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Navigating Tanzania's LNG Landscape: Towards Responsible Energy Transition and Sustainable Alternatives

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EXECUTIVE SUMMARY

The shift from fossil fuels to relatively clean energy sources has drawn significant attention to Tanzania's natural gas reserves exploration drilling. Transition to Liquefied Natural Gas (LNG) is one of the dream projects to this end. Importantly, Tanzania government is concerned with meeting energy demands, increasing rents, and joining the race to net-zero carbon emissions, making it a new hotspot for this transitional fuel. The research was conducted using multidisciplinary approach to provide a clear understanding of the complexities of LNG development lifecycle. Drawing from the lifecycle sustainability assessment framework, the report covers environmental, social, economic, and policy dimensions of LGN development. Information was gathered from the government, energy agencies, local government, civil society organizations, local leaders, local community adjacent to the project area and oil and gas industry experts.

The study found that the community is passive regarding the project's environmental impact, with a complex dilemma of project operationalization due to implementation delays. Furthermore, civil society organizations show that the gap between perceived advantages and actual outcomes underscores the importance of transparent communication and community engagement in shaping LNG development agendas. Meanwhile, the government views the projects as critical for economic growth and social development drivers.

Addressing the competing outlooks towards LNG development in Tanzania calls for more transparent communication, inclusive community engagement, and equitable distribution of ills and benefits. These emerge as indispensable pillars for ensuring sustainable developmental paradigms in Tanzania. The study recommends distributive equity, acknowledgement of host communities' contributions, procedural integrity in contractual negotiations, and proactive resolution strategies to address socio-economic ramifications. Tanzania is poised to navigate its trajectory towards a future characterized by sustainability and inclusivity in its energy transition endeavours through empowering civil society and championing efficient LNG development.

CHAPTER ONE

INTRODUCTION

1.1 Background

In an era marked by escalating concerns over climate change, environmental degradation, and the imperative transition towards sustainable energy sources, the global energy landscape is undergoing a profound transformation (Hussain, 2023). One of the pivotal countries in the global south region at the forefront of this transition is Tanzania, a nation endowed with abundant natural gas resources that have the potential to reshape not only its domestic energy sector but also contribute significantly to the global energy equation (Nkechiwetalu Nwankwo, 2023). As the world grapples with the challenge of reducing greenhouse gas emissions and mitigating the impacts of climate change, the responsible development and utilization of Tanzania's Liquefied Natural Gas (LNG) reserves have emerged as a critical focal point in the quest for a sustainable and environmentally conscious energy future (Nakanwagi, 2021).

Tanzania's LNG reserves represent a vast reservoir of clean-burning natural gas, providing an invaluable opportunity to diversify its energy mix, reduce its reliance on fossil fuels, and accelerate its journey towards responsible energy transition (Stanbic, 2022). The development of LNG infrastructure, both upstream and downstream, holds immense promise for enhancing energy access, bolstering economic growth, and fostering energy security within the country (Chuwa, 2023). Moreover, as an emerging player in the global LNG market, Tanzania stands poised to contribute positively to the broader international effort to curb carbon emissions. LNG is often touted as a transitional fuel with a lower carbon footprint than conventional hydrocarbon sources (Stanbic, 2022).

However, the path to realizing the full potential of Tanzania's LNG reserves is not without its challenges and complexities. The responsible development of this resource necessitates meticulous planning, robust regulatory frameworks, and a commitment to environmental and social sustainability (Eberhard, 2018). Managing LNG projects demands careful consideration of ecological impacts, community engagement, and the preservation of delicate ecosystems, such as the coastal regions, which are ecologically sensitive and rich in biodiversity (Bunse, 2021).

Furthermore, in the context of a rapidly evolving global energy landscape, Tanzania's decision-makers face critical choices regarding the long-term viability of LNG as an energy source (Hansson, 2019). While LNG offers immediate economic benefits and potential emissions reductions, it also raises questions about the nation's commitment to sustainable alternatives, renewable energy sources, and the fulfilment of international climate agreements (Bos, 2019). Balancing these considerations is essential for Tanzania's sustainable development and its role as a responsible global energy actor.

Therefore, this research aims to comprehensively explore Tanzania's LNG landscape, across environmental, social, economic, and policy dimensions. By assessing opportunities and challenges, it seeks to provide valuable insights and recommendations to guide Tanzania's responsible energy transition in line with global commitments. Amid the pressing need to combat climate change and transition to cleaner energy sources, Tanzania's LNG industry presents an informative case study. Through rigorous research and policy evaluation, this study aims to contribute to the broader discourse on sustainable energy transitions, offering lessons applicable to Tanzania and other nations navigating similar energy landscapes toward a more sustainable and environmentally conscious future.

1.2 Rationale of the Study

The existing literature and research on oil and gas management in Tanzania have primarily focused on economic aspects, such as revenue generation and job creation, while environmental and social impacts, along with alternatives to fossil fuels, have received limited attention (Jeuland, 2021). Furthermore, there is a gap in empowering Tanzanian civil society with the knowledge and capacity to advocate for responsible oil and gas management, particularly concerning liquefied natural gas (LNG) projects (Arregui, 2016). As Tanzania pursues an ambitious energy transition, there is a need for comprehensive research that integrates environmental, social, economic, and policy perspectives while actively involving civil society in shaping the transition (Cantarero, 2020).

This knowledge gap risks responsible oil and gas management and just energy transition. LNG projects' potential environmental and social impacts, including risks to ecosystems, biodiversity, water resources, and local communities, have not been thoroughly examined. Additionally, local civil society and key stakeholders have limited understanding regarding the evidence and advocacy capabilities to actively participate in shaping energy transition pathways and advocating for responsible oil and gas management, especially concerning LNG projects (Shelton, 2022).

The absence of a comprehensive research initiative that addresses these issues hinders informed decision-making, impedes social accountability, and may result in unsustainable energy practices. This research aims to bridge these gaps by empowering Tanzanian civil society with the necessary tools to engage effectively in advocating for responsible oil and gas management and a just transition towards sustainable energy sources, with a specific focus on LNG projects.

1.3 Objectives

This research aims to empower Tanzanian civil society with knowledge, evidence, and advocacy capabilities, enabling them to actively advocate for responsible oil and gas management and a just transition towards sustainable energy sources, with a specific focus on LNG projects. Specifically, this study intends to;

i.Explore the environmental, social, and economic aspects of LNG project in Tanzania, focusing on collecting data and evidence that can be used to advocate for responsible oil and gas management.

ii.Foster stakeholder engagement by facilitating dialogues between civil society, government agencies, industry stakeholders, and local communities to ensure that diverse perspectives are considered in decision-making processes related to LNG and broader energy transition efforts.

iii.Develop and implement training programs and workshops to enhance the knowledge and skills of Tanzanian civil society organizations in understanding the complexities of oil and gas management, including the specific challenges and opportunities associated with LNG projects. This objective seeks to empower civil society to actively engage in informed advocacy.

CHAPTER TWO

RESEARCH METHODOLOGY

2.1 Introduction

The study used a multidisciplinary research approach encompassing triangulation of various methods. The methodology adopted is essentially qualitative as it generates more depth and meaningful results to inform and enable policy transformation particularly in the LNG landscape value chain. Quantitative methodology at the end complemented qualitative findings. The inherent methodological triangulations adopted in this study enhanced novelty of the finding in informing proactive advocacy and policy relevance.

2.2 Study Area Overview

The target of this study was Liquified Natural Gas Project in Mtwara region. The rationale for selecting to study this area was based on valuable discovery of the natural gas wealth offshore and onshore. Natural gas discoveries of offshore basins are from blocks 1, 2, and 4 involving 57 trillion cubic feet in the Indian Ocean[1]. LNG project is under the Tanzania Petroleum Development Corporation in collaboration with international companies including Equinor, ExxonMobil, and Shell investing almost 30 billion USD.
[1] https://www.tanzaniainvest.com/lng

The Liquified Natural Gas Project is planned to take place in Lindi (Southern region in Tanzania) specifically in the Likongó area where the Onshore sites for the project will be centred. The discovery of the gas and LNG project Agenda started in 2014 and passed into different phases of the project mapping, actions implemented, and progressive nature of Financial Investment Decision (FDI). This project is planned to take place by 2025[1].
[1]https://www.reuters.com/business/energy/equinor-shell-exxon-agree-lng-project-with-tanzania-2023-05-19/

2.2.1 Demographic Characteristics in the Study Area

According to the National Population Census of 2022, the Lindi region has experienced a proportionate increase in population over the past decade. In 2012, the population stood at 864,652, compared to the 1,194,028 recorded in 2022. The demographic makeup of the Lindi region reveals a slight skew towards females, constituting 51% of the population, while males account for 49%. With regards to socio-economic development services the region boasts 341,398 buildings, housing 663 schools and 303 health centres. Specifically, within the Likongó-Mchinga village where the LNG project area is, there are 3,758 males and 4,098 females[1].

[1] The United Republic of Tanzania (URT), Ministry of Finance and Planning, Tanzania National Bureau of Statistics and President's Office - Finance and Planning, Office of the Chief Government Statistician, Zanzibar. The 2022 Population and Housing Census: Administrative Units Population Distribution Report; Tanzania, December 2022

2.2.2 Socio-Economic Structure of the Study Area Population

The socio-economic landscape of the project area encompasses the Likongó-Mchinga region within Lindi, where liquefied natural gas reserves are situated. This area sustains a diverse economic activity primarily centred around fishing and agriculture[1]. Notably, cashew nut cultivation predominates among local farmers, reflecting a significant portion of agricultural output. Fishing, particularly in the Indian Ocean, serves as both a means of livelihood and a source of income for the community, primarily directed towards meeting essential needs.
[1] The United Republic of Tanzania (2019) "Lindi Region Investment Guide", (ISBN: 978 - 9987 - 664 - 12 – 2)

Additionally, a variety of crops such as groundnuts, coconuts, and maize are cultivated albeit in smaller quantities. The residential architecture comprises predominantly modest mud houses with tin roofs, interspersed with a limited number of modern dwellings. Educational facilities and healthcare centres are adequately available within the area, contributing to its social infrastructure. Large expanses of the region remain undeveloped and covered with natural vegetation. The community relies predominantly on firewood for energy needs, complemented by the utilization of sunlight and solar-powered devices for illumination purposes.

2.3 Sources of Information and Data Collection Methods

The study employed primary and secondary sources of information. Data collection methods range from intensive desk review, in depth interview, focus group discussion and field observation. In pursuing a thorough and insightful exploration of the complexities surrounding LNG projects and the energy transition, the study employed a suite of primary data collection methods and complemented with quantitative data. These methods were instrumental in gathering firsthand information and perspectives from key stakeholders, communities affected by LNG projects, and experts in the field.

The primary data collection methods included key informant interviews, focus group discussions, field observations and survey. Each of these methodologies served a distinct purpose in the research process, enabling the acquisition of qualitative and quantitative data. Through these methods, the study uncovered various stakeholders' nuanced knowledge, perceptions, and concerns while also assessing the real-world impacts of LNG projects on communities and the environment. Each of the method used is explained further in the next subsections.

2.3.1 Intensive Desk Review

Extensive review of the existing literature draws from websites, reports, and data on LNG projects broadly, their environmental and social impacts, economic implications, policy frameworks, and Equinor's role in global oil and natural gas development in Tanzania. This provided a solid foundation for providing a clear understanding of the just transition research agenda in the context of LNG.

2.3.2 Key Informant Interviews

Key informant interviews were conducted involving individuals with specialized knowledge and expertise in LNG projects, energy transition, and oil and gas management. These interviews involved in-depth discussions with key stakeholders, policymakers, industry experts, and representatives from civil society organizations. This helped in collecting qualitative data, insights, and expert opinions, and provided a comprehensive understanding of the subject matter from the perspective of those deeply involved in or knowledgeable about LNG projects and energy transition.Top of Form

2.3.3 Focus Group Discussions

Focus group discussions were adopted and included various participants, including members of local communities affected by the LNG project, civil society organizations, and other relevant stakeholders. These discussions facilitated group interactions, dialogue, and sharing of opinions, perceptions, and concerns about LNG projects and the energy transition. Critically, focus group discussions offered a platform for participants to express their views collectively, uncover common themes, and generate qualitative data that can reveal community perspectives and concerns.

Two insightful sessions were conducted: one involving the Lindi Association of Non-Governmental Organizations (LANGO), and another comprising community stakeholders at Likongó, including representatives from the Lindi municipal council, LANGO, local leaders, and Project Affected Populations (PAPs). These discussions facilitated knowledge-sharing and exchange of project experiences, covering themes such as the LNG project overview, its realized and anticipated impacts, and considerations regarding energy transition and climate change. Furthermore, the discussions delved into the social and economic aspects of the Lindi region and the project area to gain a comprehensive understanding of the prevailing phenomena. Notably, both LANGO and community members raised issues associated with the project. Community members expressed concerns regarding project delays and the government's commitment to the project, while LANGO emphasized the importance of managing community expectations and highlighted the government's role in addressing climate change as a global agenda.

2.3.4 Field Observations

Physical observation was conducted directly in the Likongó area where the LNG Project Affected Persons (PAPS) are. This involved direct observation of the project sites, environmental conditions, infrastructure, and community activities. Potentially, provided firsthand information about the real-world impacts of LNG projects, including their environmental effects, changes in local landscapes, and the social dynamics of affected communities. This methodology complemented other data collection methods by offering visual and contextual data that can enhance the overall understanding of the research area.

2.3.5 Survey

A survey conducted captured quantitative data from 30 members of the host community in Lindi. Questionnaire was structured to investigate types and sources of energy the host communities used. Other questions probed respondents' knowledge about relationship between energy transition and climate change. Respondents' perception on whether LNG project should be implemented or not was also captured via the survey method. This method enabled to avoid bias in the results.

CHAPTER THREE

LIQUIFIED NATURAL GAS PROJECT LIFECYCLE

3.1 Introduction

LNG investment lifecycle sustainability assessment is the heart of this chapter findings and discussions. The assessment considers economic, social, and environmental implications of LNG just transition. Investment decision, the architect of LNG, Tanzania energy outlook, challenges of LNG development are assessed to identify gaps for advocacy and intervention. The last part of the chapter assessed energy transition in the country along with the SWOT analysis of LNG and other renewable energy alternatives.

3.2 LNG Investment Decision

The LNG project in southern Tanzania faces inherent challenges due to its large financial investment requirements and the need for collaboration between various stakeholders. These factors contribute to the project's complexity, evident in the ongoing delays around the final investment decision and the sheer scale required for completion. The delayed investment decision raises scepticism that a business-as-usual scenario is lingering in the probable emerging industries without adequately addressing the equity, inclusion, access, and benefit-sharing rights of those who also hold rights to the same resource (Kamat et al., 2019)

Further complicating matters are the socio-political landscape of Tanzania and the project's nascent nature. Without existing infrastructure to support the LNG project, these additional complexities may lead to even more significant delays in getting the project kickstart. However, the anticipated growth from the LNG industry will boost living standards and better social service provision in the host community. The gaps between the anticipated growth of wealth and development associated with the LNG industry, prompts assessment on the local community’s livelihood and sustainability in a long run (Ayifli et al., 2014).

3.2.1 The pre-and post-final Investment Decision

The Final Investment Decision (FID) determines whether to proceed with an LNG project. This decision depends on the economic profitability of the project or its potential failure. The period preceding the FID includes the feasibility study, pre-FEED (Front End Engineering and Design) and FEED (Front End Engineering Design) phase (Castillo et al., 2013). The feasibility study involves converting the project idea into a concept and considering risks such as global prices and geopolitical risks to determine the feasibility of the LNG project's economic viability. The FEED phase is the final stage, where the design is engineered to visualize how the completed LNG project would look like. During this phase, all LNG investors, in Tanzania's case, Equinor, ExxonMobil, TPDC, and Shell, ensure that all potential risks have been addressed and countermeasures have been considered.

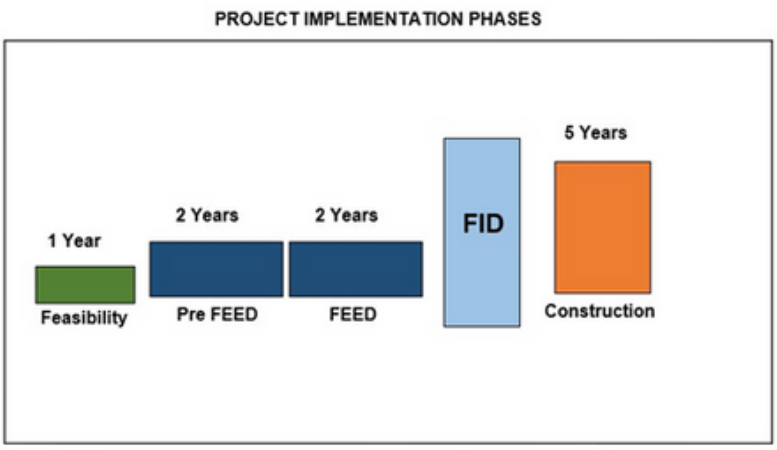

Figure 1: LNG Project Extraction Development Phases
Source: HakiRasilimali, 2024

The figure 1 above shows the ideal timeline that an LNG project needs to take place from the feasibility study to the final investment decision. To the contrary the figure 2 below shows the Tanzanian timeline that has been challenged by socio-political drivers on the ground.

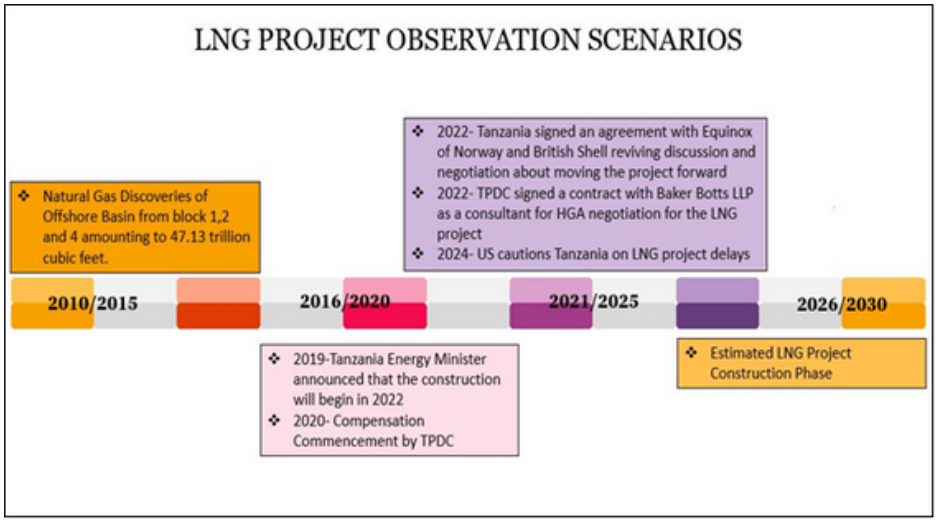

Figure 2: Observed LNG Project Development Scenarios in Tanzania
Source: HakiRasilimali, 2024

Over the past decade, Tanzania has faced significant delays in developing its natural gas reserves into a $40 billion LNG project. The COVID-19 pandemic, resource nationalism, technical and administrative bureaucracy, and other factors contributed to the delays. Despite these challenges, between 2016 and 2020, the country made progress with compensation and land transfer programmes and the "announcement" of the construction of LNG infrastructure. However, in 2024, the US government warned Tanzania about the slow pace of the project, and investors threatened to withdraw their support due to the presence of LNG in other countries. Tanzania plans to export LNG to foreign markets between 2026 and 2030, but geopolitical factors complicate matters.

The Democratic Republic of Congo has signed agreements with ENI, a prominent Italian energy company. At the same time, neighbouring Mozambique has significant gas reserves, and TOTAL, a leading investor, has resumed its LNG operations there. Foreign investors are competing for the same markets, and the push towards a decarbonised global economy leaves Tanzania's gas reserves at risk of becoming stranded assets.

3.3 The Architect of Tanzania's LNG Project

The progress of Tanzania's LNG project has been delayed for several reasons (Table 1). Social, political, and economic aspects attributed to postponing the project, thus stalling the $40 billion investment in Tanzania. COVID-19 slowed the LNG negotiations due to decreased global oil prices. These impacted the significant investors including Shell, Equinor and ExxonMobil (Stratakis and Pelagidis, 2021).

Furthermore, the Magufuli administration developed and banked on an added value industrialized-led development approach rather than the previous President, Jakaya Mrisho Kiketwe's regime, which believed in an extractive sector-development approach (Paget, 2020). The regulatory hurdles, as well as negotiations with host communities, have also led to the delay of the project. LNG, as a transitional fuel, is considered a clean alternative to fossil fuels. Hence, the development of this project is thus mutually advantageous to Shell and Equinor as global fossil fuel conglomerates. Tanzania's economic development, energy mix diversification aspirations, and the role played in increasing electricity access to the national grid influence architect of LNG transition with prolonged delays.

Table 1:Architect of Tanzania's LNG Project

Feasibility of the Project	The LNG project in Southern Tanzania, has attracted huge investments, estimated value of the project is said to over $40 billion. Though other investors such as ExxonMobil and TOTAL left the project but Shell and Equinor are still showing the will and in negotiations with the government of Tanzania.
Memorandum of Understanding	Shell and Equinor signed a MoU for formal collaboration of the LNG project in Lindi.

Commerciality	Equinor and ExxonMobil hold the license for Tanzania's Block 2, which is believed to hold some 20 Tcf of gas, while Shell operates Blocks 1 and 4 -- with estimated reserves of around 16 Tcf of gas -- in partnership with Indonesia's MedcoEnergi and Singapore's Pavilion Energy. Equinor and Shell (having 65%), and TPDC (on behalf of the Tanzanian people owning 10% working interest) will be the main operators and the risk bearers of the project as they have the largest stake in the LNG project.
Markets	Tanzania's LNG in international markets could be worth Shilling 10 trillion ($4.3 billion) per year based on today's market prices. The primary targets for Tanzania's LNG are countries such as India, China, Japan, and Korea.
Pre-Front End Engineering Design (FEED)	Statoil and ExxonMobil awarded to KBR a contract for the pre-front end engineering and design (pre-FEED) for a prospective liquefied natural gas (LNG) facility in Tanzania.
Final Investment Decision	The final investment decision is yet to be met with estimates targeting 2025. However, with the current local and primary election cycle of 2024-2025 investors will be keen to wait in the political climate and stability of the country. Thus, pushing the FID to 2028-2030.

Source: HakiRasilimali 2024

3.4 Tanzania's Energy Outlook

The overall primary energy supply in Tanzania has been cyclical and has fluctuated with time. Although it has increased in absolute terms, the rate of expansion has varied over the years. Between 1990 and 1995, it increased by 13.2%, and between 1995 and 2000, it grew by 22.14% (MEM, 2015).

However, the expansion of the energy supply reduced to 14.6% between 2000 and 2005 and further to 11.85% between 2005 and 2010 (MEM, 2015). It increased again to 14.66% between 2010 and 2015, but between 2015 and 2017, it fell sharply to 3.21%, (Jammeh et al., 2022). These fluctuations have led to access issues, indicating the need for better energy management in Tanzania.

When broken down by source, biofuels and waste are Tanzania's two primary energy sources, accounting for over 88% of the country's total energy supply (Muhihi, 2024). Following that order are hydro, natural gas, and oil, corresponding shares of 1.8%, 1.2%, and 9% (Figure 3). Compared to non-renewable energy sources, which make up 98% of the energy supply, renewable energy sources make up just about 1.2% (Muhihi, 2024). This is concerning since it shows that Tanzania's energy supply mix needs more renewable energy. Despite the energy concerns, there has been a noticeable shift from fossil fuels to renewable energy since 2015.

The share of renewable energy has increased by 0.079% between 2015 and 2017, while the share of non-renewable energy has decreased by 0.08% between 2015 and 2017 (Jammeh et al., 2022). The Tanzanian government's efforts to priorities renewable energy investment in the energy sector through the national energy strategy and the Five-Year Development Plan are primarily responsible for the shift towards renewable energy after 2015. Regrettably, there are now relatively few investments being made in renewable energy. This might make it more difficult for the nation to meet its renewable energy ambitions that are driven by the National Determined Commitments of the Paris Agreement of 2015.

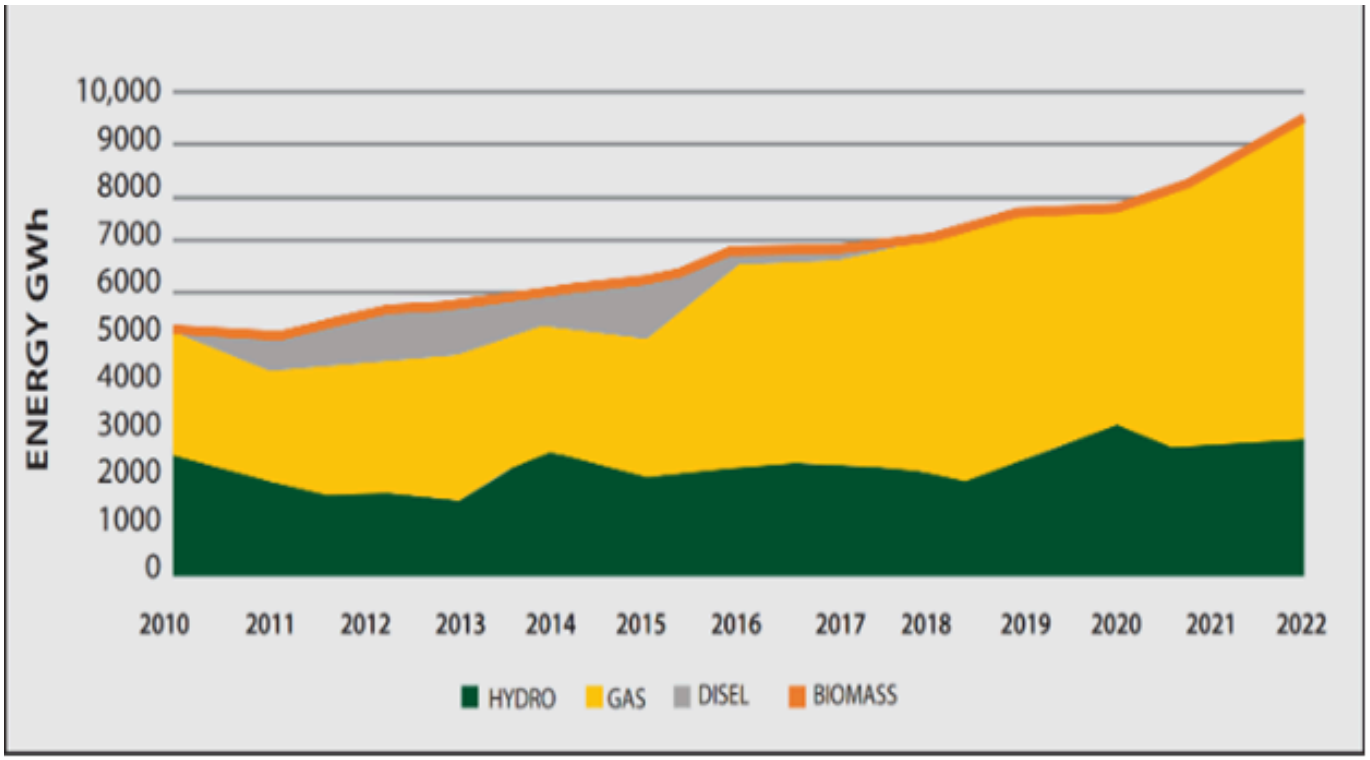

Figure 3: Tanzania Energy Sources (Power Mix) Trend 2010-2022
Source: TANESCO, 2022

As depicted in the energy mix graph above, non-renewable energy sources currently dominate Tanzania's energy supply. However, this also signifies the country's potential for significant progress towards meeting its carbon emissions targets under the Paris Agreement 2015. The government of Tanzania faces a trilemma of balancing energy demands, low carbon emissions, and sustainability (Fang et al., 2023). The LNG project in Lindi offers a promising step towards this trilemma despite LNG's transitional nature and carbon footprint. Tanzania boasts diverse energy sources, including hydropower, solar, natural gas, wind, coal, geothermal, and uranium, which hold the key to a more sustainable energy future (Haulle and Ndimbo, 2024).

Integrating renewable energy sources into Tanzania's national grid presents a unique challenge due to their intermittent nature. Solar and wind power production is weather-dependent, leading to energy availability fluctuations, particularly in the face of volatile weather patterns (Kiss et al., 2024). In order to address energy risks, Tanzania needs advanced energy storage systems to store excess energy during peak production and release it when needed. Upgrading and extending the grid infrastructure is also crucial to accommodate the scattered nature of renewable energy generation. The discourse on energy sources ultimately revolves around carbon emissions and their contribution to climate change, which poses a significant threat to Tanzania's nationally determined commitments and the global pursuit of limiting the increase in global temperature to 1.5 degrees Celsius. This underscores the urgency and global significance of the energy discussion. Table 2 illustrate how much each type of source of energy emits during its lifecycle.

Table 2: Extent each type of source of energy emits during its lifecycle

Source of Energy	gCO2e/KWh (grams of carbon dioxide equivalent per kilowatt-hour of electricity generated)
Hydropower	4 g CO2e/kWh
Wind Power	11 g CO2e/kWh
Nuclear Power	12 g CO2e/kWh
Solar Power	41 g CO2e/kWh
Natural gas	290-930 g CO2e/kWh
Oil	510-1170 g CO2e/kWh
Coal	740-1689 g CO2e/kWh

Source: COWI 2023

The table 2 above comprehensively compares natural gas and hydropower plants as energy sources. Notably, it reveals that natural gas, in contrast to hydropower, significantly contributes to carbon emissions. Tanzania is currently home to several hydropower plants, including the Kidatu plant (204 MW) and the Kihansi plant (180 MW), among the largest. These plants, along with others such as Mtera (80 MW), New Pangani Falls (68 MW), Hale (21 MW), Nyumba ya Mungu (8 MW), and Uwemba (0.84 MW), contribute to the country's renewable energy portfolio (WB, 2018). Furthermore, Tanzania is actively pursuing additional hydropower projects, including the Julius Nyerere hydropower plant (2115 MW), the Rusumo hydropower project (80 MW), the Magarasi hydropower project (49.5 MW), and the Kakono hydropower project (87.8 MW) (WB, 2018).

Tanzania's hydropower capacity produces renewable energy with minimal emissions and waste and creates reservoirs that foster recreational activities like fishing, swimming, and boating. These activities, in turn, boost tourism and local economies. In contrast, natural gas production and liquefaction into LNG often face geographical limitations, especially in remote areas as it requires costly installations, and can adversely affect water quality and flow. Therefore, the advantages of the hydropower plant projects outweigh the disadvantages if Tanzania aims to achieve the Paris Agreement's energy transition goals in light of their potential.

3.5 Challenges facing LNG Development in Tanzania

Tanzania LNG development faces several challenges ranging from environmental concerns, long lead times investment in LNG infrastructure, economic concerns of price volatility and geopolitical instability as well as social safeguards concerns.

3.5.1 Environmental Concerns

While global policymakers may view LNG as a transitional source of energy towards a decarbonized economy, it's crucial to underscore the environmental, economic and political risks it poses (Daudu et al., 2024). LNG, increasingly used in the global shipping industry, significantly contributes to a new global climate catastrophe. The primary component of LNG, methane, is a potent greenhouse gas, 30 times more harmful over time and 80 times more potent in the near term than carbon dioxide (Sakr, 2024). Methane leaks during the LNG manufacturing and delivery chain, escaping from ship funnels and seeping into the atmosphere. These leaks, often underreported, contribute significantly to global warming, making LNG a questionable choice to transition to a decarbonized economy (Kong et al., 2023).

3.5.2 Long-lead Times

Investing in more LNG infrastructure, such as pipelines and export terminals, is a commitment to long-term fossil fuel dependence. These facilities have a lifespan of 20 years or more, meaning that the pollution they generate will persist for decades. This is a significant concern for countries like Tanzania, which are yet to finalize their investment decisions. Such countries risk prolonging their reliance on conventional LNG, potentially failing to meet their global commitments to the Paris Agreement.

3.5.3 Economic Concerns and Price Volatility

While LNG is still a fossil fuel with methane emissions, the genuine concern for developing countries like Tanzania is the volatility of the LNG international market and its dependence on global socio-political stability. LNG markets are susceptible to the impacts of global pandemics, country unrest, price volatility, and the depreciation of fossil fuels. The current global and non-global uncertainties significantly impact seller/buyer behaviour in the short term due to price fluctuations (Rodgers, 2015). The global prices of LNG were high in 2022–2023, leading to a decrease in demand and purchases of LNG in potentially short-term contracts or spot market activities (Xia and Li, 2024). However, the current LNG prices are relatively low, with East Asian prices averaging around $8.45 per million British thermal units (MMBtu) for the week ending March 13, 2024 (Reuters, 2024). This is a significant decrease from the high price of over $14 per MMBtu in March 2023 (Reuters, 2024). These low prices have increased spot markets, making buyers hesitant to commit to long-term contracts. These low prices are also hedged against future price increases, making it more challenging for suppliers to cover their costs, particularly for capital-intensive LNG projects such as the $40 billion delayed project in Tanzania.

3.5.4 Geopolitical Instability

Tanzania, Mozambique and the Democratic Republic of Congo are all part of the East African Community. The three countries all have natural gas reserves, with the aim of LNG development to foreign markets. Tanzania and Mozambique have already faced political and social unrest in the Cabo Delgado region of Mozambique and Kibiti region of Southern Tanzania from extremists who are “allegedly” part of the host communities (Ntaka, 2023).

Furthermore, the geopolitical consequences “might” lead to the race-to-the bottom where countries will strategize weak policies so as to attract foreign markets despite of global conditions. Having LNG development in Mozambique, Tanzania and the DRC will weaken domestic market. Though East Africa has the East African Power Pool, it is almost impossible to unify East African markets due to different policies in the region that will not favour harmonization (Mabea and Okoli, 2020).

3.5.5 Social Safeguards Concerns

LNG project related displacement is a concern for local people that call for fair and adequate compensation safeguards. Social drawbacks are linked to communities' grievances due to their earlier expectations that have not been met. This concern is associated with the delay of LNG project implementation, on one hand. On the other hand, during implementation environmental pollution if go unchecked may result into impaired human health, seaweeds farm loss and dying of fish and other social problems associated modernity and urbanization may arise due to population increase (Kweka, 2022). Social, governance and environmental accounting, as such, are important safeguards measure that communities in the project area in collaboration with civil society has to guarantee advocacy in a long run.

3.6 Energy Transition in Tanzania

In a significant stride towards combating climate change, Tanzania has steadfastly committed to transitioning from fossil fuels to renewable energy. This commitment, coupled with the energy challenges of ensuring affordable, reliable, and sustainable energy by 2030, is a testament to Tanzania's determination to fuel its economic growth with clean energy (Rugaimukamu, 2023). As per the 2020 National Power System Master Plan, Tanzania generates over 50% of its electricity from natural gas, and 37% from hydropower (Citizen, 2023). This significant difference highlights the potential for foreign investment in renewable energy to facilitate the transition towards clean energy. The PSMP aims to shift Tanzania's energy mix to 28% from hydropower, 33% from natural gas, 26% from coal, and slightly over 12% from wind, solar, and geothermal sources by 2044 (Rweyendela et al., 2023a). However, it is unlikely that Tanzania will achieve its energy goals except through hydropower projects.

However, hydropower projects are also not reliable as they depend on rainfall and other water sources. Rainfall and other water sources have been impacted by climate change, thus causing intermittency and unreliability of renewable energy sources. Intermittency impacts renewable energy systems as we rely on the sun, wind and water to generate electricity which are not always readily availed.

3.7 LNG and Renewable Energy Systems SWOT Analysis

Table 3 presents SWOT analysis of LNG and other sources of renewable energy in Tanzania. Strengths wise, LNG availability geographical location is optimal in Tanzania. It is also regarded as transitional fuel with potential to enable sovereignty as long as strong institutions and favourable people centred development investment policy is guaranteed. Relatively, other RES are clean and can increases chances of transiting to sustainability in a long run. Identified weakness of LNG is methane and high costs of investment. Inherent weakness of RES relates to its intermittent nature and associated expensive costs during installation.

Table 3: LNG and other renewable energy systems SWOT analysis

Strengths	Weakness
• LNG optimal geographical location • LNG is a transitional fuel. • RES are clean sources of energy. • RES increases sustainability	• LNG releases methane • LNG is associated with high costs. • RES is intermittent. • RES is expensive to install
Opportunities	**Threats**
• LNG attracts massive foreign investments. • LNG increases local industrial linkages. • RES has low energy costs. • RES has increased conservation fit	• LNG increases geopolitical tensions and competition. • LNG brings unexpected shipping regulations. • RES faces raw material shortage. • RES faces price volatility

Source: HakiRasilimali 2024

Opportunities wise, LNG attract massive foreign investments and potential increase of local industrial linkages. RES are considered as low-cost energy source alternatives with potential to promote conservation. Transition to LNG extractive investment poses several threats to Tanzania. Geopolitical tensions and competition with complex shipping regulations threats make government to hesitate to rush to LNG dependence economy. RES also faces threats associated with raw material shortage and inherent price volatility.

Tanzania is facing an energy dilemma that poses a potential threat to its energy transition journey. Despite being a signatory to the Paris Agreement, which advocates for reducing fossil fuel use, projections indicate that Tanzania will continue to rely on fossil fuels such as coal as an energy source in the near future.

Despite this, the country still attracts investments and exports fossil fuels such as coal to Asian-European markets. According to the Bank of Tanzania, exports surpassed $140 million in December 2022, compared to $13.2 million in 2021 (BOT, 2023). Mr. Silas Olan'g, the African transition advisor from the Natural Resource Governance Institute, emphasizes the importance of developing a national strategy plan to minimize its reliance on fossil fuels and increase its usage of clean renewable energy sources (Citizen, 2023).

CHAPTER FOUR

LINDI VOICES: LNG PROJECT OUTLOOK AND CONCERNS

4.1 LNG Project Outlook

The local perspectives of LNG emanate from the host community surrounding the LNG project. Apolitical discourse contends that the people living in Likong'o village have been rightfully relocated to another place to leave room for the project. The host community of Likong'o consists mainly of fishermen, subsistence farmers, and small business owners. The government and foreign investors have relocated this population using the free prior informed consent mechanisms to avoid calamities and clashes between the host community and the LNG project, giving the project and foreign investors the Social License to Operate.

A counter narrative, however, reveals a host community member who lamented that ***"the LNG project has been promised to us, yet the President was here on AIDS day rally at the Illulu grounds. Surprisingly, the head of state on her visit, did not mention anything on the LNG project so we are waiting"*** (Interview, 2024). The host community within the wider Lindi municipality feels robbed due to the sluggish negotiations and delay in the investment decision of the LNG project that is expected in 2025. Another host community member stated that "since I am the direct impacted person of this project in my bloodline, I would like to see the project come into being in my lifetime" (PAP, 2024).

4.1.1 New "Iron Sheet" Economy

One of the host community members asserted that ***"the LNG project is yet to come in our lifetime with over a decade of failed promises towards this foreign investment. We have seen no gain from this investment apart from the compensation that removed our dried leaf rooftops, and we replaced them with iron sheets"*** (PAPs, 2024). As shown above, in this report, the LNG negotiations have taken over a decade with no concrete decisions to be made. Hence the host community has been restless as their way of life has been altered due to this huge expectation of the $40 billion investment in their backyard.

4.1.2 CSOs and LNG

CSOs in Lindi have projected that the LNG project would benefit the community. An official at LANGO (a host CSO) asserted that "even though the LNG is dirty, the LNG usage would facilitate the energy transition towards a cleaner energy source." The CSOs' views clearly show that the disadvantages of the LNG project do not outweigh the advantages of the project. CSOs call for a gradual energy transition to transform Tanzania into a carbon-free economy. However, the Ports of Mtwara still export coal to foreign markets as a source of energy. Furthermore, as a host community CSO, LANGO has agricultural programs with project-affected people, and they maintain that the project will create industrial linkages between the LNG and agriculture sectors.

4.1.3 LNG Project Impact on Subsistence Farming

The anticipated LNG project has had a huge impact on subsistence farming in the local community. Farmers claim that their socio-economic welfare has worsened since the relocation, mainly because the new farming and fishing grounds are not as fertile as those in the LNG project area. Additionally, the new fishing grounds do not yield as much fish as the ones in the LNG site. One member of the host community stated that their agricultural sector was coconut-based, but the relocation has forced them to switch to sesame and corn plantation, which do not grow well in their new farming grounds. Another community member lamented that the elderly may not be able to reap the fruits of their labour, as coconut trees take almost a decade to grow and bear fruits.

The lack of skills, capital, and fertile farming grounds has created new challenges for the community of Likong'o. Unfortunately, the prospective LNG economy will not accommodate the host community, as major extractive sector stakeholders usually invest and transplant their industries to other countries that are internationally competitive in terms of price, quality, and quantity of goods and services.

4.2. Local Energy Use: A Key to the Energy Transition

LNG is considered a temporary solution as it emits less carbon compared to other fossil fuels. However, Tanzania still needs transition from LNG to a new sustainable and decarbonized economy. The host community of Likong'o relies on firewood as their primary source of energy, which harms the environment. The community hasn't yet collaborated with the LNG project to find a way to change their energy usage, besides the potential economic benefits that could arise from participating in the LNG project's value chain. A survey conducted among 30 members of the host community indicates that firewood and other basic sources of energy are prevalent for local use (Figure 4).

4.2.1 Host Community Energy Use Survey

Energy sources used in the study area included mainly firewood. Use of gas and charcoal is relatively less noticeable.

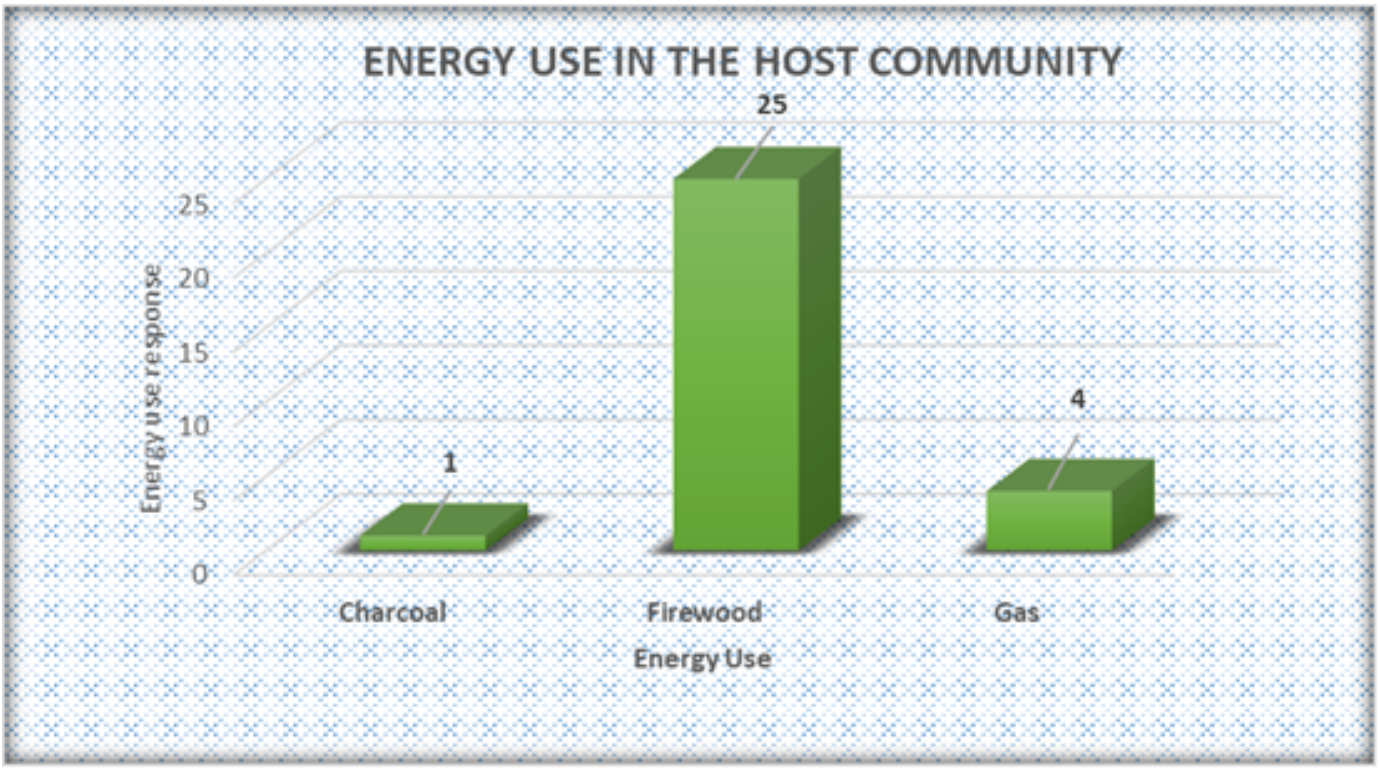

Figure 4: Types of Energy Source Used in the Host Community

Source: HakiRasilimali, 2024

The figure 4 shows that there is a high use of firewood as a source of energy. This attributed to the local economy. Indirectly the result shows partly that more than 20 respondents cannot afford to use LPG and charcoal as a source of energy for the daily lives. One of the critical initiatives in Tanzania is the "Anzia Jikoni" campaign, which aims to raise awareness about the benefits of clean cooking solutions and encourage their adoption by households across the country. The UN Capital Development Fund (UNCDF) and the United Nations Industrial Development Organization (UNIDO) are implementing this campaign with an ambitious target of increasing the use of clean cooking fuels from less than 10% currently to 80% by 2033 (Mpapalika and Mmari, 2024).

The program supports the development of a clean cooking market in Tanzania by incentivizing small and medium-sized enterprises (SMEs) to make clean cooking technologies more accessible and affordable. However, due to the low numbers of clean cooking energy users in remote areas as the Likong'o village it's is unlikely for the "Anzia Jikoni" campaign to meet its 2033 targets. This is more about commercialisation discourse. When investors target returns in investment in the first place, meaningful community investment interests is tactically perceived as generating less return. This line of thinking impends just energy transition in the global south.

4.2.2 Host Community Knowledge of the Energy Transition

The host community does not know what climate change is or what the ramifications of climate change are for a developing country like Tanzania. Figure 5 presents results regarding respondents' knowledge on energy transition and climate change. The results reveal the knowledge gap on issues of climate change and energy transition and their significance thereof.

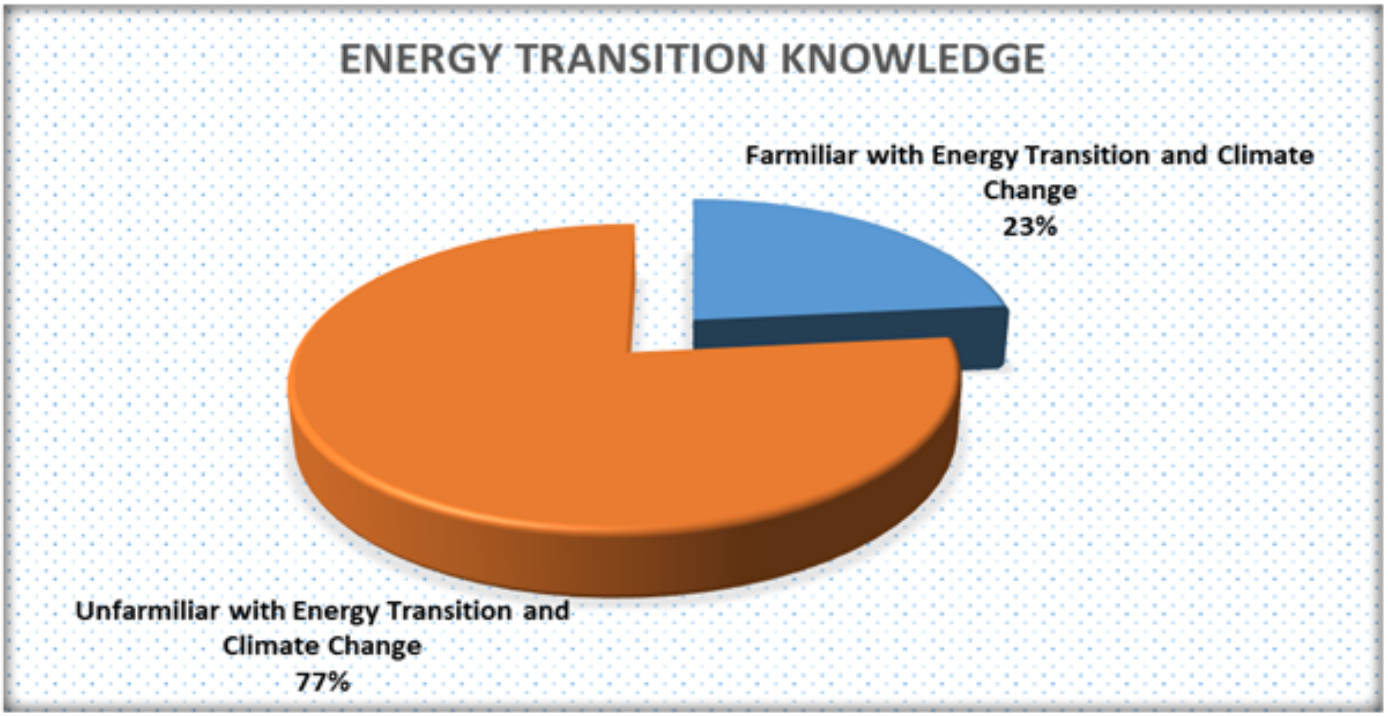

Figure 5: Respondents' knowledge about energy transition and climate change
Source: HakiRasilimali, 2024

An assessment was carried out to determine how the members of the community are informed about the issues of Energy Transition and Climate Change. The results indicate that only 23% (7 respondents) are familiar with these issues while 77% (23 respondents) are not. This knowledge gap regarding energy transition is a significant factor in the development of a decarbonized economy in Tanzania. The impacts of this gap range from socio-political to economic problem.

- **Social Impacts:** The host community's lack of knowledge on the energy transition robs the host community of opportunities in a way of living sustainably that could be advantageous to the health of the host community. Furthermore, the host community lacks access to new clean technology that could also improve their production and consumption strategies.

- **Economic Impacts:** The host community lacks linkages in renewable energy systems and how they can be catalysts in developing their host economy, through industrial linkage formation. Furthermore, the host community lacks jobs and remains reliant on fossil fuels that will hinder the clean energy transition.

- **Political Impacts:** The lack of awareness of the energy transition can also raise a public outcry and unrest towards green investments in the host community that can be implemented beyond the LNG project.

4.3. LNG Project Social License to Operate

The social acceptability of LNG projects is largely affected by the knowledge gap in the energy transition and the impacts of climate change (Table 4). The host community usually sees LNG projects as an economic opportunity to improve their livelihoods, without considering the long-term sustainability impacts of using fossil fuels. One community member asserted that ***"the government and foreign investors are the experts on the energy transition and climate change. They should develop mechanisms and strategies to mitigate the impacts of climate change and the emissions of the LNG project but leave the LNG project development in Likong'o".***

Table 4: Should the LNG project be implemented in your village?

Responses	Frequency
Yes, LNG Project should be implemented	30
No, LNG Project should not be implemented	0

Source: HakiRasilimali, 2024

Tanzania, a developing country rich in extractive resources, is pursuing export-led development strategies, particularly in the LNG sector. The positive prospects and expectations of the host community have led to an increase in the social license to operate of the LNG project in the area. Additionally, the resettled households have been reimbursed over TZS 5 billion, and foreign investors have funded more than 300 surgical procedures for community members dealing with orchitis. Shell is also constructing a modern school in the host community, which will cost TZS 1 billion. The LNG project has been granted a social license to operate with the support of the government and the local community.

4.4. LNG Project Government Outlook

Government outlook on LNG project was examined based on central government perspectives on one hand and local government perspectives on the other hand. This analysis is important because the two sets of institutions are not homogeneous when it comes to varied interests and power relations with regards to the distribution or even sharing of costs and benefits of LNG investment and associated development.

4.4.1 Central Government Outlook

The Tanzania Petroleum Development Corporation is responsible for the LNG project in Lindi, acting as its custodian and holding a significant stake in it. The project is being developed by foreign investors, mainly Equinor, Shell, and ExxonMobil with whom the Government of Tanzania (GoT) signed a host government agreement in 2023. The GoT expects the final investment decision to be made in 2025 (Kinyondo, 2024).

During a public rally at Ilulu grounds in the region, the President of Tanzania urged residents of Lindi to cooperate with investors to facilitate the smooth implementation of the project. Previously the HGA was delayed due to complexities with the production sharing agreement of existing contracts (AEP, 2019). This led to multiple suspensions of the negotiations consequently delaying the final investment decision. However, in 2022 the signing of the HGA shows that the GoT is committed to cooperating with foreign investors to develop the LNG project. According to an officer at TPDC, “the project will be economically beneficial to the country, with the local population expected to benefit by integrating the LNG value chain through the supply of goods and services”.

The central government has shown the political will to accommodate LNG investment due to the economic prospects of the project and the available markets for this transitional fuel. The extractive and agriculture industries are Tanzania's economic backbones, and their strong position enables the GoT to provide social services to the public. The GoT aims to use the LNG project to create a downstream sector to industrialize Tanzania and increase energy access through the LNG project in Lindi.

4.4.2 Local Government Outlook

The local government is the custodian of host communities serving as a bridge between the host community and the central government as well as the foreign investors. The District Commissioner, Ndemaga asserts that:

“The overall impact of the LNG project cannot be assessed as we are still in negotiations with the foreign investors. However, there have been some positive impacts of the project due to the reimbursement of the resettlement scheme, the RSK project that aims to rehabilitate the resettled communities with new fishing and agricultural practices, the foreign investors have influenced our local health, infrastructural, and education sectors” (Interview, 2024).

The local government of Lindi has been working with foreign investors to raise awareness among the public about LNG investment and to manage their expectations regarding the potential benefits of the project. The impact of climate change has disrupted the seasons and created unpredictable weather patterns, which has affected the revenue of small-scale farmers. However, due to the LNG project, the local government has seen a significant increase in land value in Lindi.

In the last fiscal year alone, the local government generated over TZS 1 billion through land surveying and sold beach plots worth over TZS 100 million. As a result, the local government views the LNG project as a new and lucrative investment that can generate substantial revenue to support the delivery of essential social services in Lindi.

4.5 The Viability of Tanzania's LNG Project

The viability of the project is an issue of major debate between environmentalists, economic development pioneers, and climate champions. The debates range on three parameters environmental concerns, as well as socio-political aspects as explained in the next subsections.

4.5.1 Environmental Viability

LNG has significant environmental consequences such as noise and air pollution, land degradation, as well as carbon emissions that exacerbate the impacts of climate change. The District Commissioner in Lindi asserted that "coal in the neighbouring region of Mtwara emits more carbon than LNG. I think we should be allowed to develop our resources if we are still exporting coal to other markets" (Interview, 2024). Furthermore, the environmental impact assessment has created carbon offset zones close to the LNG project area, conservation of beach sites and municipal areas that are being protected for land conservation purposes. Inadvertently, the emissions of the supporting infrastructure have not been considered by the local authorities. LNG requires massive shipping vessels, and energy terminals that all increase carbon emissions that increase the impacts of climate change. This project is not environmentally viable as its negative impacts outweigh its commercial value, damaging the sustainability of future generations in the host community (See also Kweka, 2022).

4.5.2 Social Viability

The Likong'o village in Lindi was a marginalized community. However, the prospects of the LNG project are giving the village a limelight that the host community will benefit from the new development. Likong'o used to be an impoverished town with nothing much happening, the LNG investment coupled with investor's corporate social responsibility and increased attention they receive from the government makes the host community blind towards the broader societal impacts and sustainability of the LNG project. Many host community members want the project to start within their lifetime as there is no other significant alternative.

The presence of the LNG project within the Likong'o village will increase rent-seeking, where locals all engage in LNG development activities leaving other sectors of production such as agriculture and fishing for the probable lucrative gains of the extractive sector. Nevertheless, Africa's trajectory of the resource curse in resource rich would definitely occur in Lindi to create a regional curse due to the presence of the natural gas and LNG development. The social drawbacks, increased population, increased corruption as well as mismanaged expectation will lead to social unrest, ultimately, making the LNG project socially unviable in the near future.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Key Findings

The comprehensive study concerning the LNG project at Likongó village provides insightful and useful benchmarks about the global Agenda of climate change and energy transition in Tanzania. Potential Stakeholders' first-hand information provided a clear picture specifically on three aspects of (i) economic aspirations, (ii) environmental concerns, and (iii) community welfare. The community aspect shows a project operationalization dilemma of anticipation and disillusionment. Despite being hopeful for the positive impact of the project but also, their concerns about fossil fuels are also passive in nature. The community shows inactiveness and non-commitment to the project's environmental impact. The community's expectations for tangible benefits for welfare improvements from the project remain largely unmet, with promises unfulfilled over a decade of negotiations. Civil Society Organizations (CSOs) project potential benefits, emphasizing an energy transition towards cleaner sources, concerns persist regarding the sustainability and inclusivity of the LNG economy. The gap between perceived advantages and actual outcomes underscores the importance of transparent communication and community engagement in shaping development agendas. Lastly, the government perspectives are subjected to economic prospects and revenue generation. the government undertakes the project as a catalyst for industrialization and social services delivery with an emphasis on environmental management for sustainability.

5.2 Conclusion

Having navigated the reality of LNG landscape in Lindi the study served in rethinking and transforming just transition within the broader context of inclusive and sustainable energy sources in the global south. The communities endowed with valuable natural gas wealth that can be harnessed to generate prosperity in the remote areas of Lindi region are still grappling with poverty. The LNG project signal a resource curse trajectory which should be avoided at any costs through participatory planning with improved social governance and environmental accounting. Inclusivity, transparency, accountability, and innovative leadership from the grassroot level to the regional, national and global scale is necessary. This must be coupled with a holistic lifecycle sustainability assessment along with advocacy, partnerships and proactive stakeholders’ engagement to negotiate appropriate pathways of sharing LNG project benefits and costs equitably.

Social services including education and health provided under the umbrella of corporate social responsibility, which is not binding to the investors, and neither is the government held accountable for its obligations could be specified and made mandatory because its motivation rests with compensating for the environmental,

health and other effects of gas extraction activities on the communities' historic livelihoods assets both on the landscape and seascape of the Western Indian Ocean. Compensation to enable adaptation and mitigation can be based on the holistic assessment of the socioeconomic and environmental impacts and not the conventional investors' self-evaluated corporate social responsibility.

Fishing community need support gears to be able to fish in the deep-sea and farming need to be linked to the LNG project. High expectations should be managed to match with the realities of the likely benefits. As LNG project impact different groups inversely, strategies to distribute the benefits need not to be homogeneous rather they should be based on equity to various groups. The explained LNG investment implications on health, environment, and society towards transition to just and equitable energy future call for proactive advocacy, policy attention and continuing participatory action research.

5.3 Recommendations

The LNG project in Tanzania has raised high expectations for the future of host communities and the country's development. The Tanzanian government has prioritized the LNG project's economic benefits. However, environmental, social, and governance concerns have been limited to investor-driven environmental impact assessments. The recommendations in this report aim to ensure justice for all stakeholders involved in the LNG project value chain. The report proposes a just energy transition while considering the context. Hence aspects of time, procedure, recognition, distributive and resolutive justice are the main proponents of the recommendations (Figure 6).

Figure 6: The Synergy of Just Energy Transition Recommendations
Source: HakiRasilimali

5.3.1 Distribution of Benefits

Distributive justice calls for the equal distribution of ills and benefits of the LNG project. Ills also represent costs or negative impacts of LNG project. Thus, considering the time aspect and price fluctuations of LNG, though LNG is a transitional fuel, the resources must be developed in a timely manner so as to reap the benefits of LNG's high prices. Furthermore, sustainability and nationally determined commitments call for the materialization of a low-carbon economy by 2030. Hence Tanzania must complete the LNG negotiations promptly to equally distribute the benefits of sustainable development.

5.3.2 Recognition of Host Communities

The local communities residing in Likong'o deserve global recognition for contributing to the LNG project. While investors and the Government of Tanzania have compensated the host communities, establishing policies and regulations is essential to safeguard their benefits. The host community must be defined by its proximity to the project and not by the citizenship of individuals seeking to benefit. Furthermore, any transplantation or rent seeking from other parts of the population should be avoided to ensure that the actual beneficiaries of the LNG project are the local communities of Likong'o.

5.3.3 Procedural Aspects of Contract Negotiation

LNG prices are closely linked to oil prices, which can fluctuate globally and cause instability. The Government of Tanzania (GoT) needs to consider both short- and long-term contracts for LNG at reduced prices, especially in East Asian markets. Long-term contracts should also include clauses for price review to protect against significant changes in market conditions. Therefore, the GoT must establish a hybrid pricing arrangement that involves a portion of the price being linked to oil, and another portion being tied to a gas or LNG benchmark. This will help ensure equitable distribution of economic benefits to the people of Tanzania.

5.3.4 Resolutive Aspects

The implementation of the LNG project has had a significant impact on the financial and social aspects of the host community and the surrounding regions. Due to increased expectations, changes in socio-economic activities, inflation of land, and an increase in population in the area, it has become necessary for investors and the Government of Tanzania (GoT) to restore the community to its previous status before the LNG project. This can be achieved by creating strong and efficient linkages between the LNG project and other economic activities. However, the extractive sector is typically disconnected from the local economy, as host communities cannot compete in terms of prices, quality, and quantity. Therefore, the GoT should focus on building local capacity, increasing awareness, and creating linkages in domestic industries to facilitate sustainable development.

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PROJECT DETAILS: The Tanzania Liquefied Natural Gas (LNG) Project

https://www.equinor.com/where-we-are/tanzania EQUINOR Tanzania

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