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Negotiating Power Acceptance for Sustainable Minigrid Project Implementation

A Grounded Theory Study of Sustainable Renewable Energy Development using East African Minigrids

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List of Abbreviations

A:RT-D Grids	Africa Research and Teaching Platform for Development- Sustainable Modular Grids for Grid Stability
CIU	Consumption Information Unit
EWURA	Electricity and Water Utilities Regulatory Authority
ERA	Electricity Regulatory Authority
FGD	Focus Group Discussions
GT	Grounded Theory
IV	Individual Interview
LCI	Local Council Chairman One
LCV	Local Council Chairman Five
PUE	Productive Use of Energy
RE	Renewable Energy
REA	Rural Electrification Authority
RDC	Resident District Commissioner
SAS	Senior Administrative Sub-chief
TANESCO	Tanzania Electric Supply Company
SE4ALL	Sustainable Energy for All
UNDP	United Nations Development Programme
WCED	World Commission on Environment and Development.

Abstract

Renewable energy project adoption is not automatic despite the lack of electricity and looming SDG7 (affordable and clean energy) timeline. Cognizant of the fact that technology-intensive engineering projects require extensive social interventions to be truly sustainable, the Africa Research and Teaching Platform for Development- Sustainable Modular Grids for Grid Stability (A:RT-D Grids) project sought an interdisciplinary approach to develop new ways of electrifying remote regions in East Africa through minigrids and their interconnections. Based on the A:RT-D Grids project and existing sustainability concerns, this study investigated the social and educational aspects of minigrid implementation in Uganda and Tanzania. Using a qualitative Straussian Grounded Theory approach, the minigrid processes, stakeholder interactions, and emerging conflicts are explored. The study presents the "negotiating power acceptance" theory, emphasizing the roles and dynamics of education and coordination strategies in the negotiation process. The study offers insights for minigrid stakeholders to improve energy access and project sustainability.

1. Introduction

> "…now that the people have understood the purpose and relevance of the electricity. It means that there is a great need …the mindset is changed and present to electricity. But to transform them from the old systems …to change to the current AC electricity, it has taken a long period to explain to the communities, for individuals to see this difference, to get them from that system to put them in the current system." (Interview 5 with local leader village 1, Paragraph 17)

> "When the electricity came here...people were scared, they therefore initially refused to embrace and accept this electricity project." (Interview 53 with former local leader, village 13 Paragraph 4)

The topic of this study is negotiating power acceptance for sustainable renewable energy development. Sustainable energy development is directly translated from the Sustainable Development Goal 7- "Ensure access to affordable, reliable, sustainable and modern energy for all." It is a topic that has generated continued interest amidst development and sustainability discourses. Lack of electricity access is a major impediment to growth and development. At present, 43% (600 million) of the total population, lacks access to electricity, most of them in Sub-Saharan Africa (International Energy Agency, 2023, p. 15). With 750 million people living in rural areas in 2020, more than 55% of Africa's total population generally has less access to basic services, including energy (International Energy Agency, 2023, p. 59). Despite the underscored urgency and magnitude of the task of transforming Africa's energy sector and the urgency of transitioning to cleaner, sustainable, and accessible energy sources, which cannot be emphasized enough, this transition is met with a formidable challenge. African nations grapple with many interconnected obstacles ranging from inadequate energy infrastructure and financial constraints to policy (Agoundedemba et al., 2023, p. 2). The Global Renewables and Energy Efficiency pledge is intended to support the tripling of renewable energy capacity globally and double the global average annual rate of energy efficiency improvements by 2030. While energy efficiency is acceptable politically, it is a complex challenge, and progress has been uneven (Chance, 2024, p. 2). This study, in accordance, seeks to comprehend social aspects and challenges related to sustainable energy implementation. Chapter 1 introduces the following components: (1.1) a background summary of research related to renewable energy projects' sustainability and acceptability, (1.2) the purpose of the study, (1.3) the need for research on the social sides of minigrid implementation, (1.4) the research questions, (1.5) the research design overview, (1.6) the conceptual framework for the study, (1.7) assumptions, scope, and delimitations, (1.8) the implications of the study, and (1.9) the structure of the thesis.

1.1 Background

The introduction of renewable energy projects does not automatically translate to electricity embrace despite the absence of electricity, the evidenced need for electricity in the remote areas in which the projects are introduced, and the looming universal sustainable development goal 7 to provide affordable and clean energy for all by 2030. Several cases of large-scale renewable energy and related technologies in different countries highlight that the deployment of these technologies is often met with opposition, leading to the construction of these being delayed or even withdrawn (Batel & Devine-Wright, 2015, p. 1). The varying responses to the energy projects, which included acceptance, rejection, interchanging acceptance and rejection, and incidents of standoffs amongst the various actors in the East African minigrid communities' energy projects identified by this study, reveal the different dynamics that are at play in the processes of introduction, implementation, and embrace of energy projects. As well, the identified deliberate and or reactive actions that influenced the acceptance status of these energy projects, and the terms and related conditions within the processes, evidenced an interrelated process of negotiating power of acceptance in the minigrid process. Emergent conflicts and the ensuing rejection, and acceptance of electricity projects and their processes brought to light the dynamics of the occurring conditions such as stakeholder credibility, access to education and information, the value attached to knowledge, resource capacity, and individual attributes that intervene in the strategies of negotiations. The Africa: Research and Teaching platform for Development- Sustainable Modular Grids for Grid Stability (A:RT-D Grids) project (https://www.art-d.net/): a project from which the research study and interests emerged, recognizes that the introduction of smart grids technology can cause unintended negative effects and that uninformed decisions by involved parties contribute to conflicts within energy project implementations. It additionally notes that as a tool for robust sustainability, technology must be in harmony with the social system, economy, ecology, and environment; therefore, within its proposals, it seeks to develop new, adapted, technology-accompanying services to ensure the long-term and sustainable use of new technologies (Krauter et al., 2019, pp. 6–7). Conflict studies reinforce the linkages of peace, participation, education, and sustainability in societies where positive peace prevails, it is assumed societies are empowered enough to take an active part in decision-making and, therefore, a sense of belonging and ownership (Fisher et al., 2000, p. 147). Critical to the success of sustainable energy for all, an inclusive, people-centered approach transition to sustainable energy that targets, amplifies, and

integrates the voices of the energy poor and most vulnerable through a multi-stakeholder approach is highlighted (Gallagher et al., 2014, p. 2).

1.2 Purpose of the Study

The purpose of this qualitative Grounded Theory study was to explore the minigrid stakeholders' interactions and their experiences with the project implementation processes to understand the subsequent relationship to the projects' sustainability status for the development of a theory that contributes to sustainable energy development. The study was conducted in the minigrid communities of Uganda and Tanzania. Participant views and experiences from national electricity regulatory authority officials, minigrid developers and operators, minigrid developers' operational partners, community administrative leaders, community local leaders, and community members were explored to provide insight into the context of the sustainability of renewable energy projects. This exploration led to the emergence of the theory of negotiating power acceptance for sustainable energy project development and implementation.

1.3 Need for Research on Social Sides of Minigrid Project Implementation

Sub-Saharan Africa remains the world region with the largest access deficit, accounting for three-quarters of the global deficit; by 2019, the access rate was 46 percent, and 570 million people still did not have access to electricity (IEA et al., 2021, p. 4) with rural areas access to electricity at only 28%, roughly 600 million people (Kyriakarakos et al., 2020, p. 1). The inadequate supply and lack of access to clean and sustainable energy have not only stifled the continent's economic growth or intensified health risks but also resulted in the over-reliance on the forest for fuel wood, which contributes to deforestation and environmental degradation (Antwi & Ley, 2021, p. 1). Yet in both electrification and renewable energy, the African landscape is littered with the remains of many "strategies" and "programs" (Tenenbaum et al., 2014). Additionally, it is noted that the demand for electricity does not necessarily grow organically and instantly after the arrival of electricity; end-user training and awareness raising are important. Understanding end-user needs and perceptions enables policymakers to deploy their tools with greater accuracy (IEA et al., 2019, p. 32). Sustainable energy transition is not a purely technological endeavor; it has a prominent social dimension as it impacts citizens and requires public support in order to be successfully realized (Perlaviciute, Steg, et al., 2018, p. 1). Findings from decades of development cooperation

projects around the world show that technology-intensive engineering projects require similarly intense social interventions to be truly sustainable (Krauter et al., 2019, p. 11). This research, therefore, sought to understand the processes of renewable energy development and its associated stakeholder dynamics using the rural minigrid East African communities to identify the different stakeholders in the process, their roles, their relationships, and the factors that contribute to the type of relationships that they have. Hence, in consequence, to identify the phenomena that are involved in the minigrid process and how they relate to a sustainable conflict-sensitive implementation of renewable energy projects. A multi-perspective stakeholders' processes and experiences exploration was necessary to contribute to an integrated approach to the sustainability of renewable energy projects.

As an educational scientist in the interdisciplinary team in the ART-D Grids project that recognized that the idea of maintenance of new technologies goes far beyond its technical aspects (Krauter et al., 2019, p. 27); the researcher was drawn by the project's interest to provide a broad social and educational perspective on the implementation of a sustainable energy supply using the cases of minigrids in East Africa.

In addition, the project's research interests coincided with the researcher's long development research studies, which sought to understand the relationship between the implementation of aid projects, projects' sustainability, and compatibility with the beneficiary communities. The researcher, therefore, was intrigued, recognized the need, and adopted the interest to understand the renewable energy development and implementation process, identify the related stakeholders and their perspectives, the emerging relationship dynamics and conflicts, and their relation to the sustainability of these renewable energy projects. Hence, the topic emerged as a potential area of research for this thesis and formed the basis of the theoretical sensitivity, which was used to initiate this research. The need to understand the sustainability of projects through their processes can also be traced in existing literature as cited in this study. Existing research has mostly focused on technical, policy, and financial challenges of energy deployment, and less attention has been paid to its social dimensions (Arende & Gonçalves, 2023; Berkeley, 2013; Bhattacharyya & Palit, 2016; Duthie et al., 2024; Palit & Chaurey, 2011). Also, it is noted that in the enthusiasm for change and innovation as drivers for societal improvement, the 'dark' and 'unintended' effects of social change and innovation often tend to be under-emphasized, as well as the fierce power struggles

and inequalities that come with it (Avelino, 2021, p. 425). This phenomenon has not been explored extensively to understand the sustainability concerns of renewable energy technologies from a social perspective; there is scanty literature to this effect. Therefore, there is practical value in researching the sustainability concerns of renewable energy projects through a social lens, which allows the exploration of the implementation process and the existing and emerging stakeholder relationship dynamics. This developed knowledge contributes to a greater understanding of the variables and notions that cause these failures and how they can be mitigated for sustainability by various stakeholders that include educational institutions, national energy policy regulators, renewable energy project developers and their operational partners, energy users, and community leaders.

1.4 The Research Problem: Sustainability Concerns of Renewable Energy Projects

The research problem - the sustainability concerns of renewable energy technology projects of this study, was identified from the highlighted existing state of failing minigrid technology projects, social-perspectives blindness of minigrid technology engineering interventions, and the related research interests of the ART-D Grids project. In its statements, the project sought to explore an interdisciplinary approach with the justification that the sustainable operation of infrastructure systems of minigrids not only depends on sound technology but also, on social and economic factors. The project also highlights existing sustainability concerns' mentality noting that, given the long history of industrialized countries helping those with "development needs", the stories about the impossibility of "real" sustainability have a lasting impact (Krauter et al., 2019, pp. 6, 27). The role of the researcher as an Educational Scientist in this interdisciplinary project awoke the researcher's interest to investigate the glaring sustainability concerns of this technical process through a social perspective lens. Additionally, the preliminary literature review conducted highlighted the concerns of failing minigrid projects long before their expiry dates and the related failure to possibilities of social concerns. Energy transitions require broader participation and changes in institutional structure. The involvement of additional stakeholders, including people on the ground and inhabitants of the affected by transition or infrastructure regions, may be crucial to improving the outcomes of decision-making processes (Komendantova et al., 2018, p. 142). Alternative narratives focus on the diverse energy needs of different people and places and the need to match these with a variety of technological and institutional options. These alternative

narratives point out the way that energy technologies become part of socio-technical and political systems and; thus, transition pathways must take account not only of technologies but also of broader social, political, and governance settings (Leach et al., 2010, p. 9). Corbin and Strauss (2015) guide that the identification of a research problem, among other ways, is choosing certain topics where funds are available for the research. The authors further state that this is quite a legitimate suggestion because often those are identified problem areas of special need (Corbin et al., 2015). Also, one may come across a problem in his or her profession or workplace for which there is no known answer. The touchstone of one's own experience might be a more valuable indicator of a potentially successful research endeavor than another more abstract source (Corbin et al., 2015). Exploring the relationship between the implementation processes and stakeholder interactions to project sustainability spoke to the researcher's previous experience, studies, and interests that sought to understand the effect of project management operations on beneficiary communities' responses and related project sustainability. Therefore, in this study, the researcher sought to investigate the sustainability concerns of renewable energy projects – an existing recognized concern- through examination of the processes that lie in renewable energy implementation, stakeholder interactions, and identification of the related dynamics and, if any, the relation to sustainability status of renewable energy projects.

Initial respondents were identified in the problem area scene, and initial interviews and observations were conducted. Chapters three and four present how based on the respondents' participation and data collected and analyzed from the minigrid communities, electricity operators, and rural electricity regulators, the area of concern becomes clearer and more focused. The field data which comprised of interviews, focus group discussions, non-participatory overt observations, and documents relevant to the emerging concepts, substantiated the emergent empirical data and allowed for insight into participants' lived experiences.

Data collection through interviews and focus group discussions with the ninety-two participants sought to encourage the emergence of underlying implicit data that would help explore and explain this thesis's area of interest and was focused on 'what, why, and how'. Observations took place during the data collection on separate occasions and these aimed at exploring the ongoing field-based interactionism between participants and complementing the interview-based data. Document review of related electricity regulatory body literature and policy documents, highlighted field reports, and stakeholder correspondence was utilized to identify patterns that

sought to broaden the collected data and either substantiate, challenge, or refute empirical data. Chapter three provides a comprehensive presentation of each data collection source used. As this research progressed, it was discovered that a core category, which is a variable derived through the systematic analysis of empirical data using Grounded Theory principles, of 'negotiation of power acceptance' emerged as a basic social process (BSP), and was explained by four emergent categories of stakeholder education, cultivating coordination, phases of negotiating power acceptance and dimensions of power acceptance. Collectively, they were used to explain the research problem through the emergent theoretical framework or theory, which presented data patterns that explained what is occurring within the research field regarding sustainability concerns of renewable energy projects.

1.5 The Research Question

To investigate the problem of sustainability concerns of renewable energy projects the following research questions were explored;

1. What are the processes of minigrid implementation, and how do they relate to the sustainability status of renewable energy projects?
2. What are the existing minigrid stakeholder interactions, and how do they relate to the implementation processes and ultimately to the projects' sustainability status?

Corbin et al. (1998) note that the research questions not only determine, to a large extent, the research methods that are used to answer them but also set the boundaries on what will be studied. The research question also helps to narrow the problem down to a workable size. Although the initial question starts out broadly, it becomes progressively narrowed and more focused during the research process as concepts and their relationships are discovered (Strauss & Corbin, 1998, p. 41).

In relation to these questions, the focus of data collection and analysis was minigrid community settings, the broader processes of minigrid development and implementation, the different stakeholders within these processes, their interactions, and how they relate to the state of minigrid project implementation. Data gathered sought to understand the concern through the perspectives of the stakeholders using interviews, focus group discussions, the study of written policies, and stakeholder interactions, as well as observing the day-to-day interactions and experiences of the

minigrid arena. Not all renewable energy means were studied; rather, only those related to the solar minigrid setting were investigated.

A qualitative Grounded Theory study was used to try to uncover the related insights and develop a theory on the sustainability of renewable energy technologies. Given the potentially layered and dimensional multi-stakeholder perspectives in the minigrid implementation processes, a quantitative research design would have been limiting in answering the stated research questions.

1.6 Overview of Research Design

This thesis is a qualitative study that derives its data collection and analysis framework from and relies upon the evolved Straussian approach of Grounded Theory principles. The Grounded Theory approach was used in this study to understand the sustainability concerns of renewable energy projects and explain the related circumstances for informed action through the exploration of the renewable energy projects implementation process and ensuing utilization of emergence, coding, and analysis. In their 1967 publication, Glaser and Strauss (1967) advocate for developing theories from research grounded in qualitative data rather than deducing testable hypotheses from existing theories (Glaser & Strauss, 2019, pp. 2–6). They propose that systematic qualitative analysis has its own logic and can generate theory (Charmaz, 2014, pp. 40, 43). Grounded Theory can help to forestall the opportunistic use of theories that have a dubious fit and working capacity (Glaser & Strauss, 2019, p. 14), and it is considered an appropriate method to rely upon for this research as it explores an unclear problem area within a social setting.

The evolved Straussian qualitative Grounded Theory approach study was used to explore and comprehend the existing and emerging processes of minigrid implementation, to investigate the interactions and relationship of these processes with the stakeholders therein, and ultimately the outcomes of their interactions on minigrid project sustainability for the development of a theory on renewable energy sustainability.

1.7 Conceptual Framework

The following concepts are defined to help the reader understand the context of each term in this study.

Sustainable Development

Sustainable development is defined by the World Commission on Environment and Development in its 1987 report, Our Common Future, as a development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 8). The report further describes sustainable development "as a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potentials to meet human needs and aspirations" (Keeble, 1988, p. 46).

The concept of sustainable development implies the need to review and understand its complex and multidisciplinary, multidimensional, and heterogeneous structure, making it one of the most complex concepts of development since the creation of humankind (Hake & Eich, 2017, p. 33).

Sustainable Energy Development

Sustainable energy development is the need to harmonize the energy development of humankind in accordance with the possibilities, i.e. natural energy resources (Hake & Eich, 2017, p. 20).

The provision of adequate and reliable energy services at an affordable cost, in a secure and environmentally benign manner, and in conformity with social and economic development needs is an essential element of sustainable development (Vera et al., 2001, p. 1).

Defining the concept and the essence of energy sustainability is a particular challenge because the list of ecologically suitable or unsuitable activities or phenomena can never be final (Hake & Eich, 2017, p. 20).

Minigrids

Minigrids are commonly described as power generation and distribution systems built to provide electricity in areas that have not been reached by the main grid or whose costs of a grid-based connection are prohibitive. Minigrids typically supply electricity to local communities, covering domestic, commercial, and industrial demand. They range in size, from systems that provide electricity to just a few customers in a remote settlement to systems that bring power to tens of thousands of customers (usually groups of households, businesses, and public institutions) in an area. In various contexts, the term minigrid is often replaced with or juxtaposed with the term microgrid (ESMAP & World Bank Group, 2022, p. 16).

Conflict Sensitivity

The phrase ‘conflict-sensitive’ or ‘conflict sensitivity’ has been at the margins of development practice since 1999; through diverse literature and interests on Peace and Conflict Impact Assessment (PCIA), a number of ‘conflict-sensitive approaches’ (CSA) have developed (Barbolet et al., 2005, p. 3). Conflict sensitivity is defined by the Resource Pack (2004) as the capacity of an organization to understand the (conflict) context in which it operates, understand the interaction between its operations and the (conflict) context; and act upon the understanding of this interaction in order to avoid negative impacts and maximize positive impacts on the (conflict) context (Alert et al., 2004, p. 1).

Conflict sensitivity is also defined as “a deliberately systematic practice that ensures that processes and actions minimize negative and maximize positive effects within a given context, based on the awareness about the interaction between the said processes and actions and the particular context” (Guide, 2019, p. 7). Key in the guiding principles of conflict sensitivity is a participatory approach, inclusiveness of actors, partnership, and networking, and respect for peoples’ ownership of their concerns among others (Alert et al., 2004, p. 5; Guide, 2019, p. 16).

Conflict Sensitive Community-Based Education for Sustainable Development

Education for Sustainable Development (hereafter referred to as ‘ESD’) is an interdisciplinary approach to learning that covers the integrated social, economic, and environmental dimensions of the formal and informal curriculum. ESD applies to all levels of education and occurs in a wide range of settings, whether in a formal, non-formal, or informal context from schooling to vocational education and workplace training, higher education, adult learning, and public awareness – as integral components of learning throughout life (UNESCO, 2005, p. 20).

The concept of Community-Based Education for Sustainable Development (CBESD) was fostered by UNESCO in 2016, with the articulation of how non-formal education and sustainable development can be brought together (Education & Development, n.d., p. 5). It brought forth the notion that the relevance of community-based non-formal education and informal learning for children, young people, and adults, especially those not in education or from marginalized or disadvantaged parts of society, must be recognized and fostered in every country of the world if the 17 Sustainable Development Goals are to be met (Brief et al., 2017, p. 1).

1.8 Assumptions, Delimitations, and Limitations

An assumption in this study was that a comprehensive exploration and understanding of the processes of minigrid implementation could be gleaned from the observation and interactions with the stakeholders in the contexts of East African minigrid communities. More so the systematic analysis of the data collected would enable the emergence of related concepts for the development of a theory to inform sustainability practices of minigrid project implementation. Another assumption was that all participants responded to questions honestly during the interviews. While studies on sustainable energy have mainly covered technical, environmental, and economic perspectives, the few that have explored social and educational sciences aspects have not explored the implications and perspectives, realities, and interactions of the stakeholders in the processes of energy implementation stakeholders: this study assumed and sought to explore a different insight into the sustainability of energy projects.

A delimitation of the study was that the participants were from Uganda and Tanzania and included ninety-two participants from fourteen (Uganda (12) and Tanzania (02)) minigrid communities, three minigrid developer companies, two operational partner companies, two academic institutions, and one electricity regulation authority. The management structures of the studied minigrids were private and community-managed operated minigrids respectively. The participant and operation scope may not fully represent the norm for all minigrid implementation projects.

The study researched cases of minigrid solar energy projects and so may not fully represent operation in other renewable energy projects that include wind, hydro, nuclear, and biomass. Larger studies, for example, that study the processes of implementation and stakeholder interactions of varied energy sources, may provide commonalities and differences with projects and processes that explain sustainable energy development.

As a team member in an interdisciplinary sustainable energy research project who has worked with community development and capacity-building projects for 12 years, the researcher likely has some unconscious and conscious biases from her workplace experience. Also, the preliminary literature review conducted for this research could also impart some bias to the study. In the classical Grounded Theory, it is feared that a literature review may contaminate and bias the researcher to lose theoretical sensitivity in the study; in contrast, Strauss and Corbin, whose Grounded Theory approach guides this study, adopt a more liberal stance, arguing that literature

can be used more actively in Grounded Theory research as long as the researcher does not allow it to block creativity and obstruct discovery. The important point for the researcher to remember is that the literature can hinder creativity if it is allowed to stand between the researcher and the data, but if it is used as an analytic tool, then it can foster conceptualization (Corbin et al., 2015). They also note that the researcher's existing experience when handled objectively contributes to enhanced theoretical sensitivity that is beneficial to the process of data collection and analysis.

1.9 Implications for Research on Practice

This study sought to understand how the minigrid implementation processes and stakeholder interactions relate to the sustainability status of renewable energy projects. Several literature on the sustainability of energy projects greatly focus on the perspective of technical, economic, and environmental perspectives (Arende & Gonçalves, 2023; Berkeley, 2013; Bhattacharyya & Palit, 2016; Duthie et al., 2024; Palit & Chaurey, 2011). Some existing sustainable energy-related social sciences studies have researched community participation and energy project rejections, however not much literature has examined the broad perspectives and aspects of the energy stakeholders on the processes of energy development and how these interrelate with the sustainability of these energy projects (Cross & Neumark, 2021; ESMAP & World Bank Group, 2022). The results of this study serve multiple stakeholders, such as national electricity regulatory bodies, minigrid developers, operational partners of minigrid developers, community leaders, and electricity users.

The theory's implication for practice is that it provides, through its emergent propositions, new potential knowledge for practitioners. The propositions, which identify, explore, and explain the interrelation of variables of processes of minigrid implementation and how they relate to the sustainability of renewable energy development, provide immense opportunity for practitioners to develop a greater understanding of similar phenomena within their energy projects in which they face rejection or non-acceptance by identifying the conditions that contribute to this state and designing action frameworks for implementation.

The participants within this thesis provide unique insight into the reality of the minigrid implementation process, i.e., their perceptions and responses as well as how these relate to the state of acceptance or rejection of these projects. Furthermore, the emergent theory provides a foundational basis and new avenues for practitioners to formulate appropriate resolution frameworks based on their contextual situation. In essence, the implication the emergent theory

and its associated recommendations could have on practice is that it creates a new thought process that helps increase insight and greater potential for successful implementation and sustainability of energy projects.

Although the emergent theory is based on a contextual situation, theories discovered through Grounded Theory are considered flexible and modifiable and can be adapted to other organizations' situations and environmental settings.

1.10 Thesis Structure

This thesis is segmented into five chapters, each retaining its own respective chapters and sections, which collectively form the entire thesis.

Chapter 1 sets forth the framework of the research, its context, and rationale, as well as the structure of the research problem and questions. The background of the research problem, sustainability concerns of minigrids projects, including the path that illuminated this research problem and ensuing research questions are presented. The discussed context of the research problem shows how this informed the applied research methodology of Grounded Theory. Assumptions and limitations of the study are highlighted, noting that, these study results of solar energy projects in Uganda and Tanzania may not be applicable to other locations and the existing circumstances in renewable energy projects emanating from other sources such as wind, hydro, nuclear, and biomass. Chapter 1 is concluded with an emphasis on the implication and relevance of the emergent theory from study to addressing knowledge gaps in research and practice of minigrid project implementation. This presents benefit to academic, policy, practice and beneficiary stakeholders contributing to sustainability of renewable energy projects.

Chapter 2 presents a preliminary review of the literature on the research problem area. The decision for the brief preliminary literature review conducted is explained through the discussion of guidelines of the chosen evolved Straussian Grounded Theory Approach. Concepts informing the sustainability of minigrid projects, and further, more specifically minigrid projects' implementation in Uganda and Tanzania, are explored. The review presented an initial conceptual background of the study, showing the sensitizing concepts that guided the initial scope of field investigations, highlighted the need for the study, and informed the initial steps of field data investigation. Chapter 2 is concluded with a discussion that relates the initial literature review conducted to the choice of the Straussian Grounded Theory approach.

Chapter 3 provides a detailed presentation of the Grounded Theory methodology principles adopted and how they were utilized within this study, including data collection and analysis (coding) processes, comparative analysis, the researcher's interaction with the process, and the adopted philosophical stance. It also includes a presentation of the Straussian Grounded Theory approach that guided this research. The step-by-step methodological presentation describes the systematic process of the research investigation, showing the place of theoretical sensitivity in respondents' selection and data analysis. The chapter evidences the rigor of the research undertaken which enabled the upholding of credibility and quality of the research in spite of the cited study limitations.

Chapter 4 is dedicated to presenting and discussing the results of the data analysis with a presentation of the relationships between the emergent categories and resultant theory. Using field data and existing literature, the categories of stakeholder education and cultivating coordination and their interrelated concepts – context, causes, actions, intervening conditions, and consequences are presented and discussed. This culminates in the presentation and discussion of the phenomena – negotiating power acceptance that brings together the two categories to form the explanatory emergent theory. Additionally, the interplay of the negotiating power strategies – stakeholder education and cultivating coordination during the occurring phases of negotiating power, as well as the varying dimensions of power acceptance, are put forth. The chapter concludes with a presentation and discussion of the emergent theory of negotiating power acceptance for sustainable renewable energy development.

Chapter 5 concludes the thesis's research with a summary and concluding discussion of the emergent model and its role in formulating informed action. The researcher's reflections on the emergent theory, its implications for the sustainability of renewable energy projects, and potential implications for practice and research are also presented, including research limitations and prospects for future research.

2. Literature Review

This chapter presents sensitizing concepts and discussions derived from the preliminary literature review conducted prior to the data collection. Drawing upon the Straussian Grounded Theory principles, the prior preliminary literature review was not comprehensive. Not only is it impossible to know prior to the investigation what the salient problems will be or what theoretical concepts will emerge, but the researcher does not want to be so steeped in the literature that he or she is constrained and even stifled by it (Corbin et al., 2015, p. 68).

This chapter, therefore, serves to provide insight into the emergence of the sensitizing concepts that guided the researcher's initial field investigation of the topic and the concepts that have contributed to the research's aims and objectives, as discussed in Chapter 1.

The researcher's focus on understanding the sustainability concerns of renewable energy projects, in particular in solar minigrid communities, guided this literature review. The social perspectives of energy projects sustainability, the existing process of the minigrid development, and the stakeholders and the dynamics therein were identified to provide an initial sensitizing framework to the study. The initial concepts and themes were further investigated while in the field.

The first section presents an understanding of the pertinent characteristics, emerging concerns, and key themes of energy development and how they relate to sustainability. The second section highlights and critically evaluates existing processes and stakeholders of minigrid development in East Africa. The concluding section briefly presents the Ground Theory's principles for facilitating the emergence of an explanatory and exploratory theory within a research area that currently remains vague and not fully addressed in the literature, which adds further justification for this thesis's area of interest.

2.1 Sustainability Concerns of Renewable Energy Development

According to the latest data, the world is making progress towards achieving Sustainable Development Goal 7 (SDG 7) but will fall short of meeting the targets by 2030 at the current rate of ambition. Thanks to significant efforts across the developing world, the global electrification rate reached 89% in 2017 (from 83% in 2010) still leaving about 840 million people without access. Sub-Saharan Africa remains the region with the largest access deficit: here, 573 million people lack access to electricity (IEA et al., 2019, pp. 1, 4). As a first step to improving access,

most governments in the region have developed national electrification strategies. Virtually every one of those strategies recommends a two-track approach to providing greater access to grid-based electrification. On the centralized track, electrification is undertaken by national governmental entities such as the state-owned national utility, a rural electrification agency (REA), or the Ministry of Energy, acting alone or together. Electrification occurs primarily through the extension of the national grid. By contrast, on the decentralized track, electrification is generally carried out through non-governmental entities such as cooperatives, community user groups, or private entrepreneurs. These entities will usually construct and operate isolated mini-grids—small-scale distribution networks typically operating below 11 kilovolts (kV) that provide power to one or more local communities and produce electricity from small generators using fossil fuels, renewable fuels, or a combination of the two (Tenenbaum et al., 2014, p. 1). However, connecting the last of the unserved populations may be more challenging than past electrification efforts, since many such populations live in remote locales or overburdened cities. To reach remote areas, off-grid solutions are essential; these include solar lighting systems, solar home systems, and—increasingly—mini-grids (IEA et al., 2019, p. 4).

However, there are also several challenges to successfully deploying RE mini-grids and especially to ensuring their long-term sustainability. These challenges include but are not limited to high up-front capital costs, low capacity factors, often higher residential tariffs compared to central grid consumers, insufficient financing support and investment, technology failures, lack of effective institutional arrangements to ensure reliable and efficient operation and maintenance over time, lack of mechanisms to address grievances, and uncertainty in the face of possible future central grid extension (Berkeley, 2013, p. 3). All too often, these initiatives are proposed with grand pronouncements from both donors and government officials. But sadly, it is not uncommon for them to achieve far less than originally envisioned because of a lack of attention to the practical aspects of implementation (Tenenbaum et al., 2014, p. 16).

Conflicts and Conflict Sensitivity

Energy infrastructure projects have caused various conflicts between stakeholders, particularly among the residents around construction sites and operators. Disputes can arise if the concerns of the community are not carefully analyzed and addressed. Additionally, limited and ambiguous

information due to imbalanced information disclosure, limited resident participation, and disregard of resident opinions and complaints heighten conflicts (Park et al., 2017, p. 3).

Noting that any intervention can have an impact on existing structures and traditions, the A:RT-D project puts forth the need for conflict-sensitive implementation. An intense conflict survey or analysis focusing on international, regional, local, and organizational contexts not only prevents unintended effects of the introduction of Smart Grid technology but also informs all parties involved about the existing needs in conflict-sensitive project management (Krauter et al., 2019, p. 26). Development interventions without conflict sensitivity can inadvertently encourage conflict, and end up doing more harm than good (Alert et al., 2004, p. 4). Social obstacles arising from improper community engagement due to a lack of collaboration with local actors and external agencies have also interfered with the acceptability of renewable energy projects (Antwi & Ley, 2021, p. 4). It is not only technological issues that pose the greatest challenge; social and economic barriers are often even more difficult to overcome (Ortiz et al., 2012, p. 342). While conflict is not new to energy transformation processes, it continues to be a concern to contend with which threatens the sustainability of the transformation projects. Even more, the dynamics of socially emanating conflicts in energy projects is one which from the literature explored, reveals gaps for further research.

Interdisciplinarity and Stakeholders

Renewable energy technologies are perceived not simply as a series of engineered artefacts performing energy conversions, but as configurations of the social and technical that have emerged contingently in particular contexts and which mirror wider social, economic, and technical relations and processes (Walker et al., 2017, p. 459). Renewable energy projects (REPs) are usually conducted in a complex environment where a lot of stakeholders and resources are involved. In any sort of project, particularly in renewable energy projects (REPs), numerous distinct and occasionally diverse interests must be contemplated. Representatives of such interests are referred to as the project stakeholders (Maqbool et al., 2020, p. 15). The A:RT-D Grids project's interdisciplinary approach is inspired by the sustainability model of the Royal Academy of Engineering (Royal Academy of Engineering, 2005, pp. 7–9). Citing the model, the project states an assumption that sustainability can only be achieved if the needs of the socio-, eco-, and technology-oriented approaches are brought to a level of convergence demanded by researchers

and practitioners while considering all consequences of that implementation into the future (Krauter et al., 2019, p. 18). In the objective to develop new ways of electrifying remote regions in East Africa; grids that, on the one hand, meet the needs of rural communities for robust and largely uninterruptible energy supply and, on the other hand, meet the politically motivated need for a centrally well-managed power supply within the framework of a national grid, the A:RT-D approach focuses on and centralizes an interdisciplinary approach (Krauter et al., 2019, p. 6). The project further emphasizes that an interdisciplinary approach makes sense since the sustainable operation of infrastructure systems not only depends on sound technology, but social and economic factors also influence sustainable operation. Combining these ideas, the A:RT-D project posed the question on how electricity grids can be made truly sustainable in an interdisciplinary way (Krauter et al., 2019, p. 18), an inquiry that gave direction to the investigation of the research.

Defining 'needs' is one of the main ways in which power within the energy assemblage is exercised, revealing that where 'needs' are closely defined, the resulting solar assemblage is orientated towards their provision (Kumar et al., 2019, p. 168). Van der Horst et al. (2021) note that minigrid communities' stakeholders are not homogeneous, they present with differences such as varying abilities to pay for electricity, existing routes for formal expression and articulation of concerns and needs relating to RE, and access to land, among others. These differences lead to tensions between formal state policies (which may look good on paper) and what happens on the ground when powerful interests interact with indigenous communities (van der Horst et al., 2021, pp. 228–230). However, a growing body of critical scholarship is beginning to re-examine these claims and the distribution of outcomes in the region's solar economy. Studies of technological innovation around energy access have concluded that a sole focus on hardware financing and private-sector entrepreneurship is unlikely to meet the needs of poor users (Cross & Neumark, 2021, p. 902). Inspite of the clear presence of an interdisciplinary, multi-stakeholder context in the energy transformation, studies examining the resulting relationship dynamics are little known.

Education and Knowledge Transfer

As societies around the world struggle to keep pace with the progress of technology and globalization, they encounter many new challenges. Energy transitions run deep into the fabric of social relations and require a fundamental change in how societies are built (Vera et al., 2001, p. 1). For societies to achieve their envisioned goals in energy transitions, all policies and initiatives

must be harmonized to aim in the same direction of change. To do so, societies must become aware of how energy transitions will change them (Döring et al., 2018, p. 1). Energy projects will not be viable unless people adopt and adequately use the related infrastructure and technology, change their behavior to adjust to the (renewable) energy supply, reduce overall energy demand, and accept policies surrounding a sustainable energy transition (Perlaviciute, Steg, et al., 2018, p. 50). People must learn to understand the complex world in which they live. They need to be able to collaborate, speak up, and act for positive change (UNESCO, 2017, p. 7). Engaging with the local actors forms an essential element of project development. Further, capacity development should be a continuous initiative, and the length of such engagement with local actors may depend on the level of absorptive capacity of a particular community and the local institutions (Bhattacharyya & Palit, 2016, p. 170). Sustainable development of our civilization will require, besides using immediate action to preserve resources and environmental capacity for future generations, to devote substantial attention to the science and technology development as well as the development of the education process (Afgan et al., 1998, p. 277)**.**

Concepts of interdisciplinarity, multiple stakeholders, participation and needs assessment, conflict sensitivity, awareness, knowledge transfer, and education emerged as sensitizing concepts to pursue in the investigation of sustainability concerns of energy projects. Further tracing the project scope of conducting an empirical study in East African minigrids, a literature review was conducted to identify the existing concepts in the arena of minigrid projects sustainability in East Africa.

2.2 East African Minigrids and Sustainability

Scoping from the A:RT-D grids' frame, preliminary literature further sought to explore the landscape and the context of sustainability of minigrids in East Africa, specifically Uganda and Tanzania, in light of the sensitizing concepts harnessed from the project proposal document and the preliminary review.

Tanzania presented a strong impetus for the country to diversify its energy mix to attain a more robust and resilient energy supply that is less subject to oil price shocks, as a result of climate change, which saw the country witness increasingly unreliable rainfall patterns and more frequent and prolonged droughts over the past two decades. These, in turn, affected the country's power sector due to its heavy dependence on hydropower. This situation induced power crises and

increased dependence on expensive and environment-polluting fossil fuels, most of which are imported (ADBG, CiF, 2013, p. 11). Noting the low electricity connection is estimated at 24 percent nationally, and only 11 percent in rural areas, the government set the goal that by the year 2025, 50 percent of the population in rural areas that have no access to the national grid will be electrified by renewable energy power (Kitonga & Bonafe, 2015, pp. 13, 27). Tanzania regards the Sustainable Energy for All (SE4ALL) as an implementation tool for the emerging Sustainable Development Goal on Energy (SDG 7) and as part of its energy sector mid-term planning. Tanzania has a series of development and sector policies and strategies, which support the country's progress towards the three SE4ALL goals: universal access, increasing the share of Renewable Energy (RE), and enhancing Electrical Energy (EE) (MEM et al., 2015, p. 10). The government of Tanzania is making significant contributions towards the development of renewable energy in the country, by providing finance through the Rural Energy Fund, and technical assistance from qualified experts in the Rural Energy Agency for feasibility studies to make projects feasible and investable. Minigrids powered by renewable energy sources account for 54 percent of installed minigrid capacity. These mini-grids based on renewable energies are providing electricity in rural areas, some of which have little realistic chance of being connected to the national grid (Odarno et al., 2017, p. 25). Just like in the reviewed energy planning policy documents, in the 2017 *"Lessons from Tanzania"*, Odarno et al. illustrate key stakeholders in the electricity sector to include government institutions, private sector operators, and nongovernmental organizations (NGOs), which cooperate to realize the development and scale-up of renewable mini-grids. The role of community is seen as customers and a source of complaints (Odarno et al., 2017, pp. 40–41). They later pick from their challenges and experiences in the field to note that community ownership and participation in project development and operations appear to be key factors for sustainability (Odarno et al., 2017, p. 54), a point that is later noted in their recommendations. Most minigrid projects are in rural areas, where it is important to include local stakeholders, not only should local priorities be taken into consideration, but the planning and implementation process should clearly define the roles and responsibilities of all stakeholders. Communities should understand the benefits of minigrid projects for the village as well as for individual households. Additionally, it is noted that a lack of coordination among stakeholders including government institutions, as well as with donors, is one of the major obstacles to the smooth planning of renewable energy mini-grids (Odarno et al., 2017, p. 54).

Uganda, at 28%, has one of the lowest electrification rates in Africa (Draft National Energy Policy, 2019). Uganda's massive energy potential has yet to be fully utilized. Around 50 % of the country's population do not have access to any form of electricity, and about 24 % have access to electricity for more than 4 hours per day. The Ugandan government, in cooperation with international partners, is involved in several projects aimed at promoting and improving the conditions and implementation of renewable energy in the country (GIZ, 2022, pp. 1–2). Minigrids provide a solution to increasing energy access, especially in hard-to-reach areas where the grid is not financially viable (UOMA, 2020, p. 3). It is highlighted that among the key barriers limiting the scale of minigrids in Uganda are financial and policy limitations, hindered access to capital, affordable cost-reflective tariff setting constraints and evolving policy on tariffs, and long bureaucratic processes on-site approval and licensing, which can take up to 18 months (UOMA, 2020, p. 4); it is also noted that operational existing minigrid projects are not sustainable due to limited consumer affordability and under-utilization. Communities are unaware of existing minigrids, limiting uptake and use; only ~30% of the installed mini-grid capacity is utilized as most of the connections are households with low energy demand. It is guided that the incorporation of community engagement increases utilization and therefore economic viability of mini-grids (UOMA, 2020, p. 11).

The preliminary review of the minigrid contexts of both Uganda and Tanzania highlights the need and relevance for renewable energy projects. It also highlights the limited embrace of the projects despite the stated desires and points to existing conflicts that hinder the effective implementation and sustainability of these projects. These existing contextual concepts further sensitized this study's preliminary areas for initial questioning and investigation.

2.3 Conclusion

The preliminary literature review highlighted the sensitizing concepts that relate to renewable energy sustainability concerns and initiated the inquiry direction of the research. These identified concepts built further investigation direction to the research questions as raised by the A:RT-D Grid project proposal document of how electricity grids can be made truly sustainable in an interdisciplinary way. Before beginning a project, a researcher can turn to the literature to formulate questions that act as a stepping-off point during initial observations and interviews. Areas for theoretical sampling can be suggested by the literature, especially in the first stage of the

research. The literature can provide insights into where (place, time, papers, etc.) a researcher might go to investigate certain relevant concepts (Corbin et al., 2015).

A review of literature on the scope of interest, i.e. minigrids in Uganda and Tanzania, also presented the concepts of the presence of various stakeholders in the minigrid implementation process and re-echoed the sustainability concerns of minigrids. While the necessity and relevance of minigrids in rural East Africa were highlighted, the existing challenges and hindrances to the implementation and sustainability were stated. The literature reviewed placed emphasis on economic, regulatory policy, and technical hindrances and limitations of the minigrid project implementation processes. Social and community insights are explored from an angle of economic limitations about failure to purchase and uptake minigrid electricity. The preliminary literature review shows the limited existence of data on social perspectives and implementation processes concerning minigrid implementation and sustainability. Grounded Theory is indicated when little is known about the area of study. Grounded Theory results in the generation of new knowledge in the form of theory; therefore, areas where little is known about a particular topic are most deserving of research effort (Birks & Mills, 2020, pp. 33–34).

This chapter has provided a knowledge-formulating literature review of the pertinent areas of renewable energy sustainability and East African minigrids concerns. The sensitizing concepts related to the general and East African (Uganda and Tanzania) minigrid projects' sustainability concerns not only informed the initial areas of inquiry of the study but also guided the choice of a Grounded Theory approach to the research that was undertaken.

3. Methodology

This chapter introduces and discusses the research methodology for this qualitative Grounded Theory study that sought to explore the implementation processes and stakeholder interactions in relation to the sustainability status of the minigrid projects. For the required deeper understanding of what is really going on in the arena of minigrid implementation, the involved stakeholders' experiences and voices were pertinent: this methodological approach was best suited as further elaborated in this chapter. It enabled systematic data analysis and the development of a theory grounded in data; a theory that contributes to the understanding of the related processes and dynamics, and their contribution to the state of minigrid project sustainability. A Grounded Theory methodology, in particular, the Straussian Grounded Theory approach, was used for this study as further detailed. The research plan, including the questions, methodology, study participants, data collection procedures, data analysis, quality and rigor, credibility, applicability, and ethical concerns of the study, are also components of this chapter.

3.1 Research Questions

The study sought to build a theory in answer to the following questions

1. What are the minigrid implementation processes, and how do they relate to the sustainability status of minigrid projects?
2. What are the existing minigrid stakeholders' interactions? How do the interactions relate to the processes of minigrid implementation; and how does this relationship affect the sustainability status of the minigrid projects?

3.2 Research Design

To explore the social dimension of minigrid implementation and related sustainability status, the exploration of the interactions and experiences of the stakeholders in the minigrid communities was necessary. A method that allowed for information to emerge and also be examined further as it evolved was required. For this, a qualitative research study was necessary. A qualitative research study seeks to examine phenomena that impact the lived reality of individuals or groups in a particular cultural and social context. Studies firmly anchored in a methodological school of thought are finely textured and nuanced – producing a much higher quality outcome (Mills & Birks, 2014, p. 34). Because this study sought to understand the processes of minigrid

implementation through the exploration of individuals'/stakeholders' experiences, perceptions, and responses to the phenomenon, a qualitative study was, therefore, the most appropriate choice.

Grounded Theory Methodology

A Grounded Theory (GT) approach was used in this study. The Grounded Theory approach is defined by Glaser and Strauss as the discovery of theory from data systematically obtained and analyzed in social research (Glasser & Strauss, 1967, p. 1). Strauss and Corbin define GT as a theory that was derived from data, systematically gathered and analyzed through the research process. The researcher begins with an area of study and allows the theory to emerge from the data (Strauss & Corbin, 1998, p. 12). Grounded Theory enables interpretation (to demonstrate how meaning is implied and how meanings are attributed to phenomena); it allows for individual and group experiences to be explicated and analyzed; and it facilitates developing the analysis conceptually and theoretically (Morse et al., 2021, p. 3).

The quest to explore the stakeholder relationships and their resulting influence on the state of the projects further informed the choice for a Straussian Grounded Theory approach that leans into a stance of pragmatism and symbolic interactionism. Corbin and Strauss (1990) note that Grounded Theory derives its theoretical underpinnings from pragmatism and symbolic interactionism. The first principle pertains to change. Since phenomena are not conceived of as static but as continually changing in response to evolving conditions, an important component of the method is to build change, through process, into the method. The second principle pertains to a clear stand on the issue of "determinism." Actors are seen as having, though not always utilizing, the means of controlling their destinies by their responses to conditions. They are able to make choices according to their perceptions, which are often accurate, about the options they encounter. Both Pragmatism and Symbolic Interactionism share this stance. Thus, Grounded Theory seeks not only to uncover relevant conditions but also to determine how the actors respond to changing conditions and to the consequences of their actions. (Corbin & Strauss, 1990, p. 5). Grounded Theory, therefore, availed to the researcher, a method that enabled this study to examine the processes of minigrid implementation and through not only exploring the related process and the stakeholders' interactions with the process but also the stakeholder's responses to these processes were investigated. This contributed to uncovering the ensuing relationship to the sustainability status of these minigrid projects.

In this method, data collection, analysis, and eventual theory stand in close relationship to one another. Grounded theories, because they are drawn from data, are likely to offer insight, enhance understanding, and provide a meaningful guide to action (Strauss & Corbin, 1998, p. 12). Through the methodology, the research study conceptualized the phenomenon of each participant's experience, to understand in abstract terms built through coding the data from interviews and building a theory based on the interpretation of their shared experiences. Accordingly, the focus was placed on the interplay between the researcher and the data. Analysis was grounded in data, the researcher aptly named emerging concepts and categories, asked stimulating questions, made constant comparisons, and extracted an innovative, integrated, realistic scheme from masses of unorganized raw data following the guiding procedures of the Straussian Grounded Theory approach (Strauss & Corbin, 1998, p. 12).

'The Basics of Qualitative Research. Techniques and Procedures for Developing Grounded Theory' book by Strauss and Corbin in their 1998 and 2015 editions, Strauss' *Qualitative Analysis for Social Scientists (1987),* Corbin's and Strauss' '*Grounded Theory Research: Procedures, Canons and Evaluative Criteria'* journal article (Corbin & Strauss, 1990), as well as *'Developing Grounded Theory. The Second Generation Revisited'* (Morse et al., 2021) formed guidance for this study, outlining the tenets of the Grounded Theory methodology used in this research study. Strauss and Corbin and the other cited Grounded Theory authors outlined procedures that, when followed to the extent circumstances permit give rigor to a research project. These among others, include data collection, coding, generating memos, theoretical sampling, consistent data analysis as it is generated to identify and relate categories, selecting core categories from coding, and generating theory. Together, the procedural steps used in the applied Grounded Theory methodology aided the researcher in continually seeing the data through a fresh lens to foster the potential for new theory to emerge from the data (Corbin et al., 2015; Corbin & Strauss, 1990; Morse et al., 2021; Strauss & Corbin, 1998).

3.3 The Role of the Researcher

To the study, the researcher brought discipline knowledge and experience in reviewing project implementation of development programs and knowledge of working with strategies that are deemed necessary to promote sustainability of less advantaged communities. The researcher worked with community capacity building and humanitarian sector projects for nine years and

holds a Bachelor's degree in Social Work and Social Administration and a Master's degree in Project Planning and Management. The researcher is experienced in conducting qualitative research. The researcher coordinated and conducted research using qualitative data collection tools that include interviews, focus group discussions, observation, and document reviews for the assessment of beneficiary capacity-building projects based on a participatory age, gender, and diversity mainstreaming basis with the intent of developing relevant humanitarian and capacity building response programs. The researcher also conducted a study that explored the effect of the implementation of the urban refugee implantation program on the self-reliance of Congolese refugees. The researcher's skills include context analysis research skills, stakeholder capacity building, and project implementation review and development. The researcher's acquired and tested research skills are necessary and facilitated her ability to conduct the designed study.

The researcher recognized that her experience and knowledge may lead to bias or the entertainment of pet concepts. The researcher, therefore, was keen to maintain objectivity and sensitivity through procedures such as obtaining multiple viewpoints of incidents through interviews, observation, written reports review, comparative thinking, memoing, consistently checking assumptions and perceptions with respondents to confirm interpretations, using literature among others as guided by Strauss and Corbin (Strauss & Corbin, 1998, pp. 44–46). This was intended to ensure that it is the voices, experiences, and interpretations of the respondents that feed into the developing theory and hence contribute, to the quality and credibility of the study.

To the study respondents, the researcher introduced herself in line with the academic institution's origin and objectives as a student from a German university conducting the study to explore social concerns related to renewable energy processes. As an outsider into these societies, the researcher was viewed by many as one who could cause a shift towards the fulfillment of their pressing needs and support the communities' lobby for the provision of electricity-related materials and services that they lacked. Mindful of the risk of this "expert/savior" related perception, and when faced with these scenarios, the researcher was consistent in stating the objectives of the study at the beginning of any inquiries and reminding the participants of these. In one instance during a focus group discussion, the respondents implored the researcher and team to train some of their interested youths as electricians since they lacked these skills, and yet the community's available trained technician was not readily available and attended to the technical challenges in an off-handed and

rude manner. In the same community, they requested the researcher and team to continue monitoring the minigrid operations to ensure community compliance to set guidelines for the efficient management of the grid. In most communities, the researcher was implored to lobby for government intervention to reduce the high unit cost of electricity and/or provide free services. Consistency with the respondents in such scenarios removed these expectations, and enabled exploration of further information relating to community capacities and ideas vis avis challenges, while not alienating them from participating in the study.

The interplay between research and researcher means that the researcher is an instrument of analysis in qualitative studies. Therefore, it is important to maintain a balance between the qualities of objectivity and sensitivity when doing analysis. Objectivity enables the researcher to have confidence that his or her findings are a reasonable, impartial representation of a problem under investigation, whereas sensitivity enables creativity and the discovery of new theory from data (Strauss & Corbin, 1998, p. 53).

In this study, no participant had a direct relationship with the researcher that represented a conflict of interest, such as a reporting relationship, contract, or any relationship with the researcher that may have imparted bias on the research study.

3.4 Study Participants

The sample was drawn from a population of stakeholders of minigrid implementation processes in Uganda and Tanzania. The scope of the minigrid communities in Uganda and Tanzania was derived from the identified interest area of research by the A:RT-D Grids project from which this study stemmed. Additionally, stemming from the sensitizing concept of community-based education for sustainable development, the researcher sought to explore the relationship, if any of knowledge transfer between academic institutions and minigrid communities. As a result, two heads of departments of Development Studies and Electrical Engineering courses at one university in Uganda, minigrid developers and operators that install and manage the operations of these projects in the communities, community leaders of these communities, both administrative and local, and community members in the areas where the minigrid projects are introduced both electricity users and non-users participated in the study. As well, rural electricity regulatory authority staff and operational partners of minigrid operators participated in the study. Open, purposive, and theoretical sampling were used to select the participants. While purposively

sampled for their presence and roles in the minigrid arena and academic institutions, open sampling was used to interview participants in the initial stages of the study

Ninety-two participants participated in this study between the period of November 2021 to January 2024 through Interviews and/or focus group discussions. All the participants were above 18 years of age. Of the 92 participants: 11 (12%) were minigrid operator staff, 2 (2%) were operational partner staff, 21 (22%) were community leaders, electricity regulatory authority officials were 2 (2%), community liaison agents were 15 (16%), 41 (44%) community members and 2 (2%) were university academic staff.

Of them, 17 (18%) were female and 75 (82%) were male. 2 (100%) of the academic institution staff were male, 10 (90%) of the eleven minigrid operator staff were male, 2 (100%) of the two minigrid operator partner staff were male, 21 (100%) of the twenty-one community leaders were male, 2 (100%) of the two electricity regulatory officer were male, 3 (20%) of the fifteen community liaison staff were female and 13 (31%) of the 41 community member respondents were female.

The participant sampling pool was limited to those participants solicited for this research as defined in this study. Written and verbal consent was sought from each participant before participating. The final number of participants was 92 (17 Female, 75 Male), as determined by saturation.

3.5 Data Collection

Approval was sought from the doctoral admissions board of the Faculty of Cultural Studies of Paderborn University. Additionally, through the A:RT-D grids project, research permits from the Uganda National Council for Science and Technology in Uganda and the Commission of Science and Technology in Tanzania were sought. Once approval was granted, the researcher, through the A:RT-D Grids project coordinator was introduced to the heads of three minigrid operator companies in Uganda and Tanzania – the scope areas of study – by email. Additionally, the researcher got an introductory letter signed by the doctoral supervisor of Paderborn University, and together with the project research permit, the researcher was then able to go to the field to carry out data collection. An informed consent form was assented to by each participant before

participating in the study. A sample of the copy is attached as an appendix at the end of this dissertation.

Initial participants were recruited through the heads and managers of the minigrid development companies and the leaders of the minigrid communities. The researcher was introduced to the heads of minigrid developer companies in Uganda and Tanzania by an email from the A:RT-D Grids project coordinator. Both in Uganda and Tanzania, the researcher was introduced and attached to field manager staff of the minigrid developer/operation companies by the company heads. The field managers introduced the researcher to the local leaders in the communities in which they operate and informed the leaders of the researcher's intent to conduct research in the communities regarding the minigrid projects. The local leaders then introduced the researcher to the community members and encouraged them to participate in the ongoing research. To the academic institutions, the researcher self-introduced herself to the heads of the Departments of Development Studies and Electrical Engineering courses.

Data collection methods of interviews, focus group discussions, observation, and document review were utilized in this study. A total of forty-seven interviews (of one to two persons) with fifty-three respondents and eight focus group discussions (of five to eight individuals) with thirty-nine participants were conducted in the five stages of data collection. Interviews and focus group discussions were conducted in person, over the phone, and during Zoom teleconferencing meetings accordingly: Forty-seven interviews (Forty-two in person, two phone interviews, three by Zoom teleconferencing) and eight focus group discussions were conducted in person.

Interview and focus group question guides were used to initiate and explore the initial sensitizing concepts of the study during the interviews and the focus group discussions. The sessions began with open-ended questions seeking to explore the knowledge regarding the process and participants in the introduction of the minigrid in the community. More intense questions followed with the intent to gather more data on the processes and the stakeholders of minigrid implementation. The discussions did not stick to questions as outlined in the question guide, the researcher only prompted participants to give information, and the responses set the direction of the topics within the scope of research to be discussed. The researcher maintained prolonged interactions with the respondents when in the field and after interviews. Follow-up discussions

over the phone were held to seek clarification and or validation of the data collected from the respondents.

The interviews concluded with more open-ended questions, framed to invite more depth regarding sustainability recommendations and prospects of the minigrid project in the community. Interview and focus group discussion participants signed a consent form and verbally consented to the interview before recording any interviews. No interview was conducted without confirming the written and verbal informed consent of the participants.

Memos were used to capture any research thoughts during and after each interview. Memos were written through the process of data collection and analysis. These varied in different forms that included observation notes, operation notes, code notes, and theoretical notes among others. Memoing and diagramming should begin with initial analysis and continue throughout the research process. Memos are important because they record the progress, thoughts, feelings, and directions of the research and researcher—in fact, the entire gestalt of the research process. Memos serve the dual purpose of keeping the research grounded and maintaining that awareness for the researcher (Strauss & Corbin, 1998, p. 218).

Additionally, observation was conducted by the researcher while in the field and during the interview sessions, noting the prevailing and presenting conditions within the community. During the interviews, the reactions, tones, postures, and attitudes of the respondents were observed, and when intrigued, the researcher inquired of them and also made notes on these observations in the memos. This contributed to the identification of areas and concepts for further data collection, and as well as enabled comparison and verification of emerging concepts from the interviews or even within the ongoing interview sessions.

The researcher additionally reviewed documents (non-technical literature) that were alluded to during the interview sessions. These included stakeholder meeting minutes, operational guidelines for minigrid operation, and written communication between stakeholders. Together with observation notes, concepts that emerged from these reviews were verified during further interviews and incorporated within the forming categories of the study.

The researcher conducted a literature review to explore the concepts of the emergent theory findings. This comparative search with other literature related to the same conceptual topics to

validate and densify the emerging theory. Additionally, the researcher shared the emerging theory with the participants of the study, the interdisciplinary project group, and the Grounded Theory colloquium colleagues' forum to obtain their feedback on the theory. At this point, the researcher presented the theory as arising from the study. Researchers can't say that they have achieved saturation until all categories show differentiation, specificity, and variation. This means well-developed categories in terms of their properties and dimensions (Morse et al., 2021, pp. 30–31).

3.5.1 Data Collection Phases

At the initial three data collection stages, during initial interactions with respondents, the question/statement, "How was the minigrid introduced to this community?" or the statement, "Tell me about the experience of minigrid introduction to this community." was used to explore relevant concepts and stakeholders to the minigrid processes, along which further inquiry was conducted. Accordingly, clarification and elaboration were elicited with follow-up questions. The researcher also sought to understand the respondents' experiences with the shared processes and how, if at all, they thought the process could have been done better.

For the first group of respondents, 40 (11 female, 29 male) respondents from three minigrid communities in central Uganda and one academic institution, open sampling and purposive sampling were conducted to explore concepts of minigrid implementation and community structure that emerged from the preliminary literature review conducted and informal discussions held with the manager of the minigrid company prior visitation of the field. The two department heads, two minigrid operator staff in Uganda, two administrative leaders (Sub County Chief and Community Development Officer), and three local leaders with whom interviews were held, were selected because they were the available personnel in the leadership positions in the field in the minigrid communities and at the university. And the 31 community member respondents who participated in five focus group discussions were purposely selected because they are residents of these communities but, at the same time, they were randomly selected from the community population to participate in the study. Open sampling can be carried out using different approaches. The researcher may look for persons, sites, or events where he or she purposefully can gather data related to categories, their properties, and dimensions (Strauss & Corbin, 1998, pp. 207–208). Preliminary interview and focus group question guides were used to explore concepts of minigrid implementation processes, participation, and education, among others in the interviews and focus group discussions conducted.

In the interviews with the university staff, the researcher sought to identify and explore the existent knowledge transfer programs between the local informal communities and the academic institutions. Student internship programs, individual staff projects which were rarely captured in the university department reports, and hosting research-practice institutions with which the university did not engage in their operations, were among the existing knowledge transfer mechanisms. No formal active knowledge practice and exchange linkages existed between the minigrid communities and the academic institution. As a result, the exploration of this concept was dropped. However, later in the field, the researcher identified linkages to practice and knowledge transfer between external universities, minigrid operators, and communities. This was seen through ongoing action research in the minigrid field conducted through the assessment, provision of electrical equipment, education, and tracking of community responses to the projects. These universities were from the United Kingdom, and the projects were ongoing in the field. The researcher's authorization for research did not extend beyond the scope of Uganda and Tanzania, hence this line of investigation was not pursued.

Study respondents for the next phases of data collection were chosen for their relevance to the emerging concepts from the systematic data analysis and comparison. Through theoretical sampling from the initial analysis of the first round of interviews, relational and variational sampling was undertaken to look out for how emerging categories relate or vary in terms of their properties and variations in the second, third, fourth, and fifth data collection phases.

In the next phase two, five participants were purposely selected as a result of theoretical sampling guided by the emerging concepts and questions arising from the initial analysis of the first set of interviews. The five male respondents included two Electricity Regulatory Authority officials, two minigrid regional manager staff, and one operational partner staff of the minigrid operator. Three were reached by email and interviews were conducted using the Zoom video conferencing medium, while one was reached and interviewed using a phone call. One follow-up interview was conducted with a local leader who had participated in the first phase interview through a phone call. In addition to interview responses, through the A:RT-D Grids project database and the minigrid operators, I obtained organizational documents (minutes of community awareness meetings) and correspondence between minigrid stakeholders and Electricity Regulatory Authority (ERA) policy documents to enable the exploration of emerging concepts and questions.

Minutes of meetings held with the operators, community leaders, and residents regarding the electricity, and letters written by two community leaders to the electricity regulator expressing discontent regarding electricity operator operation and seeking the regulator's intervention were the documents accessed from the community leaders and operators. Policy documents were accessed from the websites of the respective electricity regulatory authorities.

The third phase of the data collection was conducted in nine minigrid communities in Northern Uganda and two minigrid communities in Tanzania, 42 (05 Female, 37 Male) respondents were purposively selected as a result of theoretical sampling to discuss and explore emerging concepts of the study. These included interviews with five minigrid operator staff, seven community leaders, nine minigrid-community liaison staff, one operational partner staff, fifteen community members, and one focus group discussion with five energy committee members.

In the fourth data collection phase, conducted in Tanzania and Uganda: Five (01 Female, 04 Male) respondents, including two community administrative leaders, one community liaison minigrid operator staff, two minigrid operator management staff, and three local leaders were theoretically sampled, and interviewed to inform emerging categories of the study in a fourth phase of data collection. Follow-up engagements and discussions were held with eight community leaders in Tanzania and three community leaders in Uganda. All the respondents were purposely selected in response to the emerging concepts and categories derived from data analysis.

Prolonged interaction was maintained with the community spaces and participants while in the field, continually during transcription and data analysis stages, the researcher reached out to seek clarification on particular data collected.

In the fifth data collection phase, the researcher conducted sessions with eleven (11) male participants, who included four minigrid operator staff and seven community leaders previously interviewed to validate the researcher's interpretation of the data. The researcher conducted feedback and review sessions with four minigrid operator staff and seven community leaders previously interviewed to validate the researcher's interpretation of the data. The participants were purposely and selectively sampled through discriminate sampling with the aim of streamlining the emerging theory, validating the statements of relationship among concepts, and filling in any categories in need of further refinement. When engaged in discriminate sampling, a researcher chooses the sites, persons, and documents that will maximize opportunities for comparative

analysis. This might mean returning to old sites, documents, and persons or going to new ones to gather the data necessary to saturate categories and complete a study (Strauss & Corbin, 1998, p. 211).

3.5.2 Data Storage

Electronic copies of the completed interviews, transcriptions, coding data, field notes, and memos were saved and stored using WS-853 digital recorder, F4transkript, and F4analyze software. With the consent of the participants, all interviews and focus group discussions were recorded electronically using a conference recording service and an Olympus WS-803 Voice Recorder.

The interviews were conducted in English, Ugandan local languages (Luganda and Acholi), and Swahili language. Interpreters supported the translation processes during the interviews in the minigrid communities.

All the recorded interviews were transcribed and analyzed in English using the f4transkript software. The researcher endeavored through the transcription process to capture the verbatim occurrence of the sessions while endeavoring to capture all emerging intonations such as surprise (!), stalling and drifting (…), and local language phrases used, among others.

One notable issue was that the interviews conducted with community members and their leaders were conducted in the local language, Luganda. Even during the interviews with some minigrid operators, they preferred to use both English and Luganda simultaneously. This is a language that the interpreter is fluent in at a spoken level but not written. Language barrier was a noted issue, especially in Tanzania and Nothern Uganda. In Tanzania, the researcher was not proficient in Kiswahili language that was spoken by all the participants interviewed. In all the interviews conducted, an interpreter was used. Having a basic knowledge of the Kiswahili language, the researcher would note that, at times, the interpreters would summarize the participants' responses and or wrongly phrase a question asked. In these instances, the researcher would prompt the translator to relay the responses and questions as shared. During the transcription process, the researcher endeavored to play recordings at a slow pace so as to capture any information that may have not been relayed and or wrongly translated by the interpreters. In the interviews conducted in Northern Uganda, the researcher did not have any knowledge of the local language (Acholi), and therefore, solely depended on the hired field guide and interpreter for translation. The

researcher recognizes the possibility that some valuable information may have been lost in translation in both contexts.

Keeping in accordance with the guidance of the evolved Straussian GT approach, memos were written throughout the data collection and analysis processes. These varied in different forms including, observation, operation, code, and theoretical notes, among others. With the researcher's observation notes incorporated within them, they contributed to the identification of areas and concepts for further data collection and enabled comparison and verification of emerging concepts from the interviews. The researcher utilized both a notebook - set aside for memoing, note taking, and tracking the research process – and the F4 transkript software to jot down the memos as they came up during the ongoing data collection and data analysis processes.

Figure1 shows the phases of data collection as undertaken in this study.

Data Collection Summation						
No.	Date & Phase	Location	Type of Respondent	Data collection tool	No. of Respondents	Mode of Selection
1	1st Phase. November 2021, February 2022	Central Uganda-Island minigrid community. 03 villages	Microgrid operator field manager & Community liaison officers	Interviews (in person)	40 (11F, 29M)	Purposive Sampling
			Administrative leaders (Sub-county chief, Community Development Officer)			
			University Head of Department Staff			
			Local leaders	Focus group discussion (in person)		
			Community members			
2	2nd Phase. March 2022	Uganda-Germany	Electricity Regulatory Authority staff	Interviews (Zoom online conferencing & phone)	5M	Theoretical Sampling
			Minigrid operator regional managers			
			Minigrid Operational partner staff			
			Local community leader (follow-up interview)			
3	3rd Phase. July 2022	Central Uganda (Island minigrid community, 3 villages)	Local Community Leaders	Interviews (in person)	42(5F, 37M)	Theoretical sampling, Purposive Sampling
			Community members (electricity users)			
		Northern Uganda (09 villages)	Minigrid technicians			
			Community liaison officers			
			Local community leaders			
		Tanzania (community-run minigrid village)	Minigrid technician			
			Local community leader			
			Administrative community leader			
			Electricity committee members	Focus group discussion (in person)		
4	4th Phase. December 2022, February 2023	Northern Uganda	Administrative Leader	Interviews (in person)	5 (1F, 4M)	Theoretical Sampling
			Minigrid technician (follow-up engagement)			
			Minigrid operator manager (follow-up engagements)			
		Central Uganda	Community Liaison Officer, minigrid operational partners			
			Local leaders (follow-up engagements)			
		Tanzania (Mountainous minigrid community)	Minigrid Technician			
			Local leaders			
			Community members			
		Tanzania (community-run minigrid village)	Administrative community leaders (follow-up engagement)			
			Local community leader (follow-up engagement)			
			Electricity committee members (follow-up engagement)	Focus group discussion (in person)		
5	5th stage. July 2023, August 2023, January 2024	Tanzania	Local leaders, Administrative leaders (follow-up engagement and validation)	Focus group discussion (in person)		Theoretical Sampling
		Uganda	Minigrid Operator staff, Adminisrative leaders, local leaders (follow-up engagement and validation)	Interviews (in person)		
	Five phases of data collection. July 2023 - January 2024	Uganda and Tanzania	Minigrid stakeholders (Minigrid operator staff, operational partners, electricity regulatory officials, community administrative leaders, local community leaders, and community members)	Interviews, focus group discussions, observation, document reviews	92 (17 Female, 75Male)	Purposive Sampling, Theoretical sampling

Figure 1: Table of Data Collection Summation

3.6 Data Analysis

Data analysis commenced during the first phase of data collection. Memos were constantly written during the interview sessions to capture the observations and thought insights. These enhanced theoretical sensitivity and comparative analysis while in the field. Transcripts of the initial interviews were coded and concepts emerged. The findings and concepts emerging from the first set of interviews informed the selection of respondents and areas of further research for the next interview. The researcher did not pose direct questions to the respondents in the next stage of data collection, but rather, the open-ended questions were maintained. The emerging concepts were kept in mind and further explored during questioning if they came up or questions were brought out about them at the end of the interviews if they did not come out during the interview. Analysis should begin after the first data collection so that concepts from the initial analysis guide data collection during the next interview and/or observation and so on (Morse et al., 2021, p. 31). The data analysis process was done both manually and using the f4analyse computer-assisted qualitative data analysis software.

All interviews were transcribed and coded manually. The interviews were coded in batches of the data collection phases. During the interviews and focus group discussions, using the interview guide all respondents were asked:

- How was this minigrid project introduced to this community?
- How was and how is information and knowledge exchanged during this project?
- How did you, and how do you continue to participate in this minigrid process?
- What challenges, if any, were encountered during this process, and how were they addressed?
- How, if at all, could the process have happened differently?

The discussions did not strictly stick to these questions, but the researcher keenly listened and would seek clarification or further discussion on related issues and topics that emerged. Additionally, issues that the researcher observed but were not mentioned were incorporated in the discussions, such as distances to access minigrid services, and visible knowledge transfer means like posters, loudspeakers, or electricity blackouts that happened during interview sessions.

In addition, the researcher obtained and analyzed non-technical literature that included community engagement meeting minutes, stakeholder correspondence communication (letters), and Electricity Regulatory Authority policy guidelines for minigrid implementation. Through coding, emerging concepts and written memos guided the selection of new participants and the addition of new questions to the pool of interview guide questions. The constant comparative analysis (open coding, axial coding, selective coding), integrated with memoing and further sorting, resulted in the development of a theoretical outline – a storyline and, ultimately, the theory of negotiating power acceptance.

General-purpose software tools of F4Analyze were used to create an outline template where I was able to code, inspect, and see the emerging hierarchies of code categories through indexing, and annotating text/evidence iteratively. Using the computer program enabled the researcher to always trace and retrace the analytic steps made. Concepts, codes, categories, and memos could be easily retrieved from the data bank, making the analysis more consistent and the findings more reliable. The analysis process was done by the researcher, the computer program only offered an interface for storing, accessing, and sorting the data. It is not computer programs that make great discoveries or generate creative findings. It is researchers who make use of the programs to enhance their own capabilities to be creative and make discoveries. The computer programs make many of the chores – like recording, sifting, and sorting through data – a lot easier, leaving the researcher freer to do the thinking necessary to do "quality" analysis (Corbin et al., 2015, pp. 209–210).

A microanalysis, which is a detailed line-by-line analysis of the transcripts, was done during the initial and intermediate coding phases. This was aimed at the initial generation of concepts and initial categories (with their properties and dimensions) and to suggest relationships among categories (Strauss & Corbin, 1998, p. 57). A researcher does not have to do line-by-line analysis on each line of every document, however, line-by-line analysis is a good way to begin analysis because it enables the analyst to "open up" the data. The analyst starts by asking questions and opens up the mind to possibilities within the data this lets the data guide the analysis and truly make the analysis grounded (Morse et al., 2021, p. 34). Once categories are established, analysis becomes less micro and more focused on filling out those categories and verifying relationships.

Microanalysis includes open and axial coding and involves very careful, often minute examination and interpretation of data. At this point of interplay that takes place between the researcher and the

data, while endeavoring to remain objective, the researcher relied on her experience and knowledge to guide the process of concepts and categories development. Experience and knowledge are what sensitize the researcher to significant problems and issues in the data and allow him or her to see alternative explanations and recognize properties and dimensions of emergent concepts (Strauss & Corbin, 1998, p. 60). In line with the Straussian Grounded Theory approach; the researcher continually asked questions of the data and made theoretical comparisons which enabled the researcher to gain a better understanding of the data (Strauss & Corbin, 1998, p. 85).

Analysis in Grounded Theory research is reliant on a process of constant comparison in which each incoming segment of data is compared with existing data in the process of coding and category development. The process of data analysis in a Grounded Theory study can be divided into three phases of coding – initial, intermediate, and advanced which are open coding, axial coding, and selective coding as adopted in the evolved Straussian Grounded Theory approach (Mills & Birks, 2014, pp. 167–168).

Using open coding and comparative analysis of the initial interviews, whilst memoing; axial coding became applicable where incidents were compared to emerging codes and relationships amongst codes emerged. From the initial interview, using open coding, the researcher fractured the data into several concepts/codes as they emerged. Accordingly coupled with the memoing process, the process led the researcher to provisional answers, questions, and directions for further analysis related to the research question and emerging relationships and dimensions of the research. Through open coding, 247 open codes emerged, and as the coding progressed, the axial codes gradually became prominent.

Guided by emerging relationships and dimensions open codes were gradually grouped and linked under six categories. As the analyst moves to the next words, and the next lines, the process snowballs, with the quick surfacing of information bearing on the questions and hypotheses, and sometimes even possible crosscutting of dimensions (Strauss, 1987, p. 45).

Through the selective coding process, the researcher analyzed the codes for the core category and delimited coding to only codes that relate to the core code in sufficiently significant ways as contributing to the emerging theory. The open code of “seeking acceptance” that was identified

during the initial interview was gradually through the analysis process densified as the socially constructed code of “negotiating power acceptance”, the core category and theory of the study. The researcher accordingly analyzed data in line with the stated coding phases.

Open Coding

The initial type of coding done during a research project is termed open coding (Strauss, 1987, p. 28). As the process that commences analysis, this initial coding begins with the first data generated or collected and involves the fracturing of data into smaller segments for the purpose of comparison with other data segments from the same or other data sources (Mills & Birks, 2014, p. 168). One of the ways of doing open coding is line-by-line analysis. Doing line-by-line coding is especially important at the beginning of a study because it enables the analyst to generate categories quickly and to develop those categories through further sampling (“theoretical sampling”) along the dimensions of a category's general properties. These concepts and their dimensions are as yet entirely provisional; but thinking about these results in a host of questions and equally provisional answers, which immediately leads to further issues pertaining to conditions, strategies, interactions, and consequences (Strauss & Corbin, 1998, p. 119).

Using open coding, while continually asking questions of the data, and more importantly, looking for ‘what is going on in the data?’, the researcher was able to reduce large amounts of data to more manageable pieces of data. Concepts were identified along with their properties and dimensions, leading to the emergence of tentative categories that the researcher could explore further as a result of theoretical sampling. At this point, patterns such as actions undertaken during minigrid implementation, responses to them, and conditions relating to the minigrid projects to the communities began to emerge.

A mixed approach to microanalysis and coding was employed to enable the researcher to delve into the empirical data of the study. Saldana (2016) guides that if one’s goal is to develop new theory about a phenomenon or process, then classic or re-envisioned Grounded Theory and its accompanying coding methods (In Vivo, Process, Initial, Focused, Axial, and Theoretical Coding) are your recommended but not required options (Sadalna, 2016, p. 75). Seeking to interpret what is going on in the data, an interpretation-focused coding technique was used in the coding process. With the research question in mind and using interpretation-focused coding, you go through the participant’s response to each interview question. When a significant word, phrase, or statement is

identified, you ask yourself, what does it mean? What does the participant mean, considering his/ her background and demographic information? What does the participant want to communicate? What does he/ she want us to know? The essence of considering these questions is to get to the core meaning of the empirical indicator identified (Adu, 2019, p. 38). The excerpt and table of open codes below from field data exemplify the process of open coding as used in the study.

> "Another challenge is of electricity poles. In this village 1, they only put poles on one side. We used to call people for sensitizations and people came when they were many, and now they know about the electricity, but now you find at this time that about 40% have houses in this village 1... within the town but you find that the poles did not pass their side, they were put one side. They were few, when you look at the way the lines of electricity are set up, you see that the line did not move well, the network did not move well. So, they cannot access electricity. Poles, that is an issue, that is a very big issue, because whenever we call for sensitizations it is the first issue raised, there are even some of them that request that we wire and install their premises as they wait for the electricity poles. They think this increases their chances of getting electricity quickly." (Interview 9 with minigrid operator partner staff, Paragraph 20).

Figure 2:Table of Open Coding Illustration

Field citation	**Open codes attached**
"Another challenge is one of the electricity poles. In this village, they only put poles on one side."	Poorly fitting project implementation Unequal access to electricity service
"We used to call people for sensitizations and people came when they were many, and now they know about the electricity,"	Stakeholder education Awareness leading to project acceptance
"but now you find at this time that about 40% have houses in within this village...within the town but you find that the poles did not pass their side, they were put one side. They were few, when you look at the way the lines of electricity are set up, you see that the line did not move well, and the network did not move well. So, they cannot access electricity.	Poorly fitting project implementation Emerging inequality in access to electricity Unfulfilled desire for electricity
"Poles, that is an issue, that is a very big issue, because whenever we call for sensitizations it is the first issue raised,"	Stakeholder education Communication and coordination platforms Monitoring and evaluation Resource constraints Inability to fulfill promises and raised expectations for electricity provision

	Loss of credibility
…there are even some of them that request that they pay for the connection so that we wire and install their premises as they wait for the electricity poles. They think this increases their chances of getting electricity quickly."	Overwhelming desire for electricity Stakeholder dialogue and negotiation Trading off

Axial coding

As in the earlier discussions of microanalysis, the phases of open coding and axial coding were not distinctly separate. In axial coding, the researcher systematically developed and related categories. The developed open codes were systematically linked under their respective interrelated relationships to give rise to emerging categories. Answers to questions such as why or how come, where, when, how, and with what results, and in so doing, were used to uncover relationships among categories. The paradigm (Conditions-Actions/Interactions-Consequences) as recommended by Strauss and Corbin (1998), guided the exploration of relationships among categories but the components within it were not rigidly followed to interpret relationships of categories and concepts as cautioned by the authors. At this stage, conceptual diagrams were also utilized by the researcher to show the relationships between concepts (Strauss & Corbin, 1998, pp. 123–142).

Axial coding is an essential aspect of open coding. It consists of intense analysis done around one category at a time, in terms of the paradigm items (conditions, consequences, and so forth) which results in cumulative knowledge about relationships between that category and other categories and subcategories (Strauss, 1987, p. 32). The researcher employs this intermediate coding in two ways: firstly, to develop fully individual categories by connecting sub-categories, and fully developing the range of properties and their dimensions; and, secondly, to link categories together. While initial coding is often said to fracture the data, intermediate coding is said to reconnect the data in ways that are conceptually much more abstract than would be produced by a thematic analysis (Birks & Mills, 2020, p. 27).

As derived from the cited except in the initial coding example, an example of the researcher's memo below discusses the identified codes and their causal relationships using the axial code/ category of stakeholder education.

> "Stakeholder education is one of the strategies used to inform communities about the electricity and convince them to connect to the project. It contributes to the acceptance and embrace the electricity project processes. At the start of the project, the society is mobilized to participate in sensitization sessions. Stakeholder meetings are one of the coordination and communication platforms through which this happens. Once sensitized, the community embraced the electricity project, and there was a great desire for electricity.
>
> Resource limitations, poorly implemented programs, and unfulfilled promises intervene and limit access to electricity as well as project acceptability. The people want this electricity but now they cannot access it because of the limitations with the electricity equipment and the poorly implemented pole setting activity. To note is that not all of the community is limited by the poorly implemented project, it is only those that are at the locations where the poles were not laid.
>
> Review of the ongoing project status through village meetings is also seen to contribute to stakeholder education through which the operators and their partners get to learn about the concerns of the electricity users' concerns. The overwhelming desire for electricity caused by the awareness about the project makes some community members desperate to access electricity. They are willing to make a trade-off, to pay for the electricity and wait unknown periods of time before receiving it. Also, the failure to receive electricity as a result of equipment limitations stemming from the operator's side is making the community lose patience, and therefore put the operators under pressure to deliver and fulfill the promised access to electricity." (Memo in Interview 9 with minigrid operator partner staff, Paragraph 20).

Axial coding not only brought forth the emerging codes and their interrelated conceptual relationships but also enabled the researcher to identify areas of further questioning to clarify, validate, and or densify the identified notions in the emerging theory of negotiating power acceptance.

Selective Coding

Selective coding is the process of integrating and refining data (Corbin et al., 2015). Selective coding pertains to coding systematically and concertedly for the core category that becomes a guide to further theoretical sampling and data collection. During selective coding, understandably, the analytic memos become more focused and aid in achieving the theory's integration (Strauss, 1987, p. 33). In integration, categories are organized around a central explanatory concept through explanatory statements of relationships. Theoretical integration is aided by the use of techniques such as telling or writing the storyline, using diagrams, sorting and reviewing memos, and using computer programs (Strauss & Corbin, 1998, pp. 144–161). The goal of Grounded Theory is to generate a theory that accounts for a pattern of behavior that is relevant and problematic for those involved. The core category must be proven over and over again by its prevalent relationship to other categories. (Strauss, 1987, pp. 34–35).

In line with the methodology guidelines, the researcher employed various techniques to facilitate the data and category integration process that included descriptive and conceptual memo writing, illustration of interrelated concepts and categories through conceptual diagrams, and sorting and reviewing memos. Additionally, the researcher through presentations at the periodic colleagues' review colloquium that are guided by the supervisor, was able to present, verify, and gain confidence in the identified core category of the study. Once the theory was developed, the researcher presented it to the study respondents including the community leaders and minigrid operators, as well as colleagues for their reactions. Coupled with comparing the emergent theory with the collected raw data, presenting it to the respondents for their reactions enabled the researcher to validate that the larger concepts and categories are recognizable to the participants and that they apply to their situations. A literature review relating to the identified theory was used to densify the emergent theory of negotiating power acceptance. These contributed to the validation of the emerged theory.

F4analyse Use

A computer-assisted qualitative data analysis software, F4analyse, was used to aid in the data management and analysis process. The software was also used to support the access of transcript texts, concepts, categories, and memos within the same interface. The data analysis process was conducted manually by the researcher and the software merely acted as a storage and organizational facility that enabled efficient access to analyzed data.

3.7 Quality and Rigour

Quality in Grounded Theory research is dependent on the researcher demonstrating rigor through the use of techniques as guided by the utilized Grounded Theory approach, including demonstrating an ability to conduct the research, ensuring philosophical and methodological alignment, and the correct application of the Grounded Theory method (Mills & Birks, 2014, p. 169). Memos as a recommended useful way to maintain a research study audit trail, provide a mechanism for tracing the researcher's interactions with both participants and the data. Critically analyzing your reflective writing, therefore, is a reflexive act. Regardless of the methodological position, it is imperative for grounded theorists to be reflexive researchers (Birks & Mills, 2020, pp. 78–79). Quality qualitative research is research that resonates with readers' and participants' life experiences. It is research that blends conceptualization with sufficient descriptive detail to

allow the reader to reach his or her own conclusions about the data and to judge the credibility of the researcher's data and analysis.

Corbin and Strauss note the constant interplay between the researcher and the research act and emphasize the maintenance of a balance between objectivity and sensitivity. Objectivity enables the researcher to have confidence that his or her findings are a reasonable, impartial representation of a problem under investigation, whereas sensitivity enables creativity and the discovery of new theory from data as the data are shaped by the researcher (Strauss & Corbin, 1998, p. 53). In line with Corbin and Strauss, the researcher with sufficient training in doing qualitative research and a strong desire to do research ensured quality in this research study through ensured methodological consistency and awareness accompanied by an intensive literature review on qualitative and Grounded Theory methods specifically the Straussian Grounded Theory approach that was fitting to the circumstances of this study. This ensured methodological consistency and adherence to the recommended guidelines and procedures of the Corbin and Strauss methodological approach that was used for the study. Self-awareness, sensitivity to participants and data, and ability to connect with the creative self were enhanced through consistent memo writing, constant data comparison, and consistent debriefing and data validation sessions with peers and the respondents (Corbin et al., 2015, pp. 339–340). The multiple data collection and constant analysis means that included interviews, focus group discussion, observation, prolonged interactions with participants, constant comparison, and peer review discussions; enabled the quality and rigor of the study. Memos relating to both the data collection process and the analysis were constantly captured and referred to in this reflexive and theory-building process. The disciplinary and research experience of the researcher were self-consciously brought into the analysis in ways that intended to enhance the creative aspects of analysis rather than drive analysis. Based on the rigor exercised, the researcher is confident of the findings and the relevance and fit of the theory discovered and presented by the study.

3.8 Credibility and Applicability

Glaser and Strauss (1967) presented a research approach detailed in its level of credibility, plausibility, and trustworthiness. Grounded Theory through comparative analysis and use of different slices of data guides the correction of inaccuracies of data. The integration of a theory tends to correct inaccuracies of hypothetical inference and data and ensure that the generated

theory, substantive or formal Grounded Theory, is "accurate" in fit and relevant to the area it purports to explain. A Grounded Theory that is faithful to the everyday realities of a substantive area is one that has been carefully induced from diverse data, as we have described the process. Only in this way will the theory be closely related to the daily realities (what is actually going on) of substantive areas, and so be highly applicable to dealing with them (Glasser & Strauss, 1967, pp. 223–240).

In addition to credibility, Glaser and Strauss (1967) took up the notion of applicability, for which they also provided criteria. First, a theory should fit—that is, the area from which it was derived and in which it will be used. Second, a theory should be readily understandable by laypeople as well as professionals. Third, a theory should be sufficiently general that it can be applied to diverse situations and populations. Fourth, a theory should provide the user with sufficient control to bring about change in situations (Corbin et al., 2015, pp. 335–336).

The study was conducted using standard procedures typically used in the Grounded Theory, specifically, the Straussian GT, in its entirety. Techniques used to establish credibility included prolonged engagement with participants in the field, persistent observation, respondent validation, and peer-debriefing, member-checking, and memoing. Data collected was subjected to constant comparison, iterative questioning of the data, and returning to examine it several times. In so doing, the researcher ensured the credibility and applicability of the study.

3.9 Ethical Concerns

The researcher ensured ethics remained a top priority throughout the study. Clearance to conduct research in both Uganda and Tanzania was sought. Following the methods as outlined in this chapter was paramount in ensuring the quality, rigour, and credibility of the study. The evolved Straussian Grounded Theory approach was used in its entirety to produce the best results. Each participant had to consent to participate in the study through a consent form. This consent form was read to each participant before the interview. The consent form explained the purpose of the study as well as emphasized the confidentiality that will be exercised in the handling of data and all aspects of the study. The risks to human subjects associated with this study were minimal. All participants were over 18 years of age and did not demonstrate any impaired mental capacity, as determined by their ability to perform the positions that they hold in the workplace. Meeting these criteria qualified them as participants in this study.

To maintain the confidentiality and the anonymity of the research participants, the names of the locations visited will not be submitted in the raw data, and neither will they be mentioned in the presentation of the data procedure and findings of the study. These villages as submitted in the raw data citations and submissions are by numerical labeling e.g. village 1. The category of the respondent cited i.e. community member, local leader, administrative leader, among others is maintained to show the various sources of data collection. Additionally, all recorded materials will be erased after 5 years, following final approval by the research committee, minimizing any future risks related to confidentiality. The responsibility to finalize the research and publish the results is one that the researcher recognizes and undertakes.

3.10 Methodological Considerations

Every analyst has to accept that there are limitations to what can be discovered based on access to data, degree of analytic experience, and amount of personal reserves (Corbin et al., 2015, p. 171), and this research was no exception. Qualitative research methods, by focusing on in-depth interaction between research and participant and the emergence of theory over time, necessitate a smaller sample size and preclude data collection over long distances. Therefore, the results of this research will have less generalizability to the larger and more geographically diverse populations. Ninety respondents from fourteen minigrid communities in Uganda and Tanzania participated in the study. The communities investigated constituted private and community-managed minigrid projects. The results, despite the rigor of the applied Grounded Theory, may not apply generally to other locations.

Additionally, the evolved Straussian Grounded Theory approach recognizes the continued interplay between the researcher and the data and the risk of the researcher influencing or biasing the outcomes of the study outcomes both unintentionally and by design. With methodological guidance, the researcher strove for neutrality and objectivity in her interpretations, but there are very definite limits to objectivity. Given the population and sample constraints, the researcher's worldview, and the potential for bias, the researcher may have fallen short of attaining this neutrality.

The methodological approach strives to capture what is going on in the field of study by recognizing and harnessing the study participants' actuality. Language barriers in some of the minigrid communities necessitated that the researcher communicate with respondents using an

interpreter. The loss of the true representation of data in the interpretation and transcription process cannot be undermined. Additionally, all the mingrid communities were remote, distant, and hard to reach. These communities, which constituted of islands, mountainous, and distant locations required one to two days of travel to access, and in some cases, the researcher could not access accommodation within the community of study and had to reside at the next village or distant town council. This context limited the sufficient use of observation as a data collection tool, as the times the researcher was in the field were used to interact with the respondents during the interview sessions. Overnight and or days' residence in these communities would have facilitated observation of the community practices in their normalcy which would have further strengthened the process of comparative analysis and data validation.

4. Presentation of Research Findings

This chapter contains the results of the Grounded Theory methodology study conducted to discover an explanatory theory derived from data, which facilitates understanding of the minigrid processes and stakeholder relationships and their related contributions to projects' sustainability status. The presented findings align answers and or raise further questions to the research questions that framed this study:

1. What are the processes of minigrid implementation, and how do they relate to the sustainability status of renewable energy projects?
2. What are the existing minigrid stakeholder interactions, and how do they relate to the implementation processes and ultimately to the projects' sustainability status?

The data codes and patterns relating to minigrid processes and stakeholder interactions in renewable energy projects are brought together to explain 'what is occurring in the research field' and 'weaved to present a cohesive theoretical framework that explains what, how, and why of the presenting status on minigrid projects' sustainability. A core phenomenon of 'negotiating power acceptance' and its related categories of 'stakeholder education' and 'cultivating coordination', which emerged from within the data, are presented in this chapter as the foundational elements upon which the theory evolved. Negotiating power acceptance is actualized through the strategies of stakeholder education and cultivating coordination that are traced in the progressing and/or simultaneously happening stages of negotiation - initiation, implementation, operation, and monitoring. Within the processes and contexts of negotiating power acceptance, stakeholder education, and cultivating coordination, several intervening variables, including resource capacity (financial and human), literacy levels, individual stakeholder attributes, stakeholder credibility, coordination and communication platforms, and knowledge conceptions among others, contribute to the differing resulting dimensions of power acceptance of euphoric acceptance, trading off, re-alignment/mutual acceptance, divergence and exclusion, as will be further put forth in this chapter. Relevant areas of the literature identified in Chapter 2 and the broader related literature reviewed are intertwined with the theory to increase its scope, depth, and relevance to mingrid stakeholders including beneficiary communities, academics, and practitioners. The research questions are addressed throughout the discussion of the conceptual categories, subcategories, properties,

dimensions, and conditions comprising the theory of negotiating power acceptance. The chapter concludes with the overall presentation of the emergent theory of 'negotiating power acceptance'.

4.1 The Category of Stakeholder Education

The term *stakeholder education* in this study refers to the processes and activities aimed at the creation, capacity/skills building, awareness creation, and transfer of knowledge. In the minigrid arena, it came through that the roles of educator and learner are not constant to a particular group of stakeholders but are interchanged as per prevailing situations and conditions. Minigrid operators and their implementing partners undertook periodic assessments with the aim of learning, understanding, and working within the community contexts, as further presented in the subcategory *"contextualization".* The subcategory *"knowledge sharing: modalities and access"* expounds how the minigrid stakeholders continually participated in various knowledge creation and exchange means to not only learn about the project terms, conditions, services, and related issues but also share knowledge, experiences, and feedback. And in the "*sequencing of education"* and "*continuous education",* it is seen how the education process was introduced through accepted and trusted methods and structures, and its consistent and ongoing nature. Stakeholder education enables knowledge creation and transfer. This contributed to the awareness creation of project-related operations, soliciting cooperation and stakeholder obligation during the minigrid process, and giving insight into the navigation of emerging power dynamics among the stakeholders. However, related intervening conditions as revealed from the field in the subsections below, accounted for variations in the status and outcomes of stakeholder education. The concept of stakeholder education, as emerged from the field results, not only revealed the power of knowledge to influence actions and responses in the minigrid implementation arena, but also explained the various conditions relevant to education attaining optimal intended results as indicated in these field data citations.

> "But now let me tell you something. These people here were trained. The donor company incurred a lot of expenses on sensitization at the beginning stages of the project. They would bring trucks, they did community dialogues, talk shows on radios, sms, and banners everywhere, yet they now present with a lack of information about the project... But something I know, that I have just realized, like I have told you, it (the minigrid operation and management) is a learning process. Sensitization is a continuous process, it is continuous… People of these locations, even on how to make the payments, they keep engaging and disturbing the technicians to help them…" (Interview 39, Discussion with minigrid operator manager, Paragraph 68).

> "Also, the challenge would be that the villagers when this project was introduced, they did not welcome this project and hence they did not learn and understand the necessities and regulations of this electricity project due to their lack of involvement in the project and the initial fear they had. They therefore wouldn't provide the necessary oversight to these two minigrid management committees, and therefore, they would endorse these decisions with very little knowledge of their obligations. Whatever they were told they would agree without any challenges…" (lnterview 53 with former community leader, Paragraph 49).

As in the study findings, in existing literature, education is cited as a central and influential aspect in the journey towards sustainable energy development. From the time sustainable development was first endorsed at the UN General Assembly in 1987, the parallel concept of education to support sustainable development has also been explored, and as the concept of sustainable development was discussed and formulated, it became apparent that education is key to sustainability (McKeown, 2006, p. 10). Kolbasov (1992) also notes that education has long been identified as a process that has the power to influence stakeholder actions. He states that one of the major challenges facing the world community as it seeks to replace unsustainable development patterns with environmentally sound and sustainable development is the need to activate a sense of common purpose on behalf of all sectors of society. The chances of forging such a sense of purpose will depend on the willingness of all sectors to participate in genuine social partnership and dialogue while recognizing the independent roles, responsibilities, and special capacities of each. Individuals, groups, and organizations should have access to information relevant to environment and development held by national authorities, including information on products and activities that have or are likely to have a significant impact on the environment and information on environmental protection measures (Kolbasov, 1992, pp. 270–282). In the minigrid communities, indeed, it was shared that the education received brought various stakeholders on board the minigrid planning and operation process, it equipped them with knowledge that empowered them to carry out their respective tasks and contribute to project sustainability. This finding adds voice to various related existing perspectives on education. Governments and civil society as well as individuals bear the responsibility for a more sustainable future that is borne by, all must contribute in their own way and it is through education that the next generation of citizens, voters, workers, professionals, and leaders will be prepared for life-long learning about sustainability (UNESCO, 2014, p. 33). Embarking on the path of sustainable development requires a profound transformation of how society thinks and acts. To create a more sustainable world and to engage with sustainability-related issues as described in the SDGs, individuals must become

sustainability change-makers. They require the knowledge, skills, values, and attitudes that empower them to contribute to sustainable development. Education, therefore, is crucial for the achievement of sustainable development (UNESCO, 2017, p. 7). Kandal et al. (2014) state that education is one of the most effective means for providing solutions to the problems faced by society. They assert that renewable energy education is expected to play an important and effective role in promoting sustainable development and also contribute towards improvement in the quality of life of a large section of the global population. Awareness generation among potential users is necessary for enhancing the adoption of a new emerging technology. In the same vein, Macintyre et al. (2018) state that education and learning for societal change are viewed with a growing tendency towards more transformative social learning based on dialogue between diverse actors in open systems. Both of them agree that for energy education, in general, and renewable energy education, in particular, to be provided at a mass level on a global scale, both formal and informal modes of education should be extensively used which can be greatly helped through being inclusive, recognizing multi-voiced perspectives, and enabling transformative agency to emerge at multiple levels (Kandpal & Broman, 2014, p. 3; Macintyre et al., 2018, p. 7). The majority of socio-cultural and institutional barriers to the dissemination of renewable energy technologies may be overcome, to a large extent, if the potential end users, policymakers, and other stakeholders are made 'energy conscious' by providing them with all the relevant information about various issues involved and also about the remedial measures. In fact, the attitudes and preferences of the common public as well as of the decision-makers have to be changed for wider acceptance of renewable energy technologies (Kandpal & Broman, 2014, p. 2).

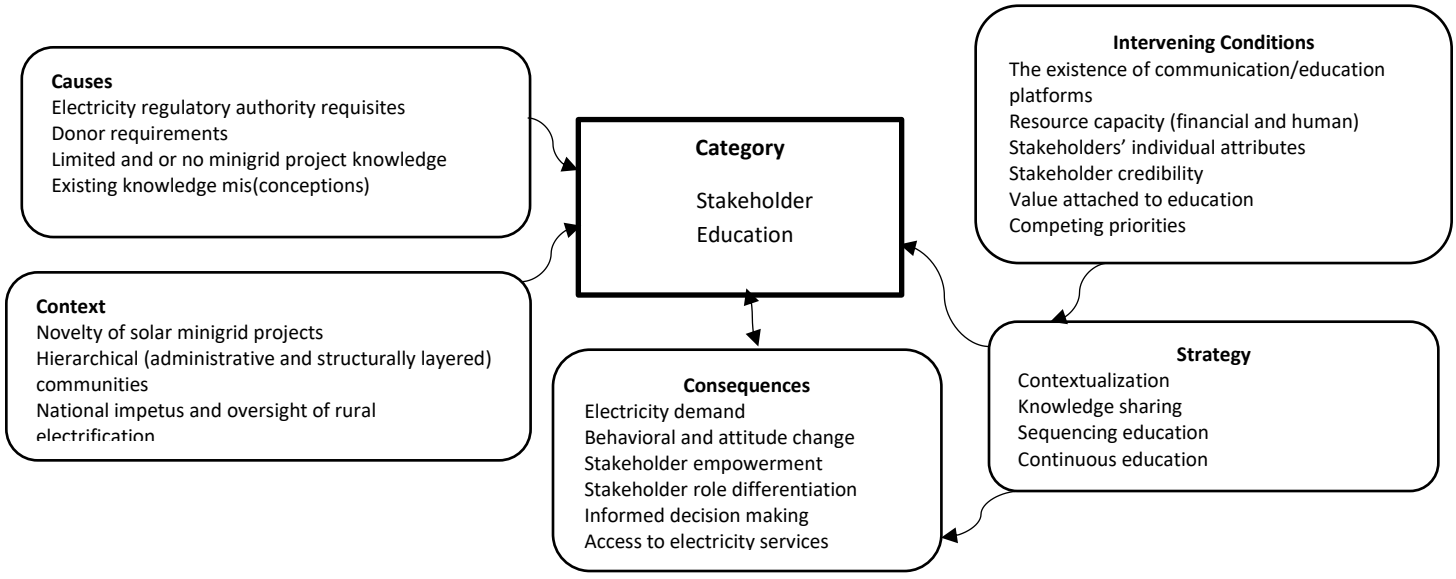
The power of education in sustainability transformations is seen to hold in energy transformations too. It is a moral imperative that individuals, energy producers, businesses, governments, non-governmental organizations, and communities come together in a new scenario that allows ample and transparent participation in the tough decisions that need to be made. The importance of dialogue is even more important if a sustainable strategy is sought, where economic, environmental, and social dimensions need to be conciliated and considered with equal weight. If the goal is sustainable energy, and if compromises are sought among seemingly contradicting objectives, stakeholder engagement and involvement at all levels is essential in the successful application of this new energy ethics (O'Neill-Carrillo et al., 2008, p. 4). In seeking to develop a Virtual and Interactive Microgrids Learning Environment (VIMLE) interactive stakeholder

platform, Bogere et al. (2023) recognize that with knowledge constructed and skills acquired; local capacity for designing, installation, operation, and maintenance of microgrids is built. With local capacity, a sustainability variable, built; microgrid sustainability is enhanced and in turn, sustainable microgrids improve levels of electrical energy access and contribute to the achievement of SDG 7 (Bogere et al., 2023, p. 7).

And yet for a concept that has long existed, the study findings further revealed that even though stakeholder education is a central ingredient in the successful implementation of minigrid projects, it is not always included in the project implementation process, and even where it is included, the result is not always successful. In some settings, the education was undertaken as a checklist activity exercise, to seek regulatory authority approval and market the projects at the beginning of the project, as opposed to as a process of knowledge exchange. It was not given the lifeline, comprehensive and continuous treatment it deserves. Additionally, noted variables either reinforced or undermined the contributions of education to sustainable development as identified in both the field data and literature and presented in the identified concepts interrelated to stakeholder education as a strategy of negotiating power acceptance.

Figure 3 depicts the findings of the category of stakeholder education and the related subcategories using the Strauss coding paradigm (Strauss, 1987, p. 44). The variables are further expounded in the subsequent sections. Data analysis was not limited to the context and variables of the coding paradigm but it guided explaining and grouping the emerging relationships.

Figure 3: Stakeholder Education Category



4.1.1 Context of Stakeholder Education

The minigrid projects are set up in areas where the concept of minigrid solar projects is new to the majority of the community members. Before the introduction of the minigrid project, the majority of the communities relied on traditional energy sources – firewood, candles, kerosene lamps, and charcoal – with a few stand-alone solar home systems, and generators for their energy needs. It was stated that the traditional energy sources only offered cooking and minimal light services, while the few stand-alone solar home systems offered basic and unreliable electricity access whose storage barely lasts a whole day and is majorly used for lighting one to two bulbs, phone charging, and maybe television and radio in a few homes. Generators were mainly utilized by a few individuals with business ventures such as saloons, grinding mills, and entertainment halls. This context did not expose the community members to the utilization of solar energy to meet the wider range of their energy needs as made possible by the minigrid electricity projects. It was continually stated that many doubted the ability and reliability of solar electricity based on their experience with solar stand-alone home systems and; therefore, they were reluctant to join the minigrid projects. A state of ignorance and underestimation of the possibilities of the minigrid projects at their initiation stage was continually resounded in the villages visited as seen in the excerpt below.

> "I had first undermined this electricity because I did not know anything about it minus that it was solar. Because we had stand-alone solar systems, and we knew their limitations. But after it was wired, I saw that indeed this is real electricity!" (Interview 8 FGD with 5 men, village 2, Paragraph 6)

Both in Uganda and Tanzania, rural electrification is coordinated by the national rural electrification authority agencies. As part of their oversight role, the rural electrification authorities require minigrid developers, as one of the many requisites for the receipt of operation licenses, to provide proof of minigrid electricity demand and awareness by the target communities. Minigrid operators were expected to evidence their stakeholders' engagements conducted in the target communities of operation, and the community consent of the electricity projects as per the policies of the electricity regulators. This required that there be stakeholder interactions and information exchange between operators and the intended communities of operation.

Hierarchical administrative and structurally layered leadership exists in all the minigrid communities visited. Formal access to the community is granted through their leaders. It was imperative that the leaders are made aware of the purpose of one's visit to their community, then

they would accordingly link the operator/foreigner and facilitate access to the community members and resources. Accessing the community through the leadership structures was stated to legitimize one's intended purpose in the community, as it transferred the leaders' endorsement and consent of the project operations to the next level of implementation. The context of hierarchical, structurally layered communities, therefore required that the leaders of the communities at various structures were aware of the energy projects to be able to cascade this information to their community or the next level of administration.

4.1.2 Causes of Stakeholder Education

The Electricity Regulatory Authorities both in Uganda and Tanzania require that the minigrid operator conducts feasibility studies in the intended areas of operation. The operator is expected to learn the context of the community and confirm the applicability of the intended project in the community. Additionally, the operator is expected to consult with key stakeholders regarding the upcoming electricity project and provide to the regulatory authority proof of demand for the electricity services through lists of community members who have expressed interest in enrolling in the electricity project (Electricity Regulatory Authority, 2021, pp. 15–16).

Donor project justification is also required by funding organizations/donors to the minigrid operator to inform the funding needs. The minigrid operators shared that the international donors to the electricity projects required feasibility studies confirming that the project implementation was viable in the selected areas and needed by the target populations. The operators accordingly undertook feasibility, baseline, and needs assessment studies to educate themselves about the communities of implementation and show justification for implementation in the selected areas. Understanding end-user needs and perceptions enables policymakers to deploy their tools with greater accuracy (IEA et al., 2019, p. 32).

The various knowledge conceptions held about the electricity projects and related processes also presented a cause for stakeholder education. In some communities, there was fear about joining the electricity projects, it was shared that some community members thought that they would die once they joined the project; they suspected that the project required human sacrifice to succeed and so was offering free electricity connection to attract them to join the electricity project and then kill them as required human sacrifice. In other communities, members refused electricity poles from being erected in their lands, as they feared that this would cause their lands and animals

to lose fertility, or even them, as human beings in the proximity of these electricity poles, would lose their sexual potency. Others thought that it was a conspiracy to put dangerous substances in their lands, while others thought that their land would eventually be taken away once electricity poles were planted within. These community knowledge beliefs and conceptions presented the need for knowledge sharing and education.

> "When the electricity came here...people were scared and refused to embrace and accept this electricity project. Because of security, they thought that if you embraced these big development projects and they worked with you, then once the project started one would die! people were scared of being sacrificed!" (lnterview 53 with former local community leader, village 13, Paragraph 4).

While knowledge conceptions were not entrenched in the generally accepted cultural beliefs of the communities, their existence was potent and if not addressed, it was seen to discourage several community members from joining the electricity project. These fears could not be traced to any empirical knowledge but were stated speculations that individuals heard, believed, and spread about the electricity project.

4.1.3 Actions of Stakeholder Education.

Through the actions of contextualization, knowledge sharing, sequencing education, and continuous education; stakeholder education was conducted as presented and discussed further with illustrations from the minigrid communities and existing literature.

i) Contextualization

To contextualize is to consider something or to help other people consider something in the situation and circumstances within which it exists or happens, which can help explain it. Contextualization in this study is used to refer to the process through which stakeholders seek to learn and understand the characteristics, needs, and related situations of the area within which the minigrid project was implemented.

Baseline and feasibility assessments conducted by minigrid operators sought to understand the contexts of the areas before the introduction of the minigrid projects. In 11 out of the 14 communities visited, the operators conducted feasibility studies to gain information and understanding of the context of the communities. These studies were conducted through conducting questionnaires, focus group discussions, community meetings, and door-to-door visits. Community members and their leaders participated in these assessments.

Engaging with the local actors formed an essential element of project development. Central to the engagement with the various stakeholders was the concept of knowledge exchange, of learning the contexts of the target communities to enlist their participation in the project process and cycles and put in place programs relevant to the contexts of the beneficiary communities. Duran and Sahinyazan (2012) state that it is especially important to start engaging the local community at the very early stages to get the input of the beneficiaries that can be incorporated into the project design. Programs that follow a 'top-down' attitude without considering the local needs of residents produce fewer overall benefits and often fail in the mid to long term. Furthermore, continuous engagement with communities is also essential so that residents understand the importance of the project and maintain their minigrids to ensure the continued success of operations (Duran & Sahinyazan, 2021, p. 7). Project initiation and planning are key aspects of community participation as it implies that the community is driving the project and thus would support its eventual financial and technical operation (Gill-Wiehl et al., 2022, p. 5). Expert mediating systems play a pivotal role in the generalization of legally proposed change. Their actors have the power to offer concrete content to generic new norms, adapting them to specific contexts and coordinating them with new practices (Castro & Batel, 2008, p. 6). To help both academics and practitioners in such a hard job, contextualization is needed, since there is no one-size-fits-all when planning and implementing, and context-specific characteristics will shape the scope and opportunities in each individual case (Holgado et al., 2016, p. 7). A danger exists that members of an academic community enter into another community without fully hearing – let alone listening to – the voices of that community. This danger is all the more substantial in helicopter projects, where students from remote contexts enter communities that manifest complex social, economic, and political, including situated knowledge in community engagement projects realities. Developing authentic engagement relies on recognizing communities as co-producers of knowledge. It is essential that the voices of these communities are taken into account (Abrahams et al., 2021, pp. 120–121).

The knowledge gained from understanding the electricity needs and challenges of the communities enabled the operator to tailor programs to suit the community such as education and implementation programs. During baseline and needs assessment studies, the operators acquired knowledge about the context of the communities; additionally, the community members were introduced to the concept of the upcoming minigrid electricity and its comparative advantage vis-avis the existing electricity sources that the communities had, such as diesel generators, stand-

alone solar home systems, and petroleum lamps among others. Individuals and institutions interested in connecting to the coming electricity and their needs were taken into account to inform the planning of the operators and to provide evidence to the regulatory authorities and the donors of the need for electricity in these areas.

ii) Knowledge Sharing

Knowledge sharing is used in this study to refer to the process of exchanging (creation and transfer) knowledge and information among stakeholders. Existing knowledge platforms and stakeholders are mediums/means through which information and knowledge are exchanged in the communities. Stakeholder meetings, structured trainings, community demonstrations, written documents, community outreach sessions, activities of community liaison staff, and public radio talk shows were among the identified and utilized avenues of knowledge sharing used by the various stakeholders in the minigrid communities as further described.

Public loudspeakers are also known as community radio systems. These were used for public access to communication and entertainment in the communities. A megaphone is placed in a central location in the community and blasts out intended communication for all within earshot to hear. These systems are either commercially run by individuals or owned by the local leadership of the community. These were used to provide continuous and periodic information to community members. In some communities, these commercial loudspeakers were stationed in one place and the sound reached wide public coverage, while in others, a vehicle or individuals moved throughout the village, sounding the message of communication. Members did not have to move away from their daily activities but could access knowledge relevant to the project as long as they were within the coverage of the loudspeakers.

However, it was shared and noted that distance from these stationary public speakers limited access to shared information. Those on the outskirts of the community centers or those whose economic activities required them to move from the village continually did not access the shared information. Additionally, the commercial loudspeakers were accessed at a cost and expense, which was stated to limit the frequency of use of this means for knowledge transfer. Some minigrid operators and local leaders stated that due to the expense of access, they minimized their use of these speakers.

In some communities, where mechanical loudspeakers were lacking, individuals substituted as the mediums of information exchange. It was shared that the community leader in charge of information would, during community social hours, move throughout the village and use their voice to loudly speak out and share related information to groups of gathered community members. Members, not in the village at that time would not receive the communication shared. It was expected that shared information, through a ripple effect, would be spread to other community members not present at the time of information sharing. This at times did not happen, hence situations of unequal access to information were stated.

Stakeholder meetings are another avenue for education and information exchange. Meetings were held at various levels that included minigrid operators and the operating partners - the minigrid operators are in charge of the overall implementation of the project, while the operational partners are charged with specific roles in the minigrid process, such as electricity wiring and installation of houses, electricity poles erection, and productive use of energy aspects. While these partners, in their operations (management and budgets and accountability, etc.), acted in an independent capacity; the communities identified them, including their successes and failures with the main minigrid operator. In the context of Uganda, it was shared that periodic monthly meetings were held amongst these operators and their operational partners to enable information exchange that was aimed at contributing to the streamlining and coordinating of project planning and implementation.

Community meetings and dialogues between the community leaders and residents, minigrid operators, and the community and/or community liaison staff, presented a knowledge exchange forum where project-related information was shared, challenges identified, and responses to community electricity-related concerns or inquiries were given. In all the communities visited, community meetings were a structural community engagement forum, that had to be held periodically and attended by all community residents according to the community governance regulations. Community meetings were used for community situation assessments, planning, conflict resolutions, and feedback on various conditions, among other purposes. In some of the communities, the meetings were held periodically, as scheduled, and the majority of the community members attended these meetings. In some other communities, even when it was part of the community governance guidelines, these community meetings were not regularly held.

The meetings presented an avenue for consistent and continuous community education. In these meetings concerns regarding the electricity projects were presented and discussed and as well decisions regarding the electricity project were made. Additionally, the community leaders would call for unscheduled meetings, and invite the minigrid operators and their operational partners to address emergent urgent electricity-related issues. In Tanzania, it was shared that matters such as reducing the unit cost of electricity, utilizing minigrid collection funds to loan community development initiatives, and repealing the government policy of lowering the unit price of minigrid electricity that was not favorable to the minigrid operator are examples of such matters that were presented before the community to discuss and make decisions upon.

Community leaders, electricity management committees, and minigrid operators independently and/or jointly held meetings. Community leadership committees held periodic independent meetings as did the electricity management committees. Additionally, the village leadership committees and electricity management committees held joint periodic meetings to share related information and harmonize minigrid operations with village operations. In one of the villages, the minigrid operator periodically participated in these meetings. Concerns and communications arising from these deliberations arising from these meetings were always shared with the community during the general village meetings, and existing community concerns were always shared and discussed in these management meetings. It was shared that community awareness and education campaigns were developed and planned during such meetings to respond to issues of concern. In these meetings, they shared the concerns of the electricity users, and together solutions were developed, the electricity committee members sought feedback on these solutions during village meetings and popularized them during periodic outreach and awareness sessions in the villages.

Operator's community liaison staff. Operator field staff and electricity committee members are a medium through which information is shared. The staff conducted community outreach sessions and dialogues, shared information during community meetings, utilized public radio systems, and also moved door-to-door discussing electricity-related concerns with community members as highlighted below.

> "Those field agents of the electricity agents would move house to house and they would tell you about the electricity and educate you and it would be up to one to decide if they want the electricity. And if one could not afford to pay the installation and connection fee upfront, then the person would

> pay this money on an installment basis and be connected upon completion of payment… They would enroll a number of people in this first phase of installment pay. When all the members in this phase had completed their payments, then they would initiate another group of community members in the same scheme in phase two. They would use the commercial loudspeaker and announce, "(…) now phase two is open, those that want electricity on loan, come and apply." (Interview 14 with household respondent, village 1, Paragraph 59 - 60).

The direct interaction in these community dialogues between the operator staff and the community enabled both the giving of information and feedback sessions to happen simultaneously. It provided opportunities for dialogue that enabled a participatory approach towards conflict identification and resolution.

Structured trainings organized by the operator built specific knowledge about specific minigrid topics. In the communities, participant selection and target were based on their relevance to the training such as the entrepreneurs, community liaison officers/ power agents. These were selected either by the initiative of the minigrid operator or with the participation of the community leaders, the selection process differed in the various communities. Topics of training depended on the category of participants selected. Topics trained among others, included productive use of energy, safety, procedures for accessing electricity services, and management of minigrid containers.

Some of the trainings were held for durations of one to five days for an average of six hours (10:00 am to 04:00 pm). In some trainings, participants were facilitated with transport and meals, and in others, they were expected to transport themselves to the venue from where they would be facilitated with meals during the training duration. It was noted that the trainees' attendance was not consistent. One of the minigrid operational partners sought to conduct evaluation and refresher training of formerly trained entrepreneurs in three minigrid communities, however, a number of persons previously trained were not willing to participate in the follow-up training. Some of the reasons cited were they were too occupied, others felt that the previous training was not conducive to their time and business schedule as entrepreneurs, as it was held for four days from 10:00 am to 4:00 pm, others stated that the trainers' promises of access to subsidized electricity equipment were not fulfilled, and, where provided, it was done at changed terms and conditions, and some stated, the lack of resources to transport themselves to the training venue among others. Before holding a second refresher training, the operator held feedback and evaluation meetings of the first trainings held, with both the local leaders and the trainees. Using knowledge gathered in the next set of trainings: community leaders were engaged and involved in community mobilization and

enlisted as trainers of trainees, as well the trainees were engaged in the decision of selection of favorable time, durations, and days for training. Much as training was conducted in local languages with the help of local leaders and community agents, the ability to read and write determined how much participants would note down for further reference and continuous access to received information. The trainees would not receive training reference material and hence would have to rely on memory to benefit from the knowledge gained. This was also seen to limit the effectiveness of the training, as not so many people would remember this information after weeks, months, and even years.

In some other communities, the training was residential; participants from several distant villages converged in a central location, and for durations of two to five days, they underwent respective training. The training operational partner would facilitate the accommodation, meals, and transport to and fro the venue. It was stated that this was effective where the participants came from distant villages, which would have greatly hindered time management and consistency of attendance.

Education by demonstration and exposure. Minigrid operators and the operational partners used demonstrations to evidence the capacity and ability of the electricity. In one of the communities, the operator set up a community hub at which a television set, refrigerator, phone charging services, and photocopier were set up. These evidenced to the community the different ways including various commercial ventures which could be pursued using the minigrid electricity. In other communities, road shows i.e. trucks were moved from village to village demonstrating different machines and how they could be used by electricity such as blenders, grinders, and saloon equipment among others. Based on the capacity and experiences that the community members had with the initially existing solar home systems that they had which were weak, didn't work when the sun did not shine, and could not power higher voltage electricity equipment; the communities were doubtful of the ability of the solar grid electricity. Several of them, including some leaders, only joined after they had seen the physical evidence through the experiences of others and the electricity project community exhibitions.

Role plays in native languages on safety while using electricity were also used during community awareness sessions. Respondents stated that even years after the training, they could remember the message and education passed on through these plays.

Experiences of those utilizing the electricity presented learning points of best and/or worst practice case examples that either encouraged or discouraged others from joining the project. In cases where others had connected to electricity and were utilizing it for business and other purposes and it was benefitting them, many others craved to join and requested to be connected to the electricity. In one community having seen the neighboring community benefit from an electric water source, the community leader reached out to the operator, offered land, and lobbied for the same to be connected within his community area scope, which was done. In other instances, the negative experiences, such as changing terms of operators, and users paying much more for the electricity services than they were initially led to believe, discouraged other members from connecting to the electricity and participating in electricity-related programs. The field citations accordingly illustrate both scenarios of positively and negatively learning from the experiences of others

> "(…) I had seen this water plant in the neighboring village 1. You see, we also have a problem with safe water access even if we have a borehole in the village. But this borehole is usually congested, it has many people fetching from it and the lake at times upheavals and the water is dirty. I told them if it is possible, I would give the land so that they help us just as they helped the people in village 1 so that our people can access safe water at a low cost. They said it was possible and so it happened." (Interview 18 with local leaders, village 2 and village 3)

> "To date, he is sitting with his extra bulbs and equipment they are not connected! He spent money on things that he is not able to utilize!! Madam, can you call such an individual to any electricity sensitization session and he comes?! He had been told that once he pays the connection fee and the application fee, he is set to receive electricity. Even when they convinced him, and he was buying extra electricity consumables, they should have asked him or explained to him that he would need to undergo extra costs to install them, but they did not. Such and many other examples discourage and disgust community members about electricity-related matters. This is also another problem." (Interview 8 FGD 5 Men, village 2, Paragraph 33 -34)

Written and pictorial educative and information-sharing materials that included information and educative communication materials on electricity equipment and payment, talking walls, minigrid management rule guidelines book, and information on community notice boards were used for stakeholder education in three of the fourteen communities visited. Electricity equipment such as electricity meters, and consumption information units (CIU) that were situated at individual electricity users' premises provided information about the consumption and enabled electricity users to manage their consumption and purchase electricity units in time. Translation of these written materials was said to contribute to the comprehension of the shared information.

Figure 4: Snapshot of Minigrid Communities' Knowledge-Sharing Modalities and Access

Knowledge-Sharing Modalities and Access	
Knowledge sharing modes 1. Public loudspeaker use 2. Stakeholders meetings ➢ Institutional/implementing partners' level ➢ Administrative level ➢ Community level 3. Community liaison staff 4. Structured training 5. Community demonstration drives 6. Drama and role-playing 7. Experience sharing 8. Written and pictorial information and educational material use	**Factors limiting/enabling modes of knowledge exchange** - Existing knowledge-sharing means and platforms - Individual stakeholder attributes - Resource capacity (financial & human) - Stakeholder credibility - Value attached to education - Language barrier - Literacy levels

iii) Sequencing Education

The term sequencing education in this study is used to refer to the gradual access or exchange of information and knowledge through the existing hierarchical community structures.

The gradual streaming of information through the existing administration and leadership structures captured education sequencing. Information and knowledge access by community leaders enabled them to cascade it to the communities. In the communities where the operators recognized the community leadership structures and streamed their entry through initial meetings and engagement with these local leaders to introduce the electricity project, the participation and commitment of leaders were noted in the process of community mobilization and awareness creation. These leaders endorsed the projects and cascaded their approval and project knowledge to the next level of leadership or the communities. Through meetings that the operators held with community leaders such as the energy committee members and/or community liaison officers/power agents,

they identified and responded to electricity-related concerns in liaison with the leaders; hence cooperation in the project implementation was noted.

> "(…) At that time, we had a Community Development Officer, a lady whom they moved with to the ground and met the chairpersons of the areas where they would put their plants. The chairpersons then moved with them through the communities introducing the idea of the electricity that is to be introduced. I think they had done their initial assessment groundwork because I did not hear of any conflict in regards to the project." (Interview 1 with 2 administrative leaders, subcounty 1, Paragraph 4).

Additionally, community leaders shared that, using the information and knowledge received, they were able to use their authority and leadership status to lobby for community access to electricity-related services. In one community in Uganda, the leader, having received information about the role of the electricity regulatory authority, wrote to the authority to raise a complaint regarding the minigrid operator's delay in connecting electricity to his community, a situation that was making community members want to uninstall and destroy equipment that had been set up in preparation for the electricity. This prompted a response from the minigrid operator who wrote formally to the village leadership to inform them of their electrification timeline and also effect the village's connection to the electricity. Similarly, in a community in Tanzania, the community leaders knowing the roles of the regulatory authority and the financial and resource limitations of the operator, lobbied the electricity regulatory authority to support the minigrid operator with electricity pole erection and wiring to extend electricity to three of their villages, where the operator had failed to reach due to financial constraints.

In communities where the operator did not engage the community leaders and conducted community engagement without the leaders' participation, the leaders doubted and even suspected the intentions and goodwill of the operator and the project. Some leaders voiced suspicions that the operator might be hiding something from them. In communities where the minigrid operator accessed the community members using structures parallel to the existing community structures, they encountered substantial friction and suspicion from the community members and their leaders. It was shared that some community members gradually embraced and accepted to join the electricity project after continuous information exchange sessions held with the electricity operators, together with their community leaders who had been eventually educated and enlisted to the project, as cited in this one of many incidents.

> "(...) Initially, I had rejected it and refused them to plant their electricity pole on my land. To eventually accept and get this electricity, it is the chairman who came and talked to me. He explained to me about the project." (Interview 6- FGD with 5 women, village 3, Paragraph 25).

Similarly, rejection and/or slow uptake of electricity projects were registered for communities where projects were introduced and implementation commenced in communities with the consent of the district and national level authorities without involving the local leaders and communities. In such cases, the administrative leaders at the district level were aware of the electricity project and lobbied for it to be taken to their villages without engaging the village community members and the local leaders. The need for local leaders' and communities' involvement in project implementation is also noted by Kolbasov (1992) and others. Because so many of the problems and solutions being addressed by Agenda 21 have their roots in local activities, the participation and cooperation of local authorities will be a determining factor in fulfilling its objectives. As the level of governance closest to the people, they play a vital role in educating, mobilizing, and responding to the public to promote sustainable development (Kolbasov, 1992, p. 285). A participatory approach in nature; conflict sensitivity in development assistance can serve not only to decrease levels of violent conflict or the potential for violent conflict but also to increase the effectiveness of the intervention. Development interventions without conflict sensitivity can inadvertently encourage conflict, and end up doing more harm than good (Alert et al., 2004, p. 4). The field data evidences that authority and status of leadership structures has the power to influence the outcome of project deliverables positively or negatively. Education and access to project information pull in this authority and activate it to bring on board the wider community and work towards the common goals of project success. While alienation and keeping the leaders in the dark trigger mistrust and conflict that stall the achievement of project timelines and even lead to full-scale rejection of the projects in some incidents.

iv) Continuous Education

Continuous education refers to the ongoing stakeholder interactions to enable a consistent flow and exchange of information and knowledge. This concept continually emerged during discussions with minigrid operators, community leaders, electricity leaders, and operational partners. They all recognized that several challenges, misunderstandings, and conflicts happen due to a lack of awareness of project information and the existence of misguiding information even when credible information has been shared before. One of the operators stated that together with their operating partners, they participated in bi-weekly meetings at the project initiation phase, and the then,

ongoing periodic monthly stakeholder meetings during the operation and monitoring project phase, to ensure consistent, continuous stakeholder knowledge exchange.

In two of the fourteen communities, it was noted that through active engagement with the local leaders, education on project-related matters is frequent, while in the other twelve communities, most of the education was conducted at the project initiation stages and was not deliberately consistent at the implementation, operation and monitoring stages. Citing it as an effect of the ongoing study, one of the operators, during interactions in the fourth stage of data collection, shared that the discussions and feedback sessions with the researcher enlightened them about the situation of electricity users' general lack of awareness regarding project-related matters and procedures and how this caused a lot of frustration and limited effective access to electricity services. He noted that the ongoing study's interactions woke them to the reality state of lack of and misinformation about project-related matters, yet they thought that the conducted awareness sessions with some communities at the project initiation stage were sufficient and that the communities were still riding on that. He further acknowledged that this state of lack of and/or insufficient project information had negative effects on the smooth operations, profitability, and relationship with the different stakeholders mainly the community and their leaders. As a result, through their funding partner, they initiated deliberate community engagement and education campaigns in twelve minigrid communities. Some electricity access-related challenges were identified with lack of or limited project-related knowledge, such as customers buying expensive high voltage electricity equipment, which they failed to operate because the voltage of these equipment was too high for the minigrid electricity. Also, whenever such equipment was switched on, it caused blackouts throughout the whole minigrid, which would frustrate the owners, other community users, and the minigrid operators. The value of continuous education was resounded in many communities.

> "We the customers of electricity, we need education constantly because not all of us have the intelligence or brain capacity to remember all the things we are taught (…) So, if there is no one to continually educate us on the different ways we can productively use this electricity, this is a challenge. Knowledge and education are greatly needed for the people here. They need to keep calling the people, they meet together and they educate them." (Interview 42 with business respondent, Village 14, Paragraph 18).

> "Another thing that regards sensitization... one thing that people really need...what the people greatly need is, what is called public sensitization, because if you look at the community they have communication and also amongst them there are those that think or belief they are wise and know how to do things and these can really disorganize or confuse electricity customers and the

> community with unfounded information and rumors. So, if the operator takes too long to sensitize the community on various issues... this may affect the whole community... like, one fault by a customer that has wrongly wired their premise the whole grid shuts down...you have to be constant with them and the sensitizations, one even sees that the sensitization sessions that we give them are not enough..." (Interview 9 with operational partner staff, Paragraph 55 - 56).

In some communities, platforms of continuous communication were not active. Community notice boards were not populated with public information, and community meetings were seldom held. Community members shared that the impetus for calling the few meetings was external, such as the agenda originating from the district or sub-county level to share information about national health, sanitation, or development projects. The community leaders also complained that these meetings were not greatly attended and that it was mainly the women who participated in these meetings, stating that most men were busy attending to other conflicting economic or social activities, as seen in these field citations.

> I: "Do you usually participate in LC village meetings?
>
> P1: The chairman usually calls people to meet at the field. It is us who are lazy and do not heed the call to attend the local village meetings.
>
> P3: No. He only calls us when there are people, say from the sub-county or district. He has never called one for us just the villagers…
>
> I: Did the electricity operators use these village meetings for any communication? 00:43:30,900
>
> P4: I cannot say much about that because, me, I never attend those meetings, I am usually in my garden which I leave when I am hungry then I proceed to cook food and by the time I finish all that time is past.
>
> P3: Me I attend, but I never saw them there."
> (Interview 6 FGD 5 women, village 3, Paragraph 165 - 170)

> "In the other villages as you see... in village 2 and 3, they take long to call for village meetings. This takes long to happen, it takes long to see that they have conducted and called for the meeting from the initiative of the community. Village 1 as a village, it is very difficult for them to take a month when they have not called for a local council meeting and the sub-county is at times part of these meetings. But village 1 is a bit unique, this is in village 1 alone, the others unless it is us that initiate the meetings! If not called, they do not have village meetings, I cannot lie to you that they organize meetings and call us to participate in these meetings. But in village 1, they do call us once in a while, they invite us to come and request us play our roles. We sometimes use this chance to educate the community, and continue to show them how to manage different electricity-related issues, and even respond to related questions that arise from the community. (Interview 9 with operational partner staff, Paragraph 62 - 63)

4.1.4 Intervening Conditions of Stakeholder Education

Stakeholder education is a strategy that is conducted with the intent of knowledge exchange and creating awareness in the project operation process. An awareness that identifies the various stakeholders relevant to the minigrid projects, and their influence on the project. An awareness that informs the process of projects' planning, design, and implementation, access to electricity, and utilization of the electricity to realize the power of positive transformation that comes along with it. In achieving its expected outcomes, identified factors either strengthen the stakeholder education actions or undermine the capacity of these actions to achieve the intended outcomes. These intervening conditions, as identified during the study, are accordingly presented;

The level of comprehensiveness of project initiation and assessment exercises that include baseline and needs assessment, and project inception meetings. Operators during the initiation of the minigrid projects conducted extensive surveys to understand the context of the community, including the target community energy needs, existing energy means and their related weaknesses, demographics, and culture of the communities, among others. During these assessments, the communities were also informed about the upcoming solar energy projects and their related deliverables. As earlier presented in 4.1.2, these assessments were also stated requisites by the respective electricity regulatory authorities and the project donors to justify projected implementation, so they had to be conducted for the operators to receive operation licenses and/or funding. In communities the assessments were comprehensive and participatory, with the community leaders and residents involved; general project awareness and acceptance were stated and noted in such communities. The involved leaders, empowered with knowledge worked with the operators to further sensitize their communities about the upcoming project and address emerging concerns. In some communities, to fulfill the requirement of proof of acceptance of the electricity projects, the operators conducted 'cosmetic surface assessments'. They moved through the communities asking residents if they wanted electricity connected to their premises; those who answered 'yes' were registered, and those who stated negative were left out. Many community residents responded 'no' to wanting the electricity because they had not been educated and guided and thus did not understand the specifics of the upcoming solar electricity. Regret was later expressed by some of these residents and their leaders, stating that if they had understood what the electricity was about, they would have assented to it.

According to the administrative structure of the village, sub-counties are comprised of smaller villages, in this arrangement, there is a central village in the sub-county. The study revealed that citing financial limitations, some operators concentrated the comprehensive efforts of education including assessments and knowledge exchange in the central villages, and once acceptance and cooperation were reeled in at these central villages, then the rest were engaged on the surface to fulfill the obligatory assessment requisites with the pretext of shallow community engagements. During field research engagements, it was noted that levels of project awareness differ from community to community, as well as levels of cooperation, community involvement, and uptake of the community. In communities where the operators were active in sharing project-related information and learning the contexts of the communities at project inception, cooperative relationships between the operators and the leaders and community embrace of the project were stated and noted. In communities where actions of information exchange were shallow and or nonexistent, suspicions of the operator's intentions existed, initial rejection of the project was cited, and leaders felt disempowered and unable to address the emerging electricity-related concerns of their communities. Moseley (1996) notes the relationship between comprehensive community engagement and project embrace. He states that over the time period of the baseline study, the maximum amount of popular involvement and decision-maker involvement should be sought. He further guides that, though at times this may seem as a distraction, comprehensive baseline studies are crucial for three reasons. First, local people are a genuine source of information, ideas, and insight. Second, the eventual strategy is likely to gain legitimacy from the process of consultation and thereby be more likely to `stick'. Third, such involvement will almost certainly increase, and not just reveal, the area's resource base; even if just a handful of local people are enthused by their involvement in the preparation of the rural development strategy and then go on to lend a hand in its implementation, the time and effort invested in the baseline study will have been well spent (Moseley, 1996, p. 34).

Continuity and consistency of knowledge sharing. Project-related information and timelines were not shared comprehensively and continuously with stakeholders in several communities. It was stated that sometimes information was only shared when it was convenient for the operators and that, even then, in such instances, not all relevant information was shared with the intention of manipulating community members and their leaders. Some leaders stated that they were only informed of project matters when it suited the project operator, like being asked to move with the

operators and identify owners of homesteads where the electricity poles would be erected, yet the community leaders were not part of the decision-making process to decide who gets electricity and did not even know what criteria are used. Enlisting the local leaders at the point of executing project-related decisions showed the communities that they, the leaders, endorsed these decisions and yet they did not have comprehensive information of what they were endorsing. Leaders, as a result, were not able to address emerging related concerns from their community members. This raised suspicions and hostility from the community residents, who stated that the leaders were in cohorts with the electricity operators to hoodwink the communities. Similarly, as a result, some leaders refrained from participating in the projects, some demanded monetary compensation for this 'convenience coordination', and others enlisted the intercession of the regulatory authorities to demand information and address concerns that they did not comprehend.

Additionally, inconsistent information contributed to project rejection and conflict. Some community members rejected the project stating limited project information regarding project plans and timelines. Even the community members who had initially accepted and enrolled to receive the electricity reacted with opposition when the operator returned after a long period with no communication to start installing electricity poles in their lands. Some community members and their leaders did not cooperate because they did not understand what was happening and also had suspicions about the effect of these electricity poles on their well-being and the quality of their land and livestock. In one of the communities, when they started having increased electricity blackout periods after the introduction of a new electricity consumption reader device in their household, the community members suspected and blamed the new electricity meters that were consuming their electricity and causing these power blackouts. Continuity and consistency of knowledge sharing built trust in the project implementation and enabled the identification of emerging concerns and responses to these concerns.

The existence of communication and knowledge-sharing platforms such as public megaphone loudspeakers, community notice boards, and period community meetings enabled access to information. Stakeholders utilized the existing means to share information, monitor the progress of project implementation, and respond to emerging concerns. In some communities, local leaders, project operators, and their partners could use the existing communication means to share information about community meetings, vacancies for electricity committee positions, field

community liaison staff positions, and other project-related information. In villages where electronic and written alternatives were lacking, word of mouth, community meetings, and door-to-door outreach sessions were the majorly utilized communication means, it was stated that public information was not as quickly diffused, and there existed low project awareness levels and compliance.

Resource capacity, including financial and human capacities. Community mobilization costs money to hire public speakers and enlist the participation of some local leaders was stated to limit minigrid operators and their partners from conducting frequent stakeholder engagements and sensitizations. The community administrative leaders also noted that financial constraints limited the frequency of their community engagement activities, given that the national budget limitations did not enable financial provision for community engagement activities. In one community, the Community Development Officer shared that they are expected to have partners' coordination meetings quarterly – four times a year. This coordination platform would enable them to keep abreast with the activities of the development partners within their communities, including minigrid companies, however, due to resource limitations, they would go years without these interactions.

Human resource capacity limitation, as cited in the excerpts below, affects stakeholder education. It limited the ability of the few hired staff to identify and quickly respond to identified concerns given the existing overwhelming need for their technical services in the multiple minigrid communities. It limited the ability to provide continuous information to stakeholders. This also was stated to give rise to discontent and conflicts where speculations about the project operations become rife and go unchecked and where inquiries and need for information were not readily addressed, among others.

> "So as if maybe I don't know, those two technicians… uuh uuhh... handling the 25 minigrids... as if their number is less because they cannot come urgently to the customer when they are given information… as if they have a lot to do... That is what I think and realized. But for me if I call them, I have nothing to do but wait, because I have already given information about customers' concerns." (Interview 34 with community liaison staff, Village 7, Paragraph 45).

> "...Yes!! sometimes you even lose your mind. We are understaffed for sure. Those days I had a very huge workload, but now as you have seen us, we have a new senior Engineer on board. We have been sitted here with him in the field all day. We have reports to make, we are currently late in submitting the January report, it is the 8th today and we are yet to submit it." (Interview 39 Discussion with minigrid operator manager, Paragraph 64).

Literacy levels and language barrier. Some local leaders and community members shied away from participating in the project as they did not know English and could not understand the language of communication. Literacy levels and limited knowledge affected the utilization of these visual education materials. It was stated that some users in some communities did not understand how to read and comprehend the acquired equipment, as exemplified by the experiences with the Consumption Information Units (CIU). Some customers kept the CIUs in their packaging box and did not mount them on the wall to guide them with electricity-related consumption guidance as educated and expected by the operator. In Tanzania, it was noted that all the education materials were in Swahili language, a national language that all the respondents stated they could read and understand. The communities appreciated that the written education materials provided a means of continuous community education. In Uganda, when asked about the use of written material for communication, some local leaders expressed that the majority of their community members are illiterate and, therefore, tend to have challenges responding to or understanding written education materials.

The value attached to education. Despite being mobilized to participate in structured trainings, community meetings, and outreach sessions, some people would choose not to participate, and they would stay away from project-related activities. Some members stated that they were too busy and chose not to participate in community meetings and mobilization sessions, also with migration and fluid communities – due to economic pursuit reasons, some members were constantly on the move between multiple communities of residence or would be in the lake fishing or farming in distant farms and hence miss verbal education sessions. Others stated that participation in these knowledge exchange sessions was a waste of time because some operators kept changing the stated terms and conditions of operation. Others stated that the same information was continually shared in the meetings, so they saw no need to partake in the community awareness sessions.

Commitment to stakeholder meetings deliberations. It was shared the stakeholder meetings are held at the headquarters levels, some operator field staff felt detached from these discussions as they did not see timely solutions to the problems that they encountered and forwarded to the headquarters office. Also, they noted that participating partners did not respond to address their reported and highlighted points of deficiency, which contributed to growing discontent towards

electricity operators in the field by the communities. An example is the operator in one of the communities continually lobbying to have electricity poles supplied by the responsible agency to enable them to extend electricity to those community members who need electricity but are out of the electricity poles' reach; a response did not happen despite of continued discussions in these meetings. Another kept reminding the national responsible authority to clear pending payments as per their role and obligation to those that had sold and availed land for minigrid operations. Response to this was not forthcoming until a point when some discontented former landowners barricaded premises and prevented field minigrid operators staff from accessing the field offices, putting operations at a standstill until they were fully paid for land sold or until the intervention of local community leaders in some instances where the payments were still not forthcoming. Such incidences were stated to undermine the partners' confidence in the efficiency or relevance of sharing concerns in the stakeholder coordination meetings.

Stakeholder attributes are highlighted among the reasons for differences in consistency in knowledge exchange and community awareness levels. Operators felt that in communities where the leaders were active and committed to the community welfare then, there were more active interaction forums; these leaders would call for periodic meetings and would liaise with the operator to share the concerns of their community members and require the operator to participate in these meetings to address raised project-related concerns. Additionally, the active leaders would go a step further and engage the regulatory authorities with community concerns where they saw that the issues were beyond the operator's capacity to respond to or when the operator was not responding to their raised concerns. While some other leaders were stated to be self-serving and expecting financial compensation from the operators before participating in project activities. It was shared that these such leaders would seldom call for community meetings nor would they put the operator to task to respond to community concerns and hence less access to project information.

The character of the operator staff also affects knowledge-sharing access. In some communities, the operator staff were stated to be approachable and respectful during community interactions. Such staff would move door-to-door to engage customers and clarify issues of misconceptions. Some respondents shared that even when they were communicating unpleasant messages like reminders about delayed payments, they were respectful, and therefore, the community members responded positively. Some operator staff, due to their callousness, lack of comprehensive

information about the minigrid process, and rudeness in responding to and addressing community members during interactions, the community members were ignorant about various matters as important as how to pay for the electricity or how much to pay. In these communities, some community members and community leaders threatened to abandon the electricity service and even some leaders stated the possibility of using their authority to stop operations of the operator in that community.

S*takeholder credibility* was also cited as an intervening factor in stakeholder education. Credibility is defined as a judgment of audiences on the competencies (e.g. effectiveness) and the trustworthiness of a political leader, an organization, an institution, or a policy. Often, credibility is considered a more static trait of a person, organization, or institution. It is a prerequisite for participation in a collaborative endeavor and thus enables legality, justifiability, and consent to develop (Levelt & Metze, 2014, pp. 2372, 2384). Stakeholder credibility was stated to beget trust. In the study, credibility and trust both in the actors and the process were stated to affect power acceptance. The dishonesty of operator staff, the changing terms and conditions, the withholding of information, and the exclusion of communities and their leaders from participation in the energy projects led to the rejection of the projects and their processes, as cited in the excerpt below.

> "Issues of information inconsistency… There was a recent meeting informing the community of the change in terms that they would pay 70% for the gadgets as opposed to the aforementioned 30%. The high cost of a unit of electricity was also mentioned. Such happenings create a feeling of mistrust by people of the information shared by operators/outsiders during the meetings, hence many of them stay away." (Interview 8 FGD with 5 Men, Village 2, Paragraph 29).

Such happenings of inconsistency presented some operators as untrustworthy and discouraged some community members from further engagement with them. In one operational partner company, the staff were corrupt and would receive money from community members for payment of electricity-related goods and services, and neither provide receipts for monies paid nor the goods paid for. This caused further discontent towards the operator, who, though not responsible for this part of the project, was a constant face of electricity-related service provision. It also led to declining economic situations of community members who had accessed finances through loans to pay for the electricity equipment, and this equipment took a long time to be given or, in some instances, they never received it, yet they had committed to payment of these loans within specific periods, a situation that led to some selling their property to set off the incurred loans.

While seeking to understand how behavioral interventions framed within the concept of the introduction of a 'traffic lights' metering system in a rural minigrid community influence energy consumption patterns, Namujju et al. (2024) note the importance of trust in learning and project embrace. They state that the community's level of trust in and understanding of the technology could have influenced the response to this metering system. Noting further that, misunderstandings or lack of clarity about how the system works could lead to mistrust and lower compliance. This situation underscores the challenges in achieving widespread behavioral change through technological interventions in community energy management (Namujju et al., 2024, p. 5). Otto et al. (2023) state that trust is crucial to achieving sustainability transformations. They note that building trust is strongly linked to processes of communication, deliberation, and participation but slightly differ from Levelt et al. (2014) in their conclusion of the review of trust theories by stating that although participation can be a relevant node in networks of trust, it is not considered as an instrumental and organized enabler of trust. They further state that the relation of trust and participation becomes a question in multiple ecologies of participation, likely to affect trust in different ways, and recommend that future studies should reflect on frequently reproduced assumptions on who the subjects and objects of trust are (who needs trust, of whom, in what?), study the rich contexts of trusting and question if and how trust can be built (Otto et al., 2023).

The presented intervening conditions either strengthened and led to positive outcomes, and contributed to enabling power relations through stakeholder education, or they had a vice-versa effect.

4.1.5 Consequences of Stakeholder Education

Stakeholder education leads to context-specific project implementation. Using the knowledge gained from the understanding of the community contexts enabled the operator to sequentially work with, and through the known community coordination and communication structures. The operators also put in place community context relevant initiatives, such as installment payment approaches for electricity connection and access fees, smart payment methods, among others. The excerpt below shows how, using the knowledge of the community context, the operator's electricity mobilization and sensitization campaigns were customized to relate to the community experiences and contribute to the electricity project embrace.

> "Some people were scared of the cost of this electricity. Some people were scared of committing themselves to this monthly payment obligation of 11,000Tzshs. But as the operator continued to educate us, also they compared for us using the examples of the kerosene lights that we were utilizing and we were able to see that the cost of kerosene monthly is more expensive than paying 11,000Tszhs for electricity. (…) This education was done by the operator staff, and they were also joined by the REA (Rural Electrification Authority) staff. The operator staff using that example to show that if one was using a kerosene lamp, then they would pay a lot more money as opposed to the monthly 11,000Tzshs for electricity… is something that really made many community members understand. These education sessions were conducted during convened community village meetings. We were all called to participate in these meetings." (Interview 41 with the chairperson of the electricity committee, Village 14, Paragraph 1 - 3).

Electricity demand is a result of project awareness. Hearing about and seeing the capacity of the minigrid projects through the various communication platforms creates a desire for electricity. Additionally, knowledge exchange sessions contribute to the overcoming of unfounded fears and suspicions regarding the electricity projects. Seeing that people who had embraced the projects did not die from it, or that lands in which the electricity poles were erected did not lose fertility, neither did their neighbors lose their sexual potency, coupled with ongoing education campaigns and local leaders' mobilizations caused community members to abandon their fears and embrace the projects and demand for electricity services.

> "As the project was progressing, the community saw that people were embracing the electricity one by one and these people were not dying... Also, even as they kept connecting it to people's homes, some community members said that this electricity kills, it can burn a house, and people were scared. But when they saw that houses were connected to the electricity and nothing was happening to them. It came to a point... you see even the local leader talked to the community encouraging them... He encouraged them to adhere to the rules and regulations of this electricity and the safety precautions. (...) but if one uses it well, this electricity will be good…" (lnterview 53 with former local leader, Village 13, Paragraph 40).

Stakeholder education guides access to project-related services. Written and pictorial education about steps taken to get electricity connection in some communities continuously reminded and informed community members on access to services. Some operators would send periodic SMS messages to customers' phones reminding them of the procedures for electricity payment. Written guidelines and contracts provided consistent guidance to electricity users on how to reach out to the operators and how to pay for electricity-related services.

Stakeholder coordination and cooperation were achieved and enhanced. Understanding what the projects are about and how they would contribute to community development sparked community goodwill towards the projects. In some communities, land was given at no cost for project operations, as well community members participated in setting up the project. Additionally, when

the operators learned about certain aspects and needs of the community, they extended their goodwill and contributed to addressing them, such as providing free electricity connections in some low-income communities or to some social institutions (schools, hospitals, religious institutions), providing water plants, and required infrastructures e.g a school fence and playground in one community, toilets on an island community with scarce sanitation facilities among others.

Stakeholder education empowered actors to participate in the project. The stakeholders were able to know what services are offered, by whom, and how. Community leaders stated that they were able to understand and access the channels through which they would lobby for electricity-related services for their communities. As seen with the leaders in Tanzania and Uganda who in different situations wrote letters to the regulatory authorities to prompt access to electricity services for their communities. In Tanzania, the regulatory authority responded by supporting the minigrid operator with electricity connection equipment (poles and wires) to extend electricity to three other villages, while in Uganda, the minigrid operator responded by providing electricity to the villages whose connection had been long delayed without communication.

Stakeholders used information accessed to make informed decisions that are beneficial for themselves and the community at large, and a lack of access to project-related knowledge results in faulty actions and decisions that do not apply to the minigrid context. Decisions that cause frustration among the community and possible negative perceptions of the project operations as exemplified below;

> "There is a man who started a welding machine in my village but the electricity strength is small. I think you have to call them first so that they guide you on the type of machines that you need to buy, that are compatible with their electricity. It is not that you just buy, bring, and plug. Like another resident who bought a ground nut paste machine and when she brought it, it would not work. A ground nut paste machine does not take use a lot of electricity but it failed to use it and she was told that it would not work." (Interview 18 with 02 local community leaders, Village 2, Village 3, Paragraph 75).

Information regarding the different stakeholder roles and responsibilities awoke stakeholders to their obligations. Stakeholders were made aware of their roles and contributions to the projects and they understood each other's roles and expectations. This enabled them to contribute to stakeholder accountability. A former local leader in one of the communities noted that the community members were not comprehensively educated about the project. Also, he noted that most of the members in this community were wary of the project at the initiation phase and

therefore did not participate in these education sessions. As a result, the community members were not able to hold their leaders accountable when they made wrong decisions such as diverting funds meant for minigrid project-specific purposes. A fact that contributed to the economic un-sustainability of the minigrid project.

4.2 The Category of Cultivating Coordination

Cultivating coordination refers to the deliberate interactive relationship between the stakeholders within the minigrid process with the intent of working together harmoniously towards the successful implementation of electricity projects. Stakeholders in this study are the identified actors that influence or those that are influenced by the minigrid process.

In all the communities visited, interactions with the respondents revealed that there are a number of actors embedded in the minigrid scene, and each, based on their presence and roles in the minigrid arena has an influence on the process or was affected by the process in one way or another. In Uganda and Tanzania, the stakeholders identified included the rural regulatory electrification agencies, minigrid developer and or operator staff (managers, electricity technicians, community liaison staff), minigrid implementation and operational partners, administrative community leaders, local community leaders, and community members (both electricity users and non-users). Specific to Tanzania were the electricity committee members. The roles, influence, and related interactions of the different stakeholders trigger a dynamic power web that affects cooperation and coordination in the minigrid project and, subsequently project acceptance.

Cultivating coordination, as captured in the field data, highlights the multisectoral context of minigrid project implementation and the dynamics involved in the stakeholders' interaction in the quest for project success and sustainability. To implement mini-grids, working with government institutions, funding bodies, and local communities is vital (UOMA, 2019, p. 26). In order to achieve universal access to clean fuels and technologies, greater political will at the national level is essential, along with coordination among different actors. Integrated energy planning can help governments decide where to direct available resources, what solutions to support or leverage, and which communities to target. (IEA et al., 2021, p. 74). Doring et.al. (2018) re-echo that inclusive governance modes that rely on multi-stakeholder involvement generate a broader knowledge base to monitor the impacts of the energy transition on society. Moreover, it builds social ownership and can harness the potential for societal support through process legitimization. Inclusive

governance unveils contestation and conflicts over power, resources, and expectations, which, if left unaddressed and unmitigated, could incite public resistance which endangers not only energy projects but public trust in the state in general. Instead, conflicts of interest must be addressed transparently and managed in a constructive way to find robust compromises through fair and meaningful participation of affected social interest groups (Döring et al., 2018, p. 40).

In their study, Salak et al. 2024 state that if the energy transition ought to be based on a broad social consensus, site selection must be participatory, involving, e.g. power companies and landscape and nature conservationists, and must consider economic needs and society preferences. They assert that incorporating a participatory approach accentuates the dynamic nature of social preferences, emphasizing the need for continual monitoring and adaptation and recommending that, as the energy landscape evolves, so should strategies, ensuring they are both sustainable and socially resonant (Salak et al., 2024). Odarno et al. (2017), in their case studies, specifically the case of Leganga community minigrid, present a number of challenges resulting from the non-participation and lack of cooperation of the community and their leaders that contribute to the failing status of the grid implementation. They note that community participation is necessary to win goodwill, buy-in, and full support for the project. Yet they do not factor in a participatory and consultative approach or step in their "major steps in planning and development small power producer projects." In their conclusions, the impact and need for social and community engagement still remained shadowed (Odarno et al., 2017, pp. 58–84). The need for a stakeholders' participatory approach to facilitate effective utilization and acceptance of renewable energy technologies is continually resounded ((Batel, 2018; Batel & Devine-Wright, 2015; Lennon et al., 2019; Perlaviciute, Schuitema, et al., 2018; UOMA, 2019, 2020). Sociotechnical regimes in energy transitions are generated through special interest groups, like engineers, policymakers, scientists, users, and economic actors. These groups collectively, but from their very own scope of interest, reproduce and stabilize certain technological developments. The social practices these groups cultivate are aligned and coordinated with each other through rules, processes, institutions, common framing, meanings, and mentalities that aim at maintaining the sociotechnical regime. Energy transitions, thus, require changes and innovation to social practices by all these actors and their interaction and cooperation among them (Döring et al., 2018, pp. 10–11).

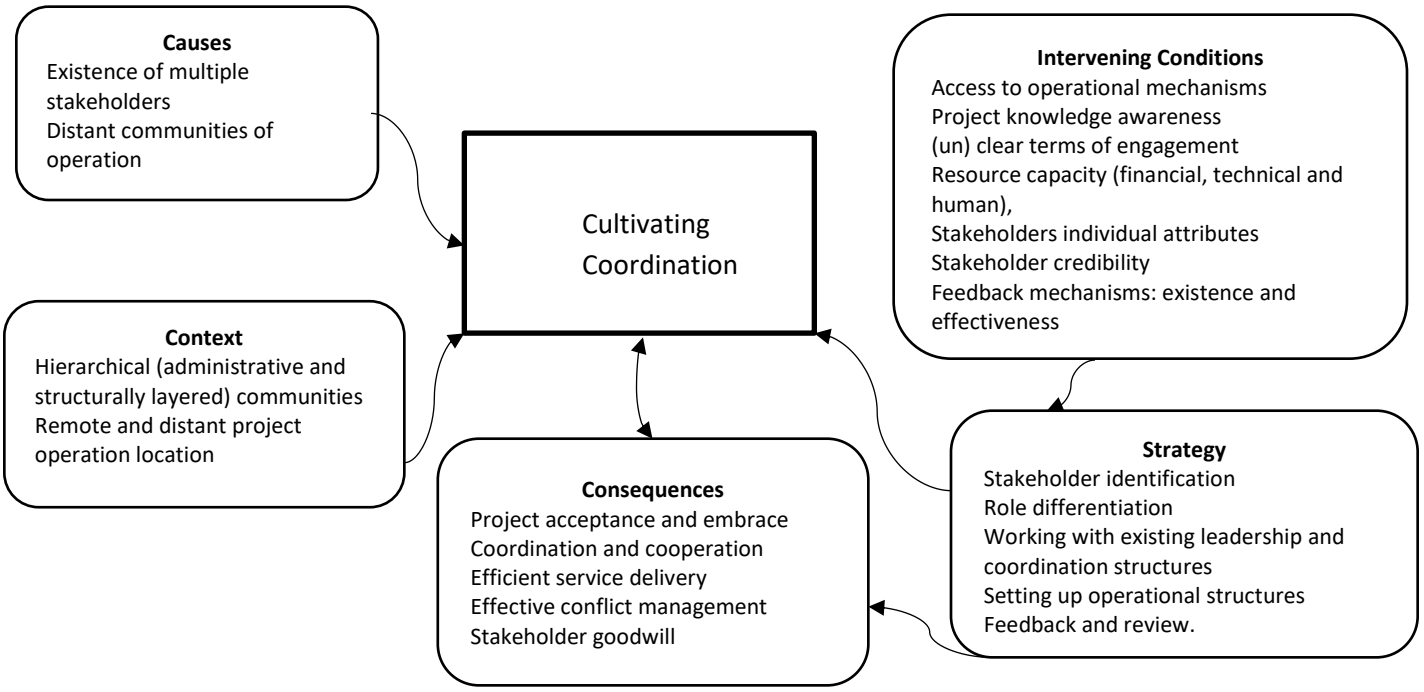
The deliberate actions of seeking coordination and mutual implementation of the minigrid projects, as deduced from the study of Tanzania and Uganda minigrid communities, are presented in the subsequent sections.

> "Actually, the local council chairman (LC) helps us in giving out information, passing out information. So maybe we wanted to conduct a meeting, we really put him in place, as a person who is really important in this project. Because this project they said LC is very important in this project. This is why last time he was put as the number one person given to actually identify the places here...because there are other machines inside the villages, like milling machines, …he is the one who is interacting with these people. Actually, per now …last time when these people are commissioning this project in the subcounty, so they told me to invite LC1, LC3, business community, and business leaders. I invited those people we went there to the meeting." (Interview 34 with community liaison officer, Village 10, Paragraph 106).

> "…but these big boys of yours, I have seen driving the cars, they have never taken time to come and check on the subcounty. I don't know if they look at the building and the building is not one that they want to enter, they look at the guys working here and they think that the guys working here may not be knowing anything but you see the guys working here have the brains we can talk and share some issues which affect us. Because if we stand on their way, they might not access the community and you see at the end of the day the service is going to be serving to community members and we are in the direct presentation of the community members in the subcounty here." (Interview 38 with administrative leader, Subcounty B, Paragraph 19 - 20).

In the two excerpts taken from interviews with respondents from two communities within the same district under the same electricity operator, it is clear that the participation and presence of different actors contribute to the implementation of the minigrid projects. That each of the different actors, in their authority and roles wields influence on the status of minigrid implementation. Deliberate actions of inclusive mobilization and knowledge exchange empower the different actors to accordingly utilize their authority for the success of the project. Not recognizing the existing authority of stakeholders and not enlisting the relevant actors in the project implementation process triggers conflicts and the ultimate rejection of the projects. The actions undertaken when working with the stakeholders in the minigrid settings have an impact on the status of coordination among the various actors, they give rise to power struggles or enable alignment in the process and ultimately contribute to the acceptance and or rejection of the electricity. As identified from the field, the properties of the strategy and category of cultivating coordination that include context, causes, and actions account for and explain the variations in the resulting consequences of coordination and power acceptance dynamics as presented and discussed below. Figure 5 illustrates the interrelated concepts of the category cultivating coordination that are further expounded in the subsequent sections.

Figure 5: Cultivating Coordination Category



4.2.1 Context of Cultivating Coordination

A hierarchical (administrative and structurally layered) system of governance exists in the minigrid communities. These are structures of administration that are recognized and put in place by the national government and the local communities. In their roles, these structures provide oversight and coordination tasks in the communities, they have authority over the communities. This gives these structures the power to vet and oversee the entry and access to communities. Hence a context that necessitates deliberate actions from the minigrid operators and stakeholders therein to establish effective working relationships.

The minigrid communities are located in remote and distant project operation locations. All the operators interacted with had their headquarter offices located in the capital city district of the country of operation and even in the donor country of operation. This called for the need to establish networks and site offices to enable them to monitor the ongoing grid operations and maintain a presence in the minigrid communities. The minigrid operator companies and their operational partner companies all had their headquarters offices in the urban central cities of

Tanzania and Uganda respectively whilst managing and operating minigrid projects in the remote, distant, hard-to-reach areas in the respective countries. They shared that management of the minigrids projects required constant operator presence and timely response to emerging issues in the communities, and therefore, they put in place strategies to work with and coordinate with the communities and their leaders, as indicated in the field citation below.

> "You see these operations by all means, we need a team here. We cannot be on the ground in the minigrids at all times. You see we even had to let go of a very active agent in one of our sites and he has been indicated in a legal case… So now what we want to do in, is enlist the lady agent of the proximate neighboring plant to take this on and manage it as well. That lady is now assisting us, she is working with us in three sites." (Interview 39 Discussion with minigrid operator manager, Paragraph 52).

4.2.2 Causes of Cultivating Coordination

A multi-stakeholder context. The minigrid project requires input from different stakeholders in their different capacities to contribute to its success. In the communities, it was continually shared that this - working together by various stakeholders does not automatically fall in line. It is sought, maintained, and guided. The existence of multiple stakeholders, with different interests and influences in the minigrid operation scope, presented the need for stakeholder engagements. Interactions, negotiations, and concessions among the different types of stakeholders, including the minigrid operator, local leaders, administrative leaders, operational partners, community members, and electricity users in the quest to achieve the project objectives, continually came into play. Different stakeholders have different opportunities to exert an influence on a project. A survey of the project's stakeholders and their relationship to the project is an important part of the project planning process (Jhala, 2014, p. 3).

> "At the beginning of the project, the company sat down and said that we as the energy company cannot work alone, we need to work with you and they requested the village government to select people will form the energy committee to represent the energy-related concerns of their communities and be able to discuss these concerns with the village leaders, them - the minigrid company and the community. So, the people chosen were from the five villages." (Interview 41 FGD with chairperson electricity committee, village 14, Paragraph 33).

The distant communities of operation prompted the minigrid operators to put in place mechanisms for coordination and networking. All the minigrid operators and their operating partners interacted with had headquarters offices in the central cities in the urban. In both Tanzania and Uganda, the operators advertised, interviewed, recruited from the minigrid communities, and trained and

deployed these skilled persons in the field offices among whom included technicians and community liaison staff. They would also recruit engineers from the city centers who would work as field staff in the minigrid communities. The staff would work with the communities, the operators, and the operational partners for a coordinated project experience and electricity service delivery.

4.2.3 Strategies for Cultivating Coordination

The actions and strategies of stakeholder identification, role differentiation, working with the existing structures, and setting up operational structures constituted cultivating coordination, as presented and discussed below.

i) Stakeholder Identification

The minigrid operators identified the different categories of stakeholders to work with based on the stakeholder's contribution and expected roles toward the achievement of the project objectives. In identification, the purpose is to undertake preliminary identification of key stakeholders. Here, it is important to identify important and influential stakeholders and decide how to involve them in design and appraisal (Jhala, 2014, p. 4). A presentation of the identified stakeholders, their selection process and interaction in the minigrid arena is accordingly detailed.

Minigrid operator/developer

The minigrid developer/operator is the entity that designs, constructs, and installs the solar energy system. The minigrid operator is the entity that runs the day management of the solar energy project and provides electricity to the end-user customers. In all the communities, the minigrid developers were contracted foreign companies that would put the solar equipment in place, prepare the system for electricity generation, and hand it over to the minigrid operator (private companies, national government, or local communities) for day-to-day running and electricity supply. The companies received financial funding from donors and subsidized support from the national governments through the rural electrification agencies to install the minigrids. Except for one minigrid community project that was identified by the national government, the minigrid operators identified operation areas, among the various nationally highlighted areas of electricity need, that were in line with their business and vision interests. Feasibility studies and stakeholder

engagements in the tentatively selected areas, as required by the electricity regulatory authorities and their respective donors were then initiated prior to the initiation of project development.

Operational partners

On putting the electricity generation equipment in place, various companies, either contracted by the operator or driven by rural electrification-related goals, with the oversight of the national and rural electrification regulatory entities, worked alongside the minigrid operator to contribute to the minigrid processes and goals. In all the communities, the rural electrification regulatory authority handled the phase of electric pole installation. Differing and relative to each minigrid community; other phases such as community sensitization and mobilization, electricity wiring and installation, end-user connection, and productive use of energy promotion were conducted by different companies. These companies are herein referred to as operational partners. The operational partners were, in most cases independent of the minigrid operator but working in relation to and contributing to the objectives of the minigrid operator and regulatory authorities. An example is the productive use of energy promotion partners that conducted training on business management and provided electric equipment at subsidized rates with the aim of increasing the productive use of electricity and related demand for electricity services. In some instances, the operational partners interacted with the minigrid operator and conducted joint activities such as awareness creation sessions, training, and beneficiary assessments.

Community leaders

Using the knowledge acquired of the existing hierarchical structures, minigrid operators identified and enlisted the community leaders onto the project through interactions and education. The operators worked with both administrative and local leaders. The administrative leaders are leaders appointed through national recruitment systems, while the local community leaders are those elected by the local communities to represent their concerns through the existing national electoral guidelines. Some of the leaders revealed that referrals from the higher leadership structures that included the relevant administrative (district and national) authorities, confirmed the legitimacy of the energy projects and contributed to their cooperation with the project. They then endeavored to work with the operators and their partners to link and liaise them with the local community leaders. In most of the communities, the local leaders not only linked the minigrid operators to the owners of identified strategically placed resources, such as land that is convenient for the minigrid

operations but also lobbied so that the owners to sell or lease the identified land to the operator at fair terms. Through local leaders; relevant institutions, entrepreneurs, and other community users were identified to accordingly work with and participate in the electricity project.

In some communities, the operators, once certain of the administrative leadership support, proceeded to start operations within the communities without enlisting the local leaders. In such communities, there was reported rejection of the electricity project by both the community leaders and the members. In one community, members woke up to operator partner staff erecting electricity poles on their land prior to their knowledge of this or given consent; they immediately sought their local leader to intervene, he, too, was not aware of this, the partner operator staff told him that they had sought consent from the leader of the neighboring community. He, therefore, tried to stop this process of electricity pole erection from going on, but the staff used force, brushed him off, and proceeded with their process in another location within the village. However, some of the community residents rejected and refused that these electricity poles be put on their lands. In the neighboring community, where the community leader was educated about the project timelines and enlisted at the start of the project, he was very active in sensitizing his community about the upcoming electricity project, which he stated contributed to the acceptance and dispelling of myths that arose regarding the electricity poles such as, that the electricity poles in one's land caused infertility to both human and the soil.

Village 3

> "It was very early in the morning when a village resident came to my home complaining and stating 'they have cut my mango tree to create room for erecting electricity poles.' He asked if they had approached me as the chairperson of the area. And I was not aware of these people and this exercise. I then approached these people and reproached them. (…) I ordered them to cease their exercise and demanded that their manager should come talk to me first as the chairman of the area. When the manager came, he mentioned that the chairman of the village had given them consent. I mentioned that I was the chairman and I was not aware of this. He then stated that the chairman of the neighboring village had approved their exercise. This was very wrong of them, they had not consulted me and I had not given them this permission. (Interview 7- FGD with 5 men, village 3, Paragraph 10 - 11).

Village 1

> "As a chairperson, I had to first embrace the project and then pass it on to our communities because I saw the development it would bring to the area. So, I put a lot of energy into sensitization even where the other chairpersons were absent and emphasized our need for electricity and the development it can bring to the community. As a result, a lot was said, there was also a lot of primitivity from some people like some people thought the electricity poles drain the fertility of the

> land, others would say that when they put the electricity it will make men impotent, …. others that the electricity will kill our children, others requiring money before the electricity poles are put in their land ... All in all, to overcome all these problems I endeavored to consistently sit with the community members and show them the truth of the matter and the benefits and development that can come from this electricity in the nearest future." (Interview 8 with local community leader, village 1, Paragraph 30-31).

Electricity committee members were identified in collaboration with the local leaders. In Tanzania, the local community leaders identified, vetted, and recommended electricity committee members. The recommended members were then presented to the community members during village meetings for either final approval or rejection. The electricity committee members are the link of coordination and liaison between the community, community leaders, and the operator.

The coordination and implementation experience of the electricity committee members contributed to the willingness of selected members to be part of these committees. In one of the communities, it was stated that there was a good working relationship among the electricity committees, the local leaders, and the community. In this community, it was shared that the nominated persons never turned down the opportunity to serve, while in another community in Tanzania, the local leaders would put out an advertisement for members interested in electricity committee leadership to apply for the positions and be vetted, but with time, given the witnessed experiences and challenges that the electricity committee members faced, enforcing community adherence to minigrid operation guidelines, the community members were no longer willing to respond to the advertisement. The community leaders then resorted to identifying, vetting, and recommending for endorsement able persons for electricity committee membership. The electricity committee members ensured that all the stakeholders' needs and concerns were represented, heard, and addressed. In one of the communities, the operator, after educating five sub-villages, extended electricity to only two of the sub-villages due to resource limitations; there were community outcries about the unfairness of this to the communities not connected, the electricity committee, together with the community leaders lobbied the Rural Electricity Authority (REA) and, as a result, REA subsidized the operator's cost by providing electricity poles and wiring services in the three villages. This enabled the operator to provide electricity to all the five sub-villages.

The electricity committees operated on a term-limit basis; in one of the communities, it was annual while in another community it was on a three-year term basis. The committees held quarterly meetings to discuss concerns regarding the minigrid project, they also conducted periodic meetings

with the local leaders and or the minigrid operator, and during community village meetings, they updated the entire community members present about the minigrid project operations and identified and responded accordingly to the community concerns regarding the minigrid project. Together with the local leaders, administrative and regulatory authority, and the minigrid operators, they conducted and participated in the knowledge exchange process in the community.

Community liaison officers in Uganda and ***electricity technicians*** in both Uganda and Tanzania were selected through the recruitment procedures of the minigrid operators. Advertisement for the vacancy positions of community liaison officers and technicians was put out by the operators in the minigrid villages using existing communication platforms. These included the public loudspeakers, advertisements put on the public notice boards, and word of mouth. Interested and skilled persons applied, they were interviewed and the successful candidates were accordingly recruited, trained, and engaged in conducting microgrid operator duties. In some cases, active and skilled community members were identified and requested to take on community liaison and electricity technician roles.

Their duties included receiving and responding to customer concerns, receiving and sharing minigrid-related communication with the operator, community members, and community leaders. The provision of minigrid maintenance and repair services (more specifically, the electricity technicians), and community liaison officers were trained and expected to conduct basic routine maintenance, hygiene, and troubleshooting. The community liaison staff and technicians provided security to the minigrid equipment and were the first line response team representing the operator to minigrid concerns. Contractual terms and references of engagement between the community liaison staff and the operator were mainly verbal. By the time of the study, the community liaison staff stated that despite promises to receive written contracts of engagement from the operators, this had not taken effect, the communication was only verbal, and they had some grievances regarding unclear and continually changing terms of engagement. The local community leaders were not involved in the process of recruiting and engaging community liaison staff.

Community members are stakeholders in the minigrid process by proxy of residing in the area of minigrid operation and being potential minigrid project beneficiaries. Through the processes of education and needs assessment, they accessed information about the project which enabled them to make decisions about enrolling and becoming ***electricity users*** or not. In other communities, by

virtue of being proximate to the minigrid, a community member was selected and enrolled on the electricity. It was noted due to fear, speculations, and limited project information, some community members refused to be connected to the electricity projects despite being situated in beneficiary-proximate positions. Electricity users were further classified under household, business, and institutional electricity users based on their electricity usage and consumption capacity.

ii) Role Differentiation

The concept of role differentiation is used to refer to the process of specifying the different tasks or functions the various actors play in the minigrid process and the community. Role differentiation is a strategy for cultivating coordination. The presenting structural order of minigrid communities laid further context for a structural order in which formal and informal stakeholder roles within the community are embedded, such as the leadership and oversight roles of leaders and community participation roles of community members, among others. The introduction of the electricity projects introduced additional roles and expectations of the respective stakeholders. Some of these stakeholder-specific roles stemmed from the existing roles and power structure, while others were newly created new roles. The project roles pertaining to the minigrid implementation were either interwoven into the existing structures, or they existed at a parallel level with the existing community structures and roles, and this accordingly contributed to the state power relations and dynamics in the projects.

Stakeholder education enabled awareness about the different tasks and roles of the various stakeholders relevant to the minigrid process in the communities and empowered stakeholders with information and knowledge to guide implementation. Minigrid operators learned about the existing community structures and their roles during baseline assessments and village community meetings. Through existing communication and coordination platforms, including inception and village meetings, public loudspeakers, discussions about the minigrid projects; the different relevant stakeholders and their roles, obligations, and expectations received communication about their roles and obligations, and as well communicated their expectations to the minigrid operators. The operators would share information with the communities about upcoming initiatives and also remind the community members of their roles such as timely payment, ways of accessing community liaison, technicians, and operational partners in case of challenges. Community leaders would access project-related knowledge that would enable their community mobilization, conflict

resolution, and community oversight roles, among others. Communities would be educated on the different ways of identifying electricity abuse and the related damages to the grid. They were encouraged, among others, to report incidents of electricity misuse and abuse. Community responsibility towards the grid was encouraged.

Project inception and introduction meetings with stakeholders provided platforms to introduce the electricity project, the respective operational partners, their roles, and modalities of access to the wider community, community leaders, businesses, and institutions. In these meetings, as seen from the cases of the fourteen communities, the minigrid operator, electricity regulatory authorities, operational partners, administrative leaders, local leaders, business communities and their leaders, institution staff, and general community members participated. Official introduction of the project, the different participating partners, and their roles and access were shared with the communities as well as the expected community roles. One of the leaders shared that, basing the information gained from the inception meeting, he knew where and how to report complaints on matters that the minigrid operator had failed to resolve. He shared a complaint with the Electricity Regulatory Authority related to the delayed electricity connection period, detailing the community members' threatened destruction of the electricity equipment in place. As a result, the electricity operator responded and the village was accordingly connected to the electricity. It was shared that these project inception meetings were conducted at the central village of the district. In Central Uganda, it was held in one of the central villages, and communities from the other two villages were mobilized to participate. Similarly, in Northern Uganda, the project entry meeting was held at the central village, and community leaders and users from 25 minigrid communities of operation scope were mobilized to attend. Several community members and leaders from the neighboring communities did not attend, citing financial constraints as they were unable to transport themselves to the venues while others felt it was cumbersome for them to move to the neighboring community to participate in these events, some leaders felt that moving them to the neighboring communities was undermining to their community autonomy and capacities, they preferred that their autonomy is recognized, that the information is brought to them within their communities.

Updates on continually changing roles and expectations were shared through community outreach sessions, and door-to-door visits by the minigrid operators and their implementing partners, community liaison agents, and electricity committee members. In three of the communities in

Uganda and one of the communities in Tanzania, through interaction and networking with the local leaders, the operator introduced initiatives of installment and loan payment for customer connection to the grid electricity. The local leaders were guarantors to the members connected on installment pay, and these payments were for specific durations ranging from one year to two years based on the community. Through community outreach sessions and communication platforms, communities were continually updated on such initiatives and the expected inputs and roles that they needed to fulfill to benefit from these initiatives.

Guideline books detailing the stakeholders in the minigrid settings and their respective roles were used for role differentiation. In one of the minigrid communities in Tanzania, the minigrid users received a guidelines rules book compiled by the Ministry of Energy officials and minigrid developer. In this book, the different actors including the regulatory authorities, community leaders, electricity committee members, electricity technicians, financial (bank signatory) committees, and electricity users, were listed, their processes of selection or recruitment, and their different roles in the grid and process of role implementation. The community and local leaders did not participate in the compilation of this guidelines book, but only received the compiled set of guidelines from the Ministry of Energy. It was noted that the community did not adhere to several of the guidelines in the book. The national and district level oversight and supervisory stakeholders were not active in the minigrid operations oversight as stated in the book, the three-year term limits of the financial (bank signatory) committee team were not adhered to for seven years, and the community had not re-elected a new financial committee, some of the old committee members were no longer staying in the village and accessing them to sign for withdrawal of funds from the bank when the project required to do maintenance work was cumbersome and at times came at an extra cost, un-provided for and un-stated in the guidelines book. The leadership and electricity committee had diverted some project funds to issue loans to community development projects which was not accounted for in the project guidelines book and yet these loans were never fully repaid. The electricity technician was not selected by the community and its leaders as per the rules and guidelines, many electricity users continually refused to pay the utility fee for electricity usage, and in their refusal, they verbally and physically attacked the electricity committee members during moments of physical fee collection. The community had reviewed some of the guidelines in the book, such as reducing of the electricity users' payment fee structure, and increasing the electricity committee allowance fees. The leaders also shared that following

these guidelines such as taking to court electricity fee payment defaulters and enforcing physical utility bills' payments were a great source of conflict between the electricity committee members and the electricity community members.

Contractual agreements were another avenue through which roles were set and shared with the electricity technicians in the minigrid communities. Of the five electricity technicians interviewed, only two of them in Tanzania had written contracts detailing their job descriptions; three of the others, one from Tanzania and two from Uganda, were engaged in the minigrid maintenance and repair roles on a verbal contractual basis. All the ten community liaison minigrid staff interviewed were engaged on a verbal contractual basis, although they kept demanding that the operator put this to written terms as they were uncertain of their roles, time schedules of engagement, and payment terms, among other conditions. Some community liaison staff were identified and recommended through their previous minigrid-related work done with four other minigrid-operational partner companies that carried out activities in the communities during the initiation of minigrid projects. Each of the companies operated long enough to carry out their specific minigrid process-related tasks such as community sensitizations, erecting of electricity poles, and productive use of energy promotion. The different implementing partner companies at the time of their tasks implementation would, through the existing database accessed from the previous partner, would enlist the services of the community liaison staff. It was noted that only one of the operational partners provided written contracts, some would engage these community liaison staff on certain verbal agreement terms of payment and even fail to pay them the full sums of money agreed upon or not pay them at all. Some of the community liaison staff had, therefore, resigned from conducting tasks in the minigrid project and no longer responded to calls, while several of them expressed a lot of discontent and uncertainty about their terms of engagement. And those of the community liaison staff who were still working with the existing minigrid operator were wary of being engaged on verbal terms of engagement.

Customer contracts issued to the electricity user at the point of connection to the electricity project detailed the roles and responsibilities of the operator and the electricity user. In some communities, these contracts were issued and a copy given to the customer, in others much as the minigrid users signed and assented to these contracts, they did not have these contracts in their custody. They were not certain if the documents were kept with the local leader or at the operator's community

site office and therefore could not regularly refer to this document and its contents of communication.

Specific groups in the community relevant to minigrid operations, like the entrepreneurs, were specifically identified by the operators and their implementing partners at times in collaboration with the community leaders. In other instances, the implementing partner and the operators would put advertisements in the communities inviting entrepreneurs to apply to participate in the productive use of energy trainings and project initiatives that involved accessing electricity equipment at subsidized prices.

Figure 6 shows the details of the stakeholders and their identified roles in the minigrid process in the community.

Figure 6: Minigrid Stakeholders - Role Matrix

Stakeholder- Role Matrix Table		
No	Stakeholder	Roles
1.	Electricity Regulatory Authority Rural Electrification Agency	Oversee, regulate, and supervise the national rural electrification process. License the operation of minigrids in the community.
2.	Minigrid developer/operator organization	Set up and manage operations of the minigrid project ****To note** With the exception of one community, where the developer set up the minigrid and it was left to the community to manage the overall operations of the minigrid project.
	Minigrid managers (Country operation managers, field level operation managers)	To oversee and coordinate the operations of the minigrid process
	Field technicians and engineers	To implement and respond to technical minigrid-related concerns of the communities.
	Community liaison officers	Local community members employed by the minigrid operator to maintain contact with the community, receive and forward electricity-related concerns to operator technical staff and managers, and provide basic minigrid-related services such as support to the electricity payment process.
3.	Minigrid implementation and operational partners	Organizations that, in partnership and coordination with the minigrid operator, provide a particular service within the minigrid cycle, such as electricity wiring of houses, and productive use of energy projects, among others
4.	Community administrative leaders	Oversee and coordinate the operations of several villages existing within a sub-county or district. They are politically appointed leaders.
5.	Local community leaders	Overall oversight and coordination within a particular village community. These leaders are elected by the local communities.
6.	Electricity committee members	Local community members are elected in conjunction with the local leaders and the wider community.

		They serve on a periodic term limit as per the minigrid guidelines and regulations. They are a liaison between the stakeholders existing within the minigrid project. These were specific to the Tanzania minigrid communities.
8	Community members	These are the inhabitants/residents of the community. They are the market for minigrid electricity; they connect to, purchase, and utilize the electricity. They participate in project activities such as community meetings. In Tanzania, they also participate in the approval of selected electricity committee members. They approve or reject members vetted and recommended by the local leaders.
9	Electricity users	These are members of the community or institutions within the community that are connected to and utilize the electricity. The electricity users are in three categories depending on what they use the electricity for, i.e. household electricity users, business electricity users, and institutional electricity users.

Roles in the minigrid settings are defined by the status of the various individuals, the behavior and characteristics of the individual actor, the ongoing interactions amongst the different stakeholders, and the community contexts that guide the role setting, allocation, and learning. Roles were constantly changing, with individuals/categories of actors seen to be having multiple roles. Based on the context, the roles were either adhered to or deviated from, like local leaders who depending on their access to information and inclusion in the project would either take on mobilizing, regulatory, enabling, advocacy, and oversight roles, or opposing, manipulator and de-campaigning roles.

Turner (2001) in role theory, deals with the organization of social behavior at both the individual and the collective levels. Individual behavior in social contexts is organized and acquires meaning in terms of roles. At the various collective levels, groups, organizations, and societies function by differentiating sets of tasks, each of which is assigned to or assumed by particular individuals. Roles are continuously constructed and reconstructed as individuals engage in role-making in the course of interaction with incumbents of alter roles, or as legitimate role definers specify and respecify the organization of activity. The dynamic reconstruction and role-making and the resolution of role conflicts are governed by three principles: functionality, representationality, and tenability. Roles are constantly modified for greater apparent effectiveness (functionality), limited by the understandings and misunderstandings of incumbents and legitimate role definers. Roles

become vehicles for conveying certain images (representationality) and are framed and reframed in relation to what they are seen to represent. Roles are subject to continuous tension to supply a tenable balance of benefits to costs for role incumbents, limited by the power and resources of those incumbents (Turner, 2001).

Jhala (2014) cautions that it is important that stakeholder participation not be exclusive, or controlled by any one group. He recommends that once an initiative has found common ground and has negotiated its goal with partners, including local stakeholders, a stakeholder agreement can be recorded in writing. This may seem overly formal, but it has the advantage of providing clarity and helping to avoid (or resolve) conflict in the future (Jhala, 2014, p. 2). Indeed, accountability, transparency, and knowledge access in the various roles in the East African minigrid communities, such as documentation of expectations and duties, are seen to prevent conflict and also act as a source of information for conflict resolution. One of the leaders in a minigrid village noted that the stakeholders' guidelines book of operation was a point of reference in handling and dealing with emerging conflicts and points of divergence in the minigrid operation scope. Similarly, in another community, the absence of written terms of reference and contracts between the operator and the community liaison staff was continually raised by the respondents as a source point of anxiety, mistrust, conflict, and unfair treatment.

iii) Working With and Through Existing Leadership and Coordination Structures

> "(...) you know it is for the lifetime of the project... it involves a series of interactions with the communities. It is not a one-time involvement that we interact with the communities… So apart from the community meetings… of course we use community radios, public address systems... we mainly communicate through their leaders… community leaders. Because apart from the engagements to do with the community, they have their village community meetings which we sometimes don't get involved in. So, it is always better to keep in touch with the community leaders, to keep them informed about project messages, so that even during other community meetings they pass on the message too, on our behalf to their subjects… we get in touch with all the community leaders at different levels… from the district headquarters to the district level and also at the sub-county level up to the Local Council one (LC1) chairpersons. So, we are always in touch with them." (Interview 49 with minigrid operator manager, Paragraph 15-17).

Stakeholder engagement and involvement is not a one-time happening; it involves a deliberate, continuous process of cultivating coordination. This involved continuous working with the communities and other stakeholders throughout the lifetime of the projects, through existing coordination structures that are known and trusted by the project beneficiaries. Deliberate actions

were undertaken to identify the relevant stakeholders, enlist them in the project, and ensure continuous stakeholder engagement and coordination.

It was shared that knowledge exchange and communication were fuel to achieving efficient and effective stakeholder coordination and networking. In communities where the operators and their partners identified and worked with the existing leadership structures, it was stated that the leaders were active in linking the operator to required resources within the community, working with the established project structures, sensitizing and mobilizing the community to participate in project related activities and active in working with the operator in conflict resolution of emergent issues. Access to continuous and updated information enabled the existing structures to positively contribute and participate in the achievement and continuity of the project goals. This, among other examples, is evidenced in this community when the regulatory authority issued a directive on electricity pricing that threatened the existence and operations of the minigrid project; through working together with the stakeholders within the minigrid communities, a negotiated amicable position was attained.

> "There was a government attempt to equal the solar power cost to the cost of the REA national electricity which is much cheaper. The company offered the community customers an offer of two months to use this electricity at the recommended REA cost. But after those two months, they found it impossible to continue operating and meeting the costs of their operations. After this as the village electricity committee, we had meetings to discuss with the local government and the community on whether this system should remain or be removed. The village committee decided to write letters to the government stating that they should leave them with their electricity at the rate favorable to the minigrid company since they keep promising them to bring the TANESCO national electricity but this is not done. So they said that whether it is expensive or what they as consumers they agreed with the costs and decided to stay with the solar electricity." (Interview 41 Local leader Paragraph 14).

All the stakeholders have a role to play towards the sustainable operation of the minigrid projects. Ramachandran (2020) notes that relationships with stakeholders are considered extremely important. Hence these groups of people or stakeholders are equally important for the organization for its very survival and growth. If business needs the cooperation and collaboration of these groups who have some stake in the organization, then organizations need to manage them properly (Ramachandran, 2020, pp. 11–13). Power is a vital ingredient in any human problem: often, conflict centers on the search for it or a fear of losing it. Power does not exist in a vacuum but is present in and based on relationships, it is varied in nature and so dependent on the situation and relationship. Authority, access to resources, networks, skills/expertise, information, and personal

qualities are some of the sources of power. In a complex set of relationships, it is not only the perceived leader who holds power but any individual who can say no or block a given proposition (Fisher et al., 2000, pp. 38–41).

In the minigrid context, it was seen that all the stakeholders contributed to the projects' success status. The operators, the partners, the communities, the electricity users, and the community leaders all had varying authority and influence and hence different tasks to play. An active flow of information exchange fed into the stakeholder project awareness and contributed to the participatory fulfillment of the various stakeholder roles, whereas lack of project awareness was detrimental to project implementation and goals' attainment. Recognizing the power of influence and authority that various stakeholders held over their actions and existing resources enabled the operators to enlist and mobilize them for the project operations. Learning about the context of the community and sharing knowledge and information about the project also further empowered the enlisted stakeholders to participate and contribute to the projects. In one of the communities, the project developer through the district and ministry officials introduced the electricity project to the local community leaders. The solar electricity project was a new experience and concept to this community, sensitizations regarding project benefits to the community, need for installation, electricity use, and safety, among others were not held with the leaders or the community and therefore were not known to the community. It is shared that there was initial project rejection from both the community members and some of the leaders because they had so many doubts and suspicions about the project. They had limited knowledge and pre-conceived knowledge and speculations about the projects as shared in the previous section, such as they thought that the project would require human blood sacrifices to succeed – which meant that community residents who joined the project would die if they enrolled in the project. Others stated fears that they had heard the electricity causes fires and burns houses and, therefore, were scared of it. Among some communities, they thought that maybe the project was a hoax that was using the guise of digging their lands for destructive materials to be put that would harm the communities or even digging up precious minerals. It took concerted and deliberate effort by the project developers, in this and other communities, to interact with the community leaders and bring them on board and then later work with the community leaders to jointly sensitize the community about the project benefits and safety, which promoted a positive attitude towards the project.

iv) Setting Up Operational Structures

The minigrid projects were established and operated in remote villages, this is where the solar energy containers were set up, and the related software of operation and monitoring was linked to or could be accessed by the minigrid operators in their city and country headquarters offices. In 11 of the 14 communities, the minigrid operators set up site location offices from where their field operation staff could be stationed and coordinate their community engagement activities and response to emerging concerns. Community liaison staff and electricity technicians were recruited from among the minigrid community residents, while the field engineers and managers were recruited from the city headquarters offices to offer routine services in the field. Four of the five electricity technicians interviewed were recruited by the electricity operator from within the villages of minigrid operation and continued to reside within these villages, while one of the technicians belonged to the region within which the village of operation was situated, but he did not reside within the village of operation. All the ten community liaison staff interviewed were residents recruited by the operator from within the villages of the minigrid operation and resided within the villages. Field engineers and managers employed by the operators conducted their tasks in both the minigrid communities and at the city headquarters, they did not have a known schedule of location. It was revealed that the presence of operator staff on the ground enabled timely resolution to challenges with the electricity such as power blackouts, emerging technical failures, and community concerns.

In two of the communities, the field office was situated in the central village to serve three minigrid communities, two of the neighboring minigrid villages were at a distance from it. Electricity users from the neighboring communities would have to incur transport costs to move to the field office to handle electricity-related concerns and/or to top up their electricity usage utility fees. Alternatively, they would incur the cost of contacting the community liaison staff at the field office by phone calls or messages to handle their concerns. Also, in some communities, much as the technicians were present, they were spread thinly, one minigrid operator company managed twenty-five minigrid villages but employed two technicians to respond to the concerns of all the twenty-five communities. The presence of the technicians as field staff was complemented by community liaison officers in each village. The community liaison staff could only respond to basic customer inquiries and did not have the skills to handle more technical concerns and,

therefore would refer these received concerns to the technicians, who were usually busy and not readily available.

In one of the nine villages visited in this operation scope, the community liaison staff had absconded duty and was no longer onsite, the community users did not know who to and how to report their minigrid-related concerns. It was also noted that some other community liaison staff, even when expected to be stationed at the minigrid container site offices, were not easily accessed within the community, and the residents, even as experienced by the researcher, had to wait long durations for them to be tracked within the community, despite the operator's expectations and assurances that they were stationed at the minigrid container offices or within community reach. Due to disgruntlement between the community liaison staff and the minigrid operator regarding unclear payment and employment terms, some staff would engage in other economic pursuit activities, and some had other employment contracts, and hence they were not readily on-site to respond to the electricity users' concerns. Interactions with the community liaison staff revealed that the two technicians were always occupied at any one point in time and were very hard to access, they were always busy in between the villages responding to emerging concerns. Some villages would go for about two weeks to a month without electricity as they waited for the technicians to turn up and attend to their reported concerns. A lot of frustration was expressed by the community liaison officers as they bore the brunt and anger from the communities and leaders resulting from these delays.

Accessing the technician who did not live within the village was even harder. In one village, it was shared that when they had electricity-related problems, the community would need to first raise resources to transport the technician to collect the key to the minigrid container, including transport that would serve for returning the key, which was said to be kept at the regional office. This increased the cost of minigrid electricity project maintenance to a community that was already struggling financially. At times, the technician was not readily available and involved in other activities of self-economic pursuit; hence the village would go days to weeks without electricity and response to their concerns till such a time when the technician was available and ready to attend to them.

v) Review and Feedback

Implementation, monitoring, and evaluation strategies as used by different actors, which included stakeholder coordination meetings, and feedback and review mechanisms were also utilized to put in place to evaluate and enhance the working relationship among the different stakeholders. Putting in place feedback and complaints mechanisms, as well as working with and through existing feedback mechanisms, was undertaken by the operators and community leaders to evaluate implementation for review and planning purposes. Existing review mechanisms included community meetings and the use of local community leaders, while some mechanisms put in place by the projects included periodic multi-stakeholder meetings at different levels such as at operator-operational partner level, operators-energy committees-community leaders, energy committees/community liaison officers-community leaders-community members level among others. Toll-free lines and the presence of community liaison staff and field staff in the communities provided avenues for feedback and review.

In some communities, the project feedback mechanisms were interwoven and coordinated within the existing feedback mechanisms. Leaders would receive customer complaints and relay them to community liaison staff, energy committee members, and the operators accordingly as the situation called for. Feedback was forthcoming, and, at times, the local leaders would call for meetings and the operators would participate to respond to raise concerns. While in some other communities, the leaders shared that the communication and response to shared concerns was slow and not forthcoming. Their residents were losing trust in their abilities as leaders to manage the community's challenges and coordinate development and yet the offices they occupied were democratically elected. Some were threatened with not being re-elected back into power due to the loss of faith and trust in their abilities to steer development in the respective communities.

> "Now this power is bringing another problem, the one which was not there is saying that maybe this LCIII (Local Council Leader III), this LCV (Local Council Leader V) is the one that is making them miss the power. That, he is favoring this village and other villages don't have power. They are telling him...`Let us wait for you in the 2026-campaign-election year, we will meet there!' That is a big challenge I got. Even when they talk, I just cower like this...I cannot talk!" (Interview 20 with community liaison officer, village 11)

> "I would request that these electricity operators… that if it is I, the chairman that has reached out to them on a particular issue, they need to quickly respond to these concerns. Because, it is I who does a great job in mobilizing the community when he needs something from them, when people want to protest and conflict, it is my job to placate them and calm them down. But when we call

> them that there is an issue and they delay, then the people lose trust in our ability to get things done or respond to their concerns. They see us as leaders who do not care or respond to their concerns." (Interview 16 with Chairpersons, village 2 and 3)

The effectiveness of the multi-stakeholder implementation context was stated to undermine the ability of the operators to respond to some raised concerns. The minigrid operator in the case of the 13 minigrid communities or the community leaders and energy committee in the case of the community-managed minigrid, were the operational face of the minigrid project. This was seen so, yet different operational partners that had specific but time-bound roles in the project, such as electricity tree planting, productive use of energy initiatives, land purchase, and community compensations among others, existed. In thirteen of the communities, the demand for more electricity poles was continually resounded, in twelve of the communities, this call was continually resounded to the responsible authority during partners' meetings, yet the response was not forthcoming. The operator was continually put to task to respond to this and considered ineffective and unable to respond and provide electricity-related services.

4.2.4 Intervening Conditions of Cultivating Coordination

The intervening conditions to cultivating coordination influenced the daily operations and state of coordination among the various stakeholders. Field interactions and observations revealed how the highlighted conditions affected the stakeholder networking and coordination experiences and, ultimately, the operational status of the minigrids. These conditions are broad, they not only stem from the local context and interactions but stretch to national and global intervening conditions, as discussed below.

The costs of renewable energy equipment, shipping, and minigrid installation were absorbed and reflected in the high unit cost of the electricity. In all the minigrid communities visited the complaint of the high cost of electricity in contrast to the national grid electricity was raised. The operators stated that continually, in all their community engagements, this complaint was raised, some communities even accused the operators of tweaking their meters to make the speed of electricity units move even faster. Some electricity users abandoned the project because of this, while others continually complained about this, and others tried to bypass the electricity meters and consume the electricity illegally.

> "This electricity was not bad but the speed at which it moves! the speed at which it moves. The electricity itself would not treat us badly but the cost is high, very high. …I have a lot of

> responsibilities and yet the electricity is really expensive and they have no explanation to explain why their unit moves fast. (Interview 17 with business respondent, Village 1, Paragraph 3 -5).
>
> "Actually, me I told them, I told all the three of them, the field agents when they were here that the moment I get the money to buy a solar battery at my place you will only remain with looking at the equipment that you connected to my house, I will switch it off, because… ehh! we have other things, goals, and needs that we are working towards, and now should one divert those to only working to pay and afford electricity? (Interview 17 with business respondent, Village 1, Paragraph 45).

The high unit cost of electricity, a continually cited complaint, led to a strained relationship between the operators and the community. However, the operators stated this state of condition stemmed from the global prices of the minigrid equipment, which was exacerbated by the Covid pandemic that led to a further rise in prices of solar minigrid equipment, shipping, and operation costs. In this result, the study gives insight into the question and need for further research on the effect of tariffs on the success of the projects, a need, and concern of intervention raised by practitioners and scholars, including Duran & Sahinyazan (2021) (Duran & Sahinyazan, 2021, p. 9).

The National Electricity Regulatory Authority guidelines were cited as conditions that affected the relationship between the minigrid operators and the customers. Bearing in mind the cost of minigrid installation, the national authorities accordingly subsidized and set the unit price of the electricity. Additionally, in some grids, as per the regulatory authority guidelines the minigrid operator was expected to pay a monthly service charge per client. This charge was deflected to the customer, the customers had to pay this monthly amidst already existing complaints about the high cost of electricity. A minigrid operator shared that this was something that they could do nothing about, they were expected to comply with the national regulations despite the bitter complaints from their customers. He shared that at the introduction of this monthly charge, a number of the meters went inactive, and customers were no longer paying for the electricity, yet this did not deter the accumulation of the monthly amount to be paid. The accumulated monthly service charge debt would be deducted once the customer effected any payment to their meter. There was a lot of discontent about this, some people abandoned the project, and the operator also moved the electricity service and equipment from some customers with docile meters and transferred it to new applicants. An action that led to further discontent from clients whose meters had been disconnected.

The existence of and adherence to operational guidelines enabled effective coordination and cooperation among stakeholders. In Tanzania, operational guidelines for minigrid operation and stakeholder coordination were compiled by the Ministry of Energy and Rural Electrification Authority. In one of the operator-managed minigrid projects in Tanzania, it was revealed that operational guidelines were existent and adhered to, that there was an existing working relationship and continuous flow of information between the operators, administrative and regulatory authorities, local community structures, and the community residents. However, in another, a community-managed grid project; despite the existence of written operational guidelines from the Ministry of Energy, they were not operational to a large extent. The minigrid project had not been handed over officially to the local leader by the administrative leaders or the minigrid developer as stipulated; there were no existing links or coordination mechanisms with the administrative leaders who were the supposed supervisory stakeholders of this minigrid. In this community, several challenges and conflicts were encountered during the different minigrid processes by the various actors, such as community members threatening violence to the electricity committee members as they collect monthly utility bill payments or the technician as he carries out his role of disconnecting the electricity service from utility bill defaulters among others. The community members continually referred to these guidelines as *"their"* (the minigrid developer and the Ministry of Energy) guidelines. The electricity technician stated that when some defaulters were reminded of the guideline rules, they stated that much as they were aware of them, they were not bound to them and, therefore, acted as they saw fit.

There were no established or known coordination guidelines between the operators and the minigrid community stakeholders in the Ugandan minigrid communities that were acknowledged by the operator, community leaders, and community residents. In Uganda, the Electricity Regulatory Authority required the engagement of the operator with the communities and their leaders as stipulated in the ERA Customer Protection Guidelines and ERA Standardized Complaints Handling (Electricity Regulatory Authority, 2015, 2017), however, it was left to the discretion of the operator forge mechanisms to work with the community structures within the context of the community of project operation. Strained relationships and friction were highlighted between the administrative leadership structures in Uganda and the operator companies due to differing expectations of each other. The administrative leaders expected the operator to routinely update them and involve them in the project community engagement activities, yet the operator

was not aware of the need to report or how to coordinate with the administrative sub-county offices regarding their implementation process, they instead worked with either the local community leaders in some communities or with their established community liaison officers and thought automatically, the administrative leaders accessed information through these structures. Both administrative leaders of the different locations, during the different first interviews held acknowledged that at the project initiation stage, they had welcomed the electricity projects into their communities and referred them to the next level of operation. However, they expressed that at the implementation and operation stage, they were frustrated by the lack of awareness regarding the ongoing implementation of the projects. They felt that the power to regulate the project's operations in their jurisdictions and to protect their communities had been taken from them. They each had, through written and telephone means, attempted to communicate with the minigrid and had ultimately issued summons to the operator staff to report to the sub-county offices but with no success. They mentioned that information about the projects was important as it could be streamed into and inform the execution of their other duties, such as tax evaluations and community development planning. They each threatened to stop the operations of the electricity operator if they were not updated and streamed into the processes of the project operations.

Follow-up data collection field visits revealed gradual improvement in the coordination between the minigrid operator and administrative leaders. The interactions with the researcher and participants during the data clarification and validation phases revealed these concerns to both parties. As a result, the operator heeded calls of summon from the administrative leaders, participated in held coordination meetings, and mechanisms of coordination and reporting were agreed upon. In one of the sub-counties, the project operator participated in the development partners' quarterly coordination meetings, and in another, the operator availed a file at the subcounty in which written updates about their project operations were continually shared. The findings, therefore, resonate that the existence of coordination mechanisms is highlighted as an intervening condition to stakeholder networking and coordination.

Clear and formal guidelines and terms of engagement in place that are known and acknowledged strengthen the effectiveness of the community management systems (leaders, agents, committees.) Situations of unknown guidelines contribute to defiance and conflict in the operations. In communities where community agents were without formal contracts of operation. The

community liaison officers, referred to as power agents or district representatives, stated that they were being engaged on a verbal term basis despite being promised written contracts, their terms of payment were unclear, and they kept receiving conflicting instructions from both the field technicians and the headquarters managerial staff. Some of them absconded and abandoned their jobs, while others took on other competing jobs, others sold off project equipment like the electronic tablets they had to use when on duty and others were never present at their duty stations when required by customers to respond to their concerns. Others continually shared their doubts about the operator's honesty in dealing with their salaries and remuneration.

In some communities, the users refused to pay their electricity consumption bills, stating that they believed that projects were donor-funded or a gift from their governments. They did not understand the terms of electricity access as they had not received written or verbal guidelines detailing these. As a result, these users were disconnected from the electricity service, which at times happened amidst resistance (verbal and physical) from the users who wanted to continue accessing 'free' electricity. This led to growing discontent towards the project in these communities.

Stakeholder credibility was continually highlighted as a condition that affects the networking relationship among the stakeholders. Credibility is defined as a judgment of audiences on the competencies (e.g. effectiveness) and the trustworthiness of a political leader, an organization, an institution, or a policy. Reputation and charisma, but also (past) performance, as well as democratic procedures, contribute to credibility (Levelt & Metze, 2014, p. 2373). In this study, the concept of credibility is used to reflect the trustworthiness of an individual or an organization. Continually the concept of credibility was mentioned about the state of working relationship among the stakeholders. In some minigrid communities the community members felt they could no longer trust the minigrid operator, they felt that the operator had withheld information or deliberately given them misleading information so that they could connect to the grid. While some community members decided to terminate their relationship with the electricity project operator and partners, others kept with the project because they had invested their financial resources but stayed away from any mobilization, community engagements, and or education trainings conducted by the operator. An example is when entrepreneurial residents were mobilized to participate in productive use of energy week-long trainings, with the promise that they could apply for and access electricity equipment at a subsidized rate by paying 30% of the cost of the equipment. Later, these terms were

changed to the beneficiaries having to pay 70% of the cost instead. Some raised suspicions that the electricity equipment was offered at high exploitative prices because fellow residents had purchased similar equipment on their own accord at lesser prices. The operational partner-field staff of this project did not provide receipts to account for money collected from beneficiaries, which increased their suspicions. Interactions with the Productive Use of Energy (PUE) partner elaborated that at the point of training, even they, the PUE partner, are not certain of the ratio of subsidization that their donor will give until they have received applicant beneficiaries, however, the fact that the beneficiaries do not have this information contributed to suspicions held and made them doubt the honesty of the PUE partner. Suspicions that the PUE partner conducted trainings and received their applications so as to use them to mobilize funds from donors for equipment, which the communities were then fraudulently asked to pay for, were continually resounded. They thought that maybe they were supposed to receive these electricity devices at no cost. Because of this, they refused to participate in feedback and accountability reports where the PUE partners required them to showcase their received items and share gratitude for the subsidized support. Additionally, the electricity equipment supplier did not undertake repairs or honor the guarantee period as promised, even when beneficiaries severally reached out. Many community members had paid money to access productive use of energy electricity equipment but were continually promised receipts of this equipment that were not forthcoming. In one of the villages, a community member reported to the legal authorities, and the field personnel staff of the company was arrested. This compelled the organization to deliver the said equipment within a matter of hours. Consistency and credibility, as reflected in these field citations, influenced stakeholders' perspectives, responses, and participation in the projects.

> "When I made the first payment, they did not treat me well. I did not like it. ...because I thought after my first payment, I would slowly pay at my pace...but they started putting pressure on me saying...'If you don't clear the balance quickly, we will put you in those to pay Ugx. 800,000shs. which is thrice the amount you have to pay!' I endeavored to see that I pay and clear the payment. But I knew and I was initially informed and led to believe that it would be on a favorable payment schedule that would be slow, given that my income is very little. If I knew things would be like this, I would not have joined it'. We persevered because we had already joined the electricity" (Interview 6 FGD with 5 women, Village 3, Paragraph 26-27).

> "Whenever I attend these meetings held by the operators, they keep changing their words. One cannot trust them… By the time you are done with the whole connection, you find that you have spent much more than you budgeted to spend, all because of their half-baked/ever-changing information. They keep changing. They are not genuine, they are interested in extorting money so they don't give you the full extent of the information you need… Madam, can such an individual

> call you to any electricity sensitization session and you come?!" (Interview 8 FGD with 5 men, Village 2, Paragraph 32 - 33).

Due to the mistrust of the operator and their partners, some residents chose to stay away from other initiatives or mobilized gatherings called by the operator. Others transferred this anger and mistrust to their leaders, stating that they worked with the operators and were in cohorts with the local leaders to hoodwink them.

In progressive data collection phases, it was revealed that the PUE partners conducted refresher training in the communities and redistributed electricity equipment at subsidized ratios. However, prior to these subsequent trainings, evaluation sessions of previous PUE were conducted with the community leaders and the beneficiaries. Communities shared their concerns about the programs and the PUE partner committed to addressing these concerns and restoring their credibility. The leaders stated that this restored hope and encouraged, though not all, but some more community members to participate in these trainings and PUE program. Credibility contributes to and enhances cooperation. Participants will collaborate most of all when they trust in and are convinced of the possible results of voluntary regional governance, and in the competencies of the regional governance network to achieve these results. The aspect of credibility is especially important, it is a prerequisite for participation in a collaborative endeavor and thus to enable legality, justifiability, and consent to develop (Levelt & Metze, 2014, pp. 2383–2384).

The individual attributes of stakeholders contribute to the way stakeholders work together. It was stated that some operator staff in some communities were friendly, they conducted door visits and talked to the community members and their leaders politely and endeavored to respond to concerns and inquiries and continuously provide information regarding the grid. Some of the respondents stated that they had rejected the electricity projects because of not understanding and having limited information, however, due to the patience and consistency of the electricity operator staff and the continuous information sharing with the operator staff and their leaders during these door-to-door community outreach visits, they eventually accepted and connected to the electricity project.

It was stated that some operator staff were rude and disrespectful when addressing the community members and their leaders; they did not take time to understand community concerns and provide information. With some technicians, the communities felt that they were at the mercy of the

technicians; it was shared that they were scared of raising concerns where they felt the technicians were treating them unfairly because the technician was the technical personnel in charge of solving their problems, more so with some technicians, it was stated that they would remind the communities and their leaders of their capacity to turn off the minigrid if the community questions them a lot. In such cases, a lot of friction was cited between the operator field staff, the community leaders, and electricity users.

The character and personality of the local leaders contribute to the status of community stakeholders' identification and onboarding. The minigrid operators, community respondents, some local leaders, and the administrative leaders noted this fact. It was stated that some leaders are active and have the goodwill and development of their communities at heart, they endeavor to seek information and participate in information-sharing platforms when invited and, therefore, can carry such information to their communities. Active leaders, community agents, and or electricity committees participated in knowledge exchange sessions, they mobilized their communities to join the electricity project, and they put the operators to task to respond to and resolve raised concerns which was said to contribute to mutual understanding among the stakeholders. Where others were not interested and when they participated in activities, they expected financial remuneration and did not endeavor to mobilize their communities to participate in the projects. These leaders stood back, feeling disempowered, and instead complained about the minigrid operator undermining their authority in their villages.

> "My local leader here is always drunk. Even now he is drunk. I tried to contact him to talk to you but I was told he is not there he is drunk somewhere. One time he told me, he used to come when I call him when we get visitors but one day he came and he walked back home just like that without getting transport, he was not given money. That is why sometimes when I call him, he doesn't come, he needs to get some transport or some soap. He told me like that straight. I asked him if he doesn't want development and he replied that the 'development these days is already here! Even him, he already has light, so he has everything that he wants." (Interview 20 with community liaison officer village 9)

Language barrier also discouraged some local community leaders from engaging with the minigrid operators and the implementing partners and participating in the minigrid processes. Some commented that issues relating to the minigrid operation required a lot of English, they did not understand them and, therefore, stayed away from interacting with the project staff, as a result, they did not have enough information to mobilize their communities to participate in the project-

related activities. Project operators stated that in some communities, they could only utilize verbal means of communication because the community population was majorly illiterate. They could not read and write and, therefore, could not comprehend written materials and banners, which would have enabled the continuous presence of information in the community. Also, when they attended structural trainings, some of the participants could not write down knowledge learned for further reference to remind them of project guidelines of coordination.

Presence of the minigrid operator in the minigrid communities. This was achieved through the enrollment of community liaison agents, technicians, and committees. Operators also set up site offices that were manned by the field staff and could be accessed by the electricity users to attend to emerging concerns and inquiries. This enhanced the accessibility of the operator on the ground (feedback and complaints mechanisms) and strengthened coordination between the operator, the community leaders, and the community leaders. Involvement and endorsement of the chosen community agents and the committees by the community leaders and community members enhances coordination in the project operations.

The existence and effectiveness of feedback and complaints structures such as the local leaders, community agents and committees, and community field offices put in place active linkages between the operators and other related stakeholders. The effectiveness, that is, the ability of the set structures to receive complaints of the community and their leaders and respond to the received complaints in time, was said to strengthen the credibility, trust, and transparency among the various actors. The absence of feedback or reporting mechanisms, lack of information about the existing mechanisms and or process of access, and the reporting mechanisms' ineffectiveness led to delayed or lack of response to raised concerns, loss of trust, escalation of conflicts to verbal and even physical, and eventual abandonment of the project. Mutual respect and information sharing contribute to cordiality during stakeholder engagements and project ownership sense and can enable different actors to persevere in uncomfortable situations such as high unit cost prices of electricity or changed terms and conditions, among others.

Resource limitations incapacitated the ability of actors to effectively respond to raised concerns. In all the communities visited, there was more need than supply or capacity of electricity than available. Technical limitations, e.g. lack of electricity equipment such as poles and meters limited the operator's ability to connect more willing customers to the electricity services. In other

instances, this delayed the provision of services to communities, like in one of the communities where electricity poles and wires were set up for over 2 years, but the electricity generation equipment and container were absent. As a result, the community was not connected to electricity yet they needed it, and therefore consistently pressured the operator and community leader to provide it. Loss of patience, trust, and faith in the operator and community leader's ability to present their needs was expressed as some community members continually expressed threats to uproot the installed non-connected equipment. They feared that the initiated but non-concluded project may disqualify them from benefiting from other alternative national electricity initiatives. The community members also expressed bitterness and loss of confidence in their leaders as they felt that these had failed to represent and lobby for their access to electricity and kept threatening not to re-elect them into power.

The lack of sufficient electricity poles limited all the willing community members from being connected to and accessing electricity. Absence of individual meters to enable self-payment of utilized or desired electricity units; in some communities, the customers paid a uniform flat monthly fee for utilization of the electricity, and yet the customers within that community had different electricity utilization needs. However still each of them within the category had to pay a monthly uniform amount respectively to access the electricity. In these communities, there was general outcry stating that this is an unfair means of electricity payment, the communities continually demanded for the introduction of individual self-managed electricity meters. Conflicts were rife amongst the consumers, electricity committee members, technicians, and fellow customers regarding electricity payment in the absence of self-regulated meters.

In the same vein, the limited capacity threshold of the electricity, low staff ceilings, and donor targets limited the ability of the operators to effectively provide services and fulfill the existing electricity demand. This, in some instances, gave rise to illegal coping strategies such as power theft. Also, some community members would excitedly purchase electricity equipment, only for it to fail to operate because of the low capacity of the electricity. This caused hostility towards the electricity company, it also further impoverished persons that had raised resources to buy electricity equipment for business, only for this equipment not to operate.

Limited user affordability and low-income levels of some users hinder their ability to connect to electricity and also to consistently utilize and pay for electricity services. Some of them resorted

to illegal means of access to electricity to bypass payment for services, while others after assessing their financial situations and obligations, decided to abandon the electricity projects.

4.2.5 Consequences of Cultivating Coordination

The concept of cultivating coordination links closely to networking and social network analysis. Freeman (2014) states that the social network approach is grounded in the intuitive notion that the patterning of social ties in which actors are embedded has important consequences for those actors. And that, network analysts seek to uncover various kinds of patterns and they try to determine the conditions under which those patterns arise and to discover their consequences (Freeman, 2014, p. 2). The deliberate actions of cultivating coordination that included identifying the existing stakeholders, working with existing coordination structures, setting up operational structure, and enabling review and feedback had varying consequences on the networking and coordination with the electricity projects, as presented and discussed below:

Cooperation amongst stakeholders. Local leaders in the different communities shared that the minigrid operators working and collaborating with them enabled a mutual understanding of their project-related challenges. This put in place platforms through which all stakeholders could exchange – gain and give – project-related knowledge and information. It enhanced coordination and cooperation in the project. Relevant and customized solutions to challenges faced were generated and implemented, such as installment loan payments for electricity connections, water pump services in some villages, and daily rate payments in one of the villages. These are examples of initiatives that were implemented as a result of discussions held with community leaders to respond to the emerging project-related challenges faced by their communities. They contributed to increased electricity consumption, stakeholder coordination, and project embrace.

Effective conflict resolution is enabled as a result of the existing coordination among the stakeholders. Through the various platforms of coordination, participatory approaches of implementation were put in place. The various stakeholders were able to engage each other, communicate their concerns, and accordingly receive feedback regarding the project implementation processes. As a result, areas of conflict and discord were discovered and addressed in a timely and effective manner. In communities where there was open communication, the leaders could reach out to the minigrid operators, their partners, and regulatory authorities regarding their challenges and these would be responded to. In one community, as a result of this

communication, the regulatory authority teamed up with minigrid operator to extend electricity to three sub-villages that had been left out due to the operator's resource limitations. On identification of challenges leaders would share these with the relevant parties and in community meetings, these parties would be present and the problems would be resolved. Minigrid operators and their operational partners would have stakeholder meetings in which they would share project-related challenges and accordingly respond to these and any uprising coordination challenges. Minigrid operators would use community meetings and public address systems to involve communities in the clarification of conflicting information about the projects and to address culprits of power theft among others.

> "In the other villages as you see... they take long. Village meetings convened by the leaders take long to happen, it takes long to see that they have conducted and called for the meeting from the initiative of the community. But in this village, they do call us once in a while, they invite us to come and request us play our roles. We use this chance to educate the community and continue show them how to manage different electricity-related issues and even respond to questions that arise from the community." (Interview 9 with operational partner staff, Paragraph 62 - 63).

> "We are supposed to have constant coordination and I wanted them (the operator) to mobilize the community dialogue using the government sub-county authority. Dialogue… You see people complain about power, the unit of power, they are really concerned about the amount of money that they are supposed to pay, the ongoing power outages... Can we organize a community dialogue and they understand? Explaining by the company to them, in our presence and they understand." (Interview 38 with administrative leaders, Subcounty B, Paragraph 42).

> "For example, we had a challenge of meters exploding, 36 of them exploded! Electricity shocks were happening in the village. Whenever each meter went off, we would always call for a meeting, until we had about 36 meetings! Then one big meeting was held, we had very important leaders participating in that meeting, we had those from the ward, district, region, and the capital. This was a very big issue. The people were very scared due to these explosions issue and they needed guidance concerning these meters. The community received guidance in these meetings. Trust in the company was restored" (Interview 41 with chairperson electricity committee, Village 14 Paragraph 44).

Stakeholder goodwill. Existing good working relationships and project awareness with the project inspired community goodwill. In some communities, individuals and institutions gave land to the project to set up the minigrid plants, erect electricity poles, construct access roads, and other minigrid-related projects such as water pump stations. The minigrid operators also provided free electricity connection to some of these individuals and institutions and conducted corporate social responsibility actions like communal toilet constructions, fences, and school play field

construction, among others. The goodwill among the stakeholders was stated to increase commitment to the projects.

> "After setting up this electricity here, there was the need to have a road down in the villages, leading to the villages to enable electricity supply. The school gave the company a place to construct the road. In exchange the village committee was to supervise this work of road construction additionally the company was to supply electricity to both the dispensary and the school and a free connection rate. Also, the company was to flatten a nearby area for the school, so as to make for them a playground. The company leveled the nearby land to make a playground for the school. Also, the school got electricity, they put a wiring fence around the school as well the dispensary got a free electricity connection. They only pay for their electricity usage." (Interview 40 with 02 electricity technicians, Village 14, Paragraph 28 - 30).

> *"*You see, we also have a problem of safe water access even if we have a borehole in the village. But this borehole is usually congested, it has many people fetching from it and the lake at times upheavals and the water is dirty. I told them if it is possible, I would give them land so that they help up just as they helped the people in the village of village 1 so that our people can access safe water at a low cost. They said it was possible and so it happened. The water pump at the point uses electricity. The money collected from the residents that fetch water from there is what we use to pay for the electricity and maintain the place." (Interview 18 with 02 local leaders, Village 2 and Village 3, Paragraph 165-167).

Stakeholder accountability and commitment are enhanced. The different stakeholders are not only aware of their roles and each other's roles but they are also empowered to carry out these roles. They can also use the existing coordination mechanisms to question what is not going right and understand why it is not going as expected. The coordination makes all the related stakeholders a part of the project, they understand that this is theirs to manage and move to success. They can put each other to task to ensure that the project is moving on smoothly as highlighted by the following examples from the field.

> "(…) My brothers and sisters we need to talk with the operator and the community after this meeting. Call for dialogue, go parish by parish, and tell them the benefits of this power and how power can transform their lives in the next ten years. See? Just like that (...) but also because somebody did not go to school but is paying 3,000 Ugx for the electricity, the explanation is not clear. My friend, a villager who did not go to school, he stopped in P.1, would you expect him to pay 3,000 Ugx without explanation from the sub-county authority? You need to work with us to reach out to them" (Interview 38 with administrative leader, Subcounty B, Paragraph 132).

> "Also, the challenge would be that, the villagers when this project was introduced, they did not welcome this project and hence they did not understand the necessities and regulation of this electricity project due to their lack of involvement in the project and the initial fear they had. They therefore wouldn't provide the necessary oversight to these two electricity committees and therefore would endorse these decisions with very little knowledge of their obligations. Whatever they were told they would agree without any challenges, even when it is not good for the electricity project ..." (lnterview 53 with former local leader, Paragraph 49).

Working together and coordination among stakeholders enables access to knowledge which empowers the different actors to understand their roles and obligations to the electricity project and also to fulfill them. This increases commitment to the project expectations and contributes to the effective implementation of the project activities. Cooperation and working with the beneficiary communities enables project embrace. The actors, including the electricity users subscribe to what they know, understand, and trust and subsequently put in the required efforts to make it work. The communities and their leaders have power and influence over the acceptance, rejection, failure, and success of the project. Working with them triggers the use of this influence and power for the success of the electricity projects.

4.3 The Phenomenon of Negotiating Power Acceptance

Negotiations are a central aspect of social and organizational life. Whenever people cannot achieve their objectives without others, they have to negotiate (Schaerer et al., 2020, p. 1). A negotiation, which is best summarized by the phrase "win-win" refers to an approach that aims to ensure that all parties to the negotiation realize they have achieved the best possible results (McCarthy & Hay, 2015, p. 4). Energy social scientists are constantly faced with dilemmas where pathways are contested. To acknowledge and address contestation requires negotiation clearly oriented toward just, inclusive, equitable transitions (Sareen et al., 2023, p. 2). It is imperative that the scientific community focuses its efforts on social acceptance where they are most needed: the study of acceptance-improving strategies. Research should be focused on devising procedures to facilitate quick and efficient negotiations between infrastructure developers and local groups (Cohen et al., 2014, p. 5).

The processes of negotiation are shaped by several factors. One factor that is widely acknowledged to shape negotiator performance is power (Schaerer et al., 2020, p. 1). Power has various sources that include a negotiator's BATNA, or Best Alternative To a Negotiated Agreement, the amount of information negotiators have, status, one's social capital, expertise, and the ability to coerce others into compliance (Schaerer et al., 2020, p. 3). Sources of power are similarly outlined by Fisher et al. (200) as, authority, access to resources, networks, skills/expertise, information, and personal qualities (Fisher et al., 2000, p. 41). Additionally, negotiation processes are heavily influenced by culture and vary from one place to another (Fisher et al., 2000, p. 116). Understanding how culture affects negotiation, as well as the factors that inhibit and facilitate

intercultural negotiations, is critical for expanding negotiation science and informing practice (Gunia et al., 2016, p. 1). Emotions and perceptions of fairness may also determine the outcome of a negotiation. People may have strong feelings about the "rightness" of a proposed agreement. Such feelings may not always be productive in reaching a jointly beneficial and efficient agreement (Hindriks et al., 2007, pp. 27–28).

In the presentation of the categories of stakeholder education and cultivating coordination in the sections above, continuous interrelated processes of education and networking are traced. These meet and activate various influences in the minigrid process, are deliberately aimed at, and directly or indirectly contribute to the acceptance status of the minigrid projects. Hence the concept of negotiating power acceptance, merged into a phenomenon that describes the processes and stakeholder interactions in the minigrid process, the power dynamics therein, and how they contribute to the sustainability status of minigrid projects. As the reviewed literature shows, the negotiation process in the minigrid arena and its related outcomes can be positively or negatively influenced (Cohen et al., 2014, p. 5; Sareen et al., 2023, p. 2). The minigrid developers and operators that go to the remote minigrid communities to provide a service of electricity that they expect to bring development to the communities, and benefit themselves economically, face incidents of unexpected resistance from the communities that lack electricity and are supposedly in need of it. Deliberate actions and relationships are employed to navigate and cultivate acceptance for not only the electricity but also the terms, changes, and relationships that come with the electricity. The employed strategies meet within the minigrid implementation arena, factors that include literacy levels, resource capacity, existence and effectiveness of communication and coordination structures, knowledge conceptions and beliefs, and individual attributes, among others. These factors affect the ability of the employed negotiation strategies to achieve their intended project acceptance outputs.

> "The operator educated the community about this for a long time. By the time electricity poles were erected in the people's respective lands they were willing and had no challenges with it." (Interview 2-FGD with 6 men, village 1, Paragraph 33).

> "We agreed, actually, the LC1 chairpersons, in Village 1 and 2... yes, because it is the local leaders that requested for this… They said, 'our community members are low earners, why don't you put for them in a way that enables them to pay in installments so that they are connected? So that they can get the electricity, do business with it, so that from the business the person can get money, pay the tariff whether 5,000 Ugx or 10,000 Ugx that they need for the month. And they pay the agreed installment for wiring as well monthly.' So, the LC1 chairpersons stood as guarantors, stating that

> they will follow up and handle those who fail to pay." (Interview 9 with minigrid operational partner, Paragraph 14 - 15).
>
> "The most common practice has been that any project developer before they start, they are to report themselves to the leadership of the area including the LCV (Local Council leader five) and the SAS (Senior Administration Sub-chief), once they have that link then they will go down on the ground. Now in most cases you find as the project is implemented they will have to include the leaders. You cannot determine for example what will be required to ensure they keep the communities are kept abreast. Some of them may have meetings, some of them may have to invite the RDC... so it really varies... it is subject to the community context." (Interview 13 with Electricity Regulatory Authority staff, country A, Paragraph 22).
>
> "In 2018, this electricity started. They came with our district leaders, they came and introduced this electricity to us. They came and met us, they sensitized us and we asked them questions. When the electricity came here... people were scared and refused to embrace and accept this electricity project. Because of security, they thought that if you embraced these big development projects and they worked with you, then once the project started, people would die! People were scared of being sacrificed!" (Interview 53 with former local leader village 13, Paragraph 4)
>
> "After they came, the people of the project and we started that work of measurement, and installing those poles. Education and sensitization about the project started, we started to sensitize the people, and we continued to sensitize and educate the community. Slowly by slowly, they changed their attitudes, later they started to see the project progressing, and they saw the technicians. Also, sensitizations and education were conducted together with the village's local council leaders. With time the fear left them and they started using this electricity..." (interview 53 with former local leader village 13, Paragraph 12).

As seen in the cited interview excerpts from the process of energy implementation and transition is not obvious despite the existence of minigrid communities that do not have electricity and minigrid developers that would like to establish minigrid plants in these communities. The process is gradual and deliberate. It requires enlisting and onboarding the beneficiary communities by working with their known and trusted structures. Education and awareness creation creates opportunities and platforms for knowledge exchange to negotiate the acceptance of electricity projects. Negotiating power acceptance, therefore, emerged as a core concept of the minigrid implementation process, negotiation is a vital process that is continually happening in the minigrid projects. It is not a matter of bringing the electricity to the people, and the people clamor for it and take it on unconditionally. There are conditions to the uptake of the electricity, there are processes and deliberate actions undertaken, there are stakeholders involved and these stakeholders accordingly come with influence/authority, and depending on how they are engaged, this influence can promote acceptance of the electricity project or work against it. Minigrid implementation involves the different stakeholders in the minigrid space working together with the intent of reaching mutual acceptance of the electricity projects and the terms of access to electricity.

Deliberate efforts and actions are undertaken to cultivate the positive mindset of the electricity recipient communities and stakeholders towards the electricity projects.

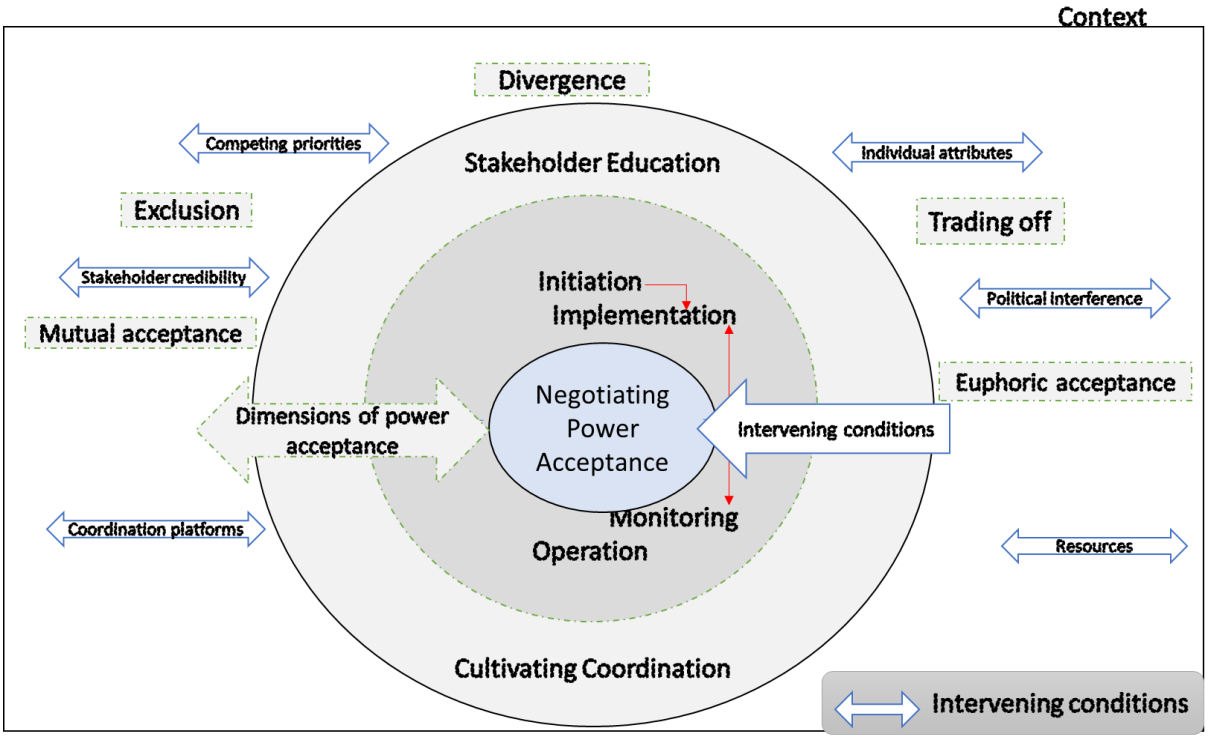
The actions undertaken to contribute to electricity acceptance include stakeholder education, where the operator and implementing partners educate the communities about the project and the communities educate the operator and implementing partners about the contexts of the community, and cultivating coordination, i.e. deliberate actions targeting the bringing stakeholders together to work towards the success of the electricity projects. Identifying, recognizing, and enlisting the influence that the different stakeholders in their various capacities and authorities have on the implementation of the projects, has positive outcomes to the negotiating power acceptance process. It is necessary to identify and recognize the power that the different stakeholders wield, to rightly enlist this power for a positive outcome to the negotiation process. The acquired knowledge empowers the electricity operators to tap into the status influence of the community leaders and align with this influence to contribute to the acceptance of the electricity projects. The strategies employed empower the stakeholders involved in various ways with information, authority, social capital, and resources among others. The power of electricity is a recognized power to bring development to a community. To give communities hope, a hope that they can trade and bargain with, such as anticipating that when they receive electricity, this will improve the performance of their business, and enable them to start businesses. A fact that the leaders front to ask for loans for their community members. But also, the power of electricity to destabilize communities, increase inequalities, disempower, and impoverish beneficiary communities is continually raised in the study.

Negotiating power acceptance continually takes place among the various stakeholders in the minigrid. The different stakeholders in the minigrid process wield power to influence the progress and the different processes of the electricity projects. The processes and strategies of minigrid implementation hold within them power that can be shared to empower or withheld to exploit and manipulate. Identifying, working with, and enabling the different capacities enables participation and mutual acceptance of electricity. It enables the recipients to recognize what the electricity can do for them, and what they can do to make this happen, and they accordingly utilize it. Hence the term negotiating power acceptance.

Negotiating power acceptance in this study refers to the actions and interactions undertaken by the stakeholders to enable acceptance of both the electricity and the terms of access to the electricity. Negotiation of power acceptance evolves through the phases that include initiation, implementation and operation, and monitoring and evaluation. The prevailing conditions within the negotiation process can lead to the acceptance, and/or rejection of the electricity and its related processes. The different interrelated conditions as presented account for the variations in the processes and results of negotiation power acceptance.

The phenomenon of negotiating power acceptance and its interrelated categories and properties are accordingly depicted in Figure 7.

Figure 7: Negotiating Power Acceptance Phenomenon



4.3.1 Context of Negotiating Power Acceptance

Minigrid projects are set up in rural communities that are remote, distant, and without the existence of the national electricity extension. Most of these areas by virtue of their geographical location and surrounding physical features that limit their access, such as lakes, and mountains, do not expect to get electricity in the near future. Some of these areas are islands surrounded by water,

while others are very mountainous and hilly and others are too distant or distant and sparsely populated. These factors contribute to making it extremely expensive and not feasible for their developing countries' national governments to extend national electricity to these locations. This makes these locations perfect candidates for the implementation of minigrid electricity projects.

Cognizant of this in the face of the need to meet the sustainable development goals timelines, in particular, Sustainable Development Goal 7; 'Access to affordable, reliable, sustainable, and modern energy for all', African governments have, through rural electrification drives embraced the promotion of renewable energy projects. This is done through an approach that enables them to partner with private and humanitarian organizations to develop, supply, and operate renewable energy projects in hard-to-reach remote areas. Using renewable sources such as the sun, wind, and biomass, energy is harnessed for the production and supply of electricity to these communities.

In many of the regions lacking electricity, the primary approach is to extend the existing central grids which is often technically and financially demanding, especially if these communities are residing in remote areas with low population density or with geographical constraints (Duran & Sahinyazan, 2021, p. 1). Mini-grids represent a relatively rapid means of providing electricity to rural centers that are far from grid infrastructure and unlikely to be connected in the short or medium term (Odarno et al., 2017, p. 10). The fourteen East African communities visited in Uganda and Tanzania were distant hard-to-reach communities. The respondents noted that before the minigrid projects, they did not have hope of receiving electricity from the national line extension in the short or even long term. There was a general anticipation and desire for the electricity in the communities. This context as seen in the field citations below provided an enabling environment to favor the setup of the minigrid projects.

> "It is only politicians during their campaigns that would talk about the upcoming electricity on this island. We were very happy about this because we know this island is very far from the national grid, additionally, we have water bodies surrounding us. We kept speculating on how the main grid would reach the island. When electricity operator company came, they told us that, that the electricity they were talking about is from the sun. They assured us that it is like the electricity of the national grid. Even I, the chairperson of this village, I had first undermined this electricity because I did not know anything about it minus that it was solar. Because we had stand-alone solar systems, and we knew their limitations. But after it was wired, I saw that indeed this is real electricity!" (Interview - FGD with 5 men, village 2, Paragraph 6).

> "When the electricity operator conducted that survey, they selected 05 villages, of those 05 villages, they found that this village is more in need of the electricity than the other villages… they then come back sat with the village leaders and they decided that they should start this system. There

> was no electricity at all, so the village took it as the only chance to get electricity." (Interview 40 with 2 electricity technicians, village 14, Paragraph 8).

Even when electrification is much desired, it is novel to these communities, it is a new concept to them. While in the communities exist a few stand-alone solar home systems and generators, generally there is no experience with solar minigrid electricity and its related procedures. The concept is new, and many communities are wary of it, they don't understand why electricity poles have to be erected on their lands, why, if it is their land, why aren't they paid for the electricity pole erection? They do not know if the electricity equipment put in their lands and vicinity has an impact on their lands, livestock, and self, they don't understand why the government and investor are taking an interest in them and in improving their welfare. These and many more inquiries and expectations were raised by the communities during the initiation phases of the solar projects.

This necessitated that the communities are made aware of what is minigrid technology, how they benefit from it, and what they need to do to benefit from it. Stakeholder education and cultivating the education of the community are indeed necessary to enable a navigation of the emerging concerns for the acceptance of this electricity, and contribute to the national electrification and global sustainable development goals.

Additionally, each community presented a different context; some were islands, some were mountainous, and all were distant. The populations had different economic and social demographics and beliefs. Some minigrid operators endeavored to learn the context of the community in order to align their implementation program to the specific contexts. However, in common, all communities have a hierarchical structure of administration streaming from the national to the local grassroots level. Access into the communities was and is through these structures of administration. In communities where the minigrid operators recognized and enlisted these administrative and leadership structures, the projects tapped into this power of authority and status to mobilize relevant community stakeholders for participation in the project. Where the minigrid operators overlooked the structures and authority of existing leaders, the projects met resistance from the community and their leaders. Some leaders would use their authority and influence to de-campaign and discourage their community members from joining the electricity projects.

4.3.2 Causes of Negotiating Power Acceptance

There exist a number of electricity regulatory authority requisites. The Electricity regulatory authorities, i.e., the Electricity Regulatory Authority in Uganda (Electricity Regulatory Authority, 2021, p. 14) and the Electricity and Water Utilities Regulatory Authority in Tanzania require that the electricity operators educate the intended beneficiary communities about the upcoming projects and also show proof of desire for the electricity project by the community. The regulatory authorities participate in public hearings with the communities and relevant stakeholders to ascertain their acceptance of the electricity.

> "We did pre-feasibility studies... of course, we had to submit them to ERA, that is the Electricity Regulatory Authority informing them about our intention to set up a minigrid. As you know they require that we have to involve the communities... uuh... community leaders and we did... uuh... Of course, it is like after the pre-feasibility studies to Electricity Regulatory Authorities, you have to go back on the ground with the authorities, they have to consult the communities on how the project is going to impact the communities... the livelihoods of communities. So, we set up like a public hearing informing them that we are going to develop the project, we are going to extend power to the communities. Informing them about the tariff, how much they are going to be paying for the electricity, all the charges were made known to the communities in those meetings." (Interview 12 with electricity operator manager, Paragraph 10 - 11).

Hierarchically structured communities and multi-stakeholder scope of minigrid communities. In the communities of minigrid operation, a hierarchical administrative structure exists. The operators had to prove the legitimacy of the project to the different layers of authority. This was proved by getting consent from the higher layers of administration, these would then authorize the operator to proceed to the next level of authority and influence. The approval was granted either through official documents showing consent or through administrative leaders moving with the operators and introducing them to the next level of authority. This granted the operator unprohibited access to the next levels of authority and eventually into the communities. Additionally, the scope of minigrid operation has different stakeholders that include the regulatory authorities, minigrid operators, operating partners of the minigrid operators, community administrative leaders, community local leaders, community members, and the eventual electricity users. Just like with the different levels of leadership structures, the different stakeholders, each in their different capacities and authority status, held power and influence over the implementation process. The regulatory authorities have the authority to license, the leaders have the power to protect and mobilize the community and public resources, the operational partners have the power to supplement service provision, the communities have the power to purchase - to accept or reject the

project, and the operators have the power to provide financial resources and technical expertise. In their capacities, each of them was custodian of information relevant to the implementation of the project. Enlisting the influence of these authorities, their participation and coordination in the project was key. Cultivating coordination and stakeholder education were interrelatedly employed in this process.

Existing knowledge mis(conceptions). In the communities, a lot of fears and unfounded conceptions were held about the minigrid operations. Some doubted the reliability and quality of the solar-generated power, others thought that the minigrid operators had ulterior motives such as taking the land of the community members or digging up something of hidden value within the land. Others thought that for the minigrid project to succeed, it would need human sacrifice, that if they joined the project they would die. Others feared that proximity to electricity equipment would cause their soils, livestock, and selves to lose (re)productive capacity. While some fears are similar across some communities, others differ from community to community but they all come from a place of limited and or no information about the project and lack of and or limited participation of the communities in the project processes. These conceptions and limited project-related knowledge result in initial rejection, in some cases, total rejection of the electricity project by individuals and communities. Knowledge exchange sessions enable such information to come to light; operators working with known trusted community structures and authority figures made it possible to get the trust of the communities and address such concerns hence contributing to the acceptance of the community. Such circumstances bring to the discussion table that it is not only about what is said but who says it to whom. The authority of known trusted sources is key in identifying and addressing community knowledge exchange stand-offs as well as enlisting the cooperation of the communities in energy projects. Knowledge conceptions and perceptions in the negotiation process and the related dynamics of rejection and knowledge exchange and coordination are further highlighted in the cited excerpt from McCarthy & Hay (2015) and from a field interview excerpt.

“In a negotiation, both parties must feel a level of trust in each other and believe that this is a mutual resolution of conflict. You may feel that this is the best deal you’ve ever offered, and factually it might be correct (…) Then the other party says, “Yes, but I’m not comfortable with it; I don’t like the way you presented it” or “I don’t think you’ve gone far enough toward my

requirements." Their perception then leads them to conclude that you are not really negotiating because you're just working on the cold facts. People's perceptions can often be at odds with reality." (McCarthy & Hay, 2015, p. 18).

> "As a chairperson, I had to first embrace the project and then pass it on to our communities because I saw the development it would bring to the area. There was also a lot of primitivity from some people like some people thought the electricity poles drain the fertility of the land, others would say that when they put the electricity it will make men impotent, others would say that when the electricity comes the taxation rates in our community area will increase, others that the electricity will kill our children, others that before they put the electricity poles in their land money should be paid to them first..." (Interview 5 with local leader, village 1, Paragraph 30*)*

4.3.3 Strategies for Negotiating Power Acceptance

As seen through the presentation of the categories of stakeholder education and cultivating coordination, the identification of the relevant minigrid actors, onboarding, and working towards mutuality in project implementation was made possible, which accordingly contributed to the acceptance and succesfull operation of the minigrid projects. They were accordingly employed as strategies for negotiating power acceptance.

i) Stakeholder Education

Stakeholder education refers to the knowledge creation and exchange process amongst the different minigrid project stakeholders. In the process of stakeholder education in the minigrid projects, the roles of teachers and learners were not consistent with a particular stakeholder but revolved based on the existing context. Actions of contextualization, and knowledge exchange enable sequential and continuous knowledge exchange in this phenomenon. In contextualization stakeholders, in particular the minigrid undertook assessments to gain an understanding of the communities' existing electricity resources and the related challenges, the community electricity needs, and structures. Additionally, during these sessions, the concept of solar electricity projects was introduced to the communities.

Through the understanding gained of the community structures sequential education was undertaken. The project was introduced to the communities through known and trusted coordination and communication structures, in particular, their community leaders. Knowledge exchange through the existing modes of communication, which included among others, public radio systems, stakeholder meetings, structured trainings, and written and pictorial information

material, contributed to continuous education in the community that increased levels of project awareness, coordination, conflict identification, and resolution.

ii) Coordinating cultivation

Through cultivating coordination stakeholder relationships intended to establish and maintain cooperation and mutuality within the minigrid process were deliberately harnessed. Stakeholders and their roles that contribute to the minigrid process were identified. This ensured that all aspects relevant to the operation of the minigrid project were represented, identified, and catered to. All the identified stakeholders in the minigrid arena had a role to play in the electrification process. Some of these roles emanated from their already existing roles in the hierarchy of the minigrid communities such as oversight roles of community leaders. While other roles emerged as a result of the introduction of the minigrid project, such as community liaison staff, technicians or electricity users. The introduction of the electricity projects at some points merged within these existing roles and structures or created new roles and structures that were either interwoven into the existing structure or ended up existing at a parallel level with the existing community structures and roles. During the information exchange process, the different stakeholders were made aware of or understood their roles and contributions to the minigrid process.

Working with and through existing leadership and coordination structures fostered networking and community cooperation and ensured continuous engagement and networking. This contributed to legitimatizing electricity projects. Enlisting the participation of the existing leadership structures conferred endorsement of the projects by the leaders and presented a legal and acceptable front to the communities. The communities embraced and trusted the project-related terms of operation because they trusted their leaders in the community protection roles. Operational structures set up by the minigrid operators such as field offices and staff, ensured the presence of the minigrid operator on the ground and a continuous link to the existing structures, communities, and electricity users. A participatory networking approach to project implementation fed in to an effective feedback and complaints mechanisms that was achieved through the use of established and existing feedback mechanisms by the operators and community leaders to evaluate implementation. This facilitates coordinated planning and implementation.

4.3.4 Intervening Conditions of Negotiating Power Acceptance

As presented from the study findings, not only is the provision of electricity an international and nationally backed Sustainable Development Goal-induced objective but it is also yearned for by the majority of the recipient communities who envision the world of difference and development that the electricity will bring to their communities. Yet again, we have seen, as revealed by the study findings, that inspite of these enabling factors, the acceptance of the electricity once introduced in these communities is not as automatic as expected, and the implementation and cooperation among the stakeholders is not as smooth. Strategies of stakeholder education and cultivating coordination are undertaken to negotiate and achieve power acceptance. Influencing the success of these strategies are a number of identified intervening conditions that account for the variations in the negotiation process and power acceptance, as presented below.

Resource capacity; electricity projects are received with a lot of expectations. Communities are educated about the various opportunities that come with the electricity projects such as possibilities of business ventures using different electrical gadgets that the electricity can power. In some communities, some members have experienced this electricity or witnessed its unlimited operational capacity in other areas and expect the same of the minigrid electricity. In all the fourteen minigrid communities, the electricity had capacity threshold limitations and could not power heavy equipment such as grinding machines and welding machines. Many users spent money and purchased electricity equipment that could not be used due to the electricity capacity limitation. A fact that caused contention and bad blood between the communities and the electricity users.

In thirteen of the fourteen communities visited, there existed more demand for electricity connections than the operators could fulfill. More community members were clamoring to access the electricity but in some cases, the electricity poles and equipment were not sufficient. In other cases, the operator had reached the maximum capacity and could not connect more users to the grid. New beneficiaries could only get a chance to receive electricity, and could only access it if an old user was discontinued from using the electricity either due to deviant behavior or by self-choice.

Not only did resource limitations deter access to electricity and its promised power of transformation to the desirous community members and institutions, but they also contributed to

changing power relations and inequalities within the communities. Some people had access to electricity and could utilize it to improve their business and economic welfare, while others despite their desire and financial ability to join the electricity, the operator didn't have the capacity to make this happen. As a result, uneven competition and comparative advantages were created for some to benefit from the electricity, while others were left out. This is a concern that many who were not able to join the electricity raised. Unlike them, their fellow community members were able to purchase electricity equipment and work longer hours into the night.

> "As you know business competition – if one business owner connects to the electricity also another one with a similar business would like to. But you find that this person would like the electricity, they even have the money but they do not have an electricity pole near their premise. And you find another who would like to connect to electricity for the sake of their business but they cannot afford the 380,000 Ugx cost for wiring in one lump sum, and yet they need electricity and the pole is near their premise. Another one has the money but they don't have an electricity pole near them... those people are many, not only those that are far away. There are those that are in the trading center itself but they do not have electricity poles near them...and these are quite many." (Interview 9 with operational partner staff, Paragraphs 30 - 31).

Additionally, in some communities, the operators could not afford to hire more staff to attend to the electricity user community concerns, the staff were really thinly spread like having two technician staff attending to twenty-five minigrid communities. It was stated that these staff were quite overwhelmed and received a lot of hostility for not being able timely to respond to raised concerns. They were always on call and on the move to respond to complaints in one community or another. Similarly, in another community where one technician did not live within the village, this technician was not always readily available and therefore, the community would go weeks without electricity waiting for him to attend to their concerns. As a result, the relationships between the electricity users and the staff were fraught with conflict and disappointment. The staff due to the heavy strenuous workloads were stated to be rude to community members, who in some cases would retaliate this rudeness or withdraw from the electricity related activities and services.

> "You see this technician is working very hard but he is the only person who manages, you see like from here up to village 25. You can imagine. I was asking him, if it is because of low staff ceiling, why not convince your boss, so they increase staff. I think there can be change to such challenges. They need more staff… Because I have seen the workload that they have. You are in one village but there is a power outage in another village, you are supposed to come back here under pressure. Reaching here, you are tired, you only feel like eating. By the time you eat, people already... they want to blow up and then you are called another village. So, you see, that is a big challenge." (Interview 38 with administrative leader, subcounty B, Paragraph 110 - 112).

The cost attached to community education and engagement was said to limit the frequency of education sessions by the operators and community administrative staff. Community loudspeakers and the participation of some local community leaders were accessed at a cost. It was noted that continued information sharing was important to streamline continuation and promote project awareness but limited resources affected the frequency.

> "When it comes to interacting with the community... Every information you ask from the developer, that is an additional cost on to them....and yet they operate on very stretched budgets…" (Interview 13 with electricity regulatory authority staff , Paragraph 24 - 25).

Financial constraints and unaffordability by some community members limit their ability to join the electricity projects. Continually it was shared that a number of individuals in the communities wished to join the project but they could not afford the connection fees. Also, some after joining the project, they realized that they could not afford to maintain it, to pay the monthly service fee and electricity consumption fees, and therefore decided to abandon the project. Others wished to access electricity equipment at subsidized prices but could not afford to pay for them, so they stayed away from these initiatives of productive use of electricity promotion.

Resource capacity constraints are seen to limit the ability of the operators and their partners to deliver the promised 'quality' and unlimited electricity. Trust in their ability was lost, and some community members resorted to deviant behaviors such as illegal connection and power theft to access electricity, which was detrimental to the grid and would cause constant power blackouts. Inequalities were made distinct and widened in cases where community members had the same business but one had electricity and the other could not access it despite wishing to due to stakeholder limitations. Poor, inefficient service delivery came up due to staff limitations, hence a lot of conflict between the communities, their leaders, and the operators. Electricity users, due to unaffordability chose to abandon the electricity projects or not to join the projects despite their willingness and wish to be part of the projects.

Stakeholder character attributes influenced the processes and eventual power acceptance. To the minigrid process, each stakeholder as an individual and or as a collective group brought with them differing levels of status, influence, and character. Minigrid operator field staff, depending on their personality and how this made them wield their authority of service provision either encouraged communities and their leaders to align with the project or to reject it. It was within the minigrid operator's power and mandate to provide effective electricity service to the people, to educate

them about the project, to involve them in project implementation, to identify concerns, and effectively respond to these concerns. Some operator staff's attitudes and attributes were aligned with their responsibilities, they conducted community dialogues, they moved door to door identifying and responding to concerns with the electricity, they worked with and interacted with the community leaders and available communication channels to keep communities abreast with project-related matters such as expected power blackouts and reasons for blackouts, and they involved the communities and their leaders in the project implementation process. Whilst one cannot say that points of conflict were not absent in such communities, it was noted and revealed that because of the character of the operator staff, there was a mutual and participatory approach to conflict resolution, coordination, and project embrace. Conflicts, when emerged, were timely identified and the responses involved the relevant stakeholders and were relevant and fitting to the community contexts and accepted as stated in the field citation below.

> "(…) this treated people very badly, but...as they kept coming back a number of times, there was one gentleman, a staff of the electricity operator, I kept asking him consistently and he explained it to me. When he explained to me, I accepted them in my heart, knowing that there was nothing more I could do about this, it was a done deal. When he explained to me, I understood and accepted it and this electricity." (Interview 6- FGD with 5 women, village 3, Paragraph 30).

Some operator staff were said to be rude, dishonest, and disrespectful, electricity users felt that these staff could not attend to their electricity-related concerns respectfully. Others were inaccessible, always on the move, and continually trailed by unresolved project-related complaints. Others did not entertain queries from the user community about their work, in one community in the face of inquiries the field technician would remind the community leaders and electricity users that they were not his bosses and therefore had no right to hold him accountable. In another community, one field staff would continually collect money from electricity users for electricity equipment but not issue receipts and, in some cases, not even provide the equipment paid for. It came to a point that some disgruntled community persons reported him to police, he was arrested and the company was forced to provide the promised equipment and or return money to some clients. He was relieved of his duties by the company that felt that he had discredited their image in the electricity operation arena. However, due to his dishonesty and lack of accountability, many community members were frustrated and others rejected participation in further phases of this program. The organization also lost touch with field beneficiary follow-up. In subsequent data collection phases, they did not have a replacement field staff and therefore could not speak to many

aspects of their field implementation and experience of their beneficiaries. The poor character attributes of the operator staff limit project awareness promotion, hinder cooperation and communication among stakeholders, and contribute to conflict and ultimate rejection of the electricity project, and its related processes. The individual characteristics of the stakeholders are a conduit for effective implementation and accessing an informed status of the project's progress and vice versa.

Community leaders have oversight, regulatory, gatekeeper, and mobilization authority in the communities. The character of the individual leaders influenced the ability of the community leaders to carry out these roles and also more specifically to the project, extend these roles to project related activities as cited below.

> "This conman took about 800,000 Ugx from the people in that village. He accessed the community without involving the local chairperson there. You see it is because that is the challenge they got is that sometimes the operator could come at talk to the people without passing through the local council chairperson. Also, that particular chairperson, their local council chairperson/ administration was poor. The chairman there is not very active, he is lazy. He is a fisherman, he is always in the lake there. You call him for local council meetings here he does not come. So, the conman was able to use that chance. But in other areas for them, they are sharp, you cannot just enter their communities like that." (Interview 10 with administrative leader, subcounty A, Paragraph 6 - 8).

> "The local council chairperson here in this village is so decisive. What he says, goes and is carried out as said. This is because he also participates in what policies are set… but when it comes to supporting that a community member receives electricity, he himself will arise and even pay the connection fee for an individual and say that let that one be connected to the electricity. On the issue of the electricity, our local council chairperson is extremely committed to it." (Interview 14 with household respondent, village 1, Paragraph 51 - 53).

Community leaders who were active and committed to the service of the community took interest and participated in the minigrid projects, they worked with the minigrid operators and their partners, mobilized their communities to join the projects, reached out to the operators when things were not going right with the community, advocated for fair terms and or considerate terms of access to the electricity project, did not sit back and used their influence to ensure that their community obligations are met not only to general duties but also even within the electricity projects. Leaders that were laid back and timid stayed away from the project, when the operators sidestepped them in order to access the community, they further withdrew and yet the people continued to report to them about minigrid-related challenges. Because they did not have active-established coordination with the operators, they were unable to use their structural authority to

put the operators to task to respond to these concerns. Other leaders were more interested in enriching themselves and would need financial remuneration to participate in community mobilization activities, they were not community and or self-driven. This put further cost on operators to conduct community engagement sessions in these communities and therefore they avoided community engagement activities in these communities. In some of these communities, electricity-related concerns would go weeks to months without response and the community leaders would listen to the community's challenges but also state powerlessness about the situations. The communities lost trust in their abilities to cater to the community needs, and mentions of them being dropped in the next elections were cited.

> "Now this power is bringing another problem, the ones who don't have electricity are saying that maybe this LCIII (Local Council leader three), this LCV (Lcoal Council Leader five) is the one that is making them miss the power. That he is favoring this this village, and other villages don't have power. They are telling him, `Let us wait in 2026-campaign-election year- we will meet there'. That is a big challenge I got. Even when they talk about electricity, I just cower like this... I cannot talk! Those that don't have electricity, they are very angry, they are seriously angry." (Interview 22 with community liaison officer, village 7, Paragraph 50 - 51).

> "Maybe, given the fact that we are the chain, their conduits, it is us that connect them to the community persons that consume this electricity, we would request from these electricity operators that if it is I, the chairman that has reached out to them on a particular issue, they need to quickly respond to these concerns. Because, it is I that does a great job in mobilizing the community when he needs something from them, when people want to protest and conflict, it is my job to placate them and calm them down. But when we call them that there is an issue and they delay, then the people lose trust in our ability to get things done or respond to their concerns. They see us as leaders that do not care or respond to their concerns." (Interview 18 with local leaders, village 2 & village 3, Paragraph 158).

The character attributes of the local leaders either contributed to coordination among the stakeholders, linked the operators to relevant communities in the communities, and resultant embrace of the electricity. Or it contributed to a distant relationship between the leaders, communities, and the operators, it limited the operators' access to relevant actors in the community and as well, uninformed decisions about the project that led to frustration, conflict, and even rejection of the electricity projects.

> "The chairman of the electricity committee. He like money a lot, when they collected money from electricity users, they would misuse it, different to the instructions of the government in the guidelines book. He take the money, he go to buy a cow! So, the people there, they make a conflict with him. `No, no we can't give this man our money, because he don't go the bank to put there.' So they are make a memo there, stop to do anything about paying money, but they are use the electricity. So, this is a problem, for 5 years, 5 years! they are use 5 years, they collected 60,000TZ only for 5 years. Somebody of the Minister of Energy go there to cross check. This is a problem and he said, `When this container die, switch off, don't do anything here, they don't know their

> responsibility', so the project die like that." (Interview 44 with electricity technician, village 13, Paragraph 34).

The community attitudes and general character contributed to the acceptance and or rejection of the projects and the processes therein. It was noted that in some communities, they were used to receiving free tokens and services from their political leaders, especially during campaign rallies. Nine of the communities visited were in areas recovering from a long disastrous internal conflict, in an area where numerous national and humanitarian efforts had been undertaken to recover the region and its population through humanitarian aid. It was continually mentioned by the operator and the staff working in those minigrids that these populations were used to receiving free capacity things and services. More so, given that on receipt of the electricity project, the donor gave them free electricity connection but expected them to take it up from there and pay their continuing consumption utility bills, something that a number of electricity users refused to do and left their connected accounts dormant and unutilized. In another community, the project was introduced through a political campaign, and with the aid of donors, the connected users received free connection to the electricity. Similarly, in this village, many residents would refuse to pay their monthly consumption bills stating that the project was a gift from their leaders and the donors. These community behaviors caused conflict between the operators and the community, the field staff in charge of the project operations and payment collections, and the electricity users. In response, non-paying clients were forcibly removed from the electricity, and the service was extended to others who wished to access it. Others were taken further for litigation and some others were arrested and forced to clear their utility bills arrears. Community relationships were greatly disrupted by these conflicts, especially as the enforcers of these unpopular repercussions were fellow community members employed by the project. In one of the communities, it was shared that because of the misunderstandings and conflicts, so many electricity users chose to willingly be put off the electricity grid, to the point that the revenue collected from the remaining about 40 out of the expected 60 electricity users was not sufficient to manage the economic needs for the continuity of the project. Also, the electricity technician who was always called in to carry out the disconnections became unpopular and disliked in the community. He felt his life was in danger and could not even accept to take food and water from any home. In this toxic environment, where the technician felt unsafe, he was still expected to offer technical services to the community to keep the electricity project going.

The existence of coordination platforms that included communication mechanisms and administrative structures was key in enabling information exchange and channels of coordination. During field discussions, it was noted that in communities with multiple, effective, and consistent mediums of communication, there were more and higher levels of project awareness, more of the community member respondents and electricity users were aware of how to access services, utilize electricity equipment, and the different operating partners in the project. Public radio systems, operator staff's door-to-door sessions, consistent stakeholder meetings and dialogues as well as written media, were used in the similar space to consistently pass on information and work with the different stakeholders. In such communities, if one missed a message through one means they would access it through another way, some community members would not attend community meetings but would always access information through the public radio and door-to-door sessions. However, in some communities, the settings were quite remote, and communication means were limited; community meetings and communication from local leaders, field staff, and fellow residents during social hours were the cited project-related communication and coordination means. In some of these communities, there were general complaints arising from limited access to information, such as residents rejecting initial registration for connection to the electricity project because they did not know about it. Also, given the remoteness of the areas, very poor network coverage was noted as a challenge by the operator, the absence of internet infrastructure in some communities greatly limited the service provision quality, there were frequent breakdowns in technical device communication and these communities would go months without electricity, some would pay for their utility bills and the systems would fail to recognize these payments. This resulted in a lot of frustration and anger towards the operator.

Stakeholder credibility is important in negotiating power acceptance. The truthfulness and consistency of actors in the minigrid process contributed mutual cooperation and coordination. It enabled access to services and participation in project-related activities without conflict. On the other hand, changing terms and conditions, deceit, and withholding information by stakeholders led to mistrust, withdrawal from participation in project-related activities, and upfront hostility and conflict in some instances as exemplified in these filed excerpts.

> "However, the authorized price that ERA told us is very different from the one that the operator is saying now. That is why you find some community members complaining and demanding they should tell us what has changed now, why is the said price now high? I as the chairperson once asked them why the change and they explained that the price of importing their working materials

went up and also inflation. The lay community member does not understand this. They continue blaming us the local leaders, they even accuse us that maybe the government or the operator paid us the local leaders to hoodwink them into this project. Some people even think they paid us the leaders so that energy operator company can erect electricity poles in their land without paying them" (Interview, FGD with 4 local leaders, village 1, Paragraph 32).

"I told them that in my residence they will not be happy from there, because I already understood that they had topped not up for me money to access the electricity device as they had led us to believe, they had robbed me! Now how do they come with a camera and newsman to start taking pictures of the fridge and tell me to be happy about it? I told them that, if you had got the fridge for free from donors and then you took money from us, tell us so that we know. Also, up to now I am still demanding for the receipt for the fridge they supposedly sold to me but I never received it." (Interview 3- FGD with 6 women, village 1, Paragraph 36).

"Now, now as I talk they have been sending messages to the beneficiaries' phones showing the figure that they should contribute to the PUE operator but peoples are scared now, people are scared… So, this… this is not being done in a transparent way…as I talk now, those beneficiaries… they have really lost confidence. I don't know, if any of them will contribute that money as I talk, to be sincere. You know it is not easy to give money when you don't know what you are paying for. Which type and even the appliances which you have not seen...you are telling me now to pay! What will come after that? You may pay and they bring you something which is...they might bring you a very small thing or a duplicate thing?" (Interview 34 with community liaison staff, village 7, Paragraph 62 -80).

Changing terms and conditions, withholding information, and lack of accountability have a grave impact on the credibility of the stakeholders. It gives rise to suspicion and speculations about the honesty of the operator and therefore conflicts among stakeholders. Dishonesty and changing terms and conditions by the operator also taint the credibility of all actors that participate with them. The credibility and authority of community leaders is challenged and undermined by the residents who lose trust and question the ability of the leaders to protect them. Along with mistrust, electricity users feel that their power of decision-making and choice has been robbed from them, they therefore rebel and reject participating in activities and programs that are imposed on them, or those that they feel are not honest and transparent. Stakeholder credibility enhances the ability of the different actors to carry out their various roles, it strengthens project transparency and commitment. A lack of credibility disempowers the ability of actors to contribute to the project, undermines the ability of self-decision-making and choice, causes a loss of confidence and trust in the project, and incites actors to withdraw from participating in the project-related activities.

Competing priorities such as solar home systems, arrival and or anticipation of the arrival of the national electricity main grid were stated to cause some community members to refrain from joining the solar energy projects and even abandon them after connection. The threat of the competing priorities was stronger in the face of factors that included unreliable (load shedding)

electricity services of the minigrid project, the high unit cost of the electricity, the low capacity threshold of the minigrid electricity that prevented it from powering high voltage equipment, and relational conflict among the stakeholders. Additionally, competing personal priorities such as economic pursuits, hindered several actors from participating in project activities. Some respondents stated that they were too busy to participate in the periodic village meetings and/or the week-long Productive Use of Energy (PUE) trainings. As a result, they missed out on information that would have enabled them to make informed decisions about the project, such as deciding to join or not to enroll to the project.

Political interference and influence on the minigrid process. It is in the interests of the national government to enable rural electrification. Minigrid operators were provided subsidies to support them to implement projects in the communities. Also, during political campaigns, some politicians would popularize the concept of electricity to communities that did not have it. It was also shared that in some of these projects, the areas of implementation were chosen because of their larger population and overwhelming support to the then-campaigning political leaders in a bid to entice them or to say thank you for the support given during the elections. Much as this politicking enabled the communities to access information, they had some adverse effects. In some communities, the politicians used their influence to change intended project locations to those where they were popular and could get more votes. In one of the communities, the operator had conducted a feasibility study in one community, erected electricity poles, and set community expectations for the receipt of the project. However, at the point of installing the electricity container for electricity generation, it was taken to a neighboring village that had greatly voted for and supported the political leader. This caused animosity between the two communities, affected the credibility of the operator who was seen as a liar, created extra costs for the operator, and also introduced the electricity project to a community that had not been inducted and prepared for it. In this community, and also as stated in some others, many community members after receiving the initial free connection, refused to pay the subsequent consumption utility bills. They stated that these electricity projects were gifts of appreciation from their politicians, and so they should not pay for them. An issue that created friction and conflict between the operators and these electricity users.

> P1: "(…) there are people that are not get enough knowledge of this electricity, some of them they know that this electricity, they are getting for free because of the campaign, so when you go there

> to take the money for electricity use, they are say, `No, this is electricity that is for free and we got it as a promise of the campaign, we get it for free...' so it was a big challenges to the electricity committee leaders. And also, the problem was that the people were expected to pay after they have used the electricity and some of them would refuse to pay. People wanted the electricity but they were not willing to pay money for it.
>
> I: And how did they handle this challenge?
>
> P1: We informed the people that all the people must pay! If one did not pay the technician was called and this person would be disconnected from the electricity. And they connect it to another individual who was ready and willing to pay." (Interview 43 with local leader, Village 13, Paragraph 35 - 37).

While political influence may kick-start the introduction of a project and popularize the electricity project in the target areas, it is seen to lay the ground for setting false expectations that later on give birth to conflict among stakeholders and threaten the continuity of the minigrid project.

4.3.5 Phases of Negotiating Power Acceptance

Negotiating power acceptance is a process, not only is it progressive but it also entails the perception and emotion of the actors involved as revealed by the field data. Negotiation – especially international negotiation – is seen as a sequence of stages, either organized in well-articulated patterns or overlapping and developing over time in a rather haphazard or even confused way. Although some negotiations develop a distinctive pattern, it is often accepted by theoreticians, and generally observed in practice, that most negotiations can be broken down into a number of phases that have definite functions. The process may be fuzzy, the phases may be of differing duration, they may overlap or backtrack, and confusion may appear in the succession of events (Druckman & Donohue, 2013, pp. 68, 70). Negotiations constitute an iterative process and are divided into different negotiation phases. In literature, the specific number of phases differs (Fisher et al., 2000, p. 116; Jung & Krebs, 2019, p. 7). Similarly, field data analysis revealed phases to the negotiating power acceptance process as captured through initiation, implementation, and operation, and monitoring and evaluation phases presented and discussed below:

Initiation Stage

The initiation stage of power acceptance reflects the actions of negotiating power acceptance intended for the project introduction to the stakeholders and the target communities, the various relationships among the minigrid actors at this stage, and the related consequences.

The national governments and rural electricity authority agencies are key in identifying suitable sites for minigrids and integrating licensing and subsidization into the tender process. Despite this, as part of the license application process, minigrid developers are still obligated to conduct site and feasibility studies and prove stakeholders' demand for electricity (Electricity Regulatory Authority, 2015, p. 6; Odarno et al., 2017, p. 42; UOMA, 2020, p. 15).

To conduct the feasibility studies, the strategy of stakeholder education strategy is enlisted; contextualization through baseline and needs assessment characterizes this stage. To fulfill the requirements of the regulatory authorities and enable their entry into the communities, the operators and regulatory authorities conduct these assessments to understand the energy needs and demands of the target community, the economic, social, and leadership structures of the community to inform the planning for the roll-out of the electricity project and be eligible for licensing and funding from donors.

Baseline studies introduce to the operator the context of the intended beneficiary community, and to the communities to the concept of the minigrid electricity. This awareness enables these actors to understand the different aspects of the project, it also contributes to the identification and establishment of an enabling platform through which resources, influences, and issues that enhance and or are detrimental to the project are identified and handled.

The baseline assessments open platforms (mediums) for education and knowledge exchange with the target communities and beneficiaries. Alongside the assessments, the minigrid communities were informed about the up-coming and its capacity, demonstration road shows were used in some communities to showcase the various electricity equipment that the electricity could use. In some communities, extensive awareness creation on the use of electricity and the safety and dangers of electricity were conducted through community outreach sessions, community meetings, and role plays. Knowing what electricity is and what it can do for them creates demand for solar electricity.

To cultivate coordination, various relevant actors are identified and enlisted to the cause of the electricity project whilst identifying and capitalizing on the influence of the various stakeholders. This set project expectations related to service delivery and expected stakeholder roles.

> "In the beginning, the electricity operator approached the Local Council committee and they explained that they were in partnership with the government and they were undertaking preparations to extend electricity to the villages. We welcomed the program. They informed us the

> leaders, that they needed to first survey the area, look at the number of homesteads within it, what kind of businesses are in the area and the population density of the area. They came, and together with us accompanying them, they surveyed the area and noted down all that they found." (Interview 4 FGD 5 Local leaders, village, Paragraph 8).
>
> "In 2016, people of this village, I the chairman was not part of them, moved door to door asking us if we would want electricity in your premises. When one said yes, they would write your name and tick it. If one said no, they would proceed on. From 2016, we waited for them in vain, until April 2020. It was very early in the morning when a village resident came to my home complaining and stating they have cut my mango tree to create room for erecting electricity poles. He asked if they had approached me as the chairperson of the area. And I was not aware of these people and this exercise." (Interview 7 FGD with 4 Men, village 3, Paragraph 10).

At the initiation phase of the project not only is information about the project passed on but also the enlisting of the influence of the known and trusted leadership structures happens. The comprehensiveness of the assessments and knowledge exchange at the initiation, coupled with the strategic stakeholder onboarding can accordingly contribute to creating electricity demand, onboarding of stakeholders, and tapping into the authority and influences of the relevant stakeholders to contribute to the electricity project. And also, interactive initiation processes can empower stakeholders with the power of choice. Respondents stated that with information gained and or not gained they were able to decide whether to join the project or not, to participate in the decisions of the locations where to erect electricity equipment in their lands, to determine where and how to participate in the other related project activities, among other decisions. At the initiation stage, it is seen that the expectations of the project deliverables are set. The different required inputs for the successful implementation of the project such as stakeholders and the related authorities, financial, natural, and human resources among others, are identified. The various actors are educated about their expected roles and contributions to the project are set. The actions and related conditions at the initiation stage either set the pace for the electricity demand, a platform for power integration, and the acceptance of the related processes or they cause ambiguity and resistance towards the electricity project and its related influences and processes.

Implementation

The implementation stage is the delivery and reality phase of negotiating power acceptance. The phase of "getting the real picture" of the project, as described by one of the respondents. The stage of setting up and putting in place the structures that will be necessary for the day-to-day running of the grid. At this point, the minigrid operators have a license to implement in the communities from the regulatory authorities. Accordingly, at this stage, the community leaders and community

members are aware of the upcoming electricity project, its related processes, their roles in the process. In communities where the operators worked through and with existing leadership structures at the initiation level, the leaders at the implementation level were active in mobilizing community residents and the required resources that included land and specific resident categories for project implementation. The leaders identified the owners of the identified suitable lands for grid construction, linked them to the operators, and guaranteed the legitimacy and credibility of the operator company. In some communities, free land and labor was offered for minigrid purposes as the residents and leaders foresaw and admired the development that it promised to bring to the communities.

Also, the operators instituted in place and recruited coordination structures that included field offices, recruited community liaison staff, electricity technicians and field engineers to enable their continued presence in the communities, effective service delivery and coordination with existing community structures. A comprehensive and consultative initiation phase flowed in to a coordinated implementation phase. The various relevant input and their influences were identified, recruited, and put to use for the coordinated construction and operation of the minigrids.

> "A village meeting was called. People came, they were very many. They were informed about the upcoming solar electricity project. The minigrid operator told them the advantages of the upcoming grid electricity. People were happy. When they saw that people were happy, they then looked for a location for their site of operation one that would be convenient for their signals and WiFi." (Interview 4 FGD with 5 Local leaders, village 1, Paragraph 11).

However, in some communities, shallow and or no community consultations and engagements were conducted at the initiation phase. Electricity projects and discussions with the electricity developers were initiated at the higher regional and district levels, local community leaders were not introduced to the project, and their community members were not educated about the project prior start of the initial construction processes or electricity tree erection. In other communities what stood for education and proof of electricity demand, was operator staff moving through the communities without the local leaders' consent and knowledge and asking whether people wanted electricity, those who wanted were registered, but many of the residents said 'no', as they did not understand the concept that they were being asked to ascent to.

> "This project we can't get the communication from the government because they are going to the district there to ask about this project, some of us we did not know. But I think that this project is get from the donor and government put little amount. After that the government give them this project as a government village.

> I: How was it introduced to the local government of the village?
>
> P1: The Minister for Energy came here and talked to the leaders and the peoples and they give them a book to all the leaders and the people that had details about this project. When the people read, they got to know about this project and all the rules pertaining it." (Interview 43 with local leader, village 13, Paragraph 13 - 15).
>
> "The challenges were that first of all, there are people that are not get enough knowledge of this electricity, some of them they know that this electricity, they are getting for free because of the campaign, so when you go there to take the money, they are say, 'No, this is electricity that is for free and we got it as a promise of the campaign, we get it for free...' so it was a big challenges to the leaders. And also, the problem was that the people were expected to pay after they have used the electricity and some of them would refuse to pay. People wanted the electricity but they were not willing to pay money for it." (Interview 43 with local leader, village 13, Paragraph 35).

Limited information about the community context led to poorly laid out operators' implementation and operation plans that were costly to the operator in terms of resources and time. In some communities, the electricity users demanded that electricity poles be removed from their plots or the position be moved to a place they were comfortable with, as they did not agree with the position of placing the electricity poles in their lands, this came with a cost of money and time to the operator. In another community, the operator purchased land for their container that did not have an access way, before engaging the owner of the plot through which they would need to achieve access way or the local leadership authorities. With time, they were blocked from accessing their electricity container, as the owner of the neighboring land was not open to them passing through his land to access their electricity container. It was only after extra cost payment and intervention of the local leaders that the minigrid operator accessed their electricity container and operation equipment. In another one of the communities, the operator undertook immense cost to set up a water purification plant, without extensive consultation and feasibility studies, they later realized that the place they erected the plant was shallow, the water was salty and the cost of purifying the water and operating the plant was not cost-effective, they abandoned this plant and the equipment was left idle, and unutilized by the time of the field study. The operator staff was not certain of the way forward to recover this undertaken cost.

Limited knowledge about the electricity project at the initiation stage, as well as lack of enlisted participation, created a state of mistrust and suspicion of the project, leading to its rejection at the implementation stage. Communities leaders stated to doubt the intentions of the operators where they were not furnished with information about the project or engaged before initiation of the project in their communities. In some communities, leaders attempted to halt the operations of the

minigrid operators due to a lack of information about the project and or not being involved in the project. They stated that they needed this information and participation to be able to conduct their regulatory and oversight duties yet it was not forthcoming, hence leading to encumbrances in the implementation process.

Sequential and continuous knowledge exchange are crucial at the implementation stage. Through known and trusted coordination and communication structures, positive participation in the project was triggered and maintained. Stakeholders can identify opportunities for project participation and contribution as seen with the examples of interested and qualifying residents that access knowledge, apply, and participate in the projects as community liaison members, electricity technicians, electricity committee members, and productive use of energy equipment beneficiaries, among others. On-going project initiatives and programs are popularized through continuous information exchange and actors can participate accordingly.

At the implementation stage, the various stakeholders, their influences, and resources that were enlisted at the initiation stage are put to work in the project operation. Not only does the enlisting of these inputs matter, but also the continued deliberate efforts to keep them oiled and in sync contributes to the smooth operation of the minigrid projects and vice versa.

Monitoring

> "By the time the electricity came, I was a local village council of the central sub-villages. The company would come to us and get advice. And even regarding the issue of wiring, I was the one who suggested the idea that they could give the community members the initial connection on a loan basis given its high cost. They kept wondering why people were not joining, and then I told one of the white men who was on this project that we were not scared of connecting to this electricity but the cost of the initial connection was high I requested that they should consider giving it to us on loan basis because in this area we have a number of income generating activities like farming in maize, beans and many things, we cannot fail to pay." (Interview 41 FGD with local leader, village 14, Paragraph 24).

At the monitoring phase of the negotiating power acceptance, the stakeholders review the existing contexts and results of project initiation and implementation. They undertake strategies to assess the outcomes and implementation status of the project and, understand the reason for the outcome. As seen, this enables them to identify the problem faced from the perspective of the affected populations within the project, and with the participation of the affected persons, they can develop solutions which are relevant to the context of communities. And feed the results and actions resulting from the monitoring and evaluation into the day-to-day operation of the minigrid projects.

Monitoring by the operator companies was conducted by technological means, such as using equipment that would reveal utilization levels of the electricity or identify illegal electricity connections in the network. Additionally, physical and verbal means that include community field visits, door-to-door sessions, stakeholder meetings, and interactions with informants within the communities were used by both the operator staff and the community leaders to evaluate the state of communities and related electricity project stakeholders concerning the electricity projects.

In one of the communities, it was stated that both the developer and the national electricity regulatory authorities had absconded their evaluation and supervisory mandates. They had not visited the minigrid village in over five years to assess the state of the project, the community was very confused and unaware of who held the mandate to handle the several challenges and conflicts that they faced in the operation of the grid. The electrician had taken advantage of this to subsume overall authority over the grid. The electricity users and community leaders were very discontent with him, but they did not have any active authority over him, yet in the minigrid guidelines book it was guided that the electrician was answerable to the electricity committee and the community leaders.

The lack of monitoring of the outcomes of the electricity projects and their implementation processes festered in place a situation where conflicts arose and grew unchecked, where there was role and authority ambiguity, with no existing coordination mechanisms to respond to arising conflicts leading to the ultimate detriment of successful project implementation.

Operation

The operation stage of negotiating power acceptance conceptualizes the day-to-day activities and motions that are conducted to enable access to and continued demand for the electricity and minigrid project operation. This stage is not distinct from the implementation and the monitoring stage but rather the three stages tend to happen concurrently once the initial setup of the minigrid is completed.

Continuous knowledge exchange, working with the existing community structures, and presence and access of operators' field coordination structures enabled participatory mutual acceptance of the project and related processes in its day-to-day running and monitoring. In communities that lacked a participatory and inclusive approach to the day to day running and evaluation of the minigrid activities, negative response was witnessed. Conflicts arose when stakeholders were not

aware of or did not have established and or accessible points of resolution. In one of the communities in Tanzania, the day-to-day operations of the grid were fraught with conflicts: among other challenges, the means of monthly utility bill charging was a flat fee payment structure, that was stated to be unfair to the majority of the grid users, several users blatantly refused to pay their monthly utility bills, others stated that, they would pay but would be accused of non-payment and asked to pay once more. Stated defaulters would be removed from the grid, some were persecuted and arrested and several others willingly asked to be taken off the grid given the conflicts and stand-offs. It came to such a time that; the few numbers of electricity users could not sustain the grid economically - the money raised from the remaining electricity users was not sufficient to cater to the staff and technical management costs of the grid.

At the operation stage negotiating power acceptance the dynamics of the day-to-day running of the minigrid and their relations to grid continuity and success are revealed.

4.3.6 Dimensions of Power Acceptance

Electricity projects are introduced into communities by national electricity regulatory authority bodies and the minigrid developers with the belief that they will be adopted and utilized by the communities, and with certainty that the electricity project will contribute to the development of the community and result in financial gain for the electricity operator. Accordingly, actions are undertaken to introduce and implement the electricity project. Influenced by the various conditions as already discussed above, differing responses were registered to the electricity projects. In this next section, the dimensions of power acceptance are presented and discussed.

Euphoric Acceptance

Euphoric acceptance conceptualizes the enthusiastic, excited response and acceptance of the electricity. In most of the communities, stakeholders received haphazard information about the electricity, they did not have comprehensive information about the electricity. They did not understand that they had to pay for consumption as some of them had received a free connection to the electricity. Some of those who had paid their connection fee did not understand that they would eventually be connected to an electricity meter that would limit the voltage of the electricity equipment connected but also ensure that they pay for the electricity consumed.

As a result of free electricity connection and also utilizing electricity without connected meters, many community members excitedly purchased as many electricity equipment as they could, without realizing some of the equipment had high voltage and couldn't be connected to the electricity grid. Others utilized the electricity excessively, without mind for rationing, leaving their electricity equipment and lights on throughout the day and night. They were very excited to receive the electricity and did not mind or have information on how to effectively utilize it. Also, they had high expectations and believed that they could now connect all the electricity equipment for home and commercial use.

It was also noted that the communities recognized this as a too-good-to-be-true situation, much as they were excitedly utilizing the electricity, they knew that it was short-lived, they recognized that they did not have all the information required to be confident in the goodness of the electricity that they were experiencing as captured in the FGD excerpt below.

> "P4: Today you have asked us about electricity and we have had a number of meetings about this electricity but what we should be talking about are the meters. We should have these meters so that we can give you a real picture of the situation regarding this electricity. We are in an artificial setting where everyone is using free electricity, so all we can say is all is good. Even with the electricity gadgets we have got, we do not know about their consumption whether we got what we will manage or what will make us cry. Will you be back here after we are connected to the electricity to collect our views and concerns then? 00:24:41,100
>
> P2: True, me I use this electricity but I am concerned on the cost because I have many gadgets connected to it like more than one TVs, more than one amplifier – I am operating a video hall. I pray we don't get to a point when the meters come and we realize that with electricity they brought a disease to impoverish us, instead of develop us!! 00:26:21,100
>
> P4: Will the government intervene for us when the electricity cost is too high? You are recording us and we are saying the electricity is good but we are not paying for it yet so we cannot say for certain that we have benefited from this electricity because we have not paid for it. 00:29:55,000
>
> P3: Electricity is extremely new to this area most people do not have any experience with it. Some people were hesitant thinking that given that it is a solar grid, it may not be strong enough to supply the community but now they confirm that it is possible and many that were doubtful have now connected to the electricity. 00:37:01,100
>
> P1: In the last meeting they said that we are two weeks away from receiving the meters. 00:37:11,100
>
> P2: Having meters is not a challenge, but how do they work, what are the charges involved? 00:36:54,400
>
> P3: Yes, the payment will be the challenge. It is at that point that people will decide either to continue with the connected electricity or revert to the earlier alternatives such as cooling drinks with ice. 00:37:32,200

> P4: We need the energy operatives to confirm to us that the meter will serve us well. It will be necessary to get our views after we are connected to the meters and we are paying the electricity. 00:39:18,600
>
> P3: The electricity is good, well wired, it doesn't electrocute, we know how to approach them when we get challenges but now we just have to wait for the payment. 00:40:14,900
>
> P1: We have many gadgets from 5:00 am to 5:00 am without any load shedding. We can only wait for the time of payment."
>
> (Interview 2 FGD with 6 Men, village 1, Paragraph 37 - 48).

There was mass wastage of electricity seen, electricity gadgets and lights among others are used limitless without worry about payment from morning to night, without any attempts to minimize or save the electricity usage. It was continually stated that the majority of the users endeavored to maximize the 'free' electricity as much as possible.

The operator goodwill and cooperation of the communities at this stage tend to spark and initiate the community goodwill. Community members, villages, and institutions were said to give land for free for the construction of the minigrid plants. In some communities individuals that gave land for the project purposes were allowed free consumption of electricity, others were connected to the electricity services and only paid their consumption fee. However, in some communities, institutions that gave land to the project had high expectations, they expected to be prioritized in access to electricity, so that they could receive as much electricity as they required to run either a school or a hospital. Yet, at the point of electricity connection, they were only entitled to three bulbs and one socket, as was with all community users and they, too, paid for their consumption fee like everybody else. Conflicting and unresolved expectations at this stage contributed to animosity towards the operator.

Electricity equipment, as many as one can afford or as one feels they need to utilize, are purchased without considering the capacity limitations of the minigrid electricity. This is not only catalyzed by the fact that users are using electricity without pay, or given free electricity connections but also because, once communities receive electricity and are connected to it, great expectations of the electricity are held. With limited and or no guidance about what electricity equipments are suited or can be powered by the grid electricity, many users rush and buy electricity equipment of their desire.

Some operators state that these free connections and periods of free electricity consumption period attract more clients to the project, while other operators do not have the equipment and resources

in place yet to input meters for electricity regulation. They, therefore connect the customers to the uncontrolled electricity as they work at inputting meters. In other projects, the expense of providing individual self-managed meters is one that the operators because of financial limitations, choose not to undertake.

The unbridled electricity consumption of electricity at this phase is costly to the operators, it is also detrimental to the grid, as some users purchase electricity equipment of high voltage, which, whenever powered, causes overall grid shutdown. This frustrates other electricity users and causes conflict between the users and the operators. The community users state that the users do not adequately guide them or give them timely advice, so they buy expensive electricity equipment and it later turns out that they cannot utilize it.

The communities experience anxiety regarding the cost of this generosity bestowed upon them by the operators. They continually wonder what the catch is, these speculations and concerns are intensified by the lack of communication and involvement that they experience. The expectations that the operator had of the community response to the electricity meet the reality with the social, structural, and economic context of the community and the community expectations.

The economic loss incurred by the operator is stated to prompt the putting in place of meters to enable payment for electricity consumption and regulation of electricity equipment voltage input. Some operators fail to deliver the promises made, such as due to resource limitations, and they are unable to extend electricity to all that desire it.

The euphoric response of acceptance is a short-lived phase as soon the excitement around the electricity and the high expectations are met with the reality of the contexts of the operator, such as limited resources to extend the electricity to all or implementation progress that sees individual electricity meters or economic guidelines put in place to enable payment for consumption, or even the operator failing to live up to the high expectations of the community, or the low levels of income limiting ability of the community to connect to the electricity.

Trading off

> "(…) we agreed with all they said because we really wanted the electricity." (Interview 2 FGD with 6 Men village 1, Paragraph 34).
>
> "This raises questions in our minds, but we cannot question the technician because we fear. If we antagonize him, he can switch off this electricity and he is the only one who knows how to manage

> it… he is the only technician on this electricity project, we cannot voice this to him. You see if a doctor is attending to you and you cross him, he is the one with the injection, he may kill you! We are left to only keep quiet but we are in pain, we are pained. …" (Interview 54, FGD with community leaders and energy committee, Paragraph 36 - 37).

> "(…) you know, electricity, once it enters your house, for sure you don't even want to ...uuh… once you have tasted its convenience. It is very difficult to give out that meter, however much the unit...uuh the cost is going to be high. At least you rather put on the small amount of money, at least to push you for a week." (Interview 39 Discussion with minigrid operator manager, Paragraph 22).

The desire to have electricity connection and access in one's premises and community is seen to override or overlap the discomfort that the customers may have regarding electricity-related matters. In all the communities visited, there were several complaints or grumblings raised about the electricity services like the high unit cost of electricity, and the unfair payment terms in some communities where flat fee rates or pre-paid fixed day rate payment systems regardless of individual consumption levels used, and the electricity payment methods of physical cash payment, or unstable payment networks. Despite these complaints, in all the communities visited the electricity demand was high; in some communities, many more people and institutions wished to connect the electricity yet the operators had reached their maximum supply capacity and in all the communities, the majority of those connected to the electricity wished it would power higher voltage electricity equipment so that they could utilize it more. The communities were aware of the challenges and acknowledged them but they continued using the electricity, they wanted it to extend to higher voltage uses, and those without the electricity were clamoring to access it. The communities noted that electricity contributed to longer working hours for business and home chores, longer reading hours for schoolgoers, more active social life in city centers, security in city centers at night, child protection as with electricity in the home, children watched television, keeping them within sight and occupied was easier among others. Statements like, *"… we are not happy, but we have nothing to do about it",* were continually resounded. They accepted it and utilized it amidst the complaints that they had.

> "This electricity, people want it, issues of high cost are there but people want it to reach their premises too. They want it, they desire it, they love it! They disturb us a lot, a lot! but we encourage them. There are villages that were surveyed but the electricity poles have never reached there. There are places that have never been surveyed but they are desirous. They continually ask when the electricity will reach their premises. Yes, if a person sees the example of another that has electricity, they see that they would wish to have it too." (Interview 18 with local community leaders, village 2 & village 3, Paragraph 144-145).

Also, it was shared that community members participated in some activities and programs, not because they were interested in them, but because of how they hoped to benefit from them. Several community members stated that they participated in the structured productive use of energy trainings not because of the business skills or education that was given but because of the hope that they would receive electricity equipment at rationed prices. Some of them, when not successful in accessing this equipment, they termed the trainings useless and a waste of time and even rejected participating in further trainings for which they were mobilized. While speaking of an electric kettle supply initiative, a community mobilizer shared that many of those who signed up to receive the electricity kettles and participate in this initiative signed up not because they needed the electricity kettles or saw the benefit of them. They did not find electricity kettles useful in their remote village, low-income contexts where they used firewood or charcoal to cook large amounts of water for tea or bathing for their big family members, but because they had hope that participating in this project made them more likely to benefit from other projects that could be upcoming and may be relevant to them. They, therefore, made the trade-off, they joined and paid the required sum to participate in this project even if they did not find it relevant to their rural or semi-urban setting where they considered having hot water for bathing, among other uses of the kettle, more of a luxury than a necessity.

In trading off, the electricity users grudgingly accept the electricity project and its related processes, but they are not committed to it. Continually, they express that if another electricity option that offers terms that are convenient to the communities comes along, then they would abandon the project. In one community where the national electricity grid was extended, several users abandoned the solar energy grid, which greatly affected the economic sustenance of this grid. Prior to this, many challenges were faced by the grid users, such as conflicts over flat rate payment and inconsistent record keeping of the electricity fee collection team, so some people who have already paid would end up being accused of non-payment, failing electricity storage batteries hence inconsistent electricity supply thus daily load shedding. Many users persevered and continued their subscription to the solar project, but this changed once the national grid was extended to this area. Not only was the commitment low, but also the electricity users stayed away from project-related activities when they were mobilized to participate as they felt that they were being exploited and that their interests were not being catered to.

Mutual acceptance

The continuous interaction of stakeholders and the existing contexts provide platforms for exchange regarding minigrid-related concerns and enable feedback receipt and sharing. Knowledge exchange about existing project-related concerns and situations enabled the operations to identify, review, and realign emerging concerns to suit the operations to existing situations. In four of the communities, it was shared that through the interactions with the community leaders and the operators, the low uptake of electricity projects by the communities was linked to the low-income generation levels of the communities. These dialogues provided a stakeholder coordination platform; the community leaders recommended the introduction of a loan installment connection fee. The operators accordingly re-aligned their operations to match this, as opposed to the upfront connection fee payment, customers in these four communities were able to pay in installments over a period ranging from one to two years, and they were connected to the electricity on payment of the first installment. The local leaders guaranteed the ability of the community members to pay and followed up on cases of payment default. The number of community members connecting to the electricity increased, and this increased access to the electricity services for the community and revenue base for the operators.

Lobbying, or the ability to negotiate and effectively communicate by the various stakeholders, including minigrid operators, their staff, and local leaders, contributed to the review and adjustment of situations considered unfavorable. Local leaders were able to front the situation of their community members and advocate for a review of electricity connection payment terms. In another instance, where the national government had passed a by-law that drastically cut the unit cost of minigrid electricity in an attempt to match the national electricity unit cost, the operator company realized that they could not meet their operational costs if this was adopted. The minigrid operator, therefore, through the electricity committee and the local leaders was able to engage and dialogue the community on this matter. They allowed the community two months of electricity access at the national government-suggested price, and they worked with the electricity committee, allowing them to see the impact of this cost reduction on their various operations. The committee members and the local leaders realized that this policy would put the operator out of business and yet they did not have an alternative electricity supply option in their remote hilly area of residence. They mobilized the community residents, signed petitions, and requested that the national government allow the electricity operator to maintain their high unit cost of electricity supply. The

local leader respondent acknowledged that the price was high, but it was the only alternative to electricity access and therefore, they asked the national government to revise their policy.

Continuing education and stakeholder engagements and exchanges regarding the electricity projects were said to eliminate ignorance and knowledge misconceptions about the project which led to some community members later embracing and joining the electricity project. Continuous reviews and alignment to address identified concerns were stated to boost confidence in the electricity services. Attitude realignment is a result of and also further enhances coordination and cooperation among stakeholders. Identifying relevant stakeholders, understanding their influence and contributions to the minigrid process, and empowering them with project-related knowledge to activate informed decision-making and actions contribute to mutuality in the implementation process. The stakeholders are enabled to operate within a space where they know what is going on, who is who in the project, and how they can work together towards what purpose. These actions of negotiating acceptance create a platform where the different actors are enabled to participate and communicate and hence realign the minigrid operations and context increasing mutual embrace and commitment to the electricity projects.

Divergence

The minigrid space, both in operation and context, brought with it procedures, standards, and terms of operation that were seen to exist in written, verbal, and or implied forms. In four of the minigrid communities visited, customers received contracts detailing the terms of operation between them and the operators. In one of the communities, the contracts were translated into the locally spoken language, and copies of the contract were kept by both the operator and the customer. In three of the communities, the contracts were in English, and the community respondents interacted with did not have in their custody a copy of the contract; they were not certain if their copies remained at the operator's office or if they were in the custody of their local council chairperson.

In one of the communities, customers did not receive contracts but they were given a rules booklet written in the local language that detailed the operations and stakeholder responsibilities. In this community, it was noted that new customers later connected to the grid after the initial identified sixty grid-connected customers, did not receive these rules booklets. While in nine of the communities visited, the customers did not receive a contract detailing terms of reference on receipt of the electricity connection.

In all communities, it is stated that sensitization and awareness creation sessions, albeit in varying degrees and at different stages, were conducted to educate the communities and stakeholders about terms of reference and operation regarding the electricity grid. At the initiation stage in eleven of the communities and after connection to electricity in three of the communities. It is in one of the communities that continuous active community engagement on project-related matters was cited at the ongoing implementation stage. The other thirteen communities noted that education incidents were far spaced and even non-existent in others, and yet there was an expressed need to keep abreast of electricity-related concerns and matters.

The staff of the electricity operator and implementing partners also assented to the terms of reference and operation. In one of the communities visited, the electricity technicians received and signed contracts of implementation from the start of the project, in another community, the technician did not sign or have a contract of operation but instead, the code of conduct was guided by a rules' guideline book. While in the other 11 communities, the electricity technicians and community liaison staff did not have written contracts, these were later introduced after challenges and tensions between the operator, community liaison staff, and the communities that resulted from uncertain operating terms.

Divergence from the stated and expected operation guidelines was reported in all the minigrid communities. This was traced in the actions of various stakeholders that included the operators, their partners, and the electricity users. In some communities, it was rife and blatant, while in others, it was minimal and concealed. In some instances, the incidents of divergence were intentional and thought out, such as illegal electricity connections and extensions, refusal to pay for monthly electricity bills, deceit about the class of consumption, hence wrong payment class (household, business, or institution), financial exploitation and manipulation of communities by electricity companies' staff and technicians. In other instances, community members participated in cases of illegal electricity extensions without realizing that these were wrong. During interviews, they were open about such practices without realizing that what they were doing was wrong.

Some electricity company staff and technicians transacted and related with the communities and the electricity customers in a way that was not in line with the written and expected terms of operation. Some of them financially manipulated and extorted the electricity users by taking unaccounted for and unreceipted money from the electricity users; in one of the communities, the

electricity technician would demand that he be given transport money upfront to collect a key to the electricity container from the far away regional headquarters and yet he would arrive in a short while once the money was disbursed, a matter that left the electricity user community suspicious, but they were scared of questioning him as he was the only technical personnel in charge of the electricity project. In another minigrid community, an operational partner staff would collect money from project beneficiaries for payment of electricity equipment, this money was not receipted and some beneficiaries would not receive the items paid for. These and other incidents were not in line with the written and stated guidelines of the minigrid projects.

Incidents of divergence caused heightened conflicts among stakeholders within the community, like power thefts and illegal connections, led to minigrid power shutdowns, grid overload, and wrong wire connections and customers' refusal to pay consumption bills led to economic failure to sustain the grid, verbal and physical exchanges with culprits, as well as prosecution and imprisonment. Electricity power shutdowns and fluctuating electricity supply caused frustrations and anger towards the minigrid operators, especially from the business class electricity users. Identified power thieves and payment defaulters were cut off from the electricity, reported to the local and administrative authority, and in some communities imprisoned or taken to court. This caused animosity between these persons and the electricity operators, committee members, and minigrid staff. Animosity towards suspected fraudulent operator staff was very potent, and in the different communities, violence was continually threatened against these staff. In one community, an operator field staff was arrested by national police during a community training exercise and compelled to deliver electricity equipment for which a beneficiary had paid expensively, and yet, he had neither delivered it nor provided receipts to show receipt of monies paid.

Limited and or knowledge about terms of reference, exceeding unfulfilled demand for electricity and related services, unclear reporting and management channels, dishonesty of individuals (both community and stakeholder staff), the unbridled authority of electricity operator staff and technicians, in affordability of electricity services were stated to cause divergencies and resulting conflicts in the minigrid operations.

Exclusion

> "When the electricity came here...people were scared and refused to embrace and accept this electricity project. Because of security… they thought that if you embrace these big development

> projects and they work with you, then once the project starts one would die! people were scared of being sacrificed!" (Interview 53 with former community leader, Paragraph 4).
>
> "As its electricity continued, the will of the people left, they no longer took it as something of worth that they respect. Many people started to default on monthly payments... they failed to pay 5,000 Tzshs per month, this was reduced to 3,000 Tzsshs, 5,000 Tzshs and 8,000 Tzshs respectively as per meters. But still, people failed to pay, some even said just take this electricity from our premises." (Interview 53 with former community leader, Paragraph 36).
>
> "We informed the people that all the people must pay. If one did not pay the technician was called and this person would be disconnected from the electricity. And they connect it to another individual who was ready and willing to pay. Because everybody got this instruction book from the Ministry of Energy, they know well about this. We disconnected about seven people as a result of them and to date, these seven people do not have electricity." (Interview 43 with community local leader, Paragraph 37 - 41).

Exclusion refers to the removal or disassociation from the electricity project. For one reason or another, stakeholders were cut off from participation in the electricity projects. This was either voluntarily, by one's self, making the decision not to participate in the project or to abandon it after being part of it. Or involuntarily, where despite one's desire to be part of the project, individuals were excluded from the project. This was seen to happen at different cycles of grid implementation. At the project initiation, many persons chose not to join the electricity services due to reasons that included a lack of adequate information about the electricity project, the capacity of the electricity, suspicions, and superstitions about the intentions and ill effects of the electricity project, need for higher voltage electricity, lack of affordability and fear of capacity to afford connection and maintenance the electricity among others. Also, resource limitations by the operators excluded interested community members from joining the electricity, and the number of connections could only match the capacity of the installed electricity equipment. Once the operator's resource capacity was reached, then, no matter how desirous one was, they could not be connected to the electricity. Also, in some instances, the lack of proximate electricity connection poles, which needed to be put in place by national regulatory authorities, hindered and excluded interested parties from joining the electricity service.

At the implementation stage, changing and unclear terms and conditions of engagement, lack of affordability, ineffective feedback mechanisms, capacity limitations of the electricity, unreliable/inconsistent electricity services, and unmet/high/unrealistic expectations regarding the electricity project, among others, contribute to the abandonment of the electricity project. Some customers realize that as much as they desire electricity, they cannot afford to continually pay for it and maintain it in the face of their many competing financial needs, so they decide to disconnect

and not continue with it. Instances of dishonesty and changing terms of conditions contribute to a loss of trust in the ability of the operators to provide quality and fair access to electricity. Other electricity users are frustrated by the inability to utilize high-voltage electricity, so they choose to use alternative electricity sources such as generators. Additionally, due to divergence incidents such as illegal connections, theft of electricity, and defaulting payment, operators disconnected and cut off defaulting parties from accessing the electricity services.

The dimensions of negotiating power acceptance and their consequential outcomes are not static. They are constantly changing based on the interaction of the strategies of stakeholder education and cultivating coordination with the intervening conditions. When not deterred and or negatively influenced, electricity demand, stakeholder coordination and cooperation, effective conflict management, behavioral and attitude change, stakeholder goodwill, and project commitment are among the positive consequences of negotiating power acceptance that contribute to the sustainable implementation of minigrid projects. And, when negatively influenced and hindered by the intervening conditions, leading to a context where the emerging power dynamics are not recognized and streamlined in the process, then a vice versa of the stated consequences is witnessed that contributes to the failure and abandonment of the minigrid projects.

4.4 Emergent Grounded Theory: Negotiating Power Acceptance – An Approach to Sustainable Minigrid Project Implementation.

> "What, I emphasized … they need to **educate** the people about their electricity and the different procedures and timelines to access this electricity. So that the **people understand** that they do not have to be paid anything for the erection of the electricity poles in **their lands** and other suspicions. That way people will **willingly, without conflict, accept** all procedures for this electricity. **We all want this development, it is good, but** for them to destroy people's food without even informing them and you are saying I, the chairman agreed to it. This **treats the people wrongly**, they also begin to **suspect** that we the local leaders are in cohorts with the operators to illegally and fraudulently take people's land." (Interview 7. FGD with 4 men, village 3, Paragraph 13; accentuation by the author).

Minigrid projects are introduced to communities with already existing structural and leadership contexts. These existing leadership structures are part of existing national and local structures of administration, accountability, coordination, and reporting systems within which they hold community oversight and gatekeeper roles. The minigrid projects are introduced to the communities through these structured layers, or at least it is as so, expected.

The minigrid project implementation process requires the input of multi-stakeholders that include national line ministries, rural electricity regulatory authorities, international donors, minigrid developers, minigrid operators, community administrative and local leaders, and beneficiary communities and their residents to succeed. Each of these stakeholders has a role to play to contribute to the success of the minigrid process and project. The theory of negotiating power acceptance delves into existing conditions that influence the sustainability status of minigrid project. The existing and emerging power dynamics revolving around the stakeholder interactions and processes of project implementation and their resultant consequences on project sustainability are outlined and discussed for insight into the possibilities of maximizing the implementation process to attain the best possible mutual outcomes towards sustainable energy transformations.

All the minigrid communities are characteristically remote, hard-to-reach, and distant communities that, at the time of the project setup, do not expect a national extension of electricity to their areas. Keeping with the SDG ambitions and aspirations, there is a generally expressed desire and demand for electricity in the communities visited at international, national, and local community levels. The minigrid projects are set up in a context where national governments, through the rural electricity authority bodies, subsidize and put in place enabling environments to encourage rural electrification through minigrid projects' investment. And yet, despite the need and enabling aspects, the embrace and acceptance of these minigrid electricity projects are not automatic, it is seen that projects are met with differing responses ranging from acceptance, fear, mistrust, and blatant rejection, among others.

Electricity, alternatively referred to as 'power', is reported to have the power to bring economic, social, academic, and health status empowerment and the power to take it away, leaving populations economically suffocated, conflicted, and socially dislodged, worse than they were before its arrival. High expectations are held of the electricity in the minigrid communities; in the minigrid communities visited residents continually expressed that with the introduction of electricity, they knew that they could establish businesses such as welding stores, saloons, and video halls, among others. School authorities and community residents shared that children could stay longer at school and even participate in night lessons due to the presence of electricity. Also, clinics and medical facilities knew that they could store drugs in refrigerators, given the presence of electricity. They purchased electricity equipment using their hard-earned incomes and or

borrowed resources with the hope of utilizing the introduced electricity. With the high expectations in the power of electricity, many community residents and institutions in the minigrid communities are connected to the electricity projects.

The resulting appreciation of the electricity projects was echoed in the communities; the expanding and initiation of business ventures, the children studying longer into the night, the improved social lifestyles, the safer, more secure electrified communities, enhanced child protection through engaging children at home on television instead of them roaming the streets, longer working hours, and the upscaling of villages to town center administrative level were among the benefits stated. Contrastingly glaring opposite responses of the project dis-service were also stated, such as the financially draining cost of the electricity in the face of struggle to meet basic needs such as food, education, and shelter. Deception by operators that lured communities to sign up for the projects with false expectations, such as not revealing all costs attached to the electrification process, beneficiaries signing up for subsidized electricity equipment and ending up paying much more than they were initially led to believe, or even, in the case of electricity equipment, not receiving the equipment paid for at all. Electricity users make wrong impacting decisions in the face of limited project-related information like eagerly buying expensive equipment only to find that the capacity of the electricity cannot power the heavy machinery purchased or that the operator, based on the resource limitations could only provide three bulbs connections and a socket regardless of whether one was a household, business or institution client. Hence leaving many community members indebted but with no actualized business venture to recover the money spent and invested. Losing the power of choice and decision-making is stated in communities where all users pay a flat fee at the end of the month regardless of how much electricity one has used or not used. Communities losing faith in their leaders for not advocating better terms of access to electricity or for not being able to put electricity operators to task to attend to their grievances, among others.

The exploration of the multi-stakeholder interactions in the minigrid processes reveals various sources of power and an interplay of power dynamics that relates to the resulting acceptance and or rejection of electricity ‘power’ projects and the different phases of negotiating electricity ‘power’ acceptance. Minigrid projects introduced through the existing community leadership tap into the authority mandate of these structures. Introducing minigrid projects through the existing leadership structure requires empowering them with project knowledge – knowledge which

enables these leaders to mobilize the various resources and categories of relevant stakeholders through existing and trusted coordination platforms. Not working through the existing community leadership and coordination structures, or 'conveniently' involving them only when they are required as opposed to comprehensively involving them contributes to limited project awareness, set-up of ill-fitting projects that do not suit the context of the community, and facing of resistance, fear, and suspicion from beneficiary communities and their leaders. Due to a lack of information and participation, some residents refuse to render their available resources for project utilization, such as rejecting to have electricity poles erected on their lands, community leaders resort to the use of force, such as threats and summons issued to operators to give them more explanation about the project and or even threaten to halt operations in their communities and some mobilize their residents to refrain from participating in the projects. The theory emphasizes the fact that minigrid project implementation is not only about bringing electricity and development to areas that need electricity as envisioned by the operators, their donors, and national regulatory authorities. There are other intricacies to the implementation process that are key recipes to achieving these anticipated electrification visions. These have the power to influence the response to the electricity projects. Depending on their employment, varying responses are witnessed to the electricity projects.

Power in this study refers to the aspects that have influence over the process and outcomes of the electricity projects. In the minigrid implementation process and communities, power is identified to come from various sources including electricity, the authority/status of the different stakeholders, information, resource capacity, ownership, expertise, and networks. Electricity is referred to as power by some stakeholders, as it is continually associated with an accompanying ability to empower communities, transform the situations of its recipients, improve their economic welfare, enrich their social lives, alter gendered restrictions, and enable access to better medical facilities and improved education services. In reverse cases, electricity rids the community of their economic independence, enslaving them as a bottomless pit they have to feed but cannot afford to feed. It alters gendered roles, which is stated to contribute to violence in families as men feel they lose financial advantage and control over women whom electricity has provided opportunity and power to earn. It creates and widens inequalities and classes of the haves and have-nots, especially where communities and individuals have the means to enroll in the electricity projects but are

hindered due to resource limitations of the operator, yet other communities and individuals have access to this electricity.

The dynamics within the stakeholder interactions and the processes of the minigrid implementation are seen to either promote inclusion or exclusion, to give different stakeholders the ability and authority to participate and contribute to mutual operations in the electricity projects, or to disorganize and remove the existing authority structures and strip them of the effectiveness of their positions. To enhance and influence the community leaders' roles to shepherd and advocate for their communities' welfare in this state of transformation or undermine other leaders' capacity to steer community participation and welfare in the process. The minigrid process is fraught with varying powers and their interrelations at play. Actions of negotiating power acceptance, i.e. the deliberate strategies to influence electricity acceptance, as well as the existing influential factors and their contribution to stakeholders' acceptance of electricity and its related processes, are presented in this theory.

The term negotiation power acceptance, therefore, conceptualizes the interactions and actions undertaken by the electricity stakeholders with the intent of reaching a mutually acceptable position. In the negotiation process, a continual give-and-take dynamic exists among the stakeholders in the quest for mutuality. In this study, the term "Negotiating power acceptance" refers to the actions and interactions undertaken to achieve a mutual benefit from the minigrid projects and the related implementation processes.

Negotiating power acceptance consists of two subprocesses (strategies): "stakeholder education" and "cultivating coordination", which are seen at play in all the identified phases of negotiating power acceptance of "initiation", "implementation", "monitoring", and "operation". Various intervening conditions arising from the contexts and stakeholder interactions account for the variations in the outcomes of the strategies of negotiating power acceptance. The resultant dimensions of power acceptance that include euphoric acceptance, trading off, mutual acceptance, divergency, and exclusion reflect these consequent variations.

Stakeholder education refers to the knowledge creation and exchange process amongst the different minigrid project stakeholders, including minigrid operators/developers, minigrid operational partners, electricity regulatory authorities, administrative community leaders, local community leaders, community members, and electricity users, and many others depending on the

context. In the process of stakeholder education in the minigrid projects, the roles of teachers and learners are not consistent with a particular stakeholder but revolve based on the existing context. Actions of contextualization, and knowledge exchange enable sequential and continuous knowledge exchange in this phenomenon.

Contextualization refers to the process of stakeholders undertaking studies and assessments to understand the prevailing situations and circumstances in the area of minigrid implementation. These among others, include baseline and needs assessments. They are undertaken by the operators to gain an understanding of the communities' existing electricity resources and the related challenges, the community electricity needs, structures, administration, and coordination, and introduce the electricity project to the communities.

Sequential education refers to the systematic introduction and conduction of education activities through the known and existing community and leadership structures. Understanding the context of the communities, the structures, and the hierarchies of leadership empowers the minigrid operators with knowledge of accessing and mobilizing the communities. Engaging leaders, in turn, empowers them with project information, this enables them to understand and embrace the project and, therefore, mobilize and educate the next level of leadership, targeted community groups like entrepreneurs and or communities at large to accept and participate in the project.

Knowledge exchange conceptualizes the teaching and learning interactions among the stakeholders. Knowledge and information sharing is conducted through existing modes of communication, which include among others, public radio systems, stakeholder meetings, structured trainings, and written and pictorial information material.

Continuous education is a necessity for stakeholder education. It refers to the ongoing knowledge exchange process among stakeholders throughout the project cycle. It enables continued project awareness and maintains stakeholder networking relationships. Existing platforms and modes of knowledge sharing enable ongoing and continuous interactions among the stakeholders.

Stakeholder education contributes to project awareness, informed decision-making, customized project implementation, conflict identification and resolution, attitude and behavioral change, and stakeholder onboarding.

Cultivating coordination refers to the deliberate interactive relationships and actions between the stakeholders within the minigrid process intended to establish and maintain cooperation and mutuality. Stakeholders are the identified actors that influence or those that are influenced by the minigrid process. The different stakeholders identified in the minigrid projects are minigrid operators/developers, minigrid operational partners, electricity regulatory authorities, community administrative and local leaders, community members, and electricity users, among others. In most communities, on top of the hierarchical administration structures, multi-stakeholder contexts of operation existed. Stakeholder identification, role differentiation, working with existing coordination structures, setting up operational structures, and review and coordination are the identified actions and strategies for cultivating coordination.

Stakeholder identification. The minigrid operations are set in a multi-stakeholder context, different stakeholders contribute to the successful implementation of these projects and also are affected by the implementation of the projects. Stakeholder identification is the process of knowing or enlisting the different individuals, institutions, and groups of people that affect and or who are affected by the minigrid projects. Identification of these stakeholders ensures that all aspects relevant to the operation of the minigrid project are represented, identified, and catered to. Through contextualization and knowledge sharing, information about the different stakeholders necessary to the minigrid processes was gained.

Role differentiation is used to refer to the different tasks or functions the various stakeholders play in the minigrid process and the community. By their relevance to the minigrid process, the different stakeholders have varying roles to play. These may be already existing roles in the hierarchy of the minigrid communities or roles that are required as a result of the introduction of the minigrid project. In the communities visited, there were existing roles within the community such as the leadership and oversight roles of leaders, and community participation roles of community members among others. These roles were informed by the existing hierarchical structure of the communities. The introduction of the electricity projects at some points merged within these existing roles and structures or created new roles and structures that were either interwoven into the existing structure or ended up existing at a parallel level with the existing community structures and roles. During the information exchange process, the different stakeholders were made aware of or understood their roles and contributions to the minigrid process.

Working with and through existing leadership and coordination structures. To foster networking and community cooperation deliberate actions are undertaken to identify the relevant and existing stakeholders, enlist them in the project, and also ensure continuous engagement and networking. This contributed to legitimatizing electricity projects. Enlisting the participation of the existing leadership structures conferred endorsement of the projects by the leaders and presented a legal and acceptable front to the communities. The communities embraced and trusted the project-related terms of operation because they trusted their leaders in the community protection roles.

Setting up operational structures. Minigrid projects are characteristically set up in remote, distant, and hard-to-reach communities. Minigrid operator headquarters offices, on the other hand, are situated in the urban centers of the countries of operation, in some cases in a far-off donor country. In the minigrid communities, the minigrid operators constructed solar energy containers, in which there was the software of operation to enable monitoring of the projects. Other operational structures that include field staff, offices, and operational guidelines put in place, to ensure the presence of the minigrid operator on the ground and a continuous link to the existing structures, communities, and electricity users.

Review and Feedback. Feedback and complaints mechanisms are established on top of working with and through existing feedback mechanisms by the operators and community leaders to evaluate implementation. This facilitates coordinated planning and implementation. Existing mechanisms of review in minigrid communities included community meetings and the use of local community leaders. The operators also held periodic multi-stakeholder meetings at different levels, respectively with their operational partners, energy committee members, community leaders, community liaison officers and community members among others. Toll-free lines and the presence of community liaison staff and field staff in the communities provided avenues for review and feedback.

Cultivating coordination contributes to networking and cooperation, stakeholder goodwill, effective conflict resolution, and project commitment among stakeholders, among others.

The state of power acceptance of the electricity projects is dynamic, it keeps changing and evolving as the stakeholders continually interact with the strategies of stakeholder education and cultivating coordination and the related different intervening conditions, causes, and contexts.

The intervening conditions to the phenomenon and actions of negotiating power acceptance contribute to the acceptance and or rejection of electricity projects. These, among others, include resource capacity (financial and human), which limits or enables the affordability of communities (individuals and institutions) to join and or continually pay for electricity, it also limits or enables the capacity of the minigrid operators and their partners to extend electricity connection equipment and timely maintenance and related services to those that may desire it and the capacity of the electricity provided to power electricity equipment of high voltage. Literacy levels and language barriers deter or enable comprehension of written materials, and proper use of electricity-related equipment, and cause some members and leaders to accordingly participate or shy away from engaging with the minigrid operators and in related project activities. Individual stakeholder attributes as seen when active and committed community leaders and operator staff participate in project activities, mobilize and encourage communities to join the electricity project, they take initiative and engage electricity operators and regulators to respond to concerns faced by their communities and vice versa. Stakeholder credibility, the ability of the operator and their partners to maintain constituency in their operations cultivates the trust of the community and their leaders which contributes to project embrace and vice versa. The existence of and access to and effectiveness of coordination and communication platforms promotes project awareness and conflict identification and management. The value attached to education, knowledge conceptions (beliefs and fears), and competing priorities such as other electricity sources, business schedules, and house chores either enable or hinder participation in electricity projects.

Phases of Negotiating Power Acceptance

Throughout the study, participants' responses continually alluded to a flow of events in the minigrid process. In response to the introductory general question that sought to understand their experience with the minigrid process, the majority of the participants would take on a chronological description detailing the introduction of the projects, and their perception then, proceeding to show why and when these changed to their then-held perceptions. It was continually noted that they experienced the process of the minigrid project implementation progressively and also, the respondents' experiences differed at the various phases. Continually, statements that referred to how the project was perceived and implemented at the project initiation and what the consequences of that were, were shared. Also, the how, why, and when these perceptions changed and what they changed to, as well as the consequences of these transitioned phases were brought

forth. Accordingly, the revealed phases of negotiating power acceptance and their related variables and consequences are presented and discussed.

Initiation Stage

At the *initiation stage* of negotiating power acceptance, actions of stakeholder education, and cultivating coordination are at constant and varying interplay. In stakeholder education, the operator seeks to learn about the existing circumstances and needs of the community (contextualization), share expected deliverables of the upcoming project (setting expectations) with the communities, and popularize the project. In cultivating coordination, the operators seek to legitimatize the electricity project and seek the endorsement of existing administrative and leadership structures. Stakeholder identification and onboarding are conducted at this stage. Ground and platforms for stakeholder coordination and cooperation are identified and established.

The existing desire for electricity in these distant hard-to-reach communities that see no other opportunity to receive electricity from their national government sets a strong condition and context for this initiation stage. Project awareness conducted at the initiation stage creates demand for electricity as different actors learn about the expected electricity project deliverables. It enables stakeholder identification and role differentiation as different stakeholders through the various interactions are kept abreast of their various roles. This sets the pace for power interplay, the different influence levels of the actors are identified and accordingly employed to contribute to project success.

In instances where awareness creation and education initiatives are not undertaken or haphazardly conducted, fear and suspicion of the upcoming electricity projects are stated. As seen in the minigrid communities, several community members reject enrollment to the project, and the operator, due to lack of knowledge of the community contexts, put in place unrealistic, poorly fitting, and or unattainable project programs, which prompts different actors to use their existing influence to work against these project plans as opposed to embracing and furthering the project. Resulting from low electricity demand, limited mobilization coverage, and limited or no stakeholder cooperation within the project; rejection, and conflict among the stakeholders hinder project success.

Implementation

The implementation stage constitutes the action and the reality phase of power negotiation. The promises, expectations, and plans that are laid at the initiation stage come to life. The enlisted stakeholders come together and work together to make the projects happen. The local leaders use knowledge gained about the project to mobilize communities and resources for the project operation. Communities offer land, resources, and labor that is utilized in the operations. Qualifying persons respond to the calls to participate in the project, apply, and are recruited to serve in different capacities that included electricity committee members, community liaison staff, electricians, and field engineers. The operator puts in place field offices and coordinating and communication platforms. With the existing coordination and communication platforms, sequential and continuous knowledge exchange among stakeholders is enabled, hence a coordinated participatory approach to project implementation is witnessed. Operation with the implementation phase refers to the day-to-day running and management of the minigrid projects. Operation activities include ongoing activities such as community engagements, marketing, and grid management.

Lack of comprehensive engagement and enlisting of the stakeholders at the initiation stage contributes to an implementation phase that is fraught with challenges and conflicts. A general lack of knowledge relating to project initiatives, timelines, roles, and obligations in the communities begets mistrust and resistance to the project actions. Community members refrain from connecting to the electricity, they reject the installation of electricity project equipment on their lands, and they refuse to abide by project requirements such as monthly utility fee payments among other responses. The actions of negotiating power acceptance are at play at this stage and depending on the related conditions and dynamics, alignment to the project deliverables is witnessed and or vice versa.

Monitoring

Mechanisms and authorities of monitoring and evaluation already exist in the minigrid communities. The Ministries of Energy, rural electrification authorities, administrative leaders, and local leaders have oversight, regulation, reporting, and monitoring roles in the communities. Through stakeholder periodic meetings, and reports these are conducted.

The minigrid operators put in place mechanisms such as field staff, field offices, and toll-free lines through which they conducted monitoring and evaluation of their ongoing projects. The introduction of the projects incorporated extra roles of monitoring onto the existing mechanisms, as within their general oversight roles, all ongoings in their jurisdictions were included.

Monitoring of the ongoing project implementation and operation was conducted by both the operators and the community leadership structures in their different capacities. Both separately and together with the existing community authorities, minigrid operators conducted and participated in door-to-door visits, leaders, partners, and village community meetings, and operated toll-free lines; all with the aims of reviewing the status and conditions of project equipment, implementation, and customer experiences. Accordingly, points of coordination were strengthened and points of divergence and conflict among the stakeholders were identified and responded to.

The monitoring and evaluation phase of negotiating power acceptance is situated within the implementation and operation phase. It constitutes actions that are geared towards reviewing and getting feedback regarding project-related matters such as stakeholder experiences with access to services. This feedback is then accordingly looped back to inform the ongoing project operation activities.

However, in some communities, the regulatory authorities in charge such as the ministry officials and community leaders did not undertake their supervisory roles. In others, the minigrid operators and their staff were not readily available and accessible in the communities. Knowledge of procedures for access to these stakeholders was not known. Communities would go long periods without an avenue of conflict resolution. Some users would abandon the electricity due to long periods of unresolved conflicts, some minigrid sites would go for weeks without operation due to lack of supervisory visits from the operators and some leaders would issue ultimatums to minigrid operators to threaten their continued operation due to the leaders hampered ability to oversee and regulate the minigrid operations in the respective communities.

Operation

The operation phase conceptualizes the day-to-day management activities that are conducted to carry out the objectives of the minigrid. Constant knowledge exchange at this phase is conducted

to keep stakeholders abreast with project-related matters. Results of monitoring guide the operation activities of the minigrid as they provide assessments of the status of response to implementation and inform the next course of operation activities. The presence of operator staff and offices and community liaison officers in the minigrid communities enables the management of the smooth running of day-to-day activities and access to electricity and related services such as customer care and after-sale services.

Dimensions of Power Acceptance

The dimensions of power acceptance conceptualize the various identified responses to the electricity projects. These outcomes which include euphoric acceptance, trading off, realignment/mutual acceptance, divergence, and exclusion are triggered by the strategies of negotiating power acceptance and their related intervening conditions.

Euphoric acceptance is characterized by joyous, delirious acceptance of the electricity. A "too good to be true" feeling was continually experienced, as expressed by the respondents. Uninterrupted electricity access and operator goodwill, usually free user connection to the electricity, initial months of electricity consumption without payment, and free and subsidized electricity equipment access among others. Additionally, community goodwill through the donation of land and labor is also witnessed and triggers this excitement.

Conditions of project awareness, effective networking amongst stakeholders, visible ongoing evidence of electricity capacity, financial resources by individuals to afford the electricity, and operators' ability to optimally and consistently provide uninterrupted electricity to all that desire to access it maintain this joyous response of power acceptance. In this, high expectations are held of the operators and the electricity consumers, and there is a cordial relationship between the electricity operators and the related stakeholders. Electricity users have unlimited trust in the project, they purchase various electricity equipment trusting the unlimited capacity and access to the electricity.

Euphoric acceptance is either short-lived or does not happen at all in some communities. In some communities and based on the existing condition the process of negotiating power acceptance may experience euphoric acceptance, while in others it does not happen.

Trading off conceptualizes the resignation to the circumstances of the electricity project, where one or more parties are not pleased with the ongoing terms or certain aspects of the minigrid projects but grudgingly accept and remain with the project to have continued access to the electricity service. The stakeholders, in this case, withdraw from active participation in related activities of the project such as awareness and knowledge exchange campaigns but continue to utilize the electricity service. They are not committed to the project and are on the lookout for the next best alternative and can easily abandon the project.

Re-alignment and mutual acceptance: The stakeholders through a participatory approach readjust certain terms and conditions to suit their context. Activities such as lobbying, advocating, and reviewing are used by the stakeholders to reach mutual agreement and suit the terms of access to electricity and or participation in the electricity projects to their communal and individual contexts. Access to electricity connection at a favorable loan installment basis, restructuring operational regulations to reduce the cost of electricity connection and unit cost, and repealing government policies that sought to drastically cut the cost of minigrid electricity at the expense of minigrid operators' operations are some examples of re-alignment and mutual acceptance as shared from the field.

Divergence conceptualized responses and situations that depart from the known and expected way of conducting operations. Divergence in the minigrid setting was identified to be, either intentional and defiant or committed unknowingly but still departing from the guidelines of operation. Such actions included power theft, illegal connections, refusal to pay monthly consumption utility bills, and financial exploitation by operator field staff among others.

Exclusion refers to the removal or disassociation from the electricity project. For one reason or another, stakeholders were cut off from participation in the electricity projects. This was either voluntarily, by one's self making the decision not to participate in the project or to abandon it after being part of it. Or involuntarily, where despite one's desire to be part of the project, individuals were excluded from the project.

Negotiation is the voluntary and systematic exploration of both parties' interests, with the objective of agreeing on a mutually acceptable compromise that resolves the conflict (McCarthy & Hay, 2015, p. 1). Parties to a negotiation need each other to obtain an outcome that is beneficial to both and is an improvement over the current state of affairs for either party. Emotions and perceptions

of fairness may also determine the outcome of a negotiation. People may have strong feelings about the "rightness" of a proposed agreement. Such feelings may not always be productive to reach a jointly beneficial and efficient agreement (Hindriks et al., 2007, pp. 27–28).

Negotiating power acceptance therefore conceptualizes what is going on in the minigrid operation. Despite the desire for electricity and its related benefits and the immense investments that are undertaken to provide electricity to these remote minigrid communities, electricity project embrace and acceptance of the processes therein does not come automatically. This theory not only identifies the interrelated processes that contribute to the minigrid implementation but also brings to light and explores the different power dynamics and conditions related to these processes and stakeholder interactions therein and how ultimately, these contribute to the resultant power effect of the electricity, the continuity or interruption of the project implementation and sustainability. The dimensions of power acceptance and their related conditions give insight that is valuable to understanding behavior, the outcomes of behavior and the resultant effect on the operation of implementation of minigrid projects. In other words, the theory provides insight into the negotiation of power acceptance, an approach to sustainable minigrid project implementation.

5. Conclusions and Recommendations

This study aimed to investigate and explore the minigrid implementation processes and related interactions of stakeholders to understand their effect on the sustainability status of minigrid projects. The research questions that guided the investigations are: What are the processes of minigrid implementation and how do they relate to the sustainability status of minigrid projects? Who are the minigrid stakeholders, and how do their related interactions with the implementation processes affect the sustainability status of minigrid projects? Following the presentation and discussion of the study results in Chapter 4, this chapter presents a concluding discussion summary of the emergent Grounded Theory of negotiating power acceptance, recommendations of the study, way forward for future research, implications, and limitations of the study.

5.1 Negotiating Power Acceptance Theory – Concluding Discussions

Negotiation is a recognized process in technological transitions. The study results show that failure to undertake deliberate efforts to work towards mutual acceptance of electricity projects lays fertile ground for conflict situations. Emerging conflicts that result in the abandonment and rejection of installed projects increase project implementation costs in terms of time and money, and lead to technically, socially, and economically unsustainable projects. Sareen et al. (2023) also note that a just energy transition remains distant when global trends favor large, powerful incumbent actors who prioritize their own financial or political goals. Inclusion and democratic processes in energy transitions face practical limits and challenges, making just pathways infeasible and excluding many vulnerable stakeholder groups from decision-making. Numerous calls for more inclusive and participatory governance practices notwithstanding, many renewable energy projects still emerge from very top-down processes of design and implementation. They highlight limitations of energy project implementation when they state that measures to foster participation are mostly construed as improving awareness and social acceptance, rather than for profoundly rethinking and democratizing energy systems (Sareen et al., 2023, pp. 2, 4). Rather than delegating the destiny of human society and the planet to the insufficiently understood, inherent logic of our entropy-accelerating artifacts, we must achieve societal control over the operation of those artifacts (Hornborg, 2017, p. 106). An inclusive, participatory process of minigrid implementation that recognizes all the stakeholders therein, their influences on the process, and how they can be

harnessed and put to effective use, is not optional, nor is it an unnecessary inconvenience if there is hope for project sustainability.

The entwinement of negotiation and power is a recognized one, though not well articulated in literature. Some variables of the negotiation process are insufficiently understood, badly captured, poorly operationalized, and little researched; among them, power is one of the most questionable and controversial. There is a challenge with the role of power and asymmetries in negotiation: to assess the question of how central and important the role of power is, negotiation has become an important issue on the research agenda (Druckman & Donohue, 2013, pp. 86, 91). In their review of power and negotiations, Schaerer et al. 2020 acknowledge that power and negotiation are intertwined, they discuss the different sources, and note that the link between power and negotiation outcomes is more complex than typically assumed and they also recommend the need for future research to examine whether different sources of power lead to diverging negotiation outcomes (Schaerer et al., 2020, p. 49). This study presents and discusses the phenomena of negotiating power acceptance for sustainable minigrid implementation. Through the data from the minigrid communities in Tanzania and Uganda, the various sources of power in the minigrid context are grounded empirically. These include information power, status power, resource ownership power, relational power, and personal power among others. Recognizing these various power sources and their related influences as well as streamlining them into the minigrid process enables the stakeholders to, through a participatory process positively and within context influence the conditions within for effective operation and sustainability of the minigrid projects.

Stakeholder education as a strategy of negotiating power acceptance welds power which, depending on how it unfolds in the energy transformation process, can either contribute to or limit the achievement and sustainability of the electrification goals. This study was rife with examples and discourses confounding this statement. In the data, stakeholder education emerged as a concept that emerged and was densified by its frequent occurrence and interlinkage to several dynamics of the minigrid implementation cycles. Statements like and in similar intonation to this one by a former local leader of village 13 were frequently resounded,

> "Education and sensitization about the project started, we started to sensitize the people, we continued to sensitize and educate the community. Slowly by slowly, they changed their attitudes, and later they started to see the project progressing, they saw the technicians. Also, sensitizations and education were conducted together with the village's local council leaders. With time the fear left them and they started using this electricity..."

These statements were not unique to one minigrid community but were traced in all the fourteen communities studied. The synonymity of education to social and sustainable transformations is re-echoed in literature (Bogere et al., 2023, p. 7; Kandpal & Broman, 2014, p. 3; Macintyre et al., 2018, p. 7; McKeown, 2006, p. 10).

Critical to note is that beneficiary communities are custodians of their structures, beliefs, and ways. Education is not one-sided – the beneficiary community learning from the minigrid developers and their partners, it also opens to the minigrid developers, operators, regulatory authorities, and all outsiders, a field to learn, an insight into the community context. Education basically holds the outsider's hands and navigates them through the intricacies of the community at a tempo that draws in the community and enables the harmonious and mutual achievement of the intended energy transformation in a way that the community can and will sustain. Contextualization through baseline and need assessments, guides the entry of minigrids developers into the community. It strengthens the processes of knowledge creation and exchange where all stakeholders are involved.

Stakeholder education is not a one-time event it is nor is it a one (wo)man show, the field data highlighted the importance and effects of a continuous and participatory education process. Some of the minigrid communities were fishing island communities that are home to multitudes of economic migrants that are seasonally on the move, others were majorly farming communities whose populations at specific times and seasons would be sparsely spread in their farms and while some were entrepreneurs always on the move, others were stable and situated within the communities through the year. Deliberate, continuous, and alternative means of education and information exchange contribute to availability and access to information while a participatory method, where all the stakeholders are involved, especially the publically accessed and endorsed structures contributes to the sustainability of measures and continuity of information. At the administrative leadership offices visited, it was noted that the minigrid operators visit these offices at the onset of their project operations, official documentation and files are not available regarding the operators, and information about the minigrid operators stays with the officer in charge at the time of project initiation, and yet these officers are by virtue of governance system rotated and deployed to other locations. Conflicts were very present between both visited administrative units and the minigrid operators stemming from lack of information about the projects, and worryingly new staff had no information about the projects and no documentation to refer to. Constant,

structured, and participatory education processes in the minigrid process go a long way in creating project awareness, stakeholder credibility, effective service access and provision and stakeholder coordination.

The context of minigrid project implementation is a multi-stakeholder one. Different stakeholders including national line ministries (energy, economic development, social development etc.), rural electricity regulatory authorities, district, village communities (leaders and residents, categories of electricity users), international donors, minigrid developers, operators, and operational partners etc., depending on the context of project operation are involved. Each of these actors, in their capacity influences the project. Each stakeholder has a role to play in contributing to the successful implementation and ultimate project sustainability. The findings of this study showcase that the identification and enlisting of these stakeholders to activate their influences for the mutual achievement of project goals and project embrace is neither a chance encounter nor an easy feat. It is a deliberate and gradual process hence the concept of cultivating coordination.

Cultivating coordination is not a stand-alone process, an interplay between stakeholder education, negotiating, and networking through the actions of stakeholder identification, role identification, and setting, working with existing coordination structures, operational structures setup, and review and monitoring make it possible. The deliberate actions undertaken to identify the stakeholders relevant to the project operation, accordingly tap into their current roles, authority, and influence for project success. Independent complementary structures such as field offices, field technicians, community liaison staff, and electricity committees set up enable the operator's constant presence and provision of timely efficient service provision. These actions provide a solid base for stakeholder participation and coordination, and continual review of project implementation through existing and established coordination mechanisms, including community leadership, coordination, and communication structures, toll-free lines, impact assessments, among others, for a participatory project re-alignment that contributes to timely conflict identification, resolution, and project goal achievement. The empirical data from the field in this study illustrated the dynamics involved in these actions, showing that where minigrid developers are deliberate about identifying stakeholders and their roles, working with them, setting up complementary operation structures, and reviewing the projects for mutual alignment, then, coordination, conflict

identification and timely resolution, stakeholder goodwill, and project embrace were witnessed, and vice versa.

Resource (financial and human) capacity, individual stakeholder attributes, stakeholder credibility, language barrier, presence of coordination mechanism, and operational guidelines, among other conditions, influence the project implementation outcomes. Depending on how they are engaged, either coordination is achieved or animosity and project failure is witnessed. Negotiation of power is vital in the journey to achieving the Sustainable Development Goals, and particular to this study, sustainable renewable energy transformations – Sustainable Development Goal 7- "Access to affordable, reliable, sustainable and modern energy for all."

5.2 Implications of the Study

The Grounded Theory of negotiating power acceptance reinforces the fact that the introduction of minigrid projects is not only a matter of bringing electricity – an agreed power of development – to those that lack it but also a matter of recognizing and bringing together the different powers that influence the project outcomes in a way that enables a mutual journey towards sustainable renewable energy development. The study, therefore, confounds the necessity of undertaking a multi-stakeholder interdisciplinary approach to sustainable renewable energy development. The indispensable individual and joint contributions of the various stakeholders including regulatory authorities, minigrid developers and operators, minigrid operational partners, community leaders, community, and the academic society, are highlighted. The study reinforces the vitality of a multi-stakeholder interdisciplinary participatory approach to minigrid projects' sustainability.

The need to understand the effect of power dynamics interrelations between power dynamics and negotiation for energy transition changes, is continually resounded, as cited in the literature. Druckman et al. (2013) and Schaerer et al. (2020) point out the worthwhile need to examine how central power is to negotiation and whether different sources of power lead to diverging negotiation outcomes (Druckman & Donohue, 2013, p. 41; Schaerer et al., 2020, p. 49). Employing power negotiation for energy transitions is stated in the cite, however, there is no "one-size-fits-all" approach for a successful energy transition project, and increasingly, the momentum building behind high-profile pathfinder projects challenges transaction parties to be more flexible in their approach in order to get projects over the line (Chance, 2024, p. 7). In the theory, the various power sources relevant to the minigrid implementation process are presented and discussed. It gives a

deep practical and theoretical insight into the power dynamics and the strategies for negotiating power acceptance – stakeholder education and cultivating coordination in the context of the various stakeholders, and intervening conditions and related outcomes of negotiating power acceptance. It shows how and at which phases these strategies of negotiating power acceptance are utilized. Furthermore, the interlinkages between negotiation, power, and the strategies of education and cultivating coordination are comprehensively explored, showing the various sources of power and conditions that reinforce and or deter mutual output achievement. The resulting dimensions of power acceptance cited in the theory give multilayered snapshots of the presenting contexts, reasons for that status quo, and possible solutions to the presenting contexts. This theory gives more insight into the relationship between power and the negotiation process and a guiding framework for stakeholder dynamics in negotiating power acceptance.

The theory also contributes to and emphasizes a conflict-sensitive project implementation approach for sustainable energy development. The interrelationship between education, power, and negotiation is reinforced in this study. Education leads to knowledge and awareness which, when utilized, is key in empowering the related stakeholders to fulfill their roles and obligations, to identify conflict, and to work together towards mutually agreed upon way forward for conflict resolution. Acquiring knowledge about the context of the beneficiary community, the existing community, and conflict structures enables stakeholder coordination for relevant and effective project implementation. Feedback sessions with minigrid operators during the data collection phases indeed highlighted the implication of the study's contribution to an approach that streams various sources of power and encourages knowledge exchange for a conflict-sensitive and mutual approach to implementation. During separate interview sessions with the operators and administrative community leaders in two different sites, the tense conflict relationship between the operator and the administrator leaders was attributed to limited information about project-related programs and as well unclear coordination structure between the two. Following feedback sessions with the interview, one of the administrative leaders initiated invites for the operator to participate in the periodic stakeholder coordination meetings. In another community, the stakeholders, guided by the administrative leaders initiated routine written communication regarding project-related activities to the administrative leaders, sharing their intended project timelines and inviting leaders' participation as well as participating with the leader in joint community meetings. In both scenarios, citing the study results' informative feedback, the operators responded to the community

leaders' reaching out to them, and hence came together into the existing coordination platforms contributing to conflict resolution and stakeholder empowerment. This greatly improved their coordination and contributed to the leaders' and communities' awareness and participation in project activities.

5.3 Recommendations of the Study

Comprehensive stakeholder education that is contextual, inclusive, consistent, sequential, and continuous throughout the phases of minigrid implementation is a recommended crucial ingredient for acceptance, participatory implementation, and ultimately sustainable renewable energy projects. The study shows that situations of shallow, discriminate fact-finding sessions, one-sided information-giving sessions, comprehensive but one-time education sessions, and no knowledge exchange at all precipitate conflict. They lead to responses of blatant project rejection, speculation and suspicion about project intentions, authority powerlessness that results in chest-pumping actions to re-establish command, unresolved prolonged conflicts, and cost of time and money to operators due to un-informed poorly implemented activities, among others. Additionally, discriminate levels of community engagement resulting from various factors such as personal attributes of mingrid actors, and limited resources, among others, were revealed. As a result of these some communities took on the project, and initiatives that benefited the electricity users and the minigrid operators were developed while other communities, even when neighboring the active ones, lagged behind and copied some of these initiatives after accidentally knowing about them. One example is when one community leader while passing through a neighboring village saw a water purification plant that had been constructed in this village as a result of coordination between the operator and the community leaders of this village. He copied this initiative and deriving from the example, he approached the minigrid operator who agreed to set up a water purification plant in land that he provided. This and many other scenarios highlight the need for structured experience-sharing and coordination interfaces among minigrid actors at different levels. In the study, the need for awareness creation and acknowledgement of the importance of comprehensive, consistent, continuous knowledge exchanges to enable confidence/trust and informed decision-making at stakeholder participation was continually resounded by the various stakeholders including the regulatory authorities, operators, their partners, and community leaders and members. More specific comprehensive education recommendations are;

- Conducting extensive baseline and needs assessments by the minigrid developers and operators.
- Introducing project knowledge and exchange initiatives into the communities through the existing and known coordination and communication mechanisms such as community experience-sharing interfaces.
- Utilisation of various communication and knowledge platforms to enable extensive access to information that may include stakeholder meetings and dialogues, door-to-door visits, public radio systems, phone messages, call access, and written materials among others.
- Continuous and consistent knowledge exchange among the minigrid stakeholders, as well as enabling feedback mechanisms and effectiveness and accountability of these feedback mechanisms.

The study in its recommendations, reinforces the call for an interdisciplinary and multi-stakeholder approach to minigrid development. It was continually revealed that the implementation and focus on one aspect at the expense of the other negatively affected the project. Involving the communities in the management of the minigrids, yet the metering system of the electricity was not set in a way that would enable individual users to each pay for what they consume and self-manage their consumption rate did not achieve the desired self-sustaining minigrid community. Instead, the poor technological aspects caused immense conflicts and derailed the good that the social engagement initiatives would have brought forth. Many electricity users felt the metering and payment system was unfair, many refused to pay electricity utility bills at the end of the month after consumption, and defaulters were forcibly removed from the electricity and sometimes arrested and sued. Some electricity committee members would not keep proper records and require users to make double payments. The identification, onboarding, and streaming of the various relevant disciplines and stakeholders in the implementation processes is necessary for effective and sustainable project implementation. This can be achieved through the outlined means:

- Identification and onboarding of relevant stakeholders accordingly in response to the context of the implementation area.
- Making strategic partnerships and resource mobilization to enable effective implementation responses.

- Conducting joint implementation with national and community structures and operational partners to tap into relevant comparative advantages and maximize the use of resources to achieve mutual outputs.

Stakeholder accountability is a crucial variable for negotiating power acceptance for sustainable minigrid implementation. The study shows that even when existing guidelines of operation and regulation exist, these are, in most cases, disregarded and not enforced for various reasons. In some cases, the stakeholders in charge do not conduct their regulatory and supervisory duties, in others, the stakeholders are not informed of the existing channels of evaluation and complaints management; and in others, some stakeholders blatantly disregard them. In some situations, there are no existing formal guidelines of operation to hold the stakeholders accountable for promises made and expectations raised. As a result, some stakeholders assumed unchecked autonomy, technicians, and operators would respond to electricity users' concerns flippantly and at their own pace and time, electricity committee members and leaders mismanage and reallocate minigrid-use intended funds, and electricity users do not adhere to set guidelines. As derived from the study, the recommended guidelines for enabling stakeholder accountability are:

- In the countries of minigrid project operation, there is the existence of regulatory guidelines and policies for minigrid project regulations. These specify the various stakeholders, the hierarchy of interactions and implementation, their roles and obligations as well as the various means of access to the regulatory authorities to raise concerns regarding the projects. These are mostly communicated at the inception meetings that are not attended by all community members and are not continually shared with the communities as required by the regulators. Therefore, the guidelines of project operation ought to be shared at continuous intervals and through various means, verbal and written. Continued access to these guidelines holds various stakeholders accountable to their roles and also empowers electricity service recipients with authority and knowledge to hold the various stakeholders accountable.
- Implementation of the supervisory mandate at all levels, national, administrative, operator, and community, through receipt of periodic reports, supervisory and monitoring field visits, and stakeholder participatory evaluations is recommended.

- At the community level, the establishment of context-relevant operation guidelines with the participation of the community structures and their residents is recommended. with recruited community liaison staff, technicians, electricity committee members, electricity users, and service-related beneficiaries, terms and structures of operation ought to be clear, documented, popularized, and accessible. This enhances cooperation, ownership, and acceptance levels.
- Accountability of existing feedback structures ought to be created through enabling the existence of alternative and accessible feedback platforms, and documentation of the raised concerns as well as the processes of concern resolution. In this study, it was established that some feedback platforms to the regulatory and supervisory bodies required access by physical visits to deposit written letters, and yet the offices of these bodies were very far and hence costly in terms of time and money to access. In other cases, even when concerns were raised using the existing structures, the responsible parties would take long or even not respond to address the concerns raised.

5.4 Way Forward for Further Research

This theory of negotiating power acceptance is a substantive theory conducted in the context of minigrid project implementation in East African minigrid communities in Uganda and Tanzania. It would be worthwhile to explore the concept of negotiating power acceptance in other minigrid locations as well as in other projects for the development of a formal theory of negotiating power acceptance for sustainable project development. Additionally, the theory presents recommendations for negotiating power acceptance for successful project implementation. This could provide insight for further research in the direction of undertaking a Grounded Action study for the development of an operational framework for negotiating power acceptance for sustainable project implementation. Simmons (2003, 2022) puts forth the conviction that Grounded Theory is very useful in closing the gap between theory and practice. He notes that the move from theory to action ought to be systematically maintain the integrity of the grounding process. The action should have earned its connection to the grounding process (Simmons, 2022, pp. 162–170; Simmons & Gregory, 2003, 2005).

The knowledge transfer relationship between academic institutions, private practice organizations, and communities and its implications for project sustainability, is also worth exploring. At the

beginning of this research, from the academic institution interviewed, it was shared that while these linkages could be very beneficial to all parties involved, a coordinated approach was absent at this university. While in the field, the researcher came across two ongoing research and practice partnerships between the minigrid operator and foreign universities. Tentatively it was shared that some actions of implementation did not speak to the local context such as providing electricity kettles at subsidized prices to the rural community residents in order to conduct an ongoing study on community response and utilization and response. A community liaison staff shared that most residents did not find it necessary to purchase these kettles, but they only did so, so as not to miss out benefitting on other projects that may come along. This research, therefore, recommends further exploration of the academic institutions, practice institutions, and community interplay, and its implications for project sustainability.

5.5 Limitations of the Study

This study experienced a limitation in accessing more minigrid developer and operator companies that were willing to comprehensively subject their operations to investigation. Two of the initially identified minigrid operator companies declined to permit the public use of data gathered from their minigrid for this research purpose. The companies, despite the assurance of confidentially and initial consent to participate in the study, stated that they depended on donor funds and were not comfortable putting their operations and field of implementation to scrutiny. Participants usually give consent to participate in a research study because they want the story told, even if what they have to say is very personal. However, if participants request that something they said or did be removed from the interview or observation, the researcher has an obligation to do so (Corbin et al., 2015, p. 64). Additionally, the companies expected financial and material benefits from this study to their operations, which the study could not commit to providing. As a result, one month's worth of data (twelve interviews) collected from these hard-to-reach minigrid communities that would have provided further insight into the power dynamics and state of minigrid operations in rural East African minigrid communities had to be dropped and was not utilized in this study.

Language barrier in some communities was a risk that led to the loss of some data in translation. In some communities, despite not fluently knowing the language, the researcher had some basic knowledge of the language spoken. The researcher noted during some sessions that the hired

interpreter would summarise some responses or wrongly phrase some questions, in these instances, the researcher would seek more detailed clarification and or request that the question posed is not altered. The limited local language proficiency and even lack of any in some minigrid communities posed a risk of change to the exact depiction of data that the researcher acknowledges.

This study was conducted in fourteen East African minigrid communities whose ownership models were private company-managed and community-managed accordingly. Observed in the study, was that some aspects were specific to some grids based on the type of ownership and also the location whether situated in Uganda or Tanzania. Additionally, another key factor is that human behavior and actions are not static, they are constantly changing, as was witnessed and captured in the various phases of data collection. Much as the comparative data analysis method and the adhered-to Grounded Theory tenants of investigation ensured that only the dense and representative concepts emerged and formed the theory, the researcher acknowledges that this theory is limited by context and may not be applied in totality to minigrid communities in different locations and different ownership models. Rather it may provide guiding and sensitizing concepts/principles in varying contexts.

The minigrid communities were situated in areas that were distant and hard to reach. The researcher had to transverse steep mountainous journeys, travel across the lake in fishing boats, and move across long, dusty, deserted roads on motorcycles to access many of these minigrid communities. Additionally, the communities were remote, and in some of them, accommodation for hire was not available. These conditions increased the time to and fro the communities and limited the duration of utilizing observation as a research method. In areas where the researcher could not spend nights, opportunities to sit amidst social crowds and observe the community dynamics and relations, which would contribute to answering and validating some questions as well as formulating lines of data inquiry were limited.

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Appendices

a) Research Instrument

QUESTIONNAIRE GUIDE

Introduction

Dear Respondent

My name is Mangeni Teddy. I'm pursuing an Educational Sciences PHD study with Paderborn University. I'm interested in understanding conflict sensitive community-based education for sustainable development effect on sustainable renewable energy development using a study of minigrid communities in Uganda and Tanzania. Your views as ……. are vital to this study. The information collected shall be used only for this purpose. I thank you for accepting to participate in this interview.

I. Date of interview ……..... Place of interview …….

II. Name/position of respondent ……...

III. Gender ……

No	Objective	Question	Respondent	Method
1.	Conflict sensitive community-based education for sustainable development practice mapping in renewable energy development projects.	What is REA's definition of sustainable renewable energy development?	REA Officials	IV
		How does REA engage a consultative process in developing its strategic plans and programs? No? How is the plan development process done?		
		What initiatives/programs are in place to educate the rural population/end user of the benefits of electricity and promote electricity use? Please detail and explain progress on this		
		How are the initiatives/programs in place to educate the rural population of the benefits of electricity developed? What are the avenues of REA's public information processes and end-use promotion?		
		How does REA monitor the initiatives/programs are in place to educate the rural population of the benefits of electricity?		
		Which policies inform renewable energy community education programs?		
2.	Relationship between conflict sensitive community-based education for sustainable	What is the purpose for a REA consultative engagement process in developing its strategic plans and programs? Is this achieved? How? If not? Why isn't it achieved?		

	development practice and sustainable renewable energy development.	What are the envisioned results for rural population energy education programs in place? Have these been achieved? Yes? How? No? Why not?		
		What factors affect the sustainability of rural electrification programs?		
3.	Dynamics of conflict sensitive community-based education for sustainable development stakeholders' in the context of sustainable energy development.	Who are the stakeholders involved in REA's sustainable renewable process		
		Who are these principal stakeholders that participate in the consultative process of developing the RESP? Highlight the consultative process		
		Which of these stakeholders participate in implementing end user training		
		What guidelines are in place to guide this stakeholder networking?		
		How does REA monitor this stakeholder coordination?		
		What challenges does REA face in stakeholders' coordination?		
4.	Conflict sensitive community-based education for sustainable development framework for sustainable development project implementation.	How can REA best achieve with their consultative process in developing its strategic plans and programs?		
		What do you feel can further enhance public awareness and end use promotion of electricity use?		
		Recommendations for streamlining stakeholder coordination		
		How can rural population energy education programs best achieve target aims?		
1.	Conflict sensitive community-based education for sustainable development practice mapping in renewable energy development projects.	What means are in place for the department to transfer knowledge to the public? None? Why not?	University Electrical Engineering and Development Studies Head of Departments	IV
		Yes? What informs the topics of knowledge transfer? How are issues of concern for intervention identified?		
		What are the different platforms of knowledge transfer/communications are used?		
		Which university policies inform these university-community knowledge transfer linkages?		
		Are identified policies clear on university community linkages?		
		How is knowledge transfer program output measured?		
		Highlight programs targeting the promotion of sustainable development in the community How are they implemented?		
		What challenges are faced related to this knowledge transfer process? How are they resolved?		
2.	Relationship between conflict sensitive community-based	What is the purpose of university-community knowledge transfer programs (if existing)? Is it achieved?		

	education for sustainable development practice and sustainable renewable energy development.	Yes, how? No? Why not?		
		What is the cause of the knowledge transfer process-related challenges faced? How are they resolved?		
3.	Dynamics of conflict sensitive community-based education for sustainable development stakeholders' in the context of sustainable energy development.	Which stakeholders are engaged in the process of knowledge transfer to the communities?		
		How does your department/university coordinate with the identified stakeholders?		
		At what levels of the knowledge transfer do each of these stakeholders participate?		
		What stakeholder coordination challenges are faced?		
4.	Conflict sensitive community-based education for sustainable development framework for sustainable development project implementation.	How existing policies on university-community knowledge transfer linkages be more effective?		
1.	Conflict sensitive community-based education for sustainable development practice mapping in renewable energy development projects.	What informed your selection of the minigrid community in which you implement?	Microgrid Operator	IV
		Community needs assessment? Yes, why and how? No, why not and how did you set your implementation targets?		
		Was the community educated/trained on minigrid related issues? Yes? How are the following handled? • Awareness creation and mobilization • Topic selection- what were the topics of training? • Instructor selection • Venue selection • Mode of instruction • Language of instruction • Participant selection/segregation • Training schedule No? How did community get information and awareness on minigrid related use, maintenance and other related issues?		
		What informs your community engagement procedures? Is it formal or informal?		
		How is the communication managed between the minigrid owner and the community? What are the platforms? Are the formal? Is the community aware of them? - how?		

		How does the operator identify and respond to community concerns? – is this formal or informal? Is the community aware of these means? Are they within the community the community identification and response mechanisms or they are specific to the operator?		
		Are there times when you deny connection or disconnect a user from electricity usage/access? Yes? Why? How is the user informed of this? Is the means of communication formal or informal?		
		Are their community practices/malpractices that are a detriment to the operation of the minigrid? Yes?		
2.	Relationship between conflict sensitive community-based education for sustainable development practice and sustainable renewable energy development.	In how far have you achieved your envisioned plans in the minigrid?		
		How has your community engagement policy affected the operation of the minigrid?		
		Is the training that was given to the community (if any) on minigrid-related issues relevant and beneficial? Yes? How? No? Why not? How is the answer measured/evidenced?		
		Does community utilization of available communication channels have any effect on the minigrid operations? Yes? How? No? Why not? How is the answer measured/evidenced?		
		In how far		
3.	Dynamics of conflict sensitive community-based education for sustainable development stakeholders' in the context of sustainable energy development.	How did other stakeholders play a role in the; minigrid implementation area selection? Community training? monitoring? conflict resolution? Is this networking formal or informal?		
		What role did other stakeholders to operationalize selection and setting up of the minigrid?		
		Which organization documents inform your stakeholder networking?		
		What challenges are faced related to stakeholder networking and coordination?		
4.	Conflict sensitive community-based education for sustainable development framework for sustainable development project implementation.	Suggestion for effective minigrid operations in the community?		
1.		What are the existing community education programs?		IV

	Conflict sensitive community-based education for sustainable development practice mapping in renewable energy development projects.	Are there existing linkages to the formal education sector? Yes? Highlight more on these linkages (coordination, challenges, recommendations)	Local Government/ Community Development Officers	
		Yes? Explain community response to these programs		
		Yes? When were these programs introduced in the national program and when were they streamlined in to this community?		
		What policies inform these programs?		
		How are these programs developed, implemented, monitored..?		
		Please comment on the following aspects of the CBE programs • Awareness creation and mobilization • Topic selection- what were the topics of training? • Instructor selection • Venue selection • Mode of instruction • Language of instruction • Participant selection/segregation • Training schedule		
		What are the existing community education programs related to sustainable development in particular sustainable energy?		
		How is the performance of the existing community education programs related to sustainable development in particular sustainable energy measured?		
		Yes? Would you say these programs have had an impact on this community? Yes? Which impact? How and Why? No? Why not?		
2.	Relationship between conflict sensitive community-based education for sustainable development practice and sustainable renewable energy development.	Do the existing community education programs related to sustainable development achieve their objectives? Yes? How? No? Why not?		
3.	Dynamics of conflict sensitive community-based education for sustainable development stakeholders' in the context of sustainable energy development.	Who are the stakeholders/players involved in the community-based education programs?		
		How do you work with the identified stakeholders?		
		How are they coordinated? Is coordination formal or informal?		
		Which of the identified means are formal? What makes them formal?		
		Which of the identified means are informal? What makes them informal?		
		What challenges are faced by stakeholder coordination?		

4.	Conflict sensitive community-based education for sustainable development framework for sustainable development project implementation.	Do these community education programs need to be improved? Yes? How?		
1.	Conflict sensitive community-based education for sustainable development practice mapping in renewable energy development projects.	Did you know about the minigrid prior installation in the community?	Microgrid community (respondent to be determined with time)	FGD
		If yes, how did you get this information?		
		Are you involved in the minigrid process? If yes, how? If no, why?		
		Did you receive training on minigrid related issues? Yes? Please comment on the following • Topic selection • Participant selection/categorization • Instructors • Timetable schedule • Language Teaching methods No? How did you access knowledge on minigrid related issues?		
		Do you work with in the minigrid process? And how?		
		Which of the identified means are formal? What makes them formal?		
		Which of the identified means are informal? What makes them informal?		
		Topics for assessment on process, challenges, existing solutions/responses, equity and fairness, awareness • Electricity connection, disconnection and reconnection process • Electricity costing & payment • Electricity usage		
		What are your alternative energy sources to the minigrid? Explain livelihood linkages to this energy source? Are you able to co-exist the different energy sources? What related challenges are faced?		
		What are the existing communication platforms used to address minigrid related issues? Are they formal? How do you receive information about them? Is language of awareness raising understood by you?		

		What minigrid challenges do you face? How do you respond to these challenges? Are there existing structures to address these challenges (policies and means)? Yes, describe them, how did you become aware of these structures? Are these structures formal or informal?		
2.	Relationship between conflict sensitive community-based education for sustainable development practice and sustainable renewable energy development.	Has the minigrid improved your life as a community? Yes? How No? Why not?		
		What about the minigrid operation (assessment, training, communication, procedures) contributes to community uptake of the electricity?		
		What about the minigrid operation (assessment, training, communication, procedures) discourages community uptake of the electricity?		
		What is the cause of the minigrid related challenges you face, if any?		
3.	Dynamics of conflict sensitive community-based education for sustainable development stakeholders' in the context of sustainable energy development.	Which stakeholders/players have you engaged with in relation to the minigrid? How have you worked with them? Has this been formal? Explain or informal? Explain		
		What challenges are faced during this process of stakeholder coordination?		
4.	Conflict sensitive community-based education for sustainable development framework for sustainable development project implementation.	Suggest ways that can contribute to the process of community education on the minigrid process		

**This is a tentative study respondent vs. interview question guide as derived from concepts identified during the preliminary literature and document review. This guide is subject to evolve and take on the direction of the study as will be deducted from initial interviews conducted and further document review.

b) Participant Consent Form

Participant's Consent Form

Research Tittle: Contribution of Conflict Sensitive Community Based Education for Sustainable Development to Sustainable Energy Development

Research Project: Africa: Research and Teaching platform for Development - Sustainable Modular Grids for Grid Stability (ART-D Grids)

Name of Researcher: Mangeni Teddy

Introduction

This research will focus on how the dynamics of stakeholder engagement during the renewable energy development and implementation in minigrid communities. This includes studies on how community is involved and educated during the microgrid process and how this will contribute to sustainable energy development.

Purpose of Research - The purpose of this research is to examine the context of minigrid operations and stakeholder interactions in relation to conflict sensitive implementation with focus on community-based education for sustainable development in sustainable energy projects using a case study of minigrid communities in Uganda and Tanzania. Research findings will contribute to theory development for strengthening sustainable development and in particular to this context sustainable energy development

Duration - This research might be completed within a period of 3 years provided that all participants will be available on the scheduled dates.

Confidentiality - The data provided by the participant will be considered strictly confidential and will not be given to others without written permission from the participant.

Right to Refuse or Discontinue - The participant has the right to discontinue or decline the participation in the research anytime he/she feels to do so.

- ☐ I confirm that my participation in this research project is voluntary.
- ☐ I acknowledge that I will not be receiving any payments in regard to my participation
- ☐ I confirm that the duration of the research wherein I will participate is 30 minutes – 1hr hours only which includes recorded interviews and completing surveys.
- ☐ I acknowledge that I have the right to decline or discontinue my participation in this research when I have a valid reason to do so.
- ☐ I have read and understood what the research is all about and how it will affect the target audience.
- ☐ I understand that the researchers will not identify me by name in any reports using information captured from one of my interviews or answers to the surveys I completed.
- ☐ I understand that the researchers will publish their materials in books, videos, newspapers, magazines, and other research-related projects.

Participants Information

Participant's Name: …… Gender: …… Age: ……

Phone Number: ……. Email: ……

Participant's Signature: …… Date Signed: ……