


# Community engagement and sustainability: Two cases of implementation of mini-grids in Lesotho

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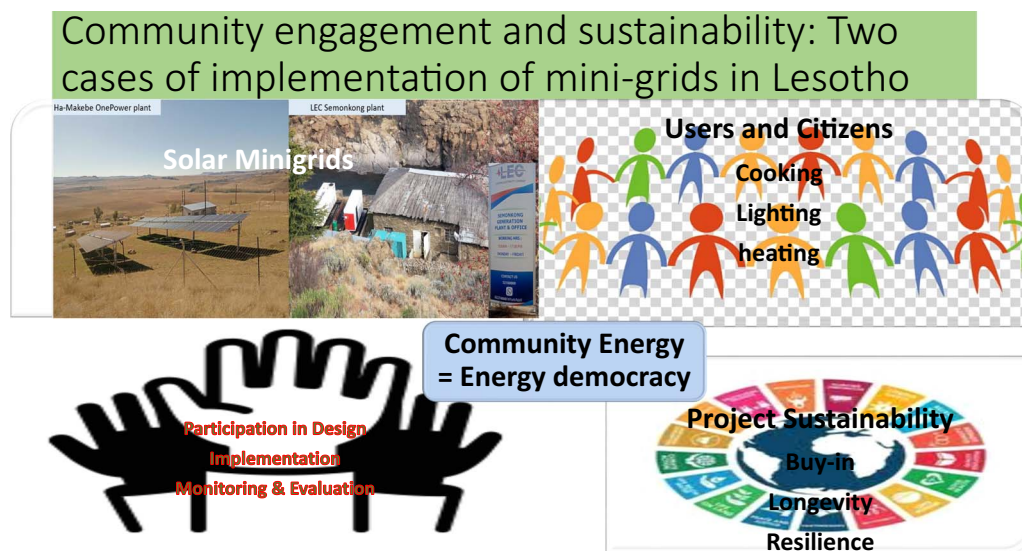
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## Abstract

Based on a survey of two Lesotho communities, this study assessed the type of governance of energy that favours the emergence of energy democracy or community energy. It established that the centralized energy governance of Semonkong seems less effective in solving conflicts compared to the decentralized energy governance of Ha-Makebe. Poor communication and lack of will to respond to community needs caused dissatisfaction and misunderstanding towards the centralized energy project. The study found that the decentralized energy project was more likely to be sustainable because it was characterized by community participation and engagement. The findings also revealed that the satisfaction of energy consumers results from a consistent supply of energy accompanied by responsiveness to community needs as opposed to a cheap inconsistent electricity supply. The implications are that the Semonkong plant's sustainability is at risk, and the project may collapse unless the Government of Lesotho, in the short term, engages with the community regarding its concerns.

## Graphical Abstract



**Keywords:** community energy, energy democracy, renewable energy, sustainability, Lesotho

## INTRODUCTION

Local people's participation in renewable energy generation has the distinct potential to accelerate the transition from fossil fuels to renewables by generating social trust and ensuring project sustainability. Social trust is a bridge to community involvement and is instrumental in forging project sustainability (Walker

et al., 2009). Moreover, social trust is a product of familiarity, social relations, cooperation, reciprocity and trustworthiness (Fukuyama, 1995; Putman, 2000). However, research is lacking in establishing to what extent citizen participation in energy projects improves the social fabric that sustains renewable energy projects.

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This study considers social trust intertwined with public participation to provide the cohesiveness and cooperation necessary for sustainable development (Moffat et al., 2016). The premise is that the above five determinants of social trust in a community towards a project or its implementers can also accrue from participation in project decision-making. Therefore, energy systems could enhance their sustainability by involving local citizens in the development of renewable resources to promote social trust, unlike past energy transitions that have mostly excluded local communities while exploiting their natural resources, leaving negative environmental and social repercussions (Burke & Stephens, 2017).

Lesotho's electricity demand has exceeded its 72MW generation capacity, and the country is compelled to import electricity from Mozambique and South Africa (Tsoeu-Ntokoane et al., 2022). Lesotho has, however, promoted decentralized energy through deregulation to allow independent power producers to supply remote communities with renewable energy. The challenges the country sought to overcome are the depletion of biomass fuel, inadequate infrastructure for electricity transmission, an undeveloped energy sector and limited penetration of renewable energy technologies and services. The government is aiming to improve energy security by reducing fossil fuel use and imported electricity, improving the access of rural and decentralized areas to modern energy, and reducing greenhouse emissions (Government of Lesotho, 2015).

After this introduction, the second section describes the methods and procedures followed when collecting and analysing data. The third section brings out the literature debates about community participation in renewable technologies and points out the literature gap. The fourth section presents findings, while the fifth section discusses them before concluding on the sustainability of the two mini-grids.

Three research questions were used to establish factors that could enhance the sustainability of renewable energy in Lesotho, namely:

- 1) What is the relationship between participation and the ability to influence decision-making related to energy projects in a decentralized and a centralized project?
- 2) What is the relationship between community participation and the sustainability of energy projects?
- 3) Does greater involvement in decision-making reduce the likelihood of experiencing conflicts regarding energy projects and thereby enhance their sustainability?

## MATERIALS AND METHODS

This study adopts a mixed-method orientation to answer the research questions. It blends qualitative data collected through interviews and quantitative data gathered through questionnaires to unearth answers. The study's analysis is based on an empirical survey from two communities with similar electricity establishment and infrastructure levels, namely Ha-Makebe and Semonkong. The two communities are located on the outskirts of Berea and Maseru districts, respectively, and depend on electricity from mini-grids.

Data collection spanned 3 months, from April to June 2022. The chiefs of the communities assisted in selecting respondents in their respective local areas to participate in this study's survey. In addition, the researchers held six focus group discussions of 10 to 12 participants in each study area, where each discussion

group was established to ensure gender balance and lasted 60 minutes on average. The discussion was phone recorded and transcribed.

The focus group data were complemented by four semi-structured interviews with key informants who were leaders of selected community projects and local chiefs. The key informants were selected based on purposive sampling. The chiefs gathered 200 and 233 households at Ha-Makebe and Semonkong, respectively, and numbers were assigned to each candidate and drawn using a lottery to select respondents. The two cases were set at a 95% confidence level and Ha-Makebe demonstrated a 3% margin of error while Semonkong was 4%. The questionnaires were distributed to 162 and 165 randomly selected respondents at Ha-Makebe and Semonkong. The quantitative data were used as descriptive statistics to analyse the influence of the project's decision-making and sustainability in centralized and decentralized energy projects.

A Likert scale was used in each of the responses in the questionnaire, where respondents rated their level of agreement or disagreement for each statement from agreeing, strongly agreeing, to disagreeing and strongly disagreeing. The questions investigated the level of citizen participation, awareness perspectives, understanding, influence and attitudes about the renewable project implemented in their respective communities. The study employed NVivo and SPSS to facilitate qualitative and quantitative data analysis, respectively. The researchers coded the transcripts based on the thematic questions and the issues emerging from the field data, and the data were subjected to content analysis.

## LITERATURE REVIEW

### Community energy

The extant scholarship does not have one static definition of community energy. Community energy simply refers to the installation of renewable energy technologies in a community with the local people's inputs which may encompass decision making, financial support, construction, or administration that benefit them (Rogers et al., 2008).

Equally, terms such as community power or energy, energy democracy and energy citizenship are used interchangeably because of ideological bents, and the blurry distinction authors attach to them (Burke & Stephens, 2017; Szulecki, 2018; Roberts, 2020; Tsoeu-Ntokoane et al., 2022). Notwithstanding, they are in accord because of an attachment to a distinct pivot, namely the quest for citizens to become involved in the management, ownership, production and distribution of energy.

The article follows Greenius et al. (2010) in visualizing a community as a social group with geographical proximity among its members. Consequently, it also follows Walker and Devine-Wright (2008) who argue that 'community energy' is related to local energy generation, community involvement and the social process of establishing energy technology locally, with economic and social benefits accruing to that community. By extension, Walker and Cass (2007) link community renewable energy to the social arrangements through which renewable energy contributes to sustainability.

Energy democracy in this paper simply refers to the involvement of the communities in influencing the projects at different stages (Burke & Stephens, 2017). This study assesses whether energy democracy could improve the sustainability of projects and accelerate the energy transition.

A substantial amount of scholarship demonstrates the value of inclusivity and public participation in project implementation. Hao et al. (2022) argue that public participation in projects enhances efficiency and effectiveness. Citizens need to understand the project and actively consider its merits. Public participation in project implementation builds credibility and social trust as it considers public views and may give room for valuing public interests. By allowing citizens to participate in project decisions, organizations and governments achieve better solutions to social problems by forging cooperation, reciprocity and trust (Putnam, 2000).

The literature demonstrates wide recognition of the significance of community participation and points out the deficiencies of centralized, top-down approaches (Walker & Devine-Wright, 2008; Hoffman & High-Pippert, 2009). It established that participation has the effect of creating an energy system that reflects local values and needs. Hence, the literature emphasizes the importance of community engagement. Participation can increase the local community's awareness, knowledge and understanding of a project and reduce possible opposition and conflict around the project (Walker & Cass, 2007; Hoffman & High-Pippert, 2009).

### Social trust and public participation

According to Allahyarahmadi (2013), trust is rooted in philosophy and ethics and is relevant in conditions of lack of information, uncertainty and ignorance about the unknown actions of others. In this study, social trust is intended to be understood as a community's favourable opinion of confidence with the other persons who may be project implementers. Fukuyama (2000) considers trust to be manifested through truthfulness and cooperative behaviour. It is the expectation of the community towards other individuals based on shared norms, beliefs and mutual support. The parties trust one another and hope that none is willing to exploit their vulnerability (Fukuyama, 2000). In this sense, social trust refers to the confidence in the reliability of another party, individual or company concerning a specific project's provisions.

According to Coleman (1988), social trust is determined through social interaction; hence, community participation in energy projects is fundamental for generating trust. There is a tacit exchange between a trustor and a trustee. For instance, the investors may trust that the community will not ruin the project they have invested in to supply electricity. In contrast, the community may trust investors by expecting them not to exploit their energy needs through energy tariffs.

Trust as a constituent of social capital inheres in the structure of relations among and between actors. Social trust can be lodged either in the implementers of an energy project as corporate entities or in the actors themselves. Information sharing can generate trust, but it requires interaction to occur; hence, community involvement and engagement are vital in creating social trust. Coleman (1988) observed that markets would be problematic without social trust; similarly, energy project implementers could face opposition and confrontation without social trust. Therefore, social trust is a fabric that could hold the community and implementers of energy projects together.

### Decentralized versus centralized energy systems

The study's conception of energy democracy presupposes decentralization of power in the planning and execution of renewable energy projects. Decentralized energy broadly denotes energy that is generated off the main grid, including renewables (Carbon Trust, 2013). In this study, decentralization of energy implies off-grid renewables, which are market driven as opposed to those

that are state-controlled, as in the case of Lesotho Electricity Company (LEC).

The paper presupposes that centralization of governance of energy entails energy security in that it casts energy planning at a national level and refers to the process in which activities involving planning and decision making of an energy company are concentrated to a specific office or location such as the headquarters (Castán Broto, 2015). In a centralized company, the decision-making powers are retained in the head office, and all branch offices receive commands from the head office. The executives and specialists who take critical decisions are based in the head office.

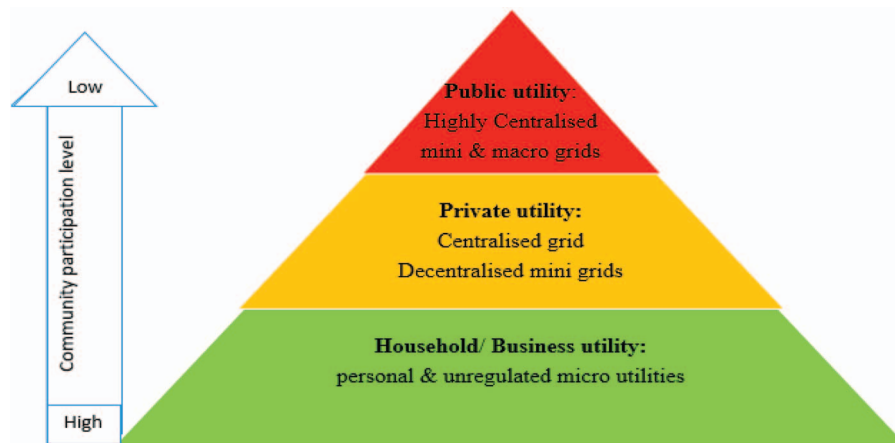
Decentralized governance of energy in this paper refers to a privatized or deregulated energy sector managed by the private sector to accommodate energy sovereignty. Energy sovereignty means that the people have the capacity to make decisions about energy planning, support policy agendas to deliver energy access in local settings and promote participation in decision making (Castán Broto, 2015). Energy democracy can be a conceptual framework for political action seeking to combat climate change effects through joint understanding and collaborative decision making. Energy democracy goals may also attempt to shift ownership, control and production of energy from centralized to decentralized models for communities to determine the managers, producers and distributors of energy (Devine-Wright, 2011 & Szulecki, 2018).

Because of the involvement of local knowledge, decentralized energy systems are likely to be environment-friendly, resilient, accessible and reliable (Carley, 2009). Their participatory nature is likely to promote social inclusion and justice; hence, local communities may support them. Conversely, centralized energy technologies often face opposition that challenges their sustainability: their ability to sustain the present and future generations. Martin et al. (2014) established that their failure results from poor communication rather than the inadequate energy supply. The engagement of citizens plays a significant role in promoting social trust in a community where the project is implemented and enhances project acceptability and sustainability (Fernandez, 2021). Hoffman and High-Pippert (2009) argued that investors in community renewable energy receive income from the projects while community members receive energy and electricity, hence decentralized benefits for all stakeholders. Besides, the government benefits by receiving tax tariffs.

### Community participation in Lesotho

The literature on community participation in energy projects in Lesotho is scanty. Besides, Tsoeu-Ntokoane et al. (2022), who focus on the participation of people in rural areas, Taele et al. (2007) assessed the potential for supplying rural areas with renewable energy technologies. However, the rest of the scholarship does not consider the participation of citizens in energy but focuses on electricity demand (Mpholo et al., 2021), challenges and sustainability (Taele et al., 2012); and evaluates the performance of electricity industry regulation in Lesotho (Thamae et al., 2015). Therefore, it is imperative to examine case studies with renewable energy generation mini-grids to assess their community participation, benefits and conflict levels. This study thus set out to fill these literature gaps and contribute to the knowledge of community energy scholarship regarding the participation level and sustainability prospects of centralized and decentralized energy systems.

To date, Lesotho's renewable energy implementation takes three hypothetical modes with differing levels of community



**Figure 1.** Modes of implementation of renewable energy available in Lesotho.

participation and participation declines between each mode of ownership from 1) household/business, 2) private utility and 3) public utility, respectively. The centralized modes demonstrate the lowest level of community participation, as Figure 1 depicts.

In Figure 1, public utilities are renewable energy sources installed and managed by the public sector, while private utilities are often installed and owned by private investors and are market-driven (Alkhuzam et al., 2018). The government of Lesotho, through the LEC, owns and manages two modes of renewable energy, namely the national grid and mini-grids. An example of the former is a hydropower station situated at 'Muela, while the latter is from the hydro-diesel-powered utility situated at Semonkong. Besides Semonkong, the only established functional mini-grid is located at Ha-Makebe. The administration of Semonkong is highly centralized: Ha-Makebe manifests the government's first successful attempt to decentralize the energy supply.

Modes of renewable energy implementation have a bearing on community participation in decision making. The general situation is that community energy and sovereignty are far from a determinable reality in Lesotho; most communities are able to demonstrate little capacity to participate in or control energy utilities and energy generation. Lack of community participation characterizes centralized energy generation, implying that decision making and expertise are concentrated in a few hands (Alanne & Saari, 2006; Hoffman & High-Pippert, 2009). Centralized systems reinforce the social disconnection between consumption and energy generation. Large-scale centralized generation and distribution of electricity, such as the LEC-managed national one, have resulted in passive citizens who are just energy consumers (Tsoeu-Ntokoane, 2022). Centralized energy generation can hardly escape criticism for inefficiencies concerning production or distribution in the long run or for being unsustainable (Carley, 2009).

## SEMONKONG AND HA-MAKEBE CASE STUDIES

Semonkong is situated in the hinterlands of Maseru in the mountain highlands. It is one of the country's coldest regions with frequent snowfalls. The government, through LEC, constructed a hydropower mini-grid in 1989 using the Maletsunyane River to generate 400 kW of electricity for the community. LEC complemented the Semonkong hydropower with standby diesel generators. However, hydropower experienced technical challenges and became dysfunctional; hence, LEC has to meet

a large part of the community's energy demand through diesel-powered electricity. The plant is in the hard-to-access outskirts of Maseru. The total population of the Semonkong community is around 8,247 (Census report, 2016).

On the contrary, Ha-Makebe is a decentralized or privately-owned solar plant managed by an independent power producer named OnePower. The community's population is around nine hundred. OnePower completed the Ha-Makebe mini-grid in 2021, and the project paved the way for developing a larger portfolio of 10 additional mini-grids in the country. This construction of the 50-kW (AC) solar mini-grid was financed through a loan in October 2018. It is backed up by batteries charged by a gas generator to ensure a consistent energy supply to the community. Its electric tariff is \$0.29 USD per unit, while Semonkong charges around \$0.10 USD per unit. Figure 2 illustrates Ha-Makebe and Semonkong plants.

The section below presents the findings on Ha-Makebe and Semonkong. The questionnaire was completed by 162 respondents from Ha-Makebe (56% females and 44% males) and 165 for Semonkong (47% females and 53% males).

### Ha-Makebe community participation, influence and challenges on the energy project

The study established whether decentralized governance of energy favours the emergence of energy democracy by examining the community's degree of satisfaction based on the participation or consultation level of the project. The participation level of a decentralized project of Ha-Makebe showed a high level of satisfaction (100%). Virtually all respondents expressed their satisfaction with the project's community involvement as Figure 3 illustrates. The policy implication of this finding is that there is a need to decentralize projects to ensure community participation, hence sustainability.

The Ha-Makebe community did not register complaints or dissatisfaction with electricity tariffs despite these tariffs being relatively higher than the general ones charged by LEC. Ha-Makebe key informant Dan maintained:

'The Ha-Makebe community we serve desperately needs electricity because the government disappointed it with several unfulfilled promises. Therefore, they are willing to pay even when the tariff is \$0.29 per unit. However, the \$0.01 USD charged by LEC is too cheap; hence we could not charge it to be sustainable.'

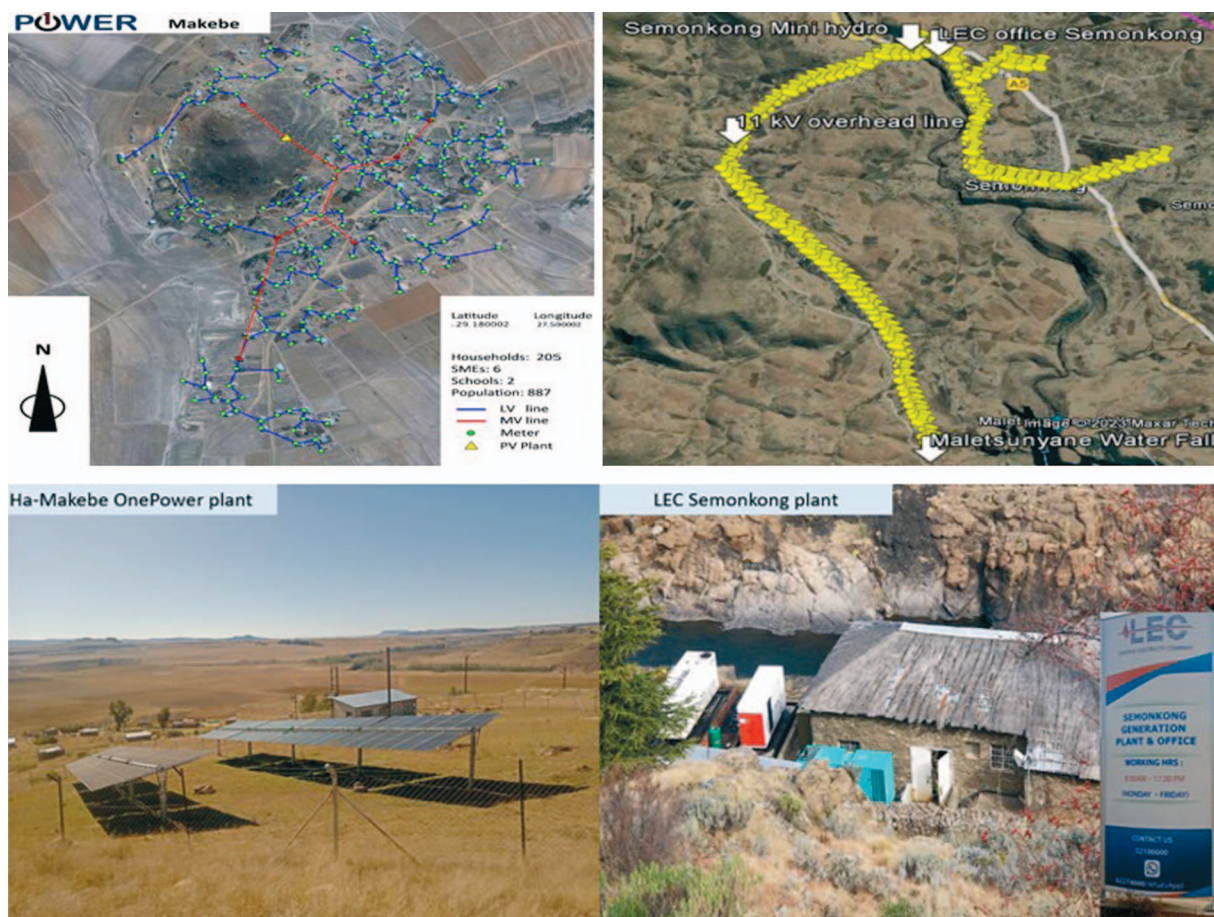


Figure 2. Ha-Makebe and Semonkong plants.

### Are you satisfied with the consultation/participatory aspect of the project?

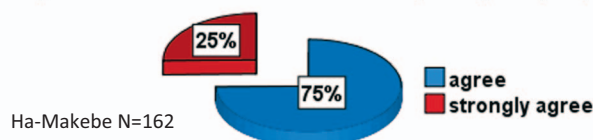


Figure 3. Level of participation satisfaction in a decentralized project.

The government red tape slowed the pace of implementation of privately owned energy projects. OnePower Key informant Dan revealed that attempts and challenges from the government still confront the company, but they are minor. Dan continued:

'At times, we are confronted with government red tape to get approvals and concessions. We must always show extra things that take us away from our main job. Some things we could discuss online, but public officials always want us to meet in person.'

Besides red tape, the threat to private utilities comes from the government's control and authority as it allocates inaccessible investment sites to private entities.

'It is a big challenge to go to our sites because the roads are bad and inaccessible. Sometimes our vehicles rundown, or we must fix the roads before investing', maintained OnePower key informant Dan.

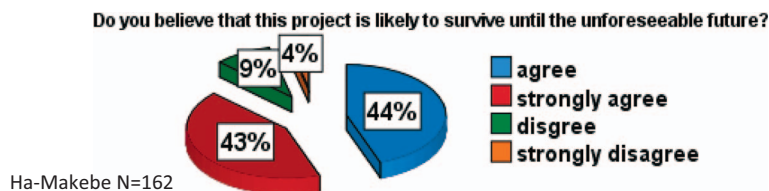
The study examined the sustainability of the Ha-Makebe energy project from the viewpoint of the community members.

Figure 4 depicts that at least 87% of respondents agreed that a decentralized project of Ha-Makebe is likely to be more sustainable.

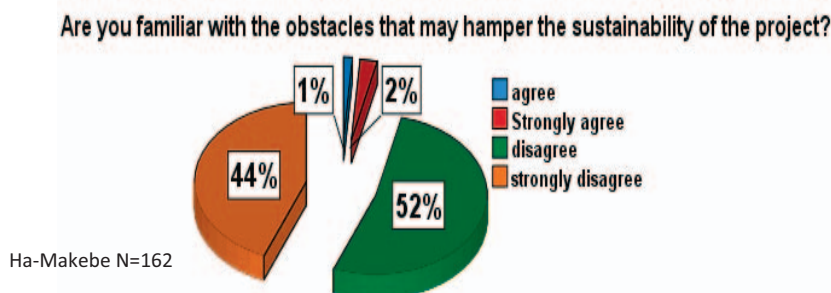
The Ha-Makebe community believed that the project managers considered the community's concerns.

'Generally, the project considers our views. At its inception, we asked them to employ us, and indeed they recruited our husbands and our children (over 18 youth), mainly male children, due to the nature of the work', explained Lisemelo, one of the Ha-Makebe focus group participants. In addition, the community was satisfied with the level of its involvement in decision making, 'We were consulted as a community through public gatherings announced to the chief. There have been around ten consultative meetings to date', maintained Ha-Makebe respondent Thabelang.

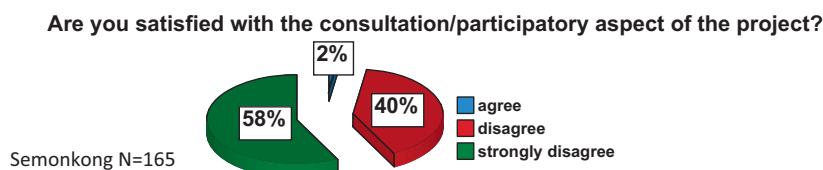
The study assessed the level of conflict experienced by the Ha-Makebe community on the energy project based on the concerned community's familiarity with obstacles threatening the project's sustainability. Figure 5 illustrates that the decentralized project of Ha-Makebe showed a low level of threats to the project's



**Figure 4.** The sustainability of Ha-Makebe energy project.



**Figure 5.** Degree of obstacles facing Ha-Makebe energy project.



**Figure 6.** Level of participation satisfaction in a centralized energy project.

sustainability. At least 97% disagreed that they were familiar with conflicts or threats to the project.

Despite Ha-Makebe management's consultations with the community, they failed to disclose their hidden discontent. Rasetho niggled:

'We use the Vodacom service to purchase electricity; hence, it benefits from our transactions. We realize that the two companies have probably offset their capital costs and realized profits, but none has thought of corporate responsibility. We do not have a clinic nearby and the roads are bad, but none of the two companies came and helped.'

Besides those concerns, the community revealed that it raised the issue of delays in electrical installation to households and has not received assistance yet. Apart from that, the community members indicated that they have an issue with the unit system. The system that stores units is separate from the box that shows the units consumed, and OnePower wants them to purchase the unit box metre. The community complained that it asked for more streetlights, and OnePower conducted a house-to-house survey and never gave them any feedback.

### Participation, influence, sustainability and challenges of the Semonkong community energy project

Almost all Semonkong community members were dissatisfied with the participation level of the Semonkong project. At least 98% expressed their dissatisfaction with the consultations made by the LEC authorities to address their concerns, as indicated in Figure 6.

The study established that the centralized project of Semonkong demonstrated significant public disgruntlement. For instance, LEC key informant Mohanoe contended:

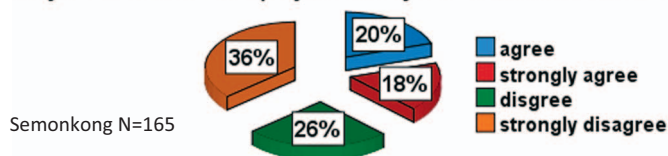
'The community of Semonkong complains that we switch on the electricity at 8:00 am and switch it off at 10:00 pm. They recently wrote a letter to the Minister to lodge their complaint. They claim that their businesses do not function well because of the power cut; however, they do not know the cost of the electricity they are supposed to pay. They just see that they are purchasing a unit with the same amount as others from other areas supplied by LEC. Therefore, they do not know they should pay more than M5 per unit'.

A centralized government-owned renewable project's sustainability may be threatened by political influence, especially when it is state-owned. Key informants revealed that the Semonkong project could have been long disbanded if a private entity operated it. It has been running a deficit for a long time, but political interests sustain it. LEC key informant Mojela asserted, 'The cost of running Semonkong is around USD \$117,266.00 per month, and the government runs a loss to operate it especially when the hydropower is not working due to water shortage.'

Inadequate community engagement and poor communication within centralized projects fail to solve misunderstandings and conflicts. LEC key informant Setho attested:

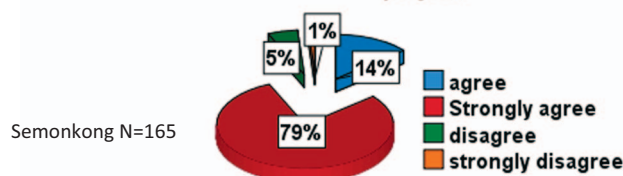
'The main challenge is that the Semonkong hydropower is inadequate to meet the community demand; hence we are compelled to complement it with Diesel-powered generators. The community needs to be sensitized; they sometimes complain and ask why we supply them with diesel-powered electricity instead of electricity from the main grid. Some issues could be

### Do you believe that this project is likely to survive until the unforeseeable future?



**Figure 7.** The sustainability of Semonkong energy project.

### Are you familiar with the obstacles that may hamper the sustainability of the project?



**Figure 8.** Degree of obstacles facing the Semonkong energy project.

addressed through public engagements, but the problem with our centralized system results in poor services.'

The study revealed that decentralized privatized projects could be more sustainable than centralized public utilities in Lesotho. LEC interviewee Sera argued that when the government prepared LEC for privatization in 2005, it solicited a private entity to run the company to demonstrate to prospective buyers that it was profitable. The top staff and managers were recruited based on merits. LEC was restructured so much that it solicited private entities to do most of the work, such as installing electric poles and maintaining some power stations. During that epoch, LEC was more effective than it is now. However, there were challenges that proved that if LEC was privatized, it could have easily overcome them and been effective and efficient.

Political influence renders state-owned renewable projects in Lesotho inefficient. According to LEC key informant Sera, at one point, when the LEC supervisor attempted to implement the company's strategic plans in selected communities, the Minister interfered. The key informant revealed:

'Honourable Mamphono Khaketla decided that the electricity should be redirected from the chosen location to where she wanted. The supervisor said he could not do that unless she provided the money for the location; however, she wanted electricity to be extended but could not change the company's plans. The Minister approached the private consultancy to fire the LEC Supervisor, and he left peacefully. This demonstrated the politicians' influence over LEC even when private consultancy was in charge. It is a foregone conclusion that the situation is worse now that LEC is directly under government control.'

The company's precariousness somehow threatens the sustainability of the LEC's centralized project. Besides projects being shifted from planned locations by political office bearers, LEC invests in sites where an investor cannot go, 'where one realizes that even after twenty years, the capital costs could not be recovered', contended Setho LEC key informant.

Regarding the sustainability prospects of the Semonkong project, at least 38% believed that it could be sustainable, but more than 60% held the opposite view, as Figure 7 depicts.

The Semonkong community doubted the projects' sustainability based on the failure of the state to address their concerns. Sehlabo for Semonkong argued:

'Lesotho Electricity and Water Authority (LEWA) and not LEC ever organized a public gathering in 2015 to discuss issues of the mini-grid electricity. LEWA intended to address the businessmen about the electric concerns and did not invite the entire community; hence the project lacked values that could render it sustainable'.

Besides, at least 93% of the Semonkong community believed that they were aware of the conflicts threatening the project's sustainability. Figure 8 depicts the degree of obstacles facing the Semonkong energy project.

The Semonkong technology project rarely values citizen engagement, which is indispensable for establishing social trust that could enhance sustainability. Semonkong focus groups revealed that the LEC micro-grid officials do not engage them in decision-making. They argued that the company has never considered their views since the project was implemented. Lineo, one of the participants, contended:

'We have been complaining about the electricity being cut at 10:00 pm and only for it to return at 08:00 am. This complaint was lodged at the LEC plant office located in our community. We also complained that the power outage continued without us being informed beforehand. Unfortunately, no one bothered explaining or responding to these grievances'.

The Semonkong project was non-participative and more likely to spark disputes than the decentralized participatory project of Ha-Makebe. The Semonkong focus group participants pointed out:

'This has primarily been due to unclear formulae for the villages' and/or households' electrification. We have had instances where people form a scheme for electricity connection. This has been mainly outside of consultations with the LEC. So, when the LEC comes to connect the electricity, they only connect a few houses in line with the amount received for electricity connection. This, at times, leaves other households

that have contributed unconnected, with the implications of such households accusing those connected of scheming to embezzle their money and getting connected at their expense’.

The participants argued that no one from the LEC advised them on how they should form those electricity schemes to benefit everyone better. The last time they had any formal meetings on the electricity issues was in 2015 when Mr Selibe Mochoboroane was the Minister of Energy. Then, however, it was organized by the regulator LEWA instead of LEC. ‘Since then, no gathering on electricity issues has been made. It has been that long since we were briefed about the challenges we are experiencing, and now we just keep guessing’, Lesala contended.

On the other point of concern, the Semonkong project caused conflicts where there was financial inequality among community members who wished to have access to electricity. Those who are well off pay heavily to bring electricity connections to their households but those who are less wealthy wait until the connections are close to connecting, becoming free riders. The fact that those now connecting to the close installation pay less amount of connection compared with the wealthy who fetched it from a distance results in the financially powerful feeling entitled to demand money from anyone who wishes to connect electricity. They want to be compensated for paying heavily to bring electricity closer to other people’s households.

The lack or absence of project participation or decentralization has created conflicts. Semonkong participants divulged that when they experienced power cuts, they used to associate them with the LEC staff. Nonetheless, the 2015 gathering held at the Semonkong airport ironed out and subsided the tensions by clarifying the issues behind the power cuts. Lerato, one of the participants, explained:

‘We were informed that the power disruptions are usually due to load-shedding, ongoing maintenance, or faults within the plant. We were also informed that sometimes the droughts dried up the river and caused the electricity demand to surpass the supply; hence, diesel generators were added to complement the shortage.’

The Semonkong project was more likely to consider citizen participation under challenging circumstances such as protests. For example, the 2015 public gathering or consultation resulted from a Semonkong community protest where they demanded that the authorities account for the power disruptions.

‘The authorities deflated our assumption that the staff is incompetent by explaining that the community electricity demand has surpassed the current hydropower supply; hence there is a need to step up the supply’, clarified ‘Marelebohile. The last time the Semonkong community had a power cut for three consecutive days was in May 2022, but they were not given any explanation for the cause of the power cut.

LEC failed to address the Semonkong conflict. ‘On 04 June 2022, we marched to Maseru to submit our petition to be supplied with electricity 24/7 because our concerns have not been addressed’, maintained Morollong. LEC management confirmed that the Semonkong community submitted a letter to the Minister to intervene in their concerns. In addition, the researchers found that the Semonkong community created a WhatsApp group where they suggested solutions to their electrical problems. Some wanted LEC to supply them with electricity from 6 am to 10 pm, while others wanted it undisrupted.

Hence, the centralized project caused many disputes ranging from poor services and administration. The Semonkong interviewee Hopolang noted:

‘Frequent power outage hampers services that we sometimes need at government offices and other businesses. At times at these places, we are told that electricity is cut, and we cannot be assisted. Some places do not have solar-powered electricity, but others, such as the clinic, do.’

A degree of discrimination and slanted service delivery sparked conflicts within the centralized governance system of renewable energy. For example, the Semonkong interviewee Molato observed:

‘Sometimes when there is an expected power cut, the LEC office informs the clinic, the lodge and other prominent businesses and leaves the rest of the community ignorant. They move around with the company vehicle to inform selected enterprises about the anticipated power cut. When there is an unexpected power cut, we usually track the time; after three or four hours, we call the office to demand accountability, but sometimes they do not pick up calls. The problem is that the staff do not care about the community’s needs.’

The centralized governance system disgruntled the Semonkong community. Semonkong key informant Katleho contended:

‘Imagine watching and enjoying a TV programme, and the electricity goes off when you are glued to the show. Sometimes you must run home so you can iron and do house chores before the electricity goes off. We feel unlucky and hated by the government. How can we be the only community in the country experiencing power cuts from 10 pm to 8 am? This is unfair, and if it depends on me, everyone from this community should not vote anymore.’

The centralized project of Semonkong disrupted business operations through power cuts. The interviewee Lisebo sustained:

‘You see those rooms there; they are all vacant because they are connected to electricity and are relatively expensive compared to those without electricity connections. The tenants argue that there is no need to pay high rent due to the unstable electricity; they are better off staying in a house without electricity and paying low rent.’

## DISCUSSION

The research established commonalities and disparities between the Ha-Makebe and Semonkong projects. Table 1 illustrates these similarities and differences and other project characteristics as established by this study.

### Community participation, social trust and project sustainability

The project of Ha-Makebe involved the community in decision-making phases in a transparent manner where every community member had an opportunity to express their views. The continu-



**Table 1.** Characteristics of Semonkong and Ha-Makebe minigrids

| Semonkong minigrid characteristics  | Ha-Makebe minigrid characteristics  |
|---|---|
| Hydropower-diesel powered minigrid<br>Situated in the outskirts of Maseru district at Semonkong | Solar generated minigrid<br>Situated at few kilometres from the Maseru city, at the outskirts of the Berea district, at Ha-Makebe |
| Operated by Lesotho Electric Company  | Operated by OnePower  |
| State-owned   | Independent Power Producer  |
| Established in 1989   | Completed in 2021   |
| Generates 400 kW  | Generates 50 kW   |
| Electric tariff is USD \$0.10   | Electric tariff is USD \$0.29   |
| Population density 8,247  | Population density 900  |
| Problem of constant supply and financial gains  | Financial sustainability  |
| Less participatory  | Participatory   |
| Community disgruntlement with poor services   | Higher satisfaction with service delivery   |
| Sustainability crisis   | Sustainable   |

ous consultations built social trust, as evidenced by the community's confidence in influencing decision making (Coleman, 1988; Putnam, 2000; Moffat et al., 2016). The community demanded Apollo lights, and they received them. Hence, the project favoured some kind of energy democracy or community sovereignty in renewable energy. It also created green jobs for community members and enhanced sustainability prospects through its continuous engagements, which helped it in addressing emerging conflicts. The project's inclination to community energy enshrined the community's awareness, knowledge and understanding of the project and reduced possible conflict around the project (Walker & Cass, 2007; Hoffman & High-Pippert, 2009).

However, the sustainability of the Semonkong project was threatened by its limited community involvement in decision making. The lack of alternative or limited options for the community acted as a glue holding the Semonkong project together. The government continued to support LEC to operate the mini-grid at a loss; hence, the project is not sustainable and requires reform. The findings reinforce the idea that a lack of community knowledge and understanding of the project and poor decision-making departing from community sovereignty jeopardize its sustainability (Walker & Cass, 2007; Hoffman & High-Pippert, 2009).

### Community's influence in decision making minimizes conflicts and enhances project sustainability

The Ha-Makebe community was satisfied with the mini-grid, not because it was less prone to conflicts. The energy tariffs of USD \$ 0.29 were relatively high compared to the general tariff of LEC, which was USD \$ 0.1 before the 01 December 2022 increment. Despite the concerns the community raised, they were content with the project because they influenced its decision making at different phases and succeeded notably in creating jobs and acquiring streetlights.

In contrast, the Semonkong community could not influence decision making concerning the mini-grid hence the project's sustainability was threatened. The community petitioned the Minister and expressed its disgruntlement to the highest authority because their concerns were not addressed over the years. The LEC managers also realized that the community needed to be engaged in decision making to minimize the conflicts, but this was not done.

### Decentralized and centralized energy technologies and their inclination to energy democracy

Lesotho's established renewable energy system (Semonkong plant) is marked by a top-down management approach, and there is a highly centralized government control with limited community participation. LEC manages and operates the country's national grid. It owns one mini-grid at Semonkong because others have been disbanded due to functional and technical problems. LEC rarely engages the community it serves; hence, misunderstandings and conflicts are inevitable under its management. Despite the low cost of its electricity, the Semonkong community does not appreciate its service as much as the Ha-Makebe community values the services offered by OnePower.

The Ha-Makebe community was convinced that the OnePower project was likely to be more sustainable because the company was inclined to community energy or involvement. Besides the conflicts created by the lack of participation at Semonkong, the community's benefits were less obvious than at Ha-Makebe. However, both projects had social and economic benefits.

**Social benefits:** Ha-Makebe community experienced an increase in local knowledge due to regular consultations; hence, community members believed that the project would be sustainable. The regular participation increased their knowledge and conviction that the project does not pose hazards to their environment; hence, they demonstrated more commitment to the project. Besides these benefits, the Ha-Makebe community experienced an improved community reputation, while the Semonkong community demonstrated the contrary. The latter community thought the government abhorred it (Michalena & Angeon, 2003).

**Economic benefits:** While the Semonkong community did not report significant local job creation because of the establishment of the mini-grid, the Ha-Makebe community acknowledged that the project created jobs. The findings resonate with Walker (2008) and Hoffman and High-Pippert (2009), who showed that innovative energy projects could support a transition to greener jobs. Increased employment that the community realized at the beginning of the project generated local income, enhancing local economic development (Hoffman & High-Pippert, 2009). OnePower and Vodacom also benefitted from electricity sales, while the government benefitted through tax tariffs; thus, these findings coincide with Hoffman and High-Pippert (2009) by showing that renewable energy projects have comprehensive economic

benefits. Equally, the Semonkong community benefitted from entrepreneurs investing in their community and others benefiting from house rental income, an issue identified by del Río and Burguillo (2009) as the advantage of green energy projects.

The study established that the decentralized energy project of Ha-Makebe was participatory and swift in addressing community needs and preventing disgruntlement. In contrast, the Semonkong plant was less participatory and hence failed to address community concerns and caused conflicts. The sustainability of the latter project is maintained at a financial loss, while the Ha-Makebe project seems sustainable. Notwithstanding, both projects created jobs in environments that cared for the environment. Nonetheless, the decentralized energy project of Ha-Makebe favours the emergence of energy democracy more than the centralized energy governance of Semonkong because it promoted a sense of ownership and was participatory and swift in addressing community needs.

## CONCLUSION

The study found that Ha-Makebe as an independent power producer favours the emergence of energy democracy or community energy. Furthermore, it revealed that a participatory project could swiftly address conflicts and allow community members to influence decision-making. Regular community involvement in decision making increases social trust and promotes a sense of ownership towards an energy project. However, the Semonkong project did not involve the community in decision-making and left misunderstandings and conflicts unaddressed. The approach of LEC is ineffective in solving conflicts and requires review. Poor communication and lack of will to respond to community needs caused dissatisfaction and misunderstanding towards the centralized energy project of Semonkong.

The study established that community participation and influence in decision making enhance an energy project's sustainability prospects. Community participation, knowledge, involvement and engagement are the social trust lubricants holding energy projects together. The value of community engagement supersedes electricity affordability. The satisfaction of energy consumers results from a consistent supply of energy accompanied by responsiveness to community needs as opposed to a cheap inconsistent electricity supply. In summation, the study established that greater involvement in projects could create room to influence decision making and address conflicts as they emerge; hence, participatory projects are likely to be more sustainable.

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## CONFLICT INTEREST

The authors declare no conflict of interest.

## AUTHOR CONTRIBUTIONS

The corresponding Dr Moeketsi Kali is responsible for the general work, fieldwork, analysis and write-up, while the co-authors contributed to shaping the paper's ideas, reviewing and editing.

## DATA AVAILABILITY

The corresponding author can provide the data generated during this study upon reasonable request.

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