

GRASSROOTS SUSTAINABILITY INNOVATIONS IN MAURITIUS ISLAND: CHALLENGES AND OPPORTUNITIES



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Abstract

Grassroots innovation initiatives play a crucial role in supporting sustainability transitions in island communities, driving fundamental changes towards more resilient and environmentally sustainable pathways. However, they are often confronted with challenges. This study seeks to understand the barriers and opportunities for accelerating grassroots innovations in Mauritius based on the experiences and perceptions of community members engaged in various grassroots initiatives. The study employs a qualitative approach, using semi-structured interviews. The findings reveal that barriers such as socio-cultural mindsets, credibility issues, funding constraints, political and institutional barriers, and policy implementation gaps hinder the acceleration of grassroots innovations in Mauritius. In response, the study suggests that policy reform, localised production, innovative financing mechanisms, experimentation, community empowerment, socio-cultural shifts, private sector partnerships, sustainable blue ocean economy, multistakeholder and regional collaboration may be instrumental in overcoming barriers and enabling grassroots sustainability innovations to thrive and contribute to broader sustainability transitions in Mauritius. The study provides pathways for accelerating grassroots innovations, shaping a sustainable and resilient future from the bottom up and offers valuable insights for grassroots change agents, researchers and policymakers alike.

Keywords: Grassroots Innovation, Islands, Mauritius, Sustainability Challenges, Sustainability transitions



1. Introduction

Sustainability transitions, which involve fundamental systemic shifts towards environmentally sustainable and resilient socio-economic practices, are urgently needed to tackle deeply entrenched, complex, and intractable sustainability challenges plaguing contemporary societies (Grin et al., 2010; Loorbach et al. 2020). Island communities face unique sustainability challenges heightened by their geographic isolation, limited land area, resource constraints, fragile economies, and heightened vulnerability to climate change impacts, including extreme weather and slow-onset events (Kelman, 2018; Nurse et al., 2001).

Nonetheless, island communities can also provide valuable opportunities as crucial laboratories for piloting, modelling and learning about innovative sustainability solutions (Kelman et al., 2015; Grydehøj and Kelman, 2017; Hennessy, 2018). By serving as niches for sustainability transitions, these communities can drive fundamental changes in societal systems towards more resilient and environmentally sustainable pathways. Experimentation is a critical starting point in sustainability transitions, where alternative technologies and practices are introduced into real-life settings. These alternative approaches can bring about transformative changes that reshape social and material realities toward more sustainable outcomes (Sengers et al., 2019). With their boundedness and manageability (Grydehøj and Kelman, 2017), island communities are perceived as flexible and controllable spaces that facilitate experimentation, niche nurturing and knowledge acquisition related to technology, social dynamics, and institutional practices (Baldacchino, 2007; 2012; Skjølvold et al., 2020), contributing to developing sustainable systems.

The capacity of citizens to foster niche nurturing and build alternative systems in response to sustainability concerns, leading to a transformation of daily practices related to production, exchange, and consumption, has become a topic of growing interest (Smith et al., 2015; Hossain, 2016). These efforts are frequently referred to as grassroots, community-driven, civil society, or bottom-up innovations, and their organisational structures vary widely, ranging from cooperatives and associations to informal local and community groups (Seyfang and Smith, 2007). Over time, niche community-based innovation may scale up and transform mainstream institutions and regimes (Seyfang and Haxeltine, 2012).

While grassroots innovations play a crucial role in supporting sustainability transitions (Hossain, 2018), their impacts remain marginal (Cairns et al., 2023) due to the inherent challenges grassroots innovators face in sustaining their initiatives (Van Oers et al., 2018). These challenges can result in a slow pace of sustainability transitions (Feola and Nunes, 2014), which is concerning given island communities' pressing environmental issues. Thus, there is a need to gain a more robust



understanding of the specific contexts and factors that either facilitate or obstruct grassroots innovations (Ornetzeder and Rohracher, 2013).

While prior empirical studies (e.g., Feola and Nunes, 2014; Loorbach et al., 2020; Dana et al., 2021) and review papers (e.g., Hossain, 2016; 2018; Seyfang and Smith, 2007) have provided insights into the barriers and opportunities of grassroots sustainability innovation initiatives, they often focus on a single initiative or movement, limiting a broader understanding of the depth and breadth of grassroots innovation initiatives' challenges and opportunities for acceleration. Furthermore, there are limited studies on grassroots innovation on Islands in the Global South. Thus, the existing studies may focus on more institutionalised grassroots groups, or not adequately capture the realities of some island communities, as grassroots innovations are highly contextual and are often developed in response to local problems (Seyfang et al., 2014; Gernert et al., 2018).

According to Kelman (2018), island communities have strong ties with their environments and deep stakes in sustainability outcomes. Additionally, Fischer-Kowalski et al. (2020) propose that it is crucial to thoroughly comprehend the local insights about sustainability transitions to identify potential risks and opportunities for sustainable outcomes. Against this backdrop, the primary aim of this research is to advance the understanding of the barriers and opportunities to unlocking the transformative potential of grassroots innovative practices that can inform sustainable transitions in Mauritius by exploring the experience and perceptions of community members who are also involved in different grassroots innovation practices. Therefore, the study seeks to address the following research questions:

- i. What are the key sustainability challenges experienced in Mauritius?
- ii. How are existing grassroots innovation initiatives in Mauritius contributing to addressing these sustainability challenges?
- iii. What are the main barriers hindering the acceleration of grassroots innovation?
- iv. What are the key opportunities that can facilitate the transformative potential of grassroots innovations in driving sustainable transitions in Mauritius?



2. Theoretical Context

2.1 Grassroots Innovations

Grassroots innovations represent endogenous processes where local community groups pioneer alternative modes of organisation lifestyles, cultural norms, values and practices that not only support behavioural shifts (that extend beyond individual-level change) within social contexts but also challenge the business-as-usual approach and produce sustainability outcomes (Seyfang and Haxeltine, 2012). Accordingly, they catalyse systemic transitions (Seyfang, 2010) and the social change necessary to address and mitigate future environmental changes (O'Brien, 2012).

Grassroots innovations are community-driven, purposeful, place-based solutions built upon the principles of local governance and community ownership for sustainable development, generating economic, social, and environmental benefits (Hossain, 2018; Hargreaves et al., 2013). They often emerge in response to environmental challenges (Smith et al., 2014), local problems (Gernert et al., 2018), economic necessity (Walker and Stepick, 2014), and/or the failure of existing systems and practices to effectively meet communities' needs (Horlings et al., 2021).

Grassroots innovation fosters collaboration among diverse stakeholders, including citizen initiatives, political activists, enthusiasts, local entrepreneurs, informal groups of individuals, craftspeople (Ornetzeder and Rohrer, 2013; Ng et al., 2022) and ecopreneurs (Ramos-Mejía and Balanzo, 2018; Sarkar and Pansera, 2017). At their core, grassroots innovations are marked by locally relevant approaches that are sensitive to the local contexts in which they operate and the priorities of the communities implementing them. Driven by local volunteers and activists within civil society networks, these initiatives experiment with social innovations, alternative practices, and unconventional technologies (Gernert et al., 2018; Seyfang and Smith, 2007) engendered towards devising new ways to address societal needs and tackle persistent social and environmental challenges (Sengers et al., 2019).

These initiatives contribute to encouraging the adoption of sustainable energy sources (Broska et al., 2022; Hargreaves et al., 2013), creating and maintaining urban green spaces (Dempsey and Burton, 2012), operating community currency systems (Seyfang and Longhurst, 2013), place-making self-consumption community gardens (Pellicer-Sifres et al., 2017), enhancing local biodiversity (Dennis and James, 2016), managing food wastes (Tartiu and Morone, 2017), recycling local materials (Smith et al., 2014), providing environmental education (Bendt et al., 2013), improving ecological and social resilience within communities (Schreuder and Horlings 2022), growing and distributing food locally (van der Jagt et al., 2017), advancing climate change mitigation efforts (Frantzeskaki et al., 2016), and



raising awareness about the impacts of pollution (Gignac et al., 2022). Furthermore, they foster behavioural shifts towards sustainability (Middlemiss, 2011), bring sustainability issues into the political and public spotlight, and motivate others to adopt more sustainable practices (Mattijssen, 2022; Horlings et al., 2020a). Notably, the sustainability outcomes of grassroots innovations are often linked to the agency of individual agents and groups within communities (Turnheim et al., 2015; Horlings, 2015; Horlings et al., 2020).

2.2 Challenges and Opportunities for Grassroots Innovations

Challenges

Grassroots innovation processes face challenges that threaten their ambitions for systemic change. In the early stages, grassroots initiatives in niche areas may encounter a "liability of newness," where their activities are often seen as odd, unsuitable or misplaced (Geels, 2010), requiring legitimisation efforts to survive (Van Oers et al., 2018). Grassroots groups often rely on volunteers, making them vulnerable to participation threats like turnover, burnout, and departure of key personnel. Furthermore, sustaining participation may constitute a significant barrier to grassroots innovations (Bradbury and Middlemiss, 2015; Genus and Iskandarova, 2020; De Vries et al., 2016; Ornetzeder and Rohracher, 2013).

While grassroots initiatives aim to be inclusive spaces, studies indicate that inequalities and exclusions stemming from expertise, skills, and sociocultural factors within grassroots may limit diverse participation (Avelino et al., 2019a) and the pluralistic evolution of grassroots innovations. For instance, Smith (2011) reveals a lack of diversity among participants in transition town initiatives, as members are overrepresented with relatively affluent and highly educated participants, failing to reflect the demographic composition of the wider local community.

According to Cabannes (2012), lack of funding presents a major challenge to the development, maintenance, and expansion of grassroots innovations. The author notes that grassroots initiatives confront various obstacles, including unclear procedures, bureaucracy, excessive paperwork, limited information on credit and subsidy opportunities, difficulties in preparing funding proposals, and burdensome processes. Uncompromising commitments to transformative or disruptive values further create obstacles for grassroots initiatives in securing funding from mainstream sources (Hossain, 2018) or limit acceptance of grassroots innovation and societal impact (Geels, 2019). Funding cuts or short funding cycles focused on short-term projects undermine the ability to pursue lasting sustainability efforts (Hossain, 2018;2016; Cairns et al., 2023; Dana et al., 2021).



Another key barrier to the development of grassroots sustainability alternatives is the lack of sustained institutional support and suppression from established, powerful actors who tend to hinder disruptions to the status quo (Avelino et al., 2023; Geels, 2014; Hossain, 2018; Schreuer, 2016). Politics and regulations can further impede the progress of grassroots innovations, as entrenched regimes may wield policy mechanisms to constrain the emergence of radical alternatives threatening their dominance (Pellicer-Sifres et al., 2018; Hossain, 2018). Grassroots movements generally lack power against incumbents' efforts to marginalize their transformative solutions through institutional blockades and regulatory hurdles (Schreuer, 2016).

The ongoing discussion indicates that grassroots innovations are embedded within the socio-political and economic systems they seek to transform. However, grassroots innovations may be co-opted by aligning with the unsustainable regimes they originally aimed to challenge, thereby compromising their radicality and uniqueness (Raj et al., 2017).

Combined, these challenges may affect the day-to-day operations of grassroots initiatives, influence the acceptance and adoption of sustainability practices within communities, and create systemic challenges that impede the scaling of initiatives beyond niche contexts.

Opportunities

While grassroots innovation initiatives face challenges, studies have shown several key opportunities to increase their transformative potential and drive sustainability transitions from the bottom-up.

Being knowledgeable and aware of sustainability issues is a fundamental prerequisite for developing ethical standards and norms. Accordingly, raising awareness about the underlying causes, providing practical solutions and breaking down complex issues into manageable steps can inspire collective action towards sustainability and generate positive expectations of success (Gernert et al., 2018). People's understanding of effective paths for taking action may generate cognitive dissonance, relatedness, and a sense of urgency to drive change, which can sustain autonomous motivation over time and motivate collective engagement (Grabs et al., 2016). This suggests that grassroots change agents must possess the necessary knowledge and adopt effective communication skills to effectively communicate the urgency of the sustainability challenges, provide concrete solutions and inspire others to join in collective action.

Essential opportunities for acceleration include good stakeholder relationships, sustainable funding sources, infrastructure, strong leadership capabilities, available skill sets and volunteer efforts (Martiskainen, 2017; Gernert et al., 2018). Furthermore, the freedom to design projects, experiment, interact openly, and make collective decisions enables a sense of collective agency (Hossain, 2018).



Sharing knowledge and best practices and promoting local-global learning facilitates the growth of grassroots efforts (Feola and Nunes, 2014). Employing strategies like participatory approaches, documentation, prototyping, research, campaigns, community mobilisation, awareness, and education helps groups actively create and occupy spaces for their innovations (Douthwaite et al., 2009).

While one may thus argue that the opportunities within the innovating groups are critical for translating their ambitions into tangible and impactful solutions, grassroots innovations do not emerge from or operate in a vacuum. The interplay between soft institutions (e.g., routines, norms, practices) and hard institutions (e.g., legal frameworks, regulations and formal organisations) plays a key role in shaping actor behaviour, interactions and the transformative dynamics of innovation (Grandadam et al., 2022; Wieczorek, 2018; Grin et al., 2010).

Hassen and Surroop (2020) maintain that broader shifts, such as institutional reforms, policy adjustments, or heightened public awareness of issues, can aid the emergence of grassroots movements and accelerate their impact. Furthermore, policy mixes that stimulate niche development and destabilise unsustainable regimes may accelerate grassroots innovation (Kivimaa and Kern, 2016; Rogge and Stadler, 2023). While Hossain (2018) and Smith et al. (2014) posit that supportive partnerships with mainstream institutions and external actors are vital for grassroots innovations to access resources needed for scaling impact and influence, Avelino et al. (2019b) contend that in contexts lacking institutional support and favourable power dynamics, 'local embeddedness and transnational connectedness' can enable grassroots actors to persist in destabilising and ultimately displacing dominant, unsustainable institutional arrangements.

Intermediaries bridge connections between often disparate, isolated grassroots initiatives and integrate them into broader networks, accelerating grassroots innovation (Boyer, 2015; Hossain, 2018). Networking and partnerships that connect grassroots initiatives to wider societies and regimes help spread information, enhance niche building, establish legitimacy, and embed alternatives into mainstream standards (Gernert et al., 2018). Coordination through networks and social media enables communication and the spread of grassroots innovations across localities (Hossain, 2016). Widespread social movements offer support, motivation, human capital, know-how, resources, and infrastructure. These larger movements can act as bridges between initiatives across different locations and time periods, leveraging their innovations and knowledge to foster sustainability transitions (Gernert et al., 2018). Through social learning from various grassroots experiments and diverse networking, the momentum of emerging niches grows, enabling them to challenge dominant, institutionalized regimes (Avelino, 2009).

One may argue that beyond opportunities within the innovating groups, grassroots innovations may be accelerated through supportive institutional contexts, cross-scalar partnerships, intermediary bridging, and leveraging broader social movements. However, grassroots groups must retain decision-making autonomy to avoid co-optation, becoming implementation arms for intermediary agendas and preserving their transformative potential.

2.3 Conceptual Framework

Based on the theoretical insights and research questions, the study's conceptual framework (Figure 1) illustrates the relationship between grassroots innovations, sustainability challenges, barriers and opportunities to accelerate grassroots innovations. For instance, it presumes that grassroots innovation emerges in response to key sustainability challenges (RQ2-RQ1). However, they are hindered by some barriers (RQ3-RQ2) that may influence the persistence of sustainability challenges (RQ3-RQ1). However, recognising and leveraging key opportunities can mitigate the barriers (RQ4-RQ3) and enhance the effectiveness in solving sustainability challenges (RQ4-RQ1) and the impact of grassroots innovations (RQ4-RQ2).

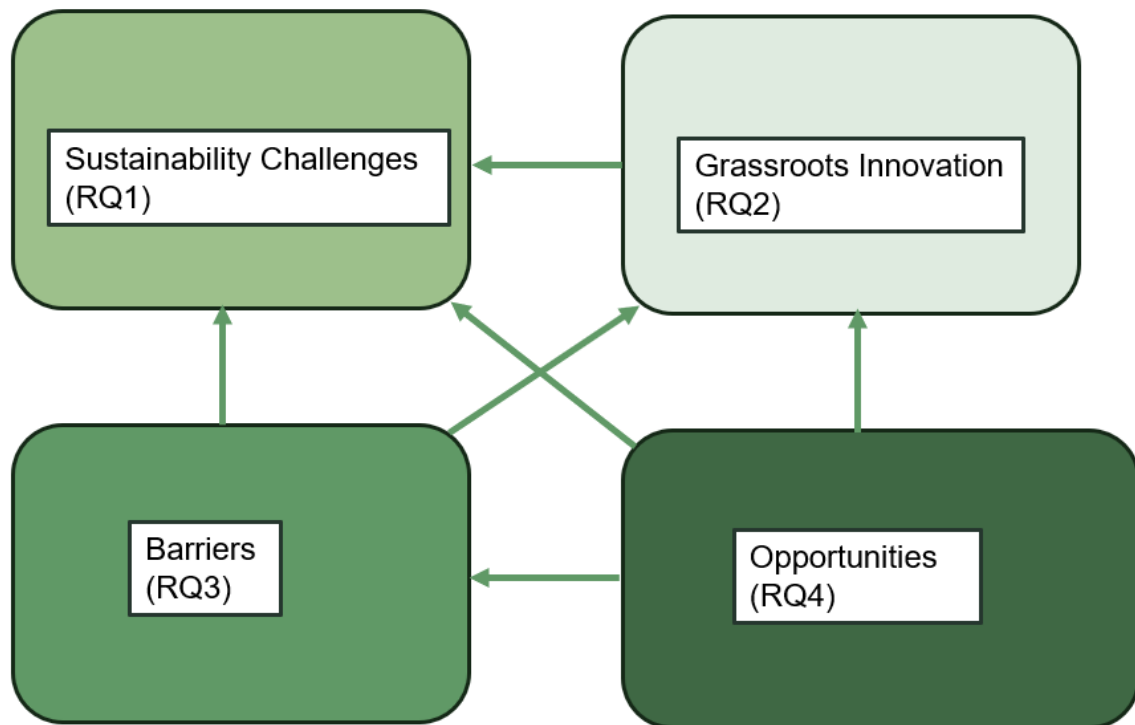


Figure 1: Conceptual Framework



3. Methodology

3.1. Philosophical Underpinnings: Ontology and Epistemology

As Patterson et al. (2017) argue, sustainability transitions do not happen automatically but depend significantly on how people perceive sustainability issues, the values they hold, and their general cognition or mental models around concepts like "environment" or "development." Furthermore, sustainability is not an objective phenomenon but rather a concept infused with normative values about what kind of society and relationship with nature humans should aspire towards (Hedlund-de Witt, 2013). Thus, an interpretivist ontology, which assumes that social reality is intersubjectively constructed through language, shared meanings, and interpretations (Al-Ababneh, 2020), is deemed appropriate for studying this topic.

The unsustainability of prevailing societal structures is contrasted with a collectively accepted set of principles for sustainability aimed at achieving desirable transitions (Olsson et al., 2014). Different grassroots actors construct and interpret sustainability in different ways based on their worldviews (Leach et al., 2010). Similarly, perceptions, values, and cognition related to sustainability are not determined by external factors, but rather constructed and negotiated intersubjectively through social, cultural, and political processes (Grafakos et al., 2022). Interpretivism allows the analysis of these intersubjective meanings and how they shape grassroots innovation and sustainability transitions.

Likewise, a constructivist epistemology fits well with studying the role of perceptions, values and cognition. Constructivism assumes that knowledge is actively constructed by subjects rather than passively observed (Crotty, 1998; Bryman, 2016). Applying this lens means recognising that people construct knowledge about grassroots innovation challenges and opportunities in relational ways, drawing on their cultural backgrounds, social contexts, and individual experiences. Their values, assumptions, and mental models actively shape how they define, analyse and propose solutions around sustainability issues (Marshall et al., 2019). A constructivist epistemology centres on the need to understand and integrate participants' intersubjective constructions rather than seek narrowly objective or generalisable explanations detached from subjects' contexts (Rosenthal and Bourgeois, 1980). It enables a richer analysis of the complex sociocognitive dynamics underpinning grassroots innovation and sustainability transitions.

Therefore, the proposed philosophical foundations- interpretivist ontology and constructivist epistemology- provide an appropriate paradigm for knowledge production about this topic because

transitions to sustainability fundamentally depend on intersubjective and context-dependent social constructions around values, perceptions, and cognition (Patterson et al. 2017).

3.2 Study Area

Islands provide compelling empirical contexts for investigating grassroots innovation dynamics, as their relatively small scales necessitate developing creative solutions to address local needs and constraints (Baldacchino, 2007; Kelman et al., 2015). In this study, Mauritius was selected as a microcosm to address the research questions, given its relatively high vulnerabilities (Williams et al., 2020; Doorga, 2022), coupled with an emerging culture of community-driven sustainability initiatives (Chacowry, 2023; Hassen and Surroop, 2020).

Mauritius is a small island developing state (SIDS) located in the Indian Ocean, approximately between latitudes 19°55'S and 20°32'S and longitudes 57°18'E and 57°48'E (Figure 2). It is part of the Mascarene Islands archipelago, which also includes Reunion Island (approximately 180 km southwest) and Rodrigues (approximately 600 km east). It lies about 1,100 km from Madagascar and 2,300 km from mainland Africa (Dzinesa, 2023), with a total land area spanning 1,865 square km, a 177 km coastline, and a current population of around 1.2 million (Rambaree, 2013).

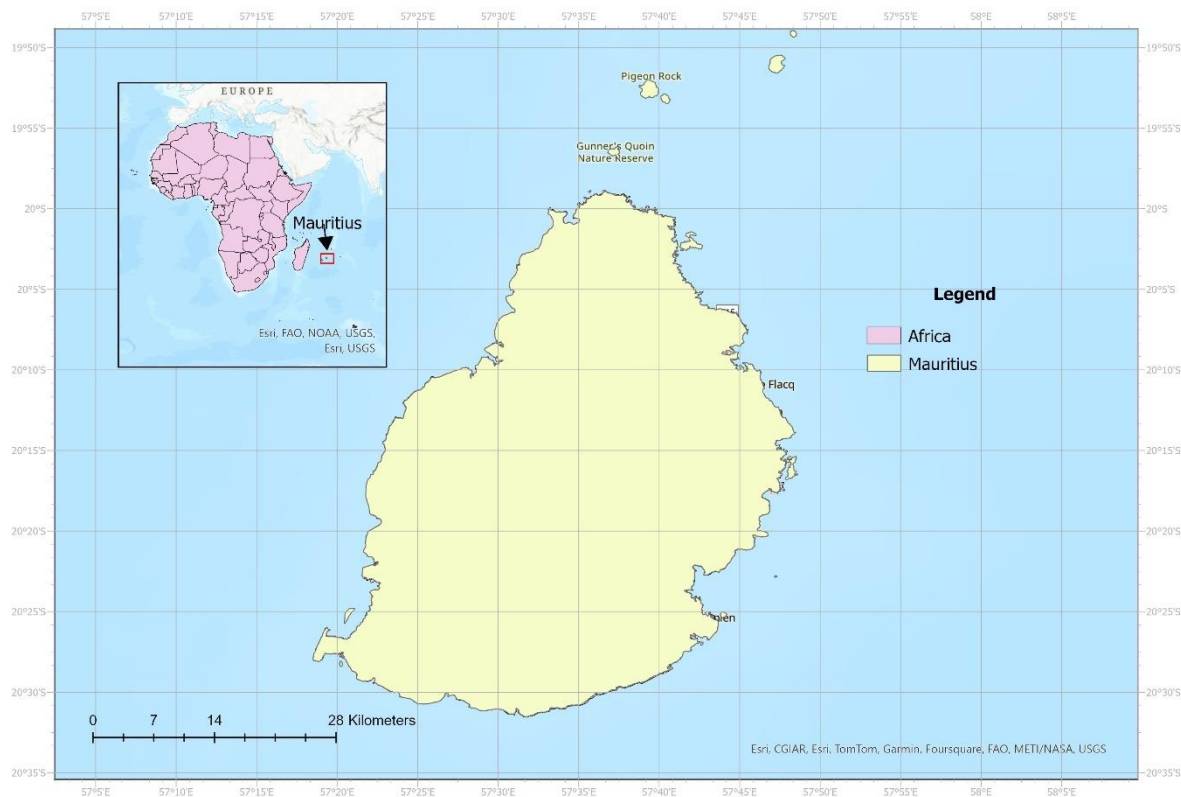


Figure 2: Mauritius in the context of Africa



Shapefile Source: Mike (2021)

3.3 Research Strategy

This study adopted a qualitative approach rooted in interpretivist ontology and constructivist epistemology. Qualitative methods are known for their robustness in investigating social phenomena within their natural environments (Kodithuwakku, 2022). A case study research design was employed because it enables an in-depth understanding of complex social phenomena in a specific context and the meanings ascribed by the actors involved while maintaining a robust and real-world perspective (Yin, 2018; Kodithuwakku, 2022). Therefore, a qualitative approach and a case study research design were deemed appropriate to address the research questions.

The data collection method was semi-structured interviews. Adult respondents who possess relevant knowledge and have been actively engaged in grassroots initiatives for over 5 years were purposively selected. Accordingly, the participants were recruited using a combination of purposive and snowball recruitment methods. Initial participants were selected through personal contacts, ensuring the inclusion of participants with pertinent knowledge about contextual sustainability issues and experiences in grassroots innovations. Subsequently, the recruitment pool was expanded through snowball recruitment, using referrals from the initial participants to address challenges related to outsider positionality. Efforts were made to ensure diversity in the gender and role of participants to obtain findings that are sensitive to different grassroots actors' needs (Table 1).

Table 1: Respondents Characteristics

Respondents	Gender	Role
Respondent 1	F	NGO Representative
Respondent 2	M	Ecopreneur
Respondent 3	M	Grassroots Environmental Activist
Respondent 4	F	Ecopreneur
Respondent 5	M	Grassroots Environmental Activist
Respondent 6	M	Youth Leader
Respondent 7	F	NGO Representative
Respondent 8	F	Civil Society Member



Respondent 9

F

Ecopreneur

In-depth semi-structured interviews were conducted between February and March 2024. This approach was chosen for its flexibility, providing the opportunity to explore emerging themes while maintaining a focus on predefined research questions (Dunn, 2005). The interview guide, which contains probing follow-ups, covers a range of themes, including the participant's involvement in grassroots innovations, major sustainability issues, barriers to grassroots innovations, and opportunities for overcoming challenges (Appendix A).

The respondents were contacted via WhatsApp and Email with an introductory note providing comprehensive information about the study, including its purpose, procedures, potential risks, and benefits. Before commencing the interview, all participants either provided written or verbal informed consent. After the consent procedures, the interviews were recorded in audio format (duration ranged from 25 min to 71 min) and later transcribed using 'Microsoft Word Transcribed button' before analysis.

3.4 Data Analysis

The first step of the analysis was to gain familiarity with the data. The transcripts were cross-referenced with the audio recordings for accuracy and thoroughly read to better understand them in context. The coding process utilises a hybrid approach that combines elements of both inductive and deductive methods (Fereday and Muir-Cochrane, 2006). This involves systematic coding aligned with the theoretical context, while also maintaining inductive openness to identify new emerging from the data (Azungah, 2018). This method supports an analysis that is contextualised, theory-driven, and empirically sensitive, avoiding a purely data-derived approach or the imposition of rigid theoretical assumptions onto the findings.

Transcript storing, systematic coding (see Appendix B for the Coding Scheme), organisation, and exploration of patterns within the dataset were carried out utilising the software Atlas.ti 24 software package. Thematic analysis was employed to identify patterns and themes within the data (Terry, 2017). The anonymity of the participants was ensured by assigning a numerical identifier to each respondent. Furthermore, potentially identifying information, such as specific job titles or affiliations, was generalised to protect the respondents' identities. The responses were reported verbatim. However, filler words (such as "um," "uh," etc.) were removed to accurately reflect the respondents' perspectives and enhance readability and clarity.



In the present study, saturation was attained in nine interviews. Saturation refers to the point at which no new information or themes are observed in the data (Guest et al., 2006). Several studies have suggested that saturation can be attained with relatively small samples (Hennink et al., 2017; Guest et al., 2006; Namey et al., 2016). The small but information-rich sample allowed for a comprehensive exploration of the research questions, aligning with the principles of qualitative inquiry, which prioritise depth and richness of information over a large sample size (Stratford and Bradshaw, 2018).

3.5 Risks and Ethical Considerations

Ensuring ethical standards is crucial in research that involves direct data collection from individuals or gathering information about living subjects (Denscombe, 2010). Accordingly, this study upholds the principles highlighted in the Belmont Report (National Commission, 1978), including Beneficence, Justice, and Respect for Persons.

Prior to the fieldwork, a comprehensive risk assessment was conducted, and approval was given by the University of Aegean Ethics Review Board. While participants were not exposed to any physical or psychological harm resulting from their involvement, their safety was further protected by de-identifying, assigning each participant a numeric identifier, and securely storing the interview transcripts and recordings on the Y-drive of the University of Groningen's on-premise storage to protect participant privacy. This aligns with the beneficence principle.

Regarding respect, participants were provided with comprehensive information about the study, including its purpose, procedures, potential risks, and benefits. Informed consent was sought (Appendix C), and participants had the freedom to withdraw from the study at any point without facing adverse consequences. Concerning the justice principle, the selection of participants was conducted equitably, without any form of discrimination.

Furthermore, participants were able to request access to the raw data and final report, promoting transparency and accountability in the research process. An open line of communication throughout the research was also maintained.

3.6 Positionality

Outsiders are considered more objective in their pursuit of knowledge about the unfamiliar (Merriam et al., 2001). It is argued that when a researcher is an outsider, the interviewees make a more significant effort to articulate their perspectives clearly and accurately during interviews (Dowling, 2016).



As a non-islander African researcher examining barriers and potential opportunities for accelerating sustainability transition in Mauritius, I acknowledge my 'outsider' positionality and its potential impact on knowledge production. My nationality and ethnic background differ from the populations under study. Nonetheless, my research master's focused on islands and sustainability issues provides a robust foundation for understanding contextual knowledge.

As an outsider, recruiting participants and scheduling interviews present challenges, but proactive networking during COP 28 in Dubai has yielded connections with willing respondents involved in grassroots innovations. Furthermore, employing a snowball sampling method further aids in overcoming credibility/trust issues related to being an outsider. Plain language was also used during interviews to mitigate the potential distancing effects of theoretical jargon on participants with differing education or social status.

A self-reflective stance was adopted during the analysis and presentation to address the potential influence of my positionality on data interpretation (Horlings et al., 2020b; Gair, 2012). By immersing myself in the subject matter with a contextually sensitive approach, I aim to generate meaningful insights that are both academically and socially valuable.

4. Findings

4.1 Sustainability Challenges

Pollution and Waste Management

Despite plastic bans, accounts from interviewees indicated that pollution remains a pervasive sustainability issue on the island, particularly in the aftermath of natural disasters such as cyclones and flooding. Respondent 6 reported, *'So all the trash that people would just throw away ironically just came back to us, and the capital was overflowing with plastic bags and bottles and all types of trash.'* Participants further emphasised that pollution issues on the island not only pose aesthetic concerns but also have detrimental environmental effects, particularly on marine ecosystems.

Participants' accounts suggest deficiencies in waste management infrastructure and systems. However, the waste management appears to reflect a lock-in to an incumbent waste regime that is proving difficult to dislodge, with participants attributing the underlying cause of waste management and pollution to a combination of cultural, social, behavioural and economic factors. Respondent 5 highlighted the role of cultural practices, citing instances where immersion of religious idols during festivals contributes to pollution in rivers and seas. Despite the cultural significance of these rituals, the materials used, including paints, clay and pigments, may be detrimental to the environment. Regarding economic factors, Respondent 4 reiterated how Mauritius *'heavy import reliance*



compounds waste issues and environmental footprints by generating loads of consumer plastic and food packaging wastes. Social and behavioural factors contributing to pollution in Mauritius include unsustainable consumption patterns, littering habits and a lack of awareness and consciousness among the population regarding their environmental impact. This is a recurring position across the interviews where participants highlight the mentality of littering streets because *it is just one litter or someone else will clean up*, leading to the accumulation of litter.

Environmental Degradation and Bio-diversity Loss

The participants reported the degradation of various ecosystems, which are crucial for sustaining biodiversity and supporting coastal communities, including wetlands, forests, mangroves and coral reefs. As Respondent 1 stated, *'one of the most critical issues is the degradation of coastal and marine ecosystems.....the loss of mangrove forests, for instance, has had severe consequences for our coastal communities.'*

Exacerbating this crisis is the prevalence of unsustainable development models that prioritise economic interests over environmental protection, leading to the encroachment of large infrastructure projects on agricultural lands, forests, and protected wetlands. Citing the case of the Roches Noires Smart City Project, Respondent 8 alleged that: *'The government proceeds with selling protected wetlands to developers for 'smart city' projects, without proper disclosure of environmental impact assessments reports, allowing the destruction of these ecologically sensitive sites.'* Furthermore, participants expressed that marine litter further contributes to ecosystem degradation.

These findings suggest that the rapid degradation and loss of vital ecosystems, driven by unsustainable development paradigms and behavioural factors like marine litter, undermine the resilience of coastal communities.

Climate Change

The participants commonly reported that cyclones, flooding, rising sea levels, and extreme heat waves are among Mauritius's most significant impacts of climate change. Many respondents emphasised that the severity and frequency of these impacts have been unprecedented in recent years. For instance, Respondent 5 expressed that: *'We all basically facing climate change on a regular basis. The weather pattern has changed. We have had torrential rain in Mauritius for a couple of weeks. I'm sure you've heard about the cyclone in Mauritius. And that was, like, unprecedented. These kind of things... I think back, like five to six years ago, it was not something that was a normal occurrence, but now it's kind of like happening regularly.'*



Respondents expressed concern about climate change impacts on local food availability and affordability. As Respondent 3 states, *'We just had flooding, and our crops have been damaged. So we are facing a price hike in food prices.'* This underscores the vulnerability of Mauritius's agricultural sector to climate change impacts. Beyond food security, respondents further highlighted water scarcity, threats to infrastructure, human lives, properties, and critical infrastructure.

The interviewees blamed external pressures from global warming as contributing factors. However, they explicitly attributed the increased severity of climate impacts to several internal factors, including dependence on imports, poor waste management, littering habits, taking natural systems for granted, unsustainable development and consumption patterns, environmental degradation, land use changes, and biodiversity loss. Additionally, a lack of consciousness regarding environmental impact and a focus on economic survival rather than sustainability were highlighted as additional factors contributing to the increased severity of climate change effects.

4.2 Grassroots Innovation

Based on the accounts of the participants, there appear to be two categories of grassroots innovation initiatives: sustainable business, and individual and collective actions (non-business-minded).

Sustainable Business

Respondents reported that sustainable business initiatives led by grassroots ecopreneurs in Mauritius experiment with eco-friendly products and upcycling practices engendered towards reducing environmental impacts, minimising waste and encouraging the emergence of new niche market dynamics targeted at reconfiguring the production-consumption systems towards more sustainable alternatives. As Respondent 4 reflected, *'...by prioritising and promoting ethical practices, we are not only meeting consumers' expectations but also creating a demand for a more sustainable and socially responsible marketplace.'*

The participants' accounts reveal that such grassroots ecopreneurs are engaged in a wide range of product development, including upcycled and recycled items (Respondents 1, 2, 4 and 9), natural fibre-based products from agro-waste, biodegradable and compostable plastic alternatives, and artisanal/handcrafted goods (Respondent 3). Beyond consumer products, Respondent 5 mentioned a group of ecopreneurs (prosumers) who generate their own renewable electricity through solar panels and then sell the excess back to the grid.

It appears that different factors create opportunities for the emergence of these initiatives. As Respondent 2 explained, *'Mauritius is currently facing a significant challenge with plastic waste, the improper disposal of waste has led to the accumulation of plastic litter...Focusing on reducing plastic*



waste is to achieve a cleaner, healthier and more sustainable future for Mauritius which allows us to fill a crucial niche on the island. While this suggests that the waste management crisis creates opportunities for ecopreneurs to emerge, the account of Respondent 9 indicates emerging market opportunities in the sustainable economy could also influence ecopreneurs to start sustainable businesses to capitalise on these events. However, many respondents thought that government policies on renewable energy provide opportunities for the prosumers.

Notably, grassroots ecopreneurs play a critical role beyond producing eco-friendly products. They act as change agents, inspiring their communities to adopt more sustainable behaviours and practices: *'We have been running school outreach programmes across Mauritius focused on waste segregation, recycling and circular economy principle for the past three years and last year alone we conducted over 15 workshops with accompanying facility visits. We get young students directly involved in sorting exercise and upcycling product design sessions to foster creative and systemic thinking earlier on, and the site visit also exposes them directly to plastic waste reprocessing, which the majority have never seen first-hand (Respondents 2).'*

These findings suggest that sustainable business initiatives led by grassroots ecopreneurs in Mauritius help drive sustainability transitions through socio-technical experimentation, circular economy principles, and knowledge diffusion and social learning.

Individual and Collective Actions

All participants who claimed to have taken individual action were also engaged in collective environmental action, suggesting a high level of engagement in sustainability efforts among the participants. Some examples of individual actions taken included reducing personal waste, installing solar panels, rainwater harvesting and using environmentally friendly products. Participants also reported participating in beach clean-ups and advocating for sustainable practices in their homes and neighbourhoods.

On the collective societal level, participants reported leveraging their skills and personal networks to drive positive environmental outcomes. Some examples of collective action included being involved in community capacity-building initiatives, educating and raising awareness on sustainability, volunteering/working in an NGO, and participating in local climate activism groups. Many of these collective actions have resulted in positive outcomes. As Respondent 3 puts it: *'So more and more people are demanding now that we have climate agenda as part of the policies of the government, and we notice we have a climate bill that has been rooted because of that.'* Participants also reported



their involvement in community garden projects, waste reduction campaigns, and mangrove restoration and ecosystem rehabilitation projects.

While respondents' actions were underpinned by their personal experiences, concern for the island, and personal connection to nature, youths recently returning from foreign universities or fellowships were more likely to transfer skills obtained from their studies to drive positive environmental outcomes in Mauritius.

Prompted by different environmental events, respondents highlighted the sense of collective awareness and shared responsibility as their motivation to engage in grassroots initiatives and contribute to addressing the sustainability challenges facing Mauritius. Respondent 8 stated for example:

'The main event of the Wakashio oil spill in August 2020 had an incredible change of mindset concerning our small island and its environment. It is the same for almost all the population as we are all very connected to the sea and nature in our country. So being a part of the rising conscience of environmental disasters, brought myself into engaging into related activities.'

These findings suggest that the participants are aware of the ecological problem's nature and effects and are motivated to take action. Nonetheless, their earlier reported perception that the public lacks awareness about the impact of their individual actions on the environment suggests a paradox within the grassroots innovation landscape in Mauritius. This disconnect may be attributed to the use of complex technical language to inspire people to action, which may be confusing for the layperson. Recognising this gap, respondents now use more accessible language to engage the broader population, inspiring them to action:

'I have sort of distilled information to make it in non-technical language where people are able to understand what I'm talking to them, and they would be able to relate to what I'm discussing with them...very simple things to do which people don't tend to think about...and we are facing so many issues these days. But when we explain to them back using very simple principles, they are really happy about that, and they are keen to know how to contribute. (Respondent 3).'

While environmental hazards may have heightened environmental consciousness on a broader level, the translation of this concern into tangible changes in individual behaviour and awareness may still be in infancy. Furthermore, entrenched behaviours, social norms and cultural practices may have been challenging to change despite increased awareness: *'Eventually, when the problem arises such as reduction in fishes. Then they start saying...something is not working but they don't realise that these small actions that they are taking is resulting in that (Respondent 5).'*



4.3 Barriers

Socio-cultural Mindset

The respondents cited sociocultural mindset as one of the reasons why the policy to ban plastic has not generated the intended results. Respondents explained how sustainability is not fully integrated into people's mindsets:

'The population do not fully understand the importance of sustainability. Due to this, there is low engagement and support by the population (Respondent 9).'

'They look at the biggest part like how am I surviving, they look at mostly like the economic part. So even though certain restriction comes into place, like policies not to use plastic, you'll still see some people still using it (Respondent 5).'

This suggests without a collective mindset that prioritises sustainability transition, it risks being resisted or marginalised in favour of immediate concerns, slowing the progress of grassroots innovation. Even well-intentioned policy interventions aimed at promoting sustainable practices may become less effective.

Furthermore, some respondents reported that people's choice of convenience over sustainability and scepticism about the quality and durability of eco-friendly products further undermine grassroots innovation, slowing down their efforts to mainstream the adoption of eco-friendly products.

Legitimacy and Credibility

Despite ongoing grassroots innovation efforts, trust and credibility remain a barrier. This issue is further exacerbated by the proliferation of greenwashing and the misalignment between the intentions and actions of various stakeholders involved in sustainability efforts. Respondent 3, reflecting on the feedback he gets from community leaders:

'They say yes, many people come and speak to us, and then that's it. They have done an engagement session. They've got their pictures, and then we don't see anything from them... now why should we believe you? Why should we trust you?'

This sentiment reflects a growing distrust in the sustainability field, where community members have grown weary of empty promises and a lack of tangible outcomes from these engagements. Based on the account of respondent 6, this erosion of trust is further compounded by the perception that some sustainability efforts are more about *'greenwashing and creating a positive image rather than genuine, impact-oriented endeavours.'* Respondent 3 states, *'the loose use of words like sustainability*



has become a problem,' undermining the credibility of those who genuinely seek to drive meaningful change.

Linked to this issue is the concern that some individuals working in sustainability roles may lack the necessary scientific background and understanding of the underlying issues they are tasked with addressing. As Respondent 6 notes, *'some of them are marketing managers that were promoted to sustainability managers,'* highlighting the potential disconnect between the expertise required and the actual capabilities of those leading sustainability initiatives.

These challenges pose significant barriers to effectively implementing and scaling grassroots sustainability innovations. Without concrete actions and the trust and buy-in of the local community, these initiatives may struggle to gain traction and sustain their efforts over the long term. Moreover, the proliferation of greenwashing and the perceived lack of expertise among some sustainability actors can further erode the credibility of the sector, making it harder for genuine grassroots efforts to gain the necessary support and resources.

Funding Constraints

The funding barriers highlighted by participants pose significant implications for grassroots innovation and the scaling of sustainable solutions. It was reported that the high upfront costs of solar panels prevent individuals and small businesses from adopting them. Even those who have chosen to adopt solar panels for their production expressed dissatisfaction with government cashback programs that do not accurately cover installation costs.

The participants noted that NGOs and CBOs rely heavily on grants and donations, which are often unpredictable and insufficient to meet their long-term needs. Respondents 9, 8 and 4 reported that many of these organisations are forced to rely heavily on pro bono, volunteer contributions and informal networks to sustain their operations. The reliance on pro bono and volunteer contributions can also hinder the legitimacy of these grassroots initiatives, as they may struggle to attract and retain skilled personnel and build robust structures to compete with incumbent regimes.

At the same time, sustainable enterprises struggle to access the finance required to scale their operations as they are often overlooked in favour of more "profitable" economic ventures that can deliver immediate returns on investment rather than those with long-term sustainability goals (Respondents 4, 2 and 9).

Respondent 3 particularly emphasised that climate funds and other sustainability-focused financing tend to be channelled through higher-level intermediaries, making it challenging for grassroots innovators to access these resources directly. The participant further noted that the bureaucratic



processes in securing the funding create additional hurdles. This mismatch between the funding landscape and the on-the-ground realities of grassroots sustainability enterprises may create a significant obstacle to scaling.

Political and Institutional Barriers

Participants highlighted that scaling innovative solutions and driving a broader impact can be challenging when navigating the political and institutional landscape. For instance, Respondent 5 stated, *'you want to try something, you can innovate the level to where you can innovate. The moment you start getting into a bigger area, affecting more people, is where you are starting to hit against the political sphere. And that is where you might be hinted in terms of how far you can go with your innovation. Unless you have the proper political backing. You might have the best idea, you might have the best resources at your disposal, but if you don't have the right people who are there, you won't get forward.'*

Respondent 8 noted that existing political and legal structures constrain the agency and influence of NGOs: *'In the case of Tourelle Tamarin where the construction of villas on top of a mountain, the appeal could not be logged by NGOs as we could not provide how this construction directly impacts us.'* The restrictive requirements for 'direct impact' to have legal standing were viewed as an institutionalised norm favouring the interests of more powerful stakeholders over the concerns of grassroots environmental organisations and limiting the ability of grassroots innovation initiatives to voice their concerns and participate in decision-making processes that may affect their communities and the environment.

Policy Implementation and Enforcement Gaps

Respondents shared divergent views concerning the policy and regulatory challenges faced by grassroots sustainability initiatives in Mauritius.

Respondent 4 pointed out that *'from a regulatory standpoint, government policy remains very focused on outmoded measures of economic progress over new emerging sustainable community development models. There have been mentions of sustainability plans and policy, but very little meaningful incentivisation so far on improving resource efficiency and localising production.'* This suggests a misalignment between the policy landscape and the needs and priorities of grassroots sustainability initiatives, which often focus on more localised, community-driven development models.

Respondent 8 noted a clear disconnect between the policy rhetoric around sustainability and the actual policy decisions: *'The Climate Change Act has nothing except administrative contents into it. It was followed in the Mauritius national assembly by the Offshore Petroleum Act 2021, which basically*



allows Mauritius to destroy seabeds in search of oil/ petrol in our extended and vast sea areas. It was believed that the actions taken to pursue fossil fuel extraction undermine the efforts of grassroots initiatives working towards more environmentally sustainable and climate-resilient development models.

Other respondents suggest that the primary problem lies not with the content of the policies, but rather with the lack of effective ‘enforcement’ of these regulations and difficulties in translating them into concrete actions. For example, Respondent 3 stated that, *‘the problem is enforcement. How do you make sure that people are actually abiding by the regulations?..If we have the right regulations, policies in place, that's a good start. But how do we transfer that to actually grassroot level?’*

These insights suggest that there may be challenges in enforcing and translating policies into practical actions, limiting their potential to drive the mainstreaming of grassroots sustainability innovations. Respondents generally noted the importance of formal institutions aligning with grassroots innovation initiatives for rapid and radical transitions to occur, suggesting that innovative solutions and sustainable practices may struggle to gain traction or achieve widespread adoption if the broader policy environment fails to create a conducive and level playing field.

4.4 Opportunities

Cultural Mindset Shift and Environmental Education

Participants reported that a cultural mindset shift facilitated by environmental education is pivotal in encouraging more active participation and accelerating grassroots innovation and sustainability transition. They emphasised the importance of instilling sustainability ethos and circular practices from an early age by integrating relevant concepts and hands-on activities in school curricula. Respondent 4, for instance, emphasised that, *‘starting at early ages, we can embed circular ethics and skills as social norms rather than as alternatives. If the school curriculum incorporated upcycling design challenges, for instance, whole generations would fundamentally shift mindsets and competencies.’*

Participants further highlighted the need for inclusive environmental education initiatives to facilitate a broader cultural mindset shift. For instance, Respondent 3 underscored the importance of *‘educating people to integrate them into action,’* while Respondent 2 recognised the *‘huge potential in educational campaigns focused on changing people's mindsets.’* They suggested that environmental education programs targeting diverse populations needs can foster a sense of collective responsibility and empowerment, ultimately contributing to a societal shift towards sustainable practices.

Respondents also emphasised the potential of arts, music, drama, and local languages in sparking cultural shifts towards sustainability. Creative expressions were believed to generate introspection,



and compelling narratives that resonate with local communities, facilitating mindset change. Additionally, Respondents stressed the significance of sharing success stories, continuous learning and promoting open-access communication to build momentum and belief in sustainable alternatives. They suggested using platforms like industry events, media articles, workshops, and digital channels to disseminate knowledge, inspire initiative replication, promote environmental consciousness and transform sustainability from a niche concept to mainstream acceptance.

Community Empowerment and Participation

Participants recurrently reported that actively involving and empowering local communities is critical for driving effective, context-appropriate sustainability solutions from the grassroots level. As Respondent 4 emphasised, *‘we know our lands and needs; we know them best...so progress will only accelerate when we get locals as equals at the table.’* Furthermore, many responses pointed to the value of inclusive and participatory approaches involving diverse community members across gender and generational boundaries. Participatory processes like *participatory budgeting, community representation on economic planning committees or mandatory civil society consultations* were thought to be necessary for accelerating grassroots innovations. Such participatory processes may foster knowledge exchange and reciprocal learning between community members and other relevant stakeholders.

Another central aspect of community empowerment identified by the respondents was capacity building through skills training, mentoring and educational initiatives. Respondent 1, for example, stated, *‘empowering local communities with the knowledge and skills to manage their natural resources sustainably can have a lasting impact.’* These insights suggest that empowerment requires not only participation but also equipping communities with the necessary skills to accelerate grassroots efforts.

Experimentation

The findings reveal an opportunity to accelerate grassroots innovation through continuous community-based experimentation models that engage the public in developing, testing, and disseminating innovations from the ground up.

Respondents emphasised creating small-scale pilot projects in local communities to co-create and validate sustainable solutions in real-world contexts and build trust. For example, Respondent 3 shared: *‘My approach is to collect some data together [with community members] and create pilot projects in specific communities. Once we get the results, I assist community leaders and members in creating grant proposals to secure funding for expansion.’* The pilot projects were seen as initial steps



in an iterative learning process, with successful experiments then being leveraged to pursue broader scaling and dissemination.

Participants reported that grassroots innovations providing contextualised tangible benefits valued and relevant to the communities engaged are a pathway to ensure that community members are motivated to adopt and sustain these innovations in the long term. Respondent 4 highlighted that, *'solutions have to present clearly demonstrated benefits to the adopters, whether for cost-savings, status, elevation, or quality of life gains.'* Similarly, Respondent 1 explained that *'initiatives need to ...foster a deep appreciation of the interconnectedness between them, their livelihoods, cultural practices and environmental health.'* These tangible benefits may include measurable outcomes that directly improve community members' lives, such as reduced utility costs, improved local environmental conditions, and new income opportunities. These insights suggest the need for grassroots innovations to provide tangible co-created solutions that deliver relatable advantages to catalyse broader shifts towards sustainability transitions.

Sustainable Financing

Sustainable financing mechanisms were identified as a catalyst for accelerating grassroots innovation. Respondents indicated the need for greater financial support from diverse sources, including the private sector, philanthropic funds, impact investors, and international development partners. However, funding from these sources must be *'strategically leveraged beyond just covering operational costs to include early-stage grant funding'* (Respondent 4), *'comprehensive feasibility studies, and bolstering supporting infrastructure,'* helping *'community groups with promising prototypes develop viability and scale impact'* (Respondent 2). Furthermore, Respondents called for democratising funding flows towards community-led grassroots initiatives rather than conventional top-down programs that undermine grassroots innovation and are often resisted:

'In terms of finance,..there are certain barriers in terms of climate funds to reach the grassroots level. While it is possible, it often requires going through bureaucratic channels to receive funding...So it becomes very difficult down the line, and a very small percentage actually reach the communities (Respondent 3).'

These funding sources and redirection may not only allow grassroots innovation to address the limitations and uncertainties of conventional donor funding cycles but also reduce the barrier to entry for grassroots innovators with limited access to traditional financing channels, enable experimentation, and identify potential barriers early on and promote the scalability of grassroots innovation.



Localised Production and Self-reliance

Participants emphasised the cultural and historical precedent for localised production and self-reliance in Mauritius, arguing that globalisation and access to cheap imports have eroded this tradition. They suggested the need to revive these practices to accelerate sustainability transitions. As respondent 5 stated, *'As an island we need to think culturally different.... We have to transit into a peer-to-peer production.'*

Respondent 2 suggests *'transitioning to locally grown alternatives instead of business as usual [reliance on importation].'* Similarly, Respondent 7 reported that: *'While there is a lot of focus on renewable energy transition in Mauritius,...I feel we need to give more importance to local production, to reduce reliance on imports, and reduce waste.'* Respondent 4 further stated that localised production could *'nurture more regenerative economic alternatives and enhance local employment, skills development and community self-sufficiency.'*

Stressing the need for self-reliance, Respondent 5, for example, highlighted: *'I feel as an Islander, it is kind of like we are just trying to play the good guy, just so that everyone can help us, but I feel like if we remain in this loop. Then we won't progress. We'll just be kind of like waiting for people to come to our aid rather than making ourselves a mark and doing what we can do...Private sectors, grassroots innovators and local communities can come all together and think about how do we co-benefit from each other in terms of [local] production.'*

Localised production and self-reliance were believed not only to reduce import dependence or nurture regenerative economic alternatives but also to create opportunities for grassroots innovators to experiment and develop innovative solutions that can help accelerate the sustainable transition.

Private Sector Partnership

Participants underscore the potential for partnerships between the private sector and grassroots initiatives to accelerate local innovation and sustainability transition. It was noted that there is growing interest among private companies to engage in corporate social responsibility (CSR) initiatives that have a tangible, community-oriented impact. As Respondent 3 noted, *'I think private companies are very interested as part of the corporate social responsibility to do things for society and if we can bring such practical projects to them. And show them it's not just about giving money, but being part of the solution and being so that accompanying these people, they'll be interested if you can make a good case.'* Participants were unanimous in their view that partnering with private sector entities has the potential to provide a more streamlined and less bureaucratic pathway to local innovation and sustainability transition.



Specific examples of how companies are already transitioning practices were provided, including *'shifting suppliers from international to local...regrowing mangroves and engaging with actors to transition to sustainability (Respondent 6)'*. Underlying these examples is the recognition that private companies are increasingly under pressure to address their environmental and social impact, both from regulatory and reputational standpoints and market necessity. As Respondent 6 observed, *'hotels and tourist actors are transitioning towards a more sustainable approach... their clients are conscious of the impact that they're having and they don't want to travel across a continent to reach Mauritius where it's going to be even more polluted. Also in terms of public image, you may have heard of the Wakashio incident, which was a huge ecological disaster. So lots of companies invested in that. They themselves did kind of a corporate social responsibility thing where they invested in projects to support cleanups.'*

Participants also revealed a more critical perspective on the private sector's involvement. As Respondent 5 observed, *'some organisations are very rapid...in terms of changing in terms of development and production. But there are others, like very old school; they are taking much more time to do that because they're just looking at the cost-benefit. Is this going to be good for a marketing PR or what?'* This suggests that some private sector involvement may be more reactive and driven by reputation management or short-term cost-benefit calculations rather than genuinely recognising the need to address the underlying unsustainable practices in their core business operations and driving fundamental, systemic change.

Nonetheless, respondents acknowledged the potential impact that could be achieved by leveraging the private sector as a driver for sustainability. For example, Respondent 6 maintained that if just 10 out of the 20-25 major conglomerates in Mauritius transitioned towards more sustainable production, it could result in significant changes across thousands of products. Respondent 7 recognises the role of the private sector in *'providing finance to support grassroots initiatives and boost climate adaptation practices.'* Respondents suggest that tapping into more financing and support from the private sector would be a valuable opportunity to explore. However, Respondent 4 noted that *'the private sector must realise that sustainability and community resilience are not at odds with profits'* to fully leverage private sector participation.

Multistakeholder and Regional Collaboration

Respondents viewed collaboration between local communities, non-NGOs, and government agencies as crucial for tackling sustainability challenges more effectively and creating a stronger collective voice for sustainability transitions.



Respondent 1 explained the potential to scale grassroots innovation through such partnerships, *'by leveraging our collective resources, expertise and influence, we can amplify our efforts and create more sustainable solutions.'* Respondent 4 further reinforced this sentiment, suggesting that forming *'aligned advocacy coalition[s]'* could strengthen their impact on policy-making.

The role of NGOs in bridging gaps, providing technical expertise, and facilitating capacity-building programs was emphasised as a crucial component of this multistakeholder approach. Respondent 1 reflected, *'NGOs like ours can collaborate with governments and communities to bridge gaps, provide technical expertise, and facilitate capacity-building programmes. We can also serve as watchdogs, holding stakeholders accountable and advocating for stronger sustainability measures.'*

Private sector stakeholders can also play *catalytic roles in securing municipal buy-in and creating formalised partnership frameworks between local governments, universities and sustainability-minded manufacturers could create aligned programming from workforce pipelines to market access; and then proactive engagement with local community groups is also very key to co-create visions respecting cultural needs* (Respondent 4).*'* The government's *'role is pivotal in creating an enabling policy environment and providing the necessary regulatory framework. This includes implementing incentives for sustainable practices, enforcing environmental regulation and allocating adequate resources for sustainable development initiatives.'* Furthermore, the government can *'lead by example by integrating sustainability principles into its operations and infrastructure projects* (Respondent 1).*'* To maximise the potential of multistakeholder collaboration, *'local communities and [grassroots] changemakers creating those solutions must be centred to chart the path relevant to their lives while other partners follow their leads* (Respondent 4).*'*

Alongside multistakeholder collaboration within Mauritius, respondents also underscore the potential for proactive regional intra-island collaboration as a catalyst for accelerating grassroots innovation and sustainability transition across the Indian Ocean region:

'Bilateral relationship between islands have to be more active in terms of taking initiative rather than waiting till it comes for summits or things like that, to start these dialogues, because right now, if we can really work together with the closest islands that we have the same ocean. This synergy in trying to combat what challenges we are facing, share resources among ourselves...it would go a long way (Respondent 5).*'*

Intra-regional island collaboration was viewed as a vehicle for sharing experiences, replicating successful initiatives across similar contexts, and pooling resources to address shared sustainability challenges. As Respondent 1 noted: *'We've been actively collaborating with similar organisations and*



communities across the Indian Ocean region. By sharing our experiences, best practices, and challenges; we aim to inspire and support others in replicating successful initiatives tailored to their local contexts.' Moreover, global connectivity through knowledge networks was also emphasised, with Respondent 4 reporting, *'university research support and global knowledge exchange through intra-island and international networks focused on local sustainability solutions can help accelerate innovation, adoption and inspiration beyond one's community context.'*

Based on these accounts, the required type of multi-stakeholder collaboration involves cross-sector partnerships within Mauritius, intra-regional alliances with other islands, and participation in global knowledge-sharing and innovation networks.

Sustainable Blue Ocean Economy

Respondents consistently emphasised that the potential of oceanic resources available to Mauritius is untapped and that there is a need to harness grassroots innovations for a sustainable blue ocean economy. As summarised by Respondent 6: *'We are surrounded by seawater and there's so much we can do with that...algae [from the sea] can be used in fertilisers, food supplies, energy sources...you can desalinate it [seawater] for consumption instead of digging into the grounds of Mauritius...you can use the power of the sea itself to produce energy.'* Recognising the sustainable blue ocean economy as a means to promote self-reliance, Respondent 7 noted, *'we are surrounded by ocean, and have a large Exclusive Economic Zone, so we need to find our own riches in those oceans, while also living in alignment with the ocean.'*

Respondents reported that building domestic capacities of grassroots innovators is necessary for the sustainable blue ocean economy to take root: *'Locals know more about their country, and they have more emotional bond to do good work...the capacity should be built locally'*(Respondent 3). Respondents uniformly thought that a strong local knowledge base would empower grassroots innovators to adapt blue economy solutions to the island's specific oceanic and socio-economic contexts.

Policy Reforms

Implementing strong environmental protection laws and regulations was viewed as essential for creating an environment conducive to sustainability initiatives. As Respondent 8 stated, *'implementation of laws that protect the environment first'* is urgently needed. Respondent 1 reinforced this, envisioning *'a stronger policy framework on the regulatory environment that incentivises sustainable practices,' including stricter environmental regulations,'* across various sectors. Furthermore, rethinking infrastructure, urban planning and development policies to



harmonise with natural systems also emerged as important. Respondent 7 advocated to *'review our infrastructural buildings policies and put emphasis on how we can live in collaboration with nature.'* Respondent 4 stated, *'the government needs to embed regenerative development into policy and planning.'*

Reducing import dependencies through policies that bolster local production capacities was suggested as a potential policy-enabled pathway to accelerating grassroots innovation. Respondent 5 stated *'there has to be...a reduction in the allowance of importation'* coupled with limitations or disincentives. Respondent 4 called for *'more government incentives for...local production'* to be put in place through policy. Policies that incentivise local production and reduce import dependencies may create opportunities for grassroots innovators to develop and scale solutions that address local needs while reducing reliance on imported goods and services.

Respondents also reported the potential for policy reforms to support the transition towards a circular economy by promoting the adaptive reuse of existing infrastructure. Respondent 4 provided an example, suggesting that idle sugar factories *'could be repurposed for local recycling and upcycling with the right policy incentives.'* The respondent further proposed that *'the government could offer tax rebates, concessional loans or grants ...to retrofit and reequip these factory spaces into recycling centres, repair shops...essentially creating a sustainable industrial park.'* Leveraging existing infrastructure for grassroots innovations may provide a cost-effective option to accelerate grassroots innovation.

5. Discussion

Like many other SIDS, the study reveals that Mauritius is threatened by three key challenges: pollution and waste management, environmental degradation and biodiversity loss, and the impacts of climate change. The management of waste sustainably remains a challenge, particularly in the face of the increasing amount of waste being produced on the island (Neehaul et al., 2020). Furthermore, the issue of waste management in Mauritius is closely linked to the problem of pollution on the island (Mattan-Moorgawa, 2021). The study confirms the threat of loss or degradation of environmentally sensitive areas in Mauritius and the increasingly severe and frequent climate impacts experienced on the island, including cyclones (Garnier and Desarthe, 2013), flooding (Chacowry et al., 2018), rising sea levels (Becker et al., 2019), and increasing temperatures (Doorga, 2022).

The study's findings acknowledge the role of external pressures, such as global warming, in exacerbating sustainability challenges like climate change impacts. However, it also highlights the critical role of internal factors embedded within the island's socio-technical regimes (e.g., cultural



norms, economic dependences on imports, and land use development models) that contribute to the lock-in of unsustainable systems (Geels, 2019) and lifestyle practices (e.g., unsustainable consumption patterns, littering habits, and predominant focus on survival rather than environmental sustainability concerns) that reinforce unsustainability.

The findings reveal two main categories of grassroots initiatives in Mauritius: sustainable businesses (ecopreneurship) and individual/collective actions. These initiatives broadly entail a variety of practices, including rethinking production and consumption patterns, using renewable resources, reducing waste, facilitating knowledge diffusion, and protecting the environment, consistent with Schreuder and Horlings' (2022) findings. The role of ecopreneurs as grassroots change agents that provide alternative socio-technical configurations that challenge and seek to transform mainstream unsustainable systems has been widely documented in transition literature (Ramos-Mejía and Balanzo, 2018; Sarkar and Pansera, 2017). Horlings (2015) and Horlings et al. (2020a) contend that people exert individual and collective agency in their daily practices, co-shaping their place of living and contributing to the sustainability transition. However, while some grassroots initiatives seem motivated by addressing environmental challenges (individual/collective actions), the findings also reveal economic motivations among the ecopreneurs, who recognise emerging market opportunities in the sustainable economy, challenging the traditional framing of grassroots innovations as primarily driven by environmental concerns or as a response to government inaction (Horlings et al., 2021). Hassen and Surroop (2020) provide evidence suggesting that the plastic ban policy enforced on Rodrigues Island influenced the increasing development of biodegradable alternatives to plastic by grassroots innovators. Furthermore, the activities of grassroots ecopreneurs suggest blurring boundaries between traditional entrepreneurship and sustainability-oriented initiatives (Belz and Binder, 2017).

The financial limitations expressed by the participants align with the study of Hossain (2016, 2018, Cabannes, 2012), who identified the lack of access to finance and cumbersome funding application processes as significant barriers to grassroots innovation. Socio-cultural and mindset barriers to grassroots innovation may be related to the manifestation of the 'liability newness' (Geels, 2010). The findings further highlight a prevalent sociocultural mindset that places economic survival over sustainability concerns.

While grassroots innovations in Mauritius benefit from pro bono and volunteer contributions, relying on these sources may limit their ability to scale and sustain their operations in the long run, as key volunteers may experience burnout or leave (Bradbury and Middlemiss, 2015). De Vries et al. (2016) maintain that retaining members and volunteers may be challenging,



particularly in the early stages with limited resources. The lack of continuity in volunteer support may disrupt the operations of grassroots initiatives. Moreover, volunteers may sometimes lack the expertise, routines, and skills needed to establish credibility with external audiences and their own community (Genus and Iskandarova, 2020), mirroring the perceived lack of expertise and legitimacy identified in the study. The proliferation of greenwashing practices and the co-optation of sustainability narratives by incumbent actors appear to further undermine the legitimacy of grassroots change agents attempting to garner community buy-in and support to drive change. Van Oers et al. (2018) contend that grassroots initiatives may not survive without legitimacy.

The study showcases how existing political and institutional structures, coupled with restrictive legal frameworks, act as barriers and limit the influence of grassroots sustainability initiatives to the niche. This finding can be interpreted as the power of incumbents, vested interests and institutionalised norms that resist regime change or create obstacles for niche-level innovations that challenge their established positions and power dynamics (Avelino et al., 2023; Geels, 2014). Furthermore, it identifies poor translation of policies into practical actions, a disconnect between the policy rhetoric around sustainability and the actual policy decisions and a misalignment between the policy landscape and the needs and priorities of grassroots sustainability initiatives were also identified as critical challenges to grassroots innovation.

The analysis suggested that experimentation through community-based pilot projects is an iterative means to co-create, validate, build trust and scale grassroots sustainability solutions from the ground up. Nonetheless, multistakeholder collaboration between communities, NGOs, government, and private sector locally and through intra-island alliances was found to be key for aligning grassroots efforts, knowledge sharing, scaling, and pooling resources to tackle complex sustainability challenges. These findings are consistent with previous research by Seyfang and Longhurst (2013) and Feola and Nunes (2014).

Furthermore, sustainable financing from diverse sources like the private sector, philanthropists, impact investors and international climate funds was identified as a major enabler. Early-stage funding, infrastructure support and comprehensive feasibility assessments were suggested as strategic uses of such financing to limit entry barriers and validate, nourish and scale grassroots innovations. Furthermore, opportunities for partnerships with the private sector in grassroots innovation were noted, with private sector entities increasingly driven by corporate social responsibility, regulatory pressure and reputational factors to transition towards more sustainable practices. This confirms the findings of Smith et al. (2014), who suggested that aligning grassroots innovation and private sector interests is key to scaling sustainability beyond the niche.



The analysis reveals the untapped potential in developing a sustainable blue ocean economy by leveraging Mauritius' oceanic resources in a sustainable manner for grassroots innovation. However, building domestic capacities and integrating local knowledge bases of grassroots innovators, community empowerment, and inclusivity appears crucial for contextualising and adopting blue economy solutions. In parallel, promoting localised production systems based on the island's historical self-reliance traditions may create synergies with the sustainable blue economy shift. Underpinning this transformative vision are systemic facilitators of grassroots sustainability innovations, including robust environmental regulations, incentives for sustainable practices, reduced import reliance, and policy-enabled circular economy models. These opportunities align with calls for policy mixes that stimulate niche development and destabilise unsustainable regimes (Kivimaa and Kern, 2016; Rogge and Reichardt, 2016; Rosenbloom, 2020; Rogge and Stadler, 2023). Additionally, a broader cultural mindset shift catalysed by environmental education, as well as through creative mediums like arts, music and local languages, may serve as a key socio-cultural lever. This finding reinforced the argument of Horlings et al. (2020a) that a fundamental shift in mindset among community members could foster sustainability.

The study confirms existing studies suggesting that successful sustainability transitions require a cohesive approach encompassing multiple socio-technical system aspects, including user behaviour, economic structures, cultural norms, etc. (Wieczorek, 2018; Grin et al., 2010). As a sovereign island state, Mauritius has the autonomy to strengthen environmental regulations, incentivise sustainable practices, and align policy actions with sustainability goals, creating an enabling environment for grassroots innovations to thrive. Mauritius's islandness offers a unique advantage in driving sustainability transitions. For instance, in contrast to larger, more complex economies, its relatively small and manageable business landscape suggests that changes in or collaborations with a relatively small number of major conglomerates can have far-reaching impacts across the entire island's production and consumption systems.

6. Conclusion

The study's findings provide insights into Mauritius's sustainability challenges, the role of grassroots innovations in addressing these challenges, and the barriers and opportunities that may foster their transformative potential. It shows that Mauritius faces a triple planetary crisis of pollution and waste management, environmental degradation and biodiversity loss, and climate change impacts, all of which are exacerbated by its islandness. For instance, the island's limited resources facilitate dependency on imports, which, in turn, complicates waste management efforts and contributes to pollution.



Grassroots innovations, marked by ecopreneurship and individual/collective actions, contribute to addressing sustainability challenges through socio-technical experimentation, circular economy principles, knowledge diffusion, social learning, and adopting and promoting sustainable practices. However, barriers such as socio-cultural mindsets, credibility issues, funding constraints, political and institutional barriers, and policy implementation gaps hinder the acceleration of grassroots innovations in Mauritius. In response, the findings suggest that policy reform, localised production, innovative financing mechanisms, experimentation, community empowerment, socio-cultural shifts, private sector partnerships, sustainable blue ocean economy, multistakeholder and regional collaboration may be instrumental in overcoming barriers and enabling grassroots sustainability innovations to thrive and contribute to broader sustainability transitions in Mauritius.

However, realising this potential requires navigating the paradox revealed in the study. While incumbent actors often maintain business-as-usual practices through greenwashing, poor regulation enforcement, restrictive legal frameworks and misalignment between policy rhetoric and actions, they simultaneously possess the resources and influence necessary to drive significant change. Mauritius must leverage its sovereignty and the manageability provided by its islandness to create policies and partnerships that encourage these key players to transition towards sustainability, while also supporting grassroots innovations that can complement and drive these larger-scale changes.

The study has several implications for grassroots innovation practice in Mauritius and other contexts facing similar challenges. First, multi-stakeholder and regional collaboration highlighted in the study suggests that grassroots innovators should actively seek to build networks and partnerships with other community groups, NGOs, government agencies, and the private sectors. Second, due to a lack of legitimacy and credibility, grassroots innovators must prioritise piloting projects rather than rhetoric, seek training and mentorship opportunities or collaborate with academic institutions or industry experts to enhance their skills, knowledge, credibility and build trust. Third, grassroots innovators must position themselves as valuable partners for private companies looking to enhance their sustainability credentials, enabling grassroots innovators to leverage the resources, expertise, and reach of businesses, thereby amplifying the impact and scaling potential of their sustainability initiatives. However, maintaining authenticity and avoiding co-optation or greenwashing will be essential to preserve the integrity and credibility of grassroots efforts. Fourth, due to the importance of socio-cultural factors and mindset shifts, grassroots innovators should actively engage with local communities, leveraging creative mediums (arts, music, local languages) to foster understanding, inclusivity, buy-in, and a sense of ownership over sustainability initiatives. Fifth, while grassroots initiatives often operate at the niche level, the study highlights the need for supportive policies and institutional frameworks. Grassroots innovators should consider advocacy efforts, policy dialogues,



and collaborations with policymakers to influence policies that create an enabling environment for their initiatives to thrive and scale. Sixth, building on the findings regarding the importance of pilot projects and localised solutions, grassroots innovators should strategise replication and scaling pathways. This may involve documenting best practices, developing toolkits or templates, and exploring opportunities for intra-island or regional collaborations to adapt and replicate applicable, successful initiatives across different contexts.

Due to the limited number of respondents and their specific characteristics, this study's findings may not fully address all sustainability challenges, grassroots efforts, barriers, and opportunities on the island. Accordingly, the extent of applicability of these findings to the broader context of Mauritius or other SIDS may be limited. While not exhaustive, the study enriches the understanding of the grassroots innovation landscape in Mauritius and offers actionable insights for policymakers interested in supporting grassroots innovation and accelerating sustainability transitions in Mauritius and other islands facing similar challenges.

The study's strength is its adoption of broader perspectives, which allows the perspectives of less institutionalised grassroots innovation to be explored rather than focusing on single initiatives or movements that are more institutionalised. Furthermore, the study adopts a qualitative approach, which allows for an in-depth exploration of the topic understudied. However, the use of snowball sampling, while addressing some outsider positionality challenges, may result in the inclusion of participants who share similar viewpoints, potentially limiting the diversity of perspectives represented. Furthermore, the study only included English-speaking participants due to resource constraints, potentially excluding valuable insights from grassroots actors who are non-English speakers. Future research could address these limitations by adopting a more diverse sampling population and techniques and involving translators to foster inclusivity. Additionally, comparative case studies with different island communities (e.g., independent island nations, territories of other states and parts of a sovereign state) could provide valuable insights into the contextual nuances of grassroots innovation processes. Moreover, as the 'sustainable blue ocean economy' emerged as a promising opportunity (which has not been discussed in the existing literature on this topic), further research could explore the specific socio-technical configurations, governance models, and stakeholder collaborations required to harness and maximise the opportunities.

The study contributes to grassroots innovation literature by proposing a framework (Figure 3) for understanding the interaction between sustainability challenges, grassroots innovation, barriers and opportunities, providing pathways for accelerating grassroots innovations and shaping a sustainable

future. Additionally, the study emphasises that transitions are place-based and that grassroots initiatives can be viewed as niche innovations that challenge the prevailing regime.

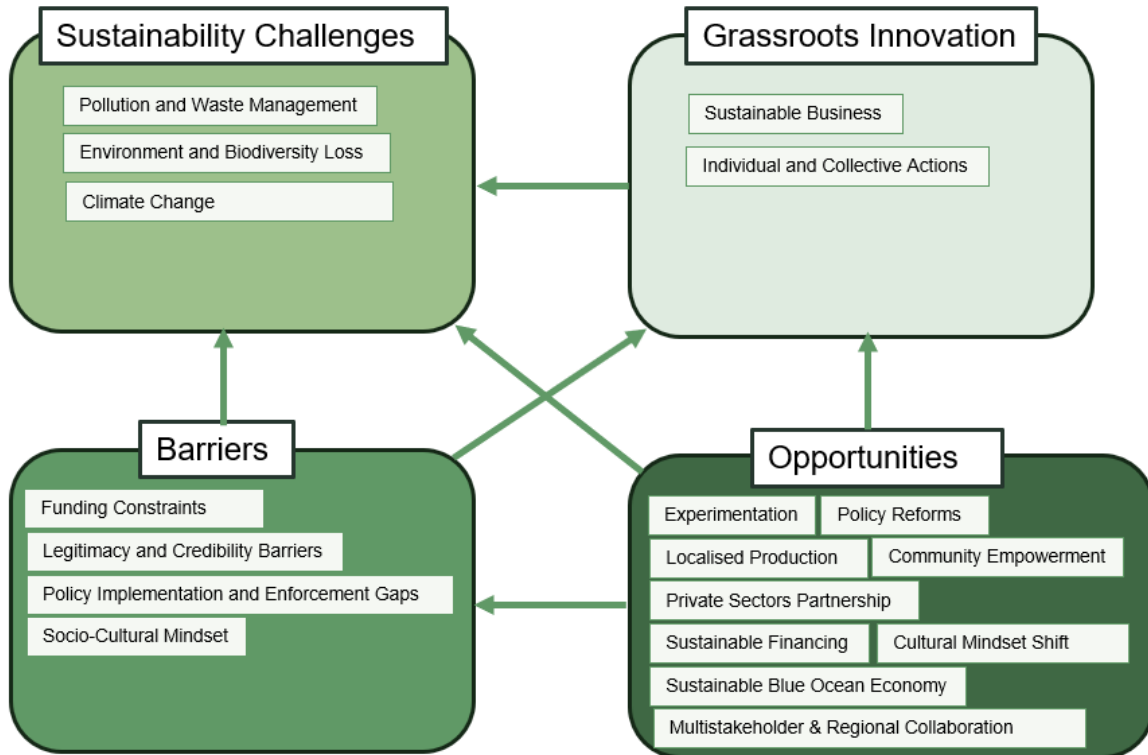


Figure 3: Interconnections Between the Research Questions



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Appendix A: Interview Protocol

Themes	Guided Questions
Introduction	<ul style="list-style-type: none"> • Can you tell me a bit about yourself? • What is your specific role/involvement in sustainability initiatives? <ol style="list-style-type: none"> a. How did you get started in this work? b. At what point did you join this particular initiative? c. Have you been involved in other sustainability efforts?
Sustainability Issue	<ul style="list-style-type: none"> • What do you see as the major sustainability issues facing your island community currently and in the future? <ol style="list-style-type: none"> a. Can you give some specific examples of the most pressing issues? How urgent are they? • What types of grassroots innovations are happening to address the identified issues? <ol style="list-style-type: none"> a. Can you provide examples of specific sustainability initiatives or projects currently underway in your community? b. How would you categorise these initiatives in terms of the types of sustainability transitions they represent (e.g., environmental conservation, renewable energy adoption, waste reduction)? c. Are there specific sectors or areas where these grassroots innovations are more prominent (e.g., community development, agriculture, energy)?
Barriers	<ul style="list-style-type: none"> • What are the key barriers or challenges facing grassroots innovations? <ol style="list-style-type: none"> a. Are there certain barriers that are more significant than others? b. How exactly do they constrain sustainability efforts? <ol style="list-style-type: none"> i. Can you give a specific example of how a barrier negatively impacts an initiative? c. What cultural factors make grassroots innovations difficult in your context? d. How do organisational issues like funding, capacity etc. pose barriers? e. Are there problems with regulations, policies or governance that hamper grassroots innovations? f. What external economic, political or other contextual forces create roadblocks?



Opportunities

- For each barrier probed above, follow up with:
 - a. Despite this (specific barrier) challenge, what opportunities exist to overcome it?
 - b. Where do you see the potential for overcoming obstacles? Emerging trends? Untapped resources? Promising innovations?
 - c. How can these opportunities be maximised to accelerate sustainability transitions?
 - d. What transformations in systems, mindsets, infrastructure etc. are needed?
- What are some of the promising community-led solutions emerging?
 - a. What makes these solutions effective or innovative? Are there examples we can learn from?
- How can these initiatives be supported and scaled up?
 - a. What types of resources, policies, partnerships etc would enable wider adoption?

Closing

- Is there anything else you would like to add that we haven't covered?
- Do you have any recommendations for other people I should speak to?
- Thank you for sharing your insights. Your perspectives are invaluable to this research.

Appendix B: Coding Scheme based on Research Questions

Categories	Sub-Categories	Codes
	Sustainability issues	<ul style="list-style-type: none"> • Climate Change • Waste management and plastic pollution



Sustainability issues experienced		<ul style="list-style-type: none"> • Environmental degradation and Biodiversity Loss
	Causes/Contributors	<ul style="list-style-type: none"> • Unsustainable consumption/practices • Littering habits • Import reliance • Economic vulnerability • Development pressures • Cultural practices • Lack of awareness • Capitalist forces • External factors
Grassroot innovations	Individual and collective actions	<ul style="list-style-type: none"> • Sustainable practises • Grassroots initiatives
	Sustainable Businesses	<ul style="list-style-type: none"> • Ecopreneurs • Prosumers
Barriers	Operational Barrier(s)	<ul style="list-style-type: none"> • Funding/cost constraints
	Socio-Cultural Barriers	<ul style="list-style-type: none"> • Legitimacy and credibility barriers • Socio-cultural mindset
	Institutional Barriers	<ul style="list-style-type: none"> • Political and institutional barriers • Policy implementation and enforcement gaps
Opportunities	Policy	<ul style="list-style-type: none"> • Sustainable Blue Ocean Economy • Policy reforms
	Partnership	<ul style="list-style-type: none"> • Private Sector Partnership



		<ul style="list-style-type: none"> • Multistakeholder/Regional collaboration
	Capacity	<ul style="list-style-type: none"> • Experimentation • Localised Production and Self-reliance • Sustainable financing • Community empowerment/participation • Cultural mindset shift and environmental education

Appendix C: Consent Letter

Dear Participant,

I am a research master's student at the University of Groningen and the University of the Aegean conducting a study on community perspectives regarding sustainability transitions on Mauritius Island.

Purpose

The purpose of this study is to understand the key barriers, opportunities, and potential policy interventions that could enable grassroots innovations on the island from the viewpoint of community members like yourself.

Participation

I am inviting adult community members involved in grassroots innovation with more than 5 years of experience to participate in an approximately 30-50-minute interview regarding their perspectives. Participation is completely voluntary. The discussion will cover your perceptions of obstacles and opportunities for grassroots innovations to overcome the challenges and accelerate sustainability transitions on the island. With your permission, I will audio-record the interview for research purposes.

Participants' Rights

- **Voluntary Participation:** Your participation in this study is entirely voluntary. You have the right to decline to answer any question and to request that the recording be turned off at any time during the interview.
- **Withdrawal:** You can withdraw from the study up to one month after the interview.
- **Data Access:** You will receive a copy of your interview transcript upon request. Additionally, if you wish to read the final research report, please email me at k.otokiti@student.rug.nl
- **Confidentiality:** I assure you that your identity will remain anonymous in the research findings. All data collected will be anonymised to protect your privacy.

Use of Data

The anonymous data will be analysed and used for my master's research thesis and a journal article. Please contact me if you would like to read the final report. If you have any questions or concerns, please contact my thesis supervisors:



Supervisor 1: Prof. Ina Horlings, l.g.horlings@rug.nl

Supervisor 2: Prof. Athanasios Kizos, akizos@aegean.gr

I greatly appreciate your time and willingness to participate in this study.

Yours Sincerely,

Kolade Victor Otokiti

I acknowledge that I have thoroughly read and comprehended the information provided in the information sheet.

Participant's Initials:		Name of the researcher	
Participant's signature		Researcher's Signature	
Date:		Date:	