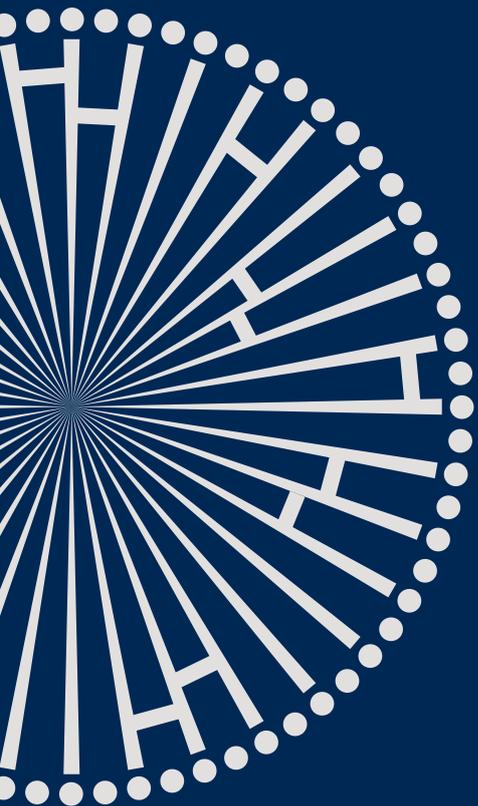


Students Reports
MScESD/SLURC Learning Alliance

Transformative strategies for a just Freetown

Edited by Rita Lambert
and Pascale Hofmann





MSc Environment and Sustainable Development

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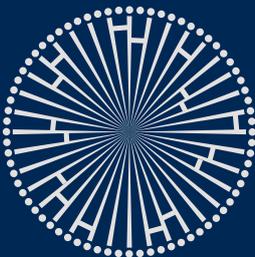
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TRANSFORMATIVE STRATEGIES FOR A JUST FREETOWN

WEITIN FỌ DO FỌ LE FRITONG WOK FỌ ỌL MAN

Edited by Rita Lambert and Pascale Hofmann

July 2021

The DPU MSc ESD/SLURC learning alliance was established in 2017 and brings together a number of partners: the practice module of the MSc Environment and Sustainable Development (MSc ESD) at the Development Planning Unit, University College London- led by Adriana Allen and Rita Lambert; the Sierra Leone Urban Research Centre (SLURC-www.slurc.org/)- a globally connected research centre in Freetown directed by Braima Koroma and Joseph Macarthy; and the Federation of Rural and Urban Poor (FEDURP) headed by Yirah Conteh.

Building upon the DPU MSc ESD/SLURC learning alliance's research conducted over the last three years, this compilation of reports, written by the 2020-2021 ESD Masters students, captures the work conducted during the fourth and closing year of the learning alliance which was led by Rita Lambert and Pascale Hofmann.

The compilation is structured around four different but connected thematic areas: Ecological Infrastructure, Food Security, Land and Housing, and Urban Infrastructure and Services to offer fresh insights for pathways towards environmental justice in Freetown. Freetown exemplifies the conditions that affect many other cities in sub-Saharan Africa, where urbanisation is increasingly coupled with the production of environmental injustices, underpinned by spatially and socially unequal development.

The research engagement was based on an ethical and practice-oriented approach over six months of primary and secondary data collection. Through a dialogue with organisations and collectives in other African cities and beyond, the aim was to learn across contexts to devise transformative strategies. The initiatives documented in these reports were selected because they tackle, directly or indirectly, environmental injustices that affect the most vulnerable social groups.

Although working at a time of a global pandemic has been extremely challenging, the immersed and remote collaborative fieldwork enabled the contribution of a wide range of organisations working on urban environmental issues around the globe. Moreover, as the fieldwork facilitated knowledge exchange between different contexts, it played a role in expanding the network of actors working towards just sustainable futures.

Many people have contributed to the research findings and strategy development: local facilitators, academics, researchers, public officials, colleagues and friends in Freetown and other cities named in the different reports. The guidance, dedication and knowledge of the core collaborators was vital. We give special thanks to the SLURC staff: Braima Koroma, Joseph Macarthy, Andrea Klingel, Ibrahim Bakarr Bangura, Hawanatu Bangura, Amadu Labor, Mary Sirah Kamara; our interns: Musa F.M. Wullarie, Fatima Kabba, Michael Garrick, Henry David Bayoh; our DPU facilitators: Nikhilesh Sinha, Alban Hasson, Loan Diep, María José Nieto Combariza and our DPU staff: Donald Brown, Kerry Bobbins, Julia Wesely. The culmination of this work was not possible without the enthusiasm and hard work of the students of the DPU's MSc Environment and Sustainable Development 2020-2021.

To all we give thanks,

Rita Lambert and Pascale Hofmann

Content

Ecological infrastructure

- 02 Pathways for sustainable livelihoods through coastal ecosystem conservation and rehabilitation in Freetown, Sierra Leone
- 23 Enhancing livelihoods through managing risk: strategies for forest regeneration and conservation in Freetown, Sierra Leone

Food security

- 59 Food sovereignty in Freetown: solidarity networks to support informal food vendors and expand community kitchens beyond COVID-19
- 84 Networking for justice and resilience: land tenure security, regenerating soil and sharing seeds for urban and peri-urban agriculture in Freetown

Land and housing

- 120 Securing safe, affordable and well-connected land in Freetown for the urban poor through community land trust and land value capture
- 138 A pathway to reduce risk and injustice in Freetown's informal settlements

Urban infrastructure and services

- 175 Promoting safe and sustainable energy through diversification and decentralisation
- 202 Improving access to sanitation through collective facilities



Learning from innovation around the world



Working through different thematic areas that link to vital urban systems, four main questions guided the research:

What are the drivers and manifestations of socio-environmental injustice in Freetown?

What capacities and practices (policy and needs driven) to promote socio-environmental justice are active in Freetown?

What key lessons can be learnt from other African cities and beyond in comparative terms, and what is their applicability to Freetown to disrupt socio-environmental injustices?

What specific recommendations (governance arrangements, policy frameworks and funding) can be made to enhance sustainable pathways towards socio-environmental justice?

The overseas practice engagement consisted in identifying a **diverse range of progressive global initiatives** that provide valuable insights for supporting environmental justice in Freetown. The participants of the MSc ESD/SLURC learning alliance interviewed several international organisations, as well as local institutions and civil society groups engaged in these initiatives drawing key lessons for just sustainability.



Ecological infrastructure

Pathways for sustainable livelihoods
through coastal ecosystem
conservation and rehabilitation
in Freetown, Sierra Leone



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This report is produced as a part of the practical learning module of the Environment and Sustainable Development MSc course from the Development Planning Unit, University College London, coordinated by Dr Pascale Hofmann and Dr Rita Lambert. It was conducted in partnership with Henry David Bayoh and Mary Sirah Kamara, local partners from the Sierra Leone Urban Research Centre, based in Freetown, and mentored by UCL staff Loan Diep and Kerry Bobbins. This report would not have been possible without their continuous support and insightful instructions.

Many people have made contributions to the findings and the strategies: local partners and community members, activists, researchers, academics, public officials, practitioners, friends and colleagues in Freetown, London, and many other cities around the world, who enthusiastically shared their valuable experience and knowledge despite the special condition during the pandemic. Furthermore, the previous students of the MSc Environment and Sustainable Development 2018-2020, who conducted detailed primary research and established the solid foundation for us.

The generous support of this diverse group of people enhanced our understanding of the everyday challenges and opportunities in coastal Freetown and contributed to the reframing of pathways to socio-environmental justice. We are deeply grateful to everyone who contributed!

Abbreviations

CMC	Community Management Committee
DPU	Development and Planning Unit
ESD	Environment and Sustainable Develop.
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organization
FCC	Freetown City Council
FEDURP	Federation of Urban and Rural Poor
MAP	Mangrove Action Project
MCM	Mangrove Community Management
MOU	Memorandum of Understanding
NPAA	National Protection Area Agency
SDI	Shack/Slum Dwellers International
SLURC	Sierra Leone Urban Research Centre
UCL	University College London

1. Executive summary

The following paper presents a research of pathways towards sustainability in coastal Freetown, Sierra Leone, from a socio-environmental standpoint. The research focused on threats and opportunities over the coastal ecosystem in Freetown, the people living in the city's coastal communities, and the interface and mutual dependencies between the two. Practically speaking, the research investigated the informal community of Cockle Bay and the informal communities in the part of the city named Portee Rokupa. The main findings from this research suggest that community participation and co-production with national and municipal governance are significant pathways towards just and sustainable existence in coastal Freetown.

Derived from these findings, and based on case studies from other cities, mainly in Africa, this paper suggests two strategies for promoting sustainability in coastal Freetown. The first strategy is enhancing socio-environmental justice through mangrove conservation and rehabilitation through the objectives of (1) developing an integrated co-produced coastal ecosystem management to monitor policies and agreements; and (2) reducing the usage of mangrove wood for fish smoking through alternative methods (Introducing new more efficient smoking stoves and expending the usage of LPG).

The second strategy involves securing coastal livelihoods and exploring pathways for sustainable livelihood alternatives as paths for sustainability in Freetown through the objectives of (1) developing the ecotourism sector in Freetown while integrating informal coastal settlements residents, and (2) creating alternative sources of livelihood from mangroves (bee hiving and blue-carbon).

Figure 1. View of Cockle Bay community. Source: ESD database.



Figure 2. Mangrove located in Cockle Bay.



2. Diagnosis and research design

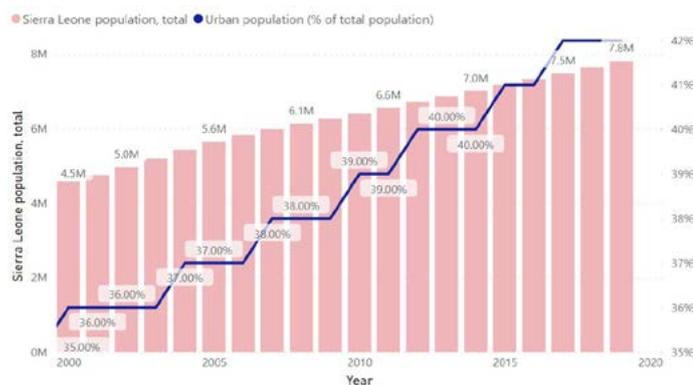
2.1 Research background

The following paper explores and presents strategies to enhance socio-environmental justice in Freetown, Sierra Leone’s capital, in the thematic area of the coastal ecosystem services, especially mangroves. This research is the last part of a four-year partnership, starting in 2018, between the Development Planning Unit (DPU) from University College London (UCL) and the Sierra Leone Urban Research Centre (SLURC). It forms part of a practice module in the Environment and Sustainable Development MSc course (ESD) in UCL, conducted by five international students from the DPU under the supervision of DPU staff members and SLURC. As this is the final year of the DPU-SLURC partnership, the main objective of this research is to provide concrete strategical recommendations as detailed in chapter 6.

Freetown is located on the coast of the Atlantic Ocean in West Africa. It has a population of over 1 million residents, according to the 2015 national census, which roughly constitutes 13.5 % of the country’s population (SSL, 2016). Freetown follows a national urbanisation trend where 42% of the 7.8 million residents of Sierra Leone lived in cities in 2019 (Figure 3). According to the Multidimensional Poverty Index in 2017, 64.8% of the population in Sierra Leone lived below the USD1.90 per day poverty line. Nevertheless, it is the most developed and most affluent part of the country, responsible for 30% of its iGDP (OPHI, 2019; World Bank 2018).

These facts make the city a popular destination for internal migration. Many of the migrants come from disadvantaged background and cannot afford to live in formal parts of the city. Thus, they tend to live in informal and unplanned settlements, many of them located in the Western-coast. (Allen et al., 2017).

Figure 3. Total Sierra Leone's population and urbanisation trends (as % of the total population) between 2000 and 2019. Source: World Bank (2021) adapted by the authors (2021).



2.2 Preliminary Diagnosis

Like many other settlements in Sub-Saharan Africa, the informal settlements in Freetown are prone to different risks due to various vulnerabilities and are under the threat of eviction due to lack of formal recognition in their living arrangement, while not being able to afford standard housing (Revi and Satterwaite, 2014).

The residents of the informal coastal communities are highly dependent on coastal ecosystem services, especially for fishing, cockle picking and mangrove wood for fish smoking and boat construction (Reingold, 2019). Ecosystem services are defined as those that contribute to human well-being through four services: supporting, provisioning, regulating, and cultural services (Bouma and Van Beukering, 2015). However, some of these communities’ residents are involved in practices related to the degradation of the ecosystem (Ibid). An especially damaging practice is land reclamation, or “land banking”, in which gravel, debris, or waste is piled over low water to elevate the sea bank and make it suitable for building houses (Allen et al., 2017). However, this practice is destroying the mangrove forest, which is important as fuel and construction material, and as a habitat for fish and other marine animals (Reingold, 2019). Additionally, the mangroves reduce the severity of ocean floods that risk low-line communities (Ajonina, 2017).

Despite the fact some of the informal settlements residents are engaged in unsustainable practices, it should be stressed that the socio-environmental context has a significant influence over their chosen practices. Considering how depletion of the fish stock is considerably related to illegal industrial fishing (Jallow et al., 2017) we assume that this depletion is a significant factor that pushes the artisanal fishers into unsustainable practices.

According to Convertino et al. (2013), the coastal ecosystem includes the coastal saline waters and the coastline and adjacent lands. Following this definition, this research has investigated Cockle Bay and Portee-Rokupa coastal communities. These communities are located close to the shoreline, and have a frequent connection and daily dependency over the coastal ecosystem (Koroma et al., 2018). They were chosen because they are important fishing communities in Freetown, and they represent many of the city’s issues, which allows the lessons learned to be applied to the wider city.

2.3 Objective and research questions

The overarching objective and research questions are centred around exploring environmentally sustainable and socially just pathways for coastal ecosystem conservation in Freetown. More specifically, we focus on currently degraded ecosystems (mangrove trees, sandbank, fish stocks), the way they are actively repaired (particularly mangroves) and how their environmental degradation can be reduced through the enhancement of alternatives for livelihoods that depend on these ecosystems. We aim to demonstrate how these can be supported by multi-stakeholder partnerships and the diversification of livelihood opportunities. We explore these through the following research questions:

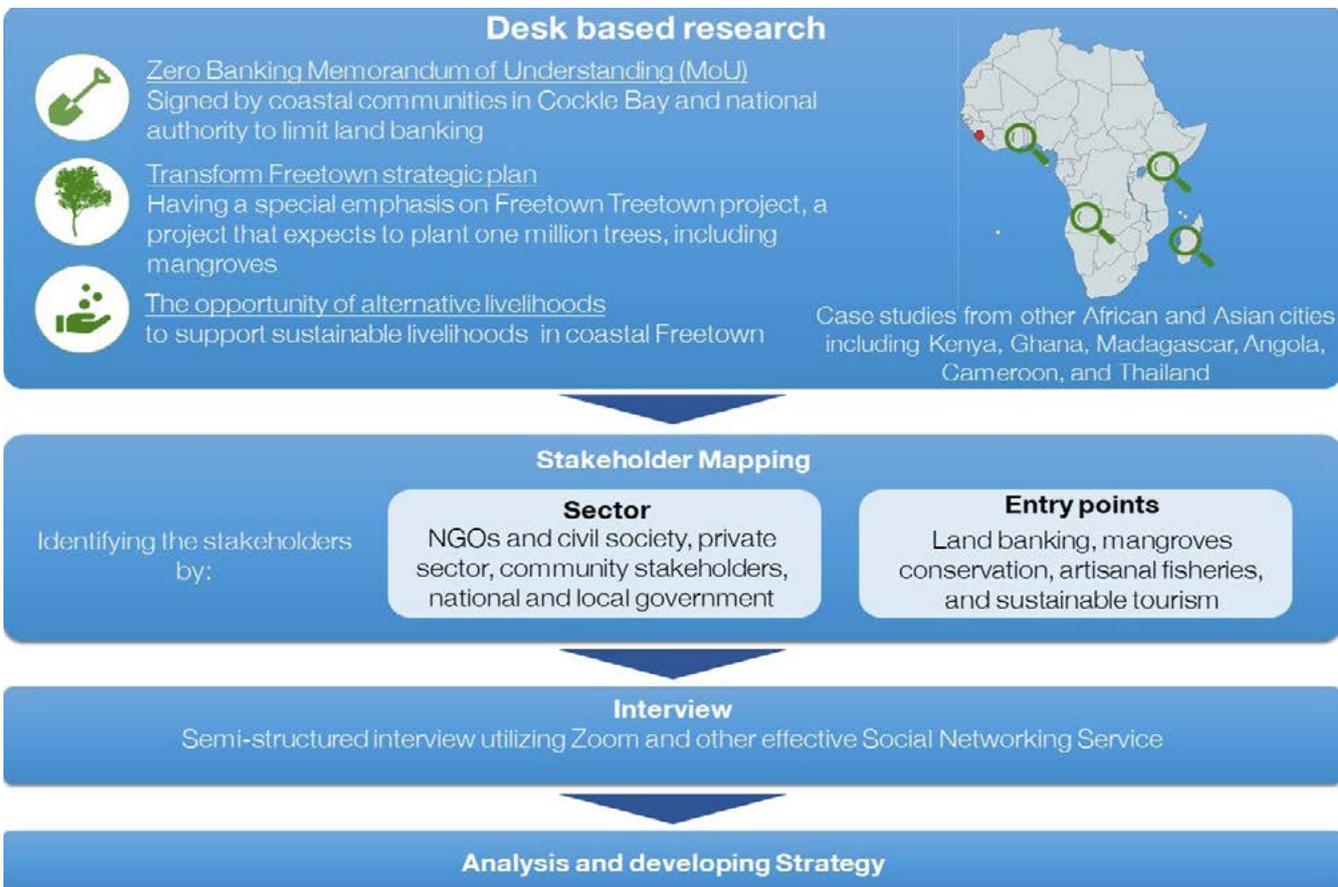
- 1) Drawing lessons from Cockle Bay, what co-produced ecosystem management mechanisms can be leveraged to help sustain zero banking agreements across coastal Freetown?
- 2) How can current municipal mangrove rehabilitation and conservation strategies be supported over the short and long-term, through planting techniques enabling the rapid restoration of mangroves, reducing energy demand on their wood?
- 3) Among other existing livelihood opportunities in coastal Freetown that help reduce demand on mangroves, which ones can be socio-economically viable and how?

2.4 Analytical framework

This report adopts a socio-environmental justice perspective that builds on environmental justice theories (Schlosberg, 2009) to support our analysis and recommendations. This enables us to further elaborate strategies which can efficiently address the current local context.

Our analytical lens derives from a multidisciplinary approach, but social science is the most dominant, and it is guided by the normative umbrella of socio-environmental justice. In line with Schlosberg's (2009) contribution to the framing of socio-environmental justice, its notion is made of three dimensions, including (1) fair distribution of social and economic benefits and cost, (2) recognition of the marginalised and (3) equitable participation in decision-making. By using socio-environmental justice as the analytical and normative framework, this report aims to recognise the marginalised groups' voices and needs and to find a path to plan these groups ways of living, while encouraging the sustainable use of natural resources. This process is intended to contribute to ecosystem conservation strategies that are inclusive for the marginalised groups' needs and locally appropriate to support the sustainability of Freetown through a focus on its coastal region.

Figure 4. Diagram showing the workflow of the research. Source: Created by the authors (2021)



In terms of organisational structures, it became evident that Freetown’s coastal communities are composed of different collectives and organisations based on gender, profession, religion or tribal ethnicity (Interview 2, 15, 16). Despite this diversity, specific overarching organisations at the community or the region level represent those communities, such as the Community Management Committee of Aberdeen Creek, representing six communities, including Cackle Bay (Interview 16).

this sense, it is essential to highlight the importance of mangroves for Freetown, especially coastal communities. In this sense, it is crucial to aim for the “right to the city” (Lefebvre, 1996) and ecosystem sustainability.

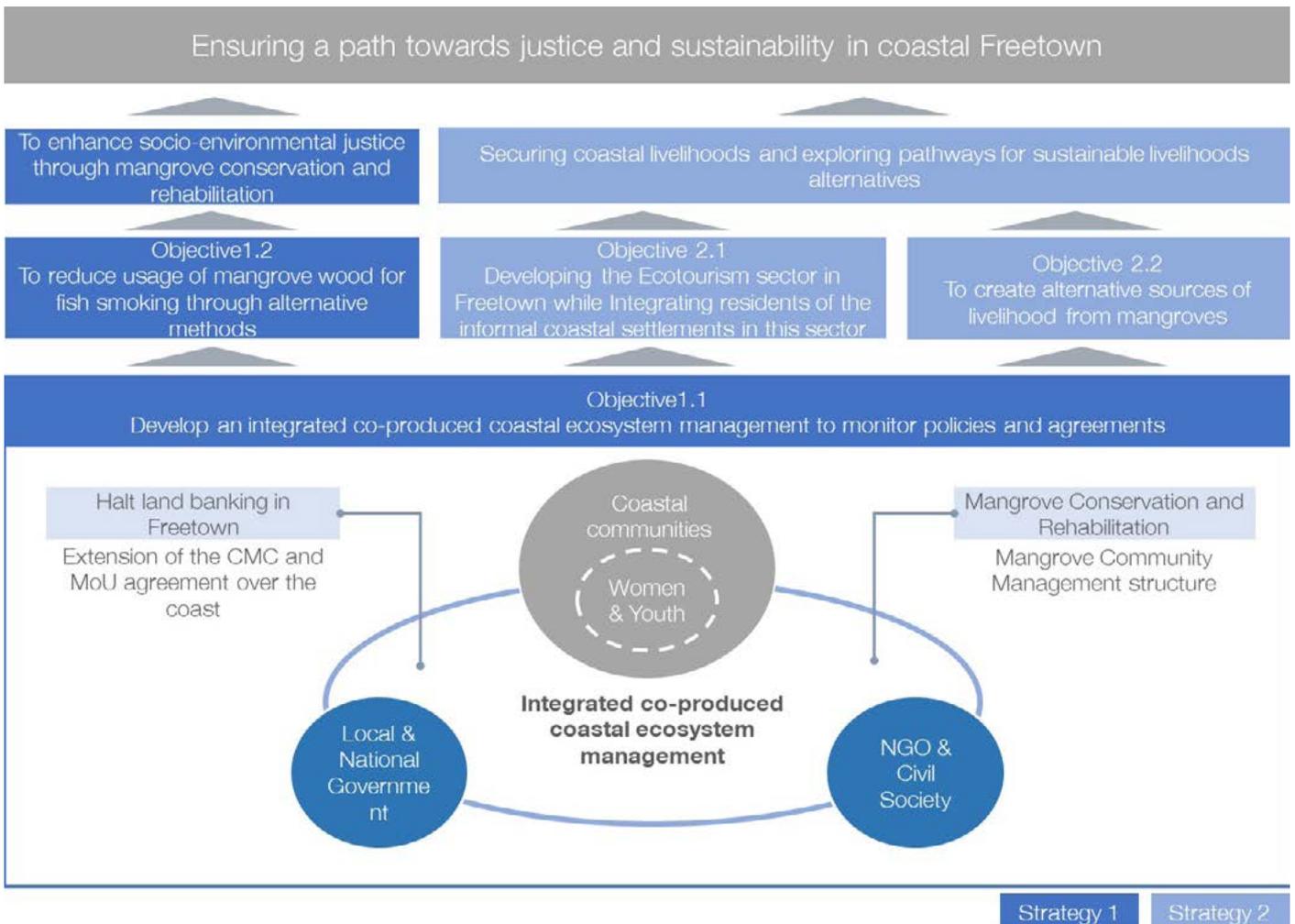
Considering market pressures on traditional practices (e.g. artisanal fisheries), together with the lack of incentives to conserve the coastal ecosystem, needs and opportunities for a diversification of livelihoods were identified. The fulfilment of these opportunities will not only benefit coastal communities, but Freetown as a whole. To this end, the second strategy explores potential sources of financing and income, especially the coastal population. The structure of these strategies is shown in Figure 5.

Lastly, the case studies also highlighted the empowerment of women and youth playing a critical role towards successful coastal ecosystem management. In this sense, knowledge building of existing women’s groups in Freetown working towards socio-environmental justice and emancipation will be explored. One of these groups was born from an initiative launched by the FCC (FCC, 2020).

4. Strategies

Based on the research, two strategies were developed considering the potential of an integrated approach, as successfully demonstrated in other East and West African coastal cities. The first strategy, named “to enhance socio-environmental justice through mangrove conservation and rehabilitation”, is meant to promote the development of an integrated co-produced coastal ecosystem management between coastal communities, civil society and authorities to monitor policies and agreements in coastal Freetown, setting the foundations for the remaining objectives. In

Figure 6. Strategy structure. Source: Created by the authors (2021)



4.1 Strategy 1: To enhance socio-environmental justice through mangrove conservation and rehabilitation

Objective 1: Develop an integrated co-produced coastal ecosystem management to monitor policies and agreements (table 1).

This new coastal ecosystem management would form an overarching structure composed of representatives from all coastal communities, the EPA, FCC and a mediator from a civil society organisation, such as Women4Climate.

Regarding possible complexities of inter-communal and inter-organisational governance structure, it would be advisable to propose a timeline of up to one year. This timeline has worked in other African contexts with more

Table 1. Summary of the key information on objective 1. Source: Created by the authors (2021)

#	OBJECTIVES	ACTION	STAKEHOLDERS	RESPONSIBLE	TIME-SCALE
1.1.1	Develop/ build-up an integrated co-produced coastal ecosystem management to monitor policies and agreements	Develop coastal ecosystem management structure	FCC / Coastal communities reps / Women4Climate / EPA	FCC	Short
1.1.2	Develop/ build-up an integrated co-produced coastal ecosystem management to monitor policies and agreements	Review and extending Cockle Bay MoU to entire coastal communities in Freetown	FCC / Coastal communities reps / Youth leaders / EPA	FCC	Short
1.1.3	Develop/ build-up an integrated co-produced coastal ecosystem management to monitor policies and agreements	Set-up a Freetown Mangroves Community Management committee	FCC / Coastal communities reps / Women4Climate / NPAA	FCC	Short

The need for a co-production of coastal ecosystem management structure between the FCC and local communities was identified. In practice, it means that the community will monitor policies and agreements related to Freetown’s coastal ecosystem in cooperation with the FCC. This integrated approach will focus on halting land banking practices, which have accelerated mangrove depletion over the last years (figure 7) and promote mangroves rehabilitation and conservation.

stakeholders (Agbogah et al., 2015; Interview 6,11).The FCC will be responsible for funding recurrent expenses and launching the committee. Each community is responsible for deciding within the next six months who are their elected representatives.

Regarding land banking, we have identified that there is already awareness of the harm of this practice to the

Figure 7. Decrease of mangrove area and land expansion in Aberdeen Creek over the last years. Source: Google Earth (2020) adapted by the authors (2021).



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environment in Cockle Bay. The MoU to halt land banking between the community and the FCC was initially successful. However, this agreement failed over time due to a lack of alternative livelihoods to replace profits from land banking and a lack of efficient monitoring. Currently, around 20% of Cockle Bay's residents rely on this practice, making the agreement unsuccessful (Interview 16). The monitoring of the contract by the NPAA was not successful as the community was not involved, which resulted in low levels of community accountability (Interview 2, 15, 16). Moreover, the fact that the agreement solely covers Cockle Bay is a limitation, as other coastal communities continue with this practice (Interview 2). Thus, there is a need to implement alternative livelihood practices and implement an effective monitoring system and to extend the MoU agreement over the coast.

Thus, it is recommended to extend the CMC agreement to help expanding to other coastal communities, and to monitor land banking practices. Stakeholders will include representatives of all coastal communities through the CMC, such as Cockle Bay and Portee-Rokupa communities. Community involvement is essential as it has helped to create an efficient and accountable monitoring system in other cases (Revi and Satterthwaite, 2014). This must include youth groups as they represent the majority working in land bank practices and have showed engagement in supporting the monitoring of agreements (Interview 16). Additionally, the NPAA and FCC will be key stakeholders, providing the funding and recognition to support the review, implementation and monitoring of the MoU. Additionally, it is recommended that this integrated coastal ecosystem management structure establishes a mangrove community management (MCM) structure together with the FCC and the NPAA. This has been a successful set-up that helped rehabilitate mangrove areas through communities' stewardship in Madagascar and Ghana (Agbogah et al., 2015).

This committee will monitor policies and agreements regarding mangroves conservation and rehabilitation in Freetown. Moreover, it will enhance existing initiatives, such as the Catholic Relief Services and FEDURP's planting of 55000 mangroves (Interview 23). The MCM should be connected to the Freetown Treetown program and further explore financing mechanisms such as those provided through the West African Coastal Areas Program from the World Bank. According to a World Bank officer (interview 20), this program is ready to explore new initiatives in Sierra Leone. Additionally, this committee should connect and leverage funds from the World Bank ProBlue program, which currently supports over USD 480 million in lending activities to Africa regarding coastal ecosystem rehabilitation (World Bank, 2020).

Regarding governance structure, the MCM will be composed of the same stakeholders of the overarching structure, additionally including technical advisors, research centres, such as SLURC, and the Freetown Treetown program manager. Furthermore, expert organisations with extensive experience in similar initiatives in Africa, such as

Mangrove Action Project (MAP) or Blue Ventures, could serve to extend networks and opportunities. Women should be a key part of this project, by being directly involved with the MCM, as they play important roles in organising and supporting certain activities, such as the pre and post phases of artisanal fisheries (Interview 4). The member of Women4Climate highlighted the challenge of involving women in management, since cultural norms may inhibit them from asserting themselves (Interview 18). Furthermore, it is recommended that the FCC takes the lead in initially setting up the committee in the coming six to twelve months.

Finally, this objective might be limited by external pressures, such as a possible low prioritisation by the authorities. In this sense, without the support from government bodies, there will not be necessary funding for implementation and proper law enforcement. Moreover, the country's extended family structure and cultural dynamics may hinder efficient monitoring, where strong religious and kinship ties create conflicts of interest.

Objective 2: To reduce the usage of mangrove wood for fish smoking through alternative methods (table 2).

The use of mangroves for fuelwood has been recognised as a factor in the destruction of mangrove forests in West and Central Africa (Dodman et al., 2006). Our research indicates that mangroves are similarly used as fuel in the fish smoking process and in household cooking in Freetown. In communities where there is no electricity or gas infrastructure, smoking is an essential method for preserving fish, and mangrove is a cheap source of household cooking fuel. According to a member of Women4Climate (interview 18), the fish smoking process is carried out by poor women living in the coastal communities. The logging of mangrove forests threatens the sustainability of fish smoking practice for two reasons: firstly, the long-term supply of firewood is compromised, and secondly, mangroves are an important habitat for the reproduction of marine resources, and their loss reduces the catch of fish (Food and Agriculture Organization, 2007).

As a short to medium-term strategy for fish smoking practice, it is proposed to follow the case study of sustainable fish smoking methods in Cameroon (UNDP, 2016). In this case study, 60% reduction of mangrove fuel in the smoking process was achieved by developing an enclosed clay stove in collaboration with local women responsible for smoking fish. The member of Women4Climate (Interview 18) also indicates that the cultural value of using mangroves for smoking needs to be addressed, but the case study has also been successful in working with fish smokers to identify locally available alternatives to mangroves for flavouring and colouring (household kitchen waste, fish scales, garden herbs). The reduction in fuelwood also lowers fish smokers' expenditure and it addresses the demand for cheaper fuel that was highlighted by the Cockle Bay community leader (Interview 16). In addition, this programme provides the formation of a fish smokers' savings group which ease the financial barriers

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Table 2. Summary of the key information on objective 2. Source: Created by the authors (2021)

#	OBJECTIVES	ACTION	STAKEHOLDERS	RESPONSIBLE	TIME-SCALE
1.2.1	To reduce usage of mangrove wood for fish smoking through alternative methods	Fish smoking stove and alternative fish smoking approaches from Cameroon	FEDURP / FCC / Coastal communities / NGO(IIED) / International organisations / NPAA	FEDURP / NGO (IIED)	Short - Medium
1.2.2	To reduce usage of mangrove wood for fish smoking through alternative methods	Planting fast-growing tree from Madagascar	FEDURP / FCC / Coastal communities / NGO(Blue Ventures) / International organisations / NPAA	FEDURP / NGO(Blue Ventures)	Long
1.2.3	To reduce usage of mangrove wood for fish smoking through alternative methods	Introducing LP gas infrastructure service by utilising community savings group (from Sierra Leone)	FEDURP / FCC / Coastal communities / private company (Afrigas) / International organisations / NPAA	FCC / Coastal communities	Medium - Long

to purchasing stoves. This encourages other community members to emulate the stove design and spread the technology. In the medium to long term, the planting of fast-growing trees, such as *Acacia mangium*, will produce fuelwood to replace mangroves (Rabemanantsoa, 2021). This is proposed to be done as part of the tree-planting project currently being carried out by FEDURP. Regarding the substitution of household cooking fuels, we envisage the introduction of LPG into the informal settlements in collaboration with Afrigas, but we refer to the Energy Group’s strategies for more details. These strategies assume the financial support of international organisations such as the UN Food and Agriculture Organization (FAO) and the African Development Bank.

4.2 Strategy 2: Securing coastal livelihoods and exploring pathways for sustainable livelihoods alternatives

Objective 1: Developing the Ecotourism sector in Freetown while integrating informal coastal settlements residents (table 3).

Profits from tourism in Freetown are rarely accessible to residents of the informal communities (Jallow et al., 2017). The development of the tourism sector in the area is focused

on hotels that require heavy infrastructure and can exacerbate damage to the endangered coastal environment (ibid; Interview14). However, ecotourism development can alleviate the socio-economic condition of marginalised fishing communities (Butler et al., 2020) while minimising environmental damage caused by unsustainable practices.

A case study from Angola (Butler et al., 2020) suggests that one possible route for ecotourism development: artisanal fishers can work as guides for recreational fishing or as drivers of charter boats between recreational fishing locations (figure 8). In addition, other community members can work in providing services to coming tourists. It is indicated that revenues from the target species, *Polydactylus quadrifilis*, which also exist in Sierra Leone waters, “was 3.6–32.6 times more valuable than the same fish caught and sold in the artisanal sector” and that recreational fishing contributed to the economic productivity of the area. (Ibid, p.1). According to the director of Ministry of Tourism and Culture (Interview 14), community-based ecotourism already exists in Levuma beach in the Freetown peninsula, where the local community is involved in the development of a tourism venture, including the selling of traditional handcrafts. Additionally, ecotourism is endorsed by the NPA and the tourism and culture ministry (Reingold, 2019; Interview 14).

Table 3. Summary of the key information on objective 1. Source: Created by the authors (2021)

#	OBJECTIVES	ACTION	STAKEHOLDERS	RESPONSIBLE	TIME-SCALE
2.1.1	Developing the Ecotourism Sector in Freetown While Integrating residents of the Informal Settlements This Sector	Developing the ecotourism sector through a co-production process with the informal communities	FCC / Tourism and Culture Ministry / FEDURP / Women4climate	FCC	Medium - Long

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Despite these promising findings, ecotourism development should not be conceived as a panacea for the socio-economic economic difficulties of the informal settlements. For example, in Angola, high rates of financial leakage have reduced the communities’ revenues from recreational fishing to a rate lower than the revenues from artisanal fisheries. Additionally, the informal settlements in Freetown are threatened by forced evictions, and tourism development could become an incentive for eviction (Reingold, 2019). Moreover, Sierra Leone still suffers from structural difficulties that limit its ability to develop its tourism industry; hence revenues remain at merely 1% of national GDP in 2019 (Figure 9). According to representatives from the tourism and culture ministry, the main difficulties include a weak legislative framework for the tourism sector, insufficient international and in-country transport, and lack of skilled personnel in the tourism sector (Interview 14; World Bank, 2020).

Figure 8. Artisanal fishers on the coast in Freetown. Source: Environmental Protected Agency Sierra Leone (2017)



Figure 9. Sierra Leone GDP (current USD) and international tourism receipts as a percentage (%) of GDP, between 2000-2019. Source: World Bank (2021) adapted by the authors (2021)



Facing these opportunities and challenges, this objective is framed as a medium-long term goal. It is expected that a few more years are needed to make all of Freetown’s coastal area an attractive tourism destination (Tourism in Africa, 2020; Interview 14). Following lessons and recommendations from the Angola case study, we highlight the importance of reducing financial leakage and protecting informal settlement’s socio-environmental rights (Butler, 2020). For this, it is suggested that the development of ecotourism in Freetown will consider stakeholders from the informal settlements with max-

imal transparency of the development process and a strong emphasis on co-production and partnership with the local community. Recommended collaboration partners are FED-URP that appears to be an important force in the community and has a strong connection to fishing and Women4Climate, as they are an influential organisation in the community. This collaboration process should include decisions over where and how ecotourism enterprises will be developed. Additionally, this process should consist of a collaborative process of investment in developing the human capital of the informal communities to have the skills needed for this developing industry. This action will answer the shortage of trained personnel and solidify the residents’ livelihood capability.

Objective 2: To create alternative sources of livelihood from mangroves.

In order to promote the sustainable use of natural resources while improving the livelihoods of the community members, it is crucial to create the resources of sustainable livelihoods opportunities from mangroves in coastal Freetown. Such opportunities should combine multiple stakeholders’ engagement. Building on this, the following two solutions are recommended. Before developing the initiatives, it is suggested a thorough feasibility study and social and environmental assessments be conducted.

Additionally, according to the executive director of Blue Ventures (interview12), the introduction of new alternatives may require time and communication with stakeholders involved. To make our recommendations cultural compatible, the participation of the local community is essential. Therefore, it is recommend that community-based organisations and traditional leaders in communities are involved in the process, who can then play an indispensable role in mobilising and coordinating the community members. Funding should be sought from an international organisation for such as FAO and Shack/Slum Dwellers International.

a. Developing the Bee-hiving livelihood in mangrove forests

Bee-hiving (figure 10) offer incentives to preserve mangroves by coastal communities. Since the bees gather nectar from various flowers and mangroves, this combination produces honey with a unique flavour (MAP, no date). Therefore it is recommend that bee-hiving is promoted as a livelihood activity in the medium term of one to three years, which would contribute to conserving the mangroves.

Based on the interviews and the lessons from the bee-hiving project in Thailand (MAP, no date), to make the bee-hiving activity locally appropriate, it is suggested that FEDURP and Mangrove Action Project should work together for technical support during the planning stage. This contains the acquisition of beekeeping knowledge by communities and the installation of beekeeping equipment. At the implementation stage, the communities can engage with mangrove conservation and generate new income resources through the production of honey and related

BLUE INFRASTRUCTURE

products. In the long run, bee-hiving can be incorporated into the tourism sector. The local people can sell their honey product as souvenirs with their story and build partnerships with the surrounding hotels to use locally produced honey. The produced honey can also serve as an additional source of nutrition.

Figure 9. Image showing local people in Thailand producing honey from the mangrove forests, while conserving them. Source: MAP (no date)



b. Developing the Blue-carbon project

Blue carbon initiatives are underway around the world. These initiatives quantify the carbon sequestration in coastal and marine ecosystems and provide mechanisms for those seeking to offset the carbon footprint to buy the carbon credits to fund coastal conservation (Wylie et al., 2016). Such initiatives highlight the importance of mangroves due to their enormous capacities as sinks of carbon dioxide (Wylie et al., 2016). Connecting to the Freetown Treetown project, it is suggested that the

blue carbon project to be an alternative for livelihood by protecting the mangroves and selling the blue carbon credits in the medium to the long term.

Drawing from the blue carbon credit project in Gazi Bay, Kenya (Huff & Tonui, 2017), at the planning stage, it is recommended that the NPAA, FCC and the local community would work together to reach an agreement on the responsibilities and further set up the regulation to ensure that the revenues generated from selling the credits will benefit the community. It is suggested that this is monitored through the coastal ecosystem management structure highlighted in the first strategy. Also, to facilitate the generation and sale of the credits, it is recommended collaborating with Plan Vivo and Blue Ventures, which have extensive experiences with blue carbon projects in African cities (table 4).

The engagement of communities is vital in conserving mangrove forests, including conducting community monitoring and preventing illegal deforestation (Huff & Tonui, 2017). Regarding the allocation of revenues, since there is a community fund mechanism, it is suggested the communities and community-based organisation will work together to decide and manage the revenues independently, and the use of revenues must be transparent (interview 23). In the long run, the revenues will provide an opportunity for alternative forms of livelihoods and a financial resource which could be utilised for community development or set aside for emergency use.

Table 4. Summary of the key information on objective 2. Source: Created by the authors (2021)

#	OBJECTIVES	ACTION	STAKEHOLDERS	RESPONSIBLE	TIME-SCALE
2.2.1	To create alternative sources of livelihood from mangroves	Developing the Bee-hiving economy in mangrove forests	FEDURP / FCC / Coastal communities /International organisations (MAP)	FCC / Coastal communities	Medium
2.2.2	To create alternative sources of livelihood from mangroves	Developing the Blue-carbon project	NPAA/FEDURP / FCC / Coastal communities / International organisations (Plan vivo) /private company (blue ventures)	FCC / Coastal communities	Medium - Long
2.2.3	To create alternative sources of livelihood from mangroves	Assessing the feasibility of crab aquaculture	NPAA/FEDURP / FCC / Coastal communities / private company (blue ventures)	NPAA/FCC / Coastal communities	Medium - Long

5. Conclusion

This paper reviewed the current situation of the coastal ecosystem in Freetown. It has identified challenges and opportunities, further proposing strategies to enhance socio-environmental justice in coastal communities, focusing on Cockle Bay and Portee-Rokupa. Through an initial diagnosis, four entry points were established, which helped in the elaboration of the strategies. These strategies approached mangrove conservation and rehabilitation and alternative livelihood sources, building on lessons learned from other African coastal cities.

It was concluded that community participation and co-production are key to achieve success in the implementation and monitoring of projects and policies related to communities, as inclusion can promote higher levels of accountability. Moreover, it was evident that women, currently overlooked in coastal ecosystem management decision making, and the youth, are critical to nature preservation. They are crucial to and must be part of the coastal ecosystem management discussions and production. This is in line with the FCC Transformation Program 2019-2022, highlighting the inclusion and empowerment of youth and women at the top of the agenda.

Moreover, this paper highlighted the need to secure alternative livelihood practices to community members engaged with activities that harm the environment, such as land banking and mangrove depletion. For that, it is necessary to support a set of different options which helps to conserve the mangroves, such as bee-hiving and blue carbon credit. Furthermore, given the potential of Freetown as an ecotourism destination, this livelihood route should be considered via a co-production process with the coastal communities.

Ultimately, the strategies proposed in this paper are aimed at the integration of local and national coastal ecosystem governance structures for the empowerment of coastal communities and to monitor and improve coastal ecosystem conservation and rehabilitation. As the city is expected to double its population in the next 20 years (UNFPA, 2021), it will be critical to preserve a healthy coastal ecosystem and move towards sustainable development while ensuring that coastal communities also benefit from this symbiotic relationship with their ecosystem.

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Learning from innovation around the world



- 01** Integrated Coastal and Fisheries Governance (ICFG) Initiative: Ghana project case study
- 02** Exploring alternative fish smoking techniques
- 03** The quest for sustainable charcoal initiatives: An alternative fuelwood programme case study
- 04** Bee hiving: Nai Nang Case Study
- 05** Blue Carbon: Mikoko Pamoja project

Appendix 1: Integrated Coastal and Fisheries Governance (ICFG) Initiative: Ghana project case study

📍 Central and Western Area, Ghana

Hen Mpoano
USAID
The University of Rhode Island
Coastal Resources Center



Figure 10. Fishmongers buying fish from a canoe.
Photo Credit: Coastal Resources Center – Ghana. [Image source](#)

Summary

Building on a four-year partnership with the University of Rhode Island, USAID, the Ghana Coastal Resources Center and Hen Mpoano, this paper provides a series of analyses and case studies of collaboration between communities, governments, and the private sector in coastal zones. It focuses particularly on weaknesses and opportunities arising from social and environmental change in coastal areas, and the study provides a proposal for an integrated co-production coastal ecosystem management mechanism between coastal communities and authorities.

Impact

This particular case study provides a very useful example of similar challenges to those faced in Freetown, and the solution it provides through an integrated coastal ecosystem management governance structure is one of the foundations for our report. Additionally, this initiative also provides useful lessons learned on how to empower women in these governance structures, and how to overcome cultural barriers in doing so.

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Appendix 2: Exploring alternative fish smoking techniques

📍 Kribi Campo, Cameroon

Organisation Pour L'environnement Et Le D'veloppement Durable (OPED)
International Institute for Environment and Development (IIED)
Planète Urgence (Environment NGO)
United Nations Development Programme (UNDP)
Food and Agriculture Organization (FAO)
World Wide Fund (WWF)
EFN
the Ministry of Forests and Fauna (MINFOF)
African Development Bank



Figure 11. Launch of the FAO-Thiaroye Fish Processing Technique (FTT) in Ghana, December 2014. © FAO/Yvette Diei-Ouadi. [Image source](#)

Summary

The organisation l'Environnement et le Développement Durable is transforming the local fishing industry in the Equatorial African Rainforest in Cameroon, in women-led Initiative. It focuses on promoting sustainable shrimp aquaculture and supplying energy-efficient alternatives to tree cutting for fish smoking, which is a major driver for mangrove forest degradation. The initiative is focused on finding substitutes to unsustainable production and processing techniques by introducing improved kilns, alternative energy sources, and the usage of compost instead of mangrove wood.

Impact

The interventions have resulted in reduced deforestation, improved women's health, and increased local incomes. Additionally, the new processing techniques are helping to reduce the amount of time spent gathering firewood and the frequency of ocular and respiratory illnesses. Additionally, revenues have improved by 33% and the mangrove deforestation rate has reduced 60%.

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Appendix 3: The quest for sustainable charcoal initiatives: An alternative fuelwood programme case study

📍 Ambanja, Madagascar

Blue Ventures, Nitidae, Municipality, Fédération Miaramientagna
Association of Coastal Ecosystem Services (ACES)



Figure 12. Mantriavy and his fellow producers collecting the charcoal.
Photo credit: Cécile Schneider. [Image source](#)

Summary

In remote areas of Madagascar, mangrove wood has become a vital resource for communities used as cooking fuel and as building material. However, with accelerating population growth and increasing demand, especially in urban areas, the production of wood from natural resources and plantations alone is no longer sufficient to meet needs.

In Ambanja and neighbouring cities, only 18% of firewood demand can be met by sustainable firewood plantations, with the remainder coming mainly from illegal logging of mangroves and upland forests.

An alternative fuelwood programme was launched in 2015. It involved five fishermen and farmers who were interested in planting trees. The basic idea behind alternative fuel planting is to plant fast-growing trees (in this case brown salwood trees, known as *Acacia mangium*) that can be harvested in just three to four years. In this programme, Blue Venture assisted the landowner in the administrative process of obtaining formal land title from the municipality.

Impact

The right of access to land and resources is ensured, and there is no fear of being expelled from the country or having their farms and property destroyed. This incentive system and the mutual commitment agreement between the growers and Blue Ventures guaranteed the whole technical and administrative process and gave the growers the confidence to invest in the project. 40 growers have planted 105,000 trees, covering an area of about 100 hectares. By 2020, the trees had grown and were ready for harvest. In addition, more efficient carbonisation techniques have been introduced, so that for every kilogram of charcoal from Brown Salwood plantations, 8 kilograms of wood are saved from mangrove forests and reserves.

As with bee-hiving and ecotourism, the revenues are also used in community development.

Sources

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Appendix 4: Bee hiving: Nai Nang Case Study

📍 Nai Nang, Thailand

Mangrove Action Project



Figure 13. Local people in Thailand producing honey from the mangrove forests. [Image source](#)

Summary

In 2014, local people in Nai Nang village, Thailand, partnered with the Mangrove Action Project to produce honey in the mangroves forest while conserving the mangroves. The community-based mangrove conservation group consists of over 45 families from the village. With the technical support of the Mangrove Action Project, the villagers have learned to produce honey and a wide range of related products and developed bee-hiving based livelihoods.

Impact

The initiative provides additional income streams for the local people. In 2015, the village produced 270 kg of honey. Currently, 10% of the revenues generated from the honey and honey products are used to establish a community fund to conserve the mangrove forests. Additionally, the villagers collaborated with an adjacent hotel to showcase and sell their honey products.

Sources

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Appendix 5: Blue Carbon: Mikoko Pamoja project

📍 Gazi Bay, Kenya

Plan Vivo
Association of Coastal Ecosystem Services (ACES)



Figure 14. Mangrove plantation. [Image source](#)

Summary

The community of Gazi Bay, Kenya relies on the mangroves for the livelihoods, with 80% of the local people earning the living by fishing-related activities. Due to mangrove deforestation, in 2010, the local community partnered with UK charity Plan Vivo and the Association of Coastal Ecosystem Services (ACES) to embark on a blue carbon project, named the Mikoko Pamoja project

The project combines community-based reforestation of mangroves, as well as selling the blue carbon credits, which are generated by quantifying the carbon dioxide that the mangroves have removed. Additionally, the project took time to ensure that the needs of the community are met. The revenues and the use of the land were managed in a transparent way; therefore, the benefits and the restrictions are well understood by the participants.

Impact

The high-level participation and support from the local community have ensured that the project reached its targeted objectives. Additionally, besides selling the blue carbon credit to create new revenue streams, the project provides the opportunity for the local communities to develop other mangroves-related livelihoods, such as bee-hiving and ecotourism. The revenues are also used in community development, such as school construction projects and water pump installation.

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Ecological Infrastructure

Enhancing livelihoods through managing risk: strategies for forest regeneration and conservation in Freetown, Sierra Leone



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Abbreviations

DRM	Disaster Risk Management
FCC	Freetown City Council
NBS	Nature-based Solutions
REDD+	Reducing Emissions from Deforestation Cooperation Agency
SLURC	Sierra Leone's Urban Research Centre
UNEP	United Nations Environment Program

1. Executive summary

This research concludes a four-year project by the Bartlett Development Planning Unit at University College London in collaboration with the Sierra Leone Urban Research Centre. This report proposes nature-based strategies and explores their potential as well as limitations to create livelihoods, while also reducing risk and increasing resilience in Freetown, Sierra Leone. It examines sustainable pathways towards reforestation to secure social and environmental benefits, along with creating spaces for community engagement and participation.

Evidence clearly shows that Freetown's increasing population and geographical features, deforestation, and climate change make the area vulnerable to a variety of natural disasters. These disasters have severe adverse social and environmental costs, which often disproportionately affect low-income groups. Our report proposes strategic nature-based solutions to address these problems concurrently.

To ensure the proposed strategies address the needs of those vulnerable communities, we strongly advocate participatory approaches in the implementation of each strategy. Enabling the formation of community and peer networks to co-learn and produce knowledge will help overcome barriers in the implementation of nature-based solutions.

Our report suggests monitoring and evaluation strategies, which are crucial in ensuring the long-term viability of the project and in prevent illegal and destructive activities. Our suggestions include participatory approaches to monitoring that involve local community members as stewards.

Funding across both strategies was identified as crucial for the proposals, as the upfront costs of nature-based solutions can be substantial. The report, therefore, places emphasis on a variety of funding opportunities. Further, nature-based solutions are more sustainable in the long-term and they reduce and mitigate disasters, providing the city with substantial savings.



Photo 1. JB, 2013

2. Introduction

“In August 2017, a massive landslide near that area led to the loss of about 1000 lives in less than 5 minutes. This is not an abstract crisis. The loss of our forest is not just about the loss of some shade, it’s about the loss of our ability to live” – Yvonne Denise Aki-Saw-yerr, Mayor of Freetown

(Aki-Saw-yerr, 2020).

This report begins by examining Freetown, Sierra Leone, providing a spatial analysis of the peninsula, concentrating on the peri-urban areas and the surrounding forest. It then examines local and national forestry policies and Freetown’s reforestation and tree-planting efforts. The report identifies current livelihood activities as one of the main hinderances to these efforts as many low-income residents of Freetown rely on environmentally harmful activities for income.

In the next section, the report discusses disaster risk management and nature-based solutions. In Freetown, environmental degradation and, more specifically, deforestation have heightened the city’s vulnerability to disasters. This report proposes that nature-based solutions are ideal for managing disaster risk in Freetown, by restoring the area’s natural resilience, and presents strategies for forest conservation. By restoring trees and protecting existing forests, Freetown’s disaster risk can be reduced and mitigated. Further, through agroforestry and other strategies, such efforts can also provide sustainable livelihoods, removing one of the main causes of degradation and providing long-term sustainability. Such strategies can require significant funding and the report discusses funding needs and present possible opportunities.

3. Diagnosis and research design

3.1 Background and preliminary diagnosis

Though located on the ‘Forest Peninsula’ deforestation is rampant in the peri-urban areas of Freetown (Wadsworth & Lebbie, 2019) and within the Western Area Peninsula Forest. Regulatory attempts to halt environmentally destructive practices have failed to address the root causes, and combined with sporadic enforcement, do not adequately protect the forests. In Freetown, deforestation is caused by urban sprawl and invasive livelihood practices. Evidence clearly shows that a large portion of informal settlement dwellers and migrants depend on these activities for income generation, through the logging for timber, fuel wood and charcoal, and cutting down trees to clear land for mining, and agriculture (Munro et al., 2012). Deforestation contributes to soil erosion and soil destabilization which, together with climate change, increases Freetown’s vulnerability to natural disasters such as flooding, and landslides. As shown in figures 1 and 2 the urban expansion and high-risk areas are intrinsically linked (Jin et al., 2020). Natural disasters not only cause financial setbacks to development, but have high social and environmental costs that disproportionately affect low-income residents (Abraham, 2018; Cui et al., 2019). Freetown also faces risks from extreme and inconsistent flooding patterns, creating a highly unpredictable relationship with water and agriculture, which ultimately complicates urban planning. This lowers the city’s resilience and impedes development progress.

3.2 Spatial analysis

Freetown’s peninsula is drastically changing, as shown in figure 1. As illustrated in figures 1 and 2, the peninsula’s risk levels rise mirrors urbanisation and forest degradation.

Maintaining a strong border between urban activities and expansion of the forest is crucial to maintaining the reserve. This makes the dynamic border of the forest ideal for more strict forest conservation efforts. This area will therefore be the main focus of the strategies presented in this report.

The bulk of the existing forestry initiatives and the report’s suggestions to improve and expand such efforts should focus on the Western Area Peninsula Forest region and it’s boundaries along with the western coast, running from Ab-erdeen to Sussex. Research from previous years supports this and has identified the Forest periphery as the main target of such initiatives in order to reduce the encroachment shown in Figure 1.

GREEN INFRASTRUCTURE

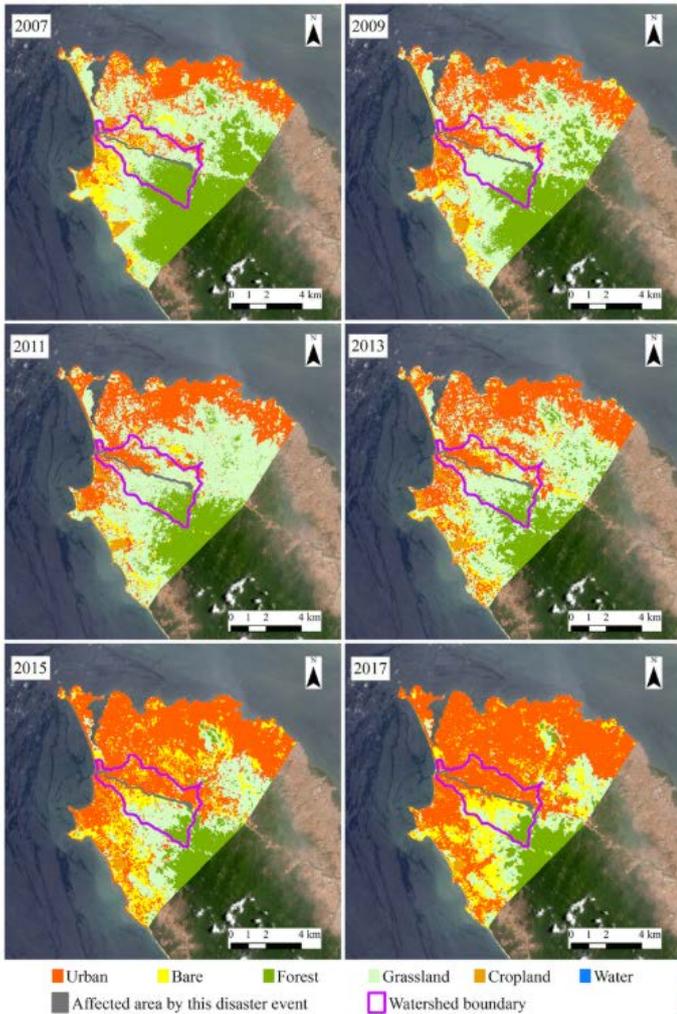


Figure 1. Land use change in Freetown 2007-2017 (Cui, 2019)

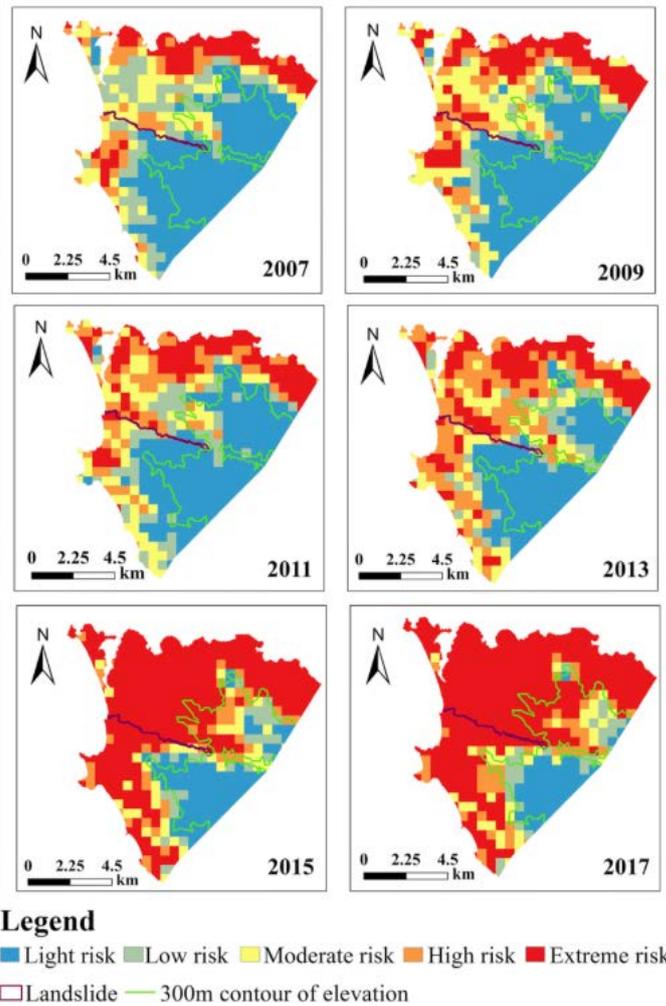


Figure 2. Distribution of ecological risk in Freetown 2007-2017 (Jin, 2020)

4. Sierra Leone forestry policies

Sierra Leone has several national policies addressing sustainable forest use under the overarching Forestry Act of 1988, the principal legislation governing the use of forest resources, shown in figure 3. The absence of definitional clarity when outlining what constitutes “forest” is one of the legal loopholes that enables environmental exploitation increasing the risk of disasters as mentioned above. These policies have been further criticised for not supporting the implementation of sustainable land management by local communities, particularly regarding their framing of land tenure and conflict resolution issues.

They also bypass traditional land tenure systems under chieftainships. Further, a 2008 revision to the Act allows land to be used for commercial logging by international industries alongside the state’s original ability to declare any land protected for conservation measures (FAO, 2015). The lack of tenure security can lead to a loss of forest resources relied upon for livelihoods by those who are socio-economically disadvantaged.

Freetown City Council (FCC) has recently made great strides to counter deforestation with the new Transform Freetown strategy. It is funded by the World Bank, through the Ministry of Finance and with help from the Environmental Foundation of Africa. Transform Freetown prioritises resilience and aims for better environmental management. It hopes to improve Disaster Risk Management (DRM), stakeholder communication, and environmental governance as shown in appendix 2.2.

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Figure 3. 1988 Forestry Act and its sub-policies and acts

One of the most prominent parts of this strategy is the #FreetownTreetown initiative which aims to plant over 1 million trees. This began in 2020 and has involved community members and community-based organisations receiving trees from local centres. The trees planted are tracked using the treetracker app. A representative from the Federation of the Urban and Rural Poor highlighted that approximately 99% of trees planted are surviving and the process is monitored by them through stewards (2021). Current initiatives and programmes are working to replant Freetown’s greenery, however little information has been made public on the qualitative data related to this initiative. The need for transparency and sharing of data through monitoring is one of the strategic improvements suggested in this report. Moreover, it is unclear how the FCC incentivises and promotes tree planting among disinterested landowners and groups.

A local climate activist who organises a similar initiative under the mentorship of Women4Climate, highlights the difficulty in convincing the older generations of landowners to plant trees. She explained that traditionally, trees are perceived as a less efficient use of space, and older generations are skeptical of climate change and other benefits trees may provide.



(Koroye-Crooks, 2020)

4.1 Analytical framework, definition of terms and research questions

This report conceptualizes disaster risk as the presence of a hazard (such as a landslide or flood event which are highly prevalent in Freetown), exposure to the hazard, and the capacity to act and the resilience of the people exposed (UNISDR, 2015). Here, resilience is understood as “the ability of a system and its component parts to anticipate, absorb, accommodate or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration or improvement of its essential basic structures and functions” (IPCC, 2012).

DRM includes understanding disaster risk, planning, strengthening governance to manage the risk, investing in risk reduction, and enhancing preparedness (UNDRR, 2015). The strategies proposed by this report are ecosystem-based disaster reduction methods. Such methods include the “sustainable management, conservation, and restoration of ecosystems” (Estrella & Saalismaa, 2013, p. 30).

Nature-based solutions (NBS) and the prevention of environmentally damaging activities are crucial to minimise environmental risks (World Bank, 2018). Well managed ecosystems can influence all areas of disaster risk (United Nations Environment Programme, 2020) from prevention, mitigation and supporting recovery efforts, as shown in figure 4. NBS can have numerous benefits, which are also shown in figure 4, benefits especially relevant to this report are increasing human resilience, by supporting livelihoods and providing for basic needs (PEDRR, 2013), along with improving environmental health and resilience. However, they do not inherently address socio-economic inequalities or injustices.

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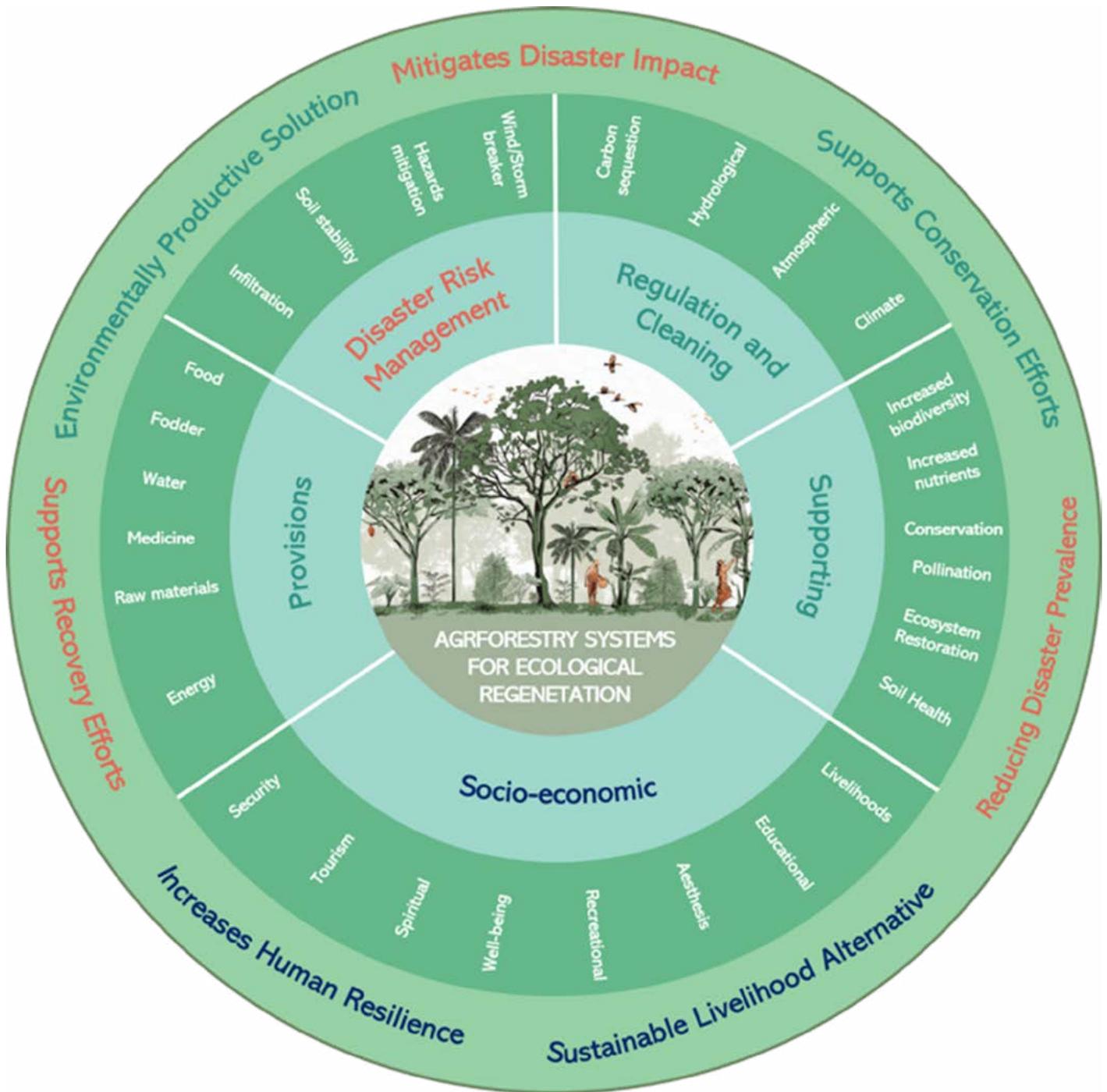


Figure 4. Agroforestry as a Nature-Based Solution for Disaster Risk Management

4.2 Research questions

How To Reduce Risks And Enhance Livelihoods Using Nature-Based Solutions?

1. How do current initiatives and programs in Freetown influence the environmental management of the peripheral forests?
2. How can redirecting forest activities towards agroforestry improve the environmental management of the peripheral forests?
3. How can agroforestry prevent disasters and provide sustainable livelihoods?
4. Which protection mechanisms can ensure resilience and where should they be implemented?
5. Which actors should be mobilized?
6. What financing is involved in such initiatives?

Figure 5. This project's research questions

5. Methods, objectives and limitations

5.1 Methods

The methodology was split into 3 stages, as shown by figure 6, with differing research methods for each stage. During the first stage, comprehensive background research was done, studying the area and local livelihood opportunities, disaster risk management efforts, and reforestation efforts, as well as the local and national forestry policies. During the next stage we spent several weeks identifying both local stakeholders and international projects that had relevance to this research and conducting expert interviews and meetings with relevant parties. At the end of this stage, we processed the collected data and used the information to identify opportunities and develop strategies to utilise nature-based solutions which reduce disaster risk, enhance livelihoods, and support forest conservation and reforestation efforts in Freetown.

5.2 Objectives

Currently the livelihood activities of many in Freetown, particularly those in lower income groups, result in deforestation. This not only causes environmental harm, but also increases the risk and prevalence of disasters, and reduces the city's resilience. The aim of this report is therefore to identify livelihood opportunities that reduce disaster risk and restore Freetown's environment, thereby benefitting not only those engaged in these activities but Freetown as a whole.

5.3 Limitations

Firstly, the interview stage took place in a constricted time frame. This was exacerbated by the COVID-19 pandemic and resultant restrictions, which made it challenging to obtain many interviews given global staffing cuts, work pressures, and internal procedures at many of the organisations contacted. Further, the pandemic made it impossible to visit Freetown and personally interact with stakeholders and others. Therefore, the report is based on secondary data, undoubtedly impacting the team's understanding of the issues. While facilitators at SLURC and interviewees were immensely helpful in bridging cultural and knowledge gaps, as many policy makers and project implementers could have their own biases. Frequent connectivity issues and differing time zones also created difficulties with communication. Additionally, while the writers have worked consciously to acknowledge the different backgrounds and perceptions, these are likely to have influenced the report.

STAGES	TASKS
Stage 1: Secondary Research [online]	<ul style="list-style-type: none"> • Desk-based research in tandem with lectures to gain insights, gather secondary data and problem frame • Video output showcasing and justifying the chosen direction of the report
Stage 2: Primary Research [online]	<ul style="list-style-type: none"> • Interview-based data collection • Interviews included participants local to Freetown, nationally as well as internationally -Members of FCC -Private companies -NGOs -Farmers in Freetown -Agroforestry experts in Africa and globally -International organisations • Interview material was centered around research questions
Stage 3: Output [online]	<ul style="list-style-type: none"> • Data processing and analysis of information relating to our chosen strategies and key concepts • Written report

Figure 6. Methodology table

5.4 Introduction

The report draws on lessons from projects summarised in Appendix 1.1-1.11 and intensive external research. This evidence has shown that the degradation of land, deforestation and illegal logging can only be effectively halted by reconciling community livelihoods needs and forest conservation (Bishaw et al., 2013; Kassie, 2018; Salazar-Díaz & Tixier, 2019; Alambo, 2020; Wekesa et al., 2021).

The following section recommends strategies that work towards regeneration and stronger conservation efforts for Freetown's periphery and Western Area Peninsula Forest to achieve sustainable environmental management. Concluded from previous years research the Forest periphery was identified to be targeted, in attempts to reduce the encroachment shown in figure 1. The project's three NBSs are as follows and are mapped out in figure 7:

- The analysis showed that more vigorous conservation efforts are required in and around the Peninsula Forest as demonstrated in figure 7. Consistent conservation efforts will help prevent misappropriation of forests for unsustainable activities.
- Regeneration activities can complement this and are required in deforested areas which are in danger of becoming overly urbanised. It should also be focused around the reservoirs that are crucial for Freetown's water supply.
- Based off similar projects, agroforestry is most suited to the areas surrounding the Peninsula Forest and can provide a buffer zone slowing encroachment while supporting regeneration and conservation efforts and sustainable livelihoods for Freetown's citizens.

Targeting the areas shown in figure 7 can form a protective green belt in order to increase environmental health of the peninsula, thus reducing the speed of uncontrolled urbanisation (see figure 1). This would also support Freetown's DRM efforts, by reducing the high-risk encroachment shown in figure 2. Although further inclusive participatory mapping would be required for specific areas to be identified for protection, regeneration and agroforestry. Increased community inclusion and participation is required for the strategy to work both in the short term and long term.

This report addresses a complex set of challenges and is comprised of three linked parts: increasing conservation efforts, increasing sustainable livelihoods and increasing participatory efforts. These are essential for success of this strategies which build upon Transform Freetown Environmental Management Strategies in their resilience section, with a focus on Target 2 (Appendix 2.2). That are trying to "to undo some of the damage that rapid urbanisation and a lack of urban planning have done to what were once Freetown's lush green mountains..." (FCC, 2019). Each strategy also aligns with numerous Sustainable Development Goals, also known as SDGs (see figure 10).

Forests are estimated to save between USD 2–3.5 billion per year equivalent in disaster damage restoration of key forest ecosystems (FAO, 2013).

As explained in figure 8, natural disasters come at a high social and economic cost. The natural DRM benefits that forests provide can reduce the financial burden caused by Freetown's frequent disasters. They help mitigate the impacts of disasters, can support recovery efforts and help to prevent protracted crises. This frees up funds to enable an increase of Transform Freetown's financial capacity, which were said to be a challenge for implementation (FCC, 2021).



(Molina, 2020)

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Freetown | Overview of Natural Hazards

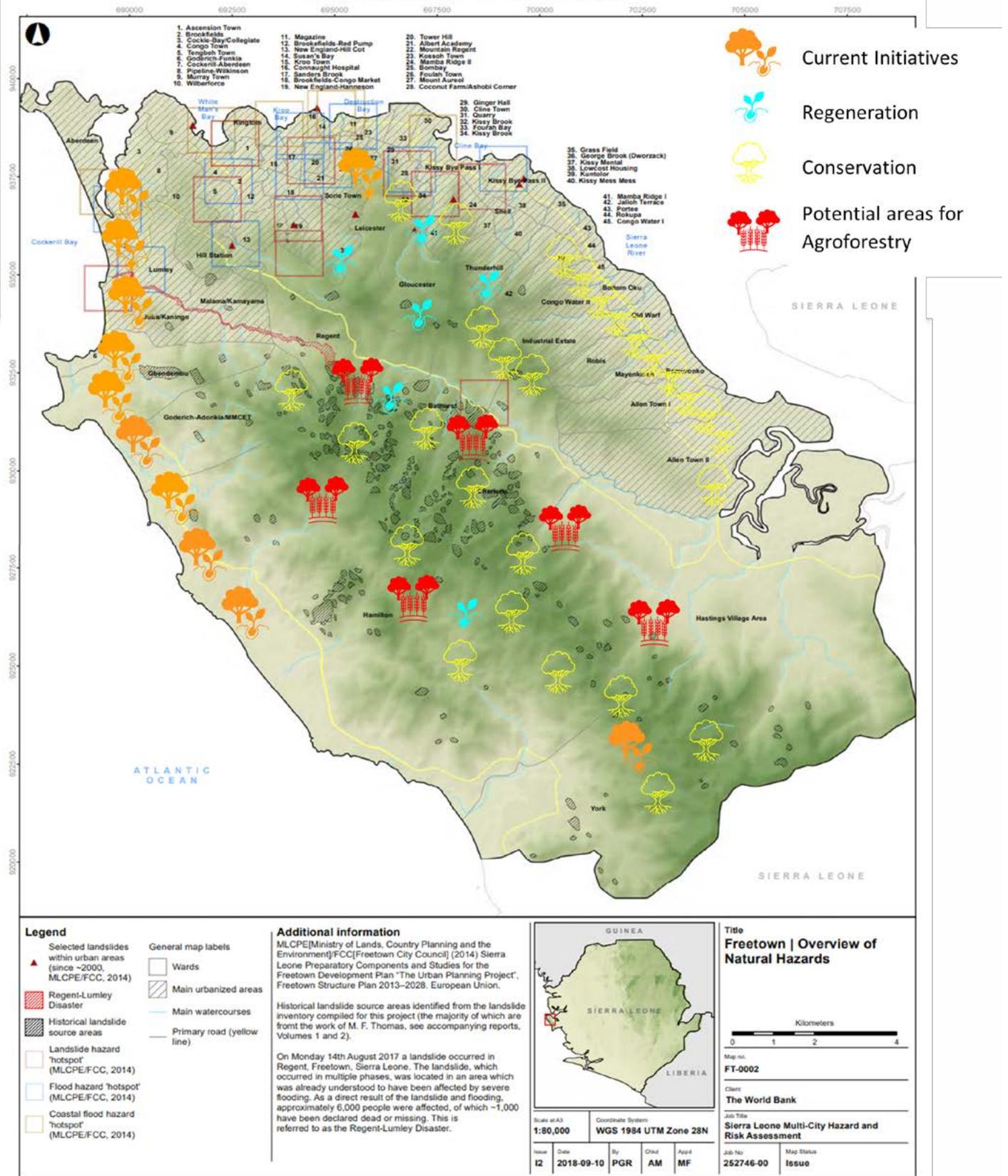


Figure 7. Preliminary recommended areas for the strategies, also displaying Freetown's natural hazards (Modified - World Bank, 2018)



Figure 8. Ecosystem Management Infographic

5.5 The overarching conservation approach

“Ecosystem services link ecosystem processes directly or indirectly to people’s quality of life” (De Leijster et al., 2021; see figure 4). Such an assertion is particularly relevant to the context of Freetown, where the consequences from the degradation of forest ecosystems, are evident from the frequency of natural disasters and have mostly impacted vulnerable and marginalised populations. As shown in figures 1 and 2, the majority of the urban areas near the forest buffer and the buffer zone itself are at high risk of disasters and require conservation practices to slow encroachment, especially at the northern edge of the forest. A strong buffer zone will help stabilise the soil and increase environmental protection, thus reducing and mitigating the intensity of both flood and landslide events.

Sustainable management of forests can contribute to livelihood and disaster resilience, playing a crucial role in providing food, water, energy, shelter and raw materials while buffering the impacts of climate change (FAO, 2019; figure 4). This will be highly beneficial for Freetown’s residents, especially those living in informal settlements which tend to be located in risk prone areas. Building upon Transform Freetown’s environmental initiatives, the report’s strategies propose a transition away from unsustainable levels of logging and deforestation into agroforestry, balancing resource use and conservation to increase Freetown’s resilience while supporting citizens livelihoods (Foresta, 2013; Nishi et al., 2021). To effectively reduce disaster risks on the peninsula, careful planning, selection of trees, spatial awareness, and community inclusion are necessary. As mentioned in figure 4, trees anchor the soil on slopes, reduce the prevalence of landslides and floods, counter the effects of climate change, thereby strengthening long-term resilience. This is particularly relevant in Freetown, where stronger conservation efforts can support slope stabilisation on Freetown’s peninsula’s hills. This is crucial, as the city’s water supply comes from reservoirs in the surrounding hills which are highly dependent on adjacent forests and it’s health. Reforestation and conservation strategies offer a cost-effective way to support water security and reduce risk levels shown in figure 2, providing socio-environmental resilience and justice to Freetown.

Two main groups of government actors must be mobilised to facilitate the transition to sustainable livelihoods through NBSs. The first group consists of the Ministry of Environment, the Ministry of Agriculture, Forestry and Food Security, and the Environmental Protection Agency. These agencies can strategically support the implementation of NBS in accordance with regulations. The second group includes the Ministry of Social Welfare, the Ministry of Planning and Economic Development. These groups can support the transition to sustainable livelihoods.

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Mobilising these different groups concurrently can form a framework that encourages the participation of citizens in complimentary sectors and creates a platform for other stakeholders from community levels, industry, and organisations to collaborate.

The immense complexity of NBS means that there are innumerable actors and stakeholders that have the potential to be mobilised. Stakeholders are project specific, for example, livelihood projects should include those whose livelihoods may be impacted, and DRM projects should include those most exposed to hazards, such as people living or working in high-risk areas. Similarly, private sector groups such as logging and mining companies whose interests may be affected should be a part of the process. Other actors such as government, universities, and NGOs who can offer expertise and help with implementation should also be included.



Figure 9. (Reid & Bruce, 2018)



Figure 10. (Sims & Hurrel, 2018)

6. Forest regeneration

6.1 Sustainable livelihoods through Agroforestry

The report builds upon the 553 green jobs created by Transform Freetown and improves opportunities and access to sustainable livelihoods. It proposes the transition from livelihoods that rely on environmentally destructive practices, to opportunities that provide incomes while also benefiting the environment.

“The potential of agroforestry to contribute to sustainable development has been recognized in international policy meetings, including the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD), justifying increased investment in its development”
(Climate ADAPT, n.d.)

Agroforestry is a sustainable land management strategy that rehabilitates degraded ecosystem services and is of utmost importance for long term urban planning in Freetown (Garrity, 2012; Kidd & Pimental, 2012; Kimball, 2016). Due to Freetown’s challenges, including environmental exploitation and degradation, the research and interviews concluded that agroforestry was the most economically viable, productive solution and other researchers have concluded the same in their areas (Kürsten, 2000; Lorenz & Lal, 2014).

Agroforestry is a land-use system that can provide multi-purpose ecosystem management by integrating spatial or rotational growth of woody perennials with plant crops (agro-silvicultural systems) and/or livestock (silvopastoral), while diversifying Freetown’s residents income revenues (Husak, 2000). Niagi, found that agroforestry can provide this diversification (2018). Transform Freetown has already identified 12 economically viable species that can be used within agroforestry.

In Freetown, where strategic land management is imperative, redirecting forest activities to agroforestry can provide communities with alternative and/or efficient land uses by combining agriculture, husbandry and forestry. Ecosystems are also vital for sustaining livelihoods and agroforestry can be implemented to create sustainable income-earning opportunities (Sudmeier-Rieux et al, 2006; Interview with representative from Soufood Forestfarm, 2021). As previously mentioned, current livelihoods, especially of poor residents, in Freetown often depend on destructive practices such as

mining or logging. These practices contribute to the reduction of Freetown’s resilience to disasters, and it is crucial to reverse this to reduce and mitigate further disaster events.

“Farmers are looking for new ways to widen their farm revenue as food markets become unpredictable. They are finding these answers in agroforestry”
(Kenya Forestry Service Official, Njagi, 2018)

Interviews and case studies, summarised in Appendix 1.1-1.11, show the ways in which agroforestry can benefit Freetown. They do so by demonstrating their effectiveness in halting land degradation, deforestation, and illegal logging, conserving forest land, and providing income earning opportunities for low-income communities.

In Freetown agroforestry can change the perspective on the socio-economic benefits of conserving the Western Area Peninsula Forest, through the production of both local (fuelwood, timber, fruit and fodder) and global commodities (as coconut, coffee, tea, cocoa, rubber and gum), among other benefits (figure 4). Redirecting forest activities to a more sustainable land management method, like agroforestry, improves Freetown’s environmental health. This in turn increases Freetown’s resilience and helps prevent protracted crises.



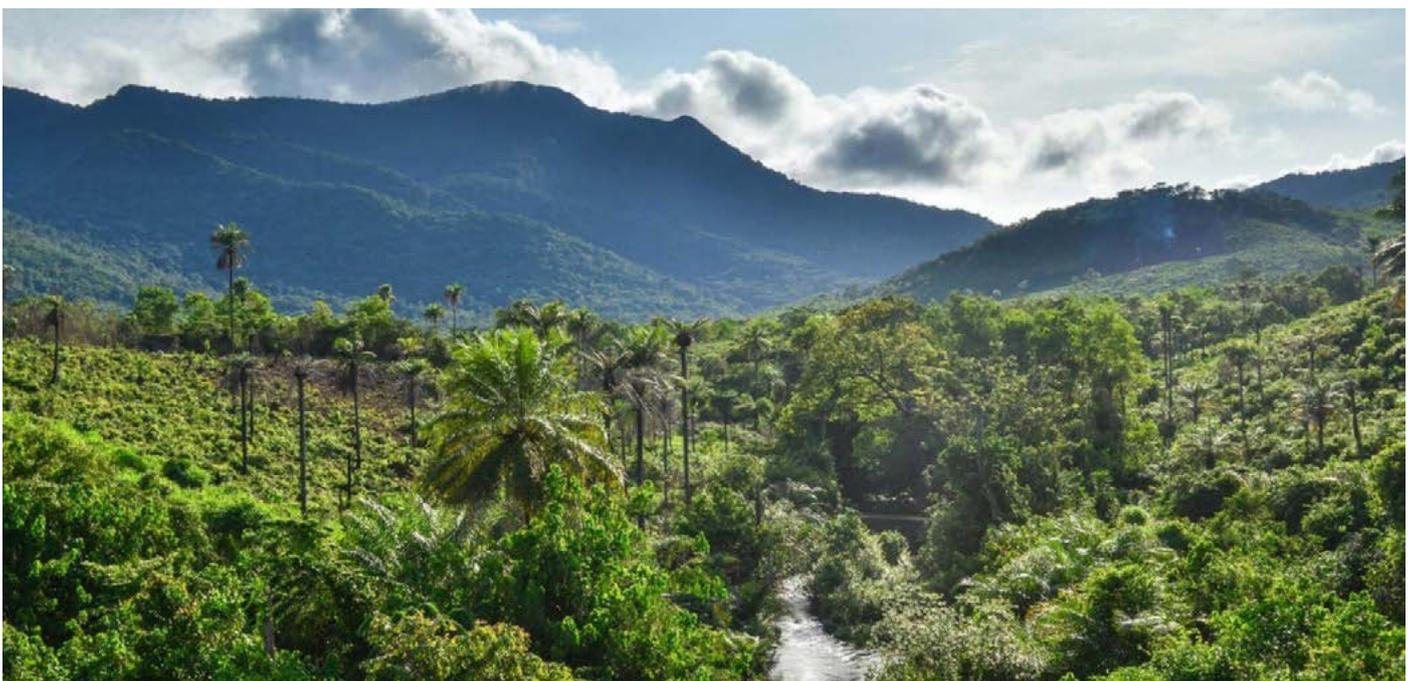
Figure 11. (Sierra Network, 2020)

6.2 Limitations of Agroforestry

Agroforestry is not a universal solution for agriculture and forest conservation (Kiyani et al. 2017).

- **Space and Time:** It is difficult to persuade communities and farmers to utilise agroforestry systems due to time and space constraints. From planting to harvest, the development of agroforestry remains a multi-year, sometimes multi-decade commitment. Many might envisage the planting of short-term cash crops as more immediately productive use of space. This is especially of concern in Freetown where interviewees have mentioned concerns including existing skepticism towards the benefits of trees and a premium on space due to urban expansion.
- **Natural disasters and pests:** Ongoing contingency planning and proactive pest management, together with plantation insurance are vital to protect fields from diseases and natural risk (e.g. drought and risk of fires) which can destroy seasons of growth. However, diversifying species reduces the spread of pests and diseases (Interview with representative from Soulfood Forestfarm, 2021) while the sustainable land management planning of agroforestry can include more fire-resistant species and fire breaks (Interview with representative from Bambra Farm, 2021).
- **Land Tenure:** Spaces dedicated to the implementation of agroforestry systems should be protected by tenure security to avoid their sale or redevelopment. Unfortunately, the literature and interviews conveyed there are ongoing issues surrounding land tenure in Freetown.
- **Local engagement:** Often agroforestry initiatives have failed due to poor community engagement. For fairness and equity, policies need to shift the power of forest management towards local communities to ensure these are not merely handed responsibilities but are part and parcel of decision-making (Chomba et al., 2015; Chomba, 2017). Community networks are part of this report's recommendations and will be a helpful platform to utilise for local engagement and involvement efforts.
- **Biodiversity:** Agroforestry systems must be adapted to the specific ecological landscape and biodiversity context of Freetown's Western Area peninsula forest. Any uninformed decisions to plant trees risk of introducing invasive species, leading to competition over nutrients, sunlight and water.

Figure 12. (TailorMadeAfrica, n.d.)



7. Forest conservation

7.1 Forest Protection and Monitoring

Monitoring and evaluation are crucial for ensuring NBSs are sustainable. It is important to find and maintain the balance between conservation and resources extraction, by ensuring the reducing illegal activities to protected areas. Many mechanisms are available but based on our interviews a co-management approach of participatory and state is likely to provide the best outcomes with Freetown's complex structures and relations.

As primary users of the ecosystem the community, especially women and young people, are essential for transformative change (Wekesa, 2021). Therefore, the protection mechanisms need to be inclusive and accessible to all. Lessons from the Solaridades programme could prove beneficial for gender inclusion (Appendix 1.9) to aid with Freetown's transformative change to a more sustainable and resilient community and city. Evaluating progress through indicators is crucial, not only to determine the effectiveness, but to increase benefits (see figure 4) while overcoming any skepticism that the interviews warned about (Kumar et al., 2021).

Developing the role of stewards in Freetown could be highly beneficial because stewards have played an important roles in many agroforestry projects (Appendix 1.11). Environmental stewards are individuals or groups that conduct activities which protect, care for, or responsibly use the environment. Although #FreetownTreetown labels all that plants trees as stewards, the role does not seem to include regular monitoring and maintenance.

This report suggests refining the concept of stewards in Freetown to set up a support network for current stewards, to ensure the monitoring, protection and maintenance of the initiatives. While the network's fundamental role would be the care of the Freetown's ecosystems, it can also help to fill the capacity gap mentioned in TransformFreetown's overview (FCC, 2021). A representative from Women4Climate mentioned that Freetown has already taken steps in this direction by connecting with like-minded individuals such as the youths in Women4Climate (2021). They are also looking to train communities in biodiversity and carbon stocks in phase 2 of FreetownTreetown (FCC, 2021).

Stewards may also be involved in protection and conflict resolution, working as forest rangers or guardians. This is the method adopted by Reducing Emission from Deforestation and Degradation (REDD+) programmes, including the project in Sierra Leone's Gola Forest (Appendix 1.11) and by developing the role of stewards in Freetown these

mechanisms can be very useful for protecting Freetown's environment. Monitoring is important to ensure that the incentives are transparent and reach the intended participants. Additionally, protection measures should suggest alternative livelihoods to those affected. However, adequate funding is needed to ensure the project's success.

There is also potential to build upon Freetown's

Treetracker app to allow for reporting and statistical analysis. An interoperability platform could be used to see the specific areas around Freetown and peninsula forest that require more protection. ForestLink is a real-time community-based monitoring tool that connects local people with law enforcement in efforts to stop illegal logging and deforestation. Incorporating a bespoke system like ForestLink, allows communities to send alerts and evidence, even in areas with non-existent or limited connectivity (Appendix 1.2) and avoid putting themselves in harms way.

This strategy increases monitoring and develops the role of stewards, and will serve as a good starting point for protection mechanisms in order to build Freetown's resilience. This strategy should be implemented across the peninsula with focus on the Western Area Forest's boundary, shown in figure 7, to reduce illegal degrading activities and risk encroachment.



Figure 13. (TrillionTrees, n.d.)

7.2 Financing

One of the challenges Transform Freetown faces is a lack of funding (FCC, 2021). The city should continue exploring diversified funding possibilities and gradually reduce its dependence on aid, by creating internal investment opportunities through public and private services provision. This could be maximized and further enhanced by using technological innovation in forest monitoring and protection (SGP, 2013).

Blended finance approaches are becoming increasingly common, because they leverage the strengths of multiple sectors and overcome the limiting factors of singular financing methods. Authorities can access financing from a variety of sources, including donations, municipal and private sector funds, international green finance and public-private partnerships as shown in figure 9, which can be utilised to support these strategies. Private sector actors can enable the scaling of agroforestry projects in Freetown for livelihoods, and the case studies demonstrate the potential of agroforestry to generate profits at local and international levels (Appendix 1.9).

Funding for NBS is also available from international organisations who often fund community-wide training schemes for livelihood projects (Clark-Ginsberg, Blake & Patel, 2020; Appendix 2.3). Importantly, such funds should be directed towards projects which can become self-sufficient through training schemes, providing Freetown and its residents with long-term independence (Interview with representative from Soulfood Forestfarm, 2021) as outlined in the report’s second strategy.

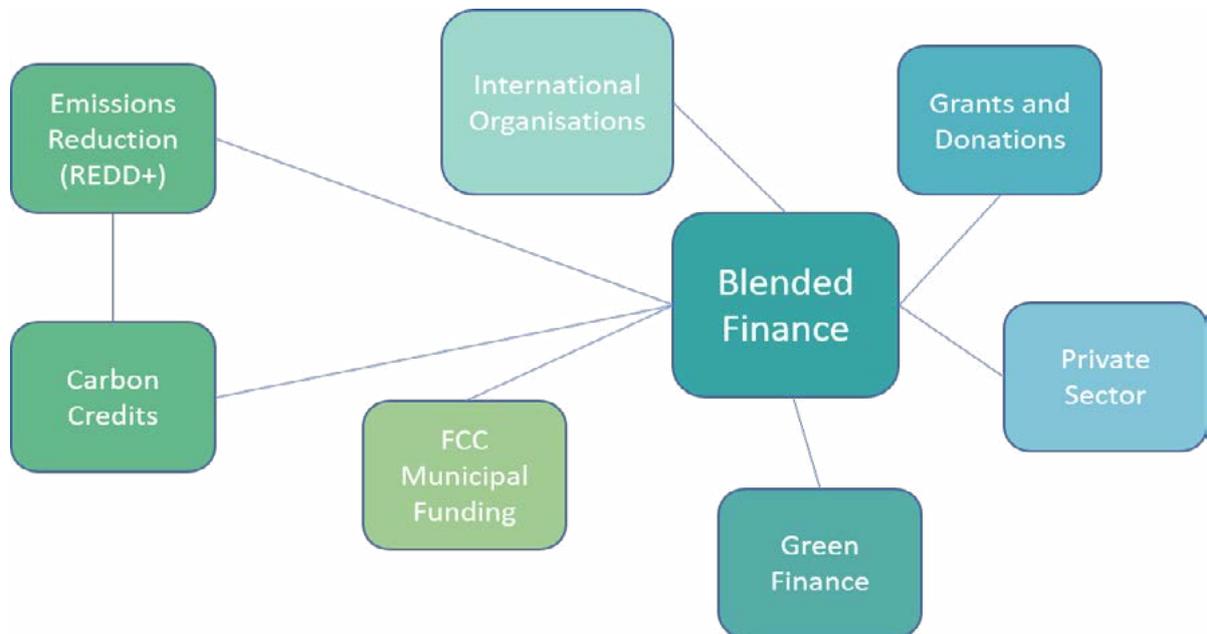


Figure 14. Blended finance schematic overview (Willox, 2021) (see Appendix 2.3 for a detailed breakdown)

Strategy	Regeneration	Monitoring & Protection
	Increased conservation efforts through NBS and environmental protection	
Sub-strategies	Agroforestry for Livelihoods	Environmental Protection & Monitoring
Breakdowns	<ul style="list-style-type: none"> • Mobilising the relevant stakeholders for training and access to necessary resources • Investigating into suitable species for economic and environmental purposes for recommendations • Encouraging the transition into agroforestry • Facilitating inclusive and accessible training • The creation of an accessible space for communities to participate 	<ul style="list-style-type: none"> • Enhancing the role of stewards • Increasing Freetown's monitoring and evaluation • Developing the Transform Freetown Treetracker app, to allow for the interoperability and sharing of data to report: <ol style="list-style-type: none"> 1. Tree health 2. Illegal activities 3. Distribution of degradation 4. Along with the sharing of knowledge for species characteristics and merits
Desired outcomes	<ul style="list-style-type: none"> • Increased environmental resilience through environmental health and security • Increased human resilience through food, water and livelihoods • Diversification of sustainable incomes • Increased resilience to disasters • Utilizing native techniques 	<ul style="list-style-type: none"> • Increased environmental health and therefore resilience • Reducing the risk of natural disasters • Allowing for the live updates • Training for stewards, conservation and regeneration accessible and inclusive, especially to women and youth • Empowering community protection
Sustainable Development Goals	1,2,3,5,6,7,8,9,10,11,12,13,15	1,3,4,5,8,9,10,11,12,13,16,17
Transform Freetown Goals	Target 1, Initiative 1 Target 1, Initiative 3	Target 1, Initiative 2 Target 1, Initiative 3
Measuring Outcomes	<ul style="list-style-type: none"> • Regular monitoring and mapping of land use change • Livelihood surveys to monitor the diversification of livelihoods 	<ul style="list-style-type: none"> • Percentage breakdown of those involved • Regular compilation of data to ensure protection of Freetown and the Western Area Peninsula Forest

Figure 10. Strategy Breakdown

8. Recommendations

8.1 Governance Changes Needed

As mentioned above, past policies in Sierra Leone have been criticized for their lack of local governance and stakeholder awareness. Transform Freetown aims to improve environmental governance (Appendix 2.2), which is key at all levels to ensure the uptake of sustainability measures and decrease the risk of disasters. This relies on thorough multi-stakeholder mapping and involvement, allowing for different perspectives and priorities to be incorporated throughout the process. Furthermore, for successful community-led forestry programmes, authorities should be chosen in a democratic, accessible and inclusive process. Participatory conflict resolution and knowledge systems are more likely to achieve accountability as this is undertaken.

8.2 International Funding Opportunities

Freetown's governance structures are highly complex, due to its large and dense population, ministerial compositions within the political sphere, and economic structures (Rydin et al., 2012). Transform Freetown encourages a mixing of state and non-state action, based on the consultation of external stakeholders. International organisations and private sector companies are key financial stakeholders in the three main areas of DRM: preparation, short-term response and long-term recovery (Changra, Moen, & Sellers, 2016). Public pressure and the climate and social missions of companies incentivise private donations to disaster relief funds, both directly to governments and to charities. International organisations often fund DRM more holistically, funding community-wide training schemes, grassroot initiatives, and prevention efforts, as well as providing relief when disasters occur. For example, United Nations Environmental Programme has funded NBS to disaster risk reduction in Afghanistan, reforesting hillsides to reduce and mitigate flood events and landslides (Appendix 1.14). Freetown will likely be able to utilise similar funding opportunities for the NBS to disaster risk reduction suggested in this report. Due the costs associated with reversing degradation (Löff et al., 2019), NBS implementation for DRM, is a worthwhile funding approach.

Carbon credit schemes are also highly sought after by international organisations, who are looking to invest in green financial initiatives, such as Carbon Neutral goals (Interview with representative from Viresco Solutions, 2021). Freetown can secure private investment through such initiatives. While the finances and administrative implementation processes can be complex initially (Interview with representative from Viresco Solutions, 2021), the inclusion of forest users and communities and stewards will create opportunities for all and reduce complexities over time. Such initiatives have been made more accessible by technologies like the ForestLink tracking app, which could be developed to meet the monitoring and reporting requirements of carbon monitoring schemes.

8.3 Community Support Networks

The research and interviews have shown that many NBS projects, especially agroforestry, benefit from the formation of support networks. People often prefer to learn from and talk to their peers, instead of unknown persons and experts (Interview with representative from Australian Agroforestry Foundation, 2021). These networks provide support, expertise, and training along with many more benefits. Further discussion of these benefits can be found in our Australian Agroforestry Foundation case study (Appendix 1.1). Moreover, as discussed, community involvement is essential and support networks can help ensure participation. Expert interviews have highlighted the importance of a change in mindset towards prioritizing sustainable practices and highlighting their benefits (Representatives from Australian Agroforestry Foundation, Green Planet Initiative 2050, and Soulfood ForestFarms, 2021). Women4Climate have already established a mentoring initiative, but this report recommends a peer network to support the transition and continuation of sustainable livelihoods along with conservation and protection efforts. Building upon this network or forming a forestry specific one, can help to change the mindset surrounding trees. The importance and challenges of creating a mindset shift was identified by a representative of Women4Climate.

9. Conclusion

The report has discussed strategies and recommendations that work towards conservation, while also mitigating disasters, creating livelihoods, and building resilience in Freetown, its periphery, and the Western Area Peninsular Forest. These strategies build upon Transform Freetown's goals while working towards achieving sustainable environmental management. Nature-based solutions and agroforestry provide sustainable land-management systems and alternatives to current unsustainable and destructive livelihoods and activities that rely on Freetown's natural resources base, such as logging and charcoal production. These strategies also improve environmental health; reduce and mitigate natural disasters in Freetown, including flooding and landslides that are common; and provide Freetown with increased food and water supplies, and overall livelihood security.

The research and interviews concluded that the Western Area Peninsular Forest is ideal for increased conservation and regeneration efforts, while Freetown's periphery and forest would be a suitable for agroforestry efforts, and would form a protective green belt around Freetown.

This integrated conservation and livelihood approach has the potential to: reduce forest destruction in Freetown, enhance landscape connectivity for biodiversity conservation, increase incomes, enhance capacity of Freetown to adapt to climate change, improve food security, enhance carbon storage, strengthen traditional local knowledge and practices, as well as ensuring the availability of clean water for the local population. To ensure the success of current efforts and future endeavours, protection, monitoring and evaluation are crucial. Those strategies suggested in the report build from existing Freetown initiatives, including the stewards and treetracker app. Funding options have also been discussed to overcome the challenges that the TransformFreetown overview has mentioned regarding capacity and funding.



Figure 15. Young Coffee PLantation using Agroforestry methods in Ecuador (Shutterstock, n.d.)

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Learning from innovation around the world



01 Australia's Agroforestry Foundation

02 Credit to Robyn Stewart, Real-Time Monitoring Project Coordinator and Stephane Piedjou ForestLink App Developer

03 Sustainable Charcoal Business Model

04 Transformational management of Taita Hills Landscape through Agroforestry

05 Intercropping systems and wood pastures

06 Soulfood ForestFarms

07 Solidarides - Agroforestry in Freetown

08 Mountain Partners - Applying Ecosystem-based Disaster Risk Reduction for Sustainable and Resilient Development Planning

09 The REDD+ Gola Forest

Global

CGIAR – Forests, Trees and Agroforestry (FTA)

Forest Governance in DRC: An Analysis from Actor's Participation in REDD+ Policy Development

Appendix 1: Australia's Agroforestry Foundation

📍 Australia

Agroforestry Foundatuion



Figure 16. [Image source](#)

Summary

Australian Agroforestry Foundation is a non-profit organisation that is working to provide the training and, upon graduation, a network of support that helps farmers and surrounding actors.

The Master TreeGrower Course is an eight-day field-based course spread over 2 months providing skills, confidence, and support networks to transition into agroforestry. The programme steers participants towards specific species, and management possibilities and encourages participants to work towards being a master tree grower themselves. This course provides farmers with essential knowledge and expertise in numerous areas; multipurpose farm tree design with tree growth and management, including the economics, rules and regulation, forestry measuring for ecological services including carbon, markets for tree products and services (timber, biofuels, bushfoods, essential oils and carbons), and the benefits and role of trees on farms. All participants receive institutional and commercial support. Each course is specific to the region and is adaptable to the time constraints of the group. Upon completion of the course participants are equipped to manage native vegetation and agroforestry on their property, as well as gaining a better understanding of community organisations, industry groups, catchment authorities and government interests.

This course has been modified to be utilized internationally and has been run in Uganda, Indonesia, East Timor, Niger, and Zimbabwe (AAF, n.d.a).

Impact

The peer group mentoring networks comprise the second aspect of the foundation. Research has found peers to have a greater impact on interests and decision making and the Foundation's experience has shown this to be the case. The peer group mentoring network's concept 'improv[es] the quality of discussion' and provides validation, interpretation of concepts and ideas for adaptation through trusted relationships among families and likeminded farmers. The networks provide advice and support that is unique to each farm and farmer to develop and maintain participant's agroforestry projects along with providing access to the complex local networks or researchers, service providers, and government agencies (AAF, n.d.b).

The foundation's network increased importance on sustainable techniques and promotes the farmers' wishes and decisions.

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Appendix 2: Credit to Robyn Stewart, Real-Time Monitoring Project Coordinator and Stephane Piedjou ForestLink App Developer

📍 United Kingdom

Rainforest Foundation UK



Summary

Rainforest Foundation UK, together with its partner organisations in Cameroon, successfully launched the ForestLink app, a real-time community-based monitoring tool that connects local people with national law enforcement in an effort to stop illegal logging and deforestation. ForestLink started being developed around 2015 with a view to use technology to empower indigenous people and forest communities to defend and protect their lands. Through the app's system, alerts can be sent by local communities and are then forwarded to Rainforest Foundation UK local partner organizations, based in each country where the tool has been implemented. Furthermore, the access to the app's database is shared with local law enforcement authorities who are able to monitor alerts that are coming from community members and take action and act upon it. What makes ForestLink different from other forest monitoring tools is its inclusionary design vision. The app is in fact been designed to work in the absence of phone connectivity and internet connection by using satellite

systems. Another inclusionary measure adopted by an interviewee, a ForestLink developer, was to make the app highly visual, so it is user-friendly to computer novices and illiterate users. This provides communities far from phone or internet connections area with the opportunity to be heard as well as offering the competitive advantage of gathering a greater amount of data. Moreover, the app also planned to minimize risk exposure of community members and forest guardians by implementing an anonymising system to filter alerts. Undoubtedly ForestLink holds a huge potential. Rainforest Foundation UK is currently working to scale this system and use it outside of forest monitoring to report different sorts of alerts, such as harassment or threats.

Impact

ForestLink was deployed and tested in Democratic Republic of Congo, Ghana, Cameroon and Peru where nearly 60 community observers have already been trained and are using the technology. Hundreds of alerts have successfully been sent by trained community monitors, leading to police and regulatory interventions. In Cameroon collected real-time alerts from communities have contributed to inspired government intervention and legal action (including fines, suspensions and timber seizures) against illegal loggers. In Peru reported alerts have led to arrests and the seizure of mining equipment across the Madre de Dios region.

Source

RainforestFoundationUK (n.d.). Rainforest Foundation UK: Securing lands, sustaining lives. <https://www.rainforestfoundationuk.org/>

Appendix 3: Sustainable Charcoal Business Model

📍 Kenya

Summary

In Sierra Leone, domestic trade of timber and fuelwood products comprise an informal sector employing a substantial proportion of informal dwellers. In particular, the woodbased commodities produced from Freetown's Western Area Forest Reserve service essential household activities such as cooking, as well as the sustenance needs of urban residents such as housing construction, furnishing, and so on. The end of the civil-war marked a massive increase in the production and consumption in urban areas - most notably in Freetown - of a particular wood-based commodity: charcoal. Charcoal has an important role in the capital's informal economies, accounting for nearly the total share of charcoal in national energy balances and national charcoal production. Its production, however, has a huge environmental impact, driving illegal logging and deforestation leading to natural disasters, including the mudslide in 2017. Analysis of the domestic charcoal trade in Sierra Leone (Table 1) shows that its production and commerce have the potential to be quite a profitable activity. This aligns with the narratives of charcoal producers who reported increased living standards once being employed in the sector. An interviewee and landscape ecologist at KEFRI has explored the potential of applying Sustainable Business Models to informal charcoal producing enterprises in coastal Kenya. His findings highlight how incomes from charcoal business positively affect several Sustainable Development Goals (SDGs) by reducing, if not eradicating, poverty and supporting basic livelihood needs (Table 2).

Impact

Similarly to Sierra Leone's timber export ban, Kenya's government attempted to halt the expansion of illegal logging by imposing a ban on charcoal production. According to them, bans and/or restrictive measures can be ineffective and counterproductive, as they fail to take in account the lack of alternative livelihoods opportunities. Instead, he advocates for the strategic transition of the charcoal sector to sustainable business models that contributes to the development of environmental conscious enterprises.

They also pointed out that streamlining charcoal production could bring improved economic value. While charcoal businesses do provide revenue opportunities, the research uncovered that in many cases the profits are not sufficient to lift participants above the poverty line. The sustainable business model guides a transition to sustainability in the charcoal sector, including implementation of charcoaling technologies that prevent accidents, reduce losses and enhance quality management, efficient kilns, and optimised tree species selection. Tree species such as *Acacia spectabilis*, *Sesbania sesban*, *Acacia polyacantha*, and *Acacia xanthophloea* that coppice after harvesting and grow very fast are suitable for sustainable charcoal production.

GREEN INFRASTRUCTURE

	ITEM	OFFICIAL PRICE (Le)	UNOFFICIAL PRICE (Le)	TYPE	#	OFFICIAL ANNUAL TOTAL (Le)	UNOFFICIAL ANNUAL TOTAL (Le)	
COSTS	Cost of Charcoal at source village	6,000	6,000	per bag		72,000,000	72,000,000	
	Charcoal Production license	200,000	0	per month	12	2,400,000	0	
	FCC registration	150,000	100,000	annual fee	1	150,000	100,000	
	NRA tax	250,000	250,000	annual fee	1	250,000	250,000	
	Forestry retail fee	500,00	0	annual fee	1	500,000	0	
	Transport	6,000	6,000	per bag		72,000,000	72,000,000	
	Transport permit	30,000	30,000	per trip	24	720,000	720,000	
	Charcoal ground fee	12,800	12,800	per visit	24	307,200	307,200	
	TOTAL						147,327,200	145,377,200
	REVENUE	Charcoal	22,000		per board	12,000	264,000,000	
ANNUAL PROFIT						115,672,8000	118,622,800	

Table 1. Charcoal Profits

Sources

FAO (2012). The Domestic Trade in Timber and Fuelwood Products in Sierra Leone: Current Dynamics and Issues. Available at: http://static1.squarespace.com/static/55b0533ce4b04e4467333254/t/567a33e0dc5cb-468974ffb35/1450849248072/final_report_-_fuelwood_and_timber_trade_in_sierra_leone.pdf (Accessed: 15 May 2021).

Mutta, D., Mahamane, L., Wekesa, C., Kowero, G. and Roos, A., 2021. Sustainable Business Models for Informal Charcoal Producers in Kenya. Sustainability, 13(6), p.3475.

SUSTAINABLE DEVELOPMENT GOALS		IMPACT FROM CHARCOAL PRODUCTION
Goal 1	End Poverty	Reliable income Source.
Goal 2	End Hunger, Achieve Food Security	Investment of charcoal income for the purchase of food products.
Goal 4	Ensure Inclusive and Equitable Education	Investment of charcoal income for education costs.
Goal 15	Protect, Restore and Promote Life on Land (forests)	Based on sustainable forest management charcoal production can foster soil fertility and encourage food cultivation.

Table 2. Sustainable Development Goals and their relation to charcoal production

Appendix 4: Transformational management of Taita Hills Landscape through Agroforestry

📍 Kenya



Impact

Intercropping with *G. robusta* offered several advantages to communities. Leaves from *G. robusta* produce abundant quantities of mulch, acting as a natural soil fertiliser. This enhances soil fertility, resulting in higher yields from food crops. Illegal logging and deforestation gradually diminished as alternative and sustainable sources of wood products were made available agroforestry. Finally, over time, the amelioration of micro-climatic conditions favoured the formation of secondary forest growth and the establishment of tree nurseries. Here seedlings from *G. robusta*, and indigenous species such as *Prunus africana*, *Nuxia congesta*, *Ficus sycomorus* and *Albizia gummifera* are raised and then sold to stakeholders involved in reforestation or farming activities or planted by members of the community nurseries in either forest or private lands. An average of 50.000 seedlings are raised annually.

Summary

The Taita Hills forests, situated in the north-eastern part of the Easter Arc Mountains, in Kenya, are among the 34 areas around the world considered to be global biodiversity hotspots. Regrettably, deforestation and the planting of exotic tree species is driving loss and degradation of indigenous forest cover, resulting in 98% forest reduction over the last 200 years. Here, innovative community-led conservation activities led by the Taita Taveta and Kamba Communities established agroforestry belts 10 meters wide on the forests' edges to ensure sustainable production of wood and halt further encroachment. The favoured tree species in the belts was *Grevillea Robusta*, a popular choice in agroforestry initiatives, because it is fast growing and easier to intercrop with food crops such as maize and beans. In Kenya, the practice of planting belts of trees is well established, the Green Belt Movement led by Wangari Maathai in the early '70s raised awareness of the clearing of indigenous forests.

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Appendix 5: CGIAR – Forests, Trees and Agroforestry (FTA)

📍 Global



Summary

CGIAR's FTA research program responds to the necessity for in-depth and long-term research on forest and tree management, addressing existing research gaps. This research spans genomics and governance, with partners from national governments, private sector, and civil society. Through the project, CGIAR seeks to build the research base around five flagships: livelihood systems, management and conservation, landscape management for environmental services, climate change, and global governance. The programme has also identified cross-cutting themes that should be considered in each of the five areas. These themes include gender, sentinel landscapes, capacity development, and monitoring, evaluation, and impact assessment.

Impact

A dual livelihood and tree cover restoration project in the Eastern Democratic Republic of Congo is one notable example of FTA's impact. Here WWF partnerships have drawn from FTA's work to "develop[ed] a framework and tools for identifying and evaluating tree planting and management options for specific people and contexts." This partnership has resulted in the promotion of over 50 tree varieties for Virunga national park's buffer zone with different options for different demographics and contributes to livelihood and environmental resilience, while also decreasing sedimentation. The project shows the practical effects possible from the CGIAR's FTA project.

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Appendix 6: Intercropping systems and wood pastures

📍 Rift Valley Ethiopia



Summary

Negash's study (2013) identified and evaluated the diversity in flora, the biomass of carbon above and below ground, soil organic carbon (SOC) stocks and litterfall and subsequent carbon and nitrogen fluxes. There were three study sites in the Gedeo zone: Enset based agroforestry, Enset-coffee based agroforestry, and fruit-coffee based agroforestry systems.

The agroforestry systems in the Gedeo zone are thought of as some of the oldest agricultural systems, dating to Neolithic times. These systems were cultivated through the domesticating naturally occurring forest and increasing agriculture within these forests. Indigenous agroforestry practices tend to include more native woody species for coffee or cereal than based practices elsewhere in Ethiopia. The IUCN Red lists and local criteria identified 22 woody varieties for conservation.

Impact

Due to the higher percentage of trees and consequential litterfall production, carbon stocks were found to be much higher in indigenous practices than tropical forests or other agroforestry systems. Litterfall is natural debris from plant, leaf, tree and soil litter.

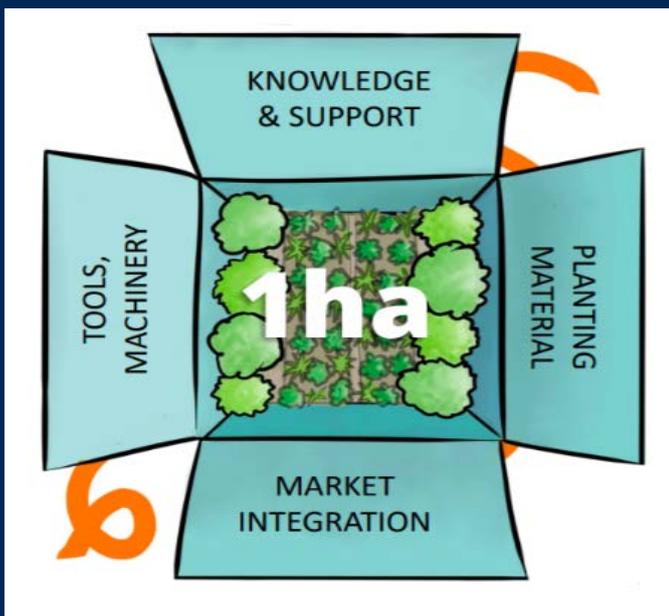
The agroforestry practices on Ethiopia's Rift Valley's edges were crucial for conservation of indigenous flora and serve as a carbon sink, while protecting both the water shed and the area's soil. These indigenous agroforestry methods also provide a dual opportunity by supplying food to and supporting the livelihoods of the local communities. Currently management practices favour the production of coffee and place native varieties at risk, which will reduce biodiversity. It is vital to make the local community aware of the damaging consequences of a reduction in biodiversity and promote maintaining a healthy balance of native varieties and cash crops. Two vital ecosystem services, biodiversity conservation and carbon sequestration, need to be acknowledged and considered as benefits local farmers as well as the environment. With increasing populations and the financial benefits of cash crops, native woody species are under threat, risking further detrimental effects such as reduced soil fertility and increased erosion.

Sources

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Appendix 7: Soulfood ForestFarms

📍 Switzerland



Summary

A representative at Soulfood Forestfarms spoke about their agroforestry initiatives across the globe, as well as offering in-depth insight into their methodology. Soulfood seeks to achieve forest regeneration through conservation and cultivation. Their agroforestry work is based on thorough scientific research into best practise on mimicking and encouraging natural agroforestry processes. For Soulfood, the purpose of agroforestry is to increase resilience and productivity in agricultural yields; to minimise 'pain points' for farmers, which consist of water shortages and the prevalence of pests; and to create positive social outcomes from agroforestry. Soulfood Forestfarms carefully selects crop and tree species that will integrate with existing flora and fauna, local weather, and social requirements. When working with farmers, they recognise the importance of not imposing on either their farmland or their ways of farming. Instead, they have seen that farmers learn from each other and from real-life examples. The non-profit therefore asks a farmer for a very small patch of land in which they grow crops using their agroforestry methods, demonstrating the many benefits. They then give farmers the training and tools necessary to transition to agroforestry in their own time.

Impact

One of Soulfood Forestfarm's social initiatives stems from their work on farms in Haiti, where they provide job opportunities for homeless persons who are fit and physically able, to work on local farms for a daily rate, payable the same day. This project has provided needed labour for farmers, income to the homeless population and lowered rates of alcoholism in homeless communities. Soul Farm also has innovative funding ideas and receives funding using collaborative financing scheme where companies pay for 'agroforestry in a box'. Companies fulfil their corporate social responsibility, carbon zero and sustainability goals by paying for one or more box. One box funds one hectare of land used to start a farmer's journey into agroforestry, funding advice and support, monitoring of the land through an app which connects to pre-existing weather reports, and the rental and upkeep of specialised machinery. The funding provides two years of training and support, so that farmers do not become dependent on the organisation and can instead expand the agroforestry scheme as they wish.

Sources

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[Data gathered from a representative of Soulfood Forestfarms]

Appendix 8: Forest Governance in DRC: An Analysis from Actor's Participation in REDD+ Policy Development

📍 Global

REDD+
World Bank Forest Carbon Partnership Facility (FCPF)
Central African Forest Initiative (CAFI)



Summary

In 2009, the DRC joined the REDD+ global initiative to address the impacts of deforestation. The project receives significant funding support from Norway, UNREDD+, the World Bank Forest Carbon Partnership Facility (FCPF) and the Central African Forest Initiative (CAFI). However, the implementation of REDD+ in DRC has been challenging due to the fragmentation of power and limitations in forest governance. These have inhibited the roll out of REDD+ inclusively, with the involvement of indigenous people and rural communities in decisions making. As part of the Global Comparative Study on REDD+, the Centre for International Forestry Research (CIFOR) made several key findings regarding the DRC's reforestation projects.

Firstly, while some actors were highly interested and expressed strong support for the program, others expressed dissatisfaction with the inclusiveness of the decision-making process and advocated an alternative approach. Secondly, low levels of participation from both international and national stakeholders demonstrated a general lack of interest in the project's sub-national initiatives. In addition, due to disagreements between the government and civil society organisations on the merits of engaging the private sectors, the absence of a national land-use plan creates additional uncertainties around the private sectors' ability to participate.

Further, some policy proposals labelled agriculture as the main cause of deforestation, creating unease and resulting in some civil society organisations urging action to protect local communities' rights to access and utilise forest land and resources. Finally, several factors were highlighted as causes of the low level of incorporation of actor's voices into REDD+ outcomes including the ineffective coordination between government agencies, private sector, and civil society in the DRC. The role and participation of civil society in REDD+ policy is politically challenging due to a history of tokenism. The development of REDD+ policies is also mainly driven by international organisations and scientific experts which do not sufficiently protect the rights of local communities and indigenous people. Furthermore, fund management has also been challenging due to growing tensions and competition for funding between government departments.

Impact

These findings show that participation in the REDD+ program in DRC is mainly driven by international agencies and donors and not the national government. Participation is a complex process and participation would likely increase if actors felt empowered and believed their participation could effect change. For this to happen both politics and power structures need to shift to give more power to stakeholders.

Sources

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Appendix 9: Solidarides - Agroforestry in Freetown

📍 Sierra Leone

Summary

Headquartered in Holland, with a branch in Freetown, Solaridades specializes in commodity value chain development. They are present in six African countries: Kenya, Ghana, Cote d'Ivoire, Liberia, Sierra Leone, and Nigeria. They select plants based on local geography and growing conditions and, in Sierra Leone, grow mainly rice because it is a staple food and essential for food security in the country. They also support farmers growing other crops which are sold both locally and internationally. Their policies integrate biodiversity and climate targets, prohibit deforestation, and highlight the land management benefits of agroforestry. They focus on growing complementary species, for example, cocoa plants which need shade to grow, thus growing well amongst trees. They also developed an innovative, small-scale, palm oil agroforestry method which increases biodiversity and produces higher crop yields than monoculture palm oil plantations which consume vast tracts of lands. However, the interviewee stated that despite its sustainability and ecological benefits, the palm oil project faces funding difficulties as international donors such as the EU refuse to fund palm oil planting.

Regarding land tenure issues, the company ensures stakeholder involvement and obtains consent to lease the land from the community before contracting to lease the land, complies with voluntary guidelines for responsible governance of land and forest and completes a robust internal due diligence process. During the due diligence process the company attempts to reduce the scale of their operations and in order to return remaining land to the community.

Impacts

Solaridades also focuses on gender, running training programmes which have achieved success in empowering women, pushes for women signatories on land agreements to break cultural barriers which exclude women from land ownership. Where there are still legal and cultural challenges for women to own land, particularly land allocated for crops, Solidaridad advocates for change. Further, Solaridades runs support centres to work with farmers who want to develop their own lands, providing the seedling and technical know-how and helping the farmers to create savings account and apply for and obtain loans when needed. Funded by the Dutch government and the EU, the programme plants cash crops such as cocoa, cashews, and palm oil alongside other tree species, using agroforestry techniques to maintain biodiversity. In Sierra Leone they have funding to implement this programme using cocoa and cashews through 2023.

[Data gathered from interview with a REDD Manager]

Appendix 10: Mountain Partners - Applying Ecosystem-based Disaster Risk Reduction for Sustainable and Resilient Development Planning

📍 Koh-E Baba Mountains of Afghanistan



Summary

A United Nations Environment Programme, Mountain Partners was implemented as a pilot demonstration on Ecosystem Disaster Risk Reduction. The project aimed to reduce harsh winters, flooding, and avalanche risks while supporting community livelihoods by applying a landscape approach to development planning. The project required significant investment in raising awareness and capacity in relevant government agencies and local and provincial partners and also relied on meaningful opportunities for communication throughout the project.

Project interventions included the establishment of a local database on ecosystems and hazards, the development and testing of a Green and Resilient Development plan, the establishment of six community tree nurseries which, over three years, produced 235,000 saplings of indigenous and resilient species, nursery management training, the planting of 235,380 trees in selected hazard-prone areas to reforest and rehabilitate degraded slopes, policy advocacy, and the creation and strengthening of partnerships between UNEP, national governments, local governments, universities, and local communities.

Impact

Mountain Partners has had a number of successful results, successfully decreasing disaster risk in the area, both by reducing hazards and increasing the communities' capacity to act. Reforestation and rehabilitation of slopes has reduced runoff and erosion, mitigating floods and landslides. Training programmes, focused on women and persons from vulnerable households, have developed local skills in both disaster preparedness and nursery management, thereby building long-lasting community capacity.

Sources

UNEP (2020). Mountain Partners: Applying Ecosystem-based Disaster Risk Reduction (Eco-DRR) for sustainable and resilient development planning in the Koh-e Baba Mountains, Afghanistan. Available at: https://postconflict.unep.ch/publications/Eco-DRR/Afghanistan_UNEP_ECODRR_Mountainpartners_2016.pdf.

Appendix 11: The REDD+ Gola Forest

📍 Sierra Leone

REDD+



Figure. Gola Rainforest National Park. [Image source](#)

Summary

The REDD+ Gola project aims to conserve the Gola Forest in Sierra Leone from the main deforestation drivers including illegal logging, industrial farming, mining, and the use of forest resources for local livelihoods. It employs around 170 staff from local areas and involves 122 communities to manage over 140,000 hectares of forest. In 2011 the area was designated as one of the only two national parks in Sierra Leone and the first REDD project in Western Africa. It is run under Sierra Leone's ministry of agriculture, forestry, and finance; the conservation society of Sierra Leone and the royal society for the protection of birds (RSPB).

Impact

The project employs locals in Kenema, enabling them to become local stewards for the area including training as forest guards. Main organisational aspects are overseen by the seven chiefdoms within the Gola Forest and supported by the RSPB (see monitoring table). Before the project was implemented, stakeholder meetings were conducted with chiefs and local community members to seek approval for the project in the local dialect.

Since the project inception it has supported the growth of over 40 cocoa farmers, the implementation of farmer field schools, and promoted the growth of rice crops in the region for local livelihoods.

Deforestation and degradation of the forest is monitored through a biannual rural appraisal and ongoing monitoring of emissions, especially in the area termed the "leakage belt" that surrounds the park.

[Data gathered during Interview]

Appendix 12 - Transform Freetown Goals

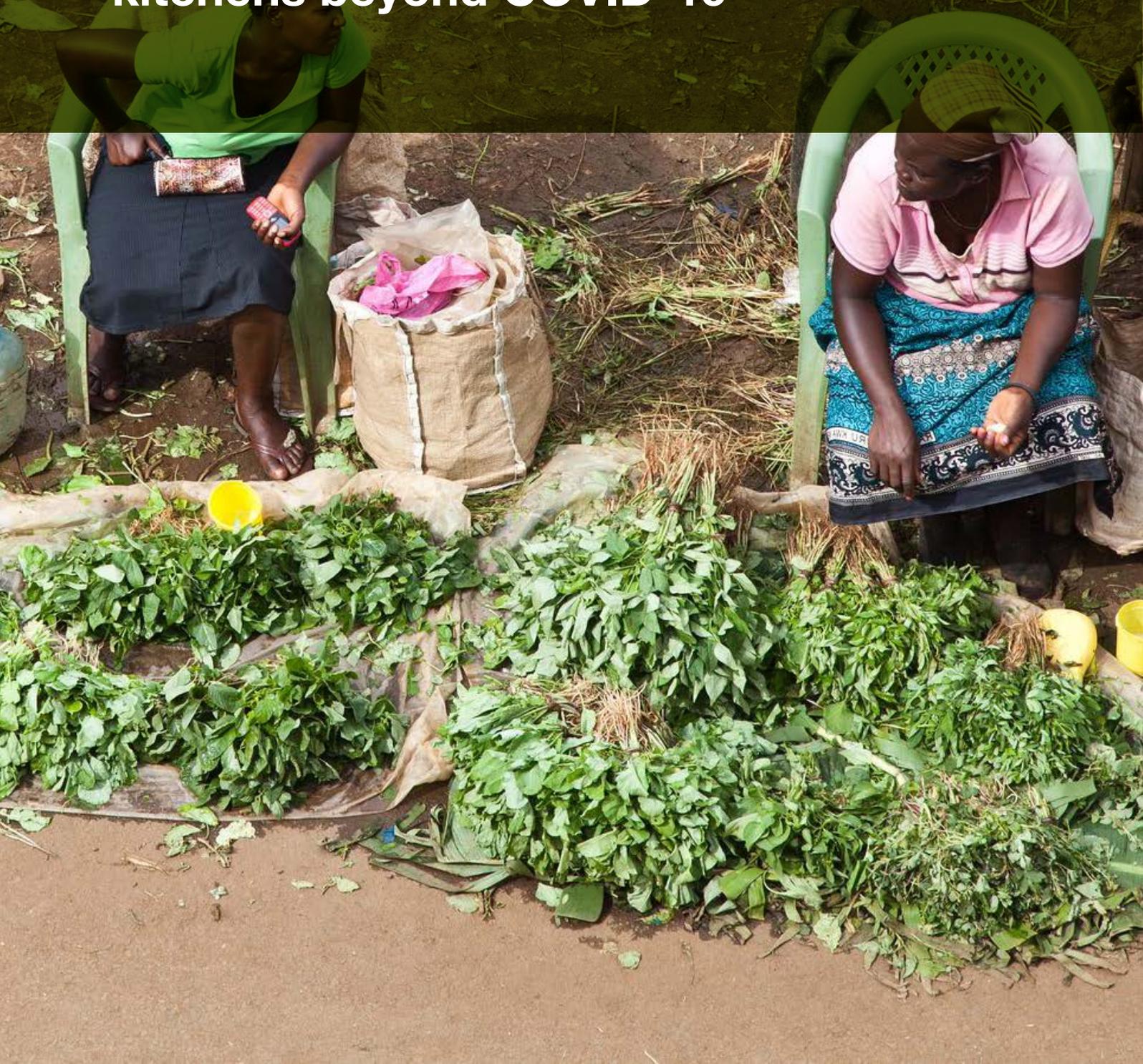
TRANSFORM FREETOWN RESILIENCE: ENVIRONMENTAL MANAGEMENT PRIORITY				
Target 1: Increase the capacity of Freetown’s 48 wards to recognize risk and identify resilient solutions to prevent and recover from disasters			Target 2: Ensure an effective multi-stakeholder collaboration mechanism and strengthen environmental governance	
Initiative 1: Empower communities and scale-up existing community-based disaster resilience efforts by:	Initiative 2: Better anchor environmental awareness and conductive mindsets/ culture in the education system by:	Initiative 3: Increase Vegetation coverage across Freetown by 50% by:	Initiative 1: Establishment of a high-level platform for all key stakeholders with clear TOR and leadership by:	Initiative 2: Review, harmonise and formulate environmental laws and enforcement at local level by:
<ul style="list-style-type: none"> • Conducting baseline analysis to establish current vegetation coverage • Engaging key stakeholders, including relevant communities and residents • Conducting feasibility study into planting options • Ensuring systems in place to ensure sustainability, including adequate maintenance and regular monitoring 	<ul style="list-style-type: none"> • Involving key stakeholders (councillors and community organisations) • Strengthening relevant community governance structures • Mapping communities and needs, and collaborating to pool and coordinate resources • Enabling communities to plan and implement specific solutions, eg. Clear and maintain drains, improve road surfacing, increase tree coverage 	<ul style="list-style-type: none"> • Facilitating collaboration of key stakeholders, eg. FCC, Ministry of Basic and Senior Secondary Education, EPA, ONS, NPAA, CSO, UNDP, UNICEF, Ministry of Lands, CMC, FEDURP • Compiling list of education institutions and their level of resources • Engaging educational staff and developing programmes to increase awareness and share best practice • Starting with a pilot, build, a network of volunteers and nature clubs in schools 	<ul style="list-style-type: none"> • Developing a clear concept document which demonstrates the value of participation to potential stakeholders and with an accompanying communications strategy • Developing a clear TOR for the platform including professional administrative arrangements and identifying the platform’s core areas of focus, namely disaster management, air quality, erosion, deforestation, and education 	<ul style="list-style-type: none"> • Review existing legal/regulatory framework in order to identify what is covered, where there are gaps in the law or enforcement, capturing and/or adapting national laws to work at local level, and what new laws are required • Reviewing existing enforcement processes in order to identify what works & what doesn’t • Developing new or amended laws/regulations • Developing partnerships with enforcement entities in implementing new practice to ensure effective enforcement

Appendix 13 - Expansion of figure 8

SECTOR	PREREQUISITES & LIMITING FACTORS	CASE STUDY EXAMPLES
<p>Grants and Donations Local authorities can access external grants for GI creation and maintenance from a variety of sources, including philanthropic organizations.</p>	<ul style="list-style-type: none"> • If authorities are diminishing resources of environmental budgets, it is not a solution for the local authority's budget. • Unpredictable long-term funding sources, especially when the models aren't inclusive of initial donation in fundraising activities. 	<p>Freetown: The first phase of implementation of Transform Freetown was complemented by funds raised at the Mayor's Ball and from Transform Freetown Inc, a specially created diaspora organization.</p>
<p>FCC Municipal Funding City governments can raise revenues from owned land upfront capital from land sales or leases, taxes, user fees, and betterment levies</p>	<ul style="list-style-type: none"> • Projects would compete with other city priorities requiring funding from local budgets. • Municipalities' tax competences are usually limited. • Introducing mandatory fees for sites is likely to be unpopular with residents. 	<p>In 1990, Bogota, implemented land value regulations through authorized land use changes including zoning, density allowances or converting land to urban. The city is working with other countries to share experiences to overcome the challenges.</p>
<p>Private Sector Will enable private sector to transition to a more sustainable practices in alignment with corporate environmental, social and governance goals</p>	<ul style="list-style-type: none"> • Requires guidelines and robust internal due diligence and CSR to ensure compliance. 	<ul style="list-style-type: none"> • Miro Forestry Freetown generated revenues and invested \$56m through sale of small-scale timber products • Carbon credits generated by the afforestation of degraded land provided additional income in Ghana.
<p>Green Finance Grants from public or private financial institutions for projects delivering environmental and/or social benefits.</p> <p>European Commission/World Bank for biodiversity and ecosystem-based adaptation to climate change to build resilience and reduce risks</p>	<ul style="list-style-type: none"> • The process may require new procedures or tools (e.g., for budget monitoring) within the administration (Climate-ADAPT, 2016c). • Accreditation is required to access Green Climate Fund or Adaptation Fund which can be limiting for small cities. 	<ul style="list-style-type: none"> • Municipal governments could apply through national agglomerations development funds like Brazil, Colombia and Morocco. • Collaboration through city networks, ie. the C40 Cities Finance Facility, can support financial climate projects preparations, develop city administrative capacities and initiate partnerships.
<p>Carbon Credit investment can reduce the carbon footprint of project's.</p> <p>Emissions Reduction through REDD+ supports sustainable management of forests and enhancement of forest carbon stocks in developing countries</p>	<ul style="list-style-type: none"> • Carbon offsetting may not represent an actual reduction of carbon emissions by the individual or business. • The failure of international payment-for-ecosystem-services scheme to protect the rights of local communities. 	<ul style="list-style-type: none"> • Freetown's treetracker app created opportunities for investing in tree growing through capturing carbon credits via token system. • Initiating REDD+ programs in Ghana faced several challenges; engaging communities, bureaucratic governance obstructing funding distribution and power asymmetry.

Food security

**Food sovereignty in Freetown:
solidarity networks to support informal
food vendors and expand community
kitchens beyond COVID-19**



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Finally, we appreciate the work of the past ESD cohorts, whose reports and conclusions were the basis of our work.

To all, many thanks.

Abbreviations

CK	Community Kitchens
CODOHSAPA	Centre of Dialogue on Human Settlement and Poverty Alleviation
EJ	Environmental Justice
FAO	Food and Agriculture Organisation
FCC	Freetown City Council
FEDURP	Federation of the Urban and Rural Poor
IFV	Informal Food Vendors
WHO	World Health Organisation
MoU	Memorandum of Understanding

1. Executive summary



Photo 1. Abacha market, Freetown, Sierra Leone. Goering 2020

This report examines the food system of Freetown, Sierra Leone, focusing on the stages of selling, distributing and consuming. The overarching goal of the report is to explore new pathways towards food security, aiming to tackle the injustices that occur in the city and often disproportionately impact the most vulnerable populations. The injustices in Freetown's food systems are connected, but not limited to, the unequal distribution and inaccessibility (geographical distribution and affordability) of markets for the urban poor, particularly the inhabitants of informal settlements. The pro-

ject intends to offer pathways through which this issue can be mitigated. To do this, we are focusing on the informal food selling sector (i.e., informal markets, informal vendors, street hawkers) and the newly formed community kitchens in the wake of COVID-19 crisis.

We developed a dual strategy based on primary and secondary research (semi-structured interviews and desk-based research), with the purpose of supporting the informal food selling sector and expanding the operation of community kitchens beyond the pandemic context. Ultimately, our approach aspires to bring the informal food selling sector and the community kitchens together by redirecting leftover produce to community kitchens in order to reduce food waste. We argue that in order to ease some of the challenges experienced in Freetown, new ways of thinking, acting, and organising are needed. Drawing on similar experiences from around the globe, we aim to bring new elements to the urban food systems of Freetown, with the objective of supporting the urban poor.

The core of our project lies in the notion of food sovereignty and the complex realities of producing, purchasing, selling and consuming food in Freetown. Under this notion, the aim of food systems is to move away from profit-driven and commercialised patterns, helping communities through building solidarity networks.



Photo 2. Women cooking food in community kitchens which is served at designated points in Portee-Rokupa (Conteh, 2020, cited in Osuteye et al., 2020b)

2. Diagnosis and research design

2.1 Background and preliminary diagnosis

Freetown has suffered from several periods of food insecurity in the last decades. During Sierra Leone's civil war (1991-2002) the city was cut off from its rural food supply (Maconachie et al., 2012) and there were severe shortages throughout the Ebola outbreak between 2014 and 2016 (Rohwerder, 2014). The scars of these crises are still raw and addressing the resilience of Freetown's urban food systems must remain at the top of the city's policy agenda.

Freetown, located in the Western Area Urban District (Figure 1), is Sierra Leone's fastest-growing city, the current population of 1,055,964 is expected to grow by 535,000 over the next decade (World Bank, 2015). Such rapid population growth is challenging the ability of the city's urban food systems to provide affordable and nutritious food for all its residents. Moreover, as illustrated in Figure 1, Freetown has undergone rapid, unplanned urbanisation and is marked by a high degree of socio-spatial inequality, where a significant proportion of the population lives in informal settlements (Rigon et al., 2020). These areas are disproportionately threatened by issues of food security, and, as such, fortifying the resilience of these communities is the focus of this report.

The beginning of the COVID-19 pandemic in 2020 has significantly exacerbated pressures on food security in Sierra Leone, with the WHO (2020) identifying Sierra Leone as one of top 25 countries at risk of severe food security deterioration due to the crisis. By June 2020, approximately 50% of Freetown's population were food insecure (EFSMS, 2020), understood as "having difficulty acquiring safe and nutritionally adequate food in socially acceptable ways" (Kelly et al., 2018). The impact of the pandemic for food security is threefold (Blay-Palmer et al., 2020):

- Households have suffered from falling purchase power due to a loss in daily income and remittances, exacerbated by rising food prices.
- Human mobility restrictions and market closures (formal and informal) have severely curtailed the ability of people to access food sources.
- Global and regional food production, food logistics, and food supply chains have been severely disrupted.

In this scenario, community-driven responses have played a pivotal role in tackling the emergency, both for their capacity to efficiently act at the local level and for strengthening community resilience, which will be crucial to face future shocks (Wilkinson, 2020). More specifically, community kitchens (CK) have operated in informal settlements in Freetown, feeding the most vulnerable, such as children,

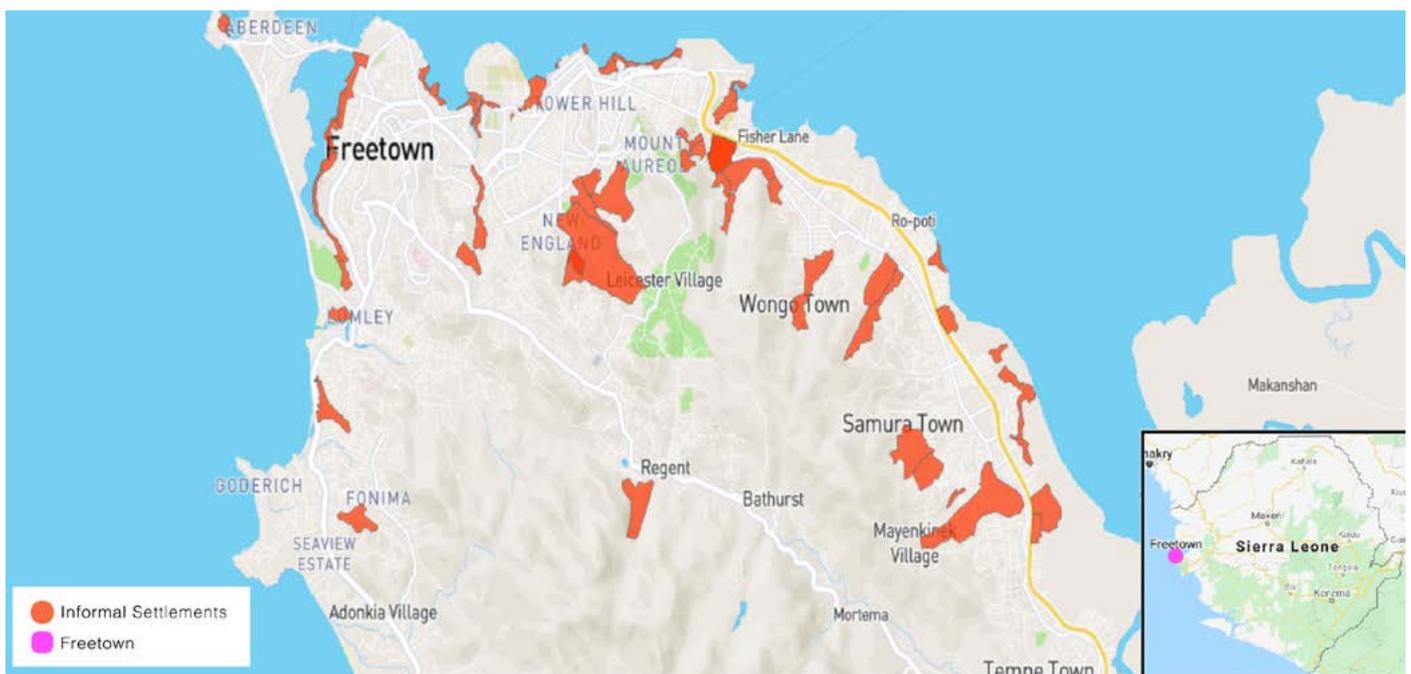


Figure 1. Map of Freetown with locations of informal settlements and its position in Sierra Leone. (Adapted from CODOHSAPA/FEDURP, 2016 cited in Munda Koroma, B. et al., 2021)

FOOD DISTRIBUTION AND COMMUNITY KITCHENS



Figure 2. Overview of food selling sector. Authors' own. (Graphics: Noun Project Inc. 2021)

disabled people, the elderly, among other groups (Osuteye et al., 2020a). On the other hand, the informal food selling sector (Figure 2) has been critically affected, with vendors seeing their incomes being reduced due to the mobility restrictions and disruptions in the food supply chains (Blay-Palmer et al., 2020).

residents of informal settlements across Freetown lacking access to formalised markets and supermarkets, which are primarily in the urban centre.

The other two pillars, participation and recognition, are also necessary for ensuring equitable food access in the city. These involve ensuring the participation of all stakeholders and recognizing that local stakeholders have legitimate

2.2. Research overview

2.2.1. Analytical framework

Firstly, food sovereignty is defined as restoring the control over food access, production, and distribution to the population (Patel, 2009). Food sovereignty also seeks to “connect consumers to producers through systems of rights based on mutual aid, rather than top-down aid” (Heynen et al., 2012; p. 307).

Secondly, as shown in Figure 3, a food systems approach encompasses activities related to producing, processing and packaging, distributing and retailing, and consuming (Ingram, 2011). At the same time, the City Region Food System approach (CRFS) provides a coherent understanding of the vulnerability of urban food systems that move cities toward integrated, sustainable, and resilient food systems and governance structure (Blay-Palmer et al., 2018). Hence, the analytical framework will focus on the resilience of food systems across the city against unforeseen events and how these can contribute to reconnecting local production and consumption in Freetown.

Thirdly, under the notion of environmental justice (Figure 4), the ‘environment’ is considered as the space of lived interaction with humans, with justice consisting of three pillars: distribution, participation and recognition (Schlosberg, 2009; Mohai et al., 2009).

Distributional environmental justice focuses on the unequal distribution of those most affected by environmental impacts. In the case of Freetown, this refers to the injustices caused by the unequal distribution of food. Often, these injustices arise due to the lack of facilities in marginalised communities (Clough, 2018), with low-income groups and

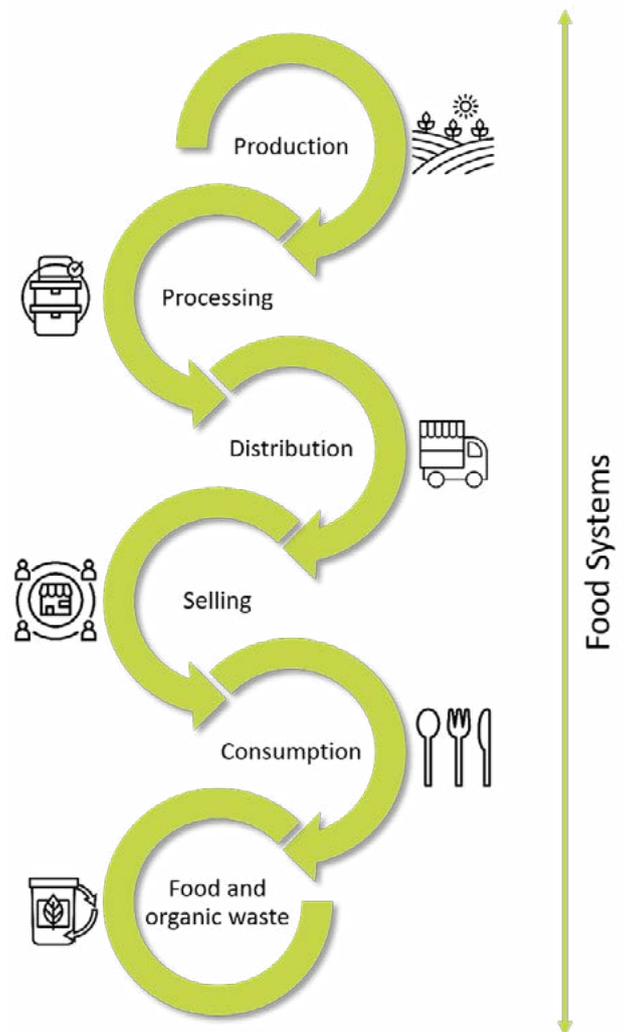


Figure 3. Food system stages. Authors' own. Adapted: Ingram, 2011. (Graphics: Noun Project Inc. 2021)

FOOD DISTRIBUTION AND COMMUNITY KITCHENS

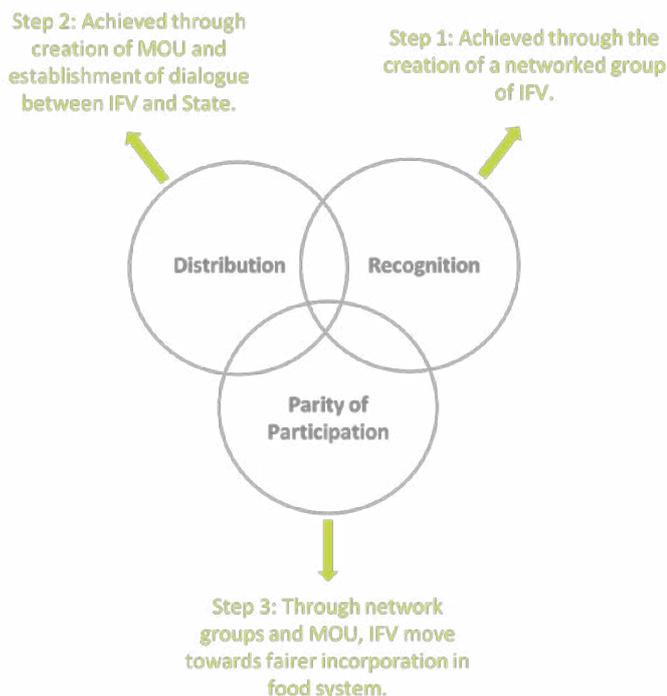


Figure 4. Environmental justice framework. Authors' own. Adapted: Ingram, 2011. (Graphics: Noun Project Inc. 2021)

contributions to decision-making processes (Schlosberg, 2009). This report employs the environmental justice framework; hence it highlights the relevance of justice as a precondition to ensure resilience (Griffin et al., 2017). On the other hand, developing strategies to enhance the food sovereignty of the urban poor in Freetown through strengthening informal food supply networks of food vendors and sustaining CK beyond the pandemic.

Therefore, as depicted in Figure 5, this report combines the distributional, participatory, and recognition-based pillars of environmental justice, focusing on food access and distribution suggested strategies for food sovereignty to benefit low-income and marginalised residents throughout Freetown.

2.2.2. Objectives

This report aims to address problems of food insecurity in Freetown by providing strategies focused on the support of informal food vendors (IFV) and the sustaining of CK beyond the COVID-19 pandemic. The strategies proposed recommend pathways based on collaborative networks which work towards food sovereignty for marginalised residents across Freetown.

2.2.3. Research questions

Primary Research Question:

How can informal food vendors and community kitchens be integrated to deliver food sovereignty for Freetown?

Sub-questions:

- How can networks support informal food selling and contribute towards an environmentally just food distribution system for Freetown?
- How can community kitchens be expanded and sustained beyond the COVID-19 context?
- What are the pathways which connect community kitchens and informal food sector?

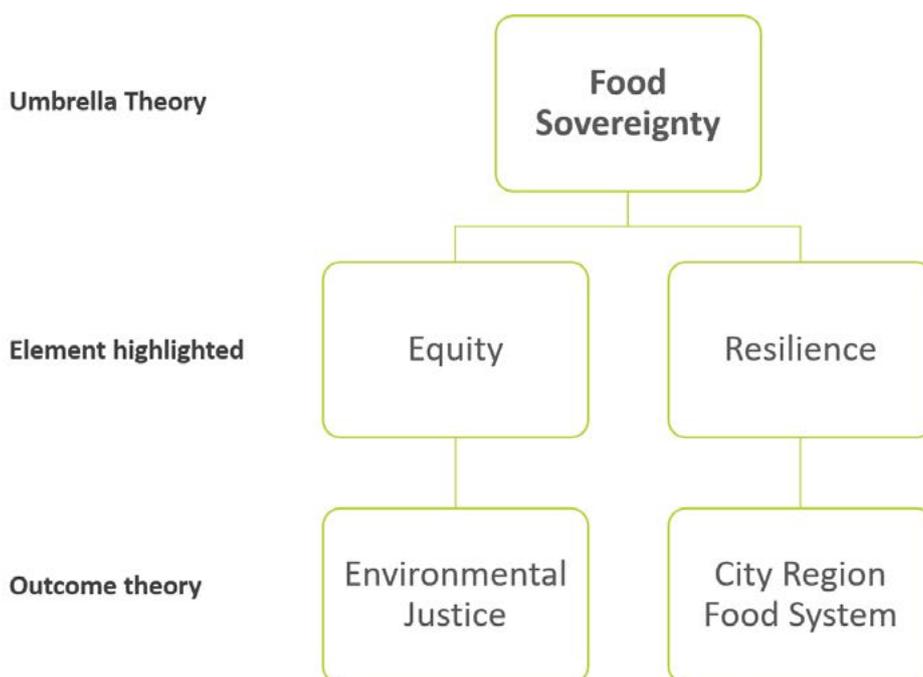


Figure 5. Theories used in the report. Authors' own, 2021.

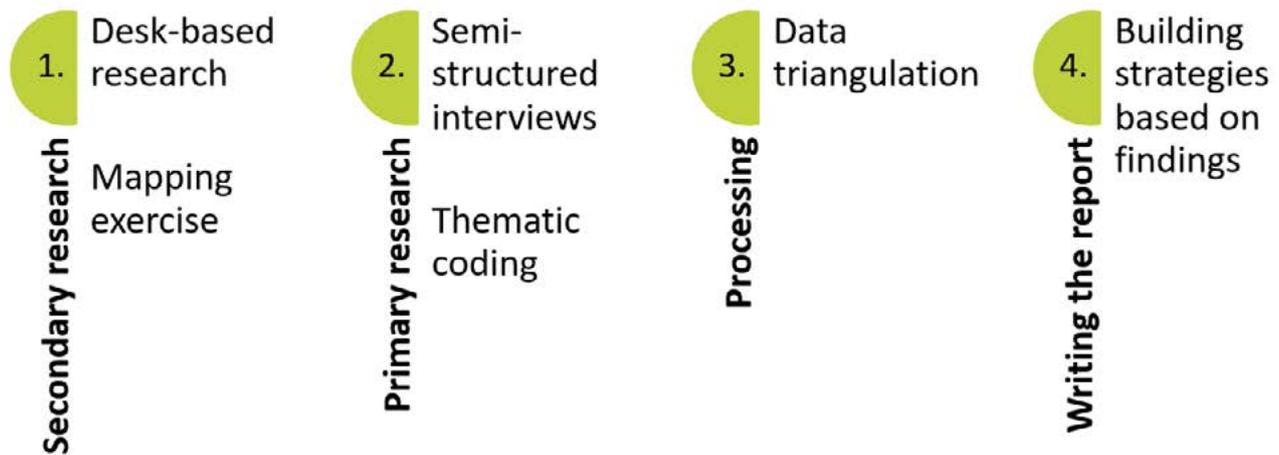


Figure 6. Research steps. Authors' own, 2021.

2.3. Methodology and Limitations

2.3.1. Methodology

As shown in Figure 6, before formulating our research questions, we conducted desk-based research to gain a better understanding of food systems and their challenges in Freetown. This involved consultation of official documents from government institutions and international organisations, as well as academic literature, news articles, blog posts and social media posts. Narrowing down our focus to IFV and CK, we carried out a mapping exercise using academic literature and official documents by the local authorities (Appendix: mapping exercise). Our findings confirmed the socio-spatial dimension of food insecurities within the city, with many formal markets located in the city centre and most CK in the informal settlements.

We continued our research with 20 semi-structured interviews with key informants from Freetown and beyond (Appendix: list of interviewees). For this, we followed a 'purposeful sampling' approach (Valentine & Clifford, 2004: 123), only interviewing subjects who participated in projects relative to our research focus. The information gathered from researchers in Freetown was used to adapt the interview questions asked to key informants from other contexts (Appendix: case studies), aiming to exchange knowledge and good practices.

After collecting all primary and secondary data, we carried out thematic (colour) coding of the interview notes (Appendix: repeated themes in interviews). The triangulation method was used to compare multiple forms of gathered data (Polit & Beck, 2012). By cross-comparing the primary data with the secondary research findings and mapped data, we developed strategies with a primary focus on increasing food distribution and access across the city.

2.3.2. Limitations

Carried out during the COVID-19 pandemic, our research was limited to remote interaction via online platforms and international calls instead of fieldwork, which delayed and complicated the data collection at times. This approach helped us reach places and people that fieldwork would not allow us to reach. However, it has also created barriers in our communication with people involved in the informal sector or inhabitants of informal settlements, where internet access is limited, resulting in us interviewing only one local involved in the informal food selling sector. Moreover, the nature of informality and the limited information regarding the recently formed CK in Freetown, have set some limitations and challenges to our mapping exercise.

Finally, it is relevant to consider our position as researchers throughout the project and understand how our background could alter our findings in the context of cross-cultural research (Limb & Dwyer, 2001).

3. Strategies

3.1. Supporting Informal Food Vendors (IFV)

As in many African cities, informality in Freetown plays a crucial role in achieving food security for the urban poor (Resnick, 2017; Giroux et al., 2020). IFV create a decentralised food network, expanding the footprint of urban food systems into residential areas and informal settlements (Giroux et al., 2020), where access to formal markets is limited. Moreover, the informal food economy improves food affordability by selling in smaller quantities at lower prices and allowing customers to pay on credit (Resnick, 2017). The effects of the pandemic highlighted the vital role of IFV to maintain food security for the urban poor, as highlighted by various interviewees (Interviews 07, 08, 12).

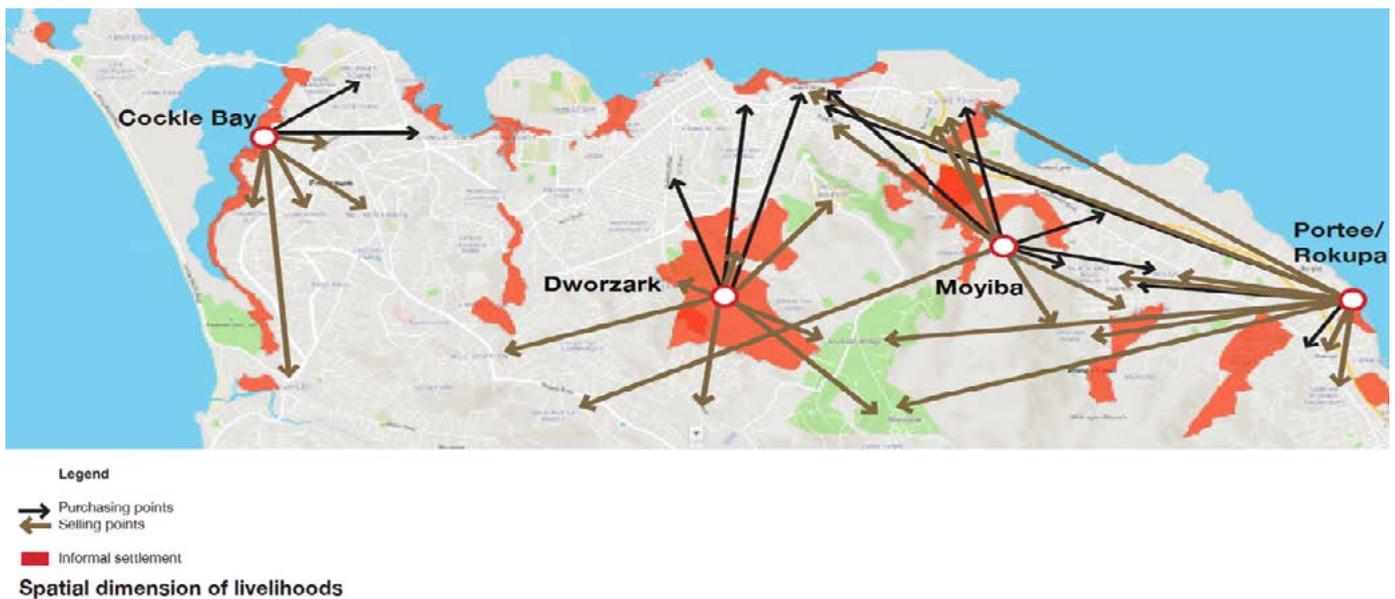


Figure 7. Map showing interaction of formal and informal activities across Freetown (Rigon et al., 2020)

However, there are many challenges that both IFV and the authorities must face regarding the informal food selling sector. On the one hand, its mobile nature makes it difficult to regulate (Interview 01), while, on the other hand, the lack of space for markets in Freetown decreases the ability to designate space for specific food vending areas.

A common policy by municipal authorities is to relocate informal vendors into established markets away from congested streets and the city centre. This approach is usually unsuccessful and ends up with IFV eventually returning to their original spots, closer to customers and suppliers (Giroux et al., 2020). Such spatial designation has been shown in Freetown through the implementation of 'Operation Pushback' in 2018, which involved moving IFV away from roads to decrease congestion in the streets, something that only lasted for a year (Kalokoh, 2019). This operation was not successful as it overlooks the major contributions that the sector makes to the daily functioning of Freetown and to maintaining the livelihoods of over 80% of the population (Rigon et al., 2020). In fact, the informal and the formal sector in Freetown are deeply interrelated, as illustrated in Figure 7.

The proposed strategy aims to strengthen IFV cooperation and empowerment, ultimately aiming to increase the dialogue between them and the authorities of Freetown. Solidarity networks of key stakeholders can create a path to strengthening collaboration and ensuring a more stable food system in Freetown.

Firstly, associations of vendors need to be strengthened across the city to promote greater representation of IFV, as well as to contribute towards organising the scattered nature of informality (Interview 09). These networks can be organised in two ways: by product (e.g., meat vendors, fish

vendors, etc.) or by locality (i.e., vendors in different informal settlements). The associations should aim to involve groups who are routinely marginalised in decision-making processes, primarily women (Interview 18), to empower them and to give them a chance to advocate for themselves. The main aims of these platforms are to allow for knowledge and experience sharing, as well as to serve for educational purposes (e.g., negotiation skills, how to draft a proposal), equipping the participants with useful skills for better communication with the authorities. This mechanism has been successfully applied in other contexts, such as StreetNet's involvement with NAPETUL, Liberia (Appendix: Liberia case study).

Identifying the representatives of the networks is also a key part of this initiating step. The representatives should be people that have the trust of fellow community members and possess a basic understanding of planning procedures and policy-making in the food selling sector of Freetown (Interviews 07, 08, 12, 18) The formation of these networks is depicted in Figure 8.

This strategy proposes a combination of the two different organisational strategies, with IFV forming associations of type of foods within specific locations across the city to develop food councils in each locality. This would increase the representation of marginalised groups, providing a platform for each player in the localised food networks to express their needs. The establishment of such councils in different areas across the city, particularly with a focus on peripheral informal settlements, provides a network that can be used to exchange information and talk through common issues faced by the vendors.

Having established food associations and IFV councils in localities that contribute to IFV networks throughout

FOOD DISTRIBUTION AND COMMUNITY KITCHENS

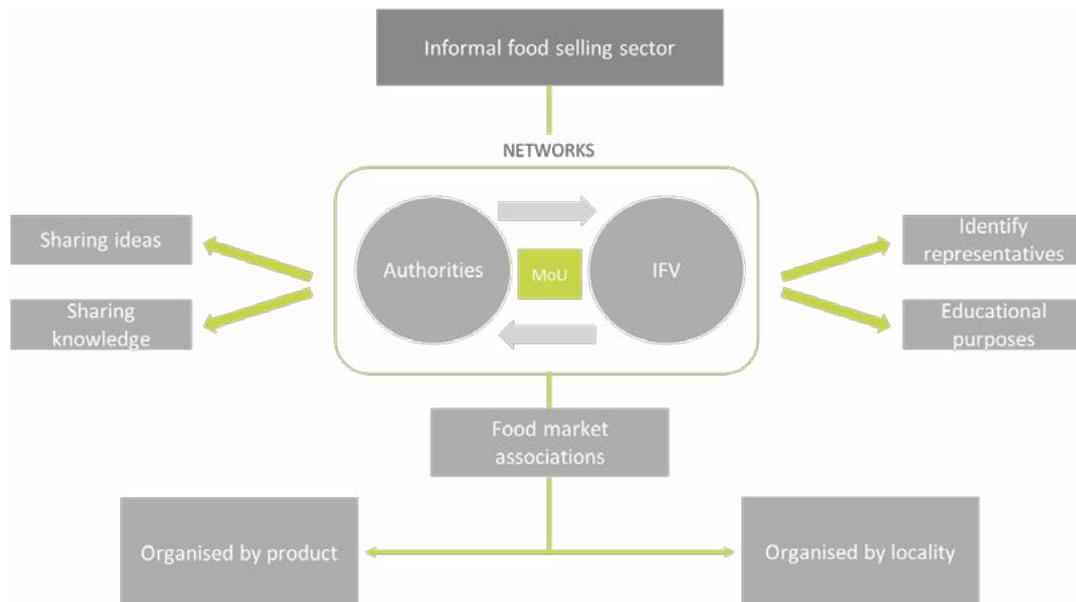


Figure 8. Diagram of networks, their function and their structure. Authors' own, 2021.

Freetown, the following step to recognition and participation of IFV is to establish a dialogue between IFV and municipal actors. Negotiations with the authorities (i.e., the FCC) through such associations result in greater recognition and integration of IFV within the policy-making process (Interview 03, 07, 09, 18). By increasing the influence of IFV associations and councils and opening a dialogue with municipal authorities, the two groups can work towards signing a Memorandum of Understanding (MoU), which serves to recognise informal vendors, designating specific groups selling points at certain times of the day (Figure 8). MoUs are often based on principles of equality, with each party facing penalties if they do not follow the agreed-upon conditions, and communication, committing the parties to meet monthly (Appendix: Liberia case study). These factors are exceptionally important in making sure that the contract runs smoothly and is sustained on a long-term basis.

Crucially, the MoU works towards legal protection for IFV, which is the most effective way to protect their rights and build a more harmonious relationship with the state (Interview 07, 12). Through the MoU and enhancing the geographical and democratic organisation of associations, IFV can benefit from less harassment from municipal authorities and a more stable role within the food sector which befits their importance. Recognising their license to operate will improve food distribution across Freetown with residents of peripheral, poorer areas not being forced to pay the price for transport into the city to access food. Considering that most residents purchase food from IFV daily, this is vital in contributing to just food systems and improving food sovereignty across Freetown. The municipality can also benefit through fostering a mutually supportive relationship with IFV as IFV will be far more likely to comply with state legislation. Such legislation could decrease congestion by allocating times of the day for selling or rotating quotas for specified IFV to come and sell their produce. Ultimately, the

formation of associations and opening of lines of communication between the state and IFV leads to better and more integrated policies whereby the rights and needs of each stakeholder can be respected and reflected.

3.2 Expanding and sustaining community kitchens (CK) beyond COVID-19

Undoubtedly, the consequences of the COVID-19 restrictions have entailed disruptions to the urban food supply chain (Singh et al., 2021). This situation has, amongst other things, threatened the food accessibility of communities. Thus, community-led initiatives emerged as a solidarity response, organised and managed predominately by women, collaboratively cooking and distributing food (Hamann et al., 2020). In this context, CK illustrate an interesting experience of solidarity network and collective action among those facing severe food insecurity (Hartley, 2020; interview 05). At the same time, CK can be used as a long-term pathway for food sovereignty, restoring people's control over the food systems, combating poverty, and fostering gender equality (Santandreu, 2018; Thornton, 2018).

While CK movement has a large trajectory worldwide (e.g., Hardy, 1986; Immink, 2001; Engler-Stringer & Berenbaum, 2007), in Freetown, CK have been set up as an emergency response initiative, bringing the community together and empowering them by creating a local response (Richer, 2000). With the support of FEDURP, CODOHSPA and the FCC, CK were established in three informal settlements, namely Portee-Rokupa, Cockle Bay and CKG (Appendix: mapping exercise) (Osuteye et al., 2020a; interview 21). This has allowed the most vulnerable in the communities, including the homeless, elderly people, people with disabilities, unemployed people and children, to access food during lockdowns.

FOOD DISTRIBUTION AND COMMUNITY KITCHENS

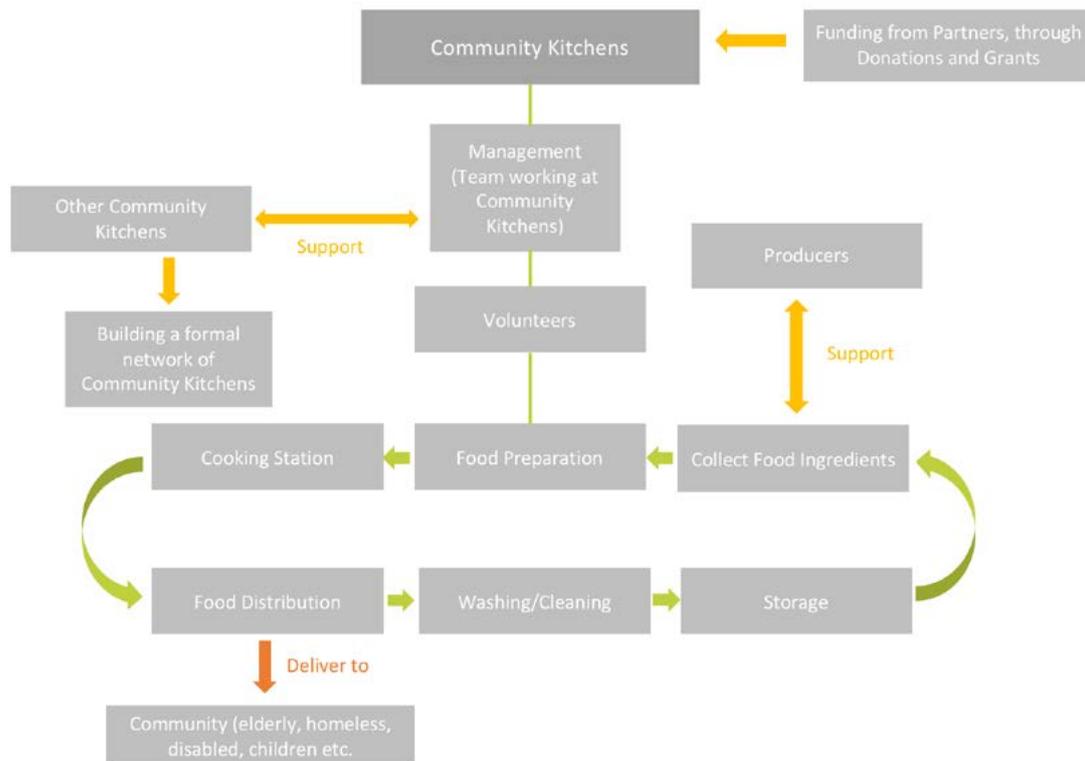


Figure 9. This diagram indicates the management and operation of sustainable community kitchens. Authors' own, 2021.

Despite struggles, CK have been successful in relieving hunger and providing a shared space for community members in the short run. This approach needs to be developed and strengthened for long-term sustainability (interview 05, 17). Hence, it needs to be organised in a way that allows them to run independently and to continue providing accessible, affordable, and nutritious food to the most vulnerable groups for years to come (interview 05, 06, 13).

To achieve this, a well-established organisation system is necessary. As shown in Figure 9, the management team of CK will allocate roles to volunteers, such as collecting, preparation and processing. Once the roles are assigned, CK will be able to deliver meals to the communities, build relationships with IFV and connect with other CK in the city to share ideas and support. When CK begin to gain traction and have a stable financial mechanism, CK will be able to pay small wages to volunteers to continue running the place on a rotational basis. Moreover, it can also be used to improve CK operation, for instance, by upgrading kitchen tools and setting up other initiatives like giving away hygienic products. The money could also be used to uphold the space of CK and to pay local producers and IFV to enhance fair trade, achieving a sustainable and equitable system across the city.

This strategy also provides the following routes to expand and sustain the CK operation. First, it is crucial to develop an interview process with key community actors and mobilisers who participated in the CK pilot initiative, seeking to examine the barriers to its operation. Next, a mapping procedure will be added to facilitate locations of vulnerable

communities as well as collect important data such as the number of people, age group and to identify other needs (interview 05, 10).

As mentioned in Section 2.1., IFV play a key role in food distribution in the marginalised areas in Freetown. As such, traders have been crucial for collecting food from local producers and markets and distributing it to informal settlements (interview 17). Drawing on this, and inspired by Bioferias in Quito, Ecuador, there is a potential for building collaborations between participants of the urban food supply chain (interview 15), who could offer their production surplus directly to CK, allowing for food to become more accessible and cheaper for CK. Moreover, considering storage is an issue in low-income areas due to the lack of electronic refrigeration (interview 06), by working closely with IFV and receiving produce as necessary, food waste is minimised, and refrigerators can be avoided. This initiative will be further discussed in Section 2.3.

Another critical issue is the funding of CK, as they mostly rely on donations and grants (interview 10). A case in Cape Town, South Africa, showed that despite having initially received funds to run the CK, they have been able to sustain themselves by charging visitors a small fee of 15 ZAR (around 0.8 GBP) (interview 04). Without being able to detach themselves from donations, CK will not be able to run in the long term (interview 05, 13). Further, the case in Lima, Peru, presented kitchen leaders who went directly to look for food donations in city centre markets, taking these back to their CK. In this process, food transportation was essential, and neighbours contributed funds from

FOOD DISTRIBUTION AND
COMMUNITY KITCHENS

Figure 10. Integration of two strategies. Authors' own, 2021.

their savings to help pay for this (interview 06). Another CK in South Africa implemented a token that is distributed to community members and ensures that the most vulnerable can get nutritious meals at a low cost by exchanging their “muse coin” for a meal (Appendix: Cape Town, South Africa case study).

It is essential to build funding mechanisms that sustain CK. Inspired by Quebec and Santiago cases, through formalisation and building networks of CK could allow access to state-based funding and participate in initiatives that already work to benefit communities, such as school feeding programmes (Richer, 2000). Moreover, the case of Lima also showed a long-term endeavour, demonstrating how CK could be formalised to community dining halls, providing access to state funding by selling meals through a membership scheme and creating centres to store food (Hartley, 2020).

Crucially, CK offer people more than just food. The premises of CK can be used to open a dialogue between community members and create a safe space. In other contexts, these have been used to offer leadership opportunities and teaching people about social entrepreneurship. Moreover, it also supports women by offering gender-based violence (GBV) mitigation projects and spreading awareness (interview 04). CK have become an important place where women are able to share their experiences and are given support through counsellors and psychologists (interview 05, 10). As GBV is a serious concern in Sierra Leone (UNFPA, 2021), we believe that incorporating these initiatives could improve women's safety and well-being in communities. Additionally, CK can offer health products such as menstrual products for women, as access to these may be limited, especially amongst the most vulnerable (interview 04).

3.3 Building solidarity networks

Solidarity networks are collaborative movements aiming to achieve mutual benefits for their community members rather than individualistic and competitive behaviours (Smith, 2009). In this regard, community-driven initiatives have been crucial to giving immediate support to the urgency of the pandemic crisis, particularly to the needs of the most marginalised people in informal settlements in Freetown (Osuteye et al., 2020a).

Building on that and aiming to close the food cycle, we suggest connecting IFV with CK, as this will help reduce food waste and increase the sustainability of the proposed strategies (Figure 10). Considering food sovereignty and solidarity networks, the aim is to create mutual benefits for IFV and CK. Through collaboration, CK can receive unsold food from IFV as donations, which in turn are offered meals from CK. As previously mentioned in Section 2.2., to reduce waste, it will be sourced on a regular basis by working alongside informal vendors, which will also reduce the need for expensive food storage. Further, the collaboration between CK and local producers, can allow for organic waste from CK to be returned to local farmers who can compost this for food production. Additionally, excess meals could be donated to the communities most vulnerable members to avoid any food waste. In the long term, as CK become more financially independent, they will be able to make small payments for produce from IFV. Importantly, sourcing produce from IFV allows CK to offer cheaper meals that benefit the whole community. This way it forms a loop of food distribution, which can help establish a sustainable urban food system.

4. Conclusion

The impacts of the COVID-19 pandemic have exposed the fragility of Freetown's urban food systems, with the city's urban poor being disproportionately affected by the pandemic. The disruption to global supply chains, market closures, and increased unemployment has significantly impacted the food systems and access to food sources across Freetown. Simultaneously, the pandemic has revealed the critical importance of the often-vilified activities of the informal food sector as it has played a fundamental role in ensuring that residents of low income, peripheral settlements can access food throughout the crisis. Furthermore, through the emergence of CK, the pandemic has shown the power of community action which can be leveraged to tackle food inequalities throughout the city in a post-pandemic society. In this sense, the crisis can serve as a moment of renewal for Freetown's food systems, whereby previously overlooked sectors and strategies that rely on the community's strength and resourcefulness can build a more integrated, sustainable, and equitable urban food systems.

This report has focused explicitly on informal food vendors and community kitchens, both of which have operated in informal settlements, providing food for the most vulnerable and marginalised residents of Freetown. The strategies proposed work towards increasing the food sovereignty of food systems within Freetown, using an environmental justice framework to fulfil the three pillars of distributional, recognitional and participatory justice approaches. Throughout both IFV and CK initiatives, there has been an overarching focus on the importance of communication in the organisation of each strategy. While CK focus on community engagement and collaboration, the IFV strategy aims to create internal food vendors associations and externally focused dialogues with municipal actors. Both work towards achieving food sovereignty in Freetown by empowering marginalised actors and increasing recognition and representation in policy-making. Throughout this report, a central thread of understanding is that engaging with a broader section of society and integrating them into urban food planning leads to a more effective, collaborative policy. As a result, the food system will be more resilient, stable and able to function for all city residents.

Following from this report, there exists much potential for further research. In particular, there is scope to take a gendered perspective to the formations of IFV associations and the operation of CK. Within the informal sector and CK, this is especially pertinent considering the large proportion of women involved in these areas as well as the success of women-headed associations across Africa. Lastly, there also exists an opportunity to connect local producers with the solidarity networks created between IFV, CK and the authorities. Involving local producers in this way can potentially lead to greater food sovereignty within Freetown with less reliance on imported foods and greater resilience to climate-related shocks.

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Learning from innovation around the world



- 01 Comedores Populares
- 02 Ollas Comunes
- 03 Collective Kitchens
- 04 Community Kitchens
- 05 Warwick Junction Urban Renewal Project
- 06 Collective Bargaining in the Informal Economy
- 07 Women Producers Markets
- 08 Bioferias
- 09 Organising self-employed women and informal vendors on an international level

Appendix 1: Comedores Populares

📍 Mariategui district/Lima, Perú

CENCA
Frères des Hommes
Don Bosco Foundation



Summary

Since the late 70s, ollas comunes (community kitchens) have developed into comedores populares (community dining halls) which provided meals to thousands of low-income residents in Lima as a long-term strategy to reduce food insecurity. Comedores populares are organised by 25-30 women members in daily volunteering basis and self-managed organisation, which serves meals 5-6 days per week. In some neighbourhoods, comedores populares have congregated with the aim of storing food and to buy together in order to reduce cost to food. They were also organised by the Federations and National Coordination. Comedores populares are set up through a mix between neighbourhood savings and international aid. To be a member of comedores populares, people must pay a membership, which provide access to cheaper plates.

Today, due to social restrictions from the COVID-19 pandemic, comedores populares have been forced to close down. This gives rise to ollas comunes as social practices based on solidarity, tradition and resilience in response to the emergency crisis. In the Mariategui district, for instance, the local NGOs CENCA has partnered with Frères des Hommes and local women to set up ollas comunes as collective actions to deal with the alarming food situation of the families in the neighbourhood.

Impact

- Economic - access to more affordable food by collective work
- Social - empowered women and overcoming poverty
- Political - community engagement rather than social assistance from foreign organisations

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Appendix 2: Ollas Comunes

📍 **Santaigo, Chile**

La Olla de Chile

Universidad Alberto Hurtado

Geografas Chile

Summary



Emerged in the late 70s during dictatorship period, the development of ollas comunes were a popular initiative that brought together local communities for the need to feed themselves during strikes and economic crisis. Ollas comunes were installed in different spaces and has a strong female presence. The community have transformed hunger issues into an opportunity for sociability, solidarity and collective organisations. In the 90s, some ollas comunes were part of the national school meal programme with the support of NGOs, which was previously dominated by private corporations.

Today, the COVID-19 pandemic has revived ollas comunes in which it particularly serves the low-income social groups children while school kitchens were forced to shut down due to restrictions and lockdown. Ollas comunes usually serve meals for 5-6 days per week which is largely operated by women in a volunteering scheme. Local and international NGOs also supported the development of this initiative. During the pandemic, crowdfunding platforms have operated by donating money and food to ollas comunes. Although it has a successful history, it still faces the challenges in implementing as participatory planning in the urban governance and secure their autonomy.

Impact

- Economic - providing work to women who regularly did domestic jobs, local economic development.
- Social - formalisation of community-based organisation.

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Appendix 3: Collective Kitchens

📍 Quebec, Canada

La Tablée des chefs
Community Food Centres Canada
The Table
The Salvation Army

Summary



Developed in 1985, collective kitchens was started by a group of women who organise themselves to purchase and cook collectively, aiming to produce healthy meals at an affordable price for everyone. Collective kitchens are community-led cooking programme and have expanded and formed across Canada. In the 90s, the collective kitchens began to provide meals to schools in vulnerable neighbourhoods. Today, they are supported by various organisations including local NGOs (e.g., The Salvation Army), as well as community organisations (e.g., Community Food Centres Canada), which then developed into a network that focuses on supporting this initiative.

The collective kitchens are set up through local community services, which provide infrastructures, a nutritionist and a community manager that manage and oversees the initiative locally. There is a salary scheme for some members of collective kitchens. It also facilitates workshops and conferences that provide social and learning benefits to the community and participants. The community kitchens are supported by food banks, and they also receive subsidies from the central government as it is a very well recognised grassroots initiative.

In the wake of COVID-19 pandemic, collective kitchens have developed into solidarity kitchens, which provide food to low-income families and people who lost their jobs during the crisis. Solidarity kitchens were emerged as collective kitchens were facing challenges in shortage of volunteers due to the risk of age groups. At the moment, solidarity kitchen is led by La Tablée des chefs and continue to serve meals to multiple communities across Canada.

Impact

- Economic - access to more affordable and healthy meals.
- Educational - health and nutritional learning

Sources

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Appendix 4: Community Kitchens

📍 Cape Town, South Africa

Amava Oluntu
Muizenberg CANs
Vrygrond United 4 Change

COMMUNITY KITCHEN MUIZENBERG

2020: in response to COVID-19, as part of the Muizenberg CAN, the Muizenberg community came together to make and serve over 30 000 meals, Monday to Friday for 8 months. This was all made possible by generous donations and volunteers!

In 2021, focus on emergency food security shifted, and the Muiz Kitchen needed to navigate with new visions & entrepreneurial aims to sustain.

The dream is to continue...
To continue cooking nutritious food, building community, sharing meals together, learning new skills, & coming alongside the most vulnerable in our community.

What we offer:
Low cost meals served at the Muiz Community Garden, R15 each.
Meals served at The Daily Goods Store, R50 each.
MON, WED & FRI: 12:30 - 2pm
Breaker Meats Veggie/ Dry Goods boxes

How to support:
Buy Muiz Coins to share Buy Lunch/ Breaker Meats/ Other Veggie Boxes
Donate through Amava Oluntu or Muizenberg CAN
Get Muiz Kitchen
Sign up to Volunteer!

We look an opportunity to move to the heart of Muizenberg Village. Now you can find us at The Daily Goods Store, Palmer Rd.

1 x Muiz Coin = R15 = 1 x Meal served from the Muizenberg Community Garden
MON, WED & FRI: 1-2pm

COMMUNITYKITCHENMUIZENBERG@GMAIL.COM

Muiz Kitchen

Unfortunately, due to its apartheid history, the community receives very little support from the state, and it is facing challenges in sustaining all the community kitchens due to lack of funding and difficulties in finding financial partners.

Impact

- Social - collective action that solved emergency hunger crisis during COVID-19 pandemic.
- Economic - access to food for people who have lost their job, elderly and disabled people, etc.

Sources

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Summary

Community kitchens in Cape Town, South Africa are set up as an emergency response to the COVID-19 pandemic, and the on-going hunger crisis in the townships of Muizenberg and Vrygrond. The initiative was a collective action, structured and managed by the local community, and a collaboration between the two neighbourhoods. At the beginning of the pandemic, Amava Oluntu have assisted them in saving and dividing grants donated by Oxfam South Africa to the community kitchen and have provided mental health programs and essential training to works and visitors to the community kitchens.

Today, community kitchens continue to serve meals for 5-6 days a week with a small fee (15 ZAR, which is 0.8 GBP). In addition to food from donors, they have also setup community gardens to grow food for the kitchen, and its waste revert as compost to the garden, creating a local food system to sustain the initiative at low cost. Food is also stored in freezers and is sold to the community at a low cost.

Appendix 5: Warwick Junction Urban Renewal Project

📍 Durban, South Africa

Asiye eTafuleni
Thekwini Municipality



Summary

At Warwick Junction, more than 7,000 informal street vendors sell everything from clothes and fresh produce to medicine and traditional delicacies. More than 450,000 commuters and shoppers pass through the market every day. During the apartheid, Warwick Junction was a tightly controlled 'black' entrance to the 'all-white' city. After the Apartheid, the eThekwini Municipality began renewal projects to reverse the racist urban design, and they improved the layout of Warwick Junction to become a safer and inclusive space for informal workers. In 2008, when the country was preparing to host the 2010 World Cup, the city announced plans to replace the Warwick Junction market with a modern shopping mall. This announcement brought great distress to informal vendors.

Impact

AeT (Asiye eTafuleni) is an NGO that protect traders in Warwick Junction. Using techniques piloted in the past, AeT worked with traders to prototype basic market infrastructures, such as multi-functional tables, safer cookstoves and storage facilities. By involving traders in this process, they gradually transformed Warwick Junction's formerly unequipped workspaces into areas that cater to the specific needs of each type of traders. Crucially, AeT amplifies the voices of informality and does not aim to represent them at any stage of the process.

Sources

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Appendix 6: Collective Bargaining in the Informal Economy

📍 Monrovia, Liberia

Federation of Petty Traders and Informal Workers Union of Liberia
National Petty Traders Union of Liberia, Petty Traders Association
Women in Informal Employment Globalising and Organising



Summary

The informal sector of Liberia's economy is very large, with the majority of Liberians working in it. However, as in many places, informal vendors in Monrovia face harassment as they go about selling their goods to earn a living. This involved repeated raids by the City Police, as well as the Liberia National Police, that were part of the government's attempt to create a "cleaner, greener and progressive capital city". The Police cited the obstruction of the free flow of vehicular and pedestrian traffic as the reason behind their actions.

This brought 1,000 men and women from the informal sector together, to march to the Monrovia City Hall and protest against these actions. They approached the Mayor and expressed their willingness to start a dialogue, in order to resolve the issue amicably. As a result, the suggestion for collective bargaining negotiations was instituted.

Impact

The street vendors established the Federation of Petty Traders and Informal Workers Union of Liberia (FEPTIWUL) and the National Petty Traders Union of Liberia (NAPETUL). The initial 1,000 people that marched to the City Hall and initiated the dialogue are now known as the Petty Traders Association. By this, the informal vendors:

- Got savvy with their negotiation skills.
- Gained the respect of officials.
- Started working with the municipality to devise a pioneering approach that includes street trade as part of the city's future.

When Monrovia's new mayor stepped into office in 2018, a great opportunity appeared for the organised informal vendors. The leaders of the formations approached the mayor to express interest in working with him to regularise street trading. They came to an agreement that was beneficial for all.

Sources

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Appendix 7: Women Producers Markets

📍 Mezitli, Turkey

RUAF Global Partnership on Sustainable Urban Agriculture and Food Systems



Impact

For the future, they aim to develop more sustainable ways of selling or consuming food (sustainable materials for stalls, like reusable cups and containers).

Sources

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Summary

In Mezitli, Turkey, most of the producers are women, who faces great barriers in selling their produce. First of all, Turkey's markets are mainly run/controlled by men, and women have little power over them. Secondly, the markets are not only for producers. Most of the stallholders have purchased their goods wholesale. Lastly, in order to sell their produce, women need to rent stalls in the markets or create their own enterprises, which involves a lot of bureaucratic and financial barriers.

In 2014, the city of Mezitli established the first markets exclusively for women. In order to participate, someone must be a producer, a woman, and located in Mezitli. The stalls are offered without rent or any other costs. Whenever an opening of a new Women Producers Market is announced, women can apply, and they are chosen randomly. The space and infrastructure for the markets are offered by the municipality. As a result of this intervention, women's income as well as their mobility increased. Moreover, the cooperation and knowledge sharing between women of different backgrounds and cultures increased.

Appendix 8: Bioferias

📍 Quito, Ecuador

Quito's Directorate for Sustainable Human Development
Economic Promotion Agency of the Municipality of Quito (ConQuito)
Food and Agriculture Organisation of the United Nations (FAO)



Summary

In Quito, small-scale agricultures are very common amongst the inhabitants of the inner-city settlements. However, Quito's urban agriculture was unrecognised in municipal regulations, only "tolerated" by planners and not considered in the programmes of the Ministry of Agriculture. This was the case until 2000, when the Quito Declaration called on the region's cities to embrace urban agriculture. Following this declaration, the Participatory Urban Agriculture Project (AGRUPAR) was launched, which brings together farmers and community-led organisations, with the aim to enhance food security.

One of the innovations of AGRUPAR is the opening of 14 agroecological farmers' markets, known as bioferias, sources of healthy food for the residents of Quito. These are located in both low-income and better-off parts of the city.

Impact

In the bioferias producers can directly sell their produce, something that keeps the prices reasonable and increases the trust between the producers and the customers. In 2012 it is calculated that the bioferias of Quito sold more than 100 tonnes of organic produce, a quarter of the project's total estimated garden production.

Sources

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Appendix 9: Organising self-employed women and informal vendors on an international level

📍 Ahmedabad, India and worldwide

Self-Employed Women's Association (SEWA)
StreetNet International
Women in Informal Employment: Globalizing and Organizing (WIEGO)



Summary

SEWA was created in 1972 with the initial aim to provide training in sewing, spinning, knitting, embroidery and other welfare activities that were popular amongst women. Since then, SEWA has expanded its activity and started involving other sectors, this includes vegetable vendors, incense-stick rollers and waste recyclers. In the 1980s, what started as a local initiative began to gain international presence. SEWA stepped into the international trade union movement. By this, informal workers were recognised as workers with a right to form trade unions. Along these lines, WIEGO was established to support informal workers in 1997. StreetNet International followed in 2002, connecting informal vendors across the world.

Impact

Organising informal vendors was now happening at an international level. The number of grassroots informal workers' organisations increased rapidly after that. Organising an international community for informal vendors helped create strong ties between them and allowed knowledge-sharing. The movement continues to grow. Informal workers are increasingly visible and recognised in various countries.

Sources

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Appendix 10: Any Supporting Information

Mapping Exercise



Figure 1. Map of Freetown and locations of community kitchens, informal markets, city specification and supermarkets. Authors' own. (Google Maps 2021)

Food security

**Networking for justice and resilience:
land tenure security, regenerating soil
and sharing seeds for urban
and peri-urban agriculture in Freetown**



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Abbreviations

UPA	Urban and Peri-urban Agriculture
AE	Agroecology
CODOHSAPA	Centre of Dialogue on Human Settlement and Poverty Alleviation
CRFS	City Region Food Systems
CSS	Community Seeds Sharing
CSB	Community Seed Bank
EJ	Environmental Justice
LT	Land Tenure
TRLUP	Tenure Responsive Land Use Planning
TS	Tenure Security
FA	Farming Associations
FCC	Freetown City Council
FEDURP	Federation of Urban and Rural Poor
FUPAP	Freetown Urban and Peri-Urban Action Platform
SAUFFT	South African Urban Food and Farming Trust
SLURC	Sierra Leone Urban Research Centre
MAFFS	Ministry of Agriculture, Forestry and Food Security
MSN	Multi-stakeholder Network
NGO	Non-Governmental Organisation
WARDC	Western Area Rural District Council

1. Executive summary

This report explores how Freetown's Urban and Peri-Urban Agriculture (UPA) influences environmental health, the overall socio-economic wellbeing, and autonomy of the city's inhabitants. Specifically, it focuses on those who produce food in and around the city, given the severity of hunger and lack of access to nutritious food for many within the city. The report's findings detail how reliance on food imports combined with limited urban space exacerbate food insecurity in Freetown. In this context, the report specifically focuses on building resilience and justice within the city so that those who are the most powerless and food insecure can sufficiently meet their nutritional needs. To this end, we recommend that a multi-stakeholder network (MSN) be founded in a participatory manner so that UPA may become institutionalised within the management and production structures of food within Freetown.

Our focus on marginalised groups within the city stems from an analytical framework rooted in Environmental Justice, which prioritises the need to recognise the barriers that vulnerable groups face in producing food, and how this shapes their livelihood decisions. Within this, any successful food security strategy must acknowledge how the social structures within Freetown's urban development and agricultural policy currently distribute resources inequitably and how these (re)shape power in the food system and the wider city. Moreover, it must also acknowledge that to overcome these structures, it must include marginalised UPA groups in a participatory manner so that food producers can take control of their own means of production and thus ensure their own food security.

As such, our strategy for an MSN involves several actors within Freetown's food system but is centred around the participatory involvement of Farming Associations (FA) with the aim of institutionalising UPA within the fabric of Freetown. From our secondary research and remote interviews, we go on to describe how a network should focus on three key areas: achieving land-tenure security for UPA, supporting and sharing knowledge of agroecological practices, and bolstering seed sharing between farmers.

Our land tenure security strategy lays out how a network can provide a platform for farmers and farming associations to gain a political voice within Freetown through collective power. Moreover, there is the chance to buy land for long-term agricultural use through collective savings groups that the network can support. We explain how food sovereignty is possible through securing UPA land. It opens the opportunity to localise production, cutting food costs due to less transportation as well as decreasing reliance on imports. Furthermore, securing land for UPA can increase the value of the land through the implementation of our second entry point: agroecology.

Agroecological practices can increase the value of land over time as it supports farming that enriches the soil, all the while decreasing production costs. This would rely on the co-production of knowledge between stakeholders in the network to adopt the right techniques within the socio-environmental context of UPA communities in Freetown. Moreover, it is shown that an emphasis on co-produced knowledge inherently strengthens the network ties between community members, potentially normalising UPA within Freetown while strengthening the wider resilience of the city through communal support.

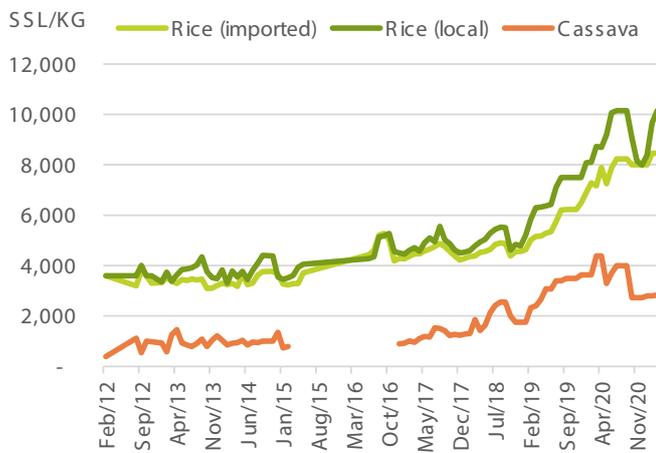
We later describe how support for the UPA community would be further enhanced through seed sharing, our third entry point. Decentralised seed sharing systems amongst farmers help establish food sovereignty in the city as it places the control of the primary agricultural input in the hands of farmers, while strengthening ties between farmers as they work together to safeguard the seeds they need. Moreover, there is the potential that through an MSN, a community seed bank can be established. These can increase Freetown's food systems' resilience by providing flood-resistant space for the storage of seeds that can be used for both large-scale dissemination of seeds and research purposes.

2. Diagnosis and research design

2.1 Background

Despite the 2002 Presidential Proclamation stating “no Sierra Leonian should go to bed hungry by 2007” various pressures mean that food insecurity is still prominent in Freetown (CAADP, n.d.). Since 1990, Freetown’s population has increased twofold due to long-term urbanisation as well as the 1991-2002 Sierra Leone civil war, which displaced nearly 3 million people leading to high rural-urban migration (Lynch et al., 2013). The conflict worsened Freetonians’ livelihoods, directly impacting access to food. Moreover, in recent years, food insecurity has been heightened by increases in food prices. Erratic rainfalls are impacting the country’s agriculture, and the Leone’s (SLL) depreciation increased imported food prices, triggering local price rises (Figure 1) (WFP, 2020).

Figure 1. Price of rice and cassava in Sierra Leone in SSL/KG



Source: Global Food Prices Database, World Food Programme (WFP, 2020)

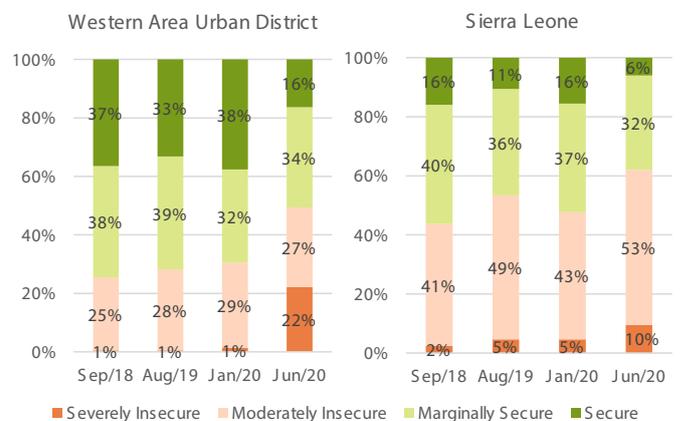
“Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences in order to lead a healthy and active life.” This definition gives greater emphasis to the multidimensional nature of food security and includes: “the availability of food, access to food, biological utilisation of food, and stability [of the other three dimensions over time].” (CFS, 2012)

The COVID-19 pandemic has exacerbated nationwide food insecurity, with particularly strong repercussions in Freetown (Figure 2). In the Western Area Urban District (including the city of Freetown and surrounding areas), the percentage of severely food insecure inhabitants increased from 1% in January to 22% in June 2020, primarily due to reliance on external food supplies which were limited by lockdowns. Recent data illustrates that roughly half of Freetonians do not have a sufficiently nutritious diet (Figure 2).

Urban and peri-urban agriculture (UPA) can greatly contribute to increasing long-term stable food security (Maconachie et al., 2012). In Freetown, UPA involves crop production, livestock rearing and fisheries. For depth, in this report, we will focus primarily on crop production.

By growing perishable crops locally, UPA complements rural agriculture and enables the urban population to access a greater variety of nutritious food that does not need to be transported from outside the city (Lynch et al., 2013). The production for household consumption allows farmers to save on food expenditures, and the remaining can be sold to provide income. This is particularly important in Freetown as both the civil war and later migration patterns created an influx of rural migrants who have skills suited to crop production and farming. UPA is thus important for the city’s economic development, poverty alleviation and the social inclusion of disadvantaged groups such as women, who make up a large majority of farmers in Freetown. Many farmers in Freetown are organised in Farming Associations (FA) which enables them to share resources, solicit financial support and achieve more secure land tenure (Maconachie et al., 2012). Finally, UPA is key in urban environmental management, incorporating organic waste recycling to produce compost or animal feed, greening the city and building resilience to climate change (RUAF, 2019). Further benefits are summarised in Figure 3.

Figure 2. Food security in Sierra Leone and its Western Urban District (including Freetown) in the years 2018 - 2020. Source: World Food Programme (WFP, 2020)



FOOD PRODUCTION AND URBAN AGRICULTURE

Figure 3. Main benefits of urban and peri-urban agriculture (RUAF, 2019)

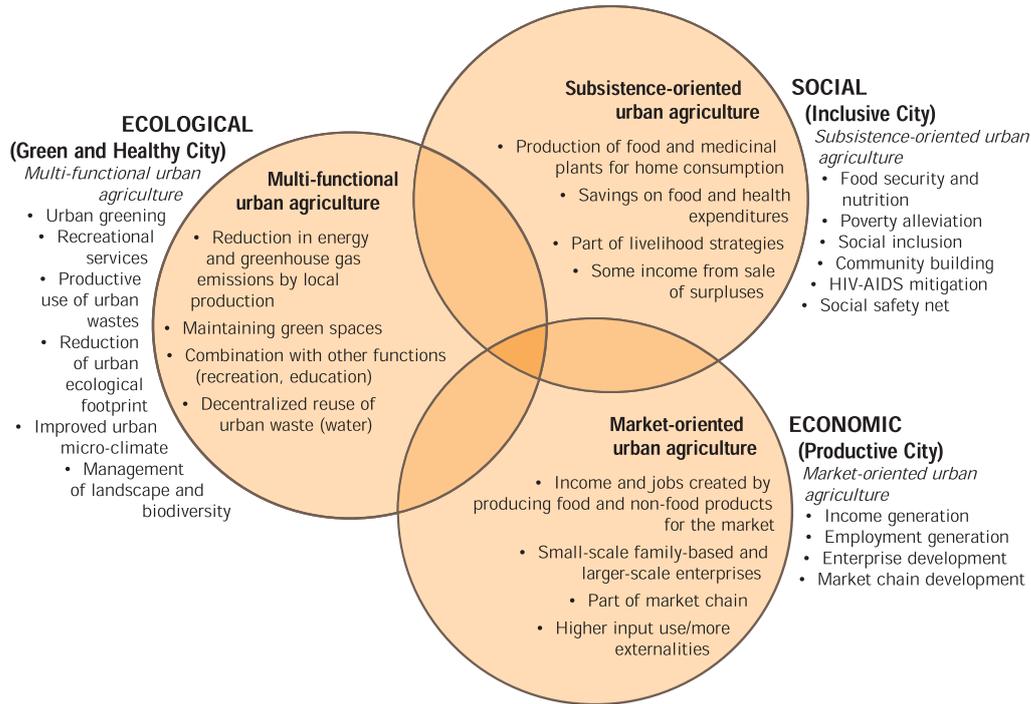
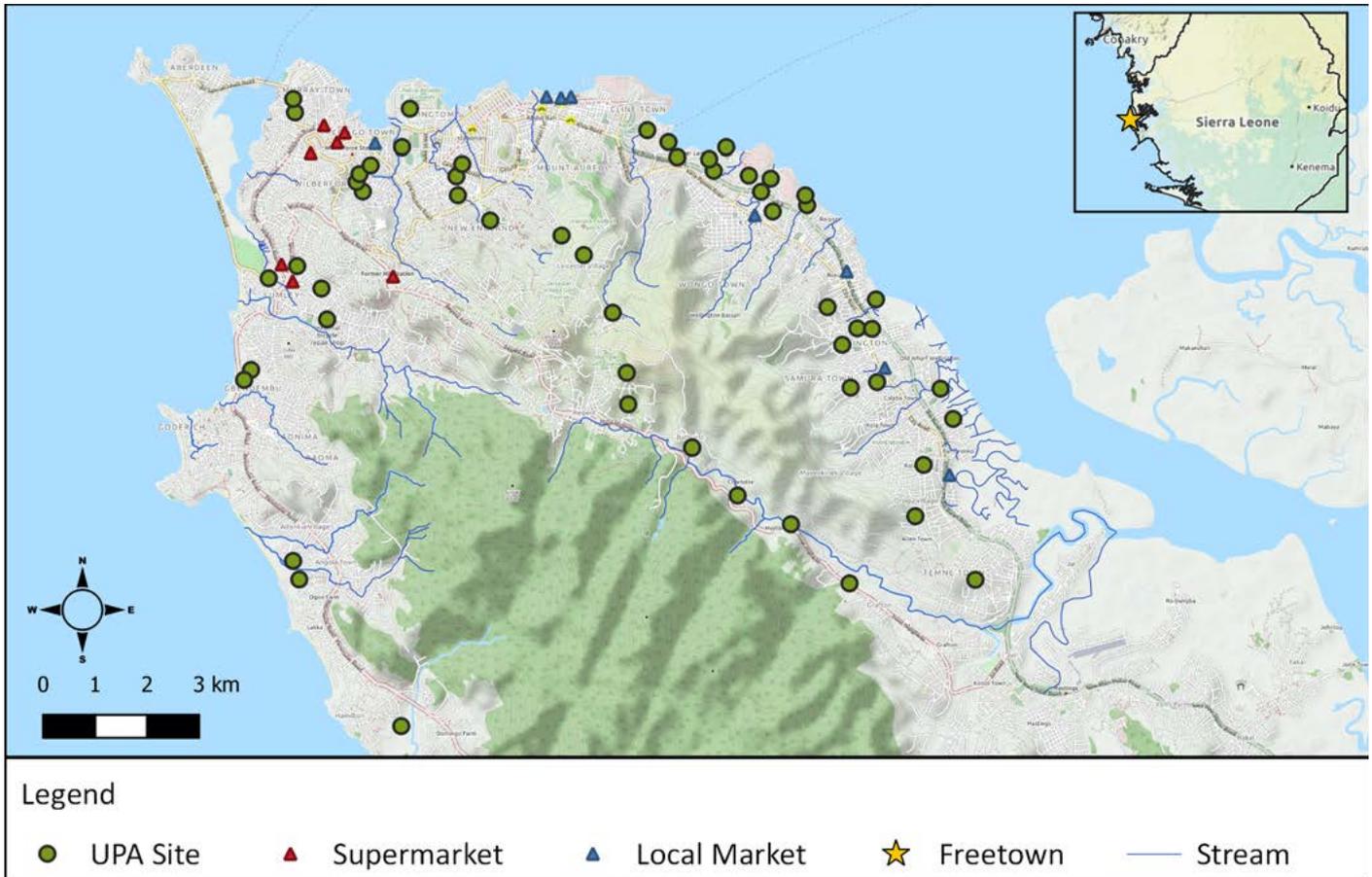


Figure 4. Map of UPA sites in Freetown, Source: Authors. Adapted from Lynch, K., Maconachie, R., Binns, T., Tengbe, P. Bangura, K. (2013) and Maconachie, R., Binns, T., and Tengbe, P. (2012).



FOOD PRODUCTION AND URBAN AGRICULTURE

Table 1. Conditions and types of crops in different UPA locations in Freetown (Cadzow, 2016)

UPA site	Typology of UPA	Dry season (November-April)	Wet season (May-October)
Lowland/ Coastal Urban Sites Districts: e.g. Poto Levuma, Lumley and New England	Open space used by multiple farmers/ farming associations (FA)	High temperatures. Crops need to be watered daily. Crops: traditional leafy greens including potato leaf, cassava leaf, krin-krin, and okra. Limited salad vegetables.	Heavy rainfall leads to seasonal flooding of established gardens in these low-lying areas making most crop production either difficult or impossible; however, rice can be grown in flooded wetland areas. Crops: rice.
	Gardens and Backyard plots		
Mountainous Peri-Urban Sites Districts: e.g. Gloucester, Leicester and Regent	Mountain wetlands	Wetlands retain water due to cooler temperature and denser foliage cover so salad vegetables can be grown. Crops: lettuce, tomatoes, cabbage, spring onions, onions, carrot, sweet peppers (capsicums), hot peppers, runner beans, cauliflower, mint, parsley, leafy greens).	Again, flooding makes crop production more difficult, though rice can be planted. Crops: rice.
	Terraced gardens on hillside	Left empty due to difficulty of transporting water. Crops: n/a	Not susceptible to flooding. Crops: salad vegetables (lettuce, tomatoes).

Freetown’s heavy rainfall patterns dictate when, where and what can be farmed. Extreme seasonal rainfall results in yearly flooding, making some areas unsuitable for residential development, but suitable for certain agriculture in the dry season (Table 1) (Cadzow, 2016). UPA is practised in various locations including backyard gardens across central Freetown and the wetlands and city’s hilly peri-urban edges (Gloucester, Regent, Leicester) (Figure 4) (ibid.).

While the high rural-urban migration contributed to the growth of UPA in Freetown, various constraints are preventing its successful functioning and expansion (RUAF, 2019). As a mountainous city with limited outward expansion potential (Lynch et al., 2013), high commercial development pressure, and unfavourable political conditions, land access for UPA is highly challenging. Land-use plans do not adequately incorporate UPA, and zoning land for

agriculture is rare and usually not enforced (FUPAP, 2007). Unsustainable practices damage ecosystems contributing to negative perceptions among local stakeholders. Another hindrance to UPA in Freetown is poor access to costly inputs (e.g., seeds and tools) for farmers struggling to access finance. This is notably the case for women in Freetown, who often cannot access credit due to poor land tenure security (Winnebah et al., 2004).

Historically, national policies have directed attention towards increasing rural agriculture. While UPA’s importance has been recognised, an appropriate national policy and legal framework for supporting UPA are still lacking. Moreover, the 2019-2022 “Transform Freetown” city strategy does not explicitly mention UPA, despite focusing on resilience and environmental management (FCC, 2019). While the Freetown City Council (FCC) initially encouraged backyard gar-

Figure 5. Madam Farmer collects hot peppers in her Regent vegetable plot, February 2014. Photo credit: Hana Cadzow, Freetown, 2014.



Figure 6. Terrace garden in Freetown, 2021. Photo credit: Andrea Klingel, Freetown, 2021



dening during the COVID-19 pandemic by providing households from informal communities with gardening tools and seedlings, UPA remains marginal within Freetown's political agenda (FCC, 2021). Freetown thus far lacks the long-term policy support that creates a thriving system.

2.2 Analytical framework

For a resilient food system that can adapt to crises and shocks, justice is imperative. Therefore, our report incorporates Environmental Justice (EJ) as a framework. By focusing on the three aspects of distribution, recognition, and participation in our strategies, we can ensure that marginalised groups gain access to collaboration spaces and a political voice within the city (Walsh-Dilly et al., 2016; Allen and Frediani, 2013). Distribution in the case of UPA in Freetown should look towards the access to and ownership of land in the city, understanding ingrained power dynamics. The second dimension emphasises the need for recognition, especially of marginalised communities, such as, women and disabled farmers. Participation in the decision making and political process is explored as the third dimension where it is vital to involve groups and networks that ensure accurate representation in decision making for the city's future.

1. **Focuses on food for the people** by: a) placing people's need for food at the centre of policies; and b) insisting that food is more than just a commodity.
2. **Values food providers** by: a) supporting sustainable livelihoods; and b) respecting the work of all food providers.
3. **Localises food systems** by: a) reducing the distance between suppliers and consumers; b) rejecting dumping and inappropriate food aid; and c) resisting dependence on remote and unaccountable corporations.
4. **Places control at a local level** by: a) placing control in the hands of local food suppliers; b) recognising the need to inhabit and share territories; and c) rejecting the privatisation of natural resources.
5. **Promotes knowledge and skills** by: a) building on traditional knowledge; b) using research to support and pass on this knowledge to future generations; and c) rejecting technologies that undermine local food systems.
6. **Works with nature** by: a) maximising the contributions of ecosystems; b) improving resilience; and c) rejecting energy intensive, monocultural, industrialised and destructive production methods.

Moreover, Food Sovereignty upholds that a food system cannot be resilient and just unless food producers control their own means of production as well as the ability to meet their consumption needs. To democratise the food system, it emphasises the importance of local, accessible food

production with control of resources (Chihambakwe et al., 2019) (Box 1). An in-depth understanding and improvement of how food systems flow around the city is thus needed to encourage food system localisation. The City Region Food Systems (CFRS) approach integrates flows of food, waste, people, and knowledge that make up the city systems as well as the policies and processes which enable resilience in the face of a changing environment and conflicting pressures on resources (Blay-Palmer et al., 2021). A multi-sectoral and multi-stakeholder participatory analysis of the city region can reveal how to build more just and resilient food production (Blay-Palmer et al., 2021).

Our framework therefore combines EJ and CFRS to integrate principles of Food Sovereignty into Freetown's food production system.

2.3 Research questions

Based on our analysis of Freetown's food production challenges and our analytical framework, our report is guided by the following research questions:

How can a multi-stakeholder network strengthen urban and peri-urban agriculture in Freetown to deliver a just and resilient food production system?

- I. How can participatory institutionalisation of UPA safeguard existing UPA sites, facilitate access to potential new UPA sites and increase land tenure security for marginalised groups?
- II. How can knowledge-sharing enable the development of agroecological practices that bring economic, social and environmental value to marginalised groups in Freetown and the city as a whole?
- III. How can cooperative networks and community seed sharing reinforce one another for resilient farming?

2.4 Methodology, objectives, and limitations

The action-research project was planned to follow a process that moves from secondary research through primary research with interview participants and then onto a final report creation stage. The steps of this process are laid out in Table 2.

FOOD PRODUCTION AND URBAN AGRICULTURE

Table 2. Stages of research

Research Stage	Activity	Purpose
Pre-Fieldwork Stage: Research using secondary data (Jan 18th – Apr 26th)	<ul style="list-style-type: none"> • Desk-based research of previous years' group work • Literature review • Remote interviews with SLURC colleagues • Mind map networks of actors • Setting research questions and research design • Presentation of research design 	<ul style="list-style-type: none"> • Understand the historical, geographic, and social context of Freetown UPA • Understand key trends in global UPA • Formulate analytical framework, research approach and questions • Understand the plan of the remote fieldwork
Remote Fieldwork Stage: Gathering data and field information (Apr 26th – May 21st)	<ul style="list-style-type: none"> • Interviews with global UPA actors (NGOs, researchers and practitioners) • Interviews with key Freetown community members • Interviews with potential network members • Land-use mapping 	<ul style="list-style-type: none"> • Understand the global trends shaping UPA • Understand best practice, successful initiatives, and common challenges • Understand the opinions and needs of Freetown UPA practitioners • Gather data on Freetown UPA practices • Assess our strategies with local community for input and feedback
Post-Fieldwork Stage: Data processing and strategy consolidation (May 21st – May 28th)	<ul style="list-style-type: none"> • Processing and analysing data • Collating and consolidating research into report • Refine strategy suggestions based on data • Prepare report to be disseminated to participants and members of wider community 	<ul style="list-style-type: none"> • Combine the best practice from elsewhere into strategies that work in Freetown • Present the strategies in a format that can be acted upon by a range of actors within UPA

Figure 7. Backcasting approach to building food resilience in Freetown



Table 3. Limitations of the research

Limitation	Outcome
<i>Pandemic-induced remote working</i>	<ul style="list-style-type: none"> • Limited by the lack of qualitative and quantitative in-person data gathering. • Places burden on local partners and need for new ways of working and reaching interview participants. • Not able to conduct focus groups to gather wider, deliberated views. • Mapping exercises are based on remote interviews and pre-existing sources as opposed to in-person mapping exercises. This hinders accurate mapping of FAs and sites of urban agriculture in the city. Map locations, therefore, are provisional approximations.
<i>Remote communication mediums</i>	<ul style="list-style-type: none"> • Connection issues can make remote calls unreliable and frustrating for participants in a manner that restricts the ease of discussion. • Unable to foster strong relationships with interviewees due to reliance on remote communication. • Hard to reach marginalised communities who may not have access to a (stable) internet connection or communications technology. • Reliance on participants’ digital literacy (Sy et al., 2020).
<i>Limited availability of local interviewees prevents accurate cross-section of actors by social role and location</i>	<ul style="list-style-type: none"> • Restricts full cycles of development in which action-research learnings can be applied and then re-fined. • Interviews had to fit into a limited time window which limits extensiveness of data gathering.
<i>Ontological Issues</i>	<ul style="list-style-type: none"> • On top of the epistemic issues presented above, there are potential issues related to our positionality, cultural biases, and especially the influence of Western academic traditions on our understanding of the intricacies of the Freetown context.
<i>Decolonial research methods</i>	<ul style="list-style-type: none"> • Implicit power dynamics of researchers’ positionality in relation to the local context (Patel, 2020). • Lack of opportunity for immersion in the community reduces the chance to be sensitized to the socio-cultural context; online research gathering can lead to the ‘digitalisation of suffering’ and “risks reducing complexity of social phenomena and omission of important aspects of lived experiences” (Mwambari et al., 2021).

2.4.1 Objectives

From our research, we would hope to discover the strategies that may work over the short and long-term to allow for the system to gain institutional backing from the Freetown community.

A long-term ambition of this process would be for the city to have a thriving UPA system that is reaching its capacity for Food Sovereignty in accordance with EJ principles. These ideas were formulated into a backcasting approach that set out optimistic goals (Figure 7) (Phdungslip, 2011).

2.4.2 Limitations

Conducted remotely during a pandemic, in-person data gathering was not feasible. However, remote-working practices meant many interview participants were available. Nevertheless, specific limitations in addition to those that might ordinarily apply can be seen in Table 3.

Measures were taken to mitigate for these limitations and make the most of the current circumstances.

3. Strategies

3.1 Multi-stakeholder network creation for UPA

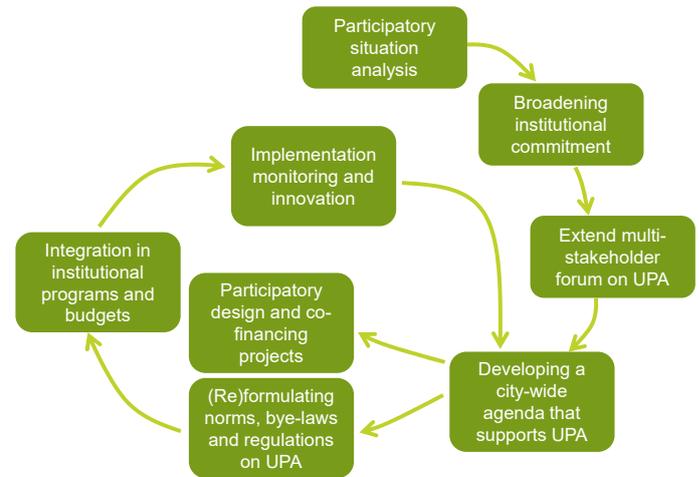
"I cannot overstate the need to network as an urban farmer. (...) Farming thrives where a collective effort and pursuit of a shared goal is evident." - Camp Green Uganda.

Given the barriers to UPA in Freetown, a multi-stakeholder network (MSN) – a transformative tool for inter-disciplinary collaboration and participation (Cabannes and Marocchino, 2018) – could integrate UPA into Freetown’s regular agenda. Cross-disciplinary ideas harnessed this way can bolster food security.

Inspired by the Ghanaian experience of a multi-stakeholder process in Tamale, the proposed MSN will engage multiple actors to collaboratively facilitate the integration of UPA into the city strategic agenda and municipal budgeting plans (Cabannes and Marocchino, 2018).

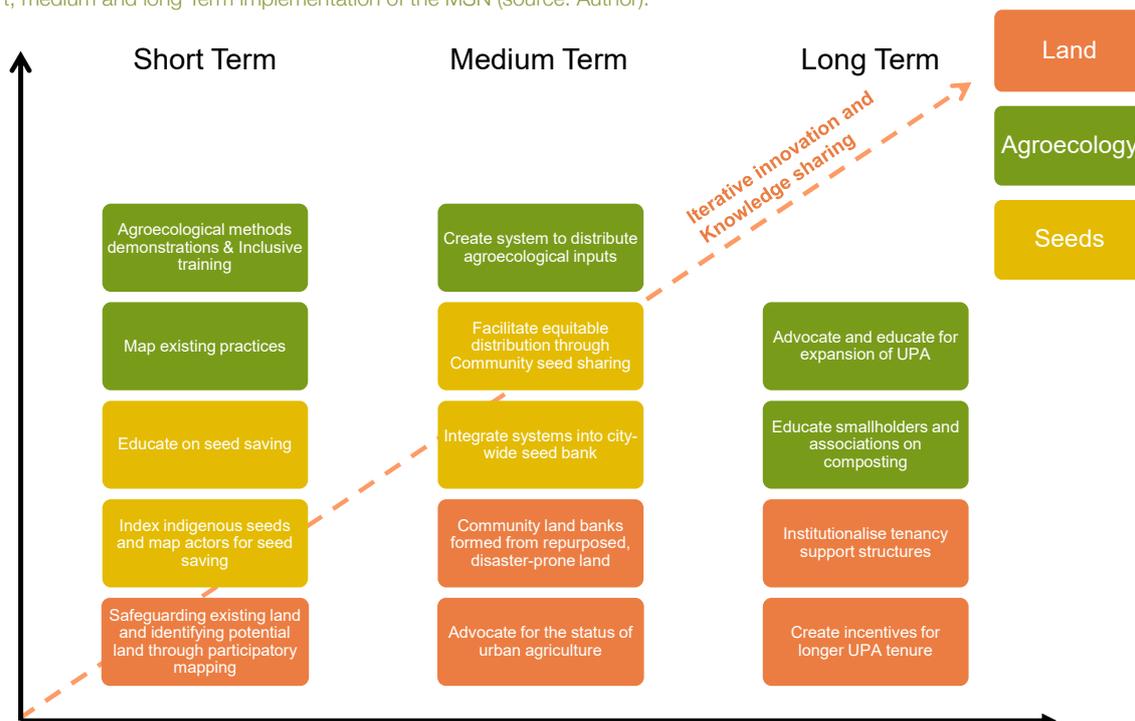
The proposed MSN will be a neutral space to promote dialogue, knowledge sharing and collective action between and within stakeholders in Freetown’s UPA. Furthermore, FAs can be promoted as valuable and well-informed partners in the eyes of government actors: an empowering participatory process (Jansen and Kalas, 2020). The MSN would be used to bolster the three proposed routes of intervention: Land Tenure Security, Agroecological Practices and Seed Sharing (Figure 8).

Figure 8. Stages of the MSN adapted from RUAF Working Paper (Dubbeling et al., 2011)



The process of development for the MSN is shown in Figure 9, where internal dialogue and iterative stages will ensure a shared vision, identifying common struggles, current solutions, and priorities for the future. In the initial stages, internal dialogue will be focused on visualising the principles and objectives of the MSN ensuring a cross-sectoral, socially inclusive guarantee of cohesion, tolerance and transparency.

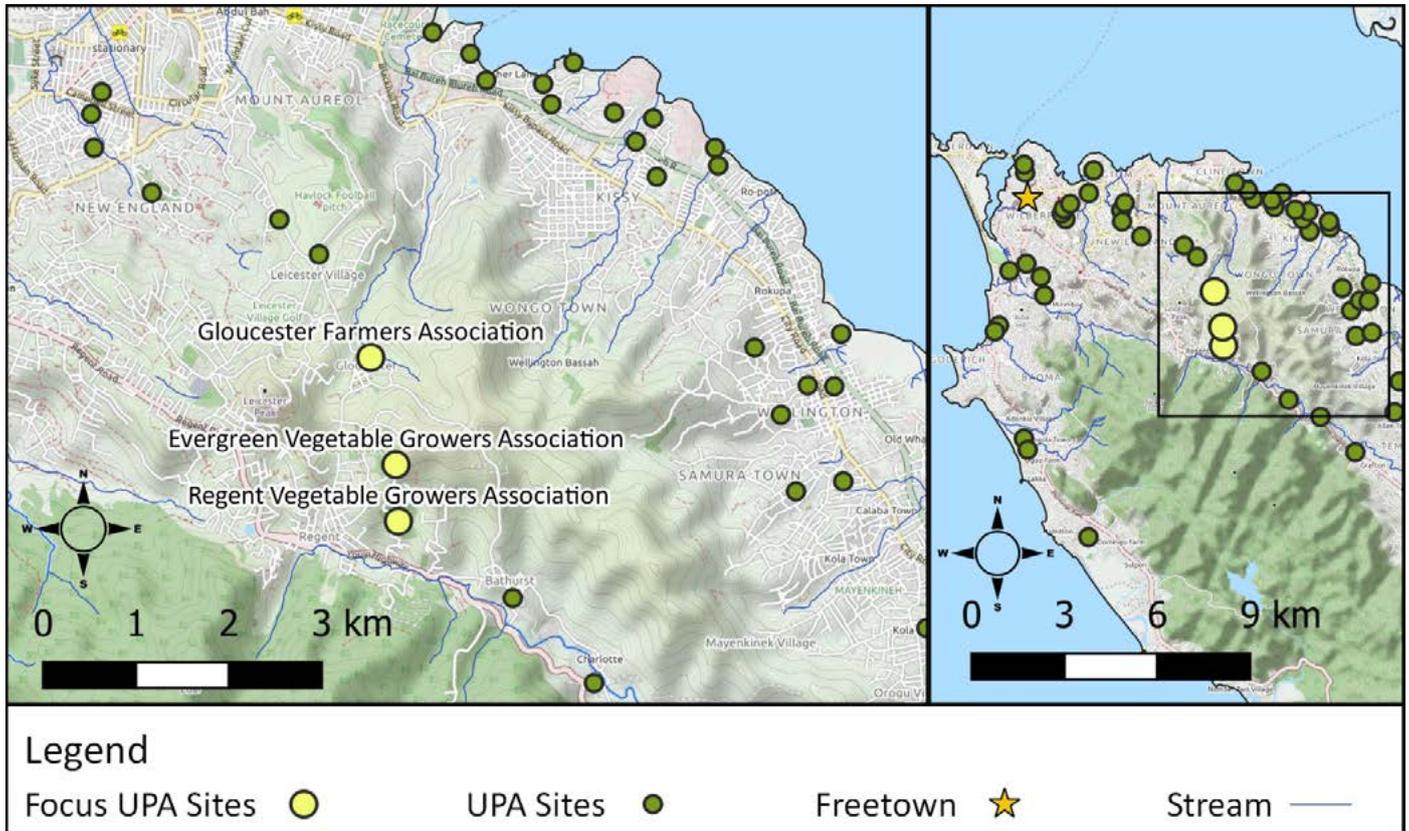
Figure 9. Short, medium and long Term implementation of the MSN (source: Author).



Note: Predicted implementation in short, medium, and long term. This does not imply that they take place in a distinct sequence, as in reality iterations are expected based on the needs and wants of the network.

FOOD PRODUCTION AND URBAN AGRICULTURE

Figure 10. Potential FAs the MSN could expand upon. Source: Authors. Adapted from Lynch, K., Maconachie, R., Binns, T., Tengbe, P. Bangura, K. (2013) and Maconachie, R., Binns, T., and Tengbe, P. (2012).



3.2 Opportunities

“Networking primarily helps bridge the knowledge gaps in urban farming.” - Camp Green Uganda

As outlined in greater detail in the strategies below, the MSN would create opportunities that numerous interviewees expressed interest in: dialogue and knowledge sharing; collective action and capacity building for tenure security and would strengthen social ties.

The MSN would be inspired by, and build upon, past and current work by a range of actors, and aims to link with current networks shown in Table 4. Our interviews suggested an initial project could implement the MSN by connecting and expanding on current collaborations such as that of the Gloucester Farming Association, the Regent Vegetable Growers Association and the Evergreen Vegetable Growers Association in the peri-urban region mapped in Figure 10.

Table 4. Previous networks for Freetown’s UPA

Network	Explanation and lessons
Freetown Urban and Peri-urban Agriculture Project (FUPAP)	FUPAP operated (2006-2013) across several different coordinating activities. They particularly focused on land tenure identifying leaseholder support strategies. Unfortunately, the network disbanded, and activities halted due to key personnel moving away. This demonstrates the benefits of greater horizontal organisation due to risks of over-reliance on external actors.
FAO’s Sierra Leone Food Security Working Group	The Working Group is a platform for dialogue between government actors and NGOs. Unfortunately, Freetown’s FAs do not play an active role in the group. Thus, the voices with the least power are again being overlooked. The EJ lens highlights the need for inclusivity within this proposed MSN.
Existing Farming Associations (FAs)	A range of FAs operate in the city with a variety of resources and representing a diverse selection of social groups. Currently, 59 FAs organise themselves by location, gender, age and/or disability to work collectively on common challenges (Lynch et al., 2013). Most members within FAs rely on urban agriculture as their main source of income (ibid.). Some have active savings groups sell their services for additional income (ie youth farmers manual labour (Maconachie et al., 2012).

FOOD PRODUCTION AND URBAN AGRICULTURE

Figure 11. Predicted members of proposed network



3.2.1 Barriers

One barrier, discussed often by interviewees, is funding. Funding issues can be alleviated by adopting self-sustaining funding models. Some networks have used low membership fees that increase buy-in and empowerment (Appendix: KALOCODE). Others have focused on keeping

running costs low, partly through the savings available from holding informal meetings that are cheaper to run (Appendix: NEFSALF, CALM Africa). This would be a key issue for members to resolve early on, but we recommend a hybrid option involving affordable membership fees charged to farmers to supplement outside funding from either institutional or Non-Governmental Organisation (NGO) actors.

Table 5. Role of stakeholders within proposed network

Stakeholder	Role within network
Freetown FAs (incl. women and youth)	Contributing to all activities (mapping, knowledge-sharing, mutual support) and inspiring the direction of the MSN. In time, this builds the voice of UPA through representative advocacy by key custodian farmers who can mediate for and represent the interests of other farmers.
SLURC	Disseminating resources that amplify local knowledge and best practice initiatives. Leveraging local relationships to recruit a representative and inclusive cohort.
Freetown City Council (FCC)	Providing resources, facilitation services, and driving local policy in collaboration with the MSN in line with Transform Freetown (FCC, n.d.).
Ministry of Agriculture, Forestry and Food Security (MAFFS) & Ministry of Lands, Country Planning and the Environment (ML-CPE)	Through interactions with the network, continue the creation of an enabling environment for UPA: land allocation through zoning and distribution; supporting research initiatives, and resources for sustainable farming practices that meet government goals (MAFFS, n.d.).
Codohsapa & Fedurp	Their previous work (mapping, savings groups, stakeholder dialogue) will provide foundations to build a strong MSN that is responsive to the interests of the marginalised groups (Appendix: Codohsapa & Fedurp).
Other supporting actors	A range of institutions and actors can contribute, as relevant to their capacity and experience, to ongoing initiatives either as participants or allies (Cabannes and Marocchino, 2018). (See Figure 11 for potential supporting actors).

This would increase self-sufficiency as it spreads the burden of funding rather than placing the challenge of long-term funding on one actor. It would also ensure members feel a sense of ownership.

Another barrier is conflicting stakeholder priorities. We recommend that ongoing stakeholder analysis and participatory practices are used to maintain a democratic and horizontal structure that can find compromises between conflicting priorities. There will need to be constant evaluation of who is being represented, and analysis of their ability to contribute.

3.3 Land tenure strategy

3.3.1 Networks for Tenure Security

Network creation is key to facilitating a favourable environment for the institutionalisation of UPA land. Academia and policy often focus on legal (de jure) ownership ensuring increased investment in UPA (Suchá et al., 2020). However, there is a need for a multi-faceted and multi-stakeholder approach that looks to more than just legal ownership. An MSN would build collective capacity for FAs and encourage greater participation in citywide planning. An interview with a women's FA stated that previously secure land was recently taken away, leaving 40 members destitute. Much UPA land is similarly insecure which exacts social and economic costs and discourages investment in long-term sustainable methods. Both research (Repetto et al., 2020) and interviews have shown that UPA land is very restricted with no easy solution, especially in the eyes of FCC who face competing claims.

Our strategy entails safeguarding current UPA as a priority to prevent encroachment and housing-driven development. The network can then attempt to connect farmers and shift mindsets regarding the use of urban land (Table 6). Some land could be used that remains unsuitable for housing. Finally, Community Land Trusts (CLT) and advocacy work could be used to institutionalise UPA within urban policy and planning frameworks. Throughout these processes, the network would facilitate collaboration, communication, and compromises to ensure marginalised communities' needs are met.

An interviewee stated the FCC is currently collaborating with C40 cities to develop a City Food Strategy. In line with the FCC's increasing interest in expanding UPA production, we envision UPA taking a key role in the policy formation. We hope financial and institutional assistance could support the activities and organisation of the proposed MSN. Harnessing the collective voice of the MSN brings strong opportunities for policy advocacy and UPA incorporation into city plans and budgets. As seen in Rosario, UPA activities were only successfully promoted after being integrated into municipal budgeting, where resources for training, promotion and marketing activities were supplied by the Council (Cabannes et al., 2003; Dubeling et al., 2010).

3.3.2 Opportunities

Interviews have highlighted how participatory processes can secure the future of UPA land with the collaboration of marginalised communities. Participatory methods for tenure security can be used to map current UPA to allow the MSN to collectively secure these spaces before identifying potential new sites. The Tenure Responsive Land Use Planning (TRLUP) method (Box 2) could be used by the network as it is iterative and built to respond to dynamic contexts with complicated tenure systems (Chigbu, 2016). It was successfully used for UPA in Addis Ababa to secure land specifically for women farmers who were unable to access credit to purchase land (Teklemariam and Cochrane, 2021) similar to Freetown. MSN's can gather consensus on the process and outcomes through continuous monitoring and evaluation to ensure that FAs voices are heard.

Box 2. Participatory Tenure Responsive Land Use Planning Steps (Chigbu, 2016)

- Step 1:** Initiate multi-stakeholder team as part of the network
- Step 2:** Collectively set objectives of UPA tenure security
- Step 3:** Collect data on UPA in the city
- Step 4:** Document and map UPA in the city
- Step 5:** Draft the Land Use Plan based on range of land rights in the city
- Step 6:** Review plan with community and relevant authorities
- Step 7:** Final presentation of plan to network and public
- Step 8:** Link data to existing information systems and repositories of land
- Step 9:** Monitor, evaluate and iterate

Once land is mapped, there are methods for gaining tenure security that involve CLTs and de facto tenure security (Box 3) that might be more reasonable considering the local context. Legal ownership is rare and interviews and research (Allen and Frediani, 2013) showed that de facto tenure would satisfy many farmers' needs. To see more on how CLTs could work in a Freetown context see the Land Production section within this report. The culmination of the TRLUP process could result in a land bank as seen in Rosario (Box 4), where available land is documented, and encouragements happen in the form of tax incentives for private landlords to share their land. We saw in interviewing various initiatives that through demonstrating successful practices and community participation, land was secured as it became socially unviable for the government to reclaim the land for development (Appendix: SAUFFT), commonly referred to as de facto tenure security (Rambaldi et al., 2007). While the social, political, economic and environmental contexts of these international initiatives vary significantly, lessons can still be transferred to Freetown, where there is still little support in policy and practice for UPA. These examples tackle this with collective action that encourages policy change and political support.

FOOD PRODUCTION AND URBAN AGRICULTURE

Box 3. Types of Tenure Security (Suchá et al., 2020)

De Jure tenure security refers to legally acknowledged property rights that are enforced by government institutions. Perceived tenure security refers to the experience of the user of the land and perceptions of threat of eviction. De Facto tenure security refers to the contextualised versions and agreements of use of land that don't constitute legal ownership but can offer the same protections if enforced.

Box 4. Land bank in Rosario, Argentina (Cabannes, 2012)

In 2003, the Municipality of Rosario (Argentina) with its Urban Agriculture Programme launched a bank of all city-owned land and private land made available by its owners. The legal framework developed by the city encourages landowners to allow the use of their lands for a minimum of two years in exchange for tax reductions. The policy focuses on providing access to land to vulnerable people, including unemployed, retired people, secondary and high school students, and drug-dependents. With the right conditions (tenure security provisions, tenure length, tax incentives) negotiated in a participatory process, a similar initiative could be implemented in Freetown. It is important to recognise that although long-term tenure is preferable, some UPA farmers and gardeners could also benefit from land being made available for a shorter period.

Before policy change takes place, there are incentives that can be used for both private and public landlords to encourage the use of land for UPA. The experiences of Cities Without Hunger in São Paulo indicate the potential role of urban (agroecological) farming in incentivising private land-owners to allow cultivation of their land: land-owners

pay for farmers to cultivate their land as it maintains the health of the earth and prevents squatting. This possibility was also highlighted in an interview with a food system planner.

3.3.3 Barriers

Despite the increased awareness of the importance of Freetown's UPA, with such high pressure on land, the network will face many hurdles and conflicting priorities. Commercial development and international actors buying up vital land for UPA is a significant threat that, without adequate policy and participatory planning, could impact the land available for UPA in the city.

Finding common ground between numerous actors and institutions will be a key challenge. Urban land is managed by the Ministry of Land while UPA is managed across various national and local government departments. Therefore, the network must balance the influence of many actors, complicating any negotiations and agreements. With FCC and Western Area Rural District Council (WARDC), there is a sentiment that more control over the land zoning would benefit UPA, as the current model gives land zoning rights to the Ministry of Land at a national level. Freetown's existing urban power dynamics could prevail, with women's land rights, though legally enshrined, being taken away through customary practices (Teklemariam and Cochrane, 2021). Therefore, the MSN must ensure collaboration and decision-making involves women in leadership positions.

Finally, as interviewees acknowledged, funding sources are often unreliable and linking into existing savings groups can be complicated when clashing with their original aims. While the network could make use of a combination of

Table 6. Possible sites for UPA in Freetown

Possible Site	Justification
Dump Sites	Both illegal and legal dumpsites have been used by UPA initiatives in other cities, where sites are cleaned up for UPA use (See Appendix: Zoma, SAUFFT, KALOCODE).
Wetlands	Although policy exists in Freetown for wetland sites to be used for UPA, sites are often encroached for housing. Through the MSN's increased influence, these sites could be safeguarded for UPA use (See Appendix: FCC).
Riverbanks	Riverbanks in Freetown are often used for housing; however, this practice is often unsuitable. Interviewed city representatives were cautious about using riverbanks due to the level of encroachment. Therefore, any strategy for using these areas would have to go along with participatory housing upgrading for residents (Michiani and Asano, 2019). (See Appendix: Zoma)
Landslide Areas	A culture of experimentation could allow the MSN to secure land for agroforestry that has proven susceptible to landslides. These areas are restricted because human activity (mining, logging) exacerbated risk. Agroforestry could make this area safer, while providing a livelihood to those who used to work in the paused industries. (This will rely on a culture of agroecological knowledge sharing outlined below).
School Gardens	Current FAs within Freetown, such as the Gloucester Farming Association, work with schools to share knowledge as well as to produce food. School gardens could provide an opportunity for the MSN to encourage UA within the city as well as secure space for small-scale farming. (See Appendix: CALM Africa)

international donors and local funds for purchasing land, we hope that informal agreements taking the place of legal ownership could reduce costs. Ideally, land could be leased from both public and private landlords for set periods of time that allow for UPA to successfully take hold. In some cases, however, it may be more beneficial to collectively purchase the land with community collaboration. The MSN will need to adapt to a mixed approach, but there is hope that collective action, leading to increased support and institutionalisation of UPA would mitigate reliance on external donors in the future.

3.4 Sustainable Practices: Agroecology

Interviews revealed the importance of not reinventing the wheel by overlooking the extent of current agroecology practices. Therefore, as with our other strategies, the MSN will initially help to map agroecology's extent and nature.

“Agroecology is both a science and a set of practices. It was created by the convergence of two scientific disciplines: agronomy and ecology. As a science, agroecology is the “application of ecological science to the study, design and management of sustainable agroecosystems.” As a set of agricultural practices, agroecology seeks ways to enhance agricultural systems by mimicking natural processes, thus creating beneficial biological interactions and synergies among the components of the agroecosystem.” (De Schutter, 2010)

The aggregated quality of the city's agroecological practices will depend on the tools used for knowledge sharing (Table 8). The methods detailed here would allow, as our interviews advised, for training organised by the MSN to happen at scale, that combines indigenous and conventional knowledge to be inclusive and effective (Pimbert, 2018). AGRUPAR in Ecuador, described how training is a core element of their UPA support and NEFSALF in Nairobi has a mandatory training course for all new members of their network (see Appendices). Also, assistance will likely be needed from network collaborators to reduce the difficulties in adjusting to these methods (more detail in ‘Barriers’).

3.4.1 Opportunities

Agroecology can bring profound social benefits. It increases women farmers' food security by “reducing labour at the beginning of the rainy season and yielding more resources from uncultivated land” (Allen and Frediani, 2013). Reduced reliance on fertilisers also helps marginalised farmers who have lower access to finance. Agroecology has also improved women's land rights in a range of African locations (Rashidah, 2021). Partly, as seen above, this is because healthier land can incentivise leasing.

As seen in the table, social harmony is both a means and an end in agroecology. Harmony would improve the MSN's resilience as its “participatory methods for research and technical assistance [...] stimulates the improvement and strengthening of a collective organisation of farmers” (Peano et al., 2020).

Box 5. Single Leg Amputee Sports Association Garden in Freetown (Bangura, 2014)

In Freetown, in Freetown, the Single Leg Amputee Sports Association makes the most of the interaction between sport, community, and regenerative agriculture. The organiser saw a connection between the healing power of sport and organic farming and so decided to start using farming alongside the football sessions.

Now, the garden is experimenting with Bokashi fertiliser. It is cheap and efficient but requires training. The organiser of this farm sees potential to link with other local industries to quickly decompose waste such as fish meal before returning it to the soil.

That an innovative organic farming model has sprung from a forward-thinking community that empowers marginalised people shows the natural link between agroecology, a vital community, and a healthy planet. The network can provide a platform to spread ideas such as this and to amplify the effect of the best work happening in Freetown.



3.4.2 Barriers

Institutionalising agroecology will require continued advocacy because the default assumption is often skewed in favour of conventional methods (Allen and Frediani, 2013). Quito's successful achievement of this culture, although having many years head start and a favourable policy context, can be emulated by the network. The MSN must continually communicate with both those in power (lobbying) and demonstrate agroecology's worth to the wider population (advertisement) to build cultural acceptance.

Also, as seen in Quito and São Paulo, measures are needed to balance out the social dichotomy of agroecology that can lead to higher prices that benefit producers while

Table 7. An explanation of the methods that will lead to scaled-up training that supports EJ and the spread of agroecological practices

Tools and practices of agroecology knowledge sharing	How can it promote knowledge sharing?	Who is involved?	How is this justified?
Horizontal & Convivial Training: knowledge sharing between peers in an ongoing cycle of learning	Bottom-up approach emphasises indigenous and community knowledge and builds inclusion.	Informal and spontaneous farming networks can form around social groupings with shared interests. Organisations like the Single Leg Amputee Sports Association Garden (see Case Study above) can share their discoveries. Inclusion should be monitored by coordinators.	Interviewees emphasised community-building as a co-benefit of agroecology. Case study of networks working together: Kampala, Nairobi. In Tamale's MSN (Ghana), farmers gained confidence from learning by doing.
Host interactions of a range of actors: combine traditional expertise with local practices	Creates cycle of action research where decision-makers and system facilitators are in constant dialogue (Pimbert, 2018) as they co-produce knowledge (Allen and Frediani, 2013; Maiello et al., 2013). As it is a living science, there need to be platforms to share advances and experiments.	NGOs, Government, Academics, Farmers, Backyard Gardeners. Consideration needed so that farmers are equal participants. Can coordinate the involvement of existing learning schools.	Farmers in Freetown spoke of wanting more help from extension services; extension officers struggle to reach enough farmers. In Nairobi, the network provides an interface between institutional actors and farmers where they can voice concerns and discuss solutions.
Demonstrations: small test plots run by local researchers/NGOs	Showing rather than telling convinces farmers and leads to behaviour change. It scales up the reach of extension services which are outnumbered.	Academics, NGOs, farmers. The inclusion of backyard farmers can help increase their yield.	Farmers described being used to demonstrations and their openness to more of this format. A routine feature of systems in Quito, Kampala, Nairobi and others.
Mobile Technology: Using digital networks to communicate knowledge and connect farmers	Mobile technology can aid inclusion of marginalised groups as it prevents the need to travel or to take time off work. It establishes forums for fluid community development and sharing of ideas.	All network members can communicate and learn. Mobile phone usage is very high in Freetown, but some may still struggle to get access.	Strengthens social participation. Discussions of conviviality with experts revealed the power of informal network building. Farmer interviewees were active users of mobile communication mediums.

disadvantaging consumers. As in Tamale, farming without certification is more likely to maintain agroecological farming, in the short-term. Later, it is worth exploring the value of a self-certified organic value chain as in Uganda, discussed by Bioversity Alliance. As seen above in Quito, communication of agroecology's benefits is needed to drive widespread appreciation for the value that these methods give to the community. Eventually, it is hoped that the community will fully understand that the benefits of agroecology to social harmony, system stability and redistributed justice will outweigh potentially increased costs.

Finally, attempting to increase the adoption of these methods through knowledge sharing needs a concurrent focus on supporting farmers with the required inputs for agroecology. For example, a lack of plentiful organic compost – essential for farming without fertiliser and with less cultivation – could become a bottleneck. Although farmers spoke of how composting knowledge is not widespread, training

could lead to distributed composting as happens in Addis Ababa and Accra. In these cities, an education-first approach has promoted the practice of composting, leading to more soil fertility. Creating a mixture of farmer-run, distributed composting sites and some centralised compost creation (see Box 5 case study) would show how overcoming input problems can create a more resilient system.

3.5 Building long term resilience through seeds and seed sharing

Our final strategy proposes a seed sharing system as part of the MSN, which would provide more equitable access to the food system for marginalised farmers. Furthermore, seed sharing networks have a proven track record of leading to wider use of locally-adapted, climate-resilient seed varieties (Zebroski et al., 2018).

Table 8. Establishing a Community Seed Sharing System

Steps	Output
Short Term	
1. Social network mapping	The MSN stakeholder-mapping exercise would identify custodial farmers with knowledge of local seeds to safeguard local knowledge within the city food system. This could include the Gloucester Farming Association, the Regents Vegetable Growers' Association and the Evergreen Vegetable Growers' Association.
2. Knowledge co-production	Knowledge-sharing workshops at which custodial farmers collaborate with researchers to learn and co-produce seed knowledge.
Medium Term	
3. Expanding the network	Custodial farmers involve interested farmers in CSSS to teach them the practices they learned in the workshop to ensure active expansion is guided by those who benefit from it.
4. Setting up Community Seed Banks (CSB)	Identify farmers who can help form a CSB, as part of the network. CSBs can be run at a small profit by a co-operative so that they are self-sustainable.
Long Term	
5. Iteration	Farmers and researchers' ongoing relationship iteratively leads to seed variety refinements.

In its simplest form, the MSN can facilitate the creation of an informal and decentralised Community Seed Sharing System (CSSS). Over time, and with the active participation of other actors (NGOs, academic partners), the CSSS could be scaled up in line with the process used by Bioversity Alliance in countries such as Uganda, Ethiopia and Kenya (see Box 6). The purpose of any CSSS is to ensure farmers rights to higher yields, fewer crops lost to climate-change induced weather events, and more convivial farming (Vernooy et al., 2020).

Box 6. Bioversity Alliance, Uganda (see Appendices for more detail)

Our suggested network could eventually follow the example of Bioversity Alliance in Uganda where seed banks and farm plots are used as places of knowledge sharing and training to ensure that knowledge around seeds can be disseminated, allowing for an informal system of quality self-assurance that can potentially add value to crops while improving the diversity of seeds.

A focus on seeds crucially enables producers' food sovereignty and access to low-cost, productive, and climate-resilient produce. Freetown farmers explained that there is some seed sharing currently happening although not at the city-scale. Low-cost seeds could help Freetown's many UPA producers who rely on purchasing imported seeds. These add burdensome costs (i.e., transport, market-based prices, quality assessment).

3.5.1 Opportunities

In being decentralised, the network can horizontally incorporate existing CSSS, maximising current community ties. The roadmap emphasises the role of knowledge-sharing

between an active community of peers and would add to agroecological knowledge sharing's social benefits. Like agroecological knowledge sharing, Community Seed Banks (CSB) can support gender mainstreaming and the interests of marginalised farmers through ensuring leadership positions for women. This can better enable gender-sensitive interventions as women can control the investment and reinvestment of produce. This may lead to better food security for the most marginalised in the community as women farmers tend to plant leafy vegetables that ensure familial nutritional needs whilst still providing a small profit. Meanwhile, male farmers tend to plant and re-plant cash crops that sacrifice long-term resilience for increased assets in the short-term while subscribing the producer to overheads and market fluctuations (Otieno et al., 2017; Dube et al., 2017). Moreover, a focus on leafy vegetable production may improve biodiversity as monocropping practices associated with cash crops can be replaced with agroecological practices that give back to the land. This ensures food sovereignty and strengthens the CRFS against risks while ensuring that farmers needs are prioritised.

The establishment of CSBs is part of the CRFS's localisation agenda which increases food sovereignty. By reducing the need to interact with external supply chains, the city region will gain greater autonomy which builds resilience (Cadzow and Binns, 2016).

The MSN can eventually ensure that researchers and FAs interact to refine the selection of climate-resilient seeds. Local research partners could emulate research from elsewhere into replacements for productive, yet climate-vulnerable hybrid seeds. The refinement of organic, locally-adapted seed varieties that are easily transferrable because they are not sourced from agricultural businesses, would lead to food security through more resilient crops and sovereignty.

CSSSs can make distribution more equitable as the burden of inputs is reduced. An inclusive leadership structure, as mentioned above, can proactively target farmers who would benefit most from reduced input costs. From our interviews, we gathered that this would help female farmers with less access to credit the most.

3.5.2 Barriers

One constraint on CSSSs is storage. As mentioned, challenging land access in Freetown leaves little space for seed storage. If expensive or unavailable land causes CSBs to be located far from farmers, they may be disincentivised or excluded by time and travel costs.

A CSB that involves central coordination and research involvement can be political and expensive, meaning that farmers may lose power within the network to more powerful actors who would be needed to secure a seed bank.

It is unlikely that the MSN network itself will generate enough finances to fund the continued research needed to develop more resilient seed types. Therefore, international support and funding will be vital to secure, so that the best seeds can be procured.

Lastly, institutional support is lacking within Sierra Leone, and policies are based around national seed industries instead of having any focus on the informal and decentralised supply systems that small-scale farmers rely on. Advocacy and demonstration of the benefits of CSS will be needed.

3.6 Monitoring and evaluation

Monitoring and evaluation can help to determine how much progress is made towards these strategies and the quality of this progress. We feel that it would be appropriate for the network to convene early on to agree to the timetables of when internal reporting will be conducted. They should also determine what information should be shared at an Annual General Meeting.

As part of the internal reporting, we would suggest that there are ongoing evaluations of stakeholder participation that determine how diverse and inclusive the various strategies of the MSN are. We recommend that there is also a mix of informal evaluation that can be run by the community members of the MSN as well as some more formal monitoring that can be facilitated by institutional members.

4. Conclusion

Environmentally just food security in Freetown is inextricably linked to UPA development. Considering this, an MSN has been proposed through this report: thematic focuses on tenure security, agroecology and seed sharing have been explored to build resilience through collective action and knowledge sharing to safeguard existing practices and introduce sustainable methods of institutionalising Freetown's UPA.

From a governance perspective, we have seen that food system improvements will require a cross-sectoral approaches with input from national ministries and local government departments. If this can be combined with a broad coalition of UPA actors throughout Freetown, then the status of UPA can rise up the agenda, making the most of the recent upswing in political enthusiasm.

We hope that future actors can operationalise as many of the elements of the strategy as possible. We believe that if it is not possible to implement each strategy to its fullest extent, the mindset and principles of the approach would still be highly beneficial to Freetown. Firstly, inclusivity will support marginalised communities, and work to counteract injustices within Freetown's food system, creating innovation embraced through community collaboration and informed by agroecological principles. Food systems are centrally related to the health of society itself: networking for a just and resilient UPA system poses a valuable approach to generating livelihood security and community-based autonomy for Freetown and its food producers.

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FOOD PRODUCTION
AND URBAN AGRICULTURE

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Learning from innovation around the world



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|--|--|
| 01 Bioversity International | 09 Kasubi Parish Local Community Development Initiative (KALOCODE) |
| 02 Camp Green | 10 Nairobi and Environs Food Security, Agriculture and Live-stock Forum (NEFSALF) |
| 03 Appendix 3: CODOHSAPA & FEDURP | 11 Navdanya |
| 04 Children's Rights Advocacy and Lobby Mission (CALM) Africa | 12 Quito's Participatory Urban Agriculture Programme (AGRUPAR) |
| 05 Ciudades Sem Fome (Cities Without Hunger) | 13 South African Urban Food and Farming Trust (SAUFFT) |
| 06 FAO Sierra Leone Food Security Working Group | 14 Tamale's Multi-Stakeholder Forum on Urban and Peri-Urban Agriculture |
| 07 Freetown Urban and Peri-Urban Action Platform (FUPAP) | 15 Zoma Museum |
| 08 Garden Africa | |

Appendix 1: Bioversity International

📍 **Kampala, Uganda**

National Agricultural Research Organisation
Government of Uganda



Summary

Based in Uganda, Alliance Bioversity (AB) are actively supporting farmers across Latin America and the Caribbean, Asia and Africa. Their work in East Africa (Kenya, Uganda, Tanzania, Zambia, Ethiopia and more) supports farmers in their efforts in climate change adaptation and mitigation through agricultural practices. AB supplies farmers with seeds which are genetically suited to the specific climatic conditions of the farmer's field site. The field-site seed requirements and climatic conditions are established through discussions with the community's custodian farmer(s) -the community's most successful farmer-, community chiefs, community elders and other farmers. Geographic Information System (GIS) and climate information is also used to gain contextual information. Once the field-site seed requirements are understood and the farmers are supplied with the seeds, farmer-led seed tests begin with crowdsourcing methodology and on-station trials which are visited by other farmers for knowledge sharing purposes.

AB work to build upon pre-existing social networks within the community. AB bolster these ties by developing a social seed network where custodian farmers take a central role in developing skills and sharing their knowledge. AB also emphasise the need to conduct social seed network analysis before entering the community to understand how -and to what extent- farmers save and share seeds, whether they feel the need for seed network, and the proximity of farmers to each other.

Impact

Delivering research-based solutions, AB have been able to develop, support and enhance social seed networks which simultaneously enable climate change mitigation and adaptation through farming, building community ties and increases agricultural and community resilience in the face of climate change.

Given that AB is externally funded by wealthy public actors such as the Dutch government, and other private actors such as the Bill and Melinda Gates Foundation, more money is available to invest in seed banks and testing and identifying suitable seeds for different climatic regions, compared to an internally sustained financial structure for the networks. This suggests the need for either multiple funding streams which include domestic government and external donors, or a more externally-dependent financial structure.

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Appendix 2: Camp Green

📍 Kampala, Uganda



Figure. Camp Green. [Image source](#)

Summary

Camp Green Uganda started as a home initiative in 1993 to address key nutrition gaps in the founder's household. This has since grown into Nakabaale's Camp Green, a community garden in Kampala which produces a wide variety of vegetables and incorporates livestock rearing. Camp Green is instrumental in addressing issues of food security which stem from the high prices of food in the city. Camp Green's philosophy is to focus solely on organic production and reuse everything: the rainwater that flows from the rooftops, plastic bottles that become planters, organic waste like banana peels which are turned into compost and briquettes. These practices generate increased awareness among the community of the importance of urban waste management.

Impact

Unlike traditional labour-intensive agriculture, urban agriculture in Camp Green can be better understood as a leisure activity, and can therefore be undertaken by youth, as well as people with disabilities and the elderly, thus providing alternative livelihoods for many marginalised groups. Camp Green has become a vehicle for community development and through the social connections made. It has increased the willingness of gardeners to share resources and help the more marginalised within the community and promote sustainable behaviours.

While the primary aim of Camp Green is to promote subsistence agriculture, the garden has also become a space to network with similar initiatives and share knowledge about urban agriculture. This is particularly important to address the knowledge deficit which many farmers face regarding varying farming inputs, techniques, and new innovations. Camp Green often hosts people from across the city, including students from the Makerere University. Camp Green has also engaged in partnership with the government, NGOs, and private companies to help broaden the avenues to share the lessons learnt from Camp Green.

They have used local television, radio, print media and the occasional digital platform to raise awareness, and they frequently advocate for the incorporation of agroecological practices into school curriculums.

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Appendix 3: CODOHSAPA & FEDURP

📍 Freetown, Sierra Leone

Slum Dwellers International; UN Habitat
Citizens Alliance



Image. Members of the organisation [Image source](#)

Summary

The Centre of Dialogue on Human Settlement and Poverty Alleviation (CODOHSAPA) is a non-profit and non-governmental organisation established in 2011. Codohsapa works to mobilise and provide both technical and financial support to its community counterpart, Federation of Urban and Rural Poor (FEDURP). CODOHSAPA and FEDURP are both part of the Slum Dwellers International network, which is a multi-national social movement of the urban poor located in over 30 countries across Africa, Asia, and Latin America. FEDURP consists of vulnerable women, men, youth and children who are mobilized around dynamic saving schemes, networked at settlement, city and national levels to drive collective, bottom-up initiatives influencing change towards inclusive and resilient cities. For example, mapping of UPA sites in Freetown has taken place, although there are currently few plans to expand on this.

FEDURP uses strategies such as peer to peer exchanges, daily savings, community profiling and mapping to organize a critical mass of poor localities – allowing them to engage with local and state authorities as partners in development. CODOHSAPA and FEDURP’s mission is to empower urban poor communities to improve their social, economic and environmental conditions through the development of their agenda.

Impact

CODOHSAPA and FEDURP use a variety of tools to make an impact on a national and city level. They support urban farmers with tools to improve their farming activity which in turn contributes to improving their livelihoods and income. The organisations empower households to grow their own food in backyards in case of another situation like COVID-19. Their initiative in Freetown was funded by the EU and UN habitat and aimed to provide nutritious food to families which highlighted that the realisation of food insecurity in Freetown was imminent, and the process of food production must be expanded.

Their aim is not to expand land for UA but to increase community resilience and ensure urban agriculture becomes climate resilient. They highlight that since the development of households and buildings is prominent in Freetown, the logical route to implement food security is through backyard farming.

Sources

“About Us.” Codohsapa & Fedurp, (2017), codohsapa.org/about-us/.

Appendix 4: Children's Rights Advocacy and Lobby Mission (CALM) Africa

📍 Uganda



Summary

Children's Rights Advocacy and Lobby Mission (CALM) is a non-profit Ugandan charitable organization that emphasizes the promotion, observance and protection of the rights of children especially those without parents and from the most vulnerable communities in Africa. They lobby international NGOs, donors and government to support children's rights through a human rights-based approach. CALM aims to achieve this by sensitising local leaders and opinion leaders on children's rights, formation of children's rights committees and running 24 radio programmes on advocacy.

Impact

Working with youth to identify issues hindering the progress and development of their communities, CALM established a variety of youth programmes. Many of these provide entrepreneurship opportunities for children who cannot continue in formal education, one of which is backyard farming. This was notably important considering the recent COVID-19 pandemic which caused massive issues for food transport within the country, and highlighted the importance to localising food production. To scale up UPA, CALM Africa approaches landlords requesting access to their unused land, and have recently looked to purchase their own land. By aligning their strategies with the Sustainable Development Goals and employing a rights-based approach, they emphasise that food security and poverty alleviation go hand-in-hand, and is imperative for the protection of children. CALM Africa has supported thousands of children, and continue to monitor and support the progress of children following project completion.

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Appendix 5: Ciudades Sem Fome (Cities Without Hunger)

📍 São Paulo, Brazil



Summary

Ciudades Sem Fome started out in 2004 as part of a public policy initiative to grow food within cities and provide employment for people during economic crises. The initiative initially took the form of community gardens which encouraged the participation of the most marginalised communities in poor neighborhoods of the city, such as Cidade Tiradentes, São Mateus, Itaquera and São Miguel Paulista areas. Due to government changes, the organisation has since shifted to become a private foundation.

Farms get initial funding from external donors such as NGOs, government and private companies. However, after a year of training and support to the local community, most farms become self-sufficient and farmers can sell their produce to middle-class neighborhoods for additional income. 25 community gardens have currently been established, providing alternative livelihood opportunities for over 115 community gardeners.

Impact

Ciudades Sem Fome managed to secure land for urban agriculture through agreements with private landlords by showing that community garden projects not only provide economic, environmental and social benefits for the communities but can also protect their land from encroachment. They also transform unused public land into community gardens and have built 38 gardens in public schools and institutions, providing deprived children with nutritious food while educating them about the importance of nutrition and agroecological practices to safeguard the environment. For example, by using compost and recycled waste from horses, cows and mushrooms to fertilize soil. The organisation also provides micro-credit to women in the local communities, enabling them to grow their own food in the short-term and become financially independent in the long term.

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Appendix 6: FAO Sierra Leone Food Security Working Group

📍 Freetown, Sierra Leone

The Food and Organisation (FAO); World Food Programme (WFP)
International Fund for Agricultural Development (IFAD)
Ministry of Agriculture, Forestry and Food Security (Sierra Leone)



Figure. Working Group. [Image source](#)

Summary

The Working Group is a knowledge sharing platform for high-level international organisations such as the Food and Agriculture Organisation (FAO), World Food Programme (WFP), International Fund for Agricultural Development (IFAD) and government actors including the Ministry of Agriculture, Forestry and Food Security (MAFF) with the aim of supporting the governmental ministries with technical assistance to improve food security and livelihoods in Sierra Leone. Discussion centers on sharing new innovations, results of project evaluations and proposed programmes to both increase understanding of successes, and ensuring projects are not unnecessarily duplicated.

The FAO, WFP and IFAD are the overall working body coordinators. However, the Terms of Reference and organisational responsibility is to be revised so that the Ministry of Agriculture, Forestry and Food Security has sectoral mandate.

Impact

Despite providing vital technical support and ability for greater scope in understanding successful projects for food security and livelihoods, a lack of active involvement of Farming Associations in the monthly meetings seems to be a slight drawback to the Working Group's understanding of daily realities of UPA for Freetonians. It is uncertain whether the planned ownership by the Ministry of Agriculture, Forestry and Food Security will threaten any impartiality or internal critique of activities and policies. Alternatively, a centralised organisational structure could improve efficiencies in decision-making.

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Appendix 7: Freetown Urban and Peri-Urban Action Platform (FUPAP)

📍 Freetown, Sierra Leone

RUAF & other local research institutions
Freetown City Council & other national ministries
National Associations of Farmers of Sierra Leone



Figure. Urban and Peri-Urban Agriculture Platform. [Image source](#)

Summary

In 2006, Freetown Urban and Peri-Urban Agriculture Platform (FUPAP) was launched. FUPAP was a multi-stakeholder network aiming to promote UPA in Freetown and coordinate activities of various actors involved in UPA in the greater Freetown area. FUPAP included farming associations, local universities, local and central governments (Ministry of Agriculture, Forestry and Food Security, Ministry of Lands and Country Planning, Ministry of Health and Sanitation, Freetown City Council), the National Association of Farmers of Sierra Leone, Institute of Agricultural Research, Fourah Bay College and Njala University.

The platform was mainly focused on facilitating dialogue between different UPA actors regarding farmers' access to land, with a pilot project aiming to enforce the wetlands land tenure policy. According to this policy, all wetlands were owned by the state and areas were designated for urban agriculture. However, there were limited government resources to enforce the policy and poor understanding among farmers resulted in landlords claiming ownership over the land and leasing it to farmers, many of whom could therefore not afford to farm in the areas. Under the FUPAP strategy, leasehold land titles were allocated to farming associations which encouraged urban agriculture within the areas. However, FUPAP's success was limited as the platform disintegrated in 2013.

Impact

FUPAP contributed to improving communication between farmers, the local and national government, and other actors relevant for the functioning of UPA. While the program stalled in 2013, the network members had agreed on the objectives and made steps towards helping farming communities in the city.

In its direct interventions, FUPAP focused on the main barrier to successful UPA in Freetown – poor access to land. It is not entirely clear how successful FUPAP was at unlocking access to land for UPA farmers. FUPAP managed to map 59 potential UPA sites, and in 2012, it rolled out a pilot project on three of them. Allegedly the process was very complex and controversial due to negotiations with landlord who claimed rights to the government land.

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Appendix 8: Garden Africa

📍 United Kingdom



Figure. Woman watering plants. [Image source](#)

Summary

Garden Africa is the only UK organisation specialising in horticulture for social development in Africa. It operates alongside partners in Zimbabwe, Swaziland, and Kenya to enhance local capacity and to guarantee safe delivery of donor support. They work on training people to grow species for food, fuel, medicine and fibre with the most efficient use of water, soil and other resources. They equip people with the skills to train others to selectively breed plants for particular traits. Their work is grounded in agroecological practices to find appropriate and low-cost solutions to alleviate poverty and environmental degradation which undermine nutrition health and food and livelihood security. Their mission is to develop and disseminate information on the appropriate use of plants that underpin solutions to sustainable growth and human well-being.

Impact

They use extension services to set up a system of representation where most of the associations were led by women. At the district level there were people from different areas elected to be district representatives, however very few ended up being women. Further, they identified farmers to take part in a training exercise on farming practice to improve the output. To incentivize farmers to join the training they promised to build farming networks in order to share their knowledge. Moreover, they focused on raising Zimbabwean organic standards so that the vulnerable farmers could grow and meet the domestic demand for organic farming produce. Training included making the most of what was around them, such as harnessing nutrients from termite mounds, compost made from comfrey, pest traps made from plastic waste, and building environments so that pest predators could live safely at an adequate distance. Training was shared with 20 agricultural extension workers, each of whom were tasked with supporting over 900 other farmers in their area. This information is now directly available to 18,991 small scale growers and farmers across 8 districts in Mashonaland East, demonstrations are available to a further 200 extension workers reaching 180,000 more farmers.

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Appendix 9: Kasubi Parish Local Community Development Initiative (KALOCODE)

📍 **Kampala, Uganda**

Living Earth Uganda
Chara Trust
International Development Research Centre of Canada



Figure. Kasubi Parish Local Community. [Image source](#)

Summary

KALOCODE is a local community-based organization founded in 2005 and based in Kasubi, Kampala with a platform for mobilizing and organizing local community groups around poverty reduction initiatives. It addresses waste accumulation, flooding and unemployment among other initiatives. To achieve these aims, KALOCODE has engaged its members in initiatives ranging from urban agriculture and greening, energy briquette production and waste recycling. KALOCODE's mission is to contribute to improving the livelihoods of the vulnerable communities by enhancing agricultural productivity and sustainable natural resource management.

Impact

The foundation of the organisation is to empower local communities to identify issues affecting them including soil fertility, flooding and waste management. With the help of KALOCODE, communities undertake Community Led Planning (CLD) and develop solutions to combat these problems, including the development of briquette production to form alternative energy practices, vegetable cultivation and mushroom cultivation. Identifying and finding their

own solutions to their problems not only gives communities a sense of ownership and thus increases their active participation within the organisation, but these participatory processes also increase knowledge-sharing with other communities.

Moreover by moving towards entrepreneurship, commercial activities such as briquette production and cultivation enable communities to generate revenue and thus become financially independent, and ensure their activities can continue in the long-term.

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Appendix 10: Nairobi and Environs Food Security, Agriculture and Livestock Forum (NEFSALF)

📍 Nairobi, Kenya

Mazingira Institute
Habitat International Coalition
RUAF



Figure. Nairobi and Environs Food Security, Agriculture and Livestock Forum. [Image source](#)

Summary

The Mazingira Institute is a civil society organization based in Nairobi, founded in 1978. Mazingira focuses on urban agriculture and food systems planning. In 2002, the Institute founded the Nairobi and Environs Food Security, Agriculture and Livestock Forum (NEFSALF), a multi-stakeholder platform and network initiative.

NEFSALF functions as a platform bringing together academic institutions, farmers groups and government officials. The work of NEFSALF contributed to changing the negative perception of urban agriculture that meant it was illegal until 2015. The Mazingira Institute provided training to support Nairobi City County when the government legalised urban agriculture. NEFSALF also functions as a network of farmers, traders and food producers through which free training is carried out for urban farmers. Since its creation, several hundred farmers have been trained through NEFSALF, spread across the whole city. Training sessions cover topics such as UPA, food waste, compost, crop production and livestock.

Through NEFSALF, the Mazingira Institute was also active in applying the Milan Urban Food Policy Pact (MUFPP) indicators to promote more sustainable food systems within the city. The MUFPP puts forth a set of recommended actions to achieve this, for example through facilitated collaboration across city agencies and department, enhanced stakeholder participation, and an improved multisectoral information system. It also promotes network creation and grassroot activities, participatory training and research, an ecosystem approach to guide land use planning, short supply chains and highlights the importance of access and secure tenure to land.

Impact

Government extension services worked with Mazingira Institute to provide the specially designed urban farmers' training. Twenty years on, these trainings are still taking place. NEFSALF provides training and problem-solving for farmers in towns and nearby rural surroundings to reach the market successfully. Within these training programmes, NEFSALF emphasizes that farmers should not use chemical fertilizer and adopt circular economy farming, expressing that manure can be used for agriculture, and food waste can be used for livestock and as compost.

Farmers of the NEFSALF network also formed informal subgroups. For example, The Women's Hub meets monthly, and the members contribute to shared savings, which demonstrates the value of informal organisation practices, even in a formal organisation. By acquiring credits and loans, members of the network have also been able to expand their enterprises, adding additional value to their food produce. There have also been several Youth Hubs, including the current NEFSALF Youth Hub that has an urban agriculture demonstration plot at a Nairobi primary school. Moreover, older trainees have started a Practitioner's Hub to counsel younger farmers, especially women, in food production and food processing.

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Appendix 11: Navdanya

📍 New Dehli, India



Figure. Navdanya. [Image source](#)

Summary

Founded by Indian scholar, environmental and eco-feminist activist, Dr Vandana Shiva, Navdanya is an 'Earth Centric, Women-centric and Farmer-led movement' grounded in the principles of biological protection and cultural diversity. Navdanya supports a large network of farmers across Latin America, Europe and India which are financed by grants primarily from the EU, as well as some internally generated income from high quality processed farmer products. In India, it has a primary membership of over 650,000 farmer families in 22 states of India. It has also established 111 Community Seed Banks (CSBs) in 17 States across India.

With the aim to counter the multidimensional degradation of industrial agriculture, Navdanya helps farmers to develop decentralised localised community seed banking systems using indigenous seeds, subsequently teaching the farmers how to grow and harvest the crops. Thus, seed banks become hubs of knowledge sharing. Navdanya also supports farmers by guaranteeing access to seeds from the organisation's two main seed banks, so the seeds can be exchanged and improved to increase climate resilience or if climate disasters strike. The seeds and other forms of Navdanya's support are free of charge for farmers.

Impact

With a focus on empowering women's farming groups, Navdanya supports the development of a decentralised network of resilient farmers who are growing low-input, organic food, increasing their food sovereignty and strengthening their connection to the Earth. Navdanya encourages farmers to produce food they are proud of, thus shifting their perception from their produce being a commodity to being a desirable item for personal consumption.

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Appendix 12: Quito's Participatory Urban Agriculture Programme (AGRUPAR)

📍 Quito, Ecuador

CONQUITO



Figure. Quito's Participatory Urban Agriculture Programme. [Image source](#)

Summary

The city of Quito has a robust system for food production and distribution which has been established with the support from CONQUITO, an NGO working on the economic development of the city. Quito has a favourable environment for such work since Ecuador's constitution enshrines a "right to adequate food" and a promotion of "food sovereignty". Nevertheless, a couple of decades ago, there were access issues for farming, and it was not inclusive. The Participatory Urban and Peri-Urban Agriculture project (AGRUPAR) sought to improve the lives of the most vulnerable groups by promoting the local and sustainable production of nutritious food. By providing training, they encouraged smallholder farmers to exchange ideas related to agroecological practices. This was intended to drive demand for organic food which was then further promoted at local Bioferías, markets intended to allow smallholders and larger scale farmers to sell their surplus organic produce at a fair price. The AGRUPAR programmes thus recognised the need to work along the entire food chain, from production to distribution.

Impact

AGRUPAR is contributing to food security as well as job creation and income generation, and consequently improving the lives of the most vulnerable groups; such as women, the elderly, people with disabilities, refugees and migrants. By promoting local production and improving access to nutritious food for the most vulnerable group, AGRUPAR also empowers these communities and helps them build strong communities ties.

Moreover, through AGRUPAR, abandoned land is converted into land suitable for farming. Community gardens are established on communal land or land rented out by the municipality for small prices. While a large majority of land used for farming is private land, farming is also carried out on institutional land such as schools, making suitable land for farming accessible to a range of people in the city.

Moreover, strong zoning regulations in the city prevents commercial development on land designated for UPA which greatly contributes to Quito's resilient food system.

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Appendix 13: South African Urban Food and Farming Trust (SAUFFT)

📍 Cape Town, South Africa

South African Urban Food and Farming Trust
Oranjezicht City Farm and Market
Langa Community Agri/Food Hub



Summary

The South African Food and Farming Trust (SAUFFT) was set up off the back of a successful community farm in the city and has expanded to include training, community resilience building and initiatives to improve collective sorting and processing of farmers produce. The Oranjezicht City Farm (OZCF) was started in 2012 with land secured by community members on what was previously a dump site. The aim was to build more community collaboration while introducing sustainable farming practices. The farm has focused on sustainable practices and methods that have been encouraged and transferred throughout the city.

The key to the Oranjezicht City Farm success was a combination of location and ability to secure the land, formal and informal networks, and community perseverance in shifting perceptions of local government. It was started by a qualified organic farmer and land designer with donations from local restaurants.

Impact

The success of Oranjezicht City Farm has resulted in shifting perceptions on the possibilities for urban farming in the city. They have introduced sustainable practices around composting, water preservation techniques, raised bed design and cultivation methods.

The initiative has built a network of urban farmers who can contribute to the collective processing of produce to build efficiency and gain economies of scale. The project has not just been about food, but also about building community support systems. Through their success with the farm, they were able to build closer ties with the city, and have been approached to undertake new city-wide projects. They have expanded into working with schools and communities, to encourage learning about city food systems and the benefits of urban agriculture.

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Appendix 14: Tamale's Multi-Stakeholder Forum on Urban and Peri-Urban Agriculture

📍 Tamale, Ghana

RUAF, University for Development Studies (UDS)
URBANET, UrbanFoodPLus
The International Water Management Institute, WASH Alliance International



Figure. Tamale's Multi-Stakeholder Forum

Summary

A multi-stakeholder forum on urban and peri-urban agriculture (UPA) was set up in Tamale, Ghana. The network was established through various organisations including RUAF, the Ghana WASH Alliance Programmes, the University for Development Studies (UDS), URBANET, the International Wash Management Institute and the UrbanFoodPlus research project. The aims of this network were to raise awareness for the importance of UPA to contribute to food security and livelihoods, increase farmers' access to land - notably for the most marginalised groups - institutionalise UPA within city plans, and access finance to scale up UPA.

In 2014, stakeholders from the network came together to develop the City Strategic Agenda (CSA) which aimed to reflect the needs of the stakeholders involved in UPA and agree on a common plan for the future of UPA in the city. This involved a suggestion for the local government to purchase areas of flood prone land and designate it for urban agriculture and suggestions to institutionalise land tenure for UPA.

Impact

The network successfully brought various actors together by building on existing partnerships present in the city. Farming associations were brought together with relevant planning authorities, local councils, local research institutions, NGOs and vendors. While the network established in the early 2010s no longer exists in its original form, some of the relevant stakeholders have retained relevance in ongoing plans for the city.

A key lesson learnt from the creation of this network was the importance of stakeholder mapping which revealed entrenched power interests, which were major barriers to accessing land to scale up UPA. Local chiefs commonly allocated land to developers, despite the land being designated as unsuitable for building and therefore ideal for urban agriculture. Being aware of these power relations means that more realistic action can be taken, and that the dialogue around UPA reflects the actual situation on the ground.

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Appendix 15: Zoma Museum

📍 Addis Ababa, Ethiopia



Figure. Zoma Museum. [Image source](#)

Summary

The Zoma museum sought to use global art to transform a corner of Addis Ababa. Finally established in 2019, the project was a culmination of many years' careful accumulation of small plots of private land. The museum, inspired by traditional building techniques, is built from mud, straw, stone, wood, and cement. The multi-purpose space now hosts art, education spaces and natural planted areas. Zoma aims to create a sustainable model where everything within the museum is circular and feeds back into the project.

As the land was previously an informal dumpsite, it required complete regeneration before it was suitable for construction and gardening. Zoma now cleans river water as it enters the site through channels conveying wastewater from the neighbourhood with sand purification systems and natural reed filtration.

Impact

The museum's successful transformation of marginal land gentrified the area, causing land prices to rise. The model that Zoma has created is niche, due to how it can use its global reputation as an artistic hub to support its environmental aims. Nevertheless, it is close to self-sufficiency and achieving admirable environmental impacts. However, due to a fee being charged to enter the museum it can be seen as exclusionary, and depends on external funding to remain operational.

Nevertheless, there is much to learn from how they combined education, art and the environment, to create a dynamic space that interlinks these pursuits, so that they each augment the others. This model points to how UPA could be more ambitious in how it seeks to diversify its impact and partners.

The Zoma Museum is rooted in its natural ecosystem and seeks to give back to its community by raising local biodiversity, while also raising the awareness of local children, who can learn in this natural and spiritually enlightening

location. That the growth of vegetables sits alongside the art that they display, as an equal attraction and priority, demonstrates the elemental power of growing and farming our food. This can act as a vector to bring people together and to bring people closer to nature.

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Land and housing

Securing safe, affordable and well-connected land in Freetown for the urban poor through community land trust and land value capture



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The enthusiasm of residents in Freetown has continuously amazed us, especially with their aspiration to protect the living environment and have a say in the development of their community.

Throughout our project's process, we found so many people are fighting to improve people's lives in the informal settlements in Global South; whether they are local residents, NGOs or researchers. Their passion and dedication will always remain in our hearts. We are grateful for this invaluable opportunity to contribute to Freetown's urban development.

Abbreviations

CBO	Community Based Organization
CDMC	Community Disaster Management Committee
CLT Center	Center for Community Land Trust Innovation
CLT	Community Land Trust
CODOHSAPA	Centre of Dialogue on Human Settlement and Poverty Alleviation
CRS	Catholic Relief Service
DPU	Development Planning Unit, UCL
FAO	Food and Agriculture Organization
FCC	Freetown City Council
FEDURP	Federation of Urban and Rural Poor
LVC	Land Value Capture
SDI	Slum Dwellers International
SEJ	Socio-environmental justice
SLURC	Sierra Leone Urban Research Centre
STDM	Social tenure domain model
UNDP	United Nations Development Program
UPFI	The Urban Poor Fund International
YMCA	Young Men Christian Association

1. Executive summary

This report builds upon the past three years' studies and work of the ESD/SLURC learning alliance, and aims to discuss how to provide affordable housing and infrastructure for residents in Freetown, Sierra Leone. Freetown faces many challenges in land tenure security because of the large population influx in recent years, and the hilly topography of this coastal city. The Freetown residents face a land shortage, and they must create habitable land by themselves. More significantly, the land management situation is complex and chaotic. These reasons cause significant social-environmental problems in Freetown.

In this report, we come up with two strategies, based on the analysis from previous studies, research, and interviews. The first strategy is land value capture. This approach aims to increase the city government's tax revenue so that they can provide more infrastructure to the residents. The second strategy is the community land trust. It is used to protect low-income groups from eviction, which is a possible by-product of land value capture strategies, and provide them stable and reliable housing in the future. The report also describes the steps of implementing these two strategies and analyses the possible challenges in this process.

In this report, it is believed that the combination of land value capture and community land trust can provide a robust approach to increase land tenure security and improve socio-environmental justice in Freetown.



Figure 1. Picture credit: Musa, 2021

2. Diagnosis and research design

2.1 Background and preliminary diagnosis

2.1.1 General background

Key Points

- Rapid urbanisation in Freetown has resulted in informal settlements being developed; along the coast and the Sierra Leone River Estuary, as well as on steep hillsides (Allen et al. 2017). Each of these locations is particularly susceptible to landslides and floods.
- Houses built in informal settlements are poorly built, with inadequate infrastructure. Residents are reluctant to upgrade their settlements due to weak land titling rights.
- A weak legal land framework and a unreliable record of land holdings have led to high tenure insecurity.

2.1.2 Study of Freetown and review of former reports

Freetown, located in the Western Area Urban District, houses the largest urban population in Sierra Leone (Figure 1). It is one of the most densely populated cities in West-Africa, with a population growth rate of 4.2 which translates into approximately “45,000 new residents in

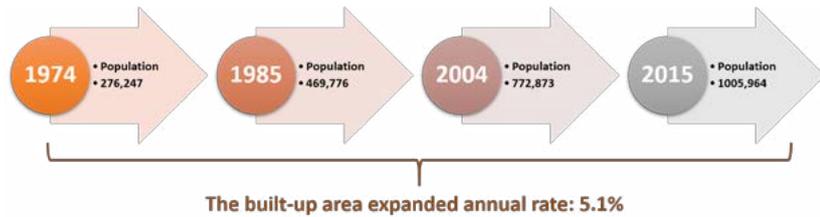


Figure 1. Freetown population growth data. Adapted from: Allen et al., 2017

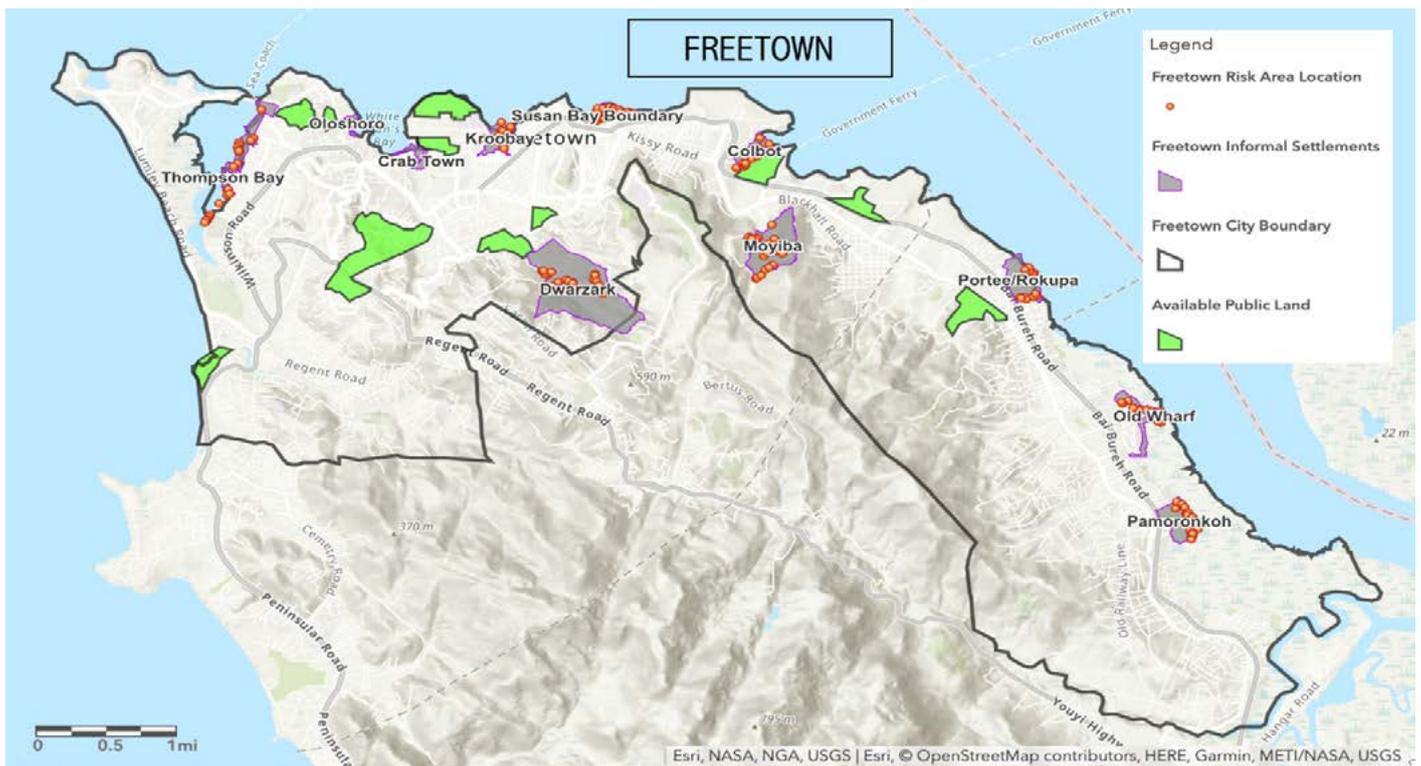
the next year, and 535,000 residents in the next decade” (World Bank, 2018).

Freetown has grown dramatically over the last 40 years. The built-up area expanded at an annual rate of 5.1% between 1974 and 2014, with the largest expansion occurring between 2000-2014. Population growth has increased in the same period from 268,000 to just over 1 million (Figure 1), while Freetown was originally designed for about 300,000 residents. The city’s unstructured growth, its dense population, in addition to its geography -surrounded by hills and the ocean, brings with it a series of development challenges.

Many problematic phenomena can be seen in this city. There is a lack of access to essential services such as water, sanitation, and healthcare. Informal settlements have developed across the city, predominantly in areas where residents face risks of flooding and diseases.

As illustrated in the map from CODOHSAPA/FEDURP most of informal settlements have been mapped in coastal regions and on the steep hills of Freetown (Figure. 2). Low-income and marginalised groups are forced to live in

Figure 2. Map of settlements and available land in Freetown, Adapted from: Allen et al., 2017



LAND PRODUCTION

the disaster-prone areas due to the limited spatial expansions Freetown is capable of (MLCPE/FCC,2014; Allen et al., 2017). Many push and pull factors contribute to rural-urban migration in the context of Freetown, such as greater economic opportunities, as well as security from the civil war in 1991-2002. The informal economy and small-scale businesses make up most of the Freetown's economy, incentivizing migration.

Access to land is often through family or community membership, leaseholds, or inheritance, resulting in many migrants squatting on state-owned land in the hills or along the coast (Dale, 2008). The land is, therefore, a scarce resource and unequally distributed, resulting in low-income groups being forced to live in more dangerous areas, and being exposed to additional risks, such as pneumonia and building collapses, stemming from the lack of regulation and poor living conditions. Compounding these problems, informal settlement residents are unable to benefit from state-provided social services and have fewer employment prospects.

2.1.3 Land system analysis

The Dual Land Systems and its Shortcomings

“Do not view this as a housing issue, but a community issue.” Dr Laila Iskandar (Smith, 2020)

There is a dual land system in Sierra Leone, which consist of a statutory (formal) law and customary (informal) law. It is complex, but in Freetown, three systems are common: private, public, and state/government ownership (Figure 3). According to the Final National Land Policy of Sierra Leone 2015, Sierra Leone's constitution and legal system have no clear distinction between public, state, and government land, and there is currently no legal definition of public land (GoSL, 2015).

In Freetown, there are two important formal laws. In 2004, the Local Government Act gave local councils the power to hold land, making them responsible for the development of settlements (Jackson, 2005). The 2005 Sierra Leone National Land Policy highlights the importance of protecting communal property held in a trust whilst also acknowledging the importance of the private sector for growth and economic development (Jackson, 2005). While the customary law is based on the traditions and customs in the local community. These informal laws also cause inequality. For example, foreigners, women, and children of mixed ethnicities are unable to gain access to land, as national and tribal citizenship is recorded through their father's lineage (Dale, 2008).

Sierra Leone lacks a comprehensive, integrated legal framework to govern land. Unreliable records of

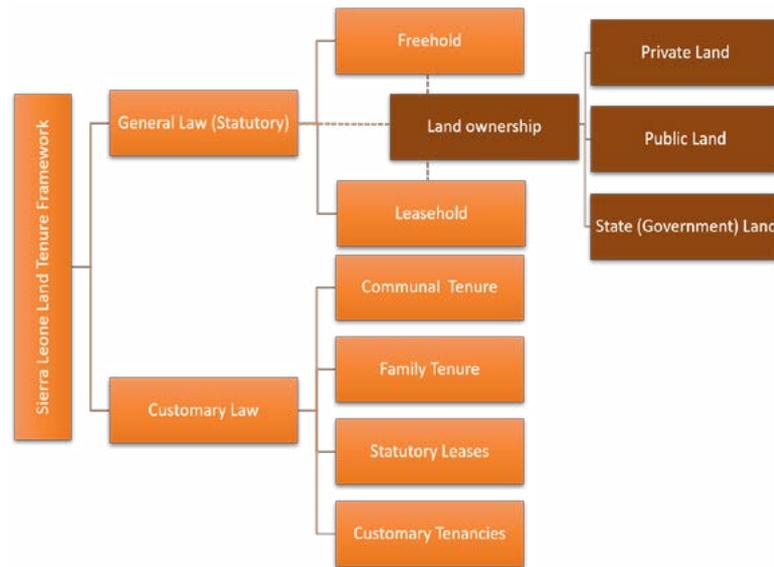


Figure 3. Serra Leone Land Tenure Framework: Adapted from: Gosl, 2015

landholdings, fraudulent housing schemes and the application of uncodified customary laws to land transfers, have fueled land tenure insecurity. The chaotic land management is evident in many aspects, such as a history of ad hoc decision-making by land authorities, and the public's prevalent ignorance, and changing of the terms of land leases. As a result, there are many indications of land tenure insecurity in Freetown, including the one-year leases and the absence of landlord-tenant relationships based on rents or other economic arrangements. Take an example, leasees are usually prohibited from planting trees or installing irrigation facilities by the landholder, because of the unclear land dynamic situation (Richards, 2005; Unruh and Turay, 2006).

Key stakeholders in the Freetown

The key stakeholders of Freetown's land tenure issue are illustrated in Appendix 2. The significant situation in Freetown attracts many NGOs and international organizations to aid the local communities, and the stakeholders in this issue can be sorted into 5 classes according to their identity.

The specifical problems caused by land

Infrastructure and nature risk problems

Informal settlement residents are exposed to environmental and health hazards, as housing lack adequate infrastructure, such as storm drains or sanitary sewage disposal. Both the public and private sectors have failed to supply sufficient housing for Freetown's rapidly growing population. 12% of households were categorised as impoverished homes in the 2015 census. Evidently, the constant growth of low-income populations is forcing them to live in vulnerable areas (SSL, 2017).

LAND PRODUCTION

“Land production” problem

Another highlighted problem in Freetown is the ‘land production’ which means that the residents use garbage and other materials to reclaim the sea to land. This practice damages the coastal ecosystem and also puts them at risk of floods.

2.2 Analytical framework and research questions

2.2.1 Practical wheel

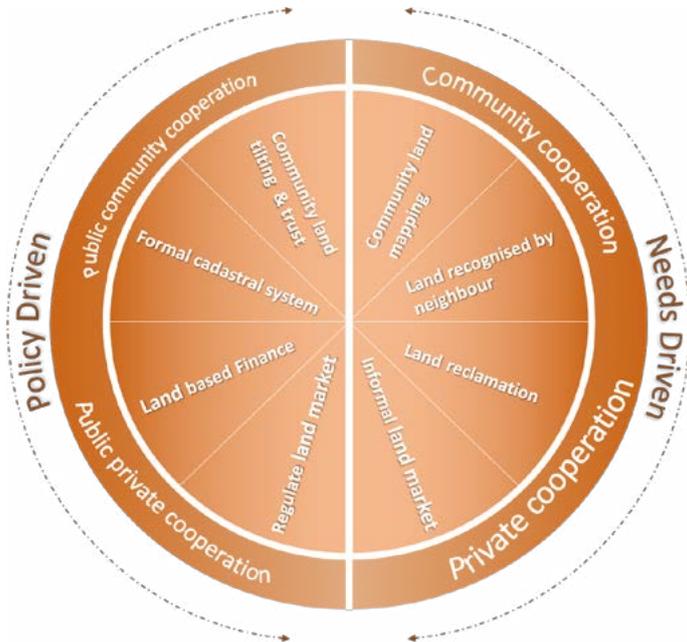


Figure 4. Land well of practice. Adapted from: Allen, Davila, Hofmann, 2006

Our entry point is aligned with land right-related targets under SDGs 1, 5, 11 and the 2015 National Land Policy of Sierra Leone (Appendix 3). The aim of the strategy is to secure formal and informal land tenure for the people living in informal settlements, and provide safe, affordable, and well-connected land in Freetown. Following the point, the report uses the ‘wheel of practices’ developed by Allen,

FINAL NATIONAL LAND POLICY OF SIERRA LEONE VERSION 6 , 2015

- Take an inventory of squatters and people who live in informal settlements.
- Determine whether land occupied by squatters is suitable for human settlement.
- Where informal tenure to land exists, the Government should acknowledge it in a manner that respects existing formal rights under national law and in ways that recognize the reality of the situation and promote social, economic and environmental well-being.
- Promote policies and laws to provide recognition to such informal tenure. The process of establishing these policies and laws should be participatory, gender sensitive and strive to make provision for technical and legal support to affected communities and individuals.
- The government should take all appropriate measures to limit the informal tenure that results from overly complex legal and administrative requirements for land use change and development on land.

— 2015 Final National Land Policy of Sierra Leone, pp 108-109

Box 1. 2015 Final National Land Policy of Sierra Leone

Dávila, and Hofmann (2006) to list Freetown’s policy-driven strategy. Meanwhile, based on our interview with several residents and community leaders living in Freetown’s informal settlement, we list some of the daily practice for tenure security as the needs-driven strategy in Freetown (Figure 4). Following the analysis, we believe that our report strategies should include the public-private-community tripartite at the planning level. Therefore, two interventions, land value capture (land-based finance) and community land trust are suggested.

Following these two confirmed strategies, the overall research questions are: How these two strategies, LVC and CLT, help the municipal government obtain land value and ensure that informal settlements can have the equal opportunity to benefit from it. Furthermore, how to ensure that residents living in informal settlements can avoid the risk of eviction and can create affordable housing and infrastructure for residents on the land through the community’s efforts.

2.2.2 Social environmental justice framework

Socio-environmental justice (SEJ) is a critical framework that can be used to analyse the urban injustice consequences result in the planning and political structure. This report will use SEJ as an analytical lens to monitor our

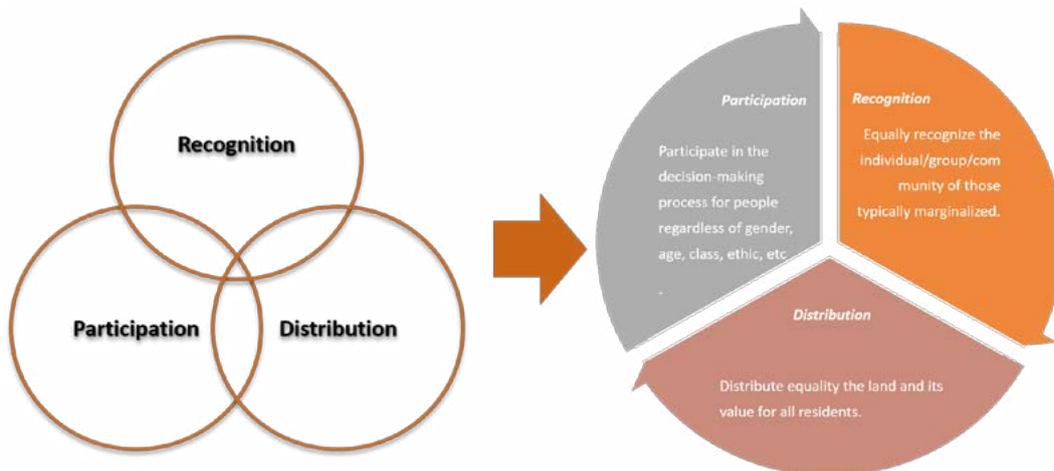


Figure 5. Sicio-environmental justice framework. Adapted from: Schlosberg,2007; Young, 2011; Butcher et al., 2021

twin-strategy application in Freetown (Figure 5). For detailed analysis and framing of the overall questions, the report also uses SEJ as a basic starting point and frame to following:

Recognition
-What critical steps and other tools can ensure formal and informal land tenure safety? -What initiatives can help the government recognized informal settler's land rights?
Distribution
-How do we ensure the land value captured can be distributed, especially to people living in informal settlements? -What's the mechanism to ensure informal settlement can have an equal chance of getting benefits from land value increase?
Participation
-What practices can CLTs use to ensure different stakeholders can help Freetown informal settlers obtain land tenure knowledge? -Is there a possibility of establishing a stable communication mechanism to enable LVC and CLT to cooperate and ultimately provide legal ownership for the community?

2.3 Methodology and limitation

2.3.1 Methodology

In order to answer the research question and subquestions, we conducted 2-month desk research and interviewed 20 people in and outside Freetown including experts and researchers working on LVC and CLT, as well as the local residents and local leaders in Freetown (Table 1).

Table 1. Methodology, Adapted by author

Before the interview	Firstly, the list of interview personnel and interview outline is determined. We invited interviewees according to the list. In addition, we also established a Gantt Chart to track the interview progress, and we classified the interviewees according to different organizations (such as NGOs, governments, and communities) so that we could classify the interview information.	
During the interview	Secondly, we interviewed 20 interviewees, including 9 experts who have knowledge of LVC and CLT, and 11 interviewees from Freetown.	
	The interviewees regarding the direction of land value capture mainly focus on overseas scholars, NGOs and Freetown City Council.	Interviewees to the Community Land Trust include overseas scholars, NGOs, Freetown Community-based organizations, community leaders, international/local NGOs, etc.
After the interview	Finally, we categorize the information we have collected.	
	The core information was refined using previously established Gantt charts, interview videos, audio, transcripts, and other materials. Finally, our team made a consent form to ask the interviewees if they were comfortable having the meeting recorded due to our full consideration of the interviewees' privacy.	

3.2 Objective and limitation



Figure 6. Research limitation, Adapted by author.

3. Strategies

3.1 Strategies 1: Land Value Capture - providing infrastructure

LVC is a financing tool that provides extra income to local governments through taxation on new transactions by adding value to land and property (World Bank, 2018). This value is added in various ways: by investing in various infrastructure projects such as transport links, water and sanitation, hospitals, and schools, or by transferring rights to private developers under the condition of allocating a portion of social housing (Hart, 2020). Once the value has been obtained by the municipality, it can work as a financing mechanism to be re-invested in further social infrastructure development which in the case of Freetown could be the provision of affordable housing in formal and informal settlements. In some African cities, this approach requires more than public investment. Private sector engagement is necessary to complete deadlines on time, and bring foreign direct investment, making the city more attractive to investors (Brown-Luthango, 2011).

For this project, we are working under the assumption that the government owns all land in the informal settlements, regardless of the underlying limitations and complexities and the ministries, chiefs and representatives who have control over the settlements in question. In this case, there needs to be a negotiation in the percentage of contribution that needs to be captured by the municipality from the private transactions outside of informal boundaries (Berrisford, Cirolia and Palmer, 2018). Alternatively, long-term leasing in the context of informal settlements can also be considered long-term private ownership, and for instance, qualify for tax collection, when these ownership rights are transferred to another party (Figure 7).

The LVC approach for different type of land ownership
<p>Private land ownership</p> <ul style="list-style-type: none"> • Development changes. • Sale/transfer of development rights. • Land readjustment. • Special tax/Tax increment.
<p>Public land ownership</p> <ul style="list-style-type: none"> • Sale/lease of land that was positively affected by infrastructure upgrades. • Sale/lease of land under development conditions (negotiation of contributions for affordable housing/infrastructure). • Equity contribution toward a joint venture (land equity in project partnerships).

Figure 7. The LVC approach for different type of land ownership, Adapted from: World Bank, 2018

3.1.1 Preconditions and barriers

Cadastral system

One of the critical preconditions for LVC policies to function is ensuring land is plotted correctly, and ownership is established and recorded in a cadastral system. In Freetown, the management of land can be a complex task. Currently, land in Freetown is not properly recorded, and land ownership can be a very lengthy and expensive process (Koroma et al., 2021). Additionally, the prevalence of multiple claims to land leads to disputes. Further conflict will deteriorate trust in the local government's ability to provide land efficiently. For instance, fixing the local cadastral system needs to be a top priority and include informal settlements (Kabba and Chan, 2020).

Issues regarding land mapping and zoning could be achieved by including the communities and empowering them through knowledge-sharing community tools. A particularly effective tool in informal settlements is "the Social tenure domain model or STDM." STDM serves as a pro-poor land management approach that allows informal dwellers to map and record their land tenure using various technical tools, such as GIS (Geographic Information System) mapping software, spreadsheets, and surveys (Lemmen, Augustinus, and van der Molen, 2007). This approach supports the creation of an incorporated cadastral system in the long term, and empowers the communities by providing skills and processes that can be replicated across the city. Regarding skill transfer, SLURC could be the perfect stakeholder to facilitate training in informal settlements as it possesses key human and technical resources.

Value proposition of land and inclusive planning

Exploring various ways in which different stakeholders add value to land could be the key to achieving socio-environmental justice for communities in the Global South, particularly those in sub-Saharan Africa. Western models are used as one-size-fits-all methods to measure land value and often miss the complexities of land and the informal (Interview with the African land market researcher at UCL). LVC values land in a very reductionist way, where land obtains its value purely based on market-oriented attributes such as geographical location and/or access to services. However, in the context of Freetown, the value that land brings to communities might also depend on the activities that are carried out in informal settlements by those living there (Rigon, Walker, and Koroma, 2020). It is imperative that a new definition of land in Freetown needs to expand beyond the concept of formality, to recognise the information as part of a much broader tenure system (Macarthy, 2020). The strengths of promoting alternatives to private titling include:

- Risk reduction in hazard-prone zones.
- A fairer redistribution of land.
- An increase in the amount of property taxation for infrastructure re-investment.

LAND PRODUCTION

However, this can only be achieved with multi-stakeholder platforms and further changes to the current land tenure policies (FAO, 2019).

Value of land and taxation system

One of the preconditions that needs to be in place for LVC to work is the implementation of a property valuation service. Fortunately, the progressive government led by the mayor has successfully introduced a point-based taxation system earlier in 2020. The system uses a combination of GIS software to measure properties, and groundwork to collect data on observable characteristics (Prichard, Kamara, and Meriggi, 2020). All the data is gathered and analysed in combination with rental prices in the area to provide an accurate tax figure which is more acceptable, transparent, and verifiable (Table 2). The system was implemented just before the COVID-19 lockdown and, since then, has helped the city overcome financial challenges. By May 2020, there was a 100% increase of registered properties from approximately 57,000 to 110,000. This system could lead to a reformed cadastral system, and if employed in combination with STDM, it could create an opportunity for a multi-stakeholder collaboration between the communities living in the informal settlements and the local government.

Safe enure Mechanisms

The biggest risk associated with implementing LVC without appropriate safety mechanisms of land tenure, is forced displacement through evictions and premium prices which are both regressive consequences of the lack of mitigation of the negative effects of gentrification (African Centre for cities, 2015). In simple terms, if land becomes available for

Average Tax Payable	Existing System (£)	New System (£)	Average Change (%)
1st Quintile	£10.14	£3.05	-70%
2nd Quintile	£11.21	£6.71	-40%
3rd Quintile	£11.21	£12.31	+8%
4th Quintile	£16.54	£26.14	+58%
5th Quintile	£29.46	£100.65	+242%

Table 2. Tax figure. Adapted by author

purchase at prime prices and private investors with financial power acquire them, local communities could be excluded, evicted, and forced to relocate to high-risk areas. This is why LVC and CLT need to be applied as part of an intertwined process where those who live in informal settlements are protected and guaranteed that they will not be relocated, unless their life is at risk, or they pose an environmental risk to their surrounding areas.

Freetown Urban Mobility Projects

Major infrastructural projects such as the Integrated and Resilient Urban Mobility Project aim at improving connectivity to critical services in Freetown by providing quality public transport, improving road safety, and incorporating informal private operators into a more comprehensive public transport network. The World Bank finances the project with an investment of \$50 million USD (£35 million GBP) and



Figure 8: Freetown urban mobility project. Adapted from: Allen et al., 2017; World Bank, 2018;

LAND PRODUCTION

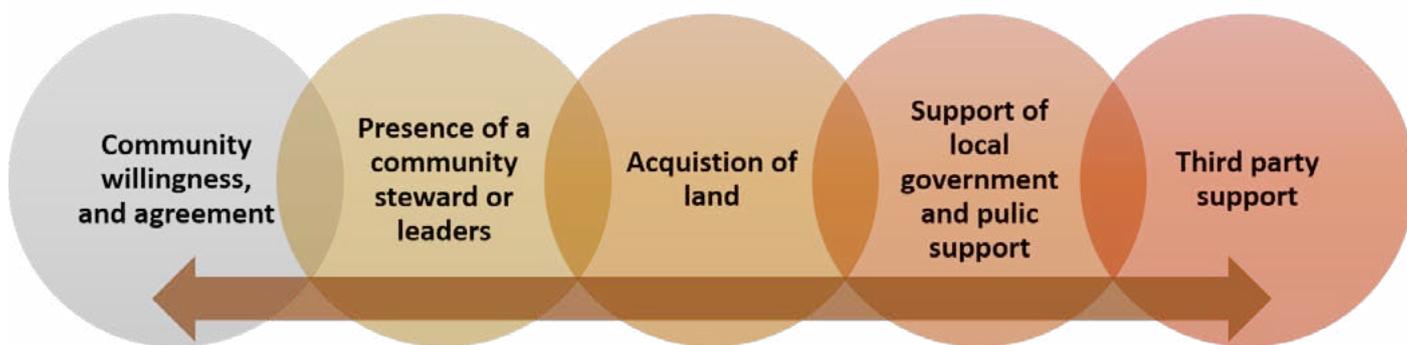


Figure 9. Five elements to implement CLT in Global South. Adapted from: Basile and Ehlenz, 2020

Sierra Leone’s Central Government with an investment of \$2 million USD (£1.4 million GBP). This project will increase accessibility and interaction between various destinations, which is considered one of the underlying problems between land use and transportation (World Bank, 2021).

Informal settlements will, directly and indirectly, benefit from these improvements, particularly those located on the east coast, such as at Old Wharf, Pamoronkoh, Portee/Rokupa, and those in the center Susan Bay, Kroobay, and Crab Town (Figure 8). With this investment, the municipality could use LVC to increase property prices in areas outside of informal settlements, and reinvest a portion of that revenue into social infrastructure development within or near informal areas (Interview with the transport expert at UCL).

3.2 Strategies 2: Community Land Trust - avoiding eviction

Community Land Trust (CLT) is the public-community co-operative model recommended in this report. The aim is to prevent the risks that LVC may bring to informal residents during the implementation process: Land prices rise and the eviction of informal settlement residents. This initiative combines the community’s land, houses, and other buildings to create a new community land ownership. This land ownership is entrusted to a community-based non-profit organization for management (CLT center, 2021). In 2019, the SLURC/DPU conducted analysis which recommended the CLT as a strategic pathway for the Freetown land issue in their policy brief (SLURC & DPU, 2020). CLT implementation in Freetown may be challenging, but it can become a breakthrough point that solves the Freetown informal settlements land issue. In the Global South, the implementation of CLT depends on five important aspects (Basile and Ehlenz, 2020) (Figure 9). This strategy will follow these elements to divide the process into four stages and use socio-environmental justice to monitor the implementation in different stages (Schlosberg, 2007; Young, 2011; Butcher et al., 2021).

3.2.1 How to implement CLT in Freetown

Stage 1: Knowledge sharing platform (1-2 years)

Objectives
Establish a local-international communication and learning platform.
Stimulate the community’s willingness to establish CLT.
Establish core community management institutions.

Key actors involved
Local NGOs: CODOHSAPA & FEDURP, YMCA, CRS & COR-DIAD
International organisation: UN Habitat, World Habitat, UNDP, SDI, CLT center
Research institute: SLURC, Lincoln Institute of Land Policy
Community: CBOs, Youth groups, Saving groups, Community leader
Local government: FCC
Other actor: Lawyer, UPFI (The Urban Poor Fund International)

The key objective in the first stage is to let informal settlers understand the structure of the Freetown land system, the formal and informal boundaries, and the definition of various land tenures. The stakeholder analysis from our desk research and the interview data shows that local, international NGOs and some community-based organisations are interested in the CLTs model, and many of these actors have a strong influence on community development. Therefore, a potential partnership should be created between these stakeholders (Figure 10). At this stage, the trust between international NGOs and the local government may not yet be established. Therefore, the local NGOs can play a crucial role in linking the two key actors (Interview with Programme Lead at World Habitat).

This partnership aims to create a knowledge-sharing platform, using workshops, reports, and speeches to enable the informal settlers to understand the Freetown land

LAND PRODUCTION

issue. The platform should also invite local lawyers and city planners to deliver their understanding of informal tenure security (Interview with researcher at the University of New Mexico). Through this platform, international organizations can spread the concepts and application cases of the CLT model to the community. However, the final choice needs to be made by the community collective. The final purpose of the education platform is to help the community develop its leadership, which can decide which strategy is the best option for the community (Interview with researcher at the University of New Mexico).

Monitoring and evaluation:

Recognition: Recognised the complexity of the land tenure of informal communities, ensure vulnerable groups: HIV, AIDS, COVID-19 infected people, and women, children, the elderly have the right to knowledge sharing (GoSL, 2015).

Distribution: Eliminate language barriers and ensure the equal distribution of knowledge through multiple communication channels (Internet, community workshops, recorded videos, petitions).

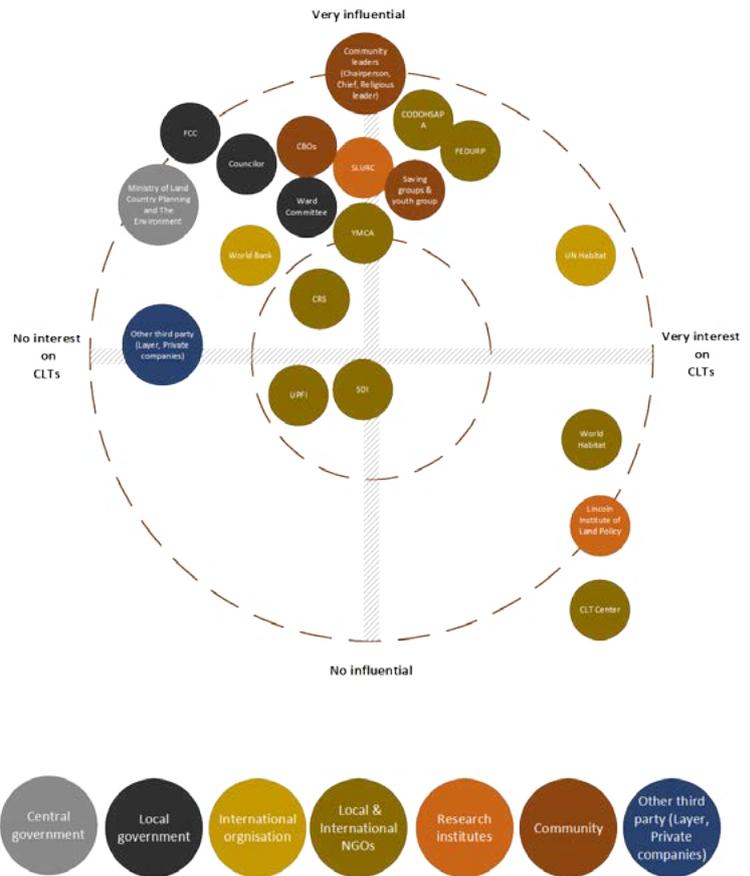
Participation: Establish regular communication mechanisms between international organizations, local organizations, communities, and other third parties (lawyers, research institutions), and interact with the public through social media to promote the concept of CLTs (Interview with Programme Lead at World Habitat).

Stage 2: Community land titling (2 years)

Objectives
Cooperate with government and third-party agencies for informal settlement land assessment and mapping.
Establish the informal community record land tenure system.
Building a stable relationship with government and public sector
Cooperate with third-party financial institutions to establish a CLT financing mechanism.

Key actors involved
Local NGOs: CODOHSAPA & FEDURP, YMCA, CRS & CORDIAD
International organisation: UN Habitat, World Habitat, UNDP, S-DI, CLT center
Research institute: SLURC, Lincoln Institute of Land Policy
Community: CBOs, Youth groups, Saving groups, Community leader
Local government: FCC
Central government: Ministry of lands, country planning and the environment
Other actor: Lawyer, UPFI (The Urban Poor Fund International), private sector link to LVC

Figure 10. Freetown CLT stakeholder analysis. Adapted from interview data.



At this stage, CLTs partner (community, NGOs) and the government will discuss further the possibility of collaborating to form a CLT. This dialogue aims to map and clarify the boundaries of the land within the community: Residential, commercial, infrastructure, agriculture, ecosystem protection, etc. Further, establish a community land titling system, and generate record tenure rights (DAG, 2018). As a substitute for the register tenure that lacks legal recognition, this record is protected by the community and elected officials to increase the tenure security of informal residents (Appendix 4).

During this stage, the LVC and CLT strategy begin to overlap. In the LVC's first stage, one of the key targets is cadastral system development for formal land, an essential stage that LVC can incorporate with communities and use the STDM to conduct a systematic verification and classification of the community's land tenure. It is also the stage where CLT can start further dialogue with the government. The critical point is to be consistent with the government's strategy.

In Transform Freetown Strategy, the local government has a clear goal in environmental management by giving the community more power to establish community disaster reduction duty (Target 1, initiative 1) and to expand the vegetation coverage of Freetown (Target 2, initiative 3) (FCC, 2019). These are opportunities for the community to

LAND PRODUCTION

cooperate with the government through the establishment of the CLT. Suppose the local government is willing to dialogue on the establishment of CLTs (Interview with the researcher at the University of New Mexico). In that case, some of the transform Freetown strategy targets could be implemented through the CLT in the future.

CLT strategy also should create their trust body during this stage. For example, the Fordibambai Trust established by FEDURP has great potential. It can become an essential financial tool for developing community land trusts (Interview with the leader and member at FEDURP).

Monitoring and evaluation:

Recognition: When creating a community titling system, it is necessary to pay special attention to the rights of women and tenants to ensure that the community protects them.

Distribution: When starting the mapping and replanning the land, it is necessary to ensure those residents living in high disaster risk areas can still have safe land in a safe space and have their rights recognised in the community.

Participation: Mapping the community requires the participation of all residents in informal settlements to reduce disputes arising from land re-division (DAG, 2018). At the same time, coordinating with the LVC strategy, it is necessary to establish regular meeting channels so that CLTs partners (communities, NGOs), governments, private companies, and other third-party organizations can recognize the data output from both. Legally, the ownership of Freetown land is still chaotic and partly controlled by the central government. Therefore, at this stage, the Ministry of Land, Country Planning, and Environment needs to be invited to confirm the current land rights of the land with the aid of lawyers and research institutes.

Stage 3: Establish CLT (More than 1 years)

Objectives
Land acquisition for community
CLT and formal land tenure must recognised at the legal level.
Obtain public support through third-party agencies.
Stabilize and expand CLT's funding sources.

Key actors involved
Local NGOs: CODOHSAPA & FEDURP, YMCA, CRS & CORDIAD
International organisation: UN Habitat, World Habitat, UNDP, SDI, CLT center
Research institute: SLURC, Lincoln Institute of Land Policy
Community: CBOs, Youth groups, Saving groups, Community leader
Local government: FCC
Central government: Ministry of lands, country planning and the environment
Other actor: Lawyer, UPFI (The Urban Poor Fund International), private sector link to LVC

When entering Stage 3, Freetown's CLT strategy needs to address the core challenges of CLTs applications in the Global South, around the world: The trust should obtain legally recognized land ownership on behalf of communities and establish CLT-related legislation at the regional and national levels (Basile and Ehlenz, 2020). Based on the experience of other cities in the Global South, it will require massive public support from civic society (World Habitat 2018). Measuring the stamina of a CLT movement is needed on all output in stages 1 and 2: The long-term partnership developed at the knowledge sharing stage, the strong community willingness, the leadership created by the community, the relationship with the media, lawyers, local government and councillor (CLT Center & World Habitat, 2020). All collective action initiatives which could lead the successful CLT legislation is vital (Interview with the researcher at the University of New Mexico).

Monitoring and evaluation:

The third stage does not have a specific timeframe. Except for a few successful cases, CLT movements around the Global South are still in progress. The core element at this stage is participation, and it has transcended the boundaries of the community. Whether it can become a public movement and promote legislation depends upon the long-term cooperation of all partners (Interview with Programme Lead at World Habitat). The only thing to note is that the development of a public movement may cause cooperative agencies and local governments to guide the community's plans. Therefore, a community leadership capable of decision-making is very necessary at this stage, to ensure that the real needs of the community can be recognized by the public, which is also the key point to measure the degree of community empowerment (Interview with the researcher at the University of New Mexico).

Stage 4: Operation

Objectives
Affordable housing development in CLT land.
Local service development (road, parking place, etc).
Develop the housing trust for housing and services. maintenance and upgrading
Green infrastructure development in the disaster risk areas.

Key actors involved
Local NGOs: CODOHSAPA & FEDURP, YMCA, CRS & COR-DIAD
International organisation: UN Habitat, World Habitat, UNDP, S-DI, CLT center
Research institute: SLURC, Lincoln Institute of Land Policy
Community: CBOs, Youth groups, Saving groups, Community leader
Local government: FCC
Central government: Ministry of lands, country planning and the environment
Other actor: Lawyer, UPFI (The Urban Poor Fund International), private sector link to LVC

Finally, for Freetown development, CLTs can become important partners in helping FCC create social value and enhance community resilience. If CLTs can be implemented in Freetown, the local government can use this model to reuse vacant and underutilized land for LVC for social services. Freetown has a clear, sustainable target relevant for affordable housing developments, and local government can advance sustainable development in line with helping to maintain the financial viability of land trust partners (Georgetown Climate Center, 2021). CLTs also have the potential for sustainable infrastructure uses in the Freetown context - when CLTs create a community cadastral system, the wetland in disaster risk areas can be reused to develop the green infrastructure or community gardens. The planning of mangrove rehabilitation, observation deck, forest trails, etc., will also continue to increase the value of surrounding land, and increase the potential for LVC.

Monitoring and evaluation:

Distribution: Improve the financial mechanism. With community land value increments, it is vital to establish a value appraising and resale formula mechanism for the purchase and sale of community housing, to ensure that the housing price remains affordable when sold and purchased through CLTs (Ingram and Hong, 2012).

Recognition and participation: Improve the membership system of CLT and ensure the balance of interests between the CLT board of directors (community, government, and other related institutions).

LVC & CLT Timelines

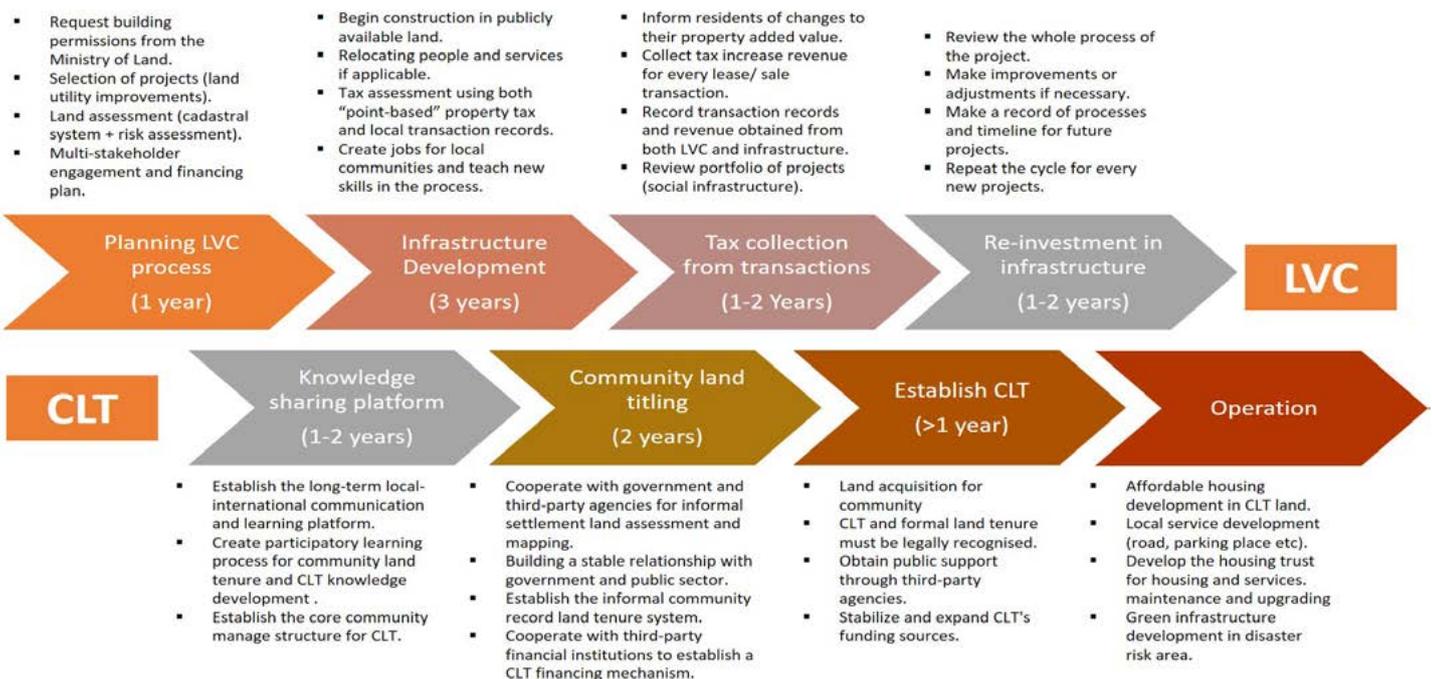


Figure 11. LVC & CLT Timelines. Adapted by author

3.2.2 Combination of two strategies and implement

Most importantly, this report strongly advises that LVC and CLT should be implemented in an integrated manner (Figure 11). They can enhance each other and CLT is an important complement to LVC. LVC can bring the infrastructure for the city while CLT can provide affordable housing to disadvantaged groups and ensuring equality.

4. Conclusion

Based on the previous research, the report analyses the social and environmental problems caused by land management by using the framework of Social Environmental Justice.

The incompatibility and lack of coordination inherent in the dual land system has led to chaotic land management and socio-environmental problems and injustice. Based on this situation and the previous studies, we recommend land value capture and community land trust as our strategies to tackle the land problems in this city. Land value capture can provide the infrastructure investment. We analyse the four improvements that Freetown needs in the process of implementing LVC based on our case studies of São Paulo, Brazil and Cape Town, South Africa. Moreover, to avoid the eviction of poor residents that usually happens when the land value increases, we also introduce the community land trust to compensate for the shortage of LVC. More importantly, LVC and CLT should be implemented in a coordinated manner and treated as an integral whole, to help Freetown residents get a brighter and more equal future.

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Learning from innovation around the world



- 01** Community land trust in informal settlements in Puerto Rico
- 02** Community-based tenure reform in urban Africa
- 03** Case studies of Land Value Capture in Cape Town, South Africa
- 04** Case studies of Land Value Capture in São Paulo, Brazil

Appendix 1: Community land trust in informal settlements in Puerto Rico

📍 San Juan, Puerto Rico

Corporación del Proyecto ENLACE del Caño Martín Peña (ENLACE Caño Martín Peña Project Corporation) the Puerto Rico Highway and Transportation Authority (PRHTA) the Ministry of Local Government in Caño

Summary

Between 2002 and 2004, residents of seven informal settlements located along the polluted Caño Martín Peña River in San Juan, Puerto Rico, established a community land trust to legalise land ownership, and protect historically marginalised communities from the threat of displacement. This community was built in the early 20th century. The formalisation of land ownership and the implementation of housing policies led to evictions and the displacement of half of the settlements.

At the beginning of the 21st century, thousands of residents were involved in a planning-action-reflection process that led to the creation of the first Community Land Trust (CLT) in an informal settlement in Latin America and the Caribbean. The National Land Trust Caño Martín Peña (Caño Martín Peña Community Land Trust; thereafter Caño CLT) is a tool to regulate land ownership through collective land ownership and individual surface rights. Unlike individual land ownership, land in Caño cannot be sold.

Impact

Caño CLT provides a way of countering the mechanisms of informal community vulnerability at a political-ecological level. In Hurricane María in 2018, 98% of formal houses had no, or only minor damage (Sin Comillas, 2018).

The experience of the Caño community also allows us to understand the democratisation of planning for sustainable measures. The Caño CLT is the result of an extensive and ongoing grassroots planning process, that aims to democratise community development and achieve environmental justice and ecological sustainability (Robbins, 2012).

Finally, as one of the largest landowners in San Juan, collective land ownership gives the inhabitants of Caño CLT the political power to control the development of their area, and the conservation of access, in a context of profound neoliberal globalisation and colonialism. This is exemplary in today's context of climate change and growing inequality.

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Appendix 2: Community-based tenure reform in urban Africa

📍 Voi, Kenya

The Ministry of Local Government in Voi
The Commissioner of Lands Office
Tanzania- Bondeni Settlement Residents Committee in Voi
The National Association of Cooperative Housing Unions (NACHU)
Ford Foundation

Summary

CLTs were adopted as a form of land ownership experiment by the local government and the Commissioner's Office of Land (Matthei and Hahn, 1991). At the end of 1993, the Voi - bondeni Residents' Committee chose to opt for a community lease. Kenya's informal settlements are primarily located on government lands that are not exclusively granted to individual owners, so the land ownership issues involved are relatively easy to resolve. CLT appears to be a form of land ownership that respects indigenous common property traditions and local resource control, while deferring to market objectives. The trust holds the land title deed for the community and leases the land to the residents of the community to live on at a low cost. The residents have only the right to use the land in the process. Other responsibilities of the trust include issuing leases to members of the community, determining land lease fees, deciding on land use overseeing the sale of improvements, controlling any proposed encumbrances on title, and transferring or purchasing of land. **pact**

For the community, CLT seemed to provide better social security and self-help for the community. Firstly, CLT provides the right incentives for housing improvements. Although the CLT model is based on community rights to land, it protects the important individual ownership rights of each resident.

For the municipality, CLT legitimises development by ensuring income generation and service delivery. From the point of view of the government, the CLT model has the potential to broaden the property tax base.

Voi is a very good example for Freetown because it shows that CLT is feasible in Sub-Saharan Africa. However, we should also pay attention to that there is a great difference between Voi and Freetown. The population size in Voi is much lower than in Freetown, and Freetown has a much more important economic and political status on its' own country. Therefore, the implementation of CLT in Freetown could be more complex than in Voi (interview 16).

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Appendix 3: Case studies of Land Value Capture in Cape Town, South Africa

📍 Cape Town, South Africa

City of Cape Town Metropolitan Municipality
Development Action Group
Lincoln Institute of Land Policy and Cities Support Programme
National treasury

Summary

Multi-stakeholder collaboration between the government, NGOs and local communities has actively encouraged more equitable dissemination of wealth among communities in the city of Cape Town. The main challenges around land access that Cape Town and many major cities in Africa have in common, relate to unaffordability due to land speculation. Often, private developers purchase land at a low cost and wait for the government to invest in public infrastructure so they can benefit from the price increase (Interview with a NGO officer in South Africa). However, constitutional policies have facilitated the introduction of LVC to avoid land market speculation. That way if private entities resell land at a premium, they will be liable to pay added tax as a percentage of the profit made from every transaction. Pro-poor initiatives such as Participatory budgeting and income-based land rights are some of the projects in which local NGOs and the South African government are collaborating on, to re-invest revenue generated by LVC. However, there is much work to be done in terms of resistance to change from developers and more affluent stakeholders (DAG, 2019).

Impact

Projects such as The Gautrain has seen an investment of R24 billion (£1.22 billion) 90% provided by the government and 10% from the private sector. This will eventually generate revenues which will be used to improve the current local transport links and logistics in the city, with a further investment of R845 million (£43 million) (Urban LandMark, 2012). Local NGOs such as the DAG (Development action Group) actively advocate for projects that provide vulnerable communities with affordable housing through inclusionary policy frameworks, where public participation leads the process of shaping fairer and transparent housing policies in the city. Overall, the impacts of using LVC in Cape Town, and generally in other South African cities, are that revenue from infrastructure projects can be used to upgrade local infrastructure projects. However this requires multi-stakeholder engagement, particularly where communities have a say in the processes.

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Appendix 4: Case studies of Land Value Capture in São Paulo, Brazil

📍 São Paulo, Brazil

Defenda São Paulo organization
Lincoln Institute of Land Policy
Municipal Department of Urban Development
São Paulo State Government
Sao Paulo Stock Market Exchange
União dos Movimentos de Moradia

Summary

Since its introduction in 1970, Brazil has adopted Land Value capture as a financing mechanism that not only facilitates investment, but also works for the community. By 2002, the city of Sao Paulo introduced LVC as part of its Strategic Master Plan (Mahendra et al., 2020). The Outorga Onerosa do Direito de Construir (OODC) is a LVC tool that enables the government of the city to generate revenue by charging developments for building rights. This approach worked in combination with Floor Area Ratios (FAR's) which are land use regulation tools that are based on the land area ratio and taxes the amount of buildable land.

Impact

This not only maximises the use of land but creates more revenue for the city as zoning regulations tariffs vary from plot to plot. In addition to this, any social and nonprofit infrastructure development was exempt or received a very reduced quota which incentivised social development projects such as schools, hospitals, and transport links (Sandroni, 2011). Other development projects include the re-development of favelas, which in this case could bring negative consequences to the local communities if they are displaced. Therefore, it is imperative that secure tenure mechanisms are put in place before LVC is used, that way local communities will not be affected to the changes in property and land policies (UCLG, 2014).

Sources

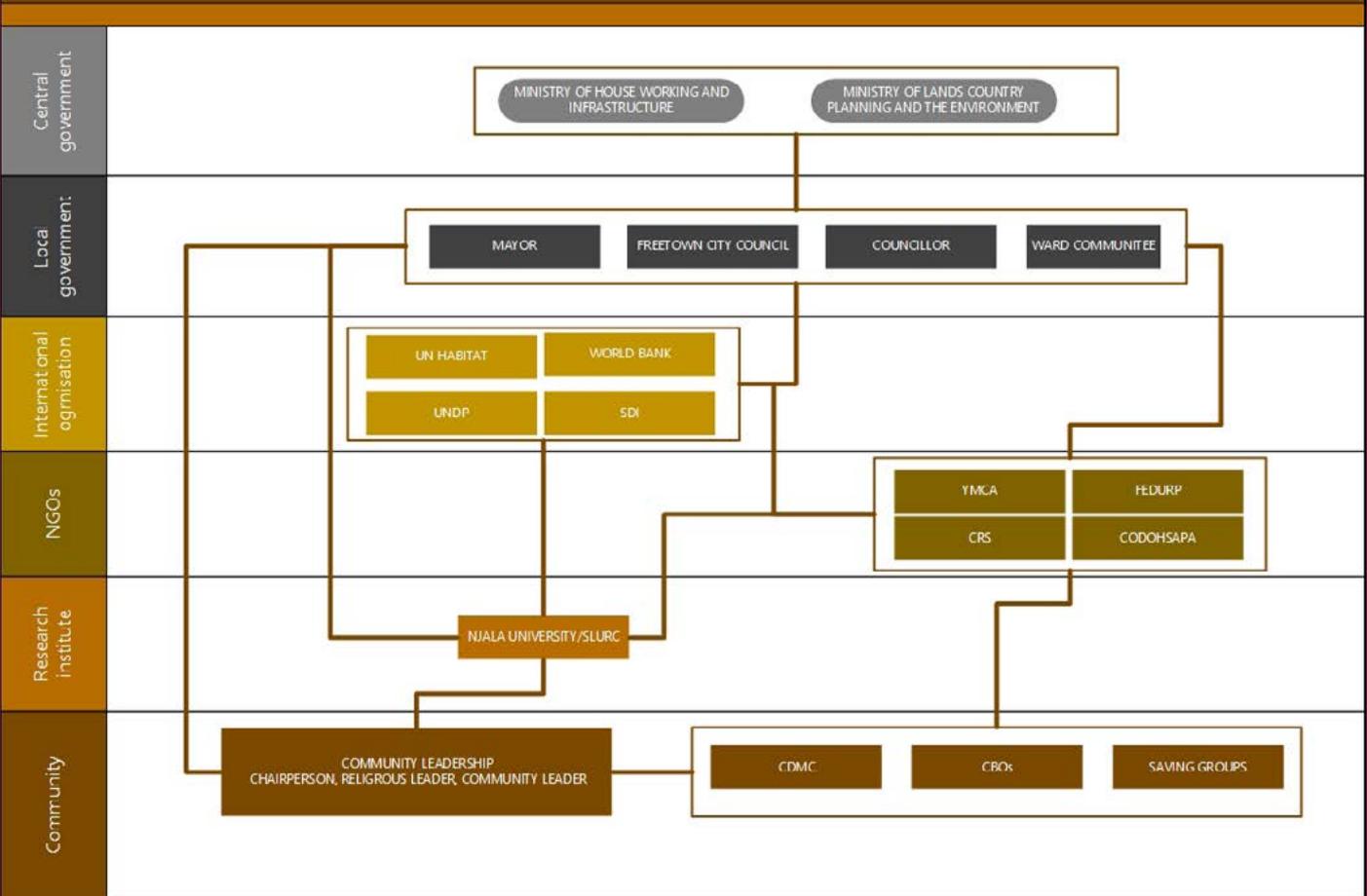
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Freetown land production stakeholder diagram



Goal 1: No poverty
<p>Target 1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance</p>
Goal 5: Gender equality
<p>Target 5.a Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws</p>
Goal 11: Sustainable cities and communities
<p>Target 11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums</p>
<p>Target 11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries</p>
<p>Target 11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities</p>

Registered Land Rights

"Registered" land rights refer to the rights to land that are recorded and registered in the deeds registries and offices of the Surveyor Generals, according to the national cadastre and the existing national property legislation (Kingwell, R. 2017).

Cadastre will include a spatial descriptions of land-parcel boundaries (location, shape and size of land parcels). They also contain a unique parcel identifier to establish the link to the land-ownership information. When maintained in a real-time manner, cadastral maps can serve as the base for a reliable property rights system. (Kingwell, R. 2017)

Recorded Land Rights

Recorded" land rights refer to rights that are recorded in a locally administered land administration system, which is not yet covered in national legislation. This systematic recording of these rights would be referred to as a "land records system" to distinguish it from the land registration system. Such locally recorded and administered rights have been used historically, with the most pervasive example being PTO certificates. These can also be verbal (Kingwell, R. 2017).

"Community land administration is not simply a mapping and registration process - it must involve the strengthening of local institutions and leadership, foster participation and accountability through local by-laws, supported ideally by enabling national legislation" - (DAG)

Co-producing in-situ upgrading

A pathway to reduce risk and injustice in
Freetown's informal settlements



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Abbreviations

ACCA	Asian Coalition for Community Action
AMT	Akiba Mashinani Trust
BMP	Baan Mankong Program
CAAP	Community Area Action Plan
CBO	Community-Based Organisation
CKG	Crab Town, Kolleh Town and Grey Bush
CLT	Community Land Trust
CODI	Community Organisations Development Institute
CODOHSAPA	Centre of Dialogue on Human Settlement and Poverty Alleviation
CORC	Community Organisation Resource Centre
DPU	Development Planning Unit
ESD	Environment and Sustainable Development
FCC	Freetown City Council
FEDURP	Federation of the Urban and Rural Poor
FFF	Foundation for the Future
FTF	Future Trust Fund
IIED	International Institute for Environment and Development
NGO	Non-Governmental Organisation
SDG	Sustainable Development Goal
SDI	Slum/Shack Dwellers International
SIA	Social Impact Assessment
SLURC	Sierra Leone Urban Research Centre
SMEDA	Small and Medium Enterprises Development Authority
UCL	University College London
UN	United Nations
YSM	Yonmenkaigi System Method

1. Executive summary

The dichotomy of formal/informal has been widely recognised as a defining feature of African urbanism, strongly reflected in the housing conditions in Sierra Leone's capital city, Freetown. Here, respective discourse has significant influence over visions of the city, its urban policies and subsequent interventions towards transformative change (Rigon, Walker and Koroma, 2020). The capacity of the government to meet the demand for equitable housing - exacerbated by spatio-demographic factors, bureaucratic bottlenecks, and internal displacement during the civil war, and economic migration - has been exceeded; manifesting in the formation of multifarious informal settlements throughout the city, a value estimated to lie between 60 – 72 (Senior Leadership at CODOHSAPA).

Amongst deep socio-environmental disparities within housing provision in the city, highlighted through the Environmental Justice framework (Figure 4), this research has identified the potential for negotiation and collaboration between the government and other active stakeholders on the delivery of improved housing and infrastructure (Boonyabanacha and Kerr, 2018). Grounded in this shift in institutionally defined roles of service provider/service consumer, this report aligns with the principals of co-production. The analytical framework employed throughout the proposed strategies champions the urban poor as central stakeholders in confronting socio-environmental injustice (Shand, 2018). In recognition of inadequate housing and infrastructure provision in Freetown, this report draws on initiatives from innovative practices and upgrading programmes in international contexts to propose three strategic pathways for transformative change towards the collective objective of co-produced in-situ upgrading of Freetown's informal settlements.

The strategies will involve: 1) strengthening stakeholder relationships and capacity building, 2) augmenting funds for improved savings capacity and 3) incorporating flexibility into the upgrading process to accommodate heterogenous communities. The first strategy addresses the current inadequacy of community involvement in decision making, planning and policy; examining the various obstacles to equitable participation, and outlining means in which to strengthen multi-stakeholder partnerships and

community inclusion. This would be achieved through the expansion of the Community Action Area Planning (CAAP) process, incorporation of the mailshot procedure, door-to-door interviews, inverse debate meetings and workshops, as well as exchanges via travelling and online platforms. The second strategy addresses the multitude of barriers currently encountered in financing the urban poor in Freetown, such as lack of access to formal banking, and the limited capacity within, and insularity between, existing savings groups. The resulting financial infrastructure not only improves access for the urban poor to external financial sources, but improves the collective capacity of savings groups themselves to manage funds in a sustainable, effective manner, and contribute to neighbourhood and city-wide transformation. Incorporating flexibility into the upgrading process is central to the third strategy, recognising the heterogeneity of communities within and between settlements grounded in differing socio-economic fabrics, geographies, needs and aspirations. The strategy will propose a spectrum of upgrading options including: in-situ, re-blocking, reconstruction and if necessary, relocation. Each of the strategies are founded on co-production arrangements and will be monitored and evaluated through various means to ensure an iterative process, whereby strategies are adaptable as variables and knowledges evolve.

This report will detail the implementation of three complementary strategies to contribute to the disruption of the risk accumulation cycle faced by informal settlement dwellers and reduce their exposure to socio-environmental injustice through co-production arrangements. Through participatory methods, the strategies outline a trajectory towards meeting the long-term housing aspirations of the urban poor, upgrading both physical infrastructure and social conditions (Box 1); and ultimately contributes to the collective objective of transforming Freetown into a dynamic and vibrant city.

Box 1:

“The value of an incremental approach is that you don't start with the end product (a house) and impose it on a community. Upgrading is not only housing. You can be in a temporary shack and as long as you have opened up spaces to basic services, then that is upgrading.” (Mary Wambui, Kenyan SDI Alliance, quoted in Hendler, 2016).

2. Diagnosis and research design

2.1 Introduction

This report explores co-produced, in-situ upgrading as a pathway to reduce risk and injustice in Freetown’s informal settlements, and aims to explore how upgrading can contribute to a more inclusive and just city. The proposal promotes more than physical upgrading, supporting the production of deeper and less tangible changes in collective capacities, societal structures, and the confidence of low-income communities. It builds on and improves community relationships with local authorities and other key stakeholders. This report will outline the context of Freetown’s housing crisis, based on which, three strategic pathways are detailed. These offer complementary interventions for a community-led approach to in-situ upgrading, in line with United Nations (UN) Sustainable Development Goal 11 (SDG) to “make cities and human settlements inclusive, safe, resilient and sustainable” (United Nations, nd).

2.1.1 Background

Freetown, akin to many other Sub-Sahara African cities, is characterised by the proliferation of informal settlements and urban sprawl, with managing the growth of risk-prone and poorly serviced settlements being a major challenge to the government and other urban actors (SLURC, 2018a), (Image 1). The spatial expansion of Freetown is limited by its geography, being coastally located and bordered by mountainous terrain, forcing a rapidly increasing low-income population to settle on hazardous lands. The result-

Figure 1. Transform Freetown priority sectors diagram (Freetown City Council, 2019).



ing informal settlements are characterised by inadequate service provision, insecure land tenure, and poor-quality housing; exposing residents to multifarious socio-environmental injustices. The construction of just 240 units in the last 40 years (UN-Habitat, 2006), alongside the increase in rental prices by 650% between 2003 and 2011 (World Bank Group, 2019), has led to a deficit of affordable housing. This report builds upon the ongoing CAAP initiatives, a project which applies participatory planning and design to produce local community action plans with residents of Cockle Bay and Dwarzack, and is forthcoming in Moyiba and Portee-Rokupa (Principal Researcher at IIED). The proposed strategies are situated within the wider Transform Freetown initiative (Figure 1), launched in 2019, aiming to address Freetown’s socio-economic challenges and environmental vulnerabilities; and for Freetown to emerge as a just and resilient city (Freetown City Council, 2019).

Image 1. Settlement located near the coast in Freetown, Sierra Leone (Doherty, 2015).



2.1.2 Problem diagnosis

Lack of government recognition of the continuum of land tenure means informal settlements in Freetown are viewed as illegal, and residents are at risk of eviction, demotivating the upgrading of houses. Inadequate land administrative systems and failure to implement the National Land Policy, has resulted in informal land transactions, giving rise to conflict over resold land, further worsening fear of eviction. Poor durability of materials used to construct settlements exacerbates vulnerability to disasters, where 40% of houses are made with cement block walls and zinc sheet roofs, and 35% of mud bricks (Koroma et al., 2018). Due to its topography, Freetown is exposed to landslides, rock-falls and floods, with approximately 38% of the built area lying in medium or high-risk land, situated on steep slopes or below sea level, making it difficult to safely upgrade without technical support (Image 2), (World Bank Group, 2019). Moreover, Freetown is exposed to frequent fires worsened by overcrowding, such as the one in Susan’s Bay in 2021 (Image 3). Government response was limited by lack of resources and poor access for emergency vehicles to enter the overcrowded settlement (Image 4).

These natural and human induced disasters lead to a cycle of risk accumulation, with residents lacking the financial, and/or technical capacity to implement long-term upgrading. Alongside Freetown City Council’s (FCC) restricted financial resources to invest in upgrading initiatives, savings groups are fragmented and limited in their capacity. Minimal involvement of the urban poor in Freetown’s service provision makes co-production methods appropriate to strengthen community capabilities and build collective capital (Mitlin and Bartlett, 2018).

Image 3. Aftermath of a fire in Susan’s Bay, March 2021 (Africa News, 2021).



Image 4. Map showing the area of Susan’s Bay affected by the 2021 fire (Macarthy and Kamara, 2021).

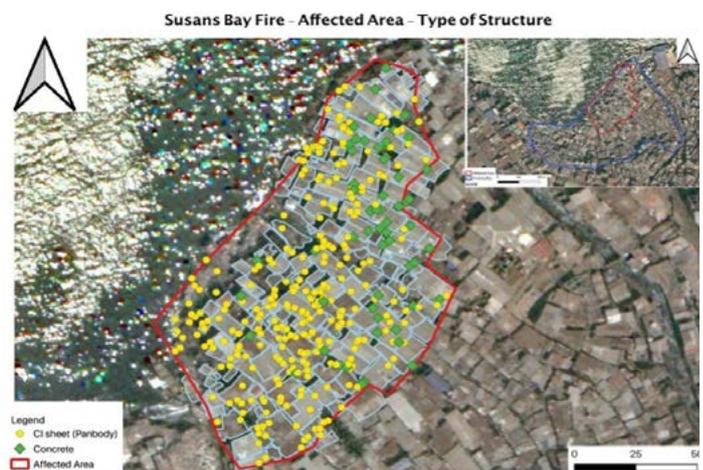
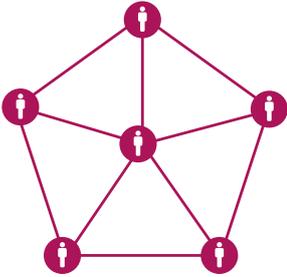


Image 2. Aerial view of housing situated on hazardous land near the coast in Freetown (Dronestagram, 2018).



Figure 2. Research questions diagram (Authors, 2021).

What co-production arrangements can be devised to strengthen participatory in-situ upgrading, reduce risk, meet residents' long-term housing aspirations and strengthen community capabilities?



How can stakeholder relationships between the community, NGOs, local authorities and other urban actors, be strengthened to facilitate capacity building and knowledge-sharing to encourage upgrading initiatives?



How can innovative finance practices be used in the upgrading process to empower residents and increase savings capacity?



In what ways can upgrading be flexible and adaptable in order to meet the short, medium, and long-term needs of different and diverse communities in Freetown?

Box 2:

Co-production is defined as “the provision of services through regular, long-term relationships between professionalized service providers (in any sector) and service users or other members of the community, where all parties make substantial resource contributions” (Bovaird, 2007, p846).

2.2 Analytical framework and research questions

Advocated for in contemporary development discourse, co-production (Box 2) is a widely recognised tool employed to promote social justice, whilst simultaneously dismantling mechanisms that reproduce inequalities (Mitlin and Bartlett, 2018). In Freetown, this analytical framework can be applied to the context of urban development; where the scale and complexity of poverty exceeds the capacity of the government alone to meet increasing demands for housing and infrastructure (Shand, 2018). As both a process of physical improvement and one through which knowledge, capacity and relationships can be established and/

or strengthened (Mitlin and Bartlett, 2018), co-production arrangements have the potential to forge equitable synergies between communities and service providers, building on pre-existing potential within Freetown and its informal settlements. Inspired by the principles outlined in Figure 3, the strategies endeavour to advance upon the Capability Approach through Participatory Methods implemented in the CAAP process (Norström et al., 2020). This recognises the heterogeneity of the individuals within Freetown’s informal settlements and the diversity of socio-environmental contexts (Deneulin and McGregor, 2010) which influence people’s choice, ability and opportunity to engage in a participatory process (Frediani, 2015).

Co-production plays a vital role in successful participatory upgrading in each strategy proposed in this report. This framework compliments wider efforts to democratise development within local spheres (Coffey and Polèse, 2007), enhance socio-environmental justice (Figure 4) and localise SDG 11. Incorporating socio-environmental justice into the framework helps to reveal the underlying factors behind the unequal distribution of services and resources. Schlosberg argues that a thorough understanding of justice requires us to see the linkages between distribution, recognition, capabilities, and participation (Schlosberg, 2007).

Figure 4. The Environmental Justice Framework (Authors, 2021, adapted from Rør, 2018).

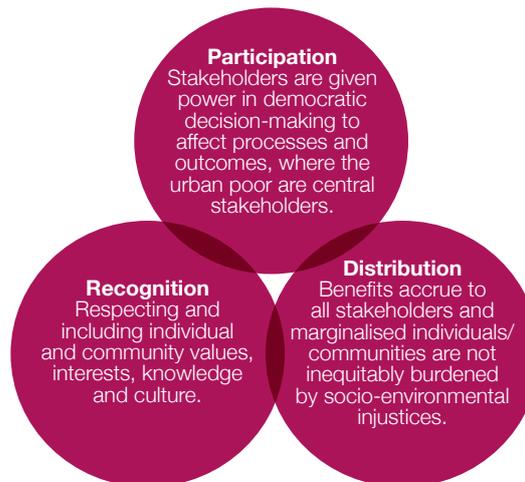
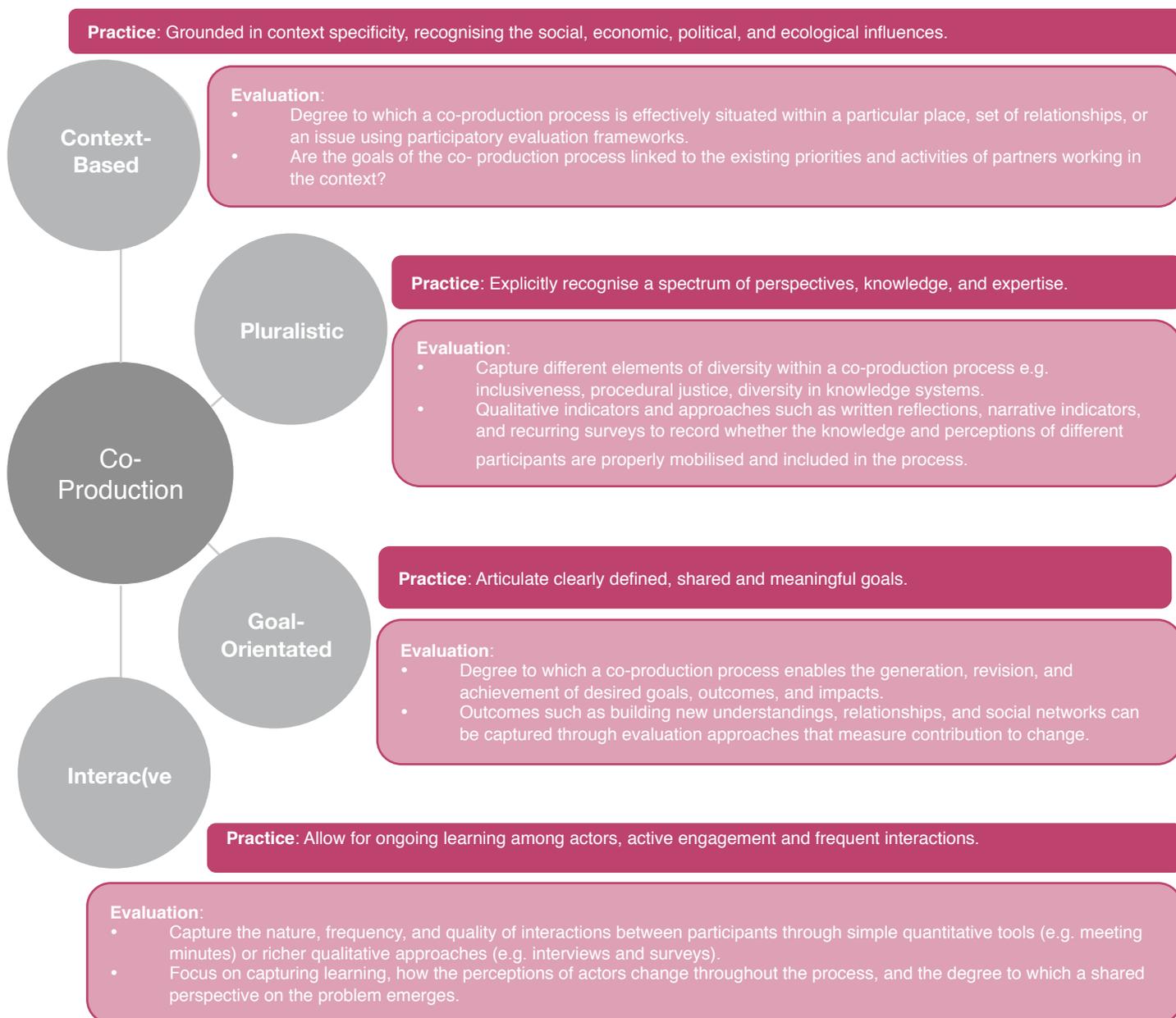


Figure 3. Diagram displaying four principals of co-production in practice and evaluation (Authors, 2021, adapted from Norström, 2020).



2.3 Methodology, objectives and limitations

This report draws upon and concludes four years of work undertaken by the Development Planning Unit (DPU) at UCL on transforming Freetown (Figure 5). Due to the ongoing COVID-19 pandemic, research was conducted remotely in three stages from mid-January 2021 until the end of May (Figure 6), facilitated through UCL and Sierra Leone Urban Research Centre (SLURC). During preliminary investigation, desk-based research was carried out, including a triangulation analysis of literature and secondary data. Back-casting was used for strategic planning, enabling the visualisation of long-term upgrading goals and subsequent identification of possible appropriate strategies (Figure 7). Analysis of previous UCL work, and Non-Governmental Organisation (NGO) and Government data, engendered this research’s problem diagnosis: a deficit of safe, affordable housing and infrastructure and risk-accumulation in Freetown’s informal settlements. Primary research, in the form of interviews and focus groups conducted online via Zoom and WhatsApp (Image 5), further scrutinised this. Using collated information, strategies were refined in the post-fieldwork stage, in an iterative process to ensure contextual-sensitivity and appropriability.

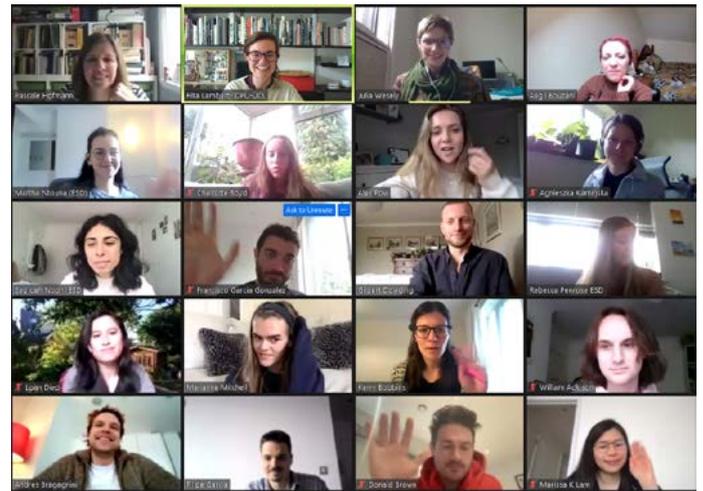


Image 5. Working online with group members.

Phase	Research Activities	Purpose
Preliminary Research (11 January - 26 April)	<ul style="list-style-type: none"> Literature review Secondary data collection and analysis Study of research methods and research ethics Lessons and approaches learning from global upgrading programmes Production of 10 minutes video to introduce entry points and research design; Production of 2 minutes video to introduce the research team 	<ul style="list-style-type: none"> To gain an understanding of the historical and social context To create an initial problem diagnosis To narrow down the research focus and initiatives Preliminary stakeholder analysis Planning interview invitation
Conducting Interviews (26 April – 24 May)	<ul style="list-style-type: none"> Weekly meetings with SLURC and DPU Refinement of research design and interview questions 16 international online interviews conducted through Zoom/WhatsApp including NGOs and academia from South Africa, Kenya, Thailand, the UK and China 13 Freetown online interviews including SLURC, NGOs, government, saving groups and ward committee members Focus groups with 2 people about Akiba Mashinani Trust (AMT) Summary of initiatives from South Africa, Kenya, Thailand, the UK Initial data analysis and strategy proposal based on collected data Further data analysis and refinement of strategies Finalise the report 	<ul style="list-style-type: none"> To summarise previous work conducted by DPU To further understand the barriers and opportunities for land upgrading in Freetown context To identify key stakeholders for proposed strategies To refine the proposed financial mechanisms in Freetown To incorporate the flexibility of upgrading strategies adapted in Freetown To finalise the output To make strategies more contextual and achievable
Analysis and report write-up (24 May – 28 May)		

Figure 5. Methodology according to project timeline (Authors, 2021).

HOUSING UPGRADING

Figure 6. Timeline of DPU UCL research process on transforming Freetown from 2018-2020 (Authors, 2021).

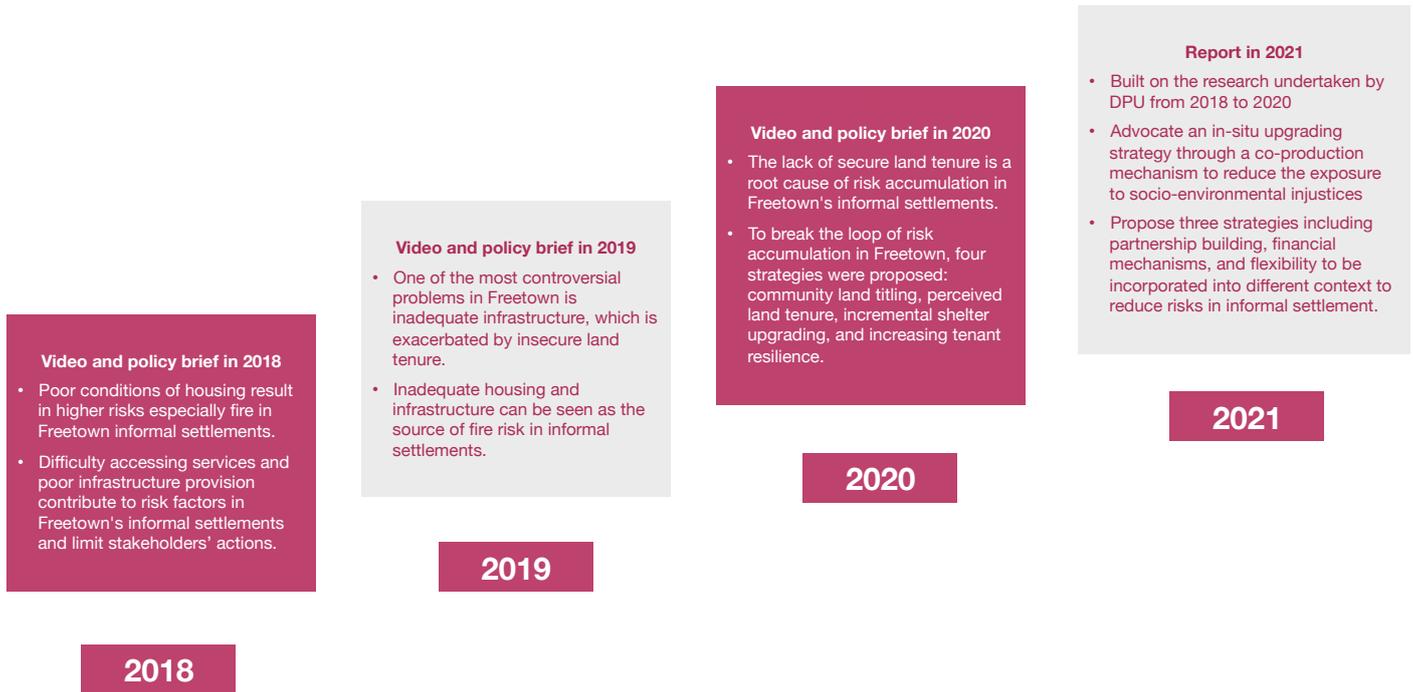
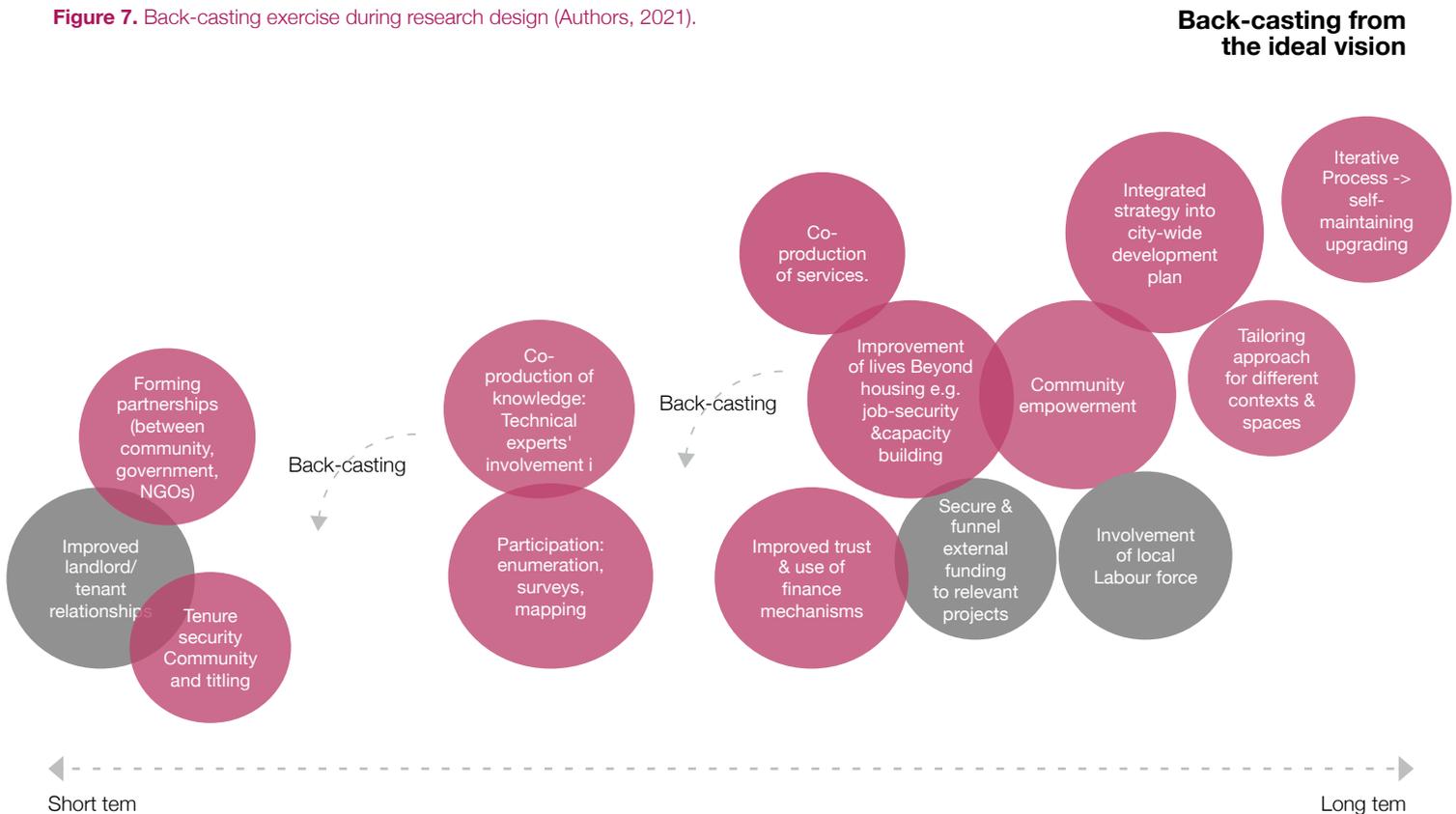


Figure 7. Back-casting exercise during research design (Authors, 2021).



2.3.1 Objectives

Box 3:

Evaluate the feasibility of co-produced in-situ upgrading as a pathway to reduce risk and injustice in Freetown's informal settlements.

Investigate the current reality of housing-upgrading in Freetown, identifying what existing arrangements can be built upon to realise the proposed strategies.

Identify innovative practices from international initiatives that have potential to be implemented in Freetown.

Recommend relevant and contextually grounded strategic pathways to facilitate in-situ upgrading.

Deduce monitoring and evaluation methodologies to ensure each strategy aligns with a co-productive framework (Figure 3).

2.3.2 Limitations

Multiple methodological constraints limited the ability to reflect the dynamic and diverse situation in Freetown. First, due to the COVID-19 pandemic, research was conducted remotely to maintain social distancing and ethical considerations. This constrained the ability to carry out effective fieldwork in Freetown and reduced opportunity for discussion with community members. Time constraints, coupled with the technical issues when interviews are conducted online, hindered the number of interviews completed and efficiency of information collection. Furthermore, since participation was voluntary, some key actors did not respond to interview requests, meaning crucial information could have been overlooked.

2.3.3 Ethical considerations

Ethical issues were also considered during primary data collection, such as in interviews and focus groups. Participation of respondents in the research was voluntary and complete anonymity was offered to each participant. Personal information of interviewees was encrypted, password-protected and stored using unique codes, ensuring data confidentiality. Data is accessible only to team members.

Figure 8. Map showing location of initiatives (Authors, 2021).



Flamingo Crescent, South Africa:
The re-blocking of Flamingo aimed to reconfigure the spatial layout of the informal settlement to ensure the provision of services and the formalisation of roads. Community-led mapping, enumerations and construction were facilitated by NGOs including Informal Settlement Network and Community Organisation Research Centre and the City of Cape Town funded basic services. Savings groups were also central to the programme with the community contributing 20% of the cost.

Akiba Mashinani Trust, Kenya:
Through community led processes, the Akiba Mashinani Trust provides access to finance and technical solutions. This includes training in financial management, accounting, business management, but also housing development and construction. Collective decision making and action by the urban poor are at the heart of AMT's approach, where action is led by the communities. Their finance services provide the means to achieve urban transformation and improved living conditions. AMT shows that savings of low-income people can leverage government resources to achieve inclusive cities.

Baan Mankong, Thailand:
The Baan Mankong 'Secure Housing' Programme is a programme which was launched by CODI. It addresses slum upgrading at the national level using a community-driven approach; providing secure tenure, access to utilities and improved housing to the slum dwellers. The programme is characterised by its flexibility, since it introduces various types of upgrading options and tenure arrangements.

CAAP, Freetown, Sierra Leone:
The CAAP process constitutes a participatory method to help communities plan their futures. Stages include (Figure 14): identification of relevant stakeholders, exploration of current housing, infrastructure and shared space conditions, analysis of resident's values and aspirations, discussion about improvement options and lastly, planning and designing ideal improvements in communities' houses and infrastructures

3. Strategies

Figure 9. Diagram outlining proposed strategies (Authors, 2021).



3.1 Tenure security

Sierra Leone’s dualistic land ownership system, encompassing both statutory and customary law systems, is complicated in Freetown where formal and informal housing markets are inextricable and mutually dependent. Widespread tenure insecurity acts as an underlying cause of risk accumulation (Barker et al., 2020) and an obstacle in the upgrading of its informal settlements (Handzic, 2010). Secure tenure, operating in a continuum for low-income settlement dwellers – as a legal construct and de facto – is recognised to encourage investment by households and communities, to alleviate poverty, risk of eviction and facilitate the provision of urban services and infrastructure (Van Gelder, 2010); therefore being pivotal to address when proposing in-situ upgrading strategies in Freetown. The strategies proposed build on previous UCL research on pathways for enhanced tenure security (Figure 10), in line

with the National Land Policy 2015 and building on the report prepared by the Development Action Group, ‘Pro-Poor Land Rights and Informality’ (Development Action Group, 2018).

Figure 11. Continuum of Urban Tenure Types and Tenure Security Zones (Development Action Group, 2018).

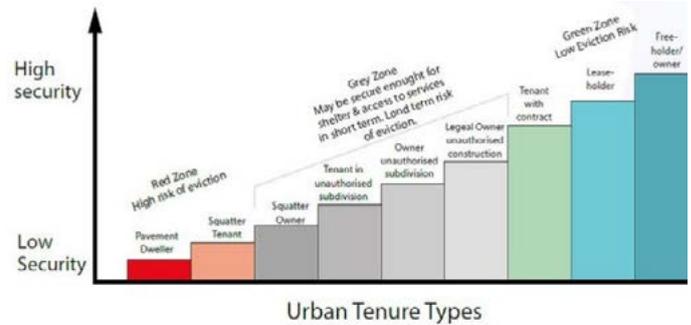
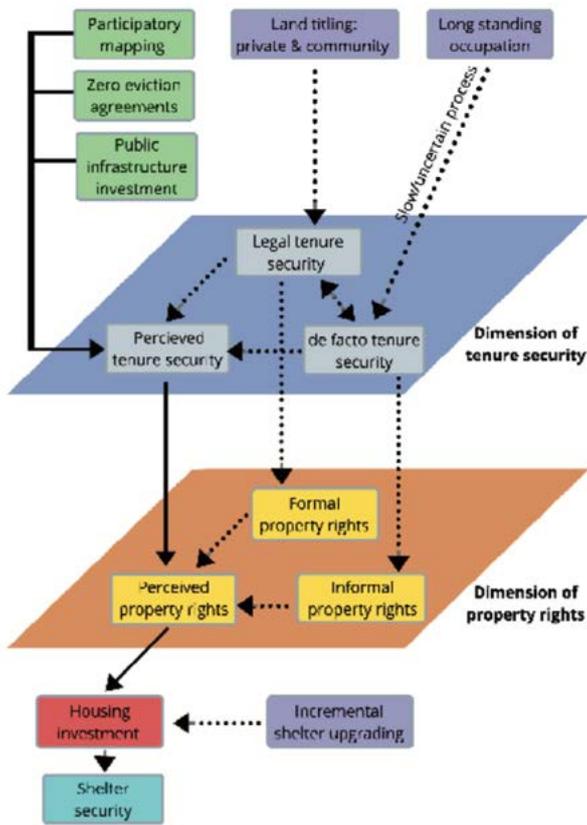


Figure 10. Table showing the tenure security strategies for Freetown (Authors, 2021, adapted from Barker et al., 2020).

Form of Tenure Security	Summary	Spatialisation in Freetown
Continuum of Land Rights	An institutional shift to recognise tenure as functioning along a city-specific land rights continuum, as opposed to a simplistic binary system; recognising the urban housing informality [24] within the city and accommodating its heterogeneous communities and their needs, aspirations and tenure arrangements (Figure 11).	Appropriate in settlements where land ownership is complex e.g. in Magazine where land is divided into customary (5%), municipal (75%) and privately owned (20%) land [27].
Community Land Titling /Community Land Trusts (CLTs)	Land is held and managed by a community trust through communal purchase or whereby municipal or state land is released to communities. CLTs can enhance tenure security and mitigate gentrification through [28]: Preservation of long-term affordable housing through removing properties and lands from the market, preventing excessive speculative investment from gentrifying areas; Enhanced neighbourhood stability through increased length of residency; and Contribution to development of community assets through owner-occupants interaction regularly on the basis of shared residential interests.	Effective in settlements with pre-existing community cohesion or which are undergoing community mobilisation. CLTs would be particularly appropriate for settlements situated on municipal land such as Susan’s Bay or Colbot, where 100% of the land is municipally owned [27]. However, it is unlikely that the community would have previous knowledge of the benefits of the CLT model, therefore it would have to be introduced to the community as an option (participant I4).
Perceived Land Tenure	Founded on individuals’ or groups’ informal experience of tenure control, absent from de jure property rights [29]. This is an alternative approach to formal tenure security where capacity for community/private land titling or CLTs is insufficient; achieved through participatory mapping, zero eviction agreements and investments in public infrastructure (Figure 12). Tenant – Landlord relationships in Freetown are built upon solidarity between land-owners and land-users, secured by ‘Gentleman Agreements’ which further strengthens perceived land tenure rights of individuals and communities without de jure tenure security.	Most effective for settlements located on municipal land where many households are land occupying dwelling owners such as in CKG (100% municipal land ownership) [27]. This enables the municipality to invest in local infrastructure and basic provisions leading to some means of de jure tenure; and despite no individualised rights granted, communities could be protected under anti-eviction law.

Figure 12. A Conceptual Framework for perceived tenure security (Barker et al., 2020).



3.2 Strategy 1. Sustained community inclusivity and stakeholder partnerships

3.2.1 Involvement of the Community in Freetown (Box 4)

Box 4:

Strengthening existing and creating new partnerships is vital in empowering the communities and their voices and building a base on co-producing knowledge and services for upgrading projects. A representative from Development Planning Office of the FCC, highlighted the necessity of a slum policy that must be formed by the citizens’ needs; as he remarked, ‘they are Sierra Leoneans; we have to listen to them’. Therefore, building partnerships is essential for any developmental project, and it is incorporated in every strategy proposed in this report.

This research has shown that despite the efforts to meet people’s housing and well-being needs, there is a lack of constructive dialogue between residents and the state. Despite the local Government Act (Government of Sierra Leone, 2004), (Box 5) recognising the importance of resident participation, uneven power dynamics within groups - which influences the equal involvement of resi-

Box 5:

‘A local council shall, before approving or reviewing a development plan, consult residents of the locality, agencies of Government and non-governmental and international organisations that have interest in working in the locality’. (Government of Sierra Leone, 2004)

dents - and lengthy meeting durations, discouraged various marginalised groups from engaging. These include the elderly, professionals, and those employed in the informal sector (Macarthy, Frediani and Kamara, 2019). These factors led to the lack of pluralism and hindered the creation of shared visions in planning; failing to incorporate community views in the plans.

3.2.2 What can other initiatives and methodologies offer to Freetown?

The Social Impact Assessment (SIA) methodology (Scott and Oelofse, 2005), (Appendix 5) proposes that mailshot procedure can form a useful tool in gathering data in relation to the affected parties’ concerns, interests and knowledge. In order to reach households without postal addresses, door-to-door interviews took place. Multi-stakeholder workshops were held, aiming to identify common interests and visions for residents’ futures, leading to the creation of an SIA report. A representative from the World Habitat Awards, also highlighted the importance of inclusivity in planning and brought to attention how smaller group meetings can be more effective in engaging community members. The Yonmenkaigi System Method (YSM), (Appendix 6), suggests that dividing communities into groups with allocated roles and debating between the groups (Image 6), motivates participants to be more engaged,

Image 6. General debating during the YSM process in Mumbai (Samaddar et al., 2015).



Figure 13. Positive outcomes associated with community exchange arrangements (Authors, 2021).



imaginative and critically involved with their proposed plans; this being valuable in the identification of deficiencies in designing, planning and ensuring the mutual commitment of all groups (Samaddar et al., 2015).

A representative from the World Habitat Awards, highlighted the importance of inclusivity in planning and brought to attention how group meetings which are smaller in nature can be more effective in engaging community members. Yonmenkaigi System Methodology (YSM) suggests that dividing communities into groups with allocated roles and debating (Image 6) between the groups motivates the participants to be more engaged, imaginative and critically involved with their proposed plans; this being valuable in the identification of deficiencies in designing, planning and ensuring the mutual commitment of all groups.

This research has also highlighted the importance of knowledge sharing (Figure 13), aligning with the pluralistic principle of co-production (Figure 3). The Flamingo Crescent initiative (Appendix 4) has completed exchanges with two

Image 7. Group photo following the development of a portfolio of options during the CAAP process in Dwarzack (SLURC, 2018a).



settlements in South Africa, which provided direct learning opportunities about upgrading processes and motivated the active participation of the residents.

The CAAP process (Appendix 1), which has already been implemented in Cockle Bay and Dwarzack (Image 7), represents a comprehensive step towards upgrading planning, using participatory methods and practices (Macarthy, Frediani and Kamara, 2019), (Figure 14). The CAAP's analysis of power relations among various stakeholders and their potential to influence communities (Figure 15), will be considered throughout the following proposed strategies to ensure the inclusion of all affected and affecting stakeholders (Box 6).

The challenges faced throughout the CAAPs (Figure 16) denote the necessity of the process to be expanded in favour of increased participation of marginalised individuals and groups.

Box 6:

'The CAAP process offered a shift in the power symmetries between those who have the resources [...] to those that are experiencing the everyday realities'. Current enumeration data doesn't "engage on a deeper spatial analysis of flows and relationships, and the trajectories of what is happening to the neighborhoods over time'. Board member of SLURC (Board Member of SLURC and Researcher at IIED).

Figure 14. Methodology of CAAP (Authors, 2021; adapted from SLURC, 2018a; SLURC, 2018b).

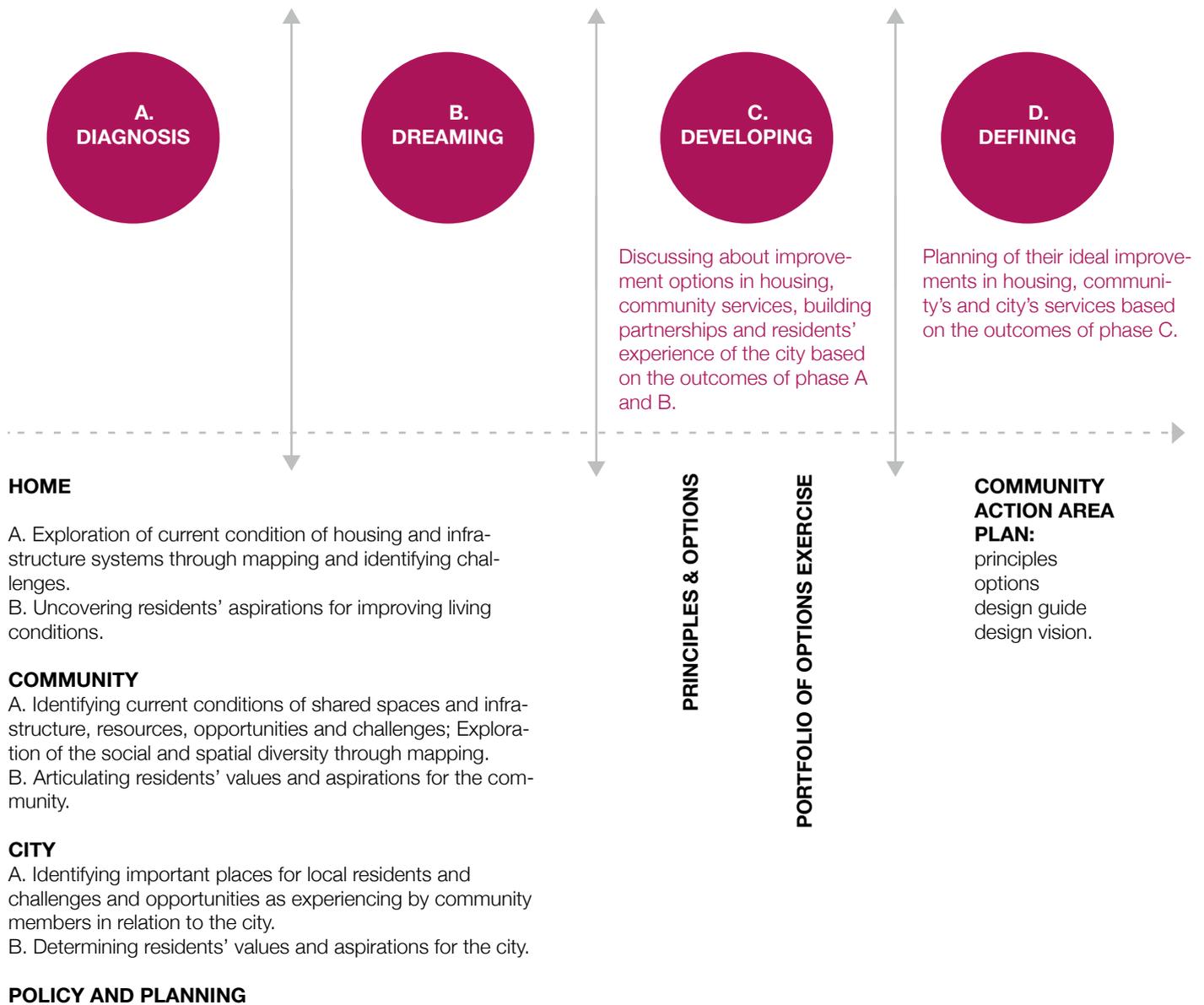
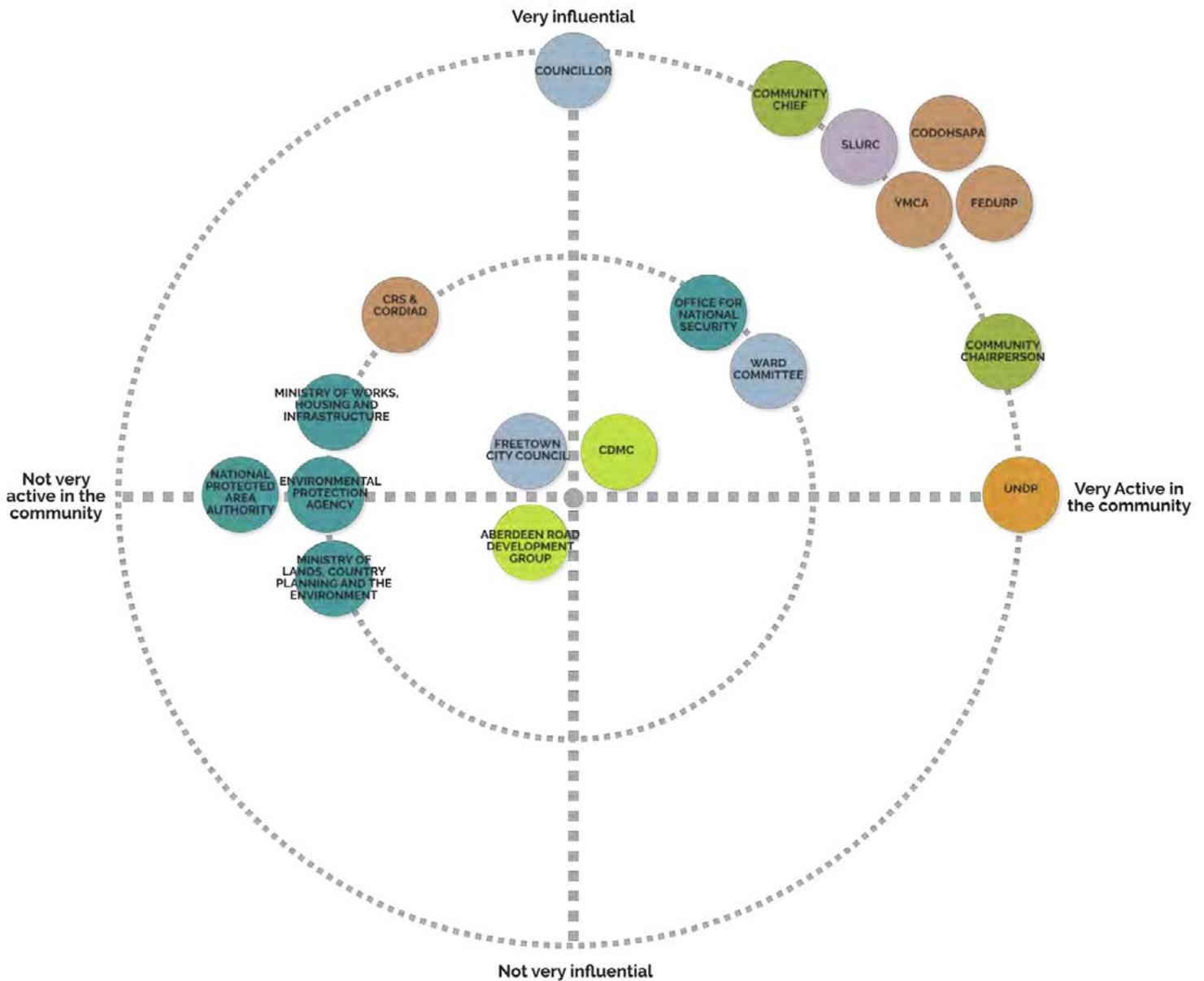


Figure 15. Stakeholder analysis of CAAP (Macarthy, Frediani and Kamara, 2019).



3.2.3 Incorporating learning outcomes in the context of Freetown

Drawing from the discussed initiatives and methodologies, the mailshot method can be performed during and at the end of the four CAAP phases, to reach more stakeholders and obtain a broader understanding of their aspirations and inputs towards planning and implementing upgrading in the city. Conducting door-to-door interviews with primary stakeholders during the Home and Community scale phases can reach illiterate community members and those who cannot be reached by mail; providing residents with wider access to stakeholder engagements within their communities. NGOs like the Federation of the Urban and Rural Poor (FEDURP) can facilitate this, with local government providing the necessary resources. Media accessible to communities such as local radio should be employed to disseminate news and information to community members. The Steering Committee can oversee these procedures ensuring inclusivity throughout planning activities (SLURC, 2018a). A certification of skills acquired during CAAPs can motivate residents to participate and transfer enhanced skills to employment opportunities; as exemplified upon the completion of the Participatory Action Learning Course (Image 8).

To address challenges arising from lengthy meetings during CAAP, the division of the participants into sub-groups can provide flexibility in meetings and ensure the input of all participants, especially those previously excluded. Inverse

debating between the various groups at the end of each phase will offer critical engagement with other groups' work, aiming to foster meaningful interaction and reinforce collaboration. Inclusion of marginalised residents within the process should be encouraged and ensured by the facilitator of the meetings and workshops (FEDURP). A board member of the Sierra Leone Urban Research Centre (SLURC) and researcher at IIED, stated that SLURC has completed an exchange trip to Cape town, meeting representatives from the Community Organisation Resource Centre (CORC), exploring the possibility of re-blocking in Freetown. Although this exchange did not instigate institutional policy change, it initiated an enhanced dialogue between stakeholders and change in practices on the ground concerning upgrading opportunities. Therefore, this report recommends that exchanges and knowledge sharing activities should be continued, motivating citizens to participate in current and future projects. Due to COVID-19, these exchanges should be taken place via Community Learning Platforms currently used by FEDURP to bring various organisations together until it is safe to do so in person.

These recommendations are detailed in Figure 16 in response to the challenges explored previously.

Alongside the financial contribution of FCC, the networks built between communities and NGOs, as outlined in Strategy 2, offer potential funding sources for these activities.

Image 8. Participants upon completion of the Participatory Action Learning Course, Freetown, Sierra Leone (Development Action Group, 2018).



Figure 16. Challenges of the CAAP process and associated recommendations (Authors, 2021).

CHALLENGES	RECOMMENDATIONS
Poor involvement of marginalised people, i.e. elderly, disabled and unemployed residents and representations of professionals.	<p>A) Mailshot process: Sending notification brochures and questionnaires in Krio and English, primary and secondary stakeholders can participate in and be informed about the processes and the outcomes of the meetings, if they are unable to attend.</p> <p>B) Door-to-door interviews: The residents ,who cannot participate in the regular meetings and cannot be reached out by the mailshot procedure, can be approached by door-to-door interviewers in a regular base.</p> <p>C) Media: The accessible and preferred media should be identify and used as means to inform residents about the CAAP process.</p> <p>D) The acquired skills and the participation, verified by a certificate can result in increased job opportunities and savings capacity and also provide a motive for unemployed people to participate in the process.</p>
Long duration of sessions, which reduced the participation rate and limited the time for livelihood activities, which negatively affected daily income.	<p>A) Dividing the participants into sub-groups based on the skills they would like to obtain, can provide more flexibility in the meetings and more space in considering people's inputs, especially marginalised ones within the CAAP process. The main roles of each group can be decided by the community.</p> <p>B) General debates and inverse debates, where groups are critically engaged with their own and other group's work, can combine the knowledge and the work of diverse groups, whereas inverse debating motivates each group to challenge its own action plan.</p>
Poor identification of the power dynamics within the community spatially and over time.	<p>A) Door-to-door interviews can provide information about networking and the dynamics of the community over time by the identification of the power relations within the communities.</p> <p>B) FEDURP as the facilitator of the meetings and workshops can ensure the acknowledgement of the voices of the most marginalised groups.</p>

3.2.4 Monitoring and evaluation

Monitoring and evaluation practices are proposed for each strategy. Methods for doing so should use performance indicators that are grounded in the local conditions of settlements in Freetown, and not extracted from other contexts. As such the facilitating platform (FEDURP) should aid the community in formulating these.

Figure 17. Proposed monitoring and evaluation methods for Strategy 1.

Strategy 1: Sustained Community Inclusivity and Stakeholder Partnerships	
These goals are suggestions. Ultimately, it is community residents who should devise goals.	
Principle	Monitoring and Evaluation
Context-Specificity	<ul style="list-style-type: none"> Creation of a social impact report at the end of CAAP process. This requires social scientists' involvement in the assessment team, to ensure social and environmental justice principles will be inherited in policy and practices.
Pluralistic	<ul style="list-style-type: none"> Profiling the participants by age, sex, occupation, educational level etc., to monitor the percentages of certain demographic groups and their rate of participation. Conduct surveys after meetings/workshops every three months, evaluating the multi-stakeholder partnerships and their efficiency during CAAP. Conduct interviews and provide questionnaires regarding communities' perceived inclusivity of the CAAP process, alongside the challenges and changes that should be incorporated into the process.
Goal-oriented	<ul style="list-style-type: none"> Conducting interviews and providing questionnaires can also provide insightful information about the effectiveness of CAAP, and the aspirations and needs that have (not) been met during and after CAAP. Quantitative methods can be used to monitor: A) percentage of responses to the mailshot method, B) percentage of people that were interviewed via door-to-door interviews, C) percentage of residents that participate in CAAP etc. Surveys can reveal the success of the learning activities to the community members, as well as the applicability and usefulness of the acquired skills after the CAAP process.
Interactive	<ul style="list-style-type: none"> The frequency and nature of meetings and workshops and the percentage of people actively participating can indicate the interaction of participants in the process. Surveys can also be utilised as an evaluation method of the effectiveness of meetings in achieving the proposed goals.

3.3.1 Financing Freetown: problem diagnosis

Whilst savings groups in Freetown are copious, many groups do not have the capacity to generate, manage and use funds effectively for community-wide projects. Furthermore, access to formal finance is either out of reach, or largely unsuitable for Freetown's urban poor; even when formal financing is accessed, its incongruity can worsen vulnerability (Archer, 2012). Women account for 80% of Freetown's savings groups (Figure 18), due to inequitable access to formal financing (Savings Group Mobiliser at FEDURP). Figure 19 details the financial barriers of Freetown's marginalised in financing community-led projects.

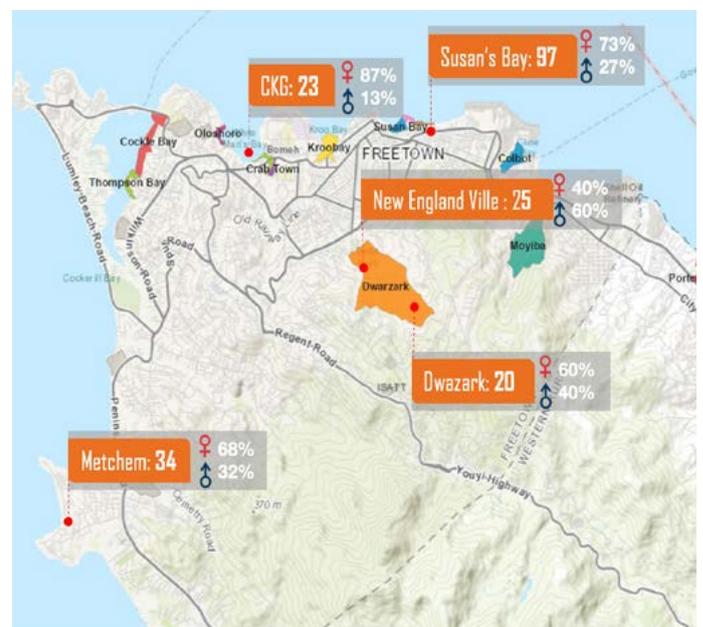


Figure 18. Map showing the number of savings groups present by settlement, alongside breakdown of group membership by sex (Authors, 2021, Data collected from interview with a Savings Group Mobiliser and a Chairlady for Women Groups within FEDURP).

Figure 19. Current barriers faced by Freetown’s urban poor in accessing finance (Authors, 2021).

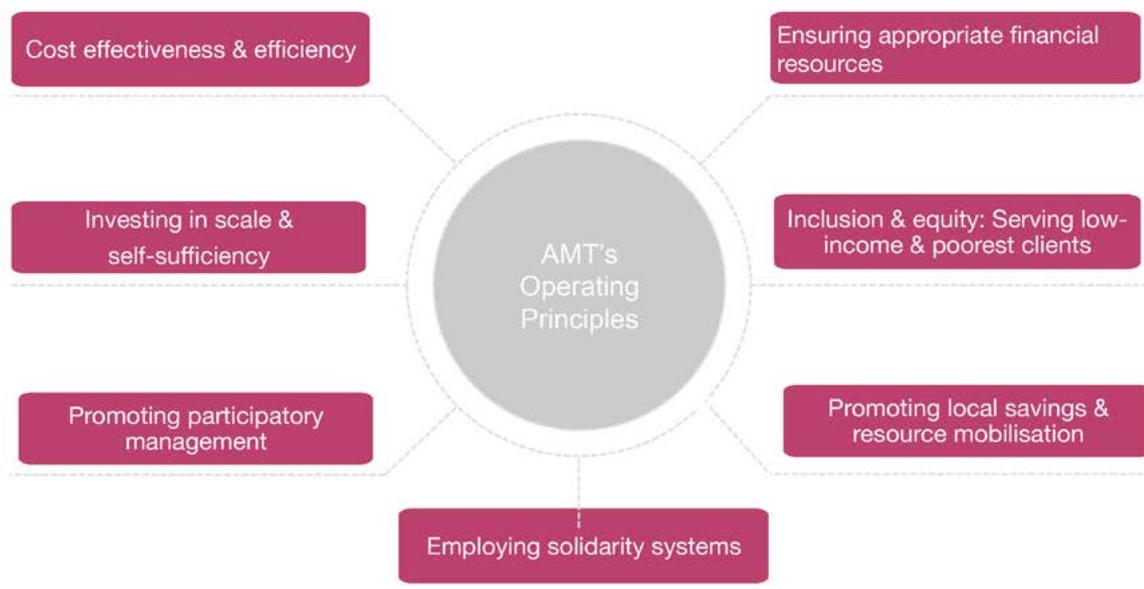


3.3.2 Drawing from other initiatives

Identified barriers can be rectified by borrowing from the Akiba Mashinani Trust (AMT), (Appendix 3), which evidences the positive relationship between accessible finance and urban transformation. Figure 20 highlights the operating principles of AMT. This strategy aims to connect pre-existing savings groups to have greater authority in influencing urban policy planning and politics, and to form new partnerships at city, national and international scales. The resulting financial infrastructure facilitates

and encourages community-led development. Secondly, this strategy aims to expand the funding opportunities for Freetown’s savings groups to increase their capacity. Through existing micro-finance infrastructures, enhancement of community solidarity, current NGO operations and a receptive city council and Mayor (Box 7), these aims have potential to be realised in Freetown. Figure 21 shows the partnership-building and financing strategy framework to fulfil these aims.

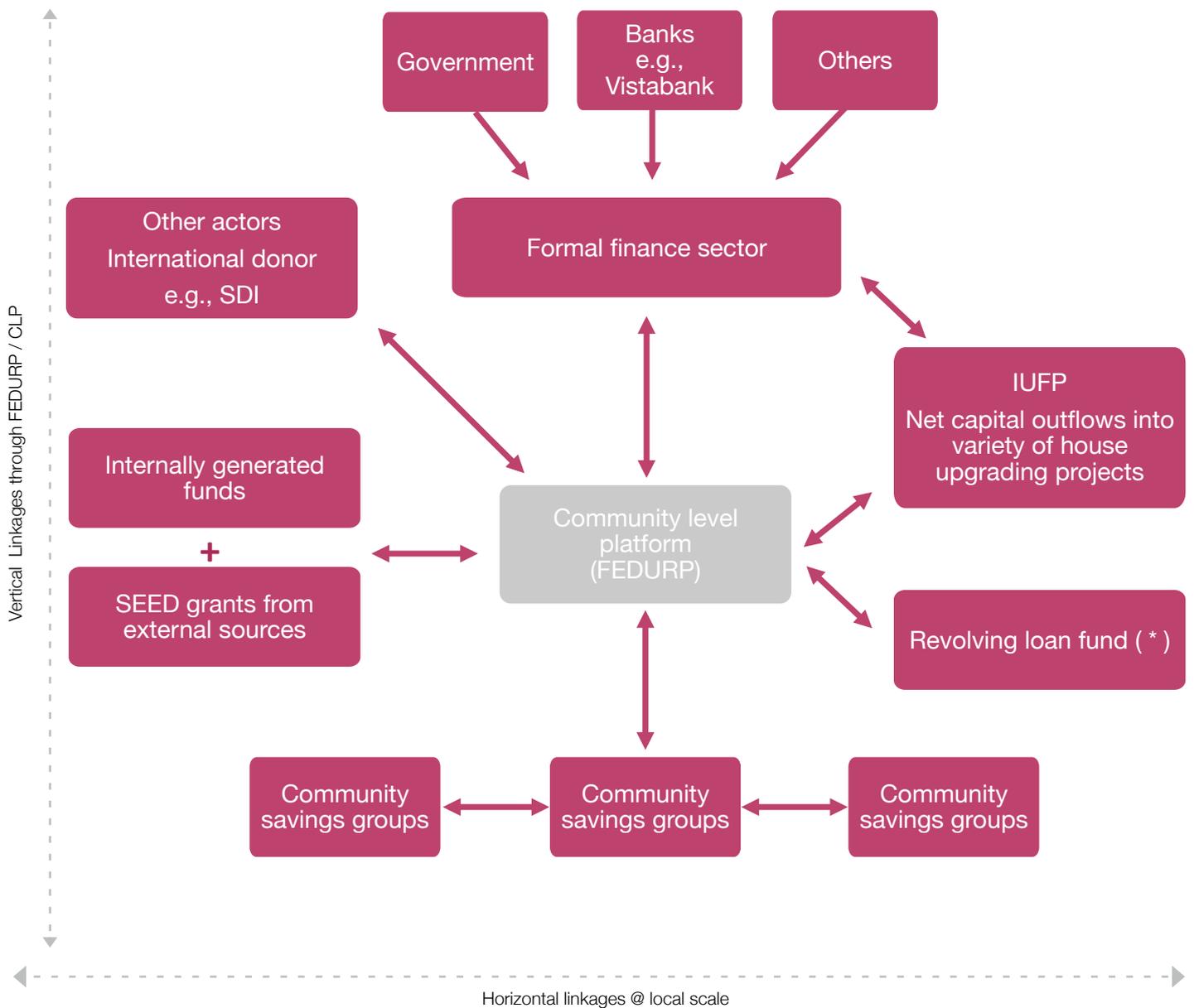
Figure 20. AMT’s operating principles (Authors, 2021, adapted from Weru et al., 2017).



Box 7:

Influential CKG community stakeholder and FEDURP member, described Mayor Yvonne Aki-Sawyers OBE, as 'willing and genuinely wanting to improve the lives of the urban poor'.

Figure 21. FEDURP linking mechanism and capital flows diagram (Source: Author-made, Adapted from Archer, 2012; Smith, Brown and Dodman, 2014).



(*) CODI's revolving mortgage fund which extends housing loans, amounting to 6,5

3.3.3 Grounding in Freetown

Connecting pre-existing savings groups:

FEDURP has the community presence required to connect pre-existing savings groups through its social mobilisation initiatives; a committee member of the Community Disaster Management Committee (CDMC) for Crab Town, Koleh Town and Grey Bush (CKG), explains how they serve as the principal body assisting the city's groups. This can be achieved through intra-committee sharing of best-practices, exchanges between groups, and community level workshops (Image 9), as is facilitated via AMT. Seed grants from the facilitator platform (FEDURP) (Figure 21) have two key purposes: networking and projects. Project capital enables communities to produce concrete results, directly benefitting community residents, subsequently joining them together and improving group membership for larger funds. Collective finance in the form of community collection, management and distribution of funds, overseen by FEDURP, is also a vital tool in cultivating social capital across horizontal and vertical planes. Important in intra-group networking, is that upgrading takes places incrementally. This encourages more community residents to actively participate, resulting in larger group membership and funds, and importantly the assurance to proceed and link groups and settlements throughout the city. Alongside FEDURP's "strong and serious" relationship with FCC and Freetown Mayor (Member of the CKG CDMC), FEDURP has the capacity to provide a platform, from which newly-formed savings group networks can leverage themselves in influencing urban policy planning in favour of urban transformation, such as in-situ upgrading, at the city-wide scale.

Facilitating vertical partnerships and funding opportunities with external stakeholders:

FEDURP has worked closely with Slum Dwellers International (SDI) in providing loans for the urban poor historically, for example in 2016 when they facilitated SDI loans to CKG during flood-events. Coupled with the Small and Medium Enterprises Development Authority's (SMEDA) forthcoming revolving loan fund (Figure 21) and commercial banks' improving receptiveness to savings group operations- senior member of FEDURP's Welfare Committee explaining how Vistabank now has a special Osusu account service- there is significant potential for FEDURP to facilitate connections between these actors in favour of a financing infrastructure which facilitates, and promotes community-driven development. The creation of such bridges and platforms is crucial in effective community-driven upgrading projects, the formal finance sector being where most funding lies, yet being "more suited to dealing with... such a platform rather than in individuals" (Archer, 2012: 425). Through using financial mechanisms to link various actors including community groups, local NGOs, regional and national authorities, and the formal finance sector in fund augmentation, the provision of new funding opportunities will be enabled, for example small amounts of 'seed' grants (Archer, 2012), to existing savings groups. Senior representative of Asian Coalition for Housing Rights (ACHR) highlighted how "we must link scattered relations of authority in a city to facilitate financial infrastructure change; the resulting structure enabling physical urban transformation to be bigger and better in many ways". Crucial, is that the poor maintain control over fund management, whilst the community level platform (FEDURP) facilitates the loans from the private sector, providing financial institutions confidence that loan repayments will be successfully made. The resulting apparatus from this strategy, is one which not only enhances the collective capacity of Freetown's residents to save larger sums for longer, and contribute to local neighbourhood and city transformation, but to expand local social capital and collective saving capacity, so informal settlement dwellers are empowered to manage funds in a sustainable, effective manner in community-driven upgrading projects in the future.

Image 9. A village savings and loan workshop in Boussou, Sierra Leone (USAID, 2014).



HOUSING UPGRADING

Figure 22. Potential barriers and associated resolutions for Strategy 2, Augmenting Funds (Authors, 2021).



3.3.4 Monitoring and evaluation

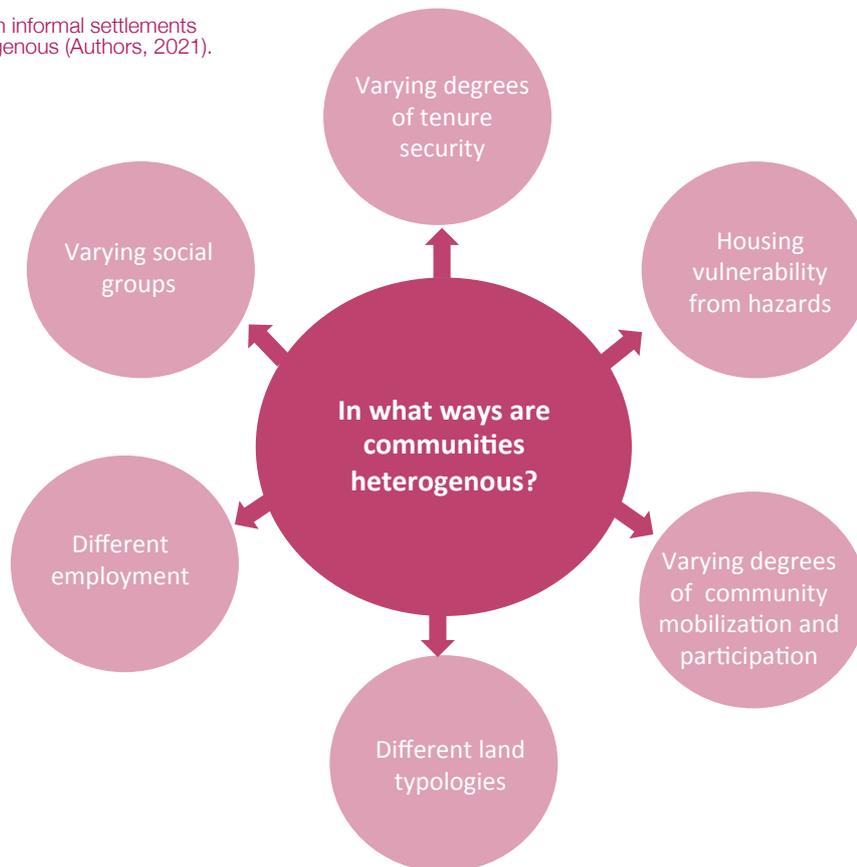
Figure 23. Proposed monitoring and evaluation methods for Strategy 2: Augmenting Funds (Authors, 2021).

Strategy 2: Augmenting Funds These goals are suggestions. Ultimately, it is community residents who should devise goals.	
Principle	Monitoring and Evaluation
Context-Specificity	<ul style="list-style-type: none"> The extent to which goals of the groups reflect existing members priorities should be evaluated using monthly surveys, where group members vote on a scale to show how relevant they feel current group goals are to their lives and individual goals (A score of 1 would mean group goals are of little relevance, 10 being highly relevant)."
Pluralistic	<ul style="list-style-type: none"> Extent of group diversity can be evaluated through group profiling, ensuring there is a proportionate number of marginalised individuals such as the very poor, elderly or disabled. This should be carried out by the facilitating platform (FEDURP), using group sociodemographics and income levels, for example. " Monthly surveys can be used to measure extent individuals feel they have authority to sway group decisions. These should be a numerical scale of 1-10, 1 being very little authority, 10 being significant authority. "
Goal-oriented	<ul style="list-style-type: none"> Financial goals should be clearly established for each savings group, along with timeframes to meet these goals. Goals could include raising X amount of funds by a certain date, or raising the required collateral to loan from a commercial bank, percentage of loan repayments and non-performing loans. Goals involving the creation of new partnerships could be measured through community perception of strength, and ability to contribute to change through, new partnerships.
Interactive	<ul style="list-style-type: none"> To capture the quality, nature of frequency of interactions, meeting minutes should be recorded for all group meetings, including discussion topics, group meeting dynamics, and any conflict encountered. These should be easily accessible for group members, and FEDURP should provide reading assistance for illiterate members. Interviews and surveys should be utilised quarterly to evaluate the extent to which residents feel they are meaningfully involved in group projects and to highlight the degree to which the groups shared perspective on issues emerge.

3.4 Strategy 3: Incorporating flexibility into the upgrading process

Freetown's informal settlements are heterogenous in their geographic, social and economic fabrics (Figure 24), which will be incorporated into the upgrading strategy.

Figure 24. Ways in which informal settlements 'communities are heterogenous (Authors, 2021).



Participatory methods are central to ensure that diverse residents' aspirations and knowledge are included within plans, whilst also catering to their different needs. All focus group discussions and community committees should represent a socially diverse group of people, especially marginalised groups such as women, the elderly and those with disabilities, in order to incorporate differing needs and wants within, and between settlements. NGOs like FED-URP should facilitate these groups to ensure that all voices are heard, and online Community Learning Platforms that are already utilised for communication should be expanded (SLURC, 2018b). The upgrading process should be holistic and not only improve housing conditions as highlighted by a Senior Member of ACHR (Box 8), but offer neighbourhood infrastructure such as schools, community gardens and community centres. This has been demonstrated in the CAAP for Cockle Bay, where religious spaces are important to the community and so were included in the upgrading plan (SLURC, 2018b). It is important that social and economic elements are coupled with the physical improvements of the upgrading strategy to ensure a long-term trajectory that improves the communities' livelihoods.

3.4.1 A Spectrum of upgrading options

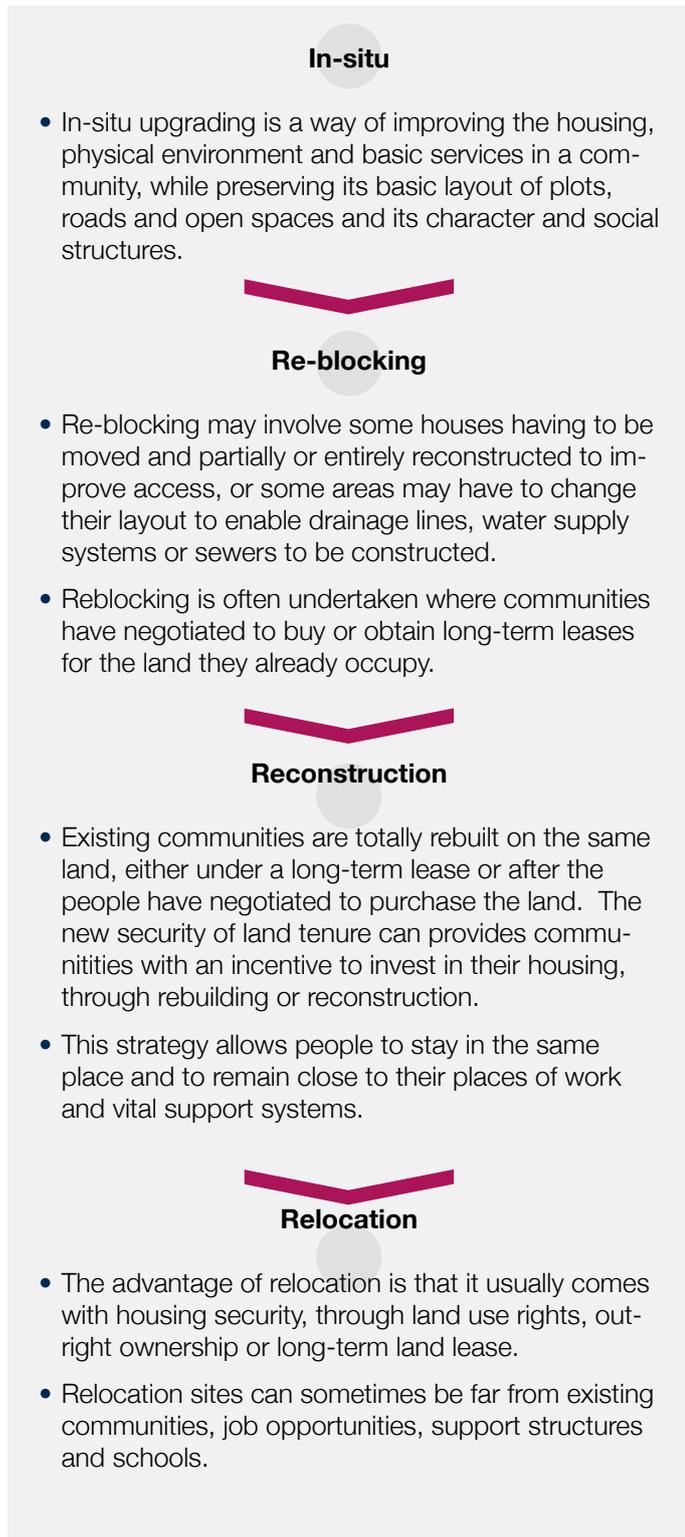
Drawing on Baan Mankong's use of flexibility in their upgrading strategy, a spectrum of upgrading solutions (Figure 25) will be offered to communities so that they can choose one that matches their varying needs and aspirations and reflects their reality. It is vital to understand that upgrading

Box 8.

"It is however, not just houses you are upgrading, but infrastructural change is taking place simultaneously. Upgrading goes beyond physical projects, you are upgrading city structure and relationships between people, the city and other actors. It is important to include, but not limit to, physical upgrading. You transform beyond the physical, the resulting structure makes physical transformations bigger and better in many ways. You mechanise the whole city with eyes to change the whole slum" -Senior Member of ACHR.

is an iterative process and as a Senior Member of Ikhayalami explained: “The most important thing to work with communities is it you always have to be fluid, you got to think on your feet and you gotta keep on adapting and keep on shifting and keep on rethinking and redefining things.”

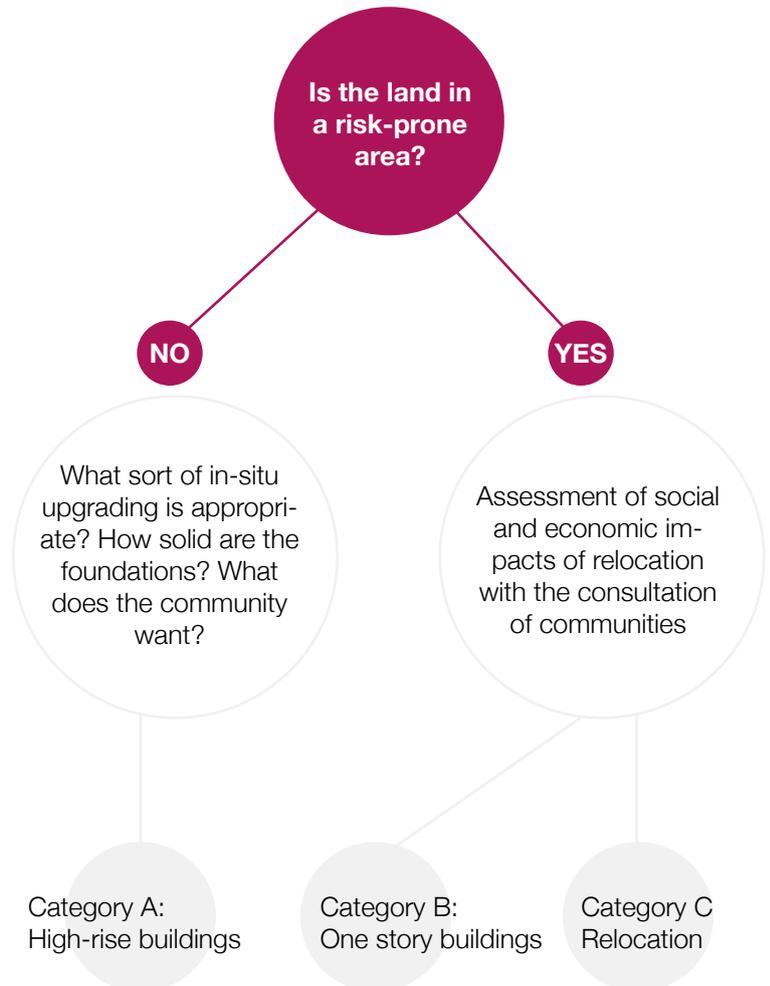
Figure 25. A spectrum of upgrading options (Authors, 2021, Adapted from Appendix 2).



3.4.2 Densification

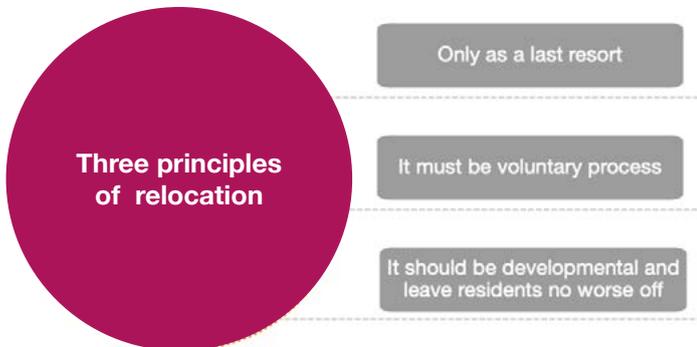
Communities in Freetown have been sorted into three categories: A, B and C, shown in Figure 26.

Figure 26. Process to determine which upgrading category communities should be in (Authors, 2021).



Category C, relocation, often results in the disruption of social and economic networks, as demonstrated in the relocation of Cobalt residents six miles north of Waterloo after the flood in 2015 (Montero, 2016). Subsequently, if relocation is required to move residents away from risk-prone areas, it must include the three principles outlined in Figure 27 (Arnall, 2019).

Figure 27. Three principles of relocation (Authors, 2021).



The CAAP for both Dwarzack and Cockle Bay have raised the need for vertical densification through rental housing, building up to 5 stories high to combat a lack of space also expressed by a Senior Representative for FEDURP (SLURC, 2018a; SLURC, 2018b). However, densification has only been suggested in communities where land is appropriate to build multi-storey buildings on, which does not include coastal land in Cockle Bay and steeper land in Dwarzack. This strategy can free-up ground floor space for commercial and business use, allowing small-scale enterprises to be established, increasing livelihood opportunities for residents. Such multi-storey buildings can also integrate leisure facilities, schools, and hospitals within close proximity to living areas, something a Senior Leadership member of FEDUP also expressed there was urgent need for. Expanding vertically requires co-production arrangements

(Figure 3) between communities, NGOs, technical experts and governments to re-design the settlements safely (Visagie and Turok, 2020). It is acknowledged that this strategy runs the risk of gentrification which can be combatted by forms of community land tenure such as a community land trust/ titling shown in Figure 10.

3.4.3 Re-blocking

During the upgrading of Flamingo Crescent, Cape Town, (see Appendix 4) a process of re-blocking was carried out by the residents (Image 10). This repositions houses to create passages for emergency vehicles, opens up space for communal areas, prevents the spread of fires, and improves access to sanitation networks (Visagie and Turok, 2020).

This process has potential to be adopted in Freetown where lack of viable routes for emergency vehicles to access disasters, notably during the fires in Susan’s Bay (Image 11) (2021), Kroo’s Bay (2019), and Cockle Bay (2018), has resulted in devastation for the communities and their livelihoods. This process emphasises the upgrading of collective spaces and not just the physical structure, central to this strategy. However, this option is not always appropriate, especially on hillside locations, and needs to be driven by a desire from the community for it to truly be co-produced.

Participatory mapping should be employed as a tool, supported by technical experts and architects, as it enables residents to visualise their space better, resulting in more effective layouts. Providing access to disasters can break the cycle of risk accumulation and subsequently reduce socio-environmental injustices in informal settlements. Re-blocking can also create a sense of belonging to the city by including the adoption of street names and numbers, which also allow residents to open banks accounts, apply for loans and receive post.

Image 10. Process of upgrading in Flamingo Crescent (SA SDI Alliance, 2015).



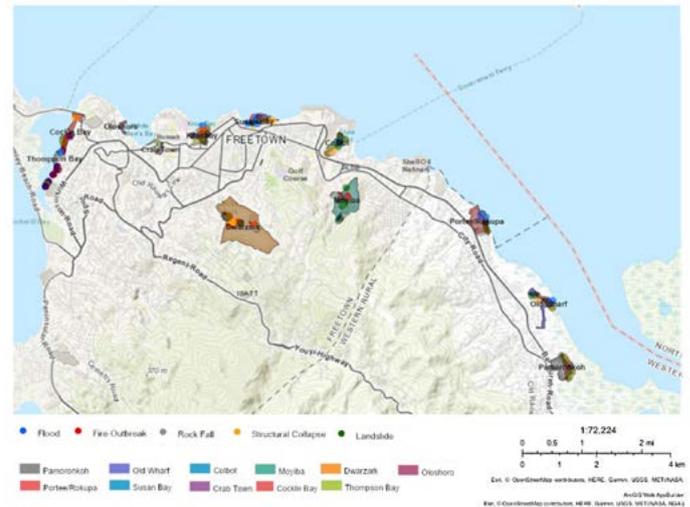
Image 11. Burnt down structures after the fire in Susan’s Bay 2021 (Macarthy and Kamara, 2021).



3.4.4 Prioritisation

Prioritisation for upgrading should be given to settlements with high to medium housing vulnerability and exposure to hazards, shown in Figure 28. This includes Susan's Bay, Kroo's Bay and Cockle Bay which have experienced fires in recent years, as well as settlements that are vulnerable to natural disasters including flooding and landslides. Kroo's Bay has experienced flooding annually since 2008 and in 2019, six residents lost their lives and 5,000 their homes (ACAPS, 2019). Susan's Bay is also situated in a risk-prone area resulting in frequent hazards that lead to economic losses, coupled with poor quality housing, residents are exposed to an unequal distribution of socio- environmental in- justices (Freetown City Council, 2014). There is also opportunity to start the upgrading process in Kissy Culvert/ Bomeh and Kingtom where there are plans to move the waste dump sites, freeing up land for housing (United Nations Sierra Leone, 2017).

Figure 28. Map showing housing vulnerability and hazards (Authors, 2021, adapted from Allen et al., 2018).



3.4.5 Monitoring and evaluation

Figure 29. Proposed monitoring and evaluation methods for Strategy 3: Incorporating Flexibility Into the Upgrading Process (Authors, 2021).

Strategy 3: Incorporating Flexibility Into the Upgrading Process These goals are suggestions. Ultimately, it is community residents who should devise goals.	
Principle	Monitoring and Evaluation
Context-Specificity	<ul style="list-style-type: none"> Flexibility of upgrading in itself is context-specific, but it is especially important in settlements where densification is taking place that this process is monitored and evaluated to ensure all safety measures are taken into consideration. This can be done through perceived safety of residents, collected through surveys, alongside the number of occupational hazards incurred during the process, collected through the same survey. FEDURP should assist illiterate members in survey completion. It is important to avoid applying the same evaluation indicators to each settlement, as progress and outcomes will be differentiated depending on the upgrading method used, along with varying communities needs and wants.
Pluralistic	<ul style="list-style-type: none"> It is important to recognise not everyone in the settlement will have the same reflections on the upgrading process - especially the most marginalised residents- so the entire process must be documented at regular intervals using surveys and data, so that they can be altered throughout the process. To measure the inclusivity and diversity of knowledge incorporated in processes, surveys can be used to measure the extent to which residents feel their knowledge and views are heard, and importantly, respected, in the process. Profiling can be used to ensure diverse demographics are included in the process through monitoring the number of marginalised groups involved, such as elderly, disabled, and women.
Goal-oriented	<ul style="list-style-type: none"> All upgrading processes should be well- documented and should include an iterative process of reflection and redefinition of goals. Time-frame goals and number of housing units upgraded should be agreed upon by the community before the process begins and should be monitored throughout by the 'ticking-off' off of relevant milestones. Goals could include: <ul style="list-style-type: none"> - X number of houses upgraded per year. -X% of residents engaged in the upgrading process. -X:X Ratio of service provision per family. -Paved road access. -Postal addresses and street names. -Increased tenure security.
Interactive	<ul style="list-style-type: none"> Where possible, the upgrading process can employ community members in construction and maintenance roles so that the process in community-led throughout. This can be measured through percentage of residents employed in the process. Surveys can be employed to measures participant's perceived authority to influence stakeholders. This can be done on a quantitative scale from 1 to 10, 1 reflecting little authority, 10 meaning significant authority.

4. Conclusion

This report aims to examine co-produced, in-situ upgrading as a method to reduce risk and injustice in Freetown's informal settlements. Strengthening partnerships and encouraging collaboration amongst stakeholders is the primary objective of Strategy 1. Effective multi-stakeholder relationships are currently lacking in Freetown, therefore this report recommends the promotion of participatory methods in planning and implementation of upgrading projects. The strategy argues for the involvement of communities and other key stakeholders in a space of negotiation and collaboration, where all voices can be heard and respected. It expands on the limitations of the CAAP process, drawing on innovative practices from global initiatives, learning activities and accessible means of communication to ensure inclusivity and equitable representation. To overcome current barriers in financing the urban poor in Freetown, such as lack of access to formal banking, and the limited capacity within, and insularity between, existing savings groups, Strategy 2: augmenting funds, is proposed. This involves the linking of existing savings groups, both to each other, and to other urban actors at city, national and international scales. The resulting financial infrastructure not only improves the access of the very poor to improved financial sources to be used in upgrading projects, but improves the collective capacity of residents to manage, and leverage, funds in a sustainable, effective manner and contribute to city-wide transformation. Incorporating flexibility and adaptability into the upgrading process as recommended by Strategy 3, is essential to cater for the diverse needs and

aspirations of the heterogeneous communities in Freetown. It recommends a spectrum of community-led upgrading options, ensuring that communities have the freedom to choose and adapt the upgrading process for individual/collective needs and differing timeframes. Prioritisation of the most vulnerable and at-risk settlements will be vital in reducing socio-environmental injustice. Future research is needed to explore specifically which international donors, aside from SDI, have the capacity, and are willing to form partnerships with, and fund, Freetown's urban poor and existing stakeholders in upgrading processes.

Co-production arrangements underpin each strategy to deliver holistic and sustainable solutions to Freetown's housing crisis. Monitoring and evaluation of the strategies and their proposed participatory practices, conducted throughout their initial implementation and at agreed upon intervals, will ensure the applicability of the strategies to align with evolving conditions in Freetown. The performance indicators suggested for each strategy present a template, however it is important that such indicators are devised by community residents themselves or relevant stakeholders.

The proposed strategies, underpinned by a framework of co-production, aim to facilitate a participatory approach to upgrading Freetown's informal settlements, and in the process, empower the residents to contribute to the transformation of Freetown into a just, dynamic and resilient city, in line with SDG 11.

Image 12. Freetown at dusk (Van Son, 2012).



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Learning from innovation around the world



- 01** Community Action Area Planning (CAAP)
- 02** Baan Mankong Program (BMP)
- 03** Akiba Mashinani Trust (AMT)
- 04** Flamingo Crescent
- 05** Social Impact Assessment (SIA) Methodology

Appendix 1: Community Action Area Planning (CAAP)

 Freetown, Sierra Leone

Summary

The CAAP process constitutes a participatory method in which various stakeholders are involved in order to help communities plan future interventions. These stakeholders are:

- Representatives from local and national governments
- The Young Men's Christian Association–Sierra Leone (YMCA-SL)
- CODOHSAPA
- FEDURP

It is implemented in two informal settlements in Freetown, Cockle bay and Dwarzack, which indicates that this decision-making tool can be incorporated in different spatial contexts, since the former is located along the coast and the latter on the hillside. In both settlements it was led by Architecture Sans Frontières –UK (ASF-UK) in collaboration with the SLURC.

Through various stages (Figure 14) CAAP process aims to:

- Identify different stakeholders and their power relations and influence in relation to the communities (stakeholder analysis),
- Explore current condition of housing, shared spaces and infrastructure systems and challenges, opportunities and the social and spatial diversity through mapping (diagnosis stage),
- Articulate residents' values and aspirations for improving living conditions and the future of their community and city (dreaming stage),
- Discuss about improvement options in housing and

community services, building partnerships and residents' experience of the city based on the outcomes of the previous stages (developing stage),

- Plan and design ideal improvements in housing and in services in the community and the city, based on the outcomes of the developing stage (defining stage).

The CAAP process ensures the active participation of the local residents, providing better understanding of the challenges that their communities encounter, as well as the necessary skills to tackle them. Through innovative learning practices, it also allows the residents to broaden their knowledge about their locality and its interconnection to the city and citywide activities. In conclusion, CAAP is conceived as a step forward to developing human capabilities and empowering community members through participatory activities, interaction and dialogue with different stakeholders.

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Appendix 2: Baan Mankong Program (BMP)

📍 Thailand

Summary

Type	No. of households	Share
Cooperative ownership (with title)	32,153	34.78%
Long-term lease	40,292	43.58%
Short-term lease (<5 years)	7,594	8.21%
Permission to use land	12,419	13.43%

Table A1. Types of tenure for Baan Mankong projects (to January 2011), (Bhatkal and Lucci, 2015).

The BMP programme was launched in 2003 by the CODI, a Thai Government institution. It addresses slum upgrading at the national level using a community-driven approach; providing secure tenure, access to utilities and improved housing to the slum dwellers. The composition of CODI's board seeks to institutionalise partnerships between various interest groups. It includes representatives from government and community organisations and, more importantly, community representatives selected through a People's Forum, which constitutes of five senior community leaders from each region. BMP receives annual government grants to subsidise investments in communal infrastructure and services, and CODI's revolving mortgage fund which extends housing loans, amounting to 6,515 million baht or \$191 million over an 11-year period (Bhatkal and Lucci, 2015; World Bank Group, 2017). Tenure security and community involvement are placed at the centre of planning. The procedure begins with a survey of all poor communities in the city. Subsequently, different stakeholders – community networks, NGOs, local government, academics and professionals – cooperate in planning and implementing the upgrading project. The programme is characterised by its flexibility since it introduces four types of upgrading:

- On-site improvement: Improvement of the existing environment and services.
- Reblocking: Layouts of the selected area so as infrastructure to be conveniently installed.
- Reconstruction: Existing settlements are demolished and rebuilt.
- Relocation: Communities ideally relocate close to their old location.

Along with various types of upgrading, options for tenure arrangements are available. The land tenure solutions are identified by the communities (Table A1). Tenure arrangements under the programme are made with a collective land title with financial support from community's savings groups by having access to loans. Thus, the BMP enables the communities to tailor upgrading according to their specific needs, aspirations and conditions (Bhatkal and Lucci, 2015; World Bank Group, 2017).

Impact

In a ten year period, the living conditions of 15% of the slum dwellers in Thailand were improved. Until 2015, it has reached over 96,000 households in 1,800 communities. The infrastructure grants and tenure security have helped to establish and have access to drainage systems, communal septic tanks for sanitation, household connections for water supply and electricity. Furthermore, tenure security has helped community members to gain formal employment as a formal address is required by many employers. Hence, it can be said that slum community members are now recognised as legitimate citizens (Bhatkal and Lucci, 2015; World Bank Group, 2017). However, it is worthwhile to mention the challenges that this upgrading housing programme has confronted. The access of the most vulnerable in the communities to the financial loan system is still a struggle; the requirement that a community needs to establish a savings network and prove its saving capacity, fails to recognise the heterogeneous nature of people living in informal settlements (Bhatkal and Lucci, 2015; World Bank Group, 2017). Moreover, the BMP focuses on the upgrading of the existing slum settlements, overlooking the increasing demand for housing by new entrants into urban areas or new low-income people in need of affordable housing. In other words, it does not make any provision for minimising the slum formation by implementing preventive policies (Bhatkal and Lucci, 2015; World Bank Group, 2017).

Sources

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World Bank Group, 2017. Unlocking Ethiopia ' s Urban Land and Housing Markets: Urban Land Supply and Affordable Housing Study Synthesis Report.

Appendix 3: Akiba Mashinani Trust (AMT)

📍 Nairobi, Kenya

Slum Dwellers International
Muungano na Wanavijiji

Summary

Muungano na Wanavijiji, which means “united slum dweller”s in Kiswahili, is a social movement of slum residents and urban poor people in Kenya. One of the key principles is that upgrading is only possible if communities are at the centre of their development. The Muugano Alliance is formed by 3 organisations, each of them focusing on a specific aspect of slum upgrading:

- Social movement: **Muungano wa Wanavijiji**, the Kenyan federation of slum dwellers
- Funding: **Akiba Mashinani Trust**, the Kenyan urban poor fund
- Support NGO: **SDI Kenya**, an NGO providing professional and technical support to the federation

Muungano works directly with communities, and a key part of their work is to function as a “connector”, liaising with authorities with the aim to influence and change policy-making for long-lasting improved living conditions for the urban poor. The funding mechanism of Muungano alliance, called the Akiba Mashinani Trust, was established in 2003 as a housing development and finance agency. Through community led processes, AMT provides access to finance and technical solutions. Collective decision making and action by the urban poor are at the heart of AMT’s approach. AMT collaborates with local savings groups and provides a range of financial services. The three key principles running through AMT’s programmes are:

- Inclusion – by forming strong community bonds and collective goals, also the lowest income groups are included
- Participation and accountability – active participation in planning to ensure services are adapted to local needs
- Community capacities – working with established service delivery mechanisms and processes, ensuring all community members can understand.

Impact

AMT enables urban transformation through supporting communities from informal settlements in saving together. This enables the provision of financial services to low-income people. The system includes also the poorest residents; one can contribute minimal amounts of money and obtain a loan commensurate with their investment. Unlike commercial banks or funds, AMT’s programmes have a broadened impact in upgrading informal settlements through community action and strengthening communities capacities.

Community members participate in the process of managing the savings groups, obtaining financial management skills through the support of AMT. In addition to this, community capacities are developed through non-financial training, such as construction training but also speaking in public. AMT builds capacity among community members to manage saving groups and projects, enabling the groups to function with minimal external support. AMT works with groups rather than with individual households, this enables them to reach as many people with as little effort and costs as possible.

The savings groups supported by AMT bring about transformative change for members, who are 70% female. Through the saving groups, strong community bonds are formed and collective development goals for their settlements are defined. These community initiatives enable the residents to liaise with local authorities and strengthen their position to achieve buy-in from government bodies.

Sources

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Appendix 4: Flamingo Crescent

📍 Cape Town, South Africa

Informal Settlement Network

Community Organisation Research Centre

The City of Cape Town

iKhayalami

Summary

The process of re-blocking Flamingo Crescent began in 2012 as one of 22 pilot projects supported by the City of Cape Town for community-led informal settlement upgrading. The Informal Settlement Network began by educating the community on the importance of upgrading, savings contributions and settlement data collection. A steering committee of 9 were elected to lead the process and engage with other external stakeholders. Exchanges were taken place to the previously upgraded settlements of Mtshini Wam and Kuku Town where community members were able to directly see and learn more about the process and the benefits it provides. Residents had to save 20% of the cost of their structures which was paid to and recorded by the treasurer of the steering committee. The Community Organisation Research Centre contributed the remaining 80% (SASDI Alliance, 2015).

A community-led enumeration was done in 2012 and used to negotiate an improved layout with the city. In 2013 technical experts verified the layout and assisted in designing a creche (WPI, 2015). The re-blocking of Flamingo ensured the upgrading of existing structures with fire-resistant materials, provision of basic services such as water, sanitation and electricity successful negotiated with the city, paved access roads throughout the settlement, road came and postal addresses, and the construction of a creche. Implementation took place from May to December 2014, with community members staying with neighbours when their structure was constructed so that it could take place in-situ.

Impact

The re-blocking of Flamingo Crescent had several positive social and physical impacts. The increase in open space improved safety in the settlement, allowed access to emergency vehicles and gave residents access to water and sanitation services. Official road numbers gave residents postal addresses allowing them to open bank accounts and every community member was registered on a city database, giving them stronger tenure security and allowed a sense of belonging in the city.

This initiative also built social capital by residents gaining skills through data collection, management and construction. This process also helped to form partnerships with government, NGOs and other informal settlements through exchanges, setting a precedent for upgrading on a larger scale.

Sources

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SASDI. (2015) Flamingo Crescent / Heights, Lansdowne (Cape Town). Available at: <https://sasdialliance.org.za/portfolio/flamingo-crescent-heights-lansdowne-cape-town/> (Accessed: 16 March 2021).

Appendix 5: Social Impact Assessment (SIA) Methodology

📍 Durban, South Africa

Summary

In 1996 the waste service providers of Durban expressed the need for and proposed the creation of three new large landfills in the north, south and west periphery of the city, since the existing landfill could not operate for more than 30 years. First SIA of the development of the landfill in South Africa was conducted for the possible location in the north, as part of the necessary Environmental Impact Assessment (EIA). This indicated that social issues were equally important as the biophysical issues; so SIA, which was conducted in 1999, was based on the social justice principles as indicated below:

- Procedural equity: fairness in environmental decision-making,
- Distributional equity: fairness in taking into account spatially located and distributed effects on primary and secondary stakeholders,
- Intergenerational equity: ensuring the non-detrimental effects of future generations.

Its methodology targeted the inclusion of the most marginalised and 'invisible' stakeholders, who were not involved in previous attempts to derive consensus of the landfill site selection. This alternative qualitative methodology consisted of three procedures:

- Mailshot: residents and key stakeholders in the city were invited via mail to respond to the forms and brochures sent in Zulu and English. These forms comprised questionnaires about the concerns, opportunities and evaluation options relating to the proposed landfill.
- Individual interviews: key secondary stakeholders were identified and interviewed. In addition, 10% sample of the households living in the area of the proposed landfill site were also interviewed as primary marginalised stakeholders. Target group was especially marginalised groups i.e. women living in the peripheral area.

- Stakeholder workshops: seven workshops were held during this procedure. Six individual workshops for the various stakeholders (Regulators, developers, community, environmental organisations, landowners, landfill users) and one multi-stakeholder workshop were held. Both types of workshops aimed at sharing the concerns and views of all the stakeholders and arising the emerging social issues, so as to conclude to common interests.
- As a final step SIA report was created as a summary of all the stages above.

Impacts

This methodology forms a practice based on social justice and promotes participatory decision-making. The rate of response from mailshot process was very low (2.6%), due to hindrances in reaching peri-urban communities by mail i.e., the lack of updating the existing database of primary stakeholders from the previous site evaluation assessments, and also the lack of postal addresses of some community members. The rate of the attendance of workshops though was 60-75%, indicating the engagement and interest of people in the site selection process. The SIA method as conducted for the periphery of the Durban provides a foundation for planning and implementation of future projects by equally represent the inputs of all affected and affecting parties.

Sources

Scott D., Oelofse C. (2005) Social and Environmental Justice in South African Cities: Including 'Invisible Stakeholders' in Environmental Assessment Procedures, *Journal of Environmental Planning and Management*, 48: 3, 445-467.

Appendix 6: Yonmenkaigi System Method (YSM)

Summary

The Yonmenkaigi System Method (YSM) is a tool employed to facilitate group decision making. As a collaboration-oriented approach, it champions intrinsic processes of mutual learning, decision making and capacity building (Okada, Fang and Teratani, 2013) It promotes disaster mitigation and prevention planning rather than post-disaster and relief management.

It can be broken down into four central components

- Carrying out a SWOT analysis, which involves identification of the strengths and weaknesses of a local community as well as the opportunities of and threats to the community through a pilot survey conducted by various methods i.e. town watching. Participants then determine the theme/goal, considering the conditions of the community through shared recognition of risks and issues which were identified in the SWOT analysis.
- Completing the Yonmenkaigi Chart within a year period, determining three timeframes (three-months, six-months and a year period).
- Debating between two groups, which can provide constructive inputs about a critical view of the others' group work.
- Presenting an action plan chart which visualises the work and the vision of the residents' plan for their neighbourhood.

Impact

The YSM has been employed in various international contexts, most widely in the capacity as a model to structure disaster risk, reduction and restoration plans at the local community level (Na, Okada and Fang, 2009). It has been applied in the City of Kyoto, Japan, where a local community organisation Shuhachi-bosaikai facilitated the workshops and conducted a disaster reduction plan through mapping hazardous areas in the Shuhachi community. Through the YSM, the need for collaborative actions was addressed by the Shuhachi-bosaikai, resulting in the opening-up of his meetings to other organisations and conducted the town watching through collaborative actions. Thus coordination between the Shuhachi-bosaikai, the local fire station, the Elementary School, and the has been achieved. This method has also been carried out in both rural and urban areas in Japan as well as in Korea, China, Indonesia and India.

Sources

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Urban infrastructure and services

Promoting safe and sustainable
energy through diversification
and decentralisation



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Abbreviations

CODOHSAPA	The Centre of Dialogue on Human Settlement and Poverty Alleviation
DPU	Development Planning Unit
EDSA	Energy Distribution and Supply Authority
EWRC	Electricity & Water Regulation Commission
FCC	Freetown City Council
FEDURP	Federation of the Urban and Rural Poor
LPG	Liquid petroleum gas
MCC	Millennium Challenge Corporation
MHT	Mahila Housing Trust
NGO	Non-governmental organisation
PAYG	Pay as you go solar
SHS	Solar Home System
SLURC	Sierra Leone Urban Research Centre
UCL	University College London

1. Executive summary

This report proposes an inclusive, non-deterministic strategy to promote safe and equitable energy access in Freetown, Sierra Leone, through diversification and decentralisation of existing on- and off-grid energy options.

Leveraging an energy justice framework, key energy-related risks of fires and cooking-related indoor air pollution are considered. Two foundational principles of context-specificity and diversification are proposed to reduce energy-related risk in Freetown, recognising diversity within and between informal settlements.

Concluding the four-year Learning Alliance between the Bartlett Development Planning Unit and the Sierra Leone Urban Research Centre, three essential pillars are proposed for risk-reduction solutions in Freetown:

- Capacity-building
- Increased accessibility of safe, affordable, and reliable alternatives
- Partnerships for just energy transitions

Capacity-building is vital to ensure that stakeholders, from the community to local government, are equipped with the knowledge, skills, and social structures needed to make informed energy choices, and collaborate on an equal footing for energy development. This strategy proposes training modules tailored to the needs of each informal settlement and delivered by partnerships between local NGOs, private sector energy companies and local government departments.

Interventions to improve the financial and physical accessibility of safe energy alternatives are proposed for actors within communities, private sector energy companies, local NGOs, government, and international funding bodies. Appropriate solutions depend on the specific informal settlement context, and emphasis is placed on overcoming socio-political barriers to safe energy options for the urban poor.

Finally, partnerships between stakeholders are identified as essential to supporting a long-term, just energy transition within Freetown's informal settlements. The strategy proposes revitalising and strengthening existing partnerships to deliver political commitment, financial viability, local capacity for installation and maintenance, security and inclusive research to support pro-poor policy-making.

2. Diagnosis and research design

In Freetown, capital of Sierra Leone, energy-related risks including fires and indoor air pollution, disproportionately affect the health, safety and livelihoods of the urban poor. This report considers the diversity within and between informal settlements, proposing an inclusive, non-deterministic strategy for safer energy access through decentralisation and diversification, including both on- and off-grid solutions.

2.1 Background and preliminary diagnosis

Rapid urbanisation following the 1991-2002 civil war outstripped Freetown’s municipal capacity to deliver essential services. Events including the Ebola outbreak (2014) diverted limited development funds away from aging, under-maintained and insufficient energy infrastructure (DPU MSc ESD/SLURC, 2018; 2019). Estimates vary, however sources suggest that, although 74.2% of households access grid electricity in Freetown, inadequate and unreliable service provision perpetuate chronic energy poverty. Only 38.5% of households use grid electricity as the primary source for lighting (Figure 1) and only 3.7% of households consistently use clean fuels for cooking (Statistics Sierra Leone, 2018). Consequently, most households engage in multiple energy practices to meet their everyday needs (DPU MSc ESD/SLURC, 2019).

Primary source of energy for lighting 2017 (% households)

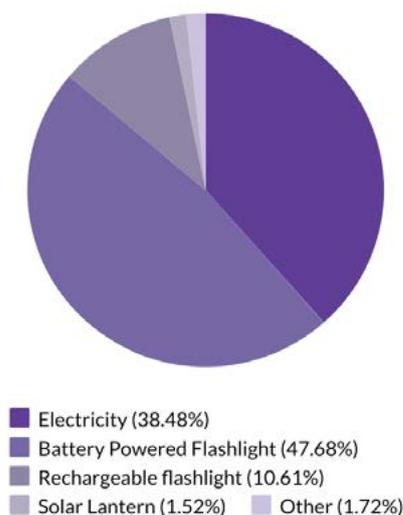


Figure 1. Energy sources for lighting (Authors’ own, data: Statistics Sierra Leone, 2018)

Energy poverty is unevenly distributed within the city. Formal energy services are poorest in informal settlements, occupied by marginalised communities of the urban poor. In informal settlements, grid access can be as low as 16% of households. Even within informal settlements, intersecting social characteristics, such as gender, age and wealth, influence experiences of energy, and therefore the injustices suffered (DPU MSc ESD/SLURC, 2020).

The absence of safe and reliable energy services, especially in unrecognised informal settlements, forces residents to seek alternative, riskier sources.

93% of informal settlement dwellers rely on charcoal and firewood for cooking, causing indoor air pollution, heightened fire risk, and releasing short-lived climate pollutants (DPU MSc ESD/SLURC, 2018; IPCC, 2018). Uptake of alternative, cleaner, cooking fuels including LPG and biomass briquettes is currently limited.

Formal, safe grid connections are difficult, time-consuming and expensive to secure through the Electricity Distribution and Supply Authority (EDSA), so meter owners often informally sell electricity to their neighbours. This improves electricity access, but creates power dynamics between meter owners and electricity users, limiting the latter’s service security. Clandestine connections to the national grid are common, overloading connections and creating fire risk, which is exacerbated by poor cabling and exposed wiring. Fires in informal settlements often go undocumented with the result that the official record of 550 fires between 2011-2015 (Figure 2) is likely an underestimate, and information on the energy-related risks faced by the urban poor is incomplete. Fires and other disasters are barriers to gaining official recognition, however the national grid is not extended into unrecognised settlements, preventing residents from accessing safe electricity. Furthermore, tenure insecurity in unrecognised informal settlements disincentivises residents’ investments in costly, safer energy technologies. The result is a vicious cycle of risk accumulation (DPU MSc ESD/SLURC, 2018; 2020).

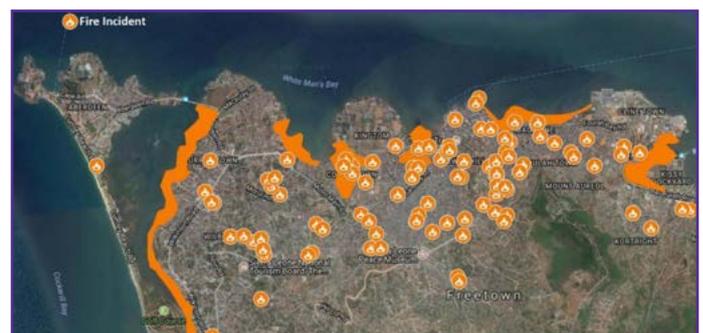


Figure 2. Fire Incidents in Freetown between 2011-2015 (DPU MSc ESD/SLURC, 2018)

Energy-related risks have far-reaching consequences for lives and livelihoods (Figure 3). Indoor air pollution causes respiratory diseases and stunting, disproportionately impacting women and children (WHO, 2018). Unlit domestic and public spaces are associated with gender-based violence, which limits women’s productivity and prevents children from studying after dark (Fraser, Viswanath, and Maclean, 2017; UNICEF, 2018). In Freetown’s informal settlements, dwellings are often homes and workplaces, leaving assets vulnerable to energy-related fires. On 24th March 2021, one such fire devastated Susan’s Bay, leaving 1,000 people homeless (Macarthy and Kamara, 2021).

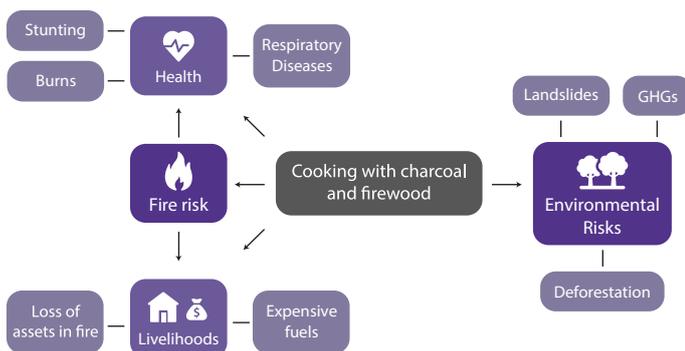


Figure 3. Impacts of cooking with charcoal and firewood

Ambitious international and state energy commitments indicate a favourable policy environment for risk-reduction interventions (Figure 4). Capacity constraints currently limit progress towards the national priorities of rural electrification and urban clean cooking (Energy4Impact Representative, 2021). Within Freetown, the Mayor’s 2019 Transform Freetown initiative has created momentum for inclusive pro-poor development, although energy issues are presently not explicitly tackled (FCC, 2018).

This report primarily focuses on three diverse informal settlements (Figure 5). Susan’s Bay and Cackle Bay are dense coastal settlements, unrecognised by the Municipality and lacking services, including grid electricity. By contrast, Dwarzack is a hillside settlement which has gained official recognition as a residential area, although service provision is still insufficient (SLURC Researcher, 2021).

Policy	Implications for Energy in Freetown
Freetown Policy Environment	Transform Freetown 2019-2022: While it does not specifically discuss Energy, the Freetown city council’s plan encourages resilience building (Freetown City Council, 2019)
Sierra Leone Policy Environment	Power for All 2025- Focuses on advocacy and market transformation to achieve universal energy access by 2025 (Power for All, 2016)
International Policy Environment	Enact 2020: Enact is an initiative which aims to expand the household solar market in Africa (Donn, 2016) UN Sustainable Development Goals (SDG’s): SDG 7 aims to provide “access to affordable, reliable, sustainable and modern energy for all” (UN, 2021)

Figure 4. National and international policy environment

Characteristic	Susan’s Bay	Cockle Bay	Dwarzack
Geographic features	3.49ha coastal settlement located in North Freetown.	18.2ha coastal settlement located in the low-lying area of Aberdeen Creek.	126ha hillside settlement located close to the city centre.
Approx. population	5,500 residents	20,000 residents	16,500 residents
Main activities	Charcoal production, wood selling, and informal market trading.	Sand mining, fishing, and cockle picking.	90% of land used for residential purposes 10% used for other purposes: e.g. road construction, agriculture and recreation.
Recent recorded fire events	Fire in March 2021 injured many, and destroyed livelihoods, properties and assets. 1,000 people displaced.	Large fire in April 2018, affected 97 people through loss of property, possessions and livelihoods.	12 recorded fire outbreaks between 2010-2016 mainly from domestic fuel use and faulty electrical equipment.

Figure 5. Informal Settlements Overview (based on: CAAP, 2018)

2.2 Analytical framework and research questions

Risk is conceptualised as the product of hazards, exposure and vulnerability, as illustrated in Figure 6 (Cardona et al., 2012). Intersecting socio-political factors including gender, wealth, age and disability, determine levels of exposure and vulnerability to hazards. This strategy, therefore, engages with the complex and unjust political landscape of marginalisation that produces risk (Adelekan et al., 2015).



Figure 6. Conceptualising energy-related fire risk in informal settlements, (based on Cardona et al., 2012)

Energy-related risks vary in frequency and severity from every-day ‘extensive’ hazards to rarer ‘intensive’ disasters (Bull-Kamanga et al., 2003). The cumulative impact of daily exposure to cooking-related indoor air pollution is severe, particularly for women and children. In addition, fires often break out due to cookstove accidents, or overloaded, poor quality electrical connections. Extreme fire events can destroy whole settlements, however the long-term implications for communities of recurring smaller fires, often overlooked by the authorities, should not be underestimated (Pelling and Wisner, 2012). This understanding of risk as complex and multi-faceted underpins this strategy’s emphasis on context specificity and inclusivity.

Evolving from environmental justice debates, energy justice is theorised via the multidimensional framework

of distributional, recognition and procedural justice (Bickerstaf, 2017; Holfield, Chakraborty and Walker, 2017). This strategy aiming for energy justice should cover the following; illustrated in Figure 7.



Figure 7. Strategy requirements

Far from being an abstract notion, energy injustices are (re) produced through time and space via embedded structural inequalities and manifest in everyday realities and risks (Hall, Hards and Bulkeley, 2013). Without this critical, socio-political framing of energy justice, it is easy to fall into “traps of technological determinism” which assume technology alone can achieve energy justice (Ockwell et al., 2018:122).

While renewable energy technology may underpin just energy transitions, it does not guarantee it, and some renewable energy initiatives actually constitute novel forms of exploitation (Howe and Boyer, 2016). Community-level interventions are often suggested to support more inclusive processes and just outcomes, however, synergies between energy justice, renewable energy and the ‘community’ should not be assumed (Bulkeley and Fuller, 2012). Communities are not homogenous in experiences and interests, therefore sensitivity to internal power relations is needed (Ibid, 2012).

2.3 Methodology

This research contributes to the conclusion of the four-year Learning Alliance between the Development Planning Unit (DPU) and the Sierra Leone Urban Research Centre (SLURC). It consists of three phases (Figures 8 and 9).



Figure 8. Three-fold methodology

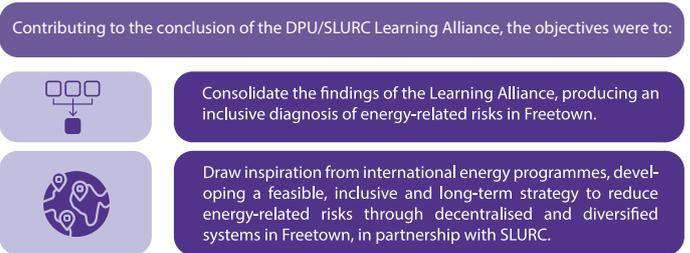


Figure 9. Research Objectives

2.4 Limitations

Research methods were defined by the COVID-19 pandemic. Remote-working offered an unprecedented opportunity to connect with, and learn from, interviewees located globally. However, as shown in Figure 10, the requirement for interviewees to access remote conferencing tools was a constraint on the project; sensitivity to absent voices is key. Although transcripts of past interviews with community members were available, engagement with the residents of Freetown’s informal settlements was challenging. Internet connectivity issues impacted interviews, especially with stakeholders in Freetown.



Figure 10. Remote data collection limitations

2.5 Research questions



3. Strategy

3.1 Foundational principles for risk-reduction

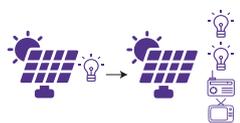
In Freetown, insufficient access to safe, reliable energy services necessitates reliance on risky alternatives. To reduce the incidence of fire hazards and indoor air pollution, increased accessibility of safe energy options, and decreased reliance on risk-generating practices are needed. Energy access and related problems are not merely technical issues; socio-cultural and political factors determine the extent to which marginalised groups benefit or suffer from different approaches to electrification (Ockwell et al., 2018).

- Reducing fire risk from overloaded grid connections by:
- Increasing access to formal electricity connections.
- Reducing clandestine connections.
- Increasing access to and uptake of safe, renewable decentralised energy such as home solar technology.
- Reducing cooking-related indoor air pollution and fire risk through:
- Increasing access to and uptake of clean cooking fuels such as LPG and biomass briquettes.

Figure 11 (above). Reducing energy risk
Figure 12 (below). Practical options for risk-reduction

Electricity

Solar Home Systems (SHS)



SHSs vary from single panels powering lights and phone charging to larger systems that can power more appliances including fans, TVs, and radios. Batteries and monitoring systems ensure lighting at night, regardless of daytime weather. Packages offered on a Pay As You Go (PAYG) basis.

Reduces risk by reducing need for clandestine connections.

- PAYG installments prohibitively expensive for the poorest residents.
- Limited awareness and uptake in urban areas.
- Most efficient with mobile payments - rare in Sierra Leone.

Formal Grid Connections



Grid connection managed by EDSA. Formal meter owners often sell electricity to neighbours.

- Cost and bureaucratic barrier to gaining new connections.
- Meter shortages.
- Power dynamics in shared connections situations

Cooking

Afrigas (LPG)



LPG, a smokeless fuel, supplied through Afrigas company. At the household level, 6kg canisters feature reusable stovetops for cooking over gas. After paying a deposit for the canister, the ongoing cost is for gas refills.

Smokeless fuel reduces indoor air pollution risk.

- Upfront cost of canister is prohibitive.
- Lack of accountability for canisters - many are sold across the border

Briquettes



Briquettes formed of coconut husks and other biomass waste. Sold in markets similarly to charcoal. 40% cheaper than charcoal.

Smokeless fuel reduces indoor air pollution risk.

- Limited awareness and uptake.

This report advocates for energy interventions to be guided by principles of context-specificity and diversification.

Considering the socio-cultural and political context, this report proposes a non-deterministic, inclusive approach (Figure 11). Risk-reduction can be achieved with several technologies already available in Freetown (Figure 12).

Energy situations differ between informal settlements. With the national grid predominately expanded into residential settlements, access is higher in Dwarzack compared to the unrecognised coastal informal settlements of Susan's and Cockle Bay (SLURC Researcher, 2021). Furthermore, greater urban density in the coastal settlements exacerbates fire risks, as fires spread rapidly. The uptake of clean cooking fuels also differs between and within informal settlements. Local energy-risk profiles differ, making context-specificity a fundamental principle when addressing them.

The second foundational principle, diversification, differs between electricity and cooking fuels access. People already rely on varying safe and unsafe practices to meet daily electricity needs, including formal and informal grid connections, kerosene lamps, and solar technology. By contrast, limited access to safe alternatives means that cooking needs are predominately met by charcoal burning, leading to indoor air pollution and fire risk (DPU MSc ESD/SLURC 2017; 2018). To achieve energy risk-reduction, it is necessary to diversify the number of accessible, safe energy options, minimising reliance on unsafe, risk-generating practices. Diversification offers flexibility, and builds on existing mixed-energy use practices (Figure 13).

KEY

- Information
- Limitations

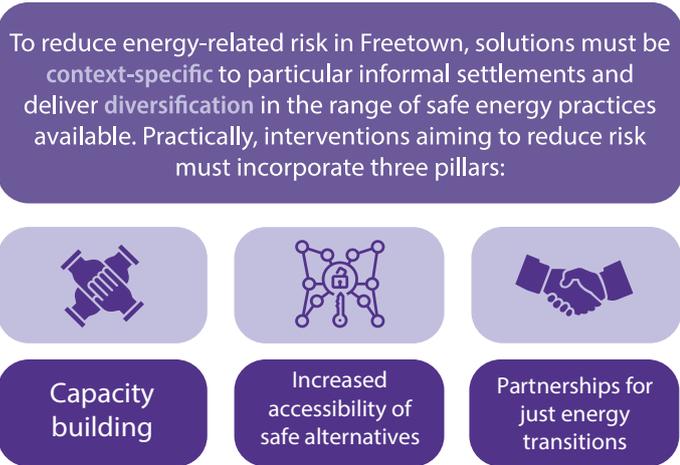


Figure 13. Pillars of risk-reduction

Suggestions for the delivery of these pillars in Freetown are presented based on experiences within and beyond Freetown. Further information on the initiatives that inspired this strategy are detailed in the appendix. Eschewing a deterministic pathway, these options serve as building blocks which can be combined in a locally appropriate manner, formulating context-specific interventions for risk-reduction. These decisions should lie with collaborative partnerships between communities and local government, rather than ‘expert’ urban planners (Lang et al., 2012). Participatory and inclusive planning is essential to delivering risk-reduction solutions that recognise diverse realities and respond to all needs, thus working towards the distributional, recognition and procedural components of energy justice. The strategy structure is illustrated in Figure 14.

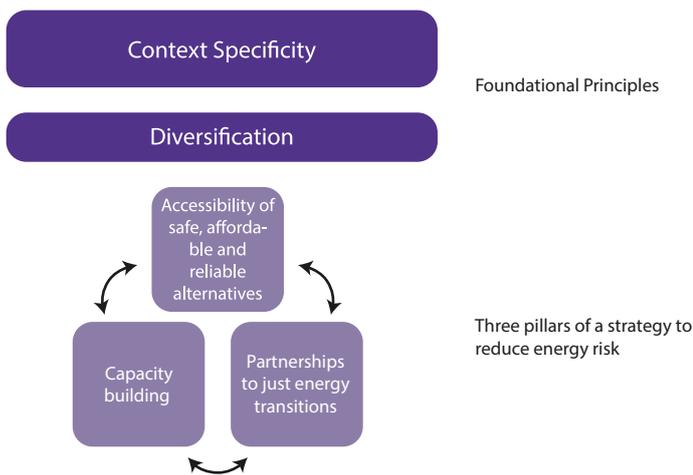


Figure 14. Strategy structure

Pillar 1: Capacity-building

Energy technologies only deliver risk-reduction when all stakeholders understand risks and solutions, and are equipped with the skills to navigate institutional barriers (Ockwell et al., 2018). Essential capacity-building is defined as facilitating the development of the knowledge, skills and

social structures needed for people and communities to make informed energy choices and collaborate on an equal footing with the state and other partners.

In Ahmedabad, India, the Mahila Housing Trust (MHT) has pioneered an innovative capacity-building approach. By involving women, who receive training modules around data collection, community cohesion and navigating the bureaucratic processes necessary for electricity delivery, MHT empowers communities to leverage state resources for informal settlement development (MHT Representative 1, 2021). MHT facilitates meetings between local government and informal settlement residents to build respectful, collaborative partnerships. Although it can take 3-5 years for residents to be independent of MHT, this approach yields long-term benefits. Positioning communities as the directors of their own development, MHT facilitates responses to specific needs and opportunities. For example, they negotiated ten-year ‘no objection’ documentation, providing sufficient tenure security for formal electricity suppliers to extend services into informal settlements (Ibid, 2021). MHT’s gender-sensitive approach facilitated registration of electricity connections in women’s names. This administrative recognition provides proof of residence for later tenure claims and allows previously undocumented women to register for passports and financial services (Ibid, 2021). Similarly, SHS providers highlight that formalised energy arrangements, such as regular SHS repayments, can provide the financial credit history necessary for larger loans (BBOX Representative, 2021).

Based on these findings, capacity-building must underpin risk-reduction interventions in Freetown. Limited awareness around cooking fuels and indoor air pollution, difficulty navigating bureaucratic processes, and inefficient electricity usage, have been identified as key barriers to risk-reduction in Freetown (Rugsal Trading Representative, 2021; Afrigas Representative, 2021; DPU MSc ESD/SLURC, 2020). Uptake of safe alternatives is hindered by limited knowledge of the multiple health, economic and environmental benefits of clean cooking fuels and home solar technologies. MHT-inspired training and capacity-building in these areas is likely to be effective in Freetown due past initiatives’ successes. The Energy4Impact programme in Susan’s Bay combined clean cooking technologies with a risk-reduction education programme (Energy4Impact Representative, 2021), and the Centre of Dialogue on Human Settlement and Poverty Alleviation (CODOHSAPA), a partner of the Federation of the Urban Poor (FEDURP), mobilise community savings to build local capacity (CODOHSAPA Representative, 2021). CODOHSAPA coordinated youth livelihood training, increasing earnings from \$0-16 to \$24-60/month (Y Care International, 2013). CODOHSAPA’s reputation may incentivise attendance, making them an appropriate coordinator of further training. CODOHSAPA have established a strong working relationship with Freetown City Council (FCC), contributing to the Transform Freetown initiative and planned informal settlement upgrading, and are, therefore, the ideal facilitator of partnerships between communities and the local government.

Potential training module	Justification	Possible training facilitators in addition to CODOHSAPA
Participatory data collection methodology	Inclusive energy baselining, providing disaggregated data, to: <ul style="list-style-type: none"> • Raise local government awareness of lived realities • Provide essential information on customer needs and capacities to key energy-solution companies 	SLURC, due to experience in participatory enumeration
Energy-risks and solutions awareness programme covering: <ul style="list-style-type: none"> • Indoor air pollution • Fire risks 	Lack of awareness of energy-related risks identified as barriers to uptake of clean cooking fuels (Rugsal Trading representative, 2021) and recent shift in municipal attitudes is further criminalising those with unregistered connections to the national grid (Ministry of Energy, 2021). Training should: <ul style="list-style-type: none"> • Build solidarity for collective risk reduction • Present and demonstrate safer energy alternatives • Emphasise health, economic and livelihood benefits of clean cooking fuels and home solar technology 	EDSA or other Ministry of Energy due regulatory knowledge Energy companies (e.g. Rugsal Trading) to present alternatives
Accessing formal electricity connections	Training to navigate bureaucratic meter registration processes and lay foundations for collective meter applications (see 'Accessibility'). Registering connections in women's names should be encouraged to secure benefits of administrative recognition, such as supporting tenure claims and credit history checks.	EDSA due to regulatory and technical knowledge
Promote energy efficiency behaviours	Those accessing electricity via clandestine connections pay fixed charges and thus, are disinclined to practice energy efficiency. After transitioning to formal connections that charge according to usage, inefficient practices result in expensive bills (SLURC researcher, 2021). Formalising energy access needs to be associated with changes in energy practices or people may want to return to risky, clandestine connections (MHT representative, 2021).	SLURC due to role in participatory data collection on energy practices
Financial decision-making	Short-term thinking may constrain uptake of clean energy options which are more affordable in the long term. Furthermore, the benefits of acquiring a positive credit history through meeting a home solar kit payment plan should be emphasised. Training is required to increase receptiveness to novel payment styles (Azuri representative, 2021; BBOX representative, 2021; Rugsal Trading Representative, 2021).	Energy companies due to their understanding of their own payment plans

Figure 15. Potential training modules for capacity-building, including justification and suggested facilitators

Stakeholder collaboration to design and deliver training modules would utilise organisations' expertise, and develop relationships between communities and local institutions. Figure 15 justifies possible training modules addressing barriers to energy risk-reduction, as identified by interviewees, and potential partnering facilitators. Context specificity is key; the content and combination of modules needed in specific informal settlements should be decided between CODOHSAPA and the community. For example, in Susan's Bay, modules should build on Energy4Impact's air pollution training.

MHT trains purpose-created, women-only groups. In Freetown, this could help empower women, challenging traditional energy decision-making roles. However, in Kenya, solar uptake was greater when marketing was targeted at both women and men (BBOX representative, 2021). As CODOHSAPA have delivered training modules to established mixed-gender community savings groups, this may be an efficient approach to deliver risk-reduction, although there is a tendency for women's voices to be lost in mixed-gender groups (MHT Representative 2, 2021). Whether existing groups or purpose-created groups would better support training depends on the particular settlement. For example in Mafengbeh, Cockle Bay, a community savings group manages a collective grid connection, thus a strategic target for training (DPU MSc ESD/SLURC, 2018). Peer-to-peer, collaborative and practical learning best support capacity-building, so community module delivery should be well-spaced, allowing participants to practice skills gained (MHT Representative 1, 2021). Capacity-building training requires long-term funding, perhaps challenging for CODOHSAPA, who typically rely on grants

and donations. However, the development of reusable teaching materials and methods could be funded by a donation, reducing CODOHSAPA's running costs. Capacity building is also important for local government (Figure 16).

Peer-to-peer learning also facilitates capacity-building and strategic partnerships at the municipal level. Momentum and political buy-in can be generated by (Ibid, 2021):

- Visits of municipal leaders to informal settlements.
- Learning exchanges between Freetown municipal leaders and municipalities such as Ahmedabad, India, where capacity-building has facilitated a collaborative partnership between informal settlement residents and the state.

Figure 16. Peer-to-peer learning for the local government

Pillar 2: Accessibility of safe, affordable and reliable alternatives

Limited access to safe, reliable energy sources inhibits risk reduction in Freetown's informal settlements. Energy accessibility is defined as the financial ability to benefit from, and the ready availability of, reliable and affordable energy sources. Financial and physical accessibility are particularly emphasised.

For the poorest households in Freetown, SHSs are prohibitively expensive. Pay As You Go (PAYG) models distribute payments in smaller installments, increasing affordability. Currently, however, installments are too high for 60% of informal settlement households (Easy Solar Representative, 2020). The expense of importing materials, and fluctuating

Level of Intervention	Access Improvement Measures
Community	<ul style="list-style-type: none"> Community saving groups to reduce upfront cost and allow longer repayment time of SHS and clean cooking solutions Community saving groups to buy LPG cylinders or bulk buy of briquettes Collective grid connection applications On Ground regulator for energy in neighbourhood
Private Sector	<ul style="list-style-type: none"> Make SHS pay as you go (PAYG) payment plan alternatives more affordable, through longer repayment periods Engage with disaggregated energy baseline to better understand informal settlement residents' needs and capabilities Awareness campaigns (e.g. Product demonstrations at local markets) Scalable solar packages, allowing customers to start on the smallest package and upgrade to more panels and devices as finances allow
NGOs e.g. CODOHSAPA/ FEDURP	<ul style="list-style-type: none"> Facilitator for different stakeholders Capacity building Leverage their own funding to support accessibility of solar & clean cooking fuel
Government	<ul style="list-style-type: none"> Quality standards for electrical products and monitoring Mini grid licensing in the urban context Subsidies or tax exemptions for clean energy Tenure security to facilitate formal grid expansion and housing upgrading through SHS and clean stoves) Enabling environment for mobile payment solutions
International Funding	<ul style="list-style-type: none"> Financial support for private companies <ul style="list-style-type: none"> Grants & private impact investment to expand scale of operations, delivering economy of scales and reducing consumer prices Long term partnerships with large companies pursuing their ESG values Financial support for community action <ul style="list-style-type: none"> Partnership to fund training modules Partnerships to fund community savings groups Kick start revolving funds for community groups

Figure 17. Multi-stakeholder accessibility improvement measures actions

exchange rates inhibit clean energy companies from offering more accessible prices (Afrigas Representative, 2021). Furthermore, Afrigas' business model is experiencing limited success as, despite cost-reduction attempts, the initial cost of the canister is prohibitively expensive (Ibid, 2021).

Physical accessibility is also financially constrained; Rugsal Trading struggles to meet demand, lacking resources to industrialise their production lines (Rugsal Trading Representative, 2021). SHS targeting predominantly focuses in rural areas, meaning awareness in the inner-city is limited, constraining uptake and accessibility.

Improving accessibility in Freetown

This strategy advocates for action at community, private sector, NGO, government and international levels to improve accessibility (Figure 17). Specific combinations of interventions should be tailored to the community, and settlement level.

Community

Community savings groups could overcome affordability constraints (CODOHSAPA Representative, 2021). Many residents pay into community savings pots, often managed by FEDURP, from which they can draw loans (SLURC Researcher, 2021). Individuals decide the size and frequency of contributions. As saving groups vary in age, size and purpose, their capacity to support energy accessibility also varies. Savings group participation could reduce upfront costs and enable smaller repayments over a longer period, with interest calculated to recharge the savings pot. Saving groups could purchase gas cylinders, reducing upfront costs for residents and allowing registration of canisters to households. This would reduce the informal export of canisters that threatens Afrigas' business model (Afrigas Representative, 2021). FEDURP, as coordinator, could support these models. Although smokeless biomass briquettes are currently 40% cheaper than charcoal and burn four times longer, uptake must be increased by awareness-raising (see Pillar 1) (Rugsal Trading Representative, 2021).

Community action could also help secure formal electricity grid connections, reducing reliance on risky clandestine connections. Collective grid connections managed by sav-

ings groups, currently present in Mafengbeh, Cackle Bay, reduce the number of bureaucratic applications needed (SLURC Representative, 2021). Furthermore, neighbouring households could submit applications together, achieving administrative efficiencies and making grid expansions into their area more attractive to EDSA. The idea could be shared between community groups through the proposed capacity and peer-to-peer learning of this strategy.

Private sector

Private sector energy companies are key in increasing clean, safe energy accessibility. BBOXX and Azuri, SHS providers in other countries, allow households to start with a small solar system powering lights and mobile phone charging, and upgrade to a larger SHS with radio and TV later (BBOXX Representative, 2021, Azuri Representative, 2021). SHSs deliver long-term savings, allowing customers to upgrade packages (Ibid, 2021). Freetown’s Solar companies, such as Easy Solar, could offer these solutions to allow small up-front costs and installment payments. The current reliance on cash in Freetown makes offering extremely accessible payment plans challenging as middlemen add an additional surcharge, and repayments are vulnerable to theft. Limited mobile payment use is a current barrier to accessibility.

Uptake is increased by engaging marketing strategies, such as demonstrations and sample products at local market stalls (Rugsal Trading Representative, 2021). Door-to-door marketing works best when visits are timed to engage all adults in the household (BBOXX Representative, 2021).

NGOs

Awareness-raising and training around new, safe energy alternatives are essential in ensuring their uptake (MHT Representative 1, 2021). The role of FEDURP and CODOHSAPA in developing community capacity and education on safe energy is discussed in Pillar 1, ‘Capacity-building’. NGOs could also collaborate with private sector energy companies to tailor products to informal settlement residents’ needs (Energy4Impact Representative, 2021). SLURC’s experience in participatory data collection would be invaluable in providing the currently-lacking disaggregated data to support evidence-based market strategies (Afrigas Representative, 2021). Moreover, the related engagement with the community, especially with local chiefs, will aid acceptance and uptake of clean energy products.

Government

Although the Sierra Leone national government could increase affordability of clean energy by offering greater incentives to companies, financial constraints may make further tax breaks or subsidies challenging (Afrigas Representative, 2021). Government can, however, support an enabling policy environment.

FCC could influence other governmental departments to align with the inclusive and proactive attitude of the Mayor’s office, for example, by advocating for the multiple benefits of grid expansion. Fire-risk is limited through a reduction in clandestine connections, while increasing customer numbers yields additional income, and progress is made towards the ambitious target of universal electricity access by 2030 detailed in the “Electricity Sector Reform Roadmap (2017-2030)” (Ministry of Energy, 2017). This offers an attractive alternative to the recent Ministry of Energy crack-down on clandestine connections which does not address a lack of energy access as the cause of the issue (Ibid, 2021).

Furthermore, Afrigas and Millennium Challenge Corporation Representatives (2021) highlighted the need for the development and monitoring of technical standards for electricity products in Sierra Leone. By guaranteeing product quality, trust and uptake of these products rise, and international investment opportunities become more attractive (Figure 18).

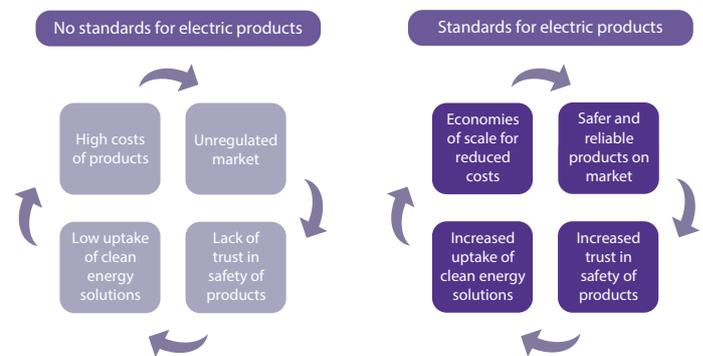


Figure 18. Implications of standardisation of electrical products

International funding

International funding (e.g., through grants, private impact investment or charitable donations) could accelerate safe energy access. Donations could support community savings groups to kick start revolving microfinance arrangements and allow greater access to SHSs. These arrangements could be coordinated by CODOHSAPA, who have already received donations from charities including Comic Relief (Kellogg, 2020). Additionally, investments in private energy companies could increase the affordability of their products. For smaller companies, such as Rugsal Trading, a one-off grant or impact investment would allow industrialisation of supply chains, increasing briquette output, and economies of scale (Rugsal Trading Representative, 2021). Commonly-occurring partnerships between multinational corporations pursuing ESG values, and SHS providers could be harnessed by Freetown’s local distributors (Azuri Representative, 2021; BBOXX Representative, 2021).

The building blocks within the first two strategy pillars could combine to deliver risk-reduction in many ways (Figure 19).

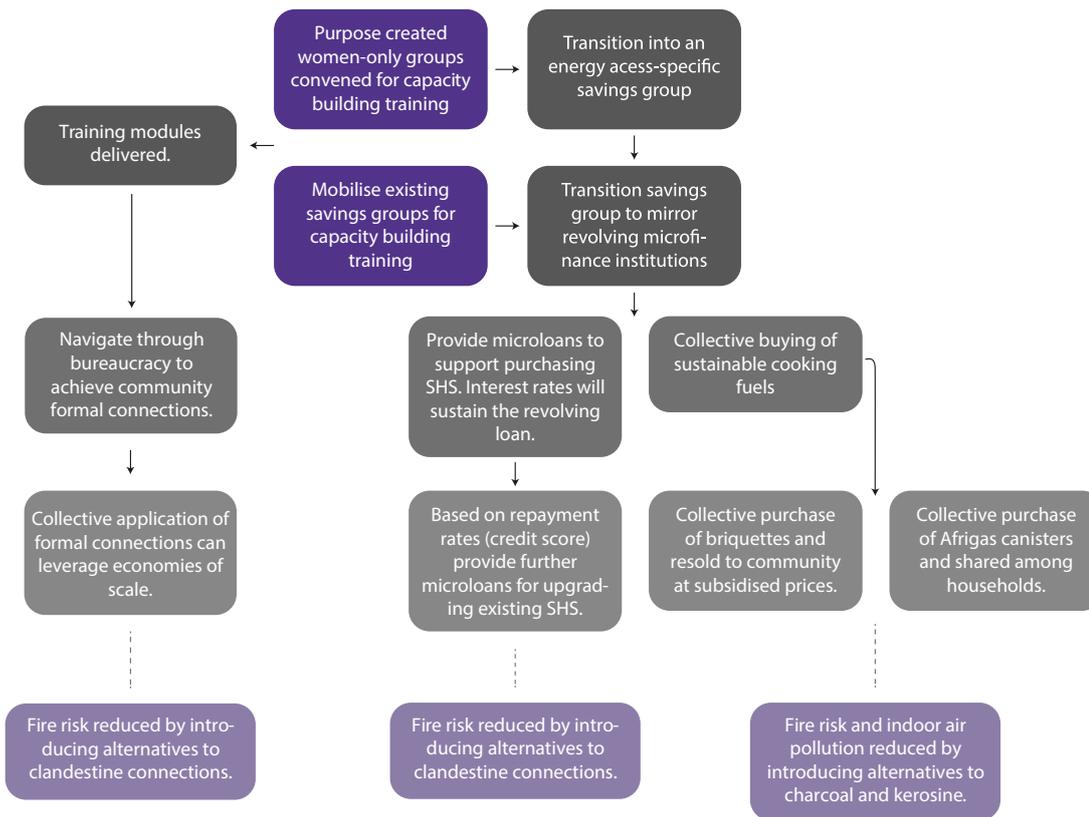


Figure 19. Risk-reduction through capacity-building and accessibility

Factors for a just energy transition	Partnership learnings from remote data collection
Political commitment	Community - Mahila Housing Trust - Ahmedabad Municipal Government (India) MHT facilitates the relationship between informal settlement residents and municipal authorities. E.g. negotiated 10-year 'no objection' documentation for informal settlements. FEDURP - CODOHSAPA - Mayor's Office / Freetown City Council (Sierra Leone) Federation and partner NGO have strong working relationships with the Mayor's Office and FCC.
Financial viability and stability	Optim Energy - volunteers and donors (Sierra Leone) Clean energy social enterprise start-up, relying on volunteers for maintenance and external private donors. SOLShare - Grameen Shakti Bank (Bangladesh) Innovative mini-grid company, partnering with revolving microfinance institutions to deliver affordable electrification services to rural communities. SOLShare - Government of Bangladesh (Bangladesh) SOLShare also partners with the government to sell mini-grids.
Installation and maintenance	SOLShare - local area managers (Bangladesh) Innovative mini-grid company, partnering with Area Manager to monitor and maintain remote mini grids. Ministry of Energy - Barefoot College (Sierra Leone) Government department partnering with NGO training women as solar panel technicians for rural electrification.
Security	FEDURP - First Responders - Community (Sierra Leone) FEDURP trains youth groups to patrol informal settlement zones at night to prevent theft of community members' property. (FEDURP representative, 2021; SLURC researcher, 2021)
Inclusive research	Community - SLURC - FEDURP - FCC / Mayor's Office SLURC coordinates participatory informal settlement mapping, the outputs of which inform FEDURP's stance with the FCC / Mayor's Office, thus influencing pro-poor policy making (e.g. Transform Freetown).

Figure 20. Partnership learnings from remote data collection

Pillar 3: Partnerships for just energy transitions

Pillar 3 is enhancing partnerships for just energy transitions, defined as the pursuit of energy justice through time. Interviews identified the need for partnerships to deliver five factors essential for just transitions; political commitment, financial viability and stability, installation and maintenance, security and inclusive research. Supporting evidence is detailed in Figure 20.

Political partnerships

MHT's experiences in Ahmedabad show that peer-to-peer learning for municipal governments generates sustained political buy-in (MHT Representative 2, 2021). In Freetown, local government visits to informal settlements could strengthen the relationship between the two. A learning exchange between officials from Freetown and, for example, Ahmedabad, could illustrate the benefits of empowered urban poor communities, increasing commitment to pro-poor participatory energy policies (Ibid, 2021). Adopting a policy similar to Ahmedabad's 'no objection' documentation could deliver sufficient tenure security to enable formal grid expansion, breaking cycles of fire-risk accumulation (Ibid, 2021). FEDURP and CODOHSAPA, with well-established state relationships, are positioned to advocate for prioritising inclusive energy policies across election cycles (FEDURP Representative 1, 2021). As noted in Pillar 2, the mayor's office could influence affiliated institutions to remove barriers, including EDSA's bureaucratic connection application (DPU MSc ESD/SLURC, 2020).

Financial viability and stability

Interviews highlighted financial viability as crucial in sustaining private sector involvement in energy services. Reliance on donations and volunteers is precarious in the long-term (Optim Energy, 2021); stable financial partnerships are necessary. SOLShare, a social enterprise working to connect SHSs into mini 'swarm' grids in Bangladesh, partners with the Grameen Shakti microfinance bank, ensuring that communities can purchase their services. SOLShare also provides services to the Bangladeshi government, ensuring contracts for SOLShare and service provision for communities (SOLShare Representative 2, 2021). In Freetown, small energy companies could partner with savings groups to replicate this revolving finance agreement. Additionally, they could partner with local government, combining Ministry of Energy grants with an ongoing purchase agreement.

Uptake of SHSs both provides long-term savings to SHS owners, particularly once the system has been paid off, and offers the potential to introduce swarm grids in Freetown. Swarm grids allow SHS owners to sell excess electricity to their neighbours for additional income. However, integrating swarm grids into the national grid can be challenging, and key enabling factors, such as mobile payments, are not currently present in Freetown (Ibid, 2021).

Installation and maintenance

Interviews emphasised partnerships' role in enhancing local capacity for the installation and maintenance of SHSs (Barefoot College, 2021; BBOX Representative, 2021; SOLShare Representative 1, 2021). Strategies included employing an Area Manager to provide continuous supervision and maintenance (SOLShare Representative, 2021) or relying on volunteers (Optim Energy Representative, 2021). In Sierra Leone, the Ministry of Energy has an established partnership with Barefoot College to train local women as solar panel technicians for rural electrification. Extending this programme to urban areas would provide much-needed technical expertise, valuable recognition of gendered experiences of energy and empower women's voices in energy-related development. Training women from informal settlements as technicians is likely to improve long-term energy safety, and create livelihood opportunities (FEDURP Representative 2, 2021).

Security

Solar panel theft in informal settlements disincentivises uptake, making security an important consideration (SLURC Researcher, 2021). In some settlements, training youth groups as 'first responders' has reduced theft (Ibid, 2021). These groups could be expanded into all areas of informal settlements through peer-to-peer learning. As FEDURP already trains these youth groups, they could facilitate the exchanges (Ibid, 2021). SHS owners tend to bring solar panels indoors overnight for security (Ibid, 2021), so private energy companies could favour product designs which simplify this process. Theft also inhibits Afrigas roll-out, therefore increased security would also benefit clean cooking (Afrigas Representative, 2021).

Inclusive research

Through their Community Area Action Plans, SLURC have set a precedent for inclusive, participatory research which unites stakeholders and reveals injustices in informal settlements (Macarthy, Frediani and Kamara, 2019). Through their relationship with FEDURP and the Mayor's Office, SLURC's findings inform pro-poor development policies, including the Transform Freetown initiative (SLURC Researcher, 2021). Informal settlements evolve through dynamic, self-organised processes (Allen, Lampis and Swilling, 2016), therefore energy interventions must be grounded in their unique contexts. Having established trusting partnerships with communities and state actors, SLURC's data could underpin long-term progress towards energy justice. Furthermore, SLURC could partner more closely with the private sector to facilitate context-specific delivery of diversified energy risk-reduction innovations.

4. Conclusion

In Freetown's informal settlements, inaccessible and unreliable formal energy services drive continuing dependence on risk-generating alternative practices, including poor quality clandestine grid connections and cooking with charcoal. Those reliant on alternative practices face fire-risk and indoor air pollution which are recurring, everyday realities with devastating effects on lives and livelihoods. These impacts are not felt evenly, with women and children particularly exposed to the effects of indoor air pollution, domestic burns and small-scale fires.

To increase the safety of energy access, it is necessary to improve the accessibility and uptake of safe energy options such as SHSs, clean cooking technologies, and formalised grid connections. Such a diversification of safe energy practices can decrease reliance on currently widespread risk-generating practices, thus improving energy safety.

To deliver risk-reduction whilst pursuing energy justice, three strategic pillars are outlined:

- Capacity-building to underpin increased accessibility and uptake of safe energy options
- Increased accessibility of reliable, safe, and affordable energy alternatives
- Partnerships for just energy transitions

Building on the findings of the four-year DPU/SLURC Learning Alliance, a significant insight of this report is the necessity to tailor interventions to specific informal settlements. By engaging with the concept of energy justice, a non-deterministic, inclusive strategy to reducing risk is proposed, which recognises diverse realities, and acknowledges the inequitable distribution of injustices. It positions communities as respected development partners, emphasising their role, without placing the onus on the urban poor to be the sole deliverers of their own development.

Strengths of this strategy are its use of tried-and-tested locally appropriate technologies, its compliance with existing policy frameworks, and its leveraging of established partnerships. By moving beyond a technical framing of energy issues, this strategy supports solutions that are embedded in, and guided by lived realities. Although the pathway to energy justice is not straightforward, a just energy transition is essential not only to reducing risk, but to delivering equitable outcomes for residents of Freetown's informal settlements.

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List of Interviewees

Afrigas Representative (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

Azuri Representative (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

BBOX Representative (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

CODOHSAPA Representative (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

Energy4impact Representative (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

FEDURP Representative 1 (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

FEDURP Representative 2 (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

Freetown City Council Representative (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

Mahila Housing Trust Representative 1 (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

Mahila Housing Trust Representative 2 (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

Millenium Challenge Corporation Representative (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

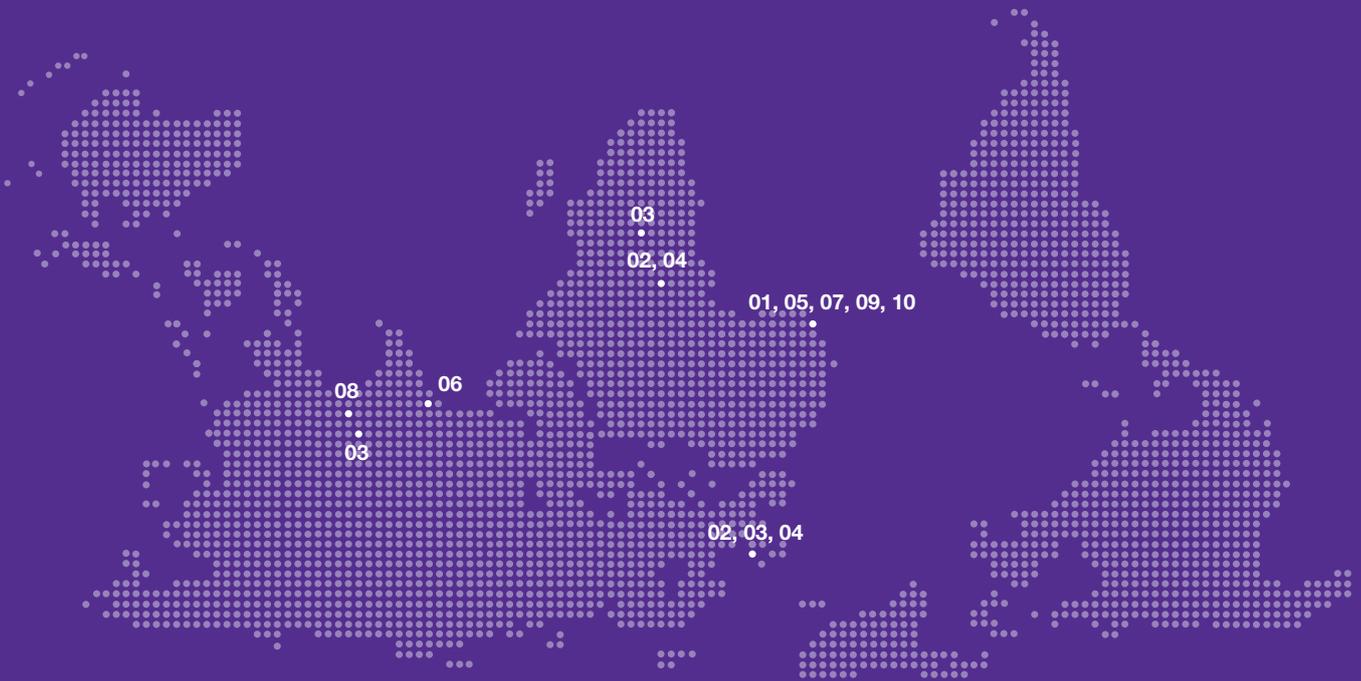
Renewables in Africa Representative (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

Rugsal Trading Representative (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

SOLShare Representative 1 (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

SOLShare Representative 2 (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

Learning from innovation around the world



- 01 Afrigas
- 02 Azuri
- 03 BBOXX
- 04 Energy4Impact
- 05 Freetown City Council
- 06 Mahila Housing Trust (MHT)
- 07 Millenium Challenge Corporation (MCC)
- 08 ME SOLShare
- 09 Optim Energy
- 10 Rugsal Trading

Appendix 1: Afrigas

📍 Sierra Leone

Afrigas
Clean Cooking Alliance
Local Vendors



Figure 20. Afrigas cylinders

Summary

Traditional cooking with charcoal or wood comes with indoor air pollution, deforestation, time poverty and fire risk in Freetown. Afrigas offers a solution to those problems with their refillable LPG cylinders and cooking stoves, which are convenient, fast to use, and made for households and restaurants. After various promotion campaigns, including cooking demonstrations, flyers and radio adverts, the yellow gas cylinders are well known around Freetown and Sierra Leone. Constant engagement with the customers, in person and via Facebook, facilitates an understanding of their customers needs and constant improvement of the services. For their products to be accessible, Afrigas prioritises price consistency in the local currency and equivalency to costs of charcoal per meal, despite a rise in material, shipping and currency exchange costs. This is achieved by increasing the volume of sales and therefore decreasing the procurement costs. The pricing strategy consists of selling the cylinders at cost, and generating a profit through LPG refills.

The LPG and cylinders are separately imported and locally bottled in Afrigas facilities. Since starting in 2012, Afrigas has managed to create a network of 700 vendors around the country as their distribution partners, with more than 50% of them being based in Freetown.

Impact

While the costs per meal are similar to charcoal, the one-off cost of the cylinder and the inability to ration the minimum 6kg refill of LPG, make the cooking solution unaffordable for the urban poor. A digital top-up system will be tested in the near future, to allow for smaller payments and make the LPG more accessible for everyone.

So far 120,000 cylinders have been sold, of which only 20,000 are being refilled regularly, which does not favour the Afrigas business model of making profit through refills. Many of the cylinders have potentially been sold to neighbouring countries, as the value of cylinders are higher abroad, while gas costs are similar.

Currently, most refills are being done during Ramadan, as the convenience and the speed of cooking is appreciated. Other benefits like health impacts or the absence of any known fire impacts involving Afrigas products are less relevant than the costs of Afrigas. Nevertheless a growth of monthly sales of 10 tonnes of LPG in 2012 to 200 tonnes of LPG today indicates the increasing uptake of this clean cooking solution.

Afrigas is seeking to rapidly expand their business to further use economies of scale to decrease their prices, and thereby become more affordable for everyone in Freetown and Sierra Leone.

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Appendix 2: Azuri

📍 Registered in the United Kingdom, operating in 12 countries across Sub-Saharan Africa.

Grant providers: e.g. USAID

Corporate partnerships: e.g. Unilever



Summary

Azuri has been offering “life-changing technologies” to households living without electricity since 2012, focusing mostly on rural areas (Azuri, 2021). They combine mobile payment software with solar technologies to offer Solar Home Systems (SHSs) at affordable prices and flexible Pay-As-You-Go enabled payment plans to increase the accessibility of their services. They also offer an upgrading service, where customers can purchase the cheapest SHS and upgrade to a larger SHS later. Azuri innovated the HomeSmart system, which employs machine learning to monitor electricity usage and climatic conditions, moderating electricity usage to ensure reliable electricity provision during poor weather and throughout the night.

Azuri has flexibly partnered with a number of grant providers, such as USAID, as well as crowd-funders and long-term corporate partnerships to support entry into new markets and accelerate the development of new products. Local partnerships are also very valuable to Azuri’s business model. By working with leading local companies with well-known “last-mile agent networks” they can rapidly expand into new markets, reach new customers and offer cost-effective services (Azuri, 2021).

Impact

The provision of SHSs has improved people’s lives in many ways. Health and wellbeing benefits arise from reduced indoor air pollution, but also through the increased awareness of health and social issues that comes with access to TV and radio. For every 10,000 SHSs installed, Azuri estimate that \$1.99 million is saved on energy-related expenditure (kerosene etc). The savings are often spent on additional food and nutritional outcomes improve.

SHSs also support rural entrepreneurs with 60% of off-grid solar owners reporting the ability to undertake more work within the first three months. Azuri has also generated 5,000 new jobs in Sub-Saharan Africa in their supply and distribution chain.

Azuri has received many awards for its work, especially for its HomeSmart system.

Sources

Azuri | Life Changing Technology (2021). Available at: <https://www.azuri-group.com/impact/> (Accessed: 27 May 2021).

Appendix 3: BBOXX

📍 Registered in the United Kingdom, operating in 11 countries across Africa and Asia.

BBOXX

Private sector partners: e.g. EDF

Academic partners: e.g. UCL



Summary

BBOXX operates across 11 countries in Africa and Asia, where they “design, manufacture, distribute and finance decentralised energy solutions” (BBOXX, 2021). They partner with large multinational corporations including Mitsubishi Corporation and UCL, for financing at the product development stage. The company provides upgradable SHS, where consumers can incrementally build upon their existing kits while simultaneously offering flexible financing through Pay-As-You-Go (PAYG) schemes. To ensure targeted repayment schedules, BBOXX has interacted with local community savings groups to mobilise its past loan repayment history as a form of credit checks. BBOXX offers an innovative technical solution to the problems of poor electricity generation on cloudy days and limited power availability during the night. The SHS monitors rates of electricity generation and consumption, automatically limiting consumption during the day by reducing radio volumes and lighting intensity to conserve power for nighttime lighting.

Moreover, in the context of Kenya, they have engaged in innovative on-ground marketing strategies to increase uptake of their products. Local women are employed as sales representatives, with door-to-door visits timed to ensure that all household adults are available to receive information on solar technology. Influential local people, such as chiefs, are targeted to create interest and enthusiasm for SHS.

Impact

BBOXX has provided 1,706,969 people with access to clean and sustainable energy across the 11 countries it works in. As well as providing safer, healthier homes, their SHSs have had significant economic benefits for their customers. On average, SHS owners save \$200 annually on reduced expenditure on expensive fuels such as kerosene. Furthermore, BBOXX have enabled 35,105 people to support their businesses and estimate that an additional \$78,849,917 has been created in income due to their products.

The company is widely acknowledged for its success and has received numerous awards and accolades for its technological innovation and its social impact.

Sources

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Appendix 4: Energy4Impact

📍 Registered in England, UK. Working in Sub-Saharan African countries

Enabling African Cities for Transformative Energy Access project (ENACT)

Local Governments for Sustainability (ICLEI)

Transforming Energy Access (TEA)

UKaid

Freetown City Council



Summary

Energy4Impact is an NGO that helps businesses and governments in Africa deliver affordable and clean access to energy, by offering support to innovative pioneering business models in the energy sector. The organisation's projects have a low-cost delivery focused structure, and primarily aim to deliver efficient cookstoves and electricity to communities of the urban poor. Their project partners are often in the private and public sector, but they also work closely with local communities to design and implement projects. For instance, participatory data collection and planning is used as the basis for most projects. Moreover, education and community capacity building is a main component of their strategy, which foster long term success of projects by making sure the population understands the secondary benefits of access to clean energy, such as health, sanitation and education.

Impact

Energy4Impact is present in Freetown through a partnership with ENACT which is a new project within the Transforming Energy Access (TEA) programme. This 3-year initiative started in July 2020 and is managed by the Carbon Trust, ICLEI Africa, as well as Energy4Impact (E4I). ENACT is looking to improve access to Energy in Freetown and Kampala. In Freetown, the project focuses mainly on Susan's Bay, but also on other informal settlements. The project is a collaboration and a result of the research of E4I in the last 2 years. The project collaborates with Freetown's city council, and aims to align with the local and national energy policies and goals; aiming to foster clean cooking practices in Freetown's informal settlements. Besides understanding the needs of the local population, E4I works to understand the barriers of the private sector to sell and advertise their products in informal settlements, in order to understand the limitations that have to be overcome (e.g. Funding, R&D, data availability). The main barrier of the research was to get verifiable data on energy access. Most data in Freetown is aggregated on the city level and not disaggregated for different settlements, particularly informal settlements.

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Appendix 5: Freetown City Council

📍 Freetown, Sierra Leone

Freetown City Council
Ministry of Energy
Energy4Impact
ICLEI



Summary

The Freetown City Council (FCC) is seeing safe access to reliable electricity and clean cooking as one of the key factors for development and disaster risk reduction in Freetown. Overloaded and clandestine electricity connections and traditional fuel sources resulted in various fire incidents over the past years. Deforestation for traditional cooking fuels, result in ground water bagging and landslides, which are major concerns of the FCC.

While power generation and transmission are regulated and implemented by national institutions like the Ministry of Energy, EWRC, EDSA and EGTC, Freetown's inclusive agenda can positively impact policy making. Decentralised solar electricity is seen as a safe and clean way to access electricity, while the grid is being extended. Furthermore, renewable energy is seen as crucial for Freetown's development and ambitions to reduce GHG emissions.

Impact

Local engagement and capacity building are major foci of the FCC, for any infrastructure and service. Training communities for awareness of new technologies and their benefits will increase uptake, and allow for long-term maintenance of energy solutions. Local Capacity around electricity is creating an enabling environment for electricity access interventions, and should therefore decrease fire risk, as well as the health impacts of current energy practices. Currently slum upgrading and tree planting projects are happening in Freetown, for which energy is a determining factor, in order to make these efforts sustainable. In order to reduce deforestation, the traditional ways of cooking with charcoal and wood need to transition to more sustainable sources. Disaster risk reduction measures as part of 'Transform Freetown' will create a more enabling environment for grid extension and also decentralised electricity generation by making the market more attractive to the private sector.

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(Accessed:22 May 2021)

Appendix 6: Mahila Housing Trust (MHT)

📍 Ahmedabad and Jaipur, India

Local and national municipalities and administration



Summary

MHT works across a number of impact areas including Water & Sanitation, Climate Resilience and Energy and predominantly facilitates collaborative social capacity building. MHT gathers women from every household and delivers training around data collection, community cohesion and navigating bureaucracy. They empower women to leverage state resources for informal settlement development; facilitating long-term self-sufficiency. They foster a respectful, collaborative relationship with the local government, often framing informal settlement women as essential additional capacity.

More specific to energy, MHT delivered an electrification programme for the informal settlements of Ahmedabad. They overcame issues of tenure insecurity through negotiating 10-year 'no objection' documentation, allowing grid expansion into unserved areas. Furthermore, MHT encouraged registration of electricity connections in women's names, providing valuable proof-of-residence needed for later land title claims, passport applications and other social security documentation.

Impact

Since its inception in 1994, MHT has grown rapidly. In the first decade, its Slum Networking Programme accelerated the delivery of essential services, including energy, to 35,000 slum dwellers in Ahmedabad, while emphasising female-specific capacity building. Now, MHT operates in 34 cities across 8 states in India and has collaborative partners in Bangladesh and Nepal.

MHT's approach of embedding action based on lived experiences within the local context has also produced a deep and inclusive understanding of rapid urbanisation, climate change and physical environments. With urbanisation accelerating throughout the world, their insights have far-reaching implications.

Sources

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Appendix 7: Millenium Challenge Corporation (MCC)

📍 Based in Washington D.C., working in Sierra Leone

Millennium Challenge Cooperation
Freetown City Council
EDSA
EGTC



Summary

MCC is an American aid agency, created in 2004, which employs a private sector approach to development. Technical and consultation experience is combined with analysis of the local context. The focus is on reducing poverty through economic growth. Countries can qualify for their programmes by meeting specific criteria around governance, democracy and human rights. MCC focuses on capacity building of national institutions and governments, to understand what is holding back the country's economy, in order to then work on those limitations in cooperation with the country. Grants from MCC are limited to 5 years in order to achieve success and independence swiftly.

Impact

In Sierra Leone, MCC's threshold programme is coming to an end and will probably be succeeded by a compact programme. During the 5 years of the threshold programme, barriers to economic growth in Sierra Leone around water and sanitation and energy were identified. The local institutions responsible for electricity generation, transmission and regulation worked with MCC to increase their capacity and create an enabling environment for further investments. Recent work has focused on grid and transmission line extension, including the inclusion of Sierra Leone in the West African Power Pool. The future compact programme will potentially also focus on decentralised solar solutions, and the enabling policies and regulations to ensure products are safe and reliable.

Sources

MCC (no date). About MCC, Available at: <https://www.mcc.gov/about> (Accessed:22 May 2021)

Appendix 8: ME SOLShare

📍 Bangladesh

Upokulio Biddutayan O Mohila Unnayan Samity (UBOMUS)
Infrastructure Development Company Limited (IDCOL)
United International University-Centre for Energy Research
Grameen Shakti



Summary

SOLShare is the pioneer of swarm electrification, a revolutionary approach to affordable rural electrification based on the principle of connecting existing Solar Home Systems (SHS) to form smart peer-to-peer microgrids. Through SOLbazaar, the purpose designed trading platform, SHS owners can sell their excess solar energy to their neighbours, allowing households that cannot afford their own solar panels to access affordable clean electricity. Established micro-grids can even be integrated into the national grid and operate flexibly, either drawing power from the grid or operating in 'island mode'. Transactions are managed through the SOLapp and the system is remotely monitored through automated analysis of real-time data.

Impact

Since its inception in 2014, SOLShare has established 27 micro-grids in Bangladesh and serves around 3,000 customers; the majority of which are farmers living on less than \$5 per day. The company aims to operate 200,000 grids and benefit more than a million customers by 2030. By providing affordable solar energy to those who cannot afford SHS's themselves, the microgrids are reducing reliance on costly and polluting energy sources, such as kerosene. Furthermore, the additional income generated through selling excess electricity is helping people build resilience to crises, including the COVID-19 pandemic.

The partners have received numerous awards, including the UN Climate Award Momentum for Change during the COP22 in Marrakech (2016) for their work on the SOLShare programme.

Sources

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Appendix 9: Optim Energy

📍 Sierra Leone, Rwanda

UN Millenium Fellows
Freetown City Council
Ministry of Energy



Summary

Optim energy is an initiative that uses kinetic energy to produce clean, affordable, and accessible energy. The co-founder of this venture is from Freetown, demonstrating passion towards sustainable energy development in every stage of creation of this project. With a background in robotics, the founder of Optim Energy has leveraged his skills in project development and data analysis. This project has already impacted more than 1500 households in his hometown in Sierra Leone. This initiative began due to an identified necessity in Freetown: Every night, over 31 students in Freetown will use a locally made “Pan Lamp” to study. The lamp is made from fabric dipped into kerosene, thus polluting with a large volume of smoke which was harming the health of the students and the environment. This led to the invention of the free energy generator which produces 250v of current from kinetic energy created through movement. Using kinetic energy means that the electricity created does not release Green-house Gasses, which contribute to climate change.

Impact

The founder of this project is experienced in the planning and execution of energy strategies, and therefore implements a decentralised energy system, which considers important key factors, including demographics, geographical environments and socio-economic differences. Education and training programmes are a key aspect of Optim Energy, and have been successful in producing energy-saving behaviour change, and increasing safety. Accurate stakeholder mapping and identifying the most influential actors and resources, is key to Optim Energy’s strategy. During

the interview, Optim Energy’s founder discussed how every energy project in Freetown’s informal settlements needs approval from the Ministry of energy and the National Power Authority. The project sets a positive examples in mapping the enabling organisations that can bring value to strategies such as the UNDP (for co-funds and resources), the Freetown City Council (constantly evaluating the livelihoods of slum dwellers), small energy institutions (for decentralised solutions), local community leadership (still aiming to gain further influence but efficient for community-led approaches). The success indicators of the energy projects include: energy coverage per household, or per person, savings indexes, CO2 emissions reduction indexes, and most importantly, education and training results. Finally, we asked the founder to lay out the most challenging barrier to the application of strategies in Freetown, and they clearly stated that reaching stakeholder agreement with government officials was, and still is a major challenge for his projects. Political dynamics can shift at any time, and they stated the importance of being adaptable and cooperative with the initiatives that have already progressed in the area.

Sources

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Additional sources:

UNDP- innovation lab- they have done a lot of research on informal settlements

DSDI- govt. institutions to facilitate tech, development

Appendix 10: Rugsal Trading

📍 Freetown, Sierra Leone

Support Mum
Harvard Business School
Innovation Salone
UN



Summary

Rugsal Trading is the first sustainable briquettes company to enter Freetown's market, based out of the need to limit deforestation and its consequent effects on the city. The briquettes are made of sustainably sourced organic materials, such as coconut husks and agricultural waste.

As smokeless fuel, this briquette reduces indoor air pollution without the need for consumers to purchase new appliances. This company also engages in the education of health and economic impacts of traditional charcoal, which kills over 4 million individuals each year.

Impact

Rugsal Trading's current production methods allows for briquette prices to be 40% lower than charcoal, with four-fold longer burning time, facilitating the city's transition towards clean cooking fuel alternatives. This will directly benefit many women and children, who currently suffer the impacts of indoor air pollution. Furthermore, 70% of its employees are women, who receive financial literacy training in collaboration with Support Mom, a local women's collective. Since the founder, himself, was a school drop out, 20% of Rugsal Trading's revenue goes towards supporting children's education, with an emphasis on facilitating returns to education. So far, the company has supported the education of 700 children.

Sources

Rugsal Trading Representative (2021) DPU MSc ESD/SLURC Learning Alliance, Energy Group remote interview.

Urban infrastructure and services

—
Improving access to sanitation
through collective facilities





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Abbreviations

ACF	Action Contre la Faim	GVWC	Guma Valley Water Company
ADF	Asian Development Fund	IIED	International Institute for Environment and Development
AfDB	African Development Bank	MoHS	Ministry of Health and Sanitation
BMGF	Bill & Melinda Gates Foundation	MSWGCA	Ministry of Social Welfare, Gender and Children's Affairs
CBA	Community-based Approach	MoWR	Ministry of Water Resources
CBO	Community-based Organisation	NGO	Non-Governmental Organisation
CKG	Crab Tong, Koleh Town, and Grey Bush	SDI	Slum/Shack Dwellers International
CODOHSAPA	Centre of Dialogue on Human Settlement and Poverty Alleviation	SLURC	Sierra Leone Urban Research Centre
CSF	Communal Sanitation Facilities	SPARC	Society for the Promotion of Area Resource Centers
DFID	Department for International Development	UNICEF	United Nations Children Emergency Fund
ESD	Environment and Sustainable Development	VIP	Ventilated Improved Pit-latrines
FCC	Freetown City Council	WASAN	Water and Sanitation
FEDURP	Federation of the Urban and Rural Poor	WASH	Water, Sanitation and Hygiene
FS	Faecal Sludge	WHO	World Health Organisation
FSM	Faecal Sludge Management	WSUP	Water and Sanitation for the Urban Poor

1. Executive summary

- Sanitation is a basic need and equitable access to sanitation interlinks with many aspects of the Sustainable Development Goals. However, the burden of inadequate sanitation is not evenly distributed. Coastal informal settlements are disproportionately affected by urban risk traps in Freetown and within such settlements, different social groups are impacted. Women, children, the elderly and disabled are often marginalised.
- In densely populated coastal informal settlements, communal sanitation facilities are the most common type of sanitation facilities, but they are poorly maintained. This report aims to increase equitable access to sanitation through increasing the provision and maintenance of communal sanitation facilities.
- Both service and knowledge co-production are key to equitable access to sanitation facilities. Stakeholder mapping of actors provides more clarity on roles and responsibilities. Transparency and coherence are needed to overcome overlapping or conflicting priorities. Committees and focus groups involving the community to co-produce knowledge and services are recommended.
- Improved inclusive design of communal sanitation facilities, such as separate entrances for men and women, child-friendly toilet design and components to help those with physical impairments, are needed. The building of a caretaker's room and communal space can support the long-term maintenance, whilst more resilient design will ensure facilities are able to withstand flooding and sea level rise, mitigating health-related hazards and environmental degradation from cross-contamination with faecal sludge.
- Financial mechanisms that are transparent, and focus on both the provision and maintenance of sanitation facilities are needed for equitable sanitation access. Stakeholder engagement and savings groups are required for a coherent funding strategy. Household permits alleviate socio-economic injustices, shaping affordable access and enabling all households to use the toilets.
- Transform Freetown highlights Freetown City Council's aspirations to improve access to sanitation. This provides an opportunity for sustainable and inclusive improvements in the provision and maintenance of communal sanitation facilities in coastal settlements.
- Figure 1 shows the overview of the strategies suggested in this report with co-production, inclusive design and funding mechanisms as the main entry points.

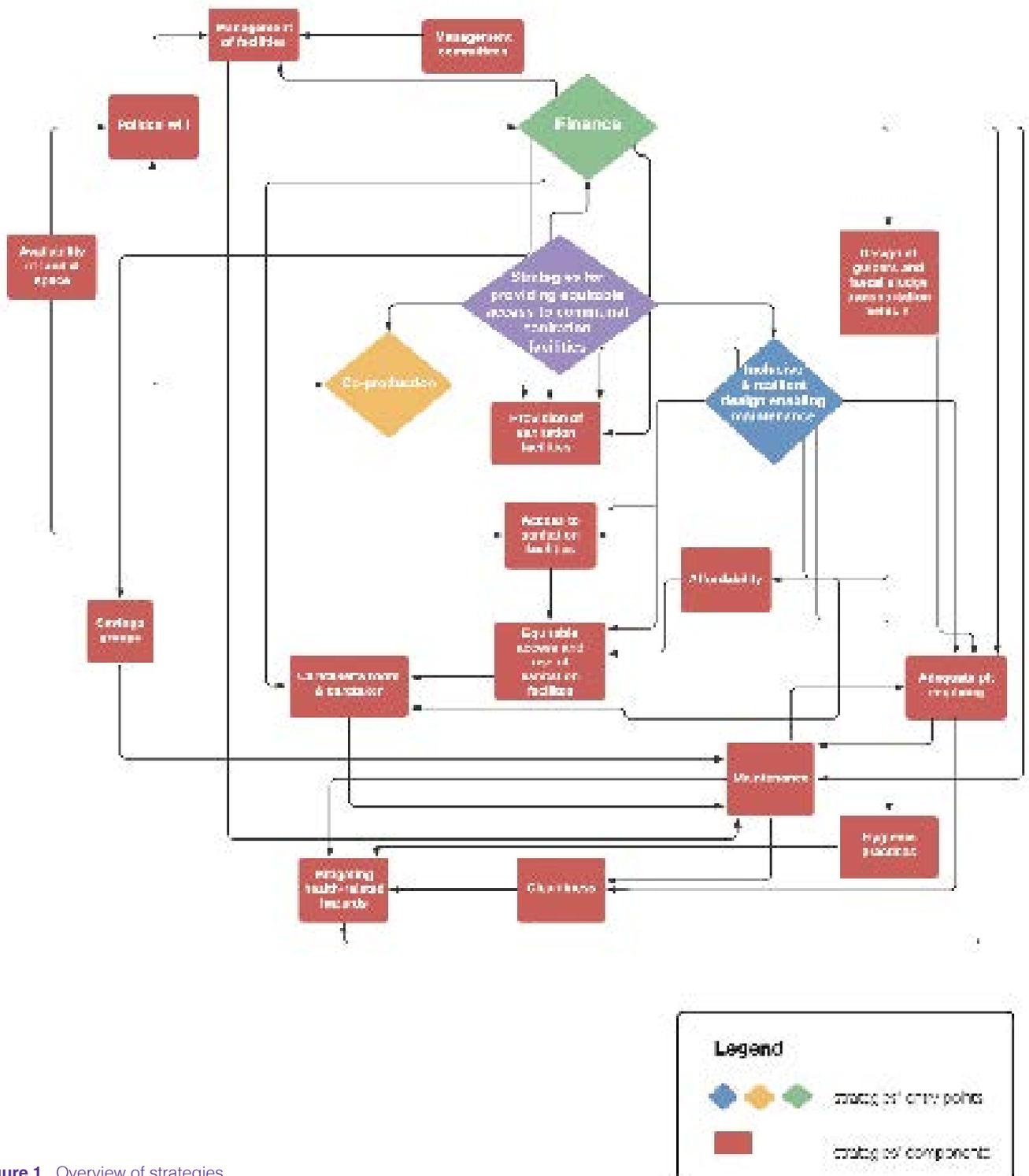


Figure 1. Overview of strategies.

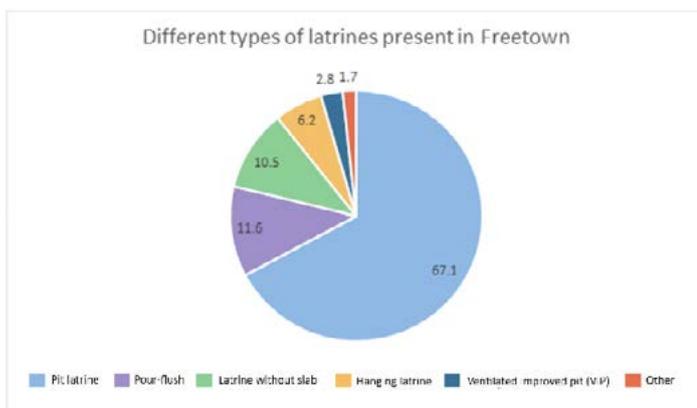
2. Research design

2.1 Background

Freetown, Sierra Leone's capital with 1.2 million inhabitants (World Population Review, 2021), faces numerous challenges underpinned by unequal development. Since 1985, post-civil war internal displacement and rural-urban migration contributed to a 3% urbanisation rate (Allen et al, 2017). Rapid unplanned urbanisation has led to the development of at least 70 informal settlements (SDI, 2019). Over 71% of the population lives below the poverty line of SLL 2,111/day (Freetown WASH Consortium, 2012). Informal settlement dwellers are trapped in a cycle of urban risk (Allen et al., 2017) exacerbated by low provision of basic infrastructure, including water and sanitation (WASAN) services.

The piped sewer system serves merely 0.3% of the population in the historic, colonial business district in the west of Freetown (OVERDUE, 2020). Only 14.5% of Freetown's residents have basic sanitation (DFID, 2018). Subsequently, 90% of Freetown's population rely on on-site sanitation facilities, of which 75% are unimproved pit latrines and between 60-75% (OVERDUE, 2020). Figure 2 shows the different types of toilets in Freetown highlighting how pit-latrines are the most common type. Population size significantly outweighs the number of sanitation facilities. Thus, with little access to improved sanitation, residents resort to alternative practices such as open defecation into water bodies, defecating in rubber buckets and bags and emptied into toilets, streams and rivers.

Figure 2. The different types of latrines present in Freetown (%) (WASH Consortium, 2012).



2.2 Preliminary diagnosis

Inadequate sanitation provision has significant interconnected socio-environmental and spatial impacts.

Socio-environmental Injustices:

Currently, communal sanitation facilities (CSF) are not broadly provided and operate on a pay-per-use system, leading to economic injustices and limited maintenance. The 500-1000SLL pay-per-use fee makes CSF unaffordable, hindering accessibility for low-income individuals (Andrews et al., 2020). Furthermore, access to sanitation facilities is not equitable across social groups. They are not easily accessible for children, women, elderly and people with disabilities. However, a knowledge gap concerning women's inaccessibility to sanitation is evident.

In 2018, only 6% of liquid waste was collected (FCC, 2018). Inadequate collection, transport, treatment and disposal of faecal sludge (FS) and liquid waste leads to diseases, including diarrhoea, hepatitis A and E, malaria, dengue and schistosomiasis, as well as environmental degradation (WHO, 2016). Health costs associated with waterborne diseases represent over one third of poor households' income (FCC, 2018). 12% of deaths for children under five, are attributed to diarrhoea in Sierra Leone (Freetown WASH Consortium, 2012). Moreover, inadequate waste management affects drainage systems, increasing flood risk, which exacerbates health and social injustices. This is further aggravated by seasonal rainfall and climate change, increasing flood incidence, extreme precipitation and sea level rise.

Spatial Injustices:

Sewage and water provision is concentrated in the city centre, leaving coastal informal settlements more at risk of water contamination and outbreaks of waterborne diseases. This is further exacerbated by a lack of regular pit emptying. Coastal settlements are particularly affected by waste dumped from upstream settlements, increasing susceptibility to flooding and waterborne diseases. CKG, one of Freetown's informal coastal settlements, is affected by groundwater contamination from the overcapacity at Kingtom treatment site (Bhilkoo et al., 2019). Coastal informal settlements' topography, inadequate access to risk-reducing infrastructure and high density contribute to the accumulation of multiple urban risks, shown in Figure 3.



Figure 3. Map of informal settlements in Freetown showing communal toilets and areas of high flood risk in coastal informal settlements. See annex for detailed mapping of WASAN infrastructure, practices and risks in coastal settlements. Source: Author’s own with data from Allen et al. (2018) and Ministry of Water Resources (2017).

Improving WASAN in Freetown is critical for achieving several Sustainable Development Goals (Figure 4). The spread of COVID-19 and manifestation of socio-environmental injustice arising from unequal access to sanitation makes improving access to on-site sanitation facilities crucial.



Figure 4. Sustainable Development Goals which relate to equitable access to sanitation.

2.3 Objectives and research questions

Objectives:

Research has identified barriers to equitable access to sanitation facilities in Freetown. These include lack of collaboration between stakeholders, exclusive WASAN strategies and infrastructure, non-standardised operating procedures and limited technical, human and financial capacity (IMF, 2019). Multiple stakeholders often have different timelines and priorities, creating challenges over roles, responsibilities, transparency, service provision and maintenance of facilities. International NGOs try to bridge sanitation gaps by providing funding and technical expertise to build sanitation facilities. However, after project implementation, NGOs often leave the management to the community, without adequate capacity building or funding for continuous management (Kpenge, 2020). Lack of capacity, clarity of roles, and funding after project implementation leads to insufficient monitoring, and

hinders the management and maintenance of facilities (IMF, 2019). The combination of high construction costs, limited resources, and lack of land and tenure security in densely populated coastal informal settlements makes the provision of individual toilets infeasible. Hence, this report seeks ways to improve the inclusivity and sustainability of CSF in informal coastal settlements and aims to provide recommendations to improve all stages of the sanitation value chain. Research has identified three entry points to achieve this: co-production, design and finance, shown in Figure 5. Knowledge co-production would enable communities’ needs to be heard and facility design to be more accessible whilst service co-production would provide technical support and leverage funding for inclusive and sustainable sanitation facilities.

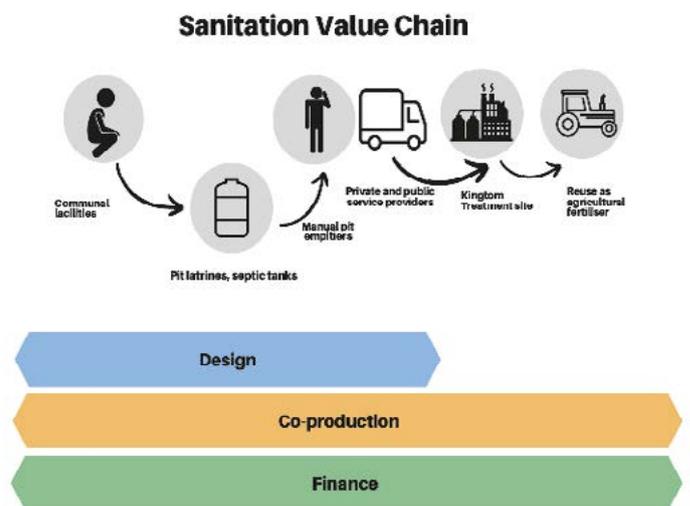


Figure 5. Strategies aiming to address all stages of the sanitation value chain (Author’s own, 2021).

2.4 Research questions

This research provides recommendations to improve the inadequate provision and maintenance of CSF in Freetown, to facilitate equitable access to decentralised on-site sanitation for informal coastal settlements. Research aims to answer the following:

1. **How can knowledge and service co-production deliver inclusive and sustainable sanitation?**
2. **How can the design and maintenance of CSF deliver inclusive and sustainable sanitation?**
3. **What funding mechanisms can deliver inclusive and sustainable sanitation to informal settlements?**

2.5 Methodology, limitations and framework

Methodology:

Initial research consisted of desk-based research and speaking to SLURC and past ESD students via video calls, to identify sanitation practices, actors, and challenges in Freetown. Narrowing the research focus enabled the identification of research gaps, entry points, research questions and prioritisation of contacts for interviews.

Qualitative methods provide meaningful insight into improving access to sanitation. Semi-structured interviews conducted remotely via email, WhatsApp, or video were used to enable in-depth responses, gain comparable data, and provide an array of knowledge and experience, as they obtain more information than closed interviews (Halperin, 2017:294). Due to the COVID-19 pandemic and ethical concerns, focus groups were not used.

Emailing participants created a selection bias of interviewees. As overseas practitioners, it is important to consider positionality. Interviewees' cultural and political positionality could decrease the results' validity as their experiences may have made them biased towards certain solutions without necessarily understanding communities' needs (Halperin 2017:272). Open-ended and follow-up questions were used to empower interviewees to use personal experiences, and stimulate rich responses.

Limitations:

Conducting interviews is inherently political as no form of data collection is unbiased (Lincoln, 1985). As interviews were targeted to Freetown and similar urban contexts, results are specific to informal coastal settlements. However, this research still offers invaluable insight and should not be devalued. Each interview had a transcriber and interviewer to facilitate accurate findings, indicating validity.

All interviewees signed consent forms to authorise interview recordings and transcription to avoid misremembering or misinterpretation of integral aspects of the interview. If provided additional time, the research could be improved by presenting research findings to interviewees to confirm the analyses, enhancing credibility.

Analytical Framework:

This report adopts a socio-environmental injustice lens as the analytical framework. This ensures parity of participation and recognition of differing needs of those typically marginalised, as shown in Figure 6. Informal settlements in coastal areas and vulnerable groups such as women, children and those with physical impairments are disproportionately exposed to socio-environmental injustices due to a lack of sanitation infrastructure and inequitable access to CSF. The urban poor bear the burden of social and environmental challenges associated with inadequate waste management. Inadequate sanitation reflects the intrinsic link between social and environmental justice. Improved sanitation can reduce environmental impacts of pollution from open defecation, which in turn reduces health and social implications. Thus, recommendations for enhancing recognition and equity for increasing immediate access in the short to medium term are made, with the aim for it to be sustainable in the long term to provide justice for marginalised and vulnerable people and the environment.

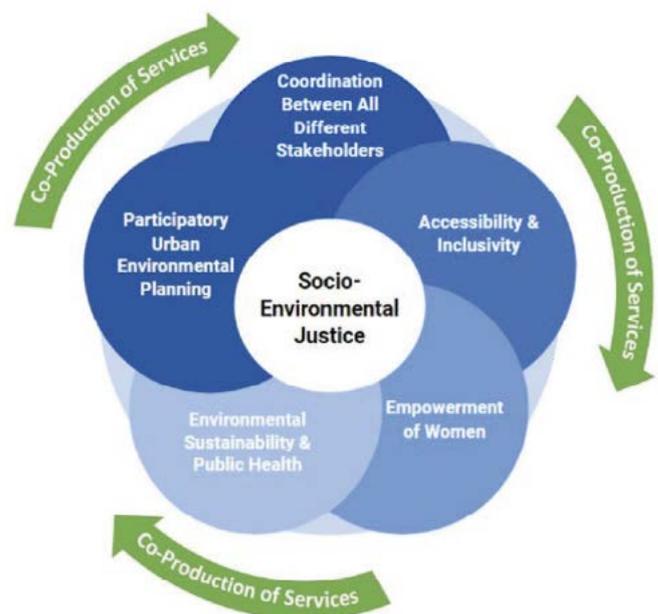


Figure 6. Socio-environmental analytical framework (Andrews et al., 2020).

3. Strategies

3.1 Co-Production

As shown in Figure 7, multiple stakeholders are involved in sanitation in Freetown. For inclusive CSF, clear pathways need to be established with emphasis on participation and co-production.

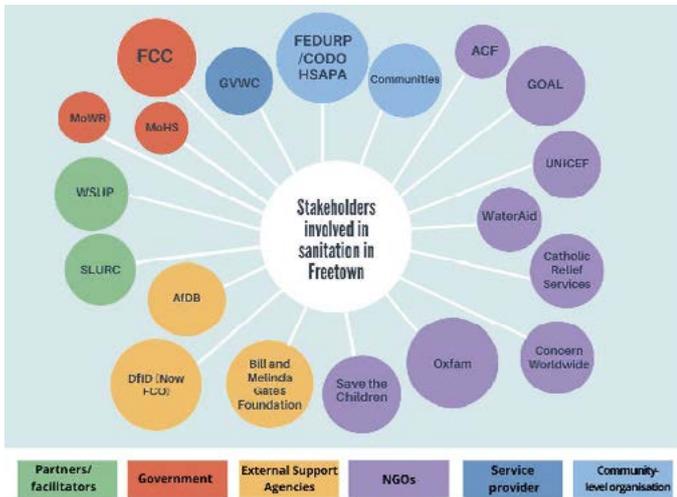


Figure 7. Stakeholders' involvement in sanitation in Freetown (Author's own, 2021).

Inclusivity:

Inclusive planning and coordination between stakeholders can increase access to facilities. Figure 8 shows the different roles, responsibilities and projects of each stakeholder, indicating overlapping and unclear roles. The community is central to sanitation provision; communities should be active and present in the planning, design, development and management of CSF to ensure inclusive access. Co-production of knowledge and services between stakeholders and the community is essential.

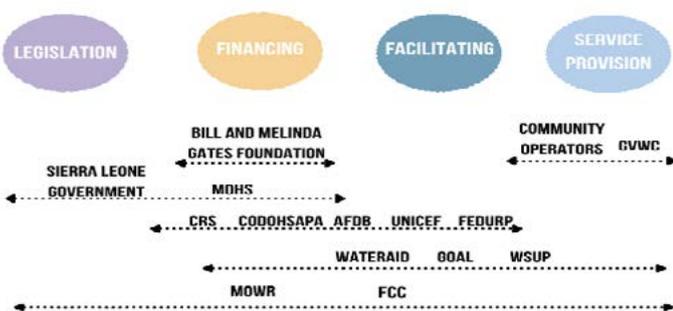


Figure 8. Stakeholder roles and responsibilities in sanitation in Freetown (Author's own, 2021).

Co-Producing knowledge:

For this report, knowledge co-production refers to the co-creation of knowledge to understand causes of, and solutions to, inadequate access to sanitation. Community involvement in the development of facilities can increase power and agency (Mitlin, 2008). Enumerations and profiles have been completed in some settlements, such as Cockle Bay (FEDURP, 2019). However, there is scope to increase the knowledge of sanitation facilities in Freetown beyond socio-economic and descriptive data (IIED Researcher and SLURC Founder, 2021). Community hazard-mapping and timelines can determine where the most at-risk areas are and when health and sanitation hazards are most prevalent (Reichel and Fromming, 2014). Community focus groups can discuss the location, need, and implementation of new facilities. NGOs already working in the communities can facilitate focus groups to ensure parity of participation. Household surveys carried out in collaboration with FEDURP, CODOHSAPA and CBOs could discuss affordability-to-pay, health, sanitation usage and practices. In CKG, the community is willing to pay (CKG Representative, 2021), however, the ability and barriers to affordability should also be assessed (IIED Researcher, 2021). Existing savings groups can be used to start a dialogue with the government, and build stakeholder relationships through funding re-prioritisation negotiations.

Building a network similar to the WASH Consortium, but with more participation and involvement of the community, could ensure coordination for inclusive action. The Community Based Disaster Risk and Management Committees (CDMC's) tackle environmental issues alongside a monitoring committee, that monitors developments during and after project implementation. These committees meet once a month, but often without members of the community present. Strong community involvement would enable all voices to be heard, and for vulnerabilities to be addressed. Community focus groups involving women can ensure their concerns and most pressing sanitation issues are expressed, and promote sharing risks and ideas (UCL Researcher, 2021; IIED Researcher, 2021). However, sensitising men is also crucial. This was achieved in Maputo through focus groups, which promoted women's leadership roles and met the needs of the whole community (Norman, 2018).

Co-Producing sanitation services:

Service co-production refers to the joint financing, planning and delivery of sanitation services. Community-led plans, like those developed in Cockle Bay and Dwarzak (SLURC, 2019) could be instrumental for inclusive planning. By involving the community, the spatial location of CSF is catered to local contexts and needs. In securing land, communities have three potential pathways: i) "unlocking" public land in settlements through negotiations with the central government, ii) re-blocking communal land, or iii) purchasing private land from a community member, as successfully achieved in Mbale, Uganda through the mobilisation of savings groups (IIED, 2021; SDI, 2015).

Sustainability:

With land tenure security, communities and the government are more willing to invest and upgrade. Sanitation facilities could be built on private land as landowners are often willing to sell land in exchange for access to facilities (Reffell, 2021). Likewise, due to the FCC and Ministry of Land’s current interest in upgrading sanitation facilities, space for sanitation could be negotiated with them (ibid).

Monitoring and evaluation is needed to ensure long-term sustainability and maintenance of the facilities. This could be carried out by sanitation committees and community members. Annual meetings with the community could be used for long-term monitoring and continuous partnership between communities and stakeholders. Ensuring community participation and meaningful action during and after projects can be achieved through pro-poor key performance indicators (Peal and Drabble, 2014). In monitoring sanitation enforcements, improved funding of the FCC/GOAL sanitation complaints hotline and community enforcements could increase responsiveness and reduce running costs (GOAL Sierra Leone, 2021).

A four-step process used in Maputo is recommended as a framework for both knowledge and service co-production in Freetown, shown in Figure 9. Specific sanitation and hygiene committees could be used to govern and operate sanitation and hygiene activities and infrastructure as piloted in Baglung (WaterAid, 2008). These could funnel into existing CDMC’s and the city learning platform, which encourages participatory planning.

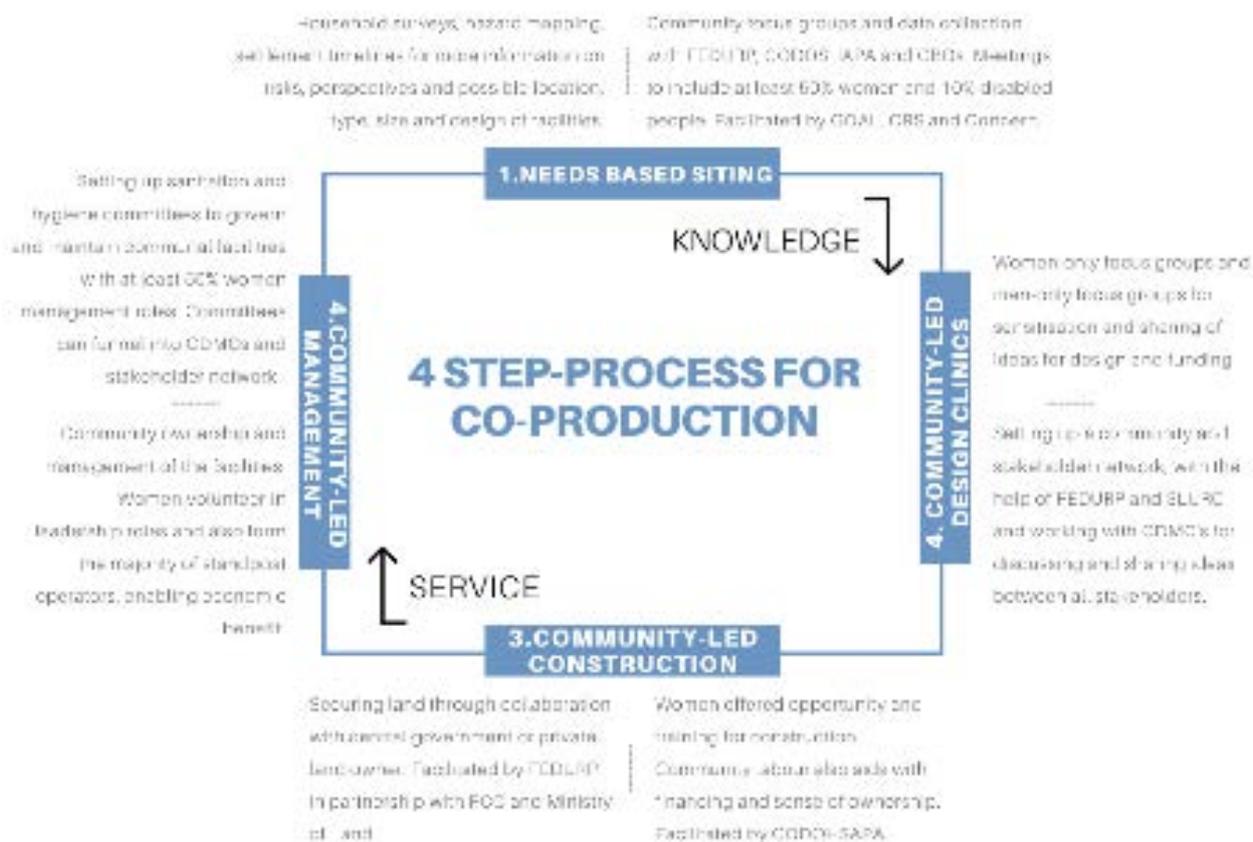


Figure 9. Four-step process for co-production, based on the 4 step process for inclusion of women implemented in Maputo. (Author’s own, elaborated from Drabble, Namburete, and da Câmara, 2014).

An informal police force who patrol settlements at night to prevent sexual harassment, as implemented in Mumbai by a self-organised collective of women (IIED Researcher, 2021), could build on the existing sanitation enforcement team, established by the FCC and youth groups in coastal settlements. Caretakers can also be trained on acceptable conduct to mitigate violence (ibid). In managing CSF, employing female community caretakers as piloted in Baglung could increase community participation, economic opportunity and representation of women in management (Singh, 2012), whilst also contributing to long-term sustainability of facilities.

Co-production can increase inclusivity, empowerment and democracy (Cleaver, 2011). However, the communities' capacity to implement large-scale, long-term projects and regulations is dependent on government support. Coordination between the community, NGOs and FCC is integral to achieve inclusive, sustainable city-wide sanitation. This requires the expansion of political space, enforcement of sanitation policies and funding. Transform Freetown's progressiveness and the Mayor's inclusive planning approach suggests a strong political will to increase sanitation equitability, providing a good entry point to facilitate improvements to sanitation in Freetown.

3.2 Inclusive and resilient design for equitable access to CSF

Inclusivity:

A lack of inclusive design within many CSF in Freetown excludes vulnerable social groups, including women, the elderly, the disabled and children (Concern Worldwide, 2015; Satterthwaite, 2021). Therefore, latrines must be designed for all users. Furthermore, CSF could provide inclusive handwashing facilities supplemented with the provision of water, educational campaigns, visual cues and signage that nudge better sanitation and hygiene practices (Irehovbude and Okoye, 2020; WSUP, 2021).

Women:

In informal settlements, women choose to not use CSF due to fear of experiencing sexual harassment (Satterthwaite, 2021). Therefore, CSF should adopt design features to allow for women and girls to feel safe. Separate facilities for both men and women are shown to be largely beneficial in CKG, and there is a need for more to be implemented (CKG Representative, 2021). The long-term benefits of this can be seen from the Slum Sanitation Programme in Pune, India, which empowered many women (SPARC, 2021). Additional safety features and design, which can enable effective menstrual hygiene management can be seen in Figure 10 (House and Cavill, 2015; Andrews et al., 2020).

Elderly and Disabled

In Freetown, approximately 10% of households include members with disabilities (Mikhael, 2011). However, the number of disability-friendly sanitation facilities is limited. Many facilities lack space and railings for individuals to hold onto (Andrews et al., 2020). Inclusive design for disabled individuals was ensured in Maputo by including a handrail in at least one cubicle per sanitation block, which could build on the existing disability-friendly facility within CKG (CKG Representative, 2021; Drabble, 2014). Further design additions to make CSF more accessible for individuals with lower mobility are shown in Figure 11.

Children:

Children's needs are often neglected within WASH facilities design (Zomerplaag and Mooijman, 2005). Children are often prohibited access due to fear that they would use the toilet improperly and make it dirty (CKG Representative, 2021). Therefore incorporating a children-friendly design such as smaller pits is recommended, as shown in Figure 12.

Sustainability:

Current design of facilities in combination with the lack of maintenance funding leads to deteriorating conditions, uncleanliness and inadequate disposal of FS, causing both health-related hazards and environmental degradation (Andrews et al., 2020). Therefore, CSF require resilient design that enables long-term maintenance, whilst withstanding climate change impacts.

In coastal informal settlements, pit latrines are constructed at ground level, without consideration for flood incidence and sea level rise (Andrews et al., 2020), often requiring rebuilding after flood events (UNICEF, 2021). Based on the disaster-resilient design of sanitation facilities piloted in Assam and Gujarat, India (Figure 13), sanitation facilities constructed in flood-prone areas in Freetown should be designed to withstand and recover from disasters (UNICEF, 2020). Sealed solutions, such as septic tanks and container-based sanitation models reduce the risk of ground and surface water cross-contamination with FS (WaterAid, 2021; IMC Worldwide Consultant, 2021). Incorporating a disaster-resilient design will incur higher initial costs of new facilities (UNICEF, 2020; IIED Researcher, 2021). However, this ensures facilities are operable during disasters and would minimise damage to infrastructure and the socio-environmental consequences resulting from flooding and sea level rise, over the long-term.

Based on the success of the Indian Alliance in re-framing CSF as multi-purpose communal space (SPARC, 2021), designing multiple-storey facilities presents an opportunity for utilising limited space available for the construction of CSF in densely populated coastal settlements in Freetown.

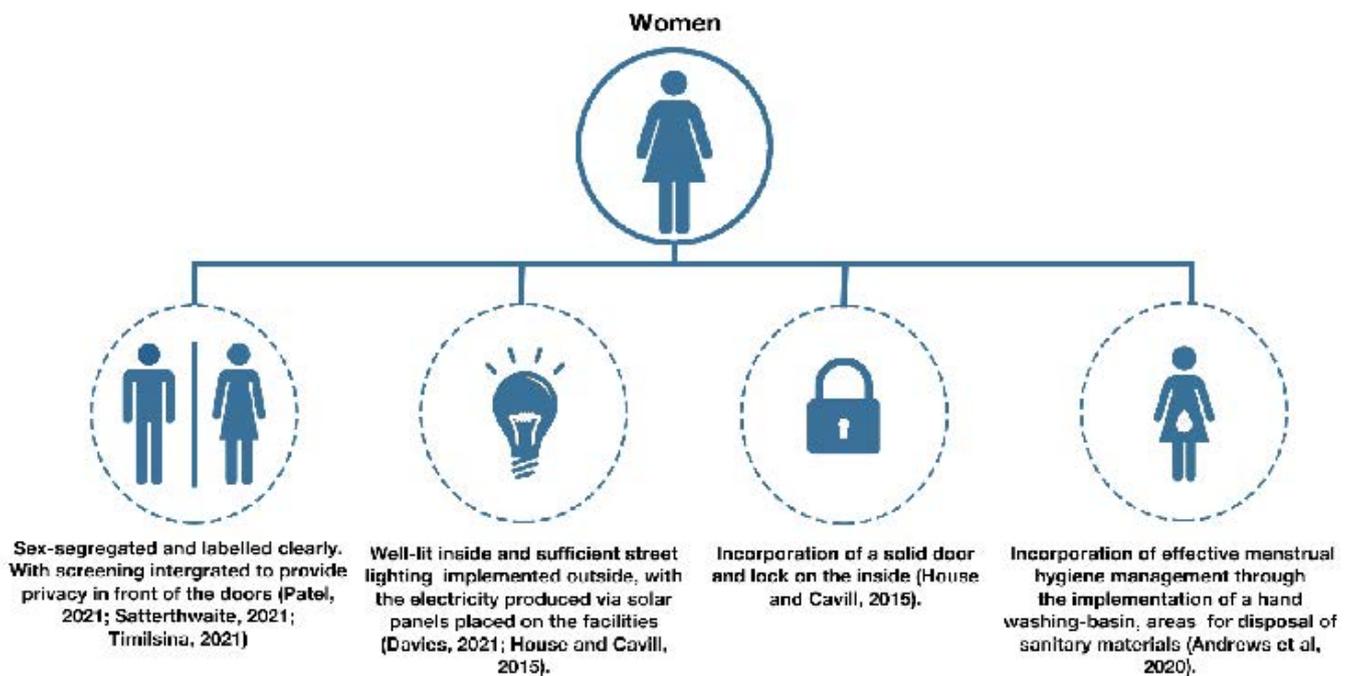


Figure 10. Design Features to Benefit Women (Author's own, 2021).

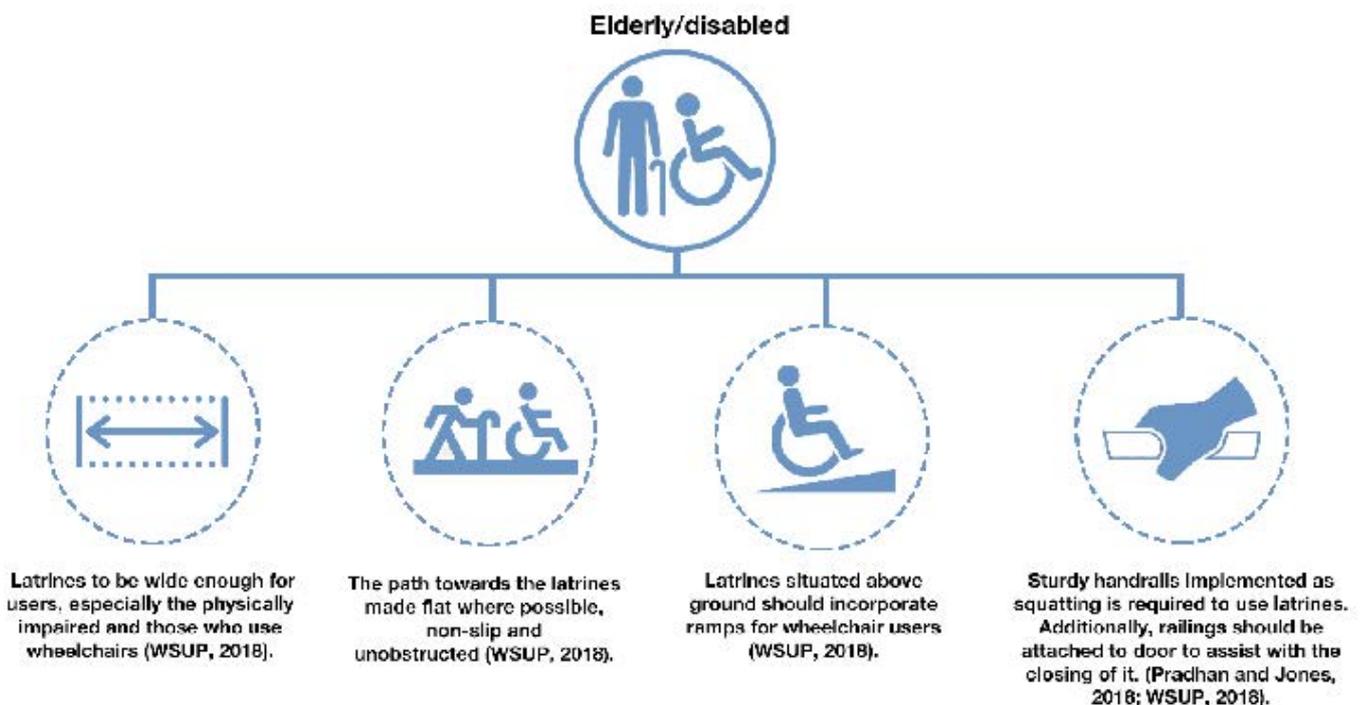


Figure 11. Design Features to Benefit the Elderly and Disabled (Author's own, 2021).

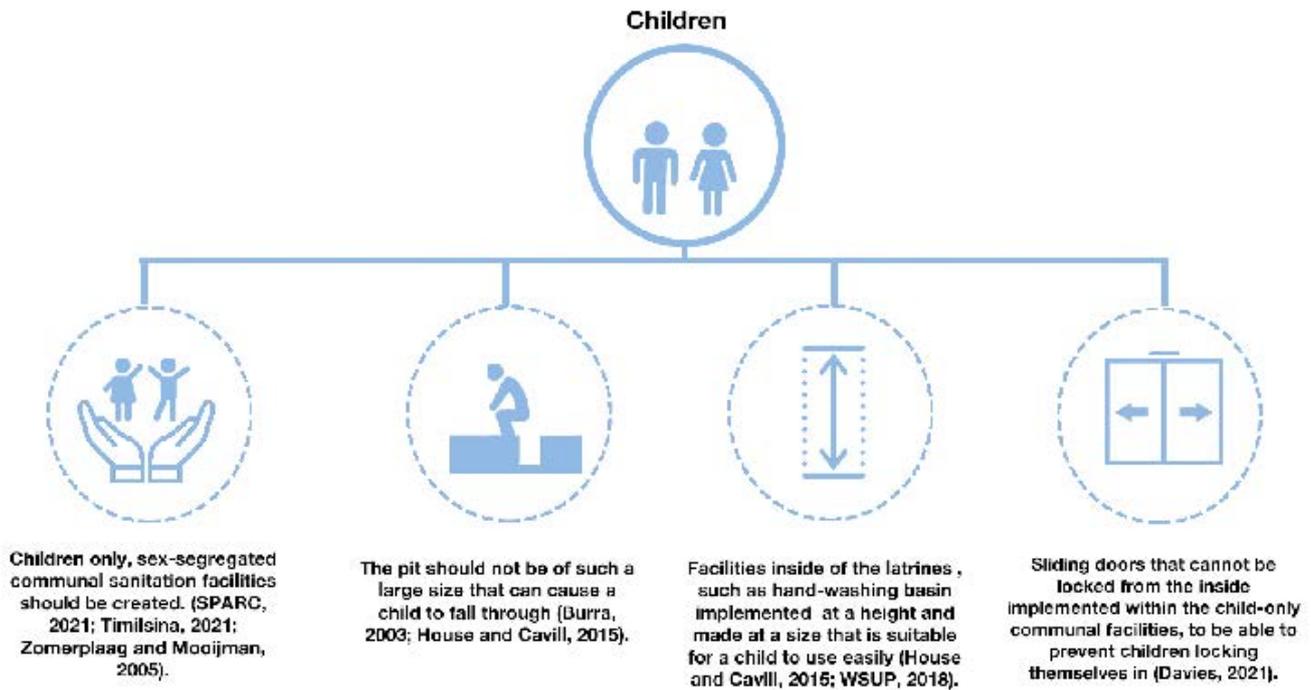


Figure 12. Design Features to Benefit Children (Author's own, 2021).

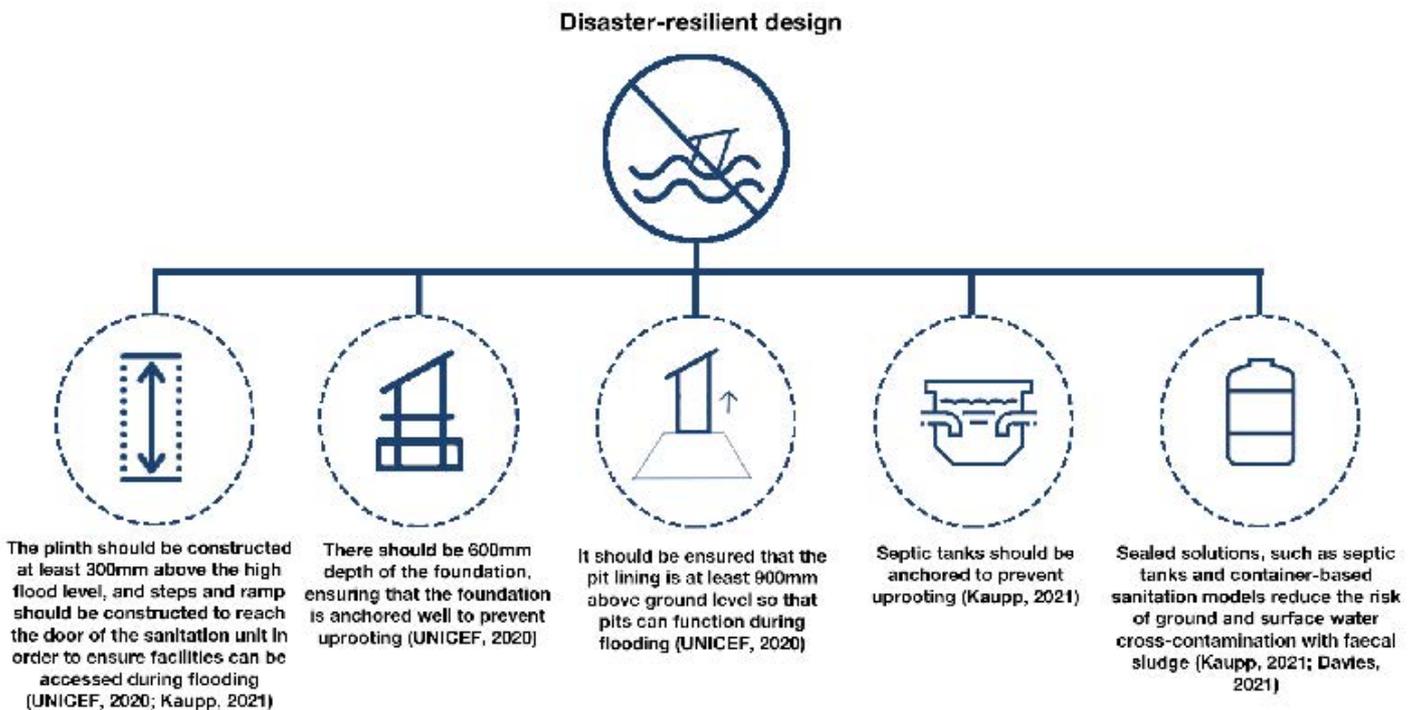


Figure 13. Disaster-Resilient Design Components (Author's own, 2021).

Renting this space out provides an alternative source of income that replenishes the maintenance fund, whilst encouraging and incentivising behavioural change towards better sanitation practices and cleanliness (SPARC Founder, 2021; IIED Researcher, 2021). In CKG and Portee-Rokupa caretakers have a voluntary role (CKG Representative, 2021; Portee-Rokupa Representative, 2021). Caretaker presence dictates operational hours, hindering the accessibility to, and safety of, sanitation facilities in the evenings (Andrews et al., 2020). Integrating a caretaker's room, located above or adjacent to the sanitation facilities where the caretaker resides, into the design of CSF, would increase hours of facilities' operability, discourage unsustainable sanitation practices outside the facilities, and improve safety. Community centres are feasible and would be well received in the coastal informal settlements, such as Portee-Rokupa (FEDURP, 2021; FCC Advisor, 2021; Portee-Rokupa Representative, 2021). However, research gaps and COVID-19 restrictions have limited the ability to gain insights into communities' needs or the potential of the community centre as an income stream.

3.3 Finance

Financing in Sierra Leone is dominated by public external finance such as government, donors, and aid agencies (UNSDG, 2021). The government has limited availability of funding for sanitation as it is not perceived as a priority. Currently, pit latrines are not emptied regularly due to both a lack of funding, and lack of access in densely populated settlements. A pay-per-use system disproportionately impacts large households and women due to care-taking roles traditionally given to women who care for children, who require more frequent use of sanitation facilities (Andrews et al., 2020). There is a need for increased state and private sector funding, coupled with better capacity and accountability through stronger and more cohesive partnerships between stakeholders (Kpenge, 2019). Faecal sludge management (FSM) needs improvements in financing for both manual and mechanical desludging.

Inclusivity:

Willingness-to-pay surveys can assess the viability of the urban poor to contribute to sanitation funding, ensuring community residents can afford to pay for the provision, maintenance and use of facilities (Renouf, 2017). Assessing affordability is essential to design tariff structures enabling equitable access to CSF (ibid). There is currently a willingness-to-pay for desludging in Freetown, which could also assess maintenance of facilities.

Almost 53% of the households would prefer a one-off payment for pit emptying, while 45% of households would prefer the option to make payments in instalments (Parikh, 2016). Community savings groups can make different forms of payments accessible.

By offering different payment options for desludging services to elected community savings group leaders, or the treasurer of the sanitation committee, pit latrines could be emptied regularly whilst different community residents can pay through their most appropriate means. Nevertheless, it is important to acknowledge that people's willingness to pay on surveys may not necessarily manifest in reality as people may opt not to, or not be able to pay (WaterAid, 2021).

The FCC have highlighted interest, capacity, and willingness in enabling an environment for the co-production of sanitation services and adopting new technologies that support the collection and transport of FS. The FCC-owned vacuum truck has been piloted through the use of a lease model, which removes the initial high start-up capital costs, encouraging the involvement of the private sector in FSM. However, the topography and unplanned development of densely populated coastal informal settlements limits the ability of large vehicles to reach communal pit latrines (GOAL Sierra Leone, 2021). Introducing FS removal and transportation technology such as gulpers and handcarts specifically designed to service densely populated and unplanned informal settlements presents an opportunity for strengthening the co-production of sanitation services. WaterAid highlighted the important role of municipality-purchased and leased technology, micro-loans in scaling-up entrepreneurship, and the involvement of the private sector (WaterAid, 2021).

Pricing brackets for pit emptying services can be calculated in different settlements, charging low-income areas a lower tariff compared to middle and high-income customers, in order to absorb costs by those willing and able to pay, as demonstrated using the SWEEP model in Dhaka (Baghirathan, 2017). In implementing the SWEEP model, tariffs should be carefully considered to balance viability and affordability. Community receptiveness should be surveyed prior to implementation. Accountability and trust are integral for the success of tariffs as at least 30% of the services should be for low-income groups. These features are integral, in order for middle- and higher-income users' willingness to pay to offset costs for low-income groups. Monitoring, accountability and trust that funds are used to finance sanitation facilities are important, as shown in Dhaka (WSUP, 2021). On-going contributions would support operation and maintenance (ibid). These mechanisms would support GOAL's project to use pumps to empty pit latrines, reduce the amount of FS disposed of illegally, and enhance awareness of challenges and socio-environmental injustices arising from poor WASAN facilities and individual behaviours (WSUP, 2021; GOAL, 2021). GOAL's Gulper II, which can be used to clean pit latrines, could employ micro-finance mechanisms to lend private pit emptiers the money to buy the Gulper II to sustain their pit emptying businesses (GOAL, 2016).

Sustainability:

For funding to be sustainable, financial flows and donor funds must be transparent. Presently, both the FCC and the central government are interested in scaling up existing sanitation facilities and providing more facilities (Founder of CODHSAPA, 2021). The government is currently implementing new laws to increase transparency of funding. Methods to close the sanitation loop such as further investment and maintenance fees could improve the sustainability of funding. A built-in caretaker room for the caretaker to live in and maintain the CSF lowers maintenance costs, as accommodation can form part of the caretaker's salary and provide employment to maintain the facilities (Sarkar, 2006; Burra, 2003).

Mahila Milan, part of the SDI Federation of the Indian Alliance, exemplifies how women's savings groups are central to the viability of CSF maintenance as they can lobby and increase women ownership of communal sanitation projects, and pay for regular pit latrine emptying (IIED Researcher, 2021). Hence, upscaling and supporting the existing 168 community savings groups in Freetown (National Chair of FEDURP, 2021) could improve facility maintenance. Additionally, changing the pay-per-use system to a monthly household permit for families in the community, and maintaining a pay-per-use system for 'outsiders', improves the financial flow for maintenance and running costs. Maintenance costs for CSF can be covered through a tiered household permit, where each household pays a proportional amount depending on household size while non-residents pay-per-use.

This can increase affordability for low-income families without marginalising large families with young children (Satterthwaite, 2021), overcoming economic barriers to sanitation access. Nonetheless, community savings groups remain integral as informal incomes of low-income groups can be precarious. Low-income residents can fall back on savings groups to pay the fees after rapport and savings have been built (Homeless International Ex-Chief Executive, 2021; IIED Researcher, 2021).

On a city-level scale, co-production of services can enable the closure of the sanitation value chain, by reusing FS, as shown in Figure 14. GOAL has highlighted interest and potential partnership with the Ministry of Agriculture and Forestry in purchasing compost for farming (GOAL Sierra Leone Country WASH Coordinator, 2021). This would contribute to safe FSM, while providing an opportunity to funnel funds towards the provision and maintenance of sanitation infrastructure (GWOPA Consultant, 2021). It can also contribute to water for handwashing, an issue particularly prevalent due to the COVID-19 pandemic. Additionally, the FCC has turned 'the COVID-19 crisis into an opportunity' as hygiene and water has been prioritised (FCC Advisor, 2021). Many of Transform Freetown's hygiene goals have inadvertently been achieved as COVID-19 resources have been funneled into sanitation and hygiene (ibid), suggesting a strong feasibility that the government is willing to invest in sanitation improvements. However, further investment is needed to ensure the sustainability of CSF improves socio-environmental injustice.

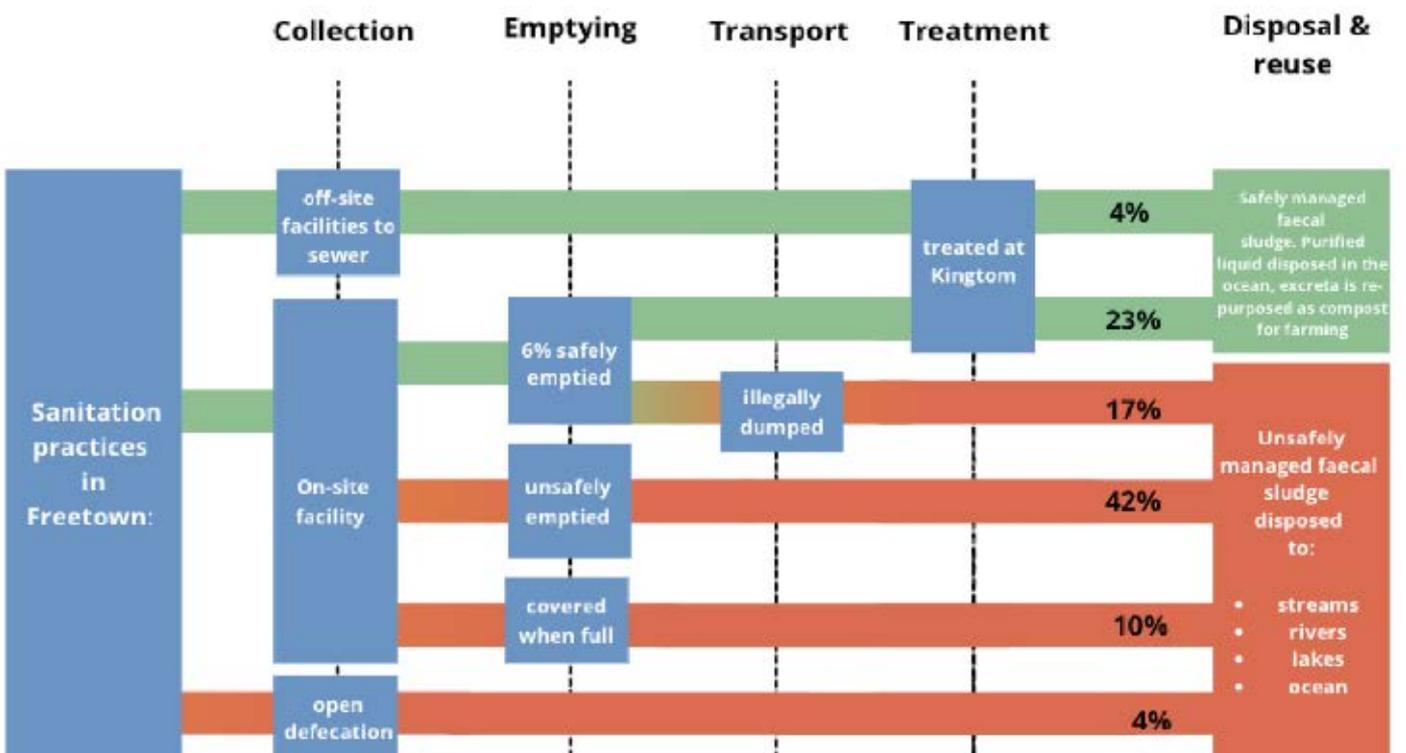


Figure 14. Sanitation Flow Diagram. Adapted from Mikhael (2011).

Nevertheless, the financial mechanisms suggested are only achievable with political will, and capital available to build CSF. The sustainable maintenance of CSF requires trust amongst community savers that money from the household permit is not abused, and will be used for the continued maintenance of CSF.

4. Conclusion

Improving sanitation is integral for Freetown to become a more socially and environmentally just city. Drawing on research, case studies from abroad and existing strategies in Freetown, this report recommends opportunities to enhance equitable access to sanitation in informal settlements through co-produced and decentralised communal facilities in Freetown, as a feasible entry point for achieving sanitation equitability at different timescales. Improving access to sanitation tackles socio-environmental injustice by reducing open defecation into the environment, positively impacting nature and people. Increasing inclusivity can enable short to medium-term access to sanitation, whilst sustainability anchors long-term solutions.

This report places a particular focus on informal coastal settlements in Freetown, due to the accumulation of socio-environmental risks and sanitation inequity. Recommendations are flexible to benefit settlements elsewhere in Freetown, and other cities with similar issues and characteristics.

Sanitation requires more stakeholder cohesion, transparency and accountability. Including the community in committees, and a range of individuals in focus groups and community meetings through co-production, ensures more inclusive and sustainable planning and monitoring. Building and adapting facilities to cater for everyone ensures inclusive access. Ensuring facilities are resilient to climate risks and finding ways to close the sanitation loop enables facilities to be sustained in the long-term. Stakeholder coordination and alternative pricing mechanisms can leverage funds, which are crucial for ensuring that facilities are accessible and sustainable.

Future studies could expand on the research gaps identified regarding land availability and ownership, gender inequalities, and understanding community sanitation needs in coastal informal settlements in Freetown. Fundamentally, a detailed and multifaceted framework to address co-production, financing and design, will ensure that no voices are marginalised during the provision and maintenance of inclusive and sustainable sanitation access in Freetown.

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Learning from innovation around the world



- 01** Creating user-friendly water and sanitation services for the disabled
- 02** Development of a disaster-resilient toilet
- 03** FSM Services through public-private partnership in Dhaka: SWEEP
- 04** Maputo Sanitation Block project
- 05** Mumbai Sewage Disposal Project (MSDP)
- 06** Pune Slum Sanitation Programme
- 07** The Indian Alliance
- 08** Affordable Maintenance Fees in Kanpur

Appendix 1: Creating user-friendly water and sanitation services for the disabled

📍 Baglung, Nepal

WaterAid
Nepal Water for Health (NEWAH)
WASH Alliance International



Summary

The 'Community Hygiene and Sanitation Action Committee (CHSAC)' was established as a sustainable institutional arrangement for the community in Baglung, Nepal. CHSAC is used to evaluate, monitor, govern, and maintain sanitation and hygiene activities, infrastructure and assets. Awareness and local knowledge was provided for behavioural change in sanitation. Due to their being community owned, the facilities were sustainable and committees were also used to create a focused plan to implement and increase sanitation and hygiene projects.

Impact

Involving the community allowed for their own planning and assessment of their activities. By involving the whole community, it transformed the perception of sanitation as an issue which marginalised certain social groups to one which involved the whole community. Collaborating with all socio-economic groups, the elderly and young, all genders, the dominant and marginalised, contributed to a successful outcome. As the communities contribute financially, it gives community residents both ownership and incentives. The Government coordinates sanitation and hygiene activities with the community to mobilise resources. This ensures resources are used effectively by the community in the long term. Collaboration of community residents and other community-based institutions has innovated sanitation hygiene services. A clear and direct plan makes it more accessible and relevant to low-income groups. Latrines were constructed in accessible spaces for the elderly, and those with disabilities. Importantly, it also includes the needs of women. The plan was made cost effective by utilising local human and raw resources, reducing transportation costs and external hires. NEWAH encourages local employment opportunities to build skills, which can keep local projects functional and sustainable, and trains women to become caretakers for the maintenance of communal facilities.

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Appendix 2: Development of a disaster-resilient toilet

📍 States of Assam and Gujarat, India

UNICEF
REDRI India



Summary

The States of Assam and Gujarat are annually affected by flooding and cyclones, and are located in an earthquake prone area. This has meant that existing facilities are damaged, beyond repair, resulting in the lack of access to safe sanitation. To supplement efforts in the Swachh Bharat Mission, which aims to achieve 100% open defecation free status in India, disaster-resilient toilet design was piloted in 2020. The design of the disaster-resilient toilets is co-produced by WASH experts, UNICEF experts, engineers, local NGOs and community members to capture user's needs and wants, while incorporating technical dimensions

Impact

In the Dhemaji district, the pilot engaged with engineers from the Public Health Engineering Department and provided training, which enabled local partners to gain a deeper understanding and build their capacity in constructing the disaster-resilient toilets. Following the training, 35 disaster-resilient toilets were constructed in Morigaon, Assam, and 2 were constructed in Banaskantha, Gujarat.

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Appendix 3: FSM Services through public-private partnership in Dhaka: SWEEP

📍 Dhaka, Bangladesh

Dhaka Water Supply and Sewerage Authority (DWASA)
 Gulshan Clean and Care(GCC)
 Water and Sanitation for the Urban Poor (WSUP)
 Funding was provided from The Bill & Melinda Gates Foundation
 The Stone Family Foundation
 UK Department for International Development (DFID) UNICEF
 Vitol Foundation
 Mahila-Milan



Figure 15. SWEEP Workers. [Image source](#)

Summary

In Dhaka, a PPP between sewerage authority (DWASA) and a local small-medium enterprise Gulshan Clean Care (GCC) addressed financial challenges for low income users. Two vacuum tankers were leased to empty septic tanks in homes and the public, then disposed of and treated in the municipal facility. The local enterprise provides a deposit and monthly lease fee to use the technology and follow regulations in exchange for use of a vacuum tanker. This city-wide programme charged lower income areas a lower tariff as costs were balanced by larger tanks and therefore higher prices for high income areas.

Impact

WSUP gained buy-in for the concept from key stakeholders within DWASA and demonstrated to business owners that faecal sludge management (FSM) was an untapped market and potentially profitable. The PPP agreement adequately balanced the strengths and weaknesses of both partners. WSUP continued to mediate between partners and to support GCC. The SWEEP became profitable within five months of start-up. Septic tanks are grouped into three categories: small (6-16m³), medium (16-32m³) and large (48-224m³). SWEEP customers living in low-income areas are charged a lower tariff of \$6-7.50 per cubic metre, compared to US\$10-15 for middle/high-income and institutional customers. Tariffs correspond to service fees ranging from US\$60-75 for small septic tanks, US\$150 for medium septic tanks and US\$250-1000 for large septic tanks. The pricing structure is not fixed which accounts for negotiations and fluctuating markets. The service has reached nearly 200,000 people, with an average 110 tanker loads collected and emptied per month. Low levels of revenue during the first five months were followed by the gradual increase in demand, as customers were satisfied by the service. Signage has also been effective in encouraging cleanliness and efficient disposal of waste. The model is replicable and now being implemented in other cities.

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Appendix 4: Maputo Sanitation Block project

📍 Maputo, Mozambique

WSUP



Figure 16. Member of the project. [Image source](#)

Summary

A gender focused approach towards communal sanitation blocks encouraged women leadership in managing, operating and maintaining communal facilities. The sensitisation of men helped to realise the importance of maintaining facilities adequately. The Maputo project had a four step process consisting of a 'needs based siting' involving community meetings with mostly women. Secondly, 'women-led design clinics' were used, whereby women-only focus groups were enabled with participation from project planners and engineers. Finally 'women-led construction' and 'women-led management' allowed women volunteers to take part in building the facilities and in leadership roles by forming the majority of standpoint operators.

Impact

The project led to the overall empowerment of women. It enabled women to have their concerns met, as their voices were heard during the design stage, as well as during construction and maintenance of communal facilities. It also enabled them to benefit economically from the blocks, as many women were employed in higher-salary paying leadership roles. As well as women, disabled individuals benefited from the new inclusive design of blocks. All of the communal facilities were built to provide access to people with physical disabilities, with one stall having railing to support a person in the individual compartment. Moreover, the project allowed for the sensitisation of men. Due to the sensitisation campaigns that were running in Maputo, many men learnt to realise the significance in maintaining CSFs in an adequate manner, and also learnt to be very supportive when women take up leadership roles.

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Appendix 5: Mumbai Sewage Disposal Project (MSDP)

📍 Mumbai, India

The Society for the Promotion of Area resource Centers (SPARC)
National Slum Dweller Federation Mahila-Milan



Figure 17. Mumbai Sewage Disposal Project. [Image source](#)

Summary

In 1998, NGOs had been invited to implement pilot projects involving the improvement of sanitation within slums in order to help the Municipal Corporation of Greater Mumbai to begin its slum sanitation program. SPARC had constructed community toilet blocks. With toilets having pour-flush latrines in equal numbers for both men and women. Separate entrances for men and women within the toilet blocks were created. As well as, specifically designed latrines for children. Community halls and a caretakers room were also established on the upper floors of toilets. Toilet blocks were designed to be easier to use for the elderly and disabled

Impact

The pilot project had proved to be a success, thus the 2001 Slum Sanitation Project (SSP) had been launched using the same model. A contract for 320 toilet blocks, or 6400 seats in 16 administrative wards was signed, however only 213 toilet blocks have been constructed due to political issues. 213 toilet blocks with 4000 toilet seats benefited at least 200,000 people within the first initial phase. The success of 'MSDP I' allowed for SSNS to leverage municipal government funding that would help improve Mumbai's infrastructure in the second and third phase of the project. The alliance will construct a further 150 toilet blocks in the second phase (MSDP II), and 120 toilet blocks under the third stage, MSDP III.

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Appendix 6: Pune Slum Sanitation Programme

📍 Pune, Maharashtra India

The Society for the Promotion of Area Resource Centers (SPARC)
Mahila Milan
The National Slum Dwellers Federation (NSDF)



Figure 18. Community meeting. [Image source](#)

Summary

The Indian Alliance worked with the Pune Municipal Corporation in 1999 to construct more than 10,000 seats in community toilet blocks. This was part of the Slum Sanitation Programme. The program had planned to build 220 blocks during 1999 to 2000, and another 220 during 2000 to 2001. The design of the facilities involved the introduction of seven pioneering innovations. The new facilities were both well-ventilated and well-lit, and due to their better quality construction, they enabled easier maintenance and cleaning. The toilet enabled separate entrances as well as facilities for both men and women. Additionally, a block of children's toilets have been constructed.

Impact

The toilet blocks benefited 500,000 slum dwellers as they reframed the communal sanitation facilities. The mode of implementation was that of a precedent-setting partnership amongst community-based organisations, NGOs and the municipality. Land had been provided, as well as capital-costs, electricity and water. CBOs and NGOs designed, constructed and were in charge of maintenance of the community toilets. This was a major positive change, as previously the government had built toilets but did not adopt a participatory approach, which resulted in poor quality construction and maintenance.

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Appendix 7: The Indian Alliance

📍 India

The Society for the Promotion of Area Resource Centers (SPARC)
Mahila Milan
The National Slum Dwellers Federation (NSDF)



Figure 19. The Indian Alliance. [Image source](#)

Summary

The Indian Alliance comprises SPARC, NSDF and Mahila Milan. SPARC works with the most vulnerable and invisible of Mumbai's urban poor. Mahila Milan is a decentralised network of poor women's collectives that manage savings and credit activities in local communities. NSDF is a national organisation of community groups and leaders who live in informal settlements and slums across India. The Indian Alliance has improved the lives of thousands of households, by providing them the necessary tools to engage with the city and state they live in.

Their design is inclusive and community-led, therefore, community needs are taken into consideration. As a result, a built-in caretaker for the caretaker to live in and maintain communal sanitation facilities were part of the design. Likewise, as it was the community's needs considered, separate entrances for men and women, as well as child friendly toilets were also incorporated within the design.

Impact

The Indian Alliance has provided thousands of individuals with communal and individual toilets in several states in India. Since its conception there have been 819 community toilet blocks constructed as part of the Indian Alliance.

These separate entrances for men and women, as well as children's toilets have alleviated some inequalities between social groups within communities. For instance, children are no longer pushed out of the queues, and women feel safer as separate facilities reduce gender-based violence.

A built-in caretaker room for the caretaker to live in and maintain the CSF lowers management and maintenance costs, as accommodation can form part of the caretaker's compensation, and provides employment to maintain the facilities.

Through exchanges and learning from Mahila Milan, women's savings groups are central to the viability of communal sanitation facilities maintenance as they can lobby and increase women ownership of communal sanitation projects, and pay for regular pit latrine emptying.

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Appendix 8: Affordable Maintenance Fees in Kanpur

📍 India

Kanpur Slum Dwellers Federation (KSDF)
Mahila Milan
Kanpur Water authority



Figure 20. Affordable Maintenance Fees in Kanpur. [Image source](#)

Summary

The KSDF conducted a survey in 1993 which found that the 66% of the population living in 228 slums had no toilets. A further 21% had inadequate toilets as they were not maintained. The first toilet-building programme was made possible with the help of the KSDF members from Mumbai, where the first toilet-building programme was built. In Kanpur, there were two fees, one of which was a monthly fee payment per family living within the community that paid ten rupees a month. The other fee was one rupee a day for people living outside the community, whether they were visiting or working in the community. These fees covered the maintenance costs of the toilets.

Impact

The fees contribute to the maintenance of the communal sanitation facilities, as it has enabled the full-time employment of someone to collect the correct fees from residents and outsiders keep the water tank filled, and to keep the stalls clean. With a full-time caretaker, these sanitation facilities are not left derelict, and it encourages users to utilise the sanitation facilities with respect. More people are opting to use communal sanitation facilities over practicing unsustainable sanitation practices, such as open defecation.

Additionally, the monthly fee works out cheaper for families rather than a daily or pay-per-use system, and does not disproportionately impact larger families. A monthly fee has overcome some socio-economic injustices surrounding gender inequality and economic barriers in Kanpur. Monthly fees are cheaper for families rather than daily fees, and this helps to overcome some gender inequalities, because women traditionally adopt caring roles, therefore disproportionately paying more than men if they have to take their children to use the toilets under a pay-per-use system. Likewise it overcomes some economic barriers for families with young children as they typically have to frequent the toilet more often.

A pay-monthly system overcomes the pay-per-use system economic inequalities faced by the large families that had to pay a disproportionate amount to use the sanitation facilities. Instead, each household could use the toilet as frequently as needed so long as they paid the monthly fee.

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