
Driving Freetown Towards Enhanced Mobility:

Emerging opportunities from health crises for improved access to livelihoods.

Eliot Froment
Jessica Clifton
Syed Mujtaba Masroor
Natalie Kwong
Nicolás Rodríguez
Raja Asvanon
Vigan Osmani
Viviana Sánchez-Aizcorbe



Acknowledgements

We would like to thank everyone we have worked with from the Development Planning Unit (DPU) and University College London (UCL) for your guidance, advice and for making this project possible: Prof Adriana Allen, Dr Rita Lambert, Dr Pascale Hoffman and a special thanks to Dr Donald Brown for his valuable inputs for the duration of the project.

We would also like to thank the Sierra Leone Urban Research Centre for setting up contacts for us on the ground and for arranging the interviews.

We extend our special gratitude to Abdulrahman Mohamed Dukuray who worked tirelessly and without who this report would not have been possible. His engagement with us and the interviewees was of high quality and without his efforts we would not have been able to successfully go forwards with this report.

Abbreviations

- CBD:** Central Business District
COVID-19: SARS-CoV-2
EVD: Ebola Virus Disease
FCC: Freetown City Council
FEDURP: Federation of Urban and Rural Poor
GHG: Greenhouse Gas Emissions
HBE: Home-Based Enterprises
PT: Paratransit
IDB: International Development Bank
IT: Institutional Transport
SL: Sierra Leone
SLURC: Sierra Leone Urban Research Centre
UCL: University College London
UN: United Nations
UPA: Urban and Peri-Urban Agriculture

Glossary of Terms

- Poda-Poda:** Minibus carrying up to 15 passengers
Keke: Three-wheel auto-rickshaw
Okada: Two-wheel motorcycle
Paratransit: Private, operated as businesses (Poda-Poda, Keke, Okada)
Institutional Transport: Government owned routed transport
Public Transport: For this report it involves both PT and IT

Executive Summary

Urban mobility is fundamental in ensuring that the capacity to access goods, services, health facilities and economic opportunities is distributed evenly amongst the population. Considering issues of environmental justice, efforts related to urban mobility take on a dimension of political participation, socio-cultural recognition and of distribution of mobility capabilities and infrastructure. With the emergence of COVID-19, the question of how these mobility networks are impacted but also what the opportunities are to further the pursuit of enhanced mobility in cities throughout the globe arise both during and beyond the pandemic.

In Dwarzack, an informal settlement of Freetown, Sierra Leone, these wide-ranging questions are experienced in everyday practices. This is particularly true for women, who face both uneven accessibility to mobility but also the social requirements of sourcing goods for households whilst balancing commerce activities. When adding the impacts of a health crisis, these existing constraints are further exacerbated. In this sense, enhanced urban mobility is perceived as a path towards ensuring that principles of equitable access to transport and opportunities are available for all.

We thus argue that to alleviate some of these experienced constraints, a novel strategic approach to urban mobility is needed. This would include a redefinition of the links between market spaces, the spatial distribution of these and the supply chains which feeds into them. Secondly, through principles of co-funding and co-planning, improved mobility infrastructure will allow for an enhanced accessibility to connectivity links. Finally, we foresee that the inclusion of women within the mobility-planning process by actively recognising their role and disclosure of their needs in transport will allow for the integration of transformative change within the mobility landscape of Freetown.

To cite: Kwong, N., Asvanon, R., Clifton, J., Rodríguez, N., Masroor, S.M., Froment, E., Sánchez-Aizcorbe, V. & Osmani, V. 2020. Driving Freetown Towards Enhanced Mobility: Emerging opportunities from health crises for improved access to livelihoods. Group output produced for the Learning Alliance between the Sierra Leone Urban Research Centre (SLURC) and the Environment and Sustainable Development (ESD) MSc Practice Module at the UCL Bartlett Development Planning Unit (DPU).



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1. Introduction

1.1 Context and overview

The COVID-19 pandemic has caused mass disruption to societal travel patterns and exacerbated mobility constraints on a global scale. The virus has disrupted already fragile systems, severely hindering development and creating a multitude of economic externalities that are negatively impacting livelihoods, particularly of marginalised, vulnerable groups. Furthermore, the requirements for staying at home and social distancing expose the deep existing socio-economic inequalities in cities across the globe. A UN report states that from past-experience and emerging data, it is possible to predict that the impacts of the COVID-19 pandemic will negatively affect women and their livelihoods for the foreseeable future (UN, 2020).

Such is the case in Freetown, Sierra Leone, where the city has undergone unplanned and sporadic urbanisation, characterised by drastic social and spatial inequalities, and thus despite being in the early stages of the virus, social groups of the urban poor, poor women in particular are being disproportionately effected (World Bank, 2019). Considering such development has occurred without adequate transport infrastructure services, and few land-use plans, the mobility of informal dwellers in Freetown is severely hindered. These constraints materialise in the form of traffic congestion, economic damage and time poverty.

In this report, we define enhanced mobility as “increased movement of people and goods through improved infrastructure, transport, and safe access to social, economic, and emergency services”. More specifically,

the scope of our focus centres on women and their livelihood opportunities. Women occupy up to 70% of food trade roles and are often responsible for purchasing fresh produce in Freetown (Diggins and Mills, 2015). As large markets are spatially removed from the informal settlements, this leaves women vulnerable to mobility risks daily. Furthermore, evidence suggest that women face sexual harassment on both institutional and PT vehicles, with more incidents being reported on the latter (World Bank, 2019). Thus, enhanced mobility plays a crucial role to improve women’s accessibility to hotspots of trade. Seasonality is an additional factor exacerbating the existing constraints on mobility, as chronic floods lead to price hikes, thereby reducing mobility and limiting accessibility. This disconnected nature between infrequency of services and price fluctuations of transport services highlight some of the problems currently existing in the transport sector of Freetown. Understanding the interconnection between gender, livelihoods, and mobility during the COVID-19 health crisis in Freetown, is thus essential for the mitigation of future risks associated with most vulnerable social groups (Figure 1).

1.2 Lessons learnt from the past health crisis

When analysing the impact of COVID-19 on mobility, we drew from studies of past health crises to provide us with insight on what opportunities for transformative change can exist post COVID-19. In so doing, we used lessons learned throughout the EVD epidemic as a baseline for the development of our report. Although the EVD exacerbated many of the aforementioned risks, it also revealed

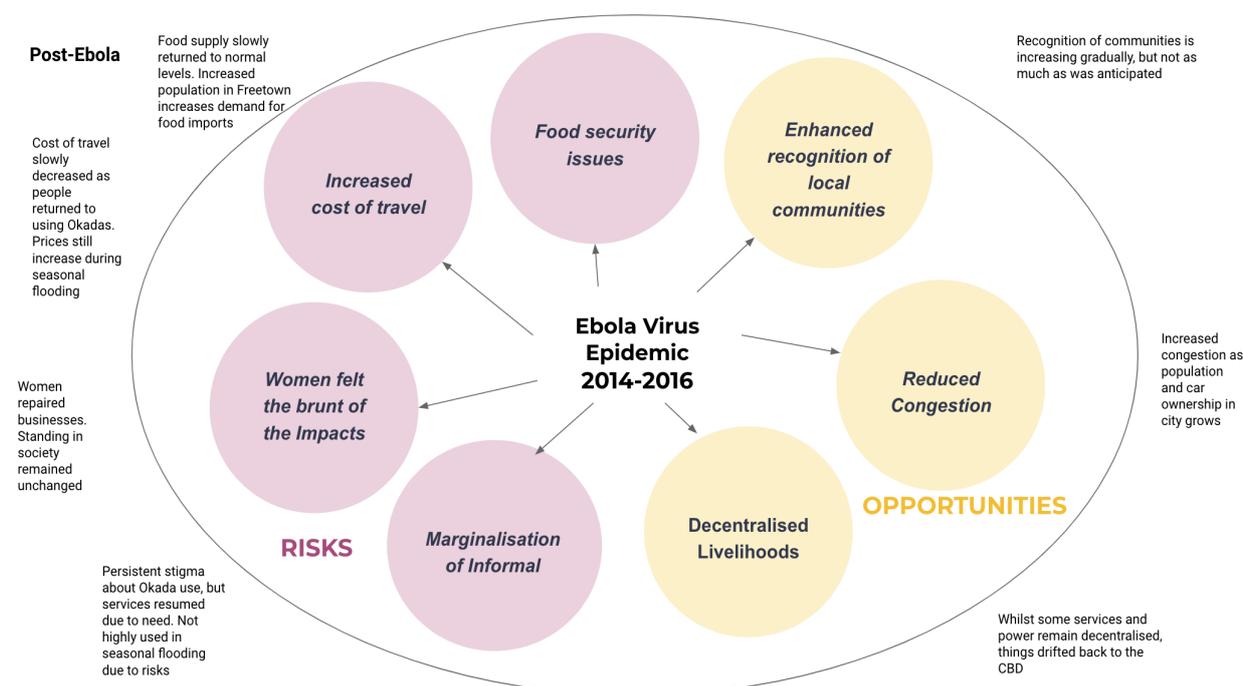


Figure 1: Risks and opportunities emerging from EVD epidemic.

opportunities in relation to enhanced mobility, livelihoods, as well as access to goods and services.

During the Ebola Virus Disease epidemic there was intra-urban, rural to urban and cross border mobility despite the top-down restrictions. The cost of travel was largely affected during the EVD, as passengers were often asked to pay for empty seats to recover lost revenue (Amara et al., 2015). In so doing, fares increased for certain destinations not reachable by foot, a factor which shapes the daily experiences of most women in informal sectors away from Dwarzack (World Bank, 2014). With women playing an important role in food production, limits on mobility inadvertently lead towards food insecurity in Freetown, as costs of goods increased due to greater transportation losses. Consequently, communities with low socio-economic status were particularly prone to suffering the brunt of the economic fallout associated with EVD (Lynch et al., 2020). As such, we anticipate that COVID-19 may present similar issues to EVD, namely the uneven distribution of impacts amongst the population of Freetown.

Despite the disproportionate effects on mobility, there was however decreased congestion as a result of the EVD, with many people preferring to walk to reachable destinations and avoiding other transport modalities altogether. The crisis also led to a partial decentralisation of power and services, with many residents becoming legitimately recognised as vital community stakeholders, due to their extensive participation in the health campaign (Macarthy et al., 2017). In effect, although the EVD crisis strengthened social cohesion amongst informal settlements in Freetown, opportunities for equitable distribution of goods through reduced supply chains were not structurally acted upon.

The EVD epidemic resulted in further urban growth given the centralisation of medical services in Freetown. With mass migration from rural areas widely encouraged, there was additional stress on the already limited resources and services in Freetown, thereby fuelling problems of inequality (Lynch et al., 2020). Marginalised PT workers, such as Okada drivers, were impacted the worst, considering they were often blamed for transporting Ebola victims and thus facilitating the spread of the disease (Doherty, 2014).

As previously mentioned, women's livelihoods were also particularly affected, with restrictions on trade and mobility severely diminishing their earning power; female-led households faced the most disproportionate risks (Diggins and Mills, 2015). When combined with the notion of decentralised access to goods and services, there appear however, certain opportunities to tackle these challenges faced by women in Freetown. This can be done in a spatially just manner, while simultaneously ensuring the proper involvement and recognition of various informal settlements. As such, it is evident that health crises such as the Ebola epidemic often expose the uneven

constraints on mobility, albeit presenting possible avenues for future transformative change through collective action. The report will draw on this experience in order to analyse the COVID-19 crisis currently unfolding in Freetown. We aim to investigate and understand the nexus between livelihoods, gender, and mobility, to explore the barriers facing enhanced mobility and to provide potential strategic recommendations for a post-COVID-19 era.

1.3 Problem analysis and research gap

The research into urban mobility in the context of Freetown has been growing in recent years. Learning alliances between UCL and SLURC have explored the area to identify potential risk accumulation cycles. In addition, the T-SUM project is currently conducting innovative research into accessibility and sustainable urban mobility for Freetown. Whilst these projects are expanding the knowledge basis for understanding mobility in the city, several factors have not been investigated. In particular, the impact of health crises on the interrelation between livelihoods, mobility, and gender, is not yet fully understood. This relates more widely to the lack of data and mobility information available for informal settlements in low income countries (Satterthwaite et al., 2019).

As a result, this report wishes to add to the understanding behind women's mobility in accessing goods and services, while simultaneously highlighting the role played by PT operators to better comprehend these issues. Furthermore, questions of mobility constraints emerge upon analysing the role of accessibility in the face of episodic environmental pressures and emergent health crises. In so doing, we aspire to provide recommendations which will facilitate investment opportunities targeting the disruption of risk accumulation cycles, thereby improving long-term community health, economic wellbeing. By developing a deeper understanding of these interrelated factors, this report aims to contribute towards transformative change in the realm of urban mobility through a focus on the uneven constraints experienced by women in Freetown.

1.4 Case study context

This report will focus on the case study of the FCC recognised settlement known as Dwarzack to contextualise our discussion. The settlement, established in 1914, has gone through several episodes of rapid expansion particularly from the 1980s onwards; other noteworthy events include the Civil War and more recently, the EVD epidemic which drove people from the rural areas into the city (Lynch et al., 2020). Through such spurts of growth, Dwarzack has developed in an unplanned and sporadic manner. This has resulted in the proliferation of makeshift roads and dirt paths as key mobility routes within the settlement and only one formal road: George

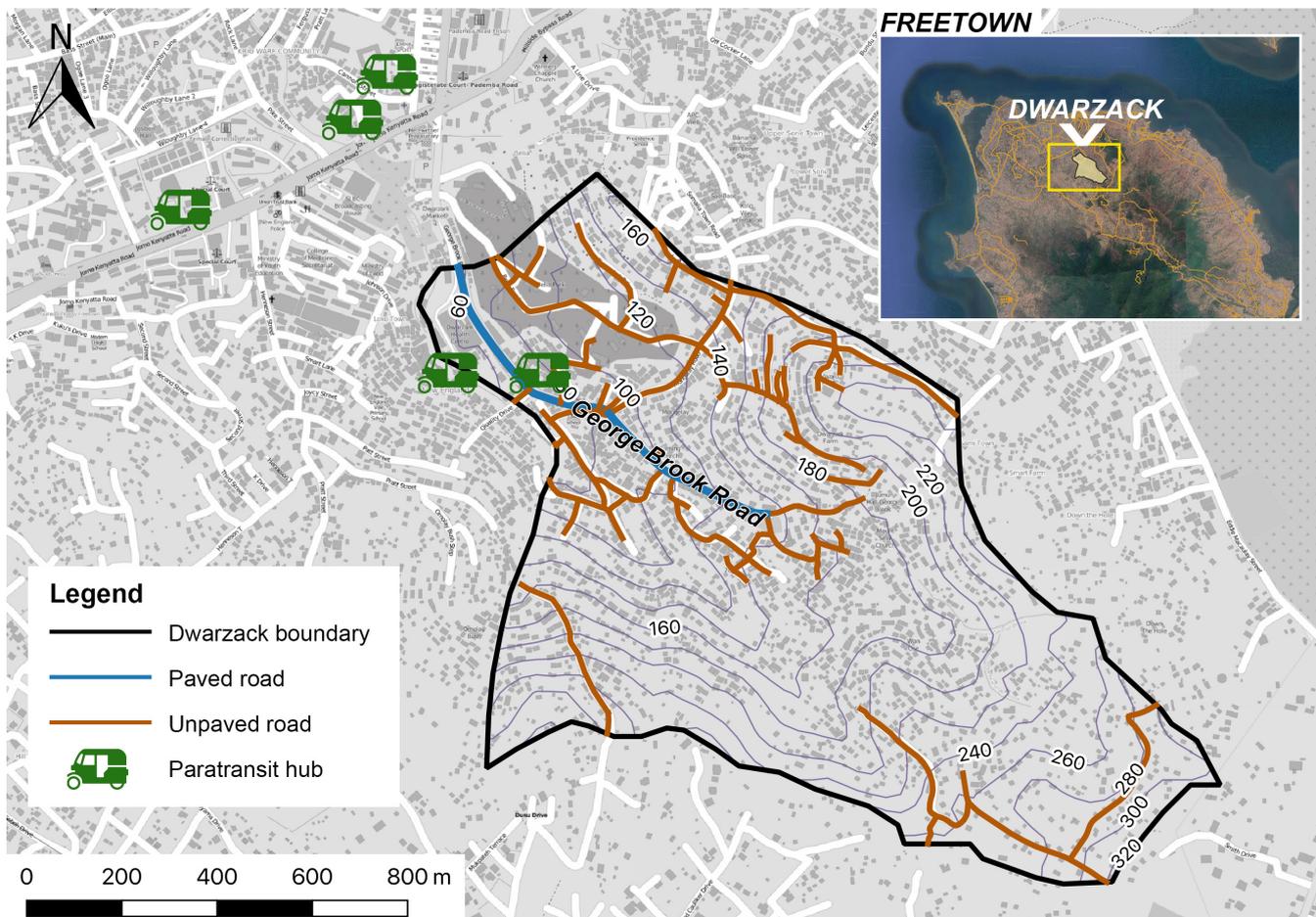


Figure 2: Main transport routes in Dwarzack ((data adapted from ASF and SLURC, 2018; PT data from (Oviedo, 2020)).

Brook Road (Figure 3). As such, transportation modalities may change according to inhabitants’ needs as well as potential environmental pressures (Lynch et al., 2020).

The topography and environmental risks thereof, are central to understanding the mobility profile of Dwarzack. It is a hillside settlement with an elevation ranging from 57m to 316 (ASF and SLURC, 2018), thus often being prone to strong environmental pressures including landslides and flooding, both of which are detrimental to general mobility. Due to the makeshift nature of the roads within the settlements, they are often inundated or washed away by episodic flooding, leading to large economic, accessibility, and quality of life losses (Nelson et al., 2019).

Despite being located just 5 km away from the city centre, inhabitants residing higher up the Dwarzack valley experience generally poor mobility and accessibility, which is exacerbated by Dwarzack’s growth into higher elevation zones. (ASF and SLURC, 2018).

The main mobility hubs of the settlement are located along the George Brook Road, with pick up spots for PT operators shown in Figure 3 (ASF and SLURC, 2018). Worrying implications materialise when analysing that there is a differentiated access to these mobility hubs within the settlement (Oviedo et al., 2020). For instance,

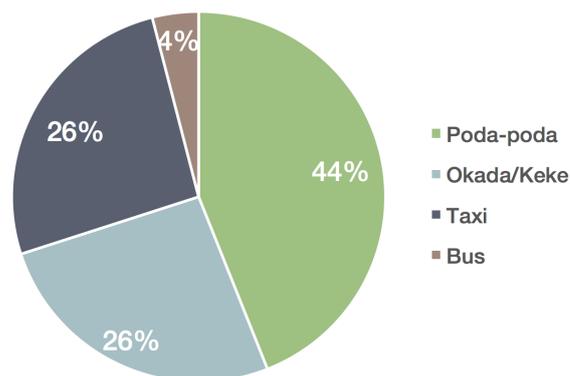


Figure 3: Types of transportation operating in Freetown (adapted from Integrated Transport Planning, 2019).

residents in the upper elevation zones suffer from poor infrastructural connections and unpaved roads, thereby resulting in considerable time constraints and poor connectivity links (Figure 3). In order to connect to the rest of Freetown, inhabitants depend on walking and public transport operators for their mobility needs given low car ownership percentages, with a preference for PT operators in the form of Okadas, Kekes and Poda-Podas (Oviedo, et al., 2020; Figure 4).

In terms of demographics and economic activity, the central sphere of productive work in the settlement

consists of petty traders and “table-top businesses”. These are central to the informal economy of the settlement and are predominantly operated by women (ASF and SLURC, 2018). Socio-cultural patterns and lack of formal education render women disadvantaged in finding formal employment, and they thus face a high level of economic constraints whilst balancing productive and reproductive responsibilities (Maclure and Denov, 2009).

Based on the aforementioned information, the case of Dwarzack will allow us to tackle the identified information gap. Additionally, the strong presence of female petty traders will enable us to explore the relationship between economic activity, livelihoods, and mobility, in the contemporary COVID-19 crisis. In reference to the EVD, the PT sector appears to hold a vital role in terms of prevention and limited spread of disease. We will use this reliance on PT transport as an entry point to understand mobility patterns and what collaborative channels exist with FCC, the settlement residents, and economic actors, for promoting enhanced mobility in Dwarzack and Freetown.



Photo 1: George Brook Road in Dwarzack; © 2019 ESD Dwarzack Group

2. Research Overview

2.1 Research question

While considering the previous impact of EVD and observing the current COVID-19 situation, we have identified the following research questions:

In reference to previous health crises, does COVID-19 provide opportunities for improved urban mobility, or does it exacerbate existing uneven mobility?

How can mobility restrictions in Freetown during COVID-19 be used as a catalyst to improve urban planning for mobility justice?

2.2 Hypothesis

We hypothesise that PT transportation is integral in controlling the disease outbreak in Freetown and maintaining livelihood in marginalised communities during a health crisis. Furthermore, a decentralisation of services in Freetown could reduce congestion, seasonal disruptions and gender inequalities, whilst improving access to goods and services through community supply chains. Finally, mobility restrictions during health crises in Freetown may represent entrepreneurial avenues for women's engagement in informal economies, thereby promoting increased resilience in an already limited economic sector.

2.3 Analytical framework

To assess uneven mobility patterns in Freetown, we used the analytical framework of Environmental and Mobility Justice.

Explained by Schlosberg (2007), Environmental Justice refers to the fair involvement and meaningful treatment of all people regardless of ethnicity, race, gender, and socio-economic status, in reference to sustainable development and the enforcement of equal regulations and policies.

As discussed by Sheller (2018), Mobility Justice analyses the socio-political issues in relation to the free movement of diverse peoples, wherein certain social groups engage in unsafe practices that inevitably produce uneven mobility patterns. In contrast to environmental justice, mobility justice aims to uncover the embodied differences in relation to gender, race, income, ethnicity, and physical accessibility to available mobility schemes. The theory seeks to address the historical injustices associated with the production of uneven mobility constraints while simultaneously developing new ways of understanding and tackling the challenges felt by marginalised groups.

Combined, we believe that these lenses provide ample opportunities for which we will be able to expand upon the uneven socio-environmental and mobility constraints currently existing in Freetown.

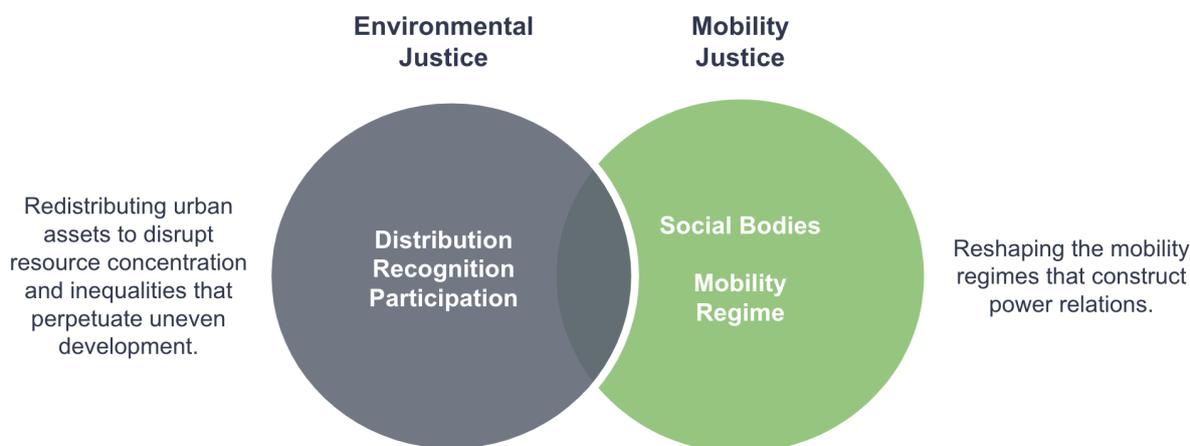


Figure 4: Environmental justice and mobility justice analytical framework.

3. Methodology

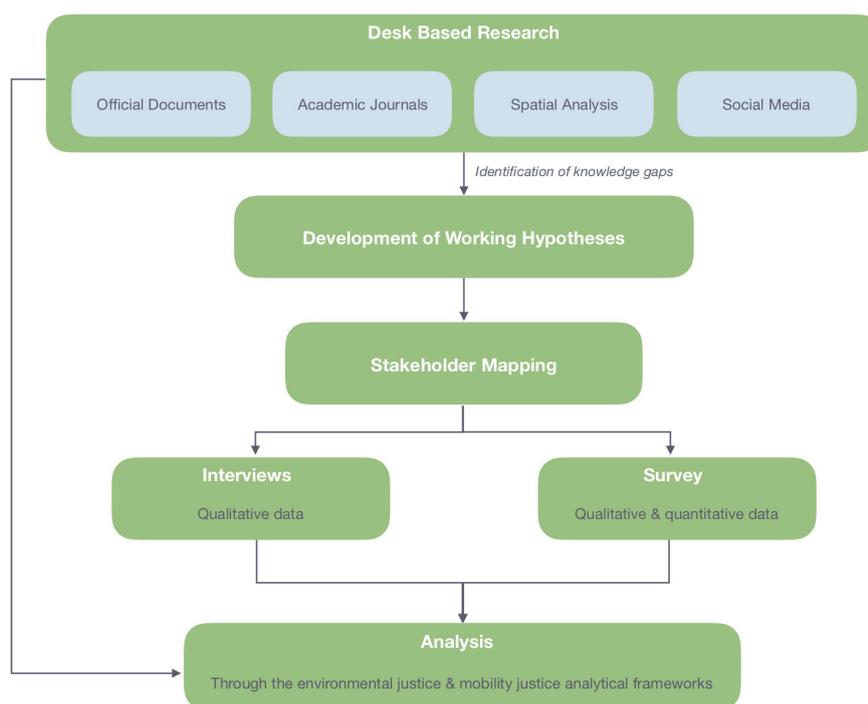


Figure 5: Workflow diagram.

3.1 Method

Prior to the development of the research question and working hypotheses, we conducted desk-based research to understand problems of urban mobility and how they relate to health crises in the global context, as well as at the municipal level of Freetown. This involved consultation of official documents published by government institutions (eg. FCC, Ministry of Transport), intergovernmental and international organisations (eg. World Bank, UN) and civil society organisations (eg. SLURC, FEDURP). Furthermore, academic literature and social media were reviewed to provide an understanding of mobility in the context of

Freetown and on the individual scale. In so doing, we have identified certain knowledge gaps (see section 1.3) through which we developed three working hypotheses. To successfully address these points, a stakeholder engagement map was drawn out to identify the potential actors to be interviewed (Appendix 1).

A total of 9 semi-structured interviews were conducted onsite and remotely in either English or Krio (Appendix 2). Additionally, we developed a survey questionnaire on Google Forms which we shared via WhatsApp, to a total of 12 respondents from Dwarzack; in some cases, the survey was conducted in person through the Krio

language (Appendix 3). Using the analytical framework developed in Section 2.3, the results of the interviews and survey in combination with the desk-based research were analysed to address the research question and working hypotheses.

3.2 Limitations

There were several limitations within the methodology that restricted a conclusive analysis for this report. In reference to desk-based research, we were only able to review English documents, resulting in the absence of potentially imperative literature by Krio authors. For the onsite interviews, questions were prepared remotely, thereby restricting possible follow-up questions which could have facilitated conclusive interviewee input. The short time frame for survey distribution further inhibited our ability to draw clearer representations from the Dwarzack community, given the small sample size of respondents. Moreover, surveys and interviews conducted in Krio may have become distorted through translation, thereby resulting in the loss of original meaning. Spatial analysis of survey results was also limited by the lack of proper georeferencing.

4. Findings

Despite these limitations, drawing from our research on previous health crises and exploration of our hypothesis in the context of Dwarzack, we were able to form the following four key findings.

4.1 Local markets and HBE in the peripheral areas are essential in maintaining livelihoods and creating opportunities

Besides the existence of a formal market, the community identified that 152 homes also operate as private businesses (ASF and SLURC, 2018). The interviews we conducted reveal that these independent enterprises (or HBE), are fundamental in maintaining the livelihoods of women in the Dwarzack community. Operating a business from home, or living in close proximity to the workplace, as is the case of an interviewed Dwarzack Market Seller who reaches the market by foot [Interview 3, May 2020], allows women to balance their home activities with their jobs. Many women also engage in such activities due to a lack of formal education as discussed with the owner of a HBE in Dwarzack [Interview 6, May 2020]:

“ Because [I] wasn’t fortunate to complete formal education and that was part of the reason [I] decided to enter into business. And secondly [I] don’t like the idea of working for other people because of the lack of education. [I] am the proud owner of the business.”



Photo 2: HBE owner and Abdulrahman Mohamed Dukuray in front of her business in Dwarzack, Freetown; © 2020 Abdulrahman Mohamed Dukuray

In the Dwarzack community, HBE's also work towards empowering women, affirmed by the Office of Gender and Social Services as a necessary step for increasing safety within the household by providing economic independence [Interview 4, May 2020].

As much as these businesses contribute to improving the economic capacity of women in peripheral areas, our findings suggest that developments of the current COVID-19 health crisis may undermine the progress made so far. These worries materialise in the form of

increased price of produce in central markets due to travel restrictions, the general decrease of customers, and limited transport services. This disruption is considered to be more severe than the Ebola Crisis, with current measures taken by the government having a more direct impact [Interview 3, May 2020]. A community representative for the area [Interview 7, conducted May 2020], considers that economic support for businesses is necessary to cushion the economic downturn.

4.2 Women are required to travel great distances to markets even during health crises and flooding

“ With regards to the location of [my] customers, mostly they come from New England because people within the Dwarzack community actually hardly come by.”
 - Interview 3, Market Stall Owner in the Dwarzack community market



Photo 3: Community representative in his office in Dwarzack, Freetown with Abdulrahman Mohamed Dukuray © 2020 Abdulrahman Mohamed Dukuray



Photo 4: Interviewed market seller with Abdulrahman Mohamed Dukuray in the Dwarzack Market, Freetown; © 2020 Abdulrahman Mohamed Dukuray

To reduce the negative impacts of the health crisis, the FCC has prepared recovery packages for the city which include a participatory approach for women “where they can decide for themselves what they want and how they want it” [Interview 5, May 2020]. However, it is currently unclear what form these packages will take and who will receive them. The government of Sierra Leone has also been working towards enhancing the capacities of women; initiatives such as monetary support granting and training, however, have been at a standstill due to the impact of COVID-19.

From the surveys conducted with Dwarzack residents, we found that all respondents opted to use markets in central areas despite their proximity to markets and HBE’s in Dwarzack. Dovecot and Congo market, both of which are approximately 5-6 km distance away from the George Brook Road in Dwarzack, were the most frequented markets. Furthermore, we discovered that it is common for women to travel there by Okadas or Kekes, a consequence of Dwarzack’s neglect from the public transport sector (Oviedo, 2020). Due to this exclusion

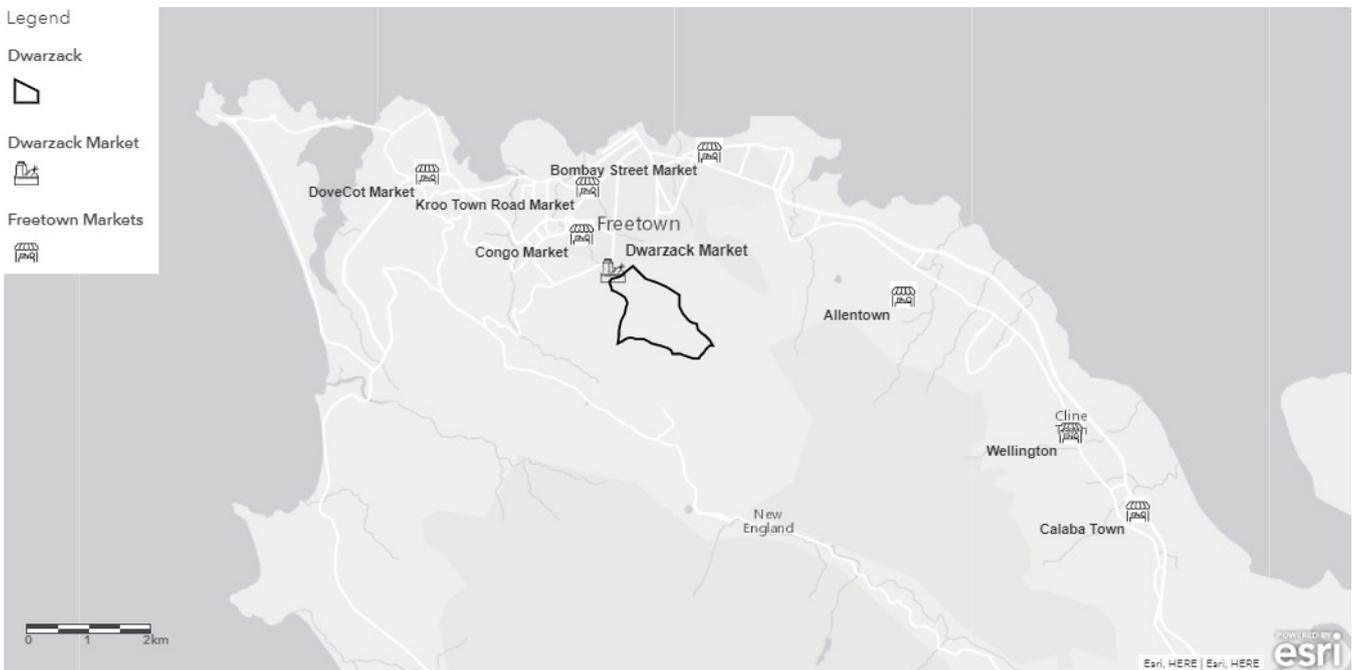


Figure 6: Map of Freetown markets used by residents of Dwarzack (created by authors).

from routed IT, the residents of Dwarzack often face higher transportation fares to central markets where they depend upon for access to livelihood opportunities and fresh produce.

As PT services remain unregulated, negotiation of fare pricing is possible. Evidence suggests however that women are likely to be charged a higher price than men (Oviedo, 2020). Despite increased journey time and price during COVID-19, respondents from our survey continue to travel to central markets in favour of markets in Dwarzack. This is primarily due to central markets being terminal points for food brought in from over provinces; food is often cheaper, there is more variety, and it is considered to be fresher. Journey times have increased by an average of 30% across all areas of Dwarzack, while it was not empirically possible to understand the exact price changes due to negotiation differences between individuals.

While we understand that, at the individual scale, people buy goods in central markets to sell for profit in the Dwarzack community; we have found no evidence of communal initiatives to bring food produce to the settlement during COVID-19. Additionally, a shortage of regulation and communication links between markets and urban and peri-urban agriculture (UPA), hinders the supply of fresh produce from reaching the settlement directly. This long supply chain is disrupted not only during health crises, but also during seasonal floods and mudslides. Consequently, the mobility of residents in Dwarzack is severely hindered in addition to increased food prices in times of scarcity. This provides evidence of supply chain disruptions causing relevant food insecurity for social groups facing disproportionate risks.

4.3 The recent COVID-19 crisis has highlighted the key role that PT operators play in the mobility of Freetown

As previously discussed, the community of Dwarzack is primarily served by PT operators, namely Okadas, Poda Poda's and Kekes (Figure 4). According to interviews with residents and the Dwarzack community leader, social distancing requirements has led to reduced availability of transportation services and higher prices to cover the empty seats.

It is found that PT operators are often left out of transportation planning decisions, even though Okadas and Kekes are recognised as a registered service. Moreover, routes and hubs remain unplanned and structured to meet the needs of the population rather than having clear and established guidelines by the FCC. An unpublished report by the ongoing T-SUM project, shares insights into the coverage of Okadas and Kekes including distribution hubs and populations served. It argues that insufficient services cause long queues, especially during seasonal flooding, with operator response times also

slowing down. Collectively, these factors highlight that specific locations within Freetown remain underserved by respective transportation services.

During the COVID-19 crisis, co-operation between the FCC and PT operators has been necessary in order to ensure that regulatory measures were adhered to. According to a member of a local PT operator [Interview 2, May 2020], PT operators have the power to levy fines against those flouting institutionalised regulations, though we are unsure what incentives are in place to encourage this. The engagement between PT operators and FCC regulations was also apparent during the Ebola crisis, thus it could provide fertile ground for further collaboration.

When asked what opportunities local actors think would arise in a post-COVID scenario for collaboration with transport authorities, a representative of the PT operators [Interview 2, May 2020], provided a brief general statement that "there will be opportunities compliant with transport authorities' directives". Based on past evidence, we can estimate that greater integration of PT and IT would increase the reliability and efficiency of transport services in Freetown. Furthermore, integration of PT operators into standardised safety training, regulations, and monitoring (assuming these exist and/or functional) could help reduce risks for passengers while also balancing fare pricing for settlement dwellers.

Similar to the Ebola crisis, residents in Freetown tend to prefer other means of transport due to concerns of viral transmission [Interview 2, May 2020]. The FCC have taken measures to provide over 10,000 masks to PT operators in order to regulate and incentivise upkeep of health and safety practices. Despite these measures and individual initiatives to sanitise hands, an Okada driver who is influential in Dwarzack operations, states that many drivers are forced to stay home during this period, thus suffering significant reductions in income. Drivers' incomes are also sensitive to seasonal variations, wherein heavy rains and flooding enable volatility in transportation rates; high demand during such times is positively associated with higher pricing regulations. Using past health crises as cornerstones for our findings, we can thus predict that the marginalisation of Okada use during COVID-19 may persist long after social distancing terminates.

“ The effects for Okada riders are much harder because of their exposure to rain. So people would rather take transport which offers protection from the rain (Kekes, Poda-Podas and taxis) – we will be running out of business.”

- Interview 2, Okada driver

4.4 The existing infrastructure is not always safe for women to travel, placing them under unnecessary risk

Women's mobility needs are made difficult by the existing infrastructure in both Dwarzack, and Freetown, including factors which make it unsafe to travel. In turn, women's accessibility to goods and services becomes severely limited. As previously mentioned, these problems are highlighted in the form of sexual harassment which varies through different transportation modalities but is mostly felt with Poda-Podas. PT operators are also not adapted to the mobility requirements of women, such as the carrying of children or material packages (Saffa GF, 2019).

Steps are being taken to increase the participation of women in the transport sector, with the Sierra Leone government requiring a 60/40 gender balance [Interview 5, May 2020]. They mentioned that the bike riders' union, of which they are a part of, requires a 50/50 split for executive positions, including the Chairlady and Vice Chairlady. The organisation is also currently training women to work as bike riders, thereby enabling entrepreneurial channels for women in this business sector [Interview 5, May 2020]. Currently however, bike riders are predominately male.

The gender balance objectives, alongside cooperation of PT operators in relation to COVID measures, marks a positive trend that the FCC hopes can materialise in Public-Private Partnerships [Interview 4, May 2020]. In so doing, there are aspirations for improved availability of transport for women, in which they do not need to impose themselves over others for access to transport modalities [Interview 4, May 2020]. A representative from the Office of Gender and Social Service also recognised that collaboration with the Ministry of Transport would aid in pushing for a more gender-friendly approach towards transportation management [Interview 5, May 2020].

Lastly, it is imperative to mention that the existing infrastructure within the Dwarzack community is another cause for concern. The DCAAP recognises the importance of improved street lighting to increase overall social safety. Bridges and footpaths are also recognised as vital additions for enhanced mobility, with evident community willingness to co-finance these initiatives (ASF and SLURC, 2018). The enhancement of walking facilities would also align with the FCC's goals of reducing GHG by promoting non-motorised modes of transport [Interview 1, May 2020], while simultaneously benefitting women who are more dependent on walking than their male counterparts (Saffa GF, 2019).

5. Strategic Approaches for Transformative Mobility Planning

In this section, we draw on our findings to support the ongoing efforts outlined throughout Section 4 by proposing strategic approaches for enhanced mobility in relation to livelihoods (Figure 7). We focus on the following pathways: Decentralising Resources and Shortening the Supply Chain, Participatory Planning for Mobility Infrastructures, and Inclusion and Recognition of Women in Mobility Regimes. Underlying these pathways, are the processes of participatory urban appraisal and community action planning, considered to be the building blocks of transformative mobility planning (UN-Habitat, 2009). As such, our strategic approaches include initiatives and interventions from both formal and informal actors, namely the FCC, PT operators, community leaders, and women entrepreneurs.

5.1 Decentralising resources and shortening the supply chain

As mentioned previously, our findings confirm that markets and businesses in Dwarzack are vulnerable to disruptions due to long supply chains associated with the delivery of fresh produce. This is corroborated by increased transportation costs and limited transportation modalities during times of high uncertainty, such as health crises and seasonal floods.

We suggest that with the aid of PT operators, the distribution of basic food supplies towards informal settlements could be improved to increase overall food security. Moreover, the provision of fresh food in the Dwarzack settlement could assist in the reduction of congestion in-and-around central markets, as well as on George Brook Road. By involving multiple stakeholders in processes of decentralisation, including PT operators and HBEs, we can expect that the distribution of resources within settlements could be largely facilitated. This will also contribute towards participatory urban appraisal and long-term mobility justice. To effectively achieve such ambitions, it is vital to provide technical and financial skill training to the relevant stakeholders. The inclusion of PT operators in the transportation of goods can present new pathways for sources of income, a procedure we see as beneficial in counterbalancing the financial impacts induced by governmental lockdown and seasonal variations on such operators.

Strengthening the links with urban and peri-urban agriculture groups could improve food security in Freetown, through providing market settlements with alternative supplies. The health crisis has revealed opportunities to mobilise collective resources through the strengthening of social networks between settlements. The Director and Co-founder of CODOHSAPA [Interview 8, May 2020] mentions that the FEDURP is currently working on creating channels for the provision of goods and services to marginalised groups during COVID-19. As such, we propose to maintain these coping efforts for a possible long-term decentralisation of markets.

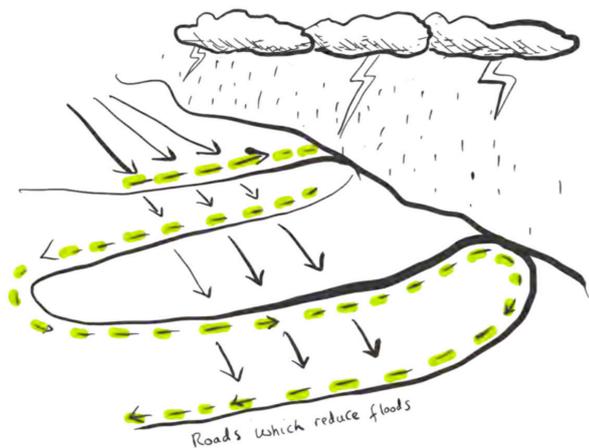


Figure 8: Footpath or road pattern water flow intensity (ASF and SLURC, 2018).

markets in the settlement (see Section 4.3 and 4.4). A practical step to plan for such upgrades, is to map socio-spatially marginalised HBEs, and identify and prioritise their needs for improved mobility.

For example, Figure 8 illustrates a footpath/road can be constructed in a whiplash pattern up the steep topography, thereby minimising the concentrated flow of water down the terrain.

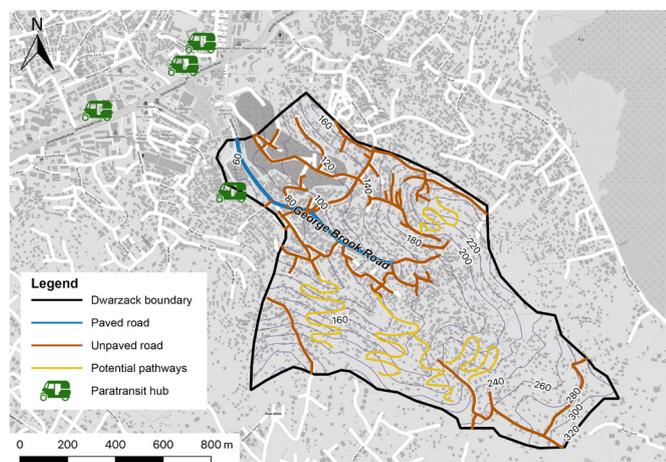


Figure 9: Potential mobility infrastructure in whiplash pattern in high elevation areas (data adapted from ASF and SLURC, 2018).

Extrapolating from suggestions by the DCAAP, we have estimated how the all-weather paths could potentially be expanded up the terrains, however a better understanding of population disruption, services and participatory input would be needed to inform this (Yellow pathways in Figure 9). Furthermore, evidence of previous community bridge building and infrastructure improvements (ASF and SLURC, 2018) suggests a willingness of the community to engage and co-fund these opportunities through the FCC’s Housing Policy (ie. Freetown Structural Plan 2014) that aims to develop ‘long-term strategic slum upgrading (and) involve the Freetown population at all levels.

We have also identified the need for bridge construction along the George Brook rivers and street lightings. For

street lighting, initiatives by the WB and IDB found that community perception of safety, community cohesion, and public trust increased as street lightings were installed (Corburn and Sverdluk, 2019).

Considering that DCAAP’s formulation included involvement from a general sample of dwellers in Dwarzack, this report suggests that future revision of the DCAAP should involve inputs from women HBE operators as well as PT operators and other mobility actors.

5.3 Inclusion and empowerment of women in mobility planning and transportation

As mentioned in earlier sections, our findings suggest that women in Dwarzack are facing disproportionate difficulties in safety and affordability whilst navigating within Freetown’s transportation systems. Additional data gathering and engagement with women in Dwarzack are needed before actionable knowledge can be implemented in the creation of equitable mobility systems. Such is the case of Kenya, where disaggregated data has been used during the COVID-19 crisis to ensure that recovery measures challenge existing gender inequalities (Hunter et al., 2020). NGO’s and international organisations are currently striving to gather data in Freetown, therefore gender disaggregated data could highlight avenues for increased equality in the post-COVID era.

The Sierra Leone’s medium-term ‘National Development Plan 2019-2023’ is designed to ensure that “by (2023), more women are supported to engage in entrepreneurial activities than in 2018” (Government of Sierra Leone, 2020). It remains unclear however what methods will be utilised to ensure safe mobility for women traveling to work sites. Nevertheless, the Transform Freetown Urban mobility plan states that they will work with SLRSA to expand road safety campaigns and provide training in communities, targeting drivers and school children (Urban mobility – Freetown City Council, 2020). We recommend this campaign to include both IT operators as well as PT workers. The standardisation of PT service prices, alongside the development of code of conducts, would for example aid in the creation of ‘gender-friendly’ or ‘gender-sensitive’ services. Furthermore, training could be expanded to include guidance on sexual harassment and considerations for women travellers; this would be a low-cost addition that could significantly reduce the risk for women passengers.

The willingness of PT operators to collaborate with transport institutions, as highlighted in section 4.3, suggest that the PT sector could be integrated into a single regulatory authority, a goal that is also envisioned in the Transform Freetown Objectives (Urban mobility – Freetown City Council, 2020). This collaborative effort would be key for the efficient provision and efficiency of transport networks. Furthermore, the creation of a women’s coalition could also be formed through engagements with

local women or through existing women's' groups who are already working towards such empowerment objectives as supported by FEDURP. A similar example of this can be seen in Uganda, where in 2006 in collaboration with the WB, the government introduced a gender agenda to ensure that road projects took account of the specific needs of women through consultations with women groups (Duchene, 2011).

With greater encouragement of women in transport roles, and the standardised training of drivers, we should expect to see less sexual harassment and overall improved gender equality in reference to mobility. Such interventions can be found in the public bus company in Africa, owned by the State of Congo in Kinshasa. The company has been hiring and training women ticket inspectors in order to counter harassment and unsuitable behaviour aimed at women passengers (Duchene, 2011). Following such an example, we can assume that engagement of both PT, IT operators, FCC, and local women, would be necessary to provide similar outcomes in Freetown.

Table 1: Future Research Questions Based on Conceptual Frameworks

- Who is mobile or immobile, and why are some social groups more influential in mobility planning than others?
- Under what conditions will the FCC prioritise the needs of PT transport workers, and women, in informal settlements in mobility planning?
- How will participatory mobility planning link Freetown's brown and green agendas?
- To what extent has the patriarchal system undermined women in engaging with the mobility regime in Freetown?

Our findings correlate to our conceptual analyses, where gender focused frameworks including environmental and mobility justice, provide alternative approaches to understanding mobility issues. In so doing, new bodies of literature can provide interesting insights into the relationship between gender and existing mobility regimes in Freetown. We strongly believe that such theoretical frameworks can be instrumental in developing transformative mobility planning; they enable diverse stakeholders, such as planners and local community members, to collaboratively engage in the physical infrastructure and social-institution aspect of mobility planning. Future research can illuminate how gendered inequalities are reproduced onto women within particular urban spaces, including households, communities, and institutional domains.

6. Conclusions

Through our research, we have found that women inevitably face disproportionate risks in relation to health crises. Women have had a higher exposure level to the virus, while simultaneously having to travel greater distances in order to reach basic goods and livelihood opportunities. These problems are exacerbated by existing mobility infrastructures, which do not guarantee a safe environment for women; bridges and walking spaces are poorly lightened, while transport options provide unsafe spaces with high risks of sexual harassment and physical assault. Similarly, local markets and HBEs provide essential livelihood opportunities for women, and therefore have an outstanding potential for increased entrepreneurial activities in a post-COVID era.

We also found that PT operators have played an integral role throughout the current COVID-19 crisis. Even so, the mobility restrictions imposed by the FCC have resulted in long queues and waiting times for accessing transport services, issues reinforced by numerous PT operators staying at home.

As the COVID-19 pandemic has exacerbated constraints on mobility, there is potential for the construction of enhanced mobility justice in the city and in similar global contexts. This report presents three main strategies for future research: (i) Decentralising Resources and Shortening the Supply Chain, (ii) Participatory Planning for Mobility Infrastructures (iii) Inclusion and Recognition of Women in Mobility Regimes. By shortening supply chains in the city, we predict increased resiliency and diversified systems in accordance to socio-cultural and environmental issues. Improved cooperation between relevant stakeholders will be necessary to fulfil the gaps of new roles, tasks, incentives, and capacity building required to function with shorter supply chains.

Regarding participatory processes, the development of an urban appraisal process will help link institutional planning and management processes with subsequent community action plans.

Lastly, health crises have intensified gender inequalities, thus an active participation of women in mobility planning will help breach traditional gender role barriers.

We believe that in order to achieve enhanced and socially just mobility, transformative change must consist of collaborative efforts between diverse stakeholders, including local communities, key decision-makers, and traditional planners. The COVID-19 crisis can be used as a catalyst for the creation of innovative channels where the co-production of knowledge can ensue and be built upon to increase social cohesion and overall mobility in Freetown and similar global contexts.

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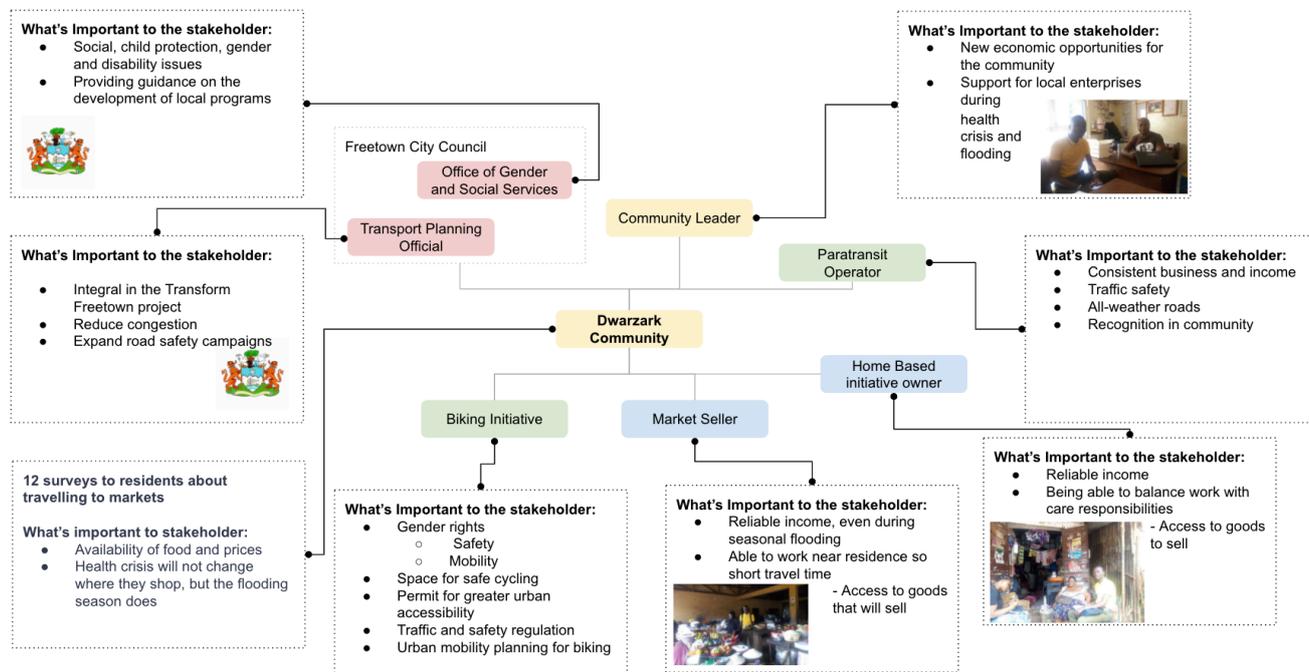
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Appendix

Appendix 1: Stakeholder engagement map



Appendix 2.1: Interview 2

Interview Number	Role	Language conducted
Interview 1	Local government official	English
Interview 2	Representative from informal sector	English
Interview 3	Market seller, chairlady of Dwarzack community market	Krio
Interview 4	Office of Gender and Social Services	English
Interview 5	Biking initiative	Krio
Interview 6	Pop up home based initiative	Krio
Interview 7	Community leader/representative	English
Interview 8	Director and co-founder of CODOHSAPA	English

Appendix 2.2: Interview questions

Interview 1: Pop up/home based initiative

1. Please describe the initiative you work in (eg. how big? What do you sell?)
2. What is your role? (eg. owner, full time/part time worker?)
3. When did the initiative start?/how long have you worked here?
4. Why did the initiative start?
5. Where do your customers come from? (eg. local or afar?)
6. Where does your produce come from and how has this been affected by Covid-19?
7. How do you balance time between work and home life?
8. Did you have your business during the ebola crisis?
9. What changed for your business during the ebola crisis?
10. Did you have more or less business? [more/less] Why do you think this was the case?
11. After the ebola crisis were you still open, how did business change?
12. What risks do you face in terms of disease transmission in densely populated environments in which businesses are now operating?
13. What social distancing rules do you have to enforce in the workplace and what are the challenges?
14. Do you have more or less business? [more/less] Why do you think this is the case?
15. Will you stay open after the travel restrictions end? If so, why?
16. What future do you see for your business after this health crisis? (eg. will business reduce when people can travel further? Will you stay open?)
17. Do you have any suggestions or comments on how your business could be improved? Who/what would help?

Interview 2: Market seller

1. How long have you been working in this market?
2. (If not mentioned in the previous question) Why did you start working here?
3. How long does it usually take you to come to the market and to get back home?
 - 3.1. Do you ever face difficulties in the journey?
 - 3.2. Is flooding an issue for you and your customers?
4. Where are your customers from?
5. Who are your providers? AND/OR Where do the goods you sell come from?
6. How has the situation changed now?
 - 6.1. Are you facing difficulties in getting to the market?
7. How have things changed for the market now during the Covid-19 situation? If the answer is only focused on the personal, probe again for her opinion on the whole market situation.
 - 7.1. Has business slowed down?
8. Is this different from how things were during ebola? In what way do you think they have varied?
 - 8.1. How much was business affected by ebola?

- 8.2. To what extent was your supply of goods affected?
9. Are people coming to buy from far away in the city?
 - 9.1. Why do you think they need or choose to come to this market?
10. Where are your goods coming from now?
 - 10.1. Who is currently bringing them?
 - 10.2. How much has this changed?
11. Do you have any suggestion or comments on how the municipality/Market groups can handle the situation?

Interview 3: Community leader

1. In what ways have the travel restrictions during COVID-19 impacted inhabitants' capacity to source food?
2. What about during the Ebola crisis?
3. Have there been local initiatives, such as food distribution centres or new market spaces, that have emerged following these crises?
4. What forms of dialogue has there been between the Dworzak community and the municipality in relation to transport? In particular, how has the community been able to access market spaces during transport restrictions and social distancing?
5. To what extent do you think that decentralisation of goods and services would or would not benefit inhabitants in accessing goods and services?
6. From the perspective of urban transport, has mobility for the inhabitants of Dworzack been negatively impacted by the COVID-19 crisis and if so, in what way?
7. The rainy season arriving soon, how do you think the combination of flooding and COVID-19 impact inhabitant's ability to access livelihoods outside of Dworzak? What about in Dworzak?
8. Finally, how do you perceive the role of local businesses in ensuring the provision of goods and services in Dworzak?

Interview 4: Biking initiative

1. In what ways did cycling help overcome mobility restrictions during the ebola crisis? How is it helping now given the current COVID restrictions?
2. How has enabling people to bike help their economic opportunities and livelihoods? And does this help enable more movement during the rainy season?
3. More specifically, from what we know about women being more involved in trading and selling in markets, how have these projects helped open up more opportunities for them?
4. What social and cultural challenges did you face when implementing these projects and how were these overcome, specifically in regards to gender dynamics?
5. What physical limitations are there in terms of infrastructure for cycling?
 - 5.1. If so, have any of these limitations gotten worse with the current mobility restrictions?
6. Has there been any dialogue/conversation/collaboration with the municipality, community leaders or government planning officials in initiating these programmes?
 - 6.1. If not, would you have interest to approach them and with what purpose?
 - 6.2. If yes, have you started the approach or they did?

6.3. Who are you communicating with?

6.4. Have you come to an agreement to tackle any social issues that have come up lately?

7. What opportunities do you see in bringing these same biking projects into the city Freetown?
8. Have you noticed any difference in the use of bicycles between women or men?
9. How do you think the initiative will change in the rainy season?

Interview 5: CODOHSAPA

1. What is your overview of women participation in CODOHSAPA activities? Have you seen an increase in women's participation in recent years?
 - 1.1. See if there are any projects related to mobility
2. How have you worked (are you working) towards women empowerment in Sierra Leone?
 - 2.1. Have you worked with particular women groups working on informal markets?
3. What has been the role of public institutions within CODOHSAPA programs with a specific focus in women groups?
 - 3.1. Is there an active role?
 - 3.2. If not, what would you expect from the government/municipality to support these groups?
4. What is your perception on how the Ebola crisis affected the livelihoods of women compared to that of men?
5. Are there any particular projects led by women that thrived from any of your programs after the Ebola crisis?
 - 5.1. How is this project doing now?
6. Was there any involvement from the government/municipality to help women initiatives specifically during or after the Ebola crisis?
7. What are the main challenges for women's livelihoods during the current crisis and how is Codosahpa supporting women recently to tackle these challenges?
8. Do you foresee any opportunities for pursuing Codosahpa's mission in Sierra Leone out of the current health crisis? And how to take advantage of it?

Interview 6: Office of Gender and Social Services

1. Culturally speaking, to what extent does gender play a role in urban mobility patterns in Freetown, Sierra Leone?
2. How do current mobility restrictions relate to those during the EBOLA crisis and what has been learned since
3. What is your opinion on the mobility restrictions and how do you perceive the role of gender during these restrictions?
4. How does the Sierra Leone Ministry of Social Welfare, Gender and Children Affairs view the existence of gender inequality in reference to livelihood opportunities?
5. When thinking of the impact of COVID-19 and past health crises, do resulting mobility restrictions exacerbate problems of unequal livelihood opportunities considering women tend to participate more in the informal sector?
6. Do you think this crisis in particular could be used as a catalyst to enhance urban mobility for women in Freetown, thereby reducing perceived gender inequalities formed by socio-cultural norms.

7. If so, do you believe that participatory planning could play a crucial role and how would you recommend such a process would unfold.
8. Could women market sellers use current mobility restrictions as entrepreneurial avenues, thereby finding innovative ways of engaging in daily practices which help shape informal economies.
9. Any recommendations you may need to address for a positive outcome of the current situation?

Interview 8: Transport/planning official

1. What rules are being recommended to the transport sector and do you think are feasible and realistic enough to be followed?
2. What are the traveling restrictions that are, and will be put in place? Does this include informal transport? How will you ensure compliance?
3. How do you respond to groups of people who need to travel because their daily income and access to food depend on it.
4. Will local authorities support vulnerable communities such as Dwarzack in the provision of food and water during covid-19 (during the lockdown)?
5. What role do you see informal transport workers playing during covid-19? Do you see any facilitating food and water to areas that are difficult to access?
6. To what extent do the government and local authorities willing to work with the informal transport sector? And are there opportunities for future collaboration? If so, what forms of collaboration do you envision?

Interview 9: Representative from informal sector

1. How long have informal transportation (keke, poda poda, and okada) been operating in this Dwarzack?
2. How active are you during the quarantine?
3. Where does your passenger(s) travel to? And for what general purposes (work, food, etc)?
4. What time are your busiest operating hours?
5. Do you have any measures to protect yourself from being infected from covid-19? If so, is it a personal initiative or an advice from the authorities?
6. Are informal transport drivers encouraging social distancing rules recommended by the Government (sitting in poda poda's with one free space in between etc.) and if so are customers willing to follow them or not?
7. What opportunities that arise during covid-19 that you see could lead to collaboration with transport authorities for mobility planning?
8. Are people using bicycles or walking instead of using informal transport more? Do you think travel behaviour will change post-covid?
9. How do you think the situation will change for the informal transport sector as the rainy season approaches?

Appendix 3: Survey questions

-- General section --

Please state if you are Male or Female:

M / F

Do you shop for fresh food for your house?

Yes / No / Sometimes

In what age group are you?

0-18 / 19-30 / 31-45 / 46-60 / 60+

Do you have any physical condition that makes moving difficult?

Yes / No

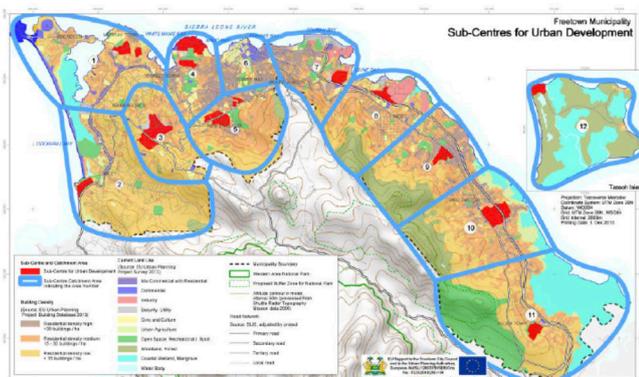
How long have you been living in Freetown?

Less than 2 years / Between 2 and 5 years /
Between 5 to 10 years / More than 10 years

In what area of Dwarzack do you live?

Upper area / Middle area / Lower area

In what area does your household usually shop for fresh food in the city?



1 -- 12

Why do you/they shop in this area?

(Optional) Please state the name of the market where you/they shop for food.

-- Before COVID-19 --

Before the current travel restrictions, how long did it take you/they to make a full trip (leaving and coming back, excluding shopping time) to buy fresh food?

0-10 minutes / 10 - 20 minutes / 20 - 40 minutes
/ 40 - 60 minutes / 60- 90 minutes / More than 90
minutes

How often did you/they need to move to purchase food in a week?

Once / Twice / Three times / More than 3 times

-- During COVID-19 --

Right now with the travel restrictions, how long does it take you/they to make a full trip (leaving and coming back, excluding shopping time) to buy fresh food?

0-10 minutes / 10 - 20 minutes / 20 - 40 minutes
/ 40 - 60 minutes / 60- 90 minutes / More than 90
minutes

How often are you/they moving to purchase food in a week?

Once / Twice / Three times / More than 3 times

Have you/they changed the market(s) where you/they shop during these times? Why?

-- After COVID-19 --

Do you think you/they will change where you/they shop after this situation is over? Why?

-- Seasonality --

During the rainy season, how much time does it take you/they to make a full trip (leaving and coming back, excluding shopping time) to buy fresh food?

0-10 minutes / 10 - 20 minutes / 20 - 40 minutes
/ 40 - 60 minutes / 60- 90 minutes / More than 90
minutes

Do you change the market(s) where you shop during the rainy season? Why?

Appendix 4: Example of roles and responsibility identification from Dwarzack CAAP (ASF and SLURC, 2018)

	Supporting Intervention	Advocating Intervention	Financing Intervention	Leading Intervention	Finalising Intervention	Upkeep and Maintenance
Be Informed	Local business Religious leaders	Community chairman	MoTrade Land-owners	Molands	Area chief	Chairman/chair-lady Women leaders
Be Encouraged to Take Part	Social club youth Chairman Other communities	World development committee	CBOs Local businesses	Planning and design consultants Youth chairmen	Religious leaders	CBOs
Need to be involved	Area chief Community chief	FEDURP	Micro credit organisation	CBOs	Chairman/chair-lady Women Leaders	Local business-people Youth group
Very Important	MoMousing	Local Councillor	MoFinance	FCC	Local Councillor	Community People
Critically Important	Major MoLands	MP	NGOs	Mayor	NGOs Mayor	FCC