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Abstract

The thesis explores, in disaster and post-disaster contexts, the ways marketplace infrastructure support (and should support) trade for traders and customers in the metropolitan area of Port-au-Prince, Haiti, as well as other cities in low- and middle-income countries. It argues that marketplaces should be considered one of the most important urban infrastructures in these cities, particularly in disaster and post-disaster contexts. Acknowledging marketplaces as an important urban infrastructure has particular implications for urban resilience, including the critical functions and attributes of infrastructure that should be maintained during crises. Exploring these aspects is necessary due to the lack of knowledge about the functions and relational attributes of marketplaces and the infrastructural needs of traders and customers in these contexts.

The research combines two theoretical approaches that are used infrequently in research on marketplaces. The first approach conceptualises marketplaces as an urban infrastructure where the functions and attributes of both its physical and socio-economic dimensions are relational. The second approach builds on the concept of disaster resilience to explore these infrastructural aspects for traders and customers in disaster contexts: firstly the desired functions and attributes of marketplace infrastructure to be maintained or rapidly restored, secondly the influence of such marketplace infrastructure on the impact of disasters, and thirdly its influence on traders' and customers' resilience process.

This publication-based thesis relies on a literature review and a multiple-case study approach to explore marketplace resilience in the recent literature on marketplaces in the cities of low- and middle-income countries and in four marketplaces of Port-au-Prince, Haiti. These Haitian marketplaces present distinct infrastructural characteristics and have been unequally affected by the 2010 earthquake: the Iron Market, *Lalue*, *Canapé-Vert,* and *La Coupe*. Qualitative and quantitative data, mostly collected during interviews with traders and customers, were analysed to produce an overview of the marketplace infrastructure's desired functions and attributes for traders and customers, as well as the negative effects of its collapse and deficiency in disaster and post-disaster contexts.

Based on the papers' findings, the thesis suggests that in addition to being the location of the main source of household income and the preferred source of basic commodities for a large part of the urban population, marketplace infrastructure features five attributes that

are desired to be maintained or restored rapidly in disaster contexts: solidarity, reciprocity, proximity, stability and security. These attributes, based on the physical and socioeconomic dimensions of marketplace infrastructure, benefit both traders and customers and contribute to facilitating and sustaining trade. Due to the interconnectedness of these functions and attributes, the thesis finds that trade in marketplaces can be hindered due to the failure of marketplace infrastructure to provide stability and security in disaster contexts.

The thesis ends by calling for more research on marketplace infrastructure in Haitian cities and other cities in low- and middle-income countries. In architecture, urban planning and humanitarian practice, it advocates for building on marketplace infrastructure more effectively, with the aim to stabilise and secure their desired functions and attributes for traders and customers in and after urban disasters.

Résumé

Cette thèse explore, dans un contexte de désastre et après-désastre, comment l'infrastructure de marché contribue (ou devrait contribuer) aux échanges commerciaux pour les commerçants et les clients dans la région métropolitaine de Port-au-Prince, Haïti, ainsi que dans d'autres villes de pays à faibles et moyens revenus. Elle soutient que les marchés doivent être considérés comme l'une des plus importantes infrastructures urbaines de ces villes, particulièrement dans un contexte de désastre et après-désastre. Envisager les marchés comme une importante infrastructure urbaine a des répercussions sur la résilience urbaine, incluant en regard des fonctions et attributs des infrastructures qui doivent être maintenues en temps de crise. Mettre en lumière ces aspects est nécessaire dû à l'indifférence, en recherche et dans la pratique, des fonctions et des attributs convoités par les commerçants et les clients ainsi que leurs besoins en infrastructure dans ce contexte.

La recherche combine deux approches théoriques qui ont été, à ce jour, peu employées dans la recherche sur les marchés. La première approche consiste à conceptualiser le marché comme une infrastructure urbaine dont les fonctions et attributs de dimensions physiques et socio-économiques sont relationnels. La seconde approche se base sur le concept de la résilience aux désastres de manière à explorer les aspects infrastructurels pour les commerçants et les clients en cas de catastrophe : premièrement, les fonctions et attributs des marchés devant être maintenus ou rapidement restaurés ; deuxièmement, l'influence de l'infrastructure de marché sur l'impact des désastres ; et troisièmement, ses effets sur le processus de résilience des commerçants et des clients.

Cette thèse par publications s'appuie sur une revue de la littérature et sur une étude de cas multiples afin d'explorer le concept de la résilience des marchés dans la littérature récente sur les marchés de villes de pays à faibles et moyens revenus ainsi que dans quatre marchés du Port-au-Prince métropolitain en Haïti. Ces derniers présentent des caractéristiques distinctes en termes d'infrastructure et ils ont été différemment affectés par le tremblement de terre du 12 janvier 2010 : le Marché en fer et les marchés Lalue, Canapé-Vert et La Coupe. Les données qualitatives et quantitatives, principalement en provenance d'entrevues réalisées avec des commerçants et des clients, ont été analysées de manière à produire un portrait des fonctions et attributs des infrastructures de marché

convoités par les commerçants et les clients, ainsi que les impacts négatifs de leur effondrement et de leur déficience dans un contexte de désastre et post-désastre.

S'appuyant sur les résultats des publications, la thèse propose qu'en plus d'être l'emplacement de la source principale de revenu pour les ménages et de la source préférée des denrées de base pour une large part de la population urbaine, l'infrastructure de marché possède cinq attributs devant être maintenus ou restaurés rapidement en temps de catastrophe : la solidarité, la réciprocité, la proximité, la stabilité et la sécurité. Ces attributs, liés aux dimensions physiques et socio-économiques des infrastructures de marché, sont bénéfiques à la fois pour les commerçants et les clients, et contribuent à faciliter et soutenir le commerce dans sa durée. En raison de l'interconnectivité de ces fonctions et attributs, la recherche démontre que le commerce dans les marchés peut être entravé par l'échec de l'infrastructure du marché à pourvoir la stabilité et la sécurité nécessaires en temps de désastre.

La thèse conclue en appelant à davantage de recherche sur les infrastructures de marché dans les villes d'Haïti et d'autres pays à faibles et moyens revenus. En architecture, en aménagement urbain et dans l'humanitaire, elle préconise le renforcement de ces infrastructures de manière diligente, dans l'objectif de stabiliser et de sécuriser leurs fonctions et attributs tant convoités par les commerçants et les clients en temps de désastres urbains.

Rezime

Tèz doktora sa chache konprann lè gen dezas oubyen apre dezas kouman enfrastrikti mache yo ede, ou dimwens te ka ede, aktivite komès metwopòl Pòtoprens, kapital peyi Ayiti, tankou nan vil lòt peyi ki pa gen gwo revni yo. Tèz sa soutni lide ke espas ak batiman mache yo se yonn nan gwo enfrastrikti vil sa yo genyen, sitou lè dezas ap pase ou fenk fini pase. Lè nou konsidere mache yo pami gwo enfrastrikti vil la, sa gen repèkisyon sou rezilyans vil la; sitou lè nou gade, pa ekzanp, yon seri karakteristik ak fonksyon infrastrikti sa yo ta dwe jwe lè gen kriz. Se enpotan pou n chache byen konprann bagay sa anndan vil yo, paske ni nan rechèch ni nan entèvansyon ki fèt pa gen atansyon ki bay sou ki kalite ak fonksyon ki nanm mache yo. Yo pa gade nonplis bezwen enfrastrikti ak amenajman espas pou kliyan ak machann yo nan moman dezas.

Tèz la itilize de apwòch teorik ki preske pa ko anplwaye nan rechèch ki fèt sou mache yo. Pou premye apwòch la, mache a se yon enfrastrikti lavil la, epi dimansyon fizik ak dimansyon sosyal ekonomik yo konekte yonn ak lòt atravè karateristik ak fonksyon yo genyen. Dezyèm apwòch la li-menm, ki plis eksploratwa, apiye sou konsèp rezilyans pou mete rechèch la sou wout pou ale wè twa bagay nan mache yo : premyèman, ki fonksyon ak karakteristik ki ta dwe kenbe pandan moman dezas oubyen retabli byen vit apre katastwòf; dezyèman, ki relasyon enfrastrikti mache yo genyen ak enpak dezas yo; epi twazyèman, ki efè ligen nan rezilyans kliyan ak machann yo.

Se yon tèz pa piblikasyon, ki baze sou revi literati ki pi resan sou sijè a. Anplis, tèz la itilize etid ka miltip. Kat mache nan zòn metwopolitèn Pòtoprens, Ayiti, te etidye nan kad pwojè sa a. Nan nivo enfrastrikti, kat mache sa yo pa gen menm karakteristik epi yo te afekte diferaman pa tranbleman tè 12 janvye 2010 la. Mache sa yo se : Mache-an-fè, Mache La Koup, Mache Kanape-Vè epi mache wout Lali yo. Pou fè pòtrè mache yo, sètadi pou fè lis fonksyon ak karakteristik ke kliyan ak machann yo atann jwenn nan yon mache, epi pou rive konprann enpak sa ka genyen lè enfrastrikti mache yo fèb oubyen pa kenbe epi fini pa efondre devan menas ak katastwòf, tèz la apiye alafwa sou analiz yon ansanm *done kalitatif* ak *done kantitafif.* Done sa yo te pwodwi apati antrevi ki te fèt ak kliyan epi machann yo.

Selon rezilta ki deja rapòte nan plizyè piblikasyon, tèz la konkli ke, mache lavil peyi san gwo revni yo, non sèlman reprezante prensipal sous revni pou menaj yo oubyen kote yon

bon pati moun lavil sa yo jwenn pwodwi de baz ke yo bezwen, men tou, nan espas mache sa yo, nou jwenn senk bagay trè enpòtan ki dwe mentni oubyen restore rapidman apre katastwòf yo. Senk bagay sa yo se : solidarite, resipwosite, proksimite, stablite ak sekirite. Bagay sa yo, ki relye direkteman a karateristik fizik epi sosyal ekonomik enfrastrikti ak amenajman espas mache yo, benefik anpil ni pou kliyan ni pou machann yo. Sa pèmèt ke aktivite mache yo kenbe djanm pi lontan malgre pwoblèm ak kalamite ke katastwòf nan vil la ta koze. Apati de koneksyon yonn rantre nan lòt sa a ant fonksyon ak karakteristik enfrastrikti e amenajman mache yo, tèz la demontre ke aktivite komès yo ka soufri si enfrastrikti mache yo pa kenbe, si yo pa sous sekirite ni stablite ke machann yo ak kliyan yo ap chèche lè vil la cho, lè gen dezas ak katastwòf.

An konklizyon, tèz la mande pou gen plis rechèch sou enfrastrikti ak amenajman espas mache yo nan peyi Ayiti ak nan lòt peyi revni yo pa gwo. Tèz la ankouraje, ke swa entèvansyon imanitè yo, achitèk ak amenajis yo, pou ranfòse rapidman enfrastrikti mache yo, konsa n’a stabilize epi sekirize aktivite mache a epi tout lòt bagay machann yo ak kliyan yo espere jwenn ladan lè gen dezas ak katastwòf nan vil la.

Sammendrag

Avhandlingen undersøker på hvilke måter infrastrukturen på markedsplasser støtter opp om (og burde støtte opp om) handel både for selgere og kunder under og etter krisesituasjoner i byregionen Port-au-Prince, Haiti, i tillegg til andre byer i lav- og mellominntektsland. Avhandlingen argumenterer for at markedsplasser bør sees på som en av de viktigste delene av de urbane infrastrukturene i denne typen byer, særlig under og etter katastrofer. Å anerkjenne markedsplasser som en essensiell del av en bys infrastruktur har særlige følger for en bys resiliens, som også inkluderer markedsplasser som del av kritisk infrastruktur der både markedsplassens funksjoner og egenskaper må ivaretas under kriser. Manglende kunnskap om markedsplassers funksjoner og markedsplassers relasjonelle egenskaper samt selgere og kunders behov for infrastruktur i disse sammenhengene gjør at det er nødvendig å undersøke disse aspektene ved markedsplasser.

I forskningen kombineres to teoretiske tilnærminger på en ny måte som ikke er blitt anvendt tidligere i forskning om markedsplasser i stor grad. Den første tilnærmingen omfatter markedsplassen som urban infrastruktur hvor funksjoner og egenskaper for både dens fysiske og sosioøkonomiske dimensjoner er relasjonelle. Den andre tilnærmingen, som tar i bruk begrepet katastroferesiliens, utforsker følgende aspekter: (1) de ønskede funksjonene og egenskapene til markedsplasser for selgere og kunder, og konsekvensene av en mangelfull fysisk infrastruktur (som fører til katastrofen), (2) ideelle funksjoner og egenskaper for selgere og kunder, og (3) selgere, kunder og andre interessenters mulige handlinger som muliggjør, utelater eller er begrenser å bygge resiliens.

Denne artikkelbaserte avhandlingen bygger på en litteraturgjennomgang av relevant litteratur, og er en case studie med flere markedsplasser som case. Markedsplassens resiliens sett i lys av i ny litteratur om markedsplasser i byer i lav- og middelsinntektsland brukes for a utforske fire markedsplasser i Port-au-Prince, Haiti, som har ulike egenskaper, og som har blitt ulikt påvirket av jordskjelvet i 2010. Casene er markedsplassene Iron Market, Lalue, Canapé-Vert og La Coupe. Kvalitative og kvantitative data, for det meste fra strukturerte intervjuer med selgere og kunder, er analysert for å definere de funksjonene og egenskapene som utgjør markedsplassenes nødvendige infrastruktur for

både selgere og kunder, samt de negative virkningene av kollaps av en markedsplass, og hva disse manglene fører til under og etter en katastrofe.

Basert på artiklenes funn, viser avhandlingen at markedsplassenes infrastruktur er hovedkilden til selgerens husholdningsinntekt og den foretrukne kilden til handelsvarer for en stor del av byens befolkning. Markedsplassenes infrastruktur har i tillegg fem attributter som er ønsket opprettholdt, eller raskt gjenopprettet, i sammenheng med en katastrofe. Dette er solidaritet, gjensidighet, nærhet, stabilitet og sikkerhet.

Disse attributtene, basert på de fysiske og samfunnsøkonomiske dimensjonene i markedsplassenes infrastruktur, kommer både selgere og kunder til gode og bidrar til å tilrettelegge for, og opprettholde handel. På grunn av sammenkoblingen av funksjonene og egenskapene, finner avhandlingen at handel på markedsplassen kan hindres når markedsplassenes infrastruktur ikke gir mulighet for stabilitet og sikkerhet i katastrofesammenhenger.

Avhandlingen avsluttes med å etterspørre mer forskning på markedsplassers infrastruktur i haitiske byer, men også i andre byer i lav- og middelinntektsland. Innen arkitektur, byplanlegging og humanitær praksis bør det fokuseres på hvordan bygge infrastruktur som styrker markedsplasser med mål om å stabilisere og sikre selgere og kunders ønskede funksjoner og egenskaper for markedsplassenes i urbane katastrofer.

List of included publications

Essay

Smith D. 2016. Petty trade and the private sector in urban reconstruction: learning from Haiti's post-earthquake Iron Market. In: Sanderson D, Kayden J, Leis J, editors. Urban Disaster Resilience: New Dimensions from International Practice in the Built Environment. New York: Routledge, 157-181. Preprint: https://ntnuopen.ntnu.no/ntnu-xmlui/handle/11250/2440224

Paper A

Smith D. 2020. Towards marketplace resilience: learning from trader, customer and household studies in African, Asian and Latin American cities. *International Journal of Sustainable Urban Development,* 12(1), pp. 14-33. DOI: https://doi.org/10.1080/19463138.2019.1666851

Paper B

Smith D. 2019. The relational attributes of marketplaces in post-earthquake Port-au-Prince, Haiti. *Environment and Urbanization*, 31(2), pp. 497–516. DOI: https://doi.org/10.1177/0956247819865701

Paper C

Smith D. (accepted for publication). A risky business: the impacts of hazards on traders located in different marketplaces in Port-au-Prince, Haiti. Conference proceedings of the 8th International Conference on Building Resilience (ICBR 2018): Risk and Resilience in practice: Vulnerabilities, Displaced People, Local Communities and Heritage, 14-16 November 2018, Lisbon, Portugal.

Paper D

Smith D. (submitted for publication). Unpacking an urban domino effect: marketplace infrastructure, traders, and resilience following the 2010 earthquake in Port-au-Prince, Haiti.

x

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I also learned a lot from my students in the *Urban Contingency Planning and Practice* module I co-taught with Mrudhula Koshy. Thank you all for the interest, discussions, and

great work. Mrudhula, I genuinely enjoyed working with you on this module. It was effortless. I hope to continue working with you in the near future.

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Preface

My interest in marketplaces developed at the end of my studies in architecture at Laval University. At the time, cultural integration had become the subject of heated public debate in Quebec, Canada. In a desire to understand how architecture could contribute to societal issues, I suggested a physical intervention at the Jean-Talon market in Montreal as part of my final master project-based dissertation. The idea was to showcase the strengths of a modern intercultural society and reveal the institutional and community services promoting integration that are normally hidden behind banal conventional office façades. Building on this particular marketplace made sense, as it hosts the fruitful exchange of fresh regional products and international flavours, linking the urban to the rural and the global.

I became interested in Haiti during my studies at the Centre for Development and Emergency Practice (CENDEP) at Oxford Brookes University. Core to the discussions at the time were how to rebuild better homes and neighbourhoods in urban Haiti following the 2010 earthquake. Meanwhile, I became aware that a historical covered marketplace in the centre of Port-au-Prince, the Iron Market, was rebuilt and reopened only one year after the earthquake. Praised in the media and in some humanitarian reports, its reconstruction was perceived as successful and a demonstration of what could and should be rebuilt following urban disasters. This initiated the topic of another master thesis that assessed the short-term impacts of the philanthropic reconstruction of an urban public space. I discuss the findings in an Essay included in this thesis (Appendix 1).

The study of these two marketplaces in Montreal and Port-au-Prince has given me insights into the strengths and limitations of architecture (and architects) in dealing with complex societal challenges. I found marketplaces to be rich cases to study due to the intertwined social, economic, and cultural aspects and their integration into the spatial and physical dimensions of a public place. This became the point of departure of my PhD: the desire to get a deeper understanding of this interrelatedness and embeddedness. My interest, as an architect, is not in the buildings per se. To paraphrase Turner (1976), what matters to me more is what marketplaces do for people. Studying marketplaces in a critical time in Haitian history, I believe, sheds light on critical issues in architectural and humanitarian practice, as well-intended (re)constructions can be disruptive, and *building on* existing social spaces requires a fine understanding of relations embedded in the place. What follows is a

presentation of the results of a few years spent reflecting on the topic and my modest contribution to bridging built environment and humanitarian research and practice.

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Glossary of key terms and acronyms

12 janvier	[12 January] Date referring to the 2010 Haitian earthquake and the disaster that followed. It is the most common term used in the interviews for referring to the event.
Disaster	'A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability, and capacity, leading to one or more of the following: human, material, economic, or environmental losses and impacts' (UNDRR 2019: N.A.)
Disaster resilience	All the overlapping processes of maintaining or rapidly returning to desired functions and attributes in the face of a disaster, adapting to change, and quickly transforming systems or structures that contribute to vulnerability and limit current or future adaptive capacity.
Domestic reproduction	Work or labour associated with care giving and domestic roles, generally unpaid.
DRR/Disaster risk reduction	'Disaster risk reduction is aimed at preventing new and reducing existing disaster risk and managing residual risk, all of which contribute to strengthening resilience and therefore to the achievement of sustainable development.' (UNDRR 2019: N.A.)
Food security	'A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Based on this definition, four food security dimensions can be identified: food availability, economic and physical access to food, food utilization and stability over time.' (FAO et al. 2018: 159)
Goudou goudou	Haitian Creole term mimicking the sound of the buildings shaking during the 2010 Haitian earthquake.
Hazard	'A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation (UNDRR 2019: N.A.).' A hazard can be natural, anthropogenic or a combination of both.
Kliyan	Synonym of *pratik.*
Madan Sara	Woman trader specialized in the transport and trade of commodities between the region and the Haitian capital
Marketplace	The physical agglomeration of small traders and service providers in an urban public space.
Marketplace infrastructure	All the physical and socioeconomic elements and relations that determine and support the primary function of urban infrastructure as being the trade of goods and services.

Marketplace resilience	All the overlapping processes of maintaining or rapidly returning to the marketplace infrastructure's desired functions and attributes in the face of a disaster, adapting to change, and quickly transforming the marketplace's systems or structures that contribute to traders' and customers' vulnerability and limit their current or future adaptive capacity.
MCV	*Marché Canapé-Vert* in Port-au-Prince
MeF	*Marché en fer*, Iron Market, *Marché Hyppolite* and *Marché Vallière* (same marketplace) in Port-au-Prince
MLC	*Marché La Coupe* in Pétion-Ville
MLL	*Marché Lalue* in Port-au-Prince
NGO	Non-governmental organisation
Physical infrastructure	Term referring to the physical elements and relations of infrastructure.
PaP	Port-au-Prince
Pratik	Term in Haitian Creole referring to trade practice, routine, praxis, experience, regular customer or regular patron. It can be used to describe both a person and an activity.
Social infrastructure	Term referring to the social elements and relations of infrastructure.
Street trade	Term covering the 'range of goods and services that can be bought on a city's streets' (Brown 2006a: 8).
System	'A set of things – people, cells, molecules or whatever – interconnected in such a way that they produce their own pattern of behaviour over time' (Meadows 2008: 2), often referred to as the system's function or purpose.
Urban infrastructure	'The basic systems and services … that [a city] uses to work effectively' (adapted from Cambridge Dictionary 2019: online).
Urban public space	'All space that is not delineated or accepted as private and where there is at least a degree of legitimate public or community use' (Brown 2006a: 22).
Vulnerability	'The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.' (UNDRR 2019: N.A.)

1 Introduction

Goudou goudou goudou goudou goudou goudou…

On 12 January 2010 at 4:53 pm local time, the soil underneath the metropolitan area of Port-au-Prince, Haiti, began to shake. The event, often referred to locally as *12 Janvier* [12 January] for the date of the disaster or as *goudou goudou* for the sound mimicking the buildings shaking, was triggered by a 7.0 magnitude earthquake with an epicentre located near Léogâne, 25 kilometres west of Port-au-Prince. The hazard, combined with the elements of vulnerability, which are explored in Section 2.1.1, resulted in one of the worst urban disasters in contemporary history. More than 300,000 buildings collapsed or were heavily damaged, claiming between 160,000 and 316,000 lives[1], injuring more than 300,000 people and displacing 1.5 million Haitians (Kolbe et al. 2010; IOM 2017). Urban infrastructure and services were also severely affected, as half of the nation's schools, three major universities, and 30 hospitals were destroyed or severely damaged (Reuters 2010; PAHO and WHO 2011). The main seaport and airport, most national and local government institutions, including Port-au-Prince's city hall and the presidential palace, were also heavily damaged or collapsed (Government of Haiti 2010).

To an extraordinary disaster came an extraordinary international aid response. An estimated 3.6 billion USD in relief funding was raised in 2010 (FTS 2010). Foreign nations and many international non-governmental organisations (INGOs) got involved with a desire to 'build back better' (Reitman 2011). The good intentions for reconstruction resulted in meagre success, which is largely documented in the literature and independent reports (see for instance Clermont et al. 2011; Davis 2012; Sanderson et al. 2014).

This thesis does not aim to evaluate the outcome of humanitarian actions. Instead, it focuses on the general disregard of small traders' and customers' infrastructural needs in the numerous marketplaces of the city by the stakeholders involved in rebuilding Haiti (Figure 1). The reconstruction agenda was, indeed, generally limited to residential and domestic spheres, notably with transitional shelter programmes (Clermont et al. 2011; Sanderson et al. 2014). The very places where many urban dwellers work and access basic

[1] The former number is an estimate following a survey published in a peer-reviewed academic journal and the latter number is the death toll according to the national government. These numbers, especially the latter, are subject to dispute.

commodities were typically outside the scope of humanitarian practice. In the field of urban food security, in particular, Battersby (2019) argues that studies and interventions overlook marketplaces because the field and sector have traditionally focused on individuals and households as their targeted units of analysis and recipients.

Figure 1 The Iron Market in ruins

Source: © PBS NewsHour, 23 January 2010, CC BY-NC 2.0, Flickr

One exception within the Haitian reconstruction agenda was the Iron Market (*Marché en fer* or *Marché Hyppolite* in French), a historic public market located in the capital's centre. Its reconstruction was financed by the Irish owner of a major telecommunication company in Haiti (Figure 2). Rebuilt within a year, it received positive coverage in local and international newspapers. It has been perceived as one of the few successful reconstruction projects in the immediate aftermath and an example of the significance of rebuilding economic infrastructure in urban contexts (see for instance Forbes 2011; Mone 2011; Vulliamy 2011).

At first, rebuilding marketplace infrastructure makes sense. Cash and markets (i.e., the activity) are acknowledged as an essential part of urban humanitarian interventions because doing so supports the local economy and local workers and builds on the existing ways urban dwellers access goods and services (High Level Panel on Humanitarian Cash Transfers 2015; Bennett et al. 2016; Sanderson 2019). In Haiti, many rely on marketplaces for their source of income and to access basic commodities. In metropolitan Port-au-Prince, Haiti, 77.1% of employment is informal (Herrera et al. 2014), and in Haitian cities, '40 per cent of the workers are employed in wholesale and retail trade—a large part of them in

"petty trade"' (Scot and Rodella 2016: 19). Statistics on Haitian urban households' preferred sources of food are non-existent except for some information about street food consumption (see WFP 2016: 29); however, it is common knowledge that physical and financial access to supermarkets is limited to the few and that most urban households rely on petty traders for their supply of food.

Figure 2 Rebuilt Iron Market

Source: © Hufton and Crow, 8 March 2011, CC BY-SA 4.0, Wikimedia Commons

Nonetheless, *building on* marketplaces appears to be particularly challenging. I discussed positive and negative aspects of the Iron Market's reconstruction in my Master's thesis in 2011 (Smith 2011) and the possible lessons for post-disaster reconstruction in an essay written at the beginning of my doctoral studies and included in the thesis (referred to as *Essay* in the thesis, see Appendix 1). The master's thesis and the Essay highlight, among others, several concerns undermining the projected positive impact on traders' livelihoods. While traders were grateful for a dignified place to work and appreciated the social impact of the project, many were concerned about the unprofitability of their businesses and the possibility of remaining in the marketplace for the long-term (Smith 2011). The new market infrastructure offered better working conditions but did not successfully support the restoration of trade and, thus, traders' livelihoods (Essay).

Although trade in the urban public spaces of cities in low- and middle-income countries has been extensively researched in the academic literature, much of it relates to the contested nature of the activity, the perceived need for and challenges facing formalisation by local

governments, and their consequences on traders' activities (e.g., Bromley 2000; Bhowmik 2005; Roever and Skinner 2016). As such, existing marketplaces are often portrayed rather negatively, as places of contingency and insecurity, sources of discord and environmental problems, and places of political contestations and evictions.

I state, at the end of the Essay, that '*perhaps* markets are truly good places to start rebuilding after [an] urban disaster' (Smith 2016: 169, emphasis by author). Here, 'perhaps' is more than an academic self-defence mechanism. It is the main starting point for this thesis: the assertion that not enough is known about the ways marketplace infrastructure influence trade in disaster and post-disaster contexts, as the most common observations and claims behind the idea that marketplaces should be built upon remain mainly based on the following unexplored assumptions:

- If marketplaces are so popular among a large part of the urban population, they must have significant desired functions and attributes for the numerous low-income traders and customers who occupy and shop at the marketplace.
- A marketplace's physical and spatial setting should positively influence these desired functions and attributes.
- Conversely, if marketplace structures collapse, as in the case of the Iron Market, traders and customers must necessarily be negatively impacted.
- Furthermore, if marketplaces withstand a disaster or are rebuilt, it is assumed that traders and customers will benefit, which will increase their resilience.

There is, therefore, a need to further explore the ways marketplace infrastructure support (and should support) trade for traders and customers in disaster and post-disaster contexts, including following the *12 Janvier*, so that marketplace traders and customers can be fully acknowledged and supported by government and non-governmental organisations in reconstruction agendas.

1.1 Research aim, objective, and research questions

The thesis argues for considering marketplaces as critical urban infrastructure in disaster and post-disaster contexts. More precisely, the aim is to convince researchers and practitioners to view marketplaces as critical urban infrastructure in future research and practice in cities in low- and middle-income countries. The target readers are researchers and practitioners in architecture, urban planning, and development and emergency practice.

The thesis formulates two central concepts: marketplace infrastructure and marketplace resilience. *Marketplace infrastructure,* in this thesis, is defined as all the physical and

socioeconomic elements and relations that determine and support the primary function of urban infrastructure as being the trade of goods and services. Based on a discussion on how marketplaces should be conceptualised in disaster settings, the thesis also formulates the concept of *marketplace resilience*, which is all the overlapping processes of maintaining or rapidly returning to the marketplace's desired functions and attributes in the face of a disaster, adapting to change, and quickly transforming systems or structures that contribute to traders' and customers' vulnerability and limit their current or future adaptive capacity. These two concepts are explained further in Chapter 2.

The concepts act as a foundation for the objective of the thesis, which is to explore the ways marketplace infrastructure support (and should support) trade for traders and customers in disaster and post-disaster contexts. Each paper included in the thesis contributes to the objective by focusing on different aspects of the object of inquiry (see Table 1): Paper A (Appendix 2) is a literature review on marketplaces in the cities of low- and middle-income countries, where traders and customers face various kinds of hazards. Papers B (Appendix 3), C (Appendix 4), and D (Appendix 5) are multiple-case studies of different marketplace infrastructural settings in Port-au-Prince, Haiti. Paper B focuses on the relational aspects of infrastructure following the *12 Janvier*, while Papers C and D mainly discuss the physical aspects of infrastructure. Because they are the main users of marketplaces, the thesis focuses on the perspectives of traders and customers.

Through the papers (Papers A, B, C, and D), the thesis addresses three overarching research questions:

> **RQ-1 What are the desired functions and attributes of marketplaces to be maintained or rapidly restored in disaster contexts for traders and customers?**

The first main research question focuses on understanding how marketplace infrastructure contributes or should contribute to trade activities and informs the second and third research questions by investigating the functions and attributes that are desired by traders and customers to be 'resilient' in disaster contexts (see section 2.3.2). **Paper A** identifies desired functions and attributes in 42 publications on marketplaces in low- and middle-income countries where marketplaces are affected by various hazards, mainly arising from detrimental policies on street trade. **Paper B** identifies the desired functions and attributes for traders and customers in three marketplaces of Port-au-Prince, Haiti, and explores their interrelatedness. **Paper D** complements Paper B, mainly based on the social aspects of infrastructure (see Section 2.2.3), by focusing on the marketplace's physical infrastructure.

Table 1 Overview of thesis in relation to the research questions

Thesis objective (partly introduced in the **Essay**): To explore, in disaster and post-disaster contexts, the ways marketplace infrastructure support (and should support) trade for traders and customers in the cities of low- and middle-income countries.

			Paper A	**Paper B**	**Paper C**	**Paper D**
			Marketplaces in cities of low- and middle-income countries	**Social infrastructure**	**Physical infrastructure**	
				in the marketplaces of Port-au-Prince, Haiti		
Overarching research questions	**Desired functions and attributes**	**RQ-1** What are the desired functions and attributes of marketplaces to be maintained or rapidly restored in disaster contexts for traders and customers?	RQ-1a What marketplace attributes contribute to (or hinder) the roles of traders and customers vis-à-vis their households?	RQ-1b What are the relational attributes of marketplaces for traders and customers?		RQ-1d What are the attributes of the marketplace's physical infrastructure for traders?
	Disaster impacts	**RQ-2** How can marketplace infrastructure influence the impact of disasters on the desired functions and attributes for traders and customers?	RQ-2a What are the shocks and stresses experienced by traders and customers in the marketplace, and how do they impact their respective households?	RQ-2b What are the impacts of the 2010 earthquake and the changed post-disaster conditions in the marketplace on the relational attributes?	RQ-2c How does the physical infrastructure of the marketplace influence traders' exposure to hazardous events and conditions?	RQ-2d What are the impacts of collapsed physical infrastructure on traders?
	Resilience process	**RQ-3** How can marketplace infrastructure influence traders' and customers' resilience process?	RQ-3a What are the acts of traders, customers and their respective households to build resilience?	RQ-3b How does the social marketplace infrastructure contribute to or impede traders' and customers' resilience process?	RQ-3c How does the physical infrastructure impact traders' acts to maintain or rapidly return to trade following a hazardous event?	RQ-3d How do improvements and regressions in physical infrastructure provision affect traders' resilience process?

RQ-2 How can marketplace infrastructure influence the impact of disasters on the desired functions and attributes for traders and customers?

The second research question focuses on the disaster impacts on traders, customers and their households, and more specifically, through the lenses of different degrees of infrastructural provision and robustness (see Section 2.3.3). **Paper A** identifies the main documented hazards experienced by traders and customers in the marketplaces of low- and middle-income countries and discusses their origins and impacts on households. **Paper B** discusses the impact of the destruction of marketplace physical infrastructure on the relational attributes from the perspectives of traders and customers. **Paper C** discusses the influence of the physical infrastructure on traders' exposure to hazards, while **Paper D** reframes the discussion on the impact of collapsed physical infrastructure on traders' businesses in Haiti.

RQ-3 How can marketplace infrastructure influence traders' and customers' resilience process?

The third research question directs the study on the infrastructural factors supporting or hindering traders' and customers' acts in building resilience (see section 2.3.4). **Paper A** identifies the documented acts of traders and customers to build resilience in the marketplaces of low- and middle-income countries. **Paper B** discusses the limitations of Haiti's marketplace social infrastructure (see Section 2.2.3) in disaster contexts, as well as how changes in physical conditions in the marketplace influence how traders and customers build resilience. **Paper C** describes how traders' and customers' actions in building resilience can vary in different marketplaces, while **Paper D** discusses further how this variation is linked to the robustness of the physical infrastructure, the improvement or regression in physical conditions, and the limitations of traders and other stakeholders in improving marketplace infrastructure.

1.2 Thesis structure

The thesis is centred on the four core papers included in the thesis[2] (Papers A to D) and is structured in a way to provide an adequate foundation for the discussion that ensues at the end.

Chapter 1 provides the rationale for this PhD research by introducing the need to explore, in disaster and post-disaster contexts, the ways marketplace infrastructure support (and should support) trade for traders and customers in the cities of low- and middle-income countries. In the introduction, the general disregard by the stakeholders involved in the rebuilding of Haiti of the infrastructural needs of small traders and customers, as well as

[2] The Essay, included in the list of publications, supports the introduction but is not central to the doctoral thesis.

some of the issues raised, in the Master's thesis and in the Essay, by the exceptional reconstruction of the Iron Market in Port-au-Prince, are discussed. The introduction concludes by formulating the main research questions and explaining their relationship to the papers.

Chapter 2 provides the contextual and theoretical foundations of the research questions formulated in Chapter 1. The first part presents the Haitian context in which the questions originate. The second part conceptualises marketplace infrastructure and disaster resilience from the academic literature. The chapter ends by formulating the concept of *marketplace resilience* as an exploratory framework and summarising the gaps in the literature on Haiti, marketplaces, and disaster resilience.

Chapter 3 establishes the methodological foundation of the research undertaken for the papers. It situates the research epistemologically in critical realism and explains the methodological approaches and the data collection and data analysis methods used in the literature review (Paper A) and the multiple-case study (Papers B, C, and D). The rationale behind the selection of the four marketplace cases in Haiti and a short description are provided. The chapter ends by discussing ethical and fieldwork considerations and the limitations of the research.

Chapter 4 summarises the findings from the review of the literature on marketplaces in the cities of low- and middle-income countries (Paper A) and from the empirical multiple-case studies on four marketplaces located in the metropolitan region of Port-au-Prince, Haiti (Papers B, C, and D). Findings are presented according to the sub-research questions (Table 1).

Chapter 5 combines, in the first part, findings from the individual papers and discusses the theoretical contributions according to the main research questions presented in Chapter 1. In the second part, the chapter suggests implications for built environments and humanitarian practices in the urban contexts of Haiti and other low- and middle-income countries.

Chapter 6 concludes the thesis by offering reflections on the thesis's contribution to theory and practice by arguing that marketplaces should be considered one of the most important urban infrastructures in the cities of Haiti and of other low- and middle-income countries, particularly in disaster and post-disaster contexts, and by providing suggestions for further research.

2 Contextual and theoretical foundations

This chapter provides the contextual and theoretical foundation of the research questions introduced in the previous chapter and the discussion of the findings from the four main papers in the thesis (Papers A, B, C, and D). The first part presents the Haitian context in which the thesis originates. The second part conceptualises marketplace infrastructure and disaster resilience from the academic literature. The chapter ends by formulating the concept of *marketplace resilience* as an exploratory framework and by summarising the gaps in the literature on Haiti, marketplace infrastructure, and disaster resilience.

2.1 Marketplaces, disaster, and resilience in the Haitian context

This section describes the Haitian context where the research questions originate and where the empirical multiple-case study takes place (Papers B, C, and D). The first part consists of a brief geographical and demographic overview and the presentation of elements necessary to understand the context in which marketplaces have developed, as well as the urban disaster of the *12 Janvier*. The second part presents a summary of the limited but compelling literature on Haitian marketplaces, followed by the third part, which focuses on the 2010 earthquake and its impact on employment and food security and how 'resilience' has been portrayed. The section ends with a summary of the gaps in the literature on Haitian marketplaces (pre- and post-earthquake).

2.1.1 Haiti and the metropolitan region of Port-au-Prince: main contextual elements

Drawing partly on the doctoral work of Thérasmé (2011) on street markets in downtown Port-au-Prince, four elements are necessary to understand the context in which marketplaces have developed in the capital of Haiti, the earthquake of 2010, and the international aid response that followed:

- The demographic and spatial expansion of the metropolitan region and its geographical exposure to natural hazards;
- A high level of household poverty and urban precariousness;

- The weakness and non-interventionism of the municipal and national authorities in the planning, infrastructure provision, and management of the city;
- A complex geopolitical heritage.

The demographic and spatial expansion of the metropolitan region and its geographical exposure to natural hazards

Figure 3 Map of Haiti

Source: © Rémi Kaupp 2009, CC-BY-SA, Wikimedia Commons

The Republic of Haiti occupies the western part of the island of Hispaniola in the Greater Antilles archipelago of the Caribbean Sea (Figure 3). It shares the island with the Dominican Republic. The population is estimated at 10.9 million inhabitants, more than half living in urban areas (IHSI 2015). The urban population is concentrated in and around the capital, Port-au-Prince. Largely due to rural migration (Herrera et al. 2014), the metropolitan region's[3] population increased from 1.6 million in 1988 to 2.6 million[4] in 2015 (IHSI 2015). The Haitian population is young, with more than half 21 years old or less in 2003, the date of the most recent census (IHSI 2003). The average size of Haitian households is 4.7 members (idem). Port-au-Prince is the administrative and commercial

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[3] The metropolitan area of Port-au-Prince is composed of following municipalities: Port-au-Prince, Delmas, Cité Soleil, Tabarre, Carrefour, and Pétion-Ville.

[4] Estimate.

centre of Haiti and occupies a strategic geographical location at the end of the Port-au-Prince Bay. French and Haitian Creole are the official languages, but only Haitian Creole is spoken by nearly all Haitians.

As the urban population increased in the metropolitan region, the urban fabric expanded considerably, from 6,700 hectares in 1988 to 11,200 hectares in 1996 and 15,850 hectares in 2015 (Thérasmé 2011; IHSI 2015). Demand for land escalated but as available land becomes rare and monetised, low-income households have no choice but to appropriate left-over spaces, notably along the numerous ravines of the city and on the steep slopes of *Morne L'Hôpital*, the mountain edge south of the city (Figure 4). The municipality of Port-au-Prince is the densest in the country, with more than 26,000 inhabitants per km^2.

Figure 4 The settlement of Jalousie, built on the extreme east of Morne L'Hôpital, near Pétion-Ville

Source: © IOM Haiti 2012, CC BY-NC-SA 2.0, Flickr

Haiti is exposed to multiple natural hazards. The country and the Greater Antilles are in an active seismic region. The island of Hispaniola is located along two major tectonic faults that separate the Caribbean and the North American plates, one of which passes underneath the capital. The seismic sources and their seismological history are considered well known by experts and have been documented since the 16th century (République d'Haïti 2010). The country is also exposed to hydrometeorological and climate-related

hazards, including the annual cyclonic season, which runs from June to November (idem). The last major hurricane that hit Haiti was Hurricane Matthew in 2016.

A high level of household poverty and urban precariousness

As of 15 October 2019, the World Bank describes Haiti as 'the poorest country in the Western Hemisphere, with a Gross Domestic Product (GDP) per capita of $870 in 2018 and a Human Development Index ranking of 168 out of 189 countries in 2018. … Over 6 million Haitians live below the poverty line on less than US$2.41 per day, and more than 2.5 million fall below the extreme poverty line of US$1.23 per day' (World Bank 2019: N.A.). Most work is informal (77%) in the metropolitan area, and most informal workers are underemployed, with 64% of informal workers in the metropolitan area generating an income of 200 gourdes (5 USD) or less per day, the established minimum salary (Herrera et al. 2014). In the metropolitan area, 40% are unemployed[5] (Herrera et al. 2014).

The ratio of women-headed households and, in particular, single-parent households led by women, is high in the metropolitan capital, as 49% of all households and 80% of single-parent households are headed by women (Herrera et al. 2014). Nearly 80% of heads of household working in the metropolitan area are active (Herrera et al. 2014). Therefore, women play an important social role in Haiti as they generate household income and perform most of the domestic and care work. They are often referred to as pillars of Haitian society (*poto mitan* in Haitian Creole). Access to primary education has increased, as 'the result of an important financial effort from the household' (Herrera et al. 2014: 59), notably women.

The weakness and non-interventionism of municipal and national authorities in the planning, provision of infrastructure, and management of the city

Like other welfare spheres, the State is minimally involved in the planning, provision, and maintenance of housing and public infrastructure (Thérasmé 2011), resulting in urban expansion occurring without dedicated urban planning. When there are urban regulations, they remain 'at the level of documents and law text' (Thérasmé 2011: 15) because they are generally unenforced by the local authorities and not followed by the inhabitants. Despite the broad scale of urban issues, the rare interventions of local authorities are generally 'inefficient, insignificant, and inappropriate' (Holly 1999 in Thérasmé 2011: 16).

Access to basic services has generally improved since the earthquake but remains problematic, with only 18% of households having access to drinkable piped water, 33% to a waste collection service, and 76% to the electric grid for lighting (Herrera et al. 2014). In urban areas at the national scale, nearly 70% of households use charcoal for cooking

[5] Enlarged unemployment ratio that includes people without employment, capable of working but not necessarily looking for work.

(IHSI 2003). Furthermore, most education services are provided by the private sector, as most pupils (77%) attend non-public schools in the metropolitan area.

A complex geopolitical heritage

There is a tendency to describe Haiti, as we have so far in this section, in rather negative terms. Its national history and vibrant culture, a source of pride among Haitians, are rarely addressed. Haiti was the first black colony to declare independence in 1804. As the most profitable colony of the French empire and most prosperous colony in the Caribbean region, it relied heavily on slavery. Shortly before independence, there were 452,000 slaves working on plantations for 40,000 white colonists and 28,000 free blacks (Richardson 1992). The 12-year Haitian Revolution was remarkable; Trouillot describes it as 'unthinkable … even among the slaves, even among its own leaders' (1995: 73, 88).

It is, perhaps, because Haitians know their history well that Haiti also has a complicated relationship with international actors. Since the declaration of independence in 1804, Haiti has indeed struggled to develop fruitful relationships with foreign nations that are truly beneficial to the Haitian people. The international recognition of independence, 'more difficult to gain than military victory over the forces of Napoleon' (Trouillot 1995: 95), lasted for half a century and resulted in a heavy indemnity payable to France. The country was occupied by the Americans from 1915 to 1934, and the Duvalier dictatorships from 1957 to 1986 were supported or tolerated by the international community (see Trouillot 1990). The perceived failure of international aid organisations to provide long-term development assistance following the 2010 earthquake is also particularly evident. The intention, here, is not to give a history lesson, but to acknowledge that the situation Haiti is in today, including the magnitude of the impacts of the 2010 earthquake, is also largely rooted in its complex geopolitical heritage.

2.1.2 Haitian marketplaces

Port-au-Prince is a city of marketplaces. As in most, if not all, cities in low- and middle-income countries, trade is a visible urban phenomenon in Haiti. Its presence is particularly striking in the metropolitan urban landscape (Thérasmé 2011): from the vast agglomeration of public markets and street markets downtown Port-au-Prince (Figure 5), where 90% of the sidewalks are occupied by commercial and craft activities (Malebranche 2000), to markets occupying the ravines of the city, trading spots positioned strategically at crossroads, and mobile vendors refreshing drivers and passengers stuck in traffic under the Haitian sun. In the municipality of Port-au-Prince alone, only a dozen marketplaces are formally dedicated urban public places for trade and administrated by the municipality, while approximately more than a hundred urban public places are used as de facto marketplaces by traders and customers (Neiburg et al. 2012). Hence, the municipal

provision of trading space for traders and customers is largely insufficient to meet demand (Thérasmé 2011). As a result, most petty trade occurs on the streets, sidewalks, and urban interstices of the capital city.

Figure 5 Satellite image of street markets in downtown Port-au-Prince

Source: © Maxar Technologies 2020, Google Earth

However, the literature on Port-au-Prince's marketplaces remains limited in comparison to the scale of the phenomenon. Drawing mainly from the work of Bazabas (1997), Blanc (1997), Thérasmé (2011), and Neiburg et al. (2012), mostly on street markets, this section describes the functioning and importance of marketplaces, from the country scale to urban public spaces.

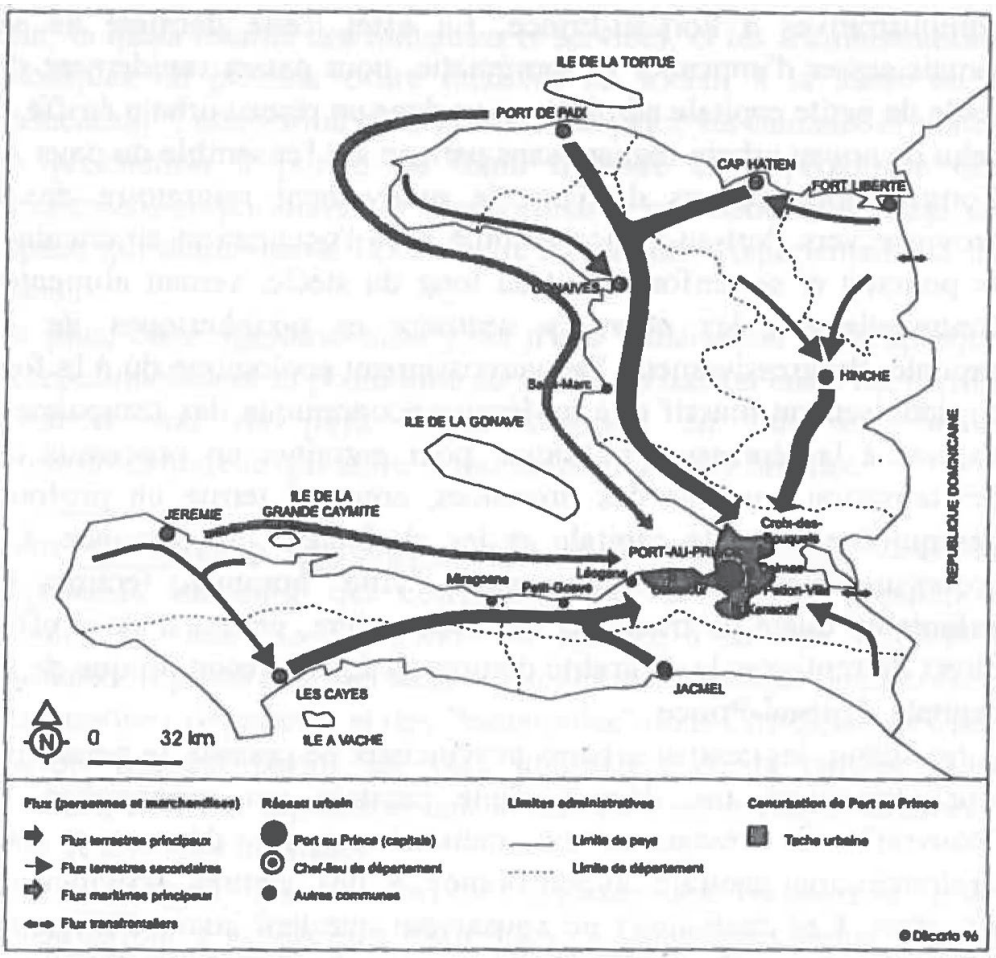
A national system with Port-au-Prince at its core

Marketplaces have been of great economic importance to Haitian society for decades (Bazabas 1997). More than 5,000[6] marketplaces are scattered across the country (Bazabas 1997), and 'every town has a marketplace' (Mintz 1960[7]). They are strategically located, whether formally planned in the *communes*[8] [municipalities] or informally formed along

[6] Again, due to the informal character of marketplaces, Neiburg et al. (2002) emphasises the inherent difficulty in quantifying the number of markets in Haiti.
[7] Mintz, among other anthropologists, studied Haitian petty trade over half a century ago. While his description of the phenomenon merits an update to the contemporary urban reality, it remains very accurate regarding what was observed in 2016 and mentioned in other literature. Consequently, such references are included in this paper when the described realities at the time have also been observed by the author. In this particular case, the visited nearby 'rurban' municipalities (e.g. Kenscroff and Croix-des-Bouquets) and other Haitian towns (e.g. Léogâne and Jacmel) all have marketplaces.
[8] The commune is the third-level administrative division in Haiti. Haiti has 144 communes.

the regional roads of the *départements*[9] [administrative regions] or at the busiest intersections of the country. Connected by road infrastructure and activated by numerous vendors and re-sellers, these marketplaces form a highly organised network of economic exchange and distribute a variety of national and imported products across the country (Figure 6). Supermarkets also contributes to the provision of goods and services in Port-au-Prince, but its impact on the provision of food and basic commodities, in particular, remains relatively marginal and mostly benefits the richest members of Haitian society. A preliminary assessment determines that approximately thirty supermarkets exist in the metropolitan region of the Haitian capital, mostly in Pétion-Ville, Delmas, and Port-au-Prince.

Figure 6 Haiti's internal marketplace system



Source: Bazabas 1997: 33

[9] The département is the first-level administrative division in Haiti. Haiti is divided in 10 départements.

There is a significant number of intermediaries between producers and consumers who bulk and un-bulk commodities and transport them on foot, on shared *taptaps*[10], or on trucks. These flows of transactions are multiplied by the number of people required to manage, transport, and buy relatively small quantities at a time, daily or weekly. The following is an illustration of these flows, reconstituted from several documents:

> Rural producers sell small quantities of their agricultural production in the local rural marketplace to a *revandèz*. The *revandèz* gathers products from different producers and sells them in bulk to a *madan sara*, specialised in transporting specific types of commodities to the capital. She resells them to a *spékulatè* or a *gwo machann* in one of the marketplaces of the capital that supply other marketplaces in nearby neighbourhoods. *Lokal machann* buy smaller quantities from *gwo machann* located in the major marketplaces of the city, such as Croix-des-Bossales, or from one of the other major specialised *magasins*. She transports her stock on foot or on *taptaps* and sells these commodities in her local marketplace to residents.

Port-au-Prince occupies a central place in market operations because of its geographical location (Figure 6). Most main roads converge toward the city centre, where the main marketplaces and *magasins* are located, in addition to the main seaport. Products intended for local consumption in the capital, as well as commodities on their way from the North to the South of the country (and vice-versa) and imported goods for the whole population, are transported via this economic hub. As a result, the roads of the country and the streets of Port-au-Prince tend to be extremely busy.

Economic, social, and political aspects of marketplaces

Unlike rural areas where residents can rely on self-sufficient agricultural production to meet basic needs (Lamaute-Brisson, 2002), the urban population depends on the marketplace system as a source of both basic commodities (Bazabas, 1997) and income (Thérasmé, 2011). Marketplaces appear and expand where urbanisation occurs. Similar to the State's lack of interest in and capacity and resources for managing urban sprawl (see previous Section 2.1.1), investments in marketplace infrastructure have not followed the pace of urbanisation. The result is the presence of market vendors occupying much of the sidewalks and, sometimes, entire streets in low-income neighbourhoods (Goulet, 2006).

More than solely economic spaces, many scholars emphasise the importance of marketplaces in the social life of Haitian society and the country's history. The marketplaces are also important because they 'structure' the social life of its users (Bazabas, 1997, Thérasmé, 2011). Because the chain is made of personal relationships, it acts as a social network linking rural and urban communities and members of extended

[10] Small truck converted for public transportation, often decorated and painted with bright colours.

families. In the heart of the capital city, the rural connects with the urban in fruitful economic exchange, providing income, commodities and services to rural communities as well as many low-income urban residents (Bazabas, 1997). Notably, Mintz observed and described these socioeconomic relations, called *pratik*, in rural marketplaces (1961, in Mintz 2011). Social networks are also key in accessing a trading spot in street markets (Thérasmé 2011). There is strict social control of who can join the kin group of vendors and thereby access a vending space. It is nearly impossible to start vending in spaces already occupied unless introduced by a family member (Thérasmé 2011).

Members of the elite in Haiti, whether newspaper journalists, professionals (including in the built environment), or large business owners, generally view marketplaces as 'a source of problems' (Thérasmé 2011). They perceive marketplaces as having high criminality, an extremely low level of sanitation, and lacking order; long-term residents of Port-au-Prince often accuse the new *Port-au-Princiens* of being responsible for the poor image of the Capital because of their informal practices (Thérasmé 2011). There is, therefore, tension between the large low-income population, who participate in the market system and rely on it for their livelihoods and to access commodities, and the small but influential high-income population, who perceive marketplaces as stains on the image of the city.

2.1.3 The effect of the *12 Janvier* on markets and their so-called resilience

On the 12 January 2010 at 4:53 pm local time, something went terribly wrong:

> It sounded like a tornado, followed by a bomb dropping. Then, the noise under the ground started … You heard the noise under the ground and it's shaking and shaking, and everybody started running … Houses were falling and falling, all of the fences were falling, people were falling, people were crying. … Twenty seconds later, it was over. … There was nothing but rubble and dirt. … You cannot see the air. All of a sudden, it's dark. … After that, you saw the sun, the sun was falling under the horizon. (Frantz Florestal in Sturcke 2010: N.A.)

The earthquake, combined with the elements of vulnerability described briefly in Section 2.1.1, resulted in one of the worst urban disasters in history. Beyond the impacts mentioned in the introduction on human lives, migration, and the built environment, *the 12 Janvier* had a documented effect on markets (i.e., trade and business activities) and, hence, on employment and food security.

The *12 Janvier*'s impact on employment and income was significant. Only half of the respondents employed before the earthquake were still employed five months after it (Kim et al. 2014). Furthermore, 'the retention rate of employment significantly differed by gender (male: 55.6%, female 34.2% …)', revealing that women were struggling more than men in returning to livelihood activities (idem: 343). Another study conducted 12 months after the earthquake, which compared camp and neighbourhood socioeconomic conditions,

reported that 'the overwhelming majority of households in both camps (90 per cent) and neighbourhoods (73 per cent) reported their income was affected by the earthquake … Prior to the earthquake, approximately 1 per cent of households reported that their financial situation was so difficult they could not meet basic needs while, at 1-year post-earthquake, 46 per cent of camps and 27 per cent of neighbourhood households reported this' (Green and Miles 2011: 87).

The *12 Janvier* also impacted food security and the food market. A report published a few days after the earthquake states that 'in the short-term, household food security in Port-au-Prince is principally affected by the loss of income caused by the severe decline in income-earning opportunities. Food security has also been impacted through damage to infrastructure and property in Port-au-Prince and through immediate increases in food prices' (FEWS/NET 2010: 1). A few weeks later, emergency market mapping and analysis (EMMA) revealed effects on the supply of rice, a staple food in Haiti: 'the main market disruption is at the small wholesaler level. 80% of them lost their storing facilities and "PaP [Port-au-Prince] Madan Sara [semi-retailers]" are now dealing directly with the main wholesalers who were usually refusing to deal with small orders. As a coping strategy to [deal with] high insecurity in PaP markets, the PaP Madam Sara and retailers purchase smaller quantit[ies] to reduce the stocks left overnight' (IRC and partners 2010: 3).

As mentioned in the introduction, marketplaces have been largely overlooked in the reconstruction efforts. It is, perhaps, because Haitian marketplaces and small retailers are generally perceived as 'resilient'[11] that they have not been given more attention in the reconstruction efforts. This perception can be due to many factors. Despite the impacts on employment and food security and the physical damage to marketplaces, reports mention, for instance, that 'the majority of markets in Port-au-Prince are well-stocked and functioning' (FEWS/NET 2010: 1) and that 'street markets were operating within a couple of days' (Clermont et al. 2011: 4). Photos and accounts of traders working within days and, sometimes, within hours after the earthquake are also frequent in the literature. For example, journalist Jonathan Katz reports the following, a few hours after the quake:

> On the way to the embassy, under a working light beside a standing building, a woman was selling cooked food. The portly matron, still finding plenty to laugh about on that catastrophic night, was offering rice, plantains, and fried pork that she had cooked up that morning. People with pocket change were lining up to have some. … mere hours after the disaster, … as with the cigarette man in Pétionville, commerce continued to function in spots. In the midst of near-total disaster, people were trying to go on. (Katz 2013: 29-30)

[11] In the limited understanding of the term, that is being able to bounce back. See section 2.3.4.

2.1.4 Marketplaces and their resilience in post-disaster Haiti: the gaps

Section 2.1 provided the contextual foundation for the thesis. It presented how the combination of Haiti's exposure to natural hazards and the contextual elements of vulnerability, such as the high level of household poverty, urban precariousness, weakness and non-interventionism of the public authorities, and the country's geopolitical heritage, led to the urban disaster of 2010. The section also presented a summary of the written knowledge on Haitian marketplaces, mainly on Haiti's market system and street markets. The literature on Haitian marketplaces is, however, limited and focused on the spatial occupation of traders and environmental conditions of street markets. Less is known about the infrastructural needs of traders, how marketplaces are used by customers, and the socio-spatial attributes of marketplaces supporting trade. There is some literature on social practices in Haitian rural marketplaces, but they remain unexplored in urban contexts.

The section also documented impacts of the *12 Janvier* on employment, food security, and the relative 'resilience' of Haitian markets. The impacts of the 2010 earthquake on Haitian marketplaces and on traders and customers remain largely undocumented, as most of the attention was focused on domestic and residential spheres during reconstruction. While available research indicates that trade was impacted, there is little information about the effects of the collapse of the physical marketplace infrastructure on trade. It is, perhaps, because marketplaces are not perceived as infrastructure, particularly in low- and middle-income countries and in disaster contexts, that they were generally overlooked in the reconstruction agenda in Haiti. A study of the impacts of collapsed marketplace infrastructure on urban residents would support a discussion on whether marketplaces should be considered part of the infrastructure to be supported in post-disaster contexts.

The quick 'recovery' of markets supports the idea of markets as an essential urban service for citizens, but this view, in previous research by the author (Smith 2011; Essay) and others (IRC and partners 2010; Clermont et al. 2011), is largely based on observations, and statistics about employment tend to support the opposite. The so-called resilience of traders deserves further exploration and a more nuanced discussion. Of particular interest is what is behind this so-called resilience (notably, the role of traders' and customers' households), whether it varies in different marketplace environments, and whether the resilience process includes a critical set of actions aiming to transform an undesirable status quo (see Section 2.3.4).

2.2 Marketplace infrastructure in theory

This section presents and argues for a conceptualisation of marketplaces as urban infrastructure. The first part presents how marketplaces are usually conceptualised as

urban public spaces and suggests an original definition of marketplace infrastructure. The second part presents, largely based on the work of Dewar and Watson (1990), how the physical dimension of marketplace infrastructure can support or hinder trade activities. Then, the third part explores the socioeconomic dimension of marketplaces. The section ends with a summary of the gaps in the literature for a more comprehensive understanding of marketplaces as infrastructure.

2.2.1 Defining and conceptualising marketplaces as infrastructure

Drawing from Dewar and Watson (1990) and Brown (2006a), marketplaces can be defined simply as the physical agglomeration of small traders and service providers in an urban public space. In urban public spaces, Brown includes 'all space that is not delineated or accepted as private and where there is at least a degree of legitimate public or community use' (2006a: 22). Therefore, urban public spaces can include squares, parks, and sidewalks, typically recognised as public areas in the cities of high-income countries, as well as spaces between buildings, unbuilt land, and ravines that are accessed and used by a large part of the population living in the cities of low- and middle-income countries. The publicness of some of these spaces may be contested, but they are considered public by those appropriating the space (Brown 2006c). Many authors have, for instance, documented the contestations of the public use of street markets by politicians, formal businesses, and socioeconomic elites. The wish to beautify and modernise central areas for their benefits often result in evictions and harassment of street traders (see Paper A).

Considerable research has been conducted regarding the ownership of, access to, and right to use urban public spaces, in general, and street markets, in particular (for instance Bromley 2000; Brown 2006a; Roever and Skinner 2016), and regarding the importance of public spaces as a livelihood resource for the urban poor (Lyons and Snoxell 2005; Brown 2006a; Smith 2011; Thérasmé 2011; Hart et al. 2015). Much of the literature theorises or conceptualises marketplaces as urban public spaces and focuses on how physical form and spatial organisation influence human experience and the social character of the place, as well as how social and political factors influence spatial use, access, and control.

A core argument in the thesis is that marketplaces should also be considered urban infrastructure, one of 'the basic systems and services … that [a city] uses to work effectively' (adapted from Cambridge Dictionary 2019: online). In contrast with urban public spaces, using infrastructure to support an understanding of marketplaces is not widely represented in the literature. Indeed, common functions of urban infrastructure normally include water and sanitation, waste management, transport, communications, energy, and education and health services (UN-Habitat 2015) but usually exclude the trade of basic commodities, such as food. Only a few authors consider food provision as within

the urban infrastructure functions portfolio and more often in terms of urban food production and food safety (Pinderhughes 2004) than in terms of distribution and retail. An exception is Dewar and Watson (1990: 23), who argue in a book on urban markets' location, structures, and management that 'markets must be treated as an essential form of urban infrastructure – as essential as roads, schools, or other urban elements'. Considering marketplaces as essential urban infrastructure has an intended normative argument that trade and traders' wellbeing should be eased, enhanced, and sustained with investments in the construction, maintenance, and management of marketplaces.

However, their call for acknowledging marketplaces as essential urban infrastructure in the cities of low- and middle-income countries remains largely unaccounted in the literature and in urban planning practice since the book's publication. It is a hope that this thesis, as mentioned previously (see Section 1.1), contributes to the shift advocated by Dewar and Watson (1990) from controlling urban public spaces to providing adequate and robust infrastructure. Acknowledging marketplaces as important urban infrastructure also has implications for urban resilience, including critical infrastructure functions that should be maintained during crises (see section 2.3.2).

Considering both systems and services in infrastructure allows not only thinking about dedicated services in silos (e.g., municipal water service) but also acknowledging the complexity of interconnected social actors, physical structures, and flows of resources that also fulfil functions desired by people (e.g., water provision in human settlements without access to a municipal water service). A shift from tackling urban infrastructure provision with a more complex system approach is echoed in recent literature and policy (da Silva et al. 2012; UN-Habitat 2015) as a better fit for the actual provision of infrastructure in the cities of low- and middle-income countries.

This is reflected in the way marketplace infrastructure is conceptualised in the thesis. Marketplace infrastructure is defined as

> *all the physical and socioeconomic elements and relations that determine and support the primary function of urban infrastructure as being the trade of goods and services*

The definition builds on a hypothesis that both the physical and socioeconomic dimensions of infrastructure—and their interrelatedness—are significant for trade activities. The physical and socioeconomic dimensions of the elements and relations are discussed further in the following sub-sections.

2.2.2 The physical dimension of marketplace infrastructure

The physical dimension of urban infrastructure notably applies to the physical elements and networks generally planned by experts and financed, regulated, and maintained by the State; these elements, such as water pipes and electric lines, are permanent and often invisible at the eye level (Star and Bowker 2010). Several authors qualify these as 'hard infrastructure' (Graham and Thrift 2007), which is often characteristic of cities in high-income countries. In the cities of low- and middle-income countries, however, hard infrastructure development has not followed recent rapid urbanisation due, in part, to limited institutional and financial capacities (Ali 2002; da Silva et al. 2012).

This is similar in the case of marketplace infrastructure. 'Internationally, a wide range of types and levels of market infrastructure is to be found in urban markets, ranging from situations where nothing is provided by the authorities' (Dewar and Watson 1990: 53), for example, the open street markets of Port-au-Prince (Figure 7), 'to situations where high levels of infrastructure are publicly provided' (idem: 53-54), such as the fully- serviced covered markets built to high standards in Barcelona, Spain (Figure 8). As mentioned regarding Haiti (Section 2.1.2), the provision of 'hard' marketplace infrastructure has not followed the latest rapid urbanisation processes, resulting in significant parts of the city being under-serviced. This results in most marketplaces in the cities of low- and middle-income countries, including Haiti's metropolitan region, being street markets. However, as seen below and in the thesis, this does not mean that the physical dimension does not play a role in under-serviced marketplaces.

The influence of the physical dimension—its functions and attributes—draws on physical and spatial determinism. Central to the idea is that physical and spatial materials and networks influence people's activities and quality of life because they can facilitate (or impede) and accommodate (or deny) multiple socioeconomic forms of exchange (Carmona et al. 2010). This is the core rationale behind planning and providing structures for marketplaces. While infrastructure needs have traditionally been investigated in the global South in relation to informal residential settlements (such as McGranahan et al. 2008), Lund and Naidoo (2016) and Nunan and Satterthwaite (2001) argue that they can also impact the productivity and conditions of workers, such as home-based workers, waste collectors and traders, by protecting human health, reducing environmental hazards (Ali 2002), and ensuring physiological needs are met.

Figure 7 An open street market in the neighbourhood of Saint-Martin, Port-au-Prince, Haiti

Source: Photo by author, 2016

Figure 8 A fully-serviced, covered market: Mercat dels Encants in Barcelona, Spain

Source: Photo by author, 2015

The physical dimension's influence can be discussed at different spatial scales. At the urban and neighbourhood scales, of primary relevance is the physical location of the marketplace for the success of traders' businesses (and the success of the marketplace as a whole) and customers. Dewar and Watson (1990: 23) explain, in the case of newly covered marketplaces, how 'inappropriate location had led to the total failure of [planned] markets: in many cases, expensive shelter and infrastructure had simply been abandoned while vendors took matter into their own hands to find more suitable locations'. Street markets, in contrast, tend to be located at strategic points in the city, as traders negotiate their spatial position between being close to high population flows or their clientele's places of residence, being close to an existing physical agglomeration of traders to tap into and contribute to the marketplace's commercial attractivity, and being at an acceptable distance from their supply sources (Dewar and Watson 1990).

In documenting the impacts of deficient infrastructure in low-income settlements on women's capacity to generate income, referred to as domestic production, and perform care and other household work, referred to as domestic reproduction, gender-related urban research has demonstrated the vital importance of infrastructure location for women and their households (Chant and McIlwaine 2015). This is further discussed in Paper A. For low-income residents, easier physical access (by foot) to the marketplace is considered a significant advantage 'because of their lower income and greater time constraints' (Dewar and Watson 1990: 27), which limit their mobility. They are, therefore, 'usually confined in their consumer behaviour to their local areas' (Dewar and Watson 1990: 27). Physical access to food is also a topic of interest in food desert research[12] (Cummins and Macintyre 2002; Hendrickson et al. 2006; Walker et al. 2010) and is further discussed in Paper B.

At the marketplace scale, Dewar and Watson (1990) argue that, in addition to their location, the effectiveness of marketplaces can be influenced by the provision of 'hard' infrastructural elements within the marketplace. Typical infrastructural elements of markets are listed in Table 2.

The provision of physical infrastructural elements and services within the marketplace is not without consequences on traders. Sometimes, less is better. Dewar and Watson (1990) make significant observations:

- There is no correlation between a high level of physical infrastructure provision and a highly successful marketplace. The economic success of traders, and of markets as a whole, depends primarily on the location and its environmental qualities

[12] The term food desert can mean (1) the lack of food stores in a given urban area (Hendrickson et al. 2006) or (2) an urban area 'where residents cannot buy affordable, healthy food' (Cummins and Macintyre 2002: 436).

(including hygiene and shopping experience). The persistence of many street markets with no or little 'hard' infrastructure provision serves as an example.

- Higher levels of infrastructure engender higher costs to traders if capital recovery and maintenance are not highly subsidised and, therefore, based on cost-recovery or profit-based schemes.
- Traders 'show great ingenuity' (1990: 58) in the self-provision of marketplace physical infrastructure, notably with regard to shelters and displays, and is influenced by the duration of market activities (i.e., shorter trading times will result in the use of lighter and more mobile structures) and by the level of security (i.e., less security will impede traders' willingness to invest in physical infrastructure).
- There is, therefore, no universal or highest level of infrastructure provision. Physical infrastructural needs and capacity should be assessed contextually.

Table 2 Typical infrastructural elements of fully-serviced marketplaces

Infrastructure elements	**Functions and attributes**
Flooring	Cleanable; to reduce levels of dust, mud, and foul smells.
Clean tap water source	To clean floors and vegetables and to drink. Needs vary with the type of commodity.
Electricity	Needs vary with the type of commodity.
Toilet facilities	For all users of marketplaces. Essential in large marketplaces and when existing alternatives are not easily accessible. Pay-as-you use systems are often counter-productive.
Shelter	Shelter needs depend on climate, urban context, environmental impact, permanence, and costs. It can take many forms: dedicated communal shelters (e.g., covered markets), shelter provided by natural environments (e.g., arcades or trees), and shelter provided by light materials (e.g., tarps and umbrellas).
Selling and displays	Adequate and attractive displays are an essential part of trade. They can take many forms, from entirely public (e.g., permanent concrete slabs) to entirely private (e.g., wooden stalls and baskets on the ground). Needs vary according to the commodity.
Storage	Needs and use vary according to the commodity and its costs.
Waste collection	Dedicated waste bins or areas. Responsibilities should be clear (e.g., traders clean up waste, and the municipality collects it from a dedicated area), with accountability enforced and traders organised.

Reference: Dewar and Watson (1990) and Brown (2006b)

In addition to infrastructural elements, the spatial organisation and physical layout also impact the economic success of traders' commerce. The grouping of traders of similar commodities contributes to comparative buying (i.e., customers comparing the cost and

quality of items), probabilistic consumer behaviour (i.e., the likelihood of finding the desired product), and the different infrastructural, financial and environmental requirements and effects of different goods (Dewar and Watson 1990; Pratt 2006). Dewar and Watson (1990) also document how the design of municipal markets, particularly circulation spaces, can create 'dead zones'. The functions and attributes of infrastructural elements and the physical layout of marketplaces are further discussed in Paper D.

2.2.3 The socioeconomic dimension of marketplace infrastructure

As mentioned previously, 'hard' infrastructure provision has not followed the latest rapid urbanisation processes in most cities of low- and middle-income countries. However, infrastructural provision still occurs in under-serviced areas, to a certain degree, due to extensive socioeconomic actors and networks. Such infrastructure is sometimes rereferred to as 'incremental infrastructure' (Silver 2014) or 'people as infrastructure' (Simone 2004: 411). In this thesis, it is referred to as social infrastructure. It tends to be financed and operated by the informal sector, is provisional and generally at odds with local regulations, requires human labour, and generates higher total costs for customers (Larkin 2013; Silver 2014), as demonstrated in the case of water (Hughes and Wickeri 2011; World Bank 2013).

Infrastructure overlaps conceptually and practically with trade and urban public spaces. When 'hard' infrastructure provision is deficient, basic needs tend to be commodified, resulting in many, such as drinking water, being the object of trade in urban public spaces. By providing urban services, the urban poor transform urban public spaces into 'functional destinations' (Simone 2004: 408). Consequently, the public space becomes 'a crucial resource' for the urban poor, but often, it 'is ignored if there is a narrow policy focus on housing and shelter' (Brown and Lloyd-Jones 2002: 168). Because the urban poor is central to the creation and operation of infrastructure services, but nevertheless often ignored as such, Smit (2016), Ali (2002), and Silver (2014) call for the urban poor, as users and providers, to be 'mainstreamed' in discussions on infrastructure.

This thesis, like Brown (2006c) and others, acknowledges the significance of the physical form on socioeconomic practices and human experiences in marketplaces but insists that marketplaces are also manifestations of social, economic, and political norms and processes in their own right. Specifically, while the physical qualities of spaces and infrastructural elements impact people's activities in and experiences of the urban space, 'materiality and physicality … may often be overstated' (Carmona et al. 2010: 122) at the expense of other pertinent perspectives and multiple social activities. A 'static characterisation of space' (Brown 2006c: 20) can, indeed, overlook important dynamics of social dimensions, such as gender and power (Massey 1994).

Therefore, a determinist view of urban public spaces, such as marketplaces, can be limiting. A relational approach that considers how different people perceive and use infrastructure and, therefore, the urban public space, seems more appropriate to uncover different functions and attributes. In this sense, the human geography discourse on place is instructive (Massey 1994). For instance, Madanipour (2010: 237) insists that public places are the product of 'intense processes of social interaction' determining a variety of, and sometimes opposite, perspectives according to different individuals or social groups. Building on the work of Harvey (1973), Brown (2006c) states that 'in the context of the city, the proper conceptualisation of space is resolved by human practice' and by asking how different human practices and experiences generate different social spaces, framed in the thesis in relational attributes.

The political dimension is not considered separately from the socioeconomic dimension in the thesis, largely due to fieldwork considerations (see section 3.8). It is, nevertheless, considered part of socioeconomic relationships. Power relates notably to the limitations of traders', customers', and other stakeholders' in their acts. To ease the discussion on the socio-economic dimension of marketplaces and their relational attributes, the section begins by providing an overview of the socioeconomic position and conditions of traders with regard to informality and poverty. Then, a discussion follows of their socio-economic activities, first in relation to customers and suppliers, and second, with other marketplace workers and stakeholders.

Marketplace traders buy from suppliers and resell goods and services to customers (Oxford Learner's Dictionaries 2019). The economic and spatial occupation of marketplace traders is generally qualified as informal. According to the International Labour Organisation, it is considered in the informal employment of own-account workers in the informal sector, which is

> the production of goods or services with the primary objective of generating employment and incomes [for] the persons concerned. The informal sector is a subset of unincorporated enterprises not constituted as separate legal entities independently of their owners (ILO, 1993). They are owned by individual household members or several members of the same or different households. Typically, they are operating at a low level of organisation, on a small scale and with little or no division between labour and capital as factors of production. (ILO 2018: 7)

Early and subsequent studies show how the informal sector contributes to urban economies as a source of growth and flexibility (Cross 2000), income generation for a large part of the urban population (Hart 1973), and the efficient delivery of goods and services to low-income dwellers (ILO 1972 in Dewar and Watson 1990).

In marketplaces, including street markets, making a distinction between formal and informal is generally not easy. Formal and informal sectors are interlinked and sometimes interdependent; traders can be informal providers of goods to formal enterprises, as well as informal customers of formal suppliers (Dewar and Watson 1990; Pratt 2006). For instance, Thérasmé (2011) exemplifies how traders stationed in front of formal stores are often perceived as competitors of these shops, but many of them are supported by and contributing to generating profit for the formal store. Moreover, one trader's small enterprise may not be formally registered, for instance, for tax purposes, while she or he pays market fees to the municipality. The degree of informality can vary based on 'the nature of their activity, the size of their enterprise and the extent to which they comply with official regulations' (Pratt 2006: 39). While it is a common perception that traders are self-employed, Bromley (1997, in Pratt 2006) suggests that financially independent traders are rarer than we think, as many depend on credited goods or rented equipment and locations.

Although informal workers, such as marketplace traders, are not always poor (Brown 2006a), they are often characterised as such because they rely on very low profit margins and lack social protection. Overall, incomes are generally lower in the informal sector than in the formal sector. The correlation between being poor and working in the informal sector tends to be stronger for women than for men, and women within the informal sector tend to earn less than men (ILO 2018). Globally, informal workers also typically lack access to social protection measures, such as unemployment insurance, that can be offered in formal waged employment, often dominated by men (Alfers Laura et al. 2017). The relationships between traders and their households, their attributes, and how they are affected in disaster contexts are explored further in Paper A.

Traders engage in various socioeconomic relations in the marketplace and beyond. Some relations form the core practice of trade, while other relations engage in ways that support trading activities and marketplace infrastructural functions. The sum of these economic activities within and related to marketplaces are diverse and generally complementary. Drawing on the work of Bromley (1997, in Pratt 2006) on street economies and Brown and Lloyd-Jones (2002) work on urban livelihoods, the main marketplace activities can be classified as follows:

1. Retail and wholesale of everyday commodities (e.g., foodstuffs and charcoal);
2. Retail and wholesale of specialised commodities (e.g., construction materials);
3. Services provided to marketplace clientele (e.g., shoe-shining and small-scale passenger transport);
4. Services and management directed specifically to the functioning of the marketplace (e.g., porters, security, and waste collection and recuperation).

The thesis mainly draws attention to the socio-spatial aspects of retail businesses involving everyday commodities, specifically traders and customers, as they are most prominent in number and the core of trade activities. However, it is important to acknowledge the presence of other actors and activities that can support or influence trade. They include the many service providers who compensate for the lack of and deficient provision of physical infrastructure by the State. Because most urban marketplaces are located in areas underserved by infrastructure, service providers play a key role in creating and maintaining infrastructural services in marketplaces. While the price of 'hard' infrastructural services may be included in the municipal market fee in covered markets, street traders pay various individual fees in open-air markets. The sum of these socioeconomic interactions and activities result in marketplaces being perceived as complex, dense, intense, vibrant, busy, and noisy.

The thesis focuses on relationships among traders, between traders and their customers, and between traders, customers, and their respective households. Regarding trader-trader relationships, a few authors have mentioned how marketplace social capital allows traders to leave their stalls to fulfil other household or business-related tasks while keeping their businesses open (Lyons and Snoxell 2005; Asiedu and Agyei-Mensah 2008). On the topic of trader-customer relationships, the literature provides insights into how it can influence food security, such as being able to buy on credit (Lyons and Snoxell 2005; Mackie et al. 2014). In Haiti, the 2016 urban food security assessment indicates that local marketplace traders were ranked second as the source of credit to buy food (15% of the surveyed households that were able to access credit), after family and friends (52%) (WFP 2016: 32). The gender-related literature on low-income settlements, focused on the domestic sphere and home-based enterprises, shows how women play a dual role of generating household income and performing household and care duties (Chant and McIlwaine 2015), but this role has not been explored in trader- and customer-household relationships. The relationships among traders, between traders and their customers, and between traders, customers, and their households are explored further in Papers A, B, and D.

2.2.4 Marketplace in theory: the gaps

This section argued for conceptualising marketplaces as urban infrastructure comprised of both physical and socioeconomic dimensions. Taking a holistic relational approach, in contrast with an exclusively economic or physical view on marketplaces, is necessary because of the interconnected nature of physical structures, social actors, and flows of resources embedded in trade activities. Marketplace infrastructure is defined as all the physical and socioeconomic elements and relations that determine and support the primary function of urban infrastructure as being the trade of goods and services.

Specifically, the section showed how infrastructure in low- and middle-income countries are relational in nature and more than just physical elements. Specifically, infrastructural elements and networks of marketplaces can be positioned within a spectrum formed, at one end, of engineered networks of structures and facilities, or 'hard' infrastructure, and at the other end, of what Simone (2004: 411) conceptualises as 'people as infrastructure', a notion of infrastructure that is inherently social and directly linked to what people produce and reproduce with very little resources.

Considering marketplaces to be vital urban infrastructure in low- and middle-income countries, however, is uncommon in the literature, particularly from a customer perspective. Further research is needed to support the shift advocated by Dewar and Watson (1990), from controlling urban public space to providing adequate and robust infrastructure for traders. Furthermore, Dewar and Watson (1990) work, as well as the food desert literature, relates mainly to the physical and spatial dimension of infrastructure. Household food security research conducted in other low- and middle-income countries indicates that the advantages of marketplaces over supermarkets seem to be embedded in the social relations and the possibility of buying smaller quantities at a time. This notion is, however, supported by only a few studies, mostly in South Africa (Battersby 2019), and the ways this spatially and physically unfolds in marketplaces still need to be explored.

The interplay between the physical and socioeconomic dimensions of marketplaces is key to understanding not only how physical infrastructure can contribute or hinder socioeconomic relational attributes but also, and importantly for this thesis, the effect of deficient and collapsed infrastructure on traders, customers, and their respective households. The latter links to households are particularly key, as urban infrastructure in low-income settlements is more often researched along with its contribution to household needs and wellbeing.

2.3 Disaster resilience in theory

This section conceptualises disaster resilience in a way that is constructive for the objective of the thesis. The first part provides a general definition of and arguments for using the concept of disaster resilience as a concept in research. The subsequent parts unfold three significant aspects: the desired functions and attributes, the disaster, and the resulting resilience process. The section ends with an overview of the gaps in the literature with regard to how resilience can be applied in the thesis.

2.3.1 Defining and conceptualising disaster resilience

Disaster resilience is defined in this thesis as

> all the overlapping processes of maintaining or rapidly returning to desired functions and attributes in the face of a disaster, adapting to change, and quickly transforming systems or structures that contribute to vulnerability and limit current or future adaptive capacity.

This definition is adapted from a systematic review of numerous definitions of resilience and urban resilience by Meerow et al. (2016), who suggest a definition that is applicable at an urban scale. It intentionally excludes a reference to the object of resilience because the thesis formulates an original definition related to marketplace resilience at the end of this chapter (Section 2.4) based on the previous section. However, most of the discussion on resilience is based on urban resilience and disaster literature.

This definition engages with three significant aspects, which are discussed further in the following subsections:

1. Desired functions and attributes (resilience of what and for whom);
2. A disaster, real or potential (resilience to what);
3. The resulting resilience process.

Like sustainable development, resilience has been used and developed relatively recently and has an array of definitions and applications in policy, research, and practice. The proponents on the use of resilience in urban planning and humanitarian practice and research generally argue, among others, that

- Strengthening resilience is included in global policy agendas, such as the Sendai Framework for Disaster Risk Reduction (UNISDR 2015) and the United Nations' Sustainable Development Goals (UN 2016), and 'measuring resilience' is needed to 'prioritise policy approaches and field activity, monitor progress, and foster accountability' (Gaillard J C and Jigyasu 2016: 39).
- Resilience provides holistic insight into the complexity, dynamics, and sustainable management of socio-ecological and socio-technical systems that constitute urban environments (Folke 2006; Pickett et al. 2014).
- Resilience is a relevant approach with respect to current climate change impacts and predictions, as well as climate change uncertainties (Leichenko 2011; Tyler and Moench 2012).
- Resilience is generally perceived as a positive and aspirational concept, encouraging solutions across sectors and research across disciplines (Béné et al. 2012; Weichselgartner and Kelman 2014; Sanderson 2016).

- By its focus on understanding how people are *actually* impacted by disturbances and what they *actually* do during and after crises, it supports measures that will support and complement existing capacities (Sanderson and Sharma 2016).

Still, using and applying resilience in urban planning and humanitarian research and practice is not without debates about its value. Critiques claim, among others, that

- 'Resilience continues to be mainly externally defined by expert knowledge from academia, international organisations, and governmental agencies' (Weichselgartner and Kelman 2014: 257) and is yet to be fully legitimised in local discourses and practices (Béné et al. 2012; Andresen 2019).
- Advocating for resilience in disaster-risk reduction has little meaning if put within neo-liberal discourses and practices that favour the disengagement of the welfare state and of its citizens, leaving the disaster-affected as aid recipients or corporation clients instead of 'political actors with rights' (Tierney 2015: 1339).
- Resilience is becoming a buzzword. The two favourable functions ('the technical role as a pertinent concept to characterise dynamic systems and the use as an intuitive policy discourse) are distinct and should remain separated. Mixing or even confounding them is part of the problem as it does not necessarily help in assessing the concept correctly' (Béné et al. 2012: 45).
- Resilience does not substitute for other useful concepts and frameworks in disaster and poverty reduction (Béné et al. 2012), and it may not work as an explanatory concept in certain contexts (such as the one alluded by Andresen 2019). Other concepts and frameworks may be more suitable.

The above arguments for and critiques of the use of resilience in research, policy, and practice are valid and reveal the strengths and limitations of the term. Resilience as a concept should, therefore, be used critically and prudently. In response, the following subsections also clarify and discuss further how resilience is conceptualised and framed analytically in the thesis.

2.3.2 Desired functions and attributes

The review of resilience and urban resilience theories and definitions by Meerow et al. (2016) shows how most conceptualisations rely on a systems approach. A system is defined as 'a set of things – people, cells, molecules or whatever – interconnected in such a way that they produce their own pattern of behaviour over time' (Meadows 2008: 2), often referred to as the system's function or purpose. The city is, thus, conceptualised as being formed of multiple systems. Urban infrastructure *is* one of these urban systems. A systems approach generally develops 'a holistic view of the components and the interrelationships among the components of a system' (Berkes et al. 1998: 8). Similarly,

for urban systems, both the physical and socioeconomic dimensions of infrastructure (as discussed previously in Section 2.2.1) adopt a systemic understanding of infrastructure, one that is complex and interconnected. While some categorise urban systems by their components, for instance, social, economic, and physical (Resilience Alliance 2007; Campbell 2016), it is, by definition, more appropriate to classify them by their functions and purposes. As a result, one component or sub-system can (and normally does) belong to several systems, and therefore, contributes to several functions or purposes. For instance, a vegetable trader can be the preferred source of fresh food for nearby residents, as well as generate household income. It is the sum of these functional and changing characteristics of multiple interrelations and interdependencies that lead to characterising urban systems as complex and adaptive (Friend and Moench 2013; Sitko 2016).

For resilience to be a positive and constructive concept in research, policy, and practice, functions must be desirable (Caputo 2013). Seeking the 'purpose of resilience' (Caputo 2013: 37), and for whom, should, therefore, be of primary concern. As the 'best actions [to reduce disaster risk] are people-centred' (Sanderson and Sharma 2016: 11), the desired functions of urban systems (or infrastructure) should be conceptualised from the perspectives of those who use, take part in, and depend on these urban systems to live and work. This is in contrast to a more top-down approach to resilience, often characteristic of resilience applied at the urban scale.

This thesis understands marketplaces as one of the many urban systems that low-income dwellers rely on daily and favours the perspectives of traders and customers, as the main users of the marketplace, in the formulation of marketplaces' desired functions. The thesis also complements these desired functions with desired attributes to uncover features and qualities present in marketplaces that are perceived as significant by traders and customers to be included in the 'purpose of resilience', but could be overlooked in the more rational conception of functions. The thesis argues that these emergent attributes also form relevant 'patterns of behaviour' (Meadows 2008: 2) discussed in system thinking.

2.3.3 Disaster – not disturbance

Meerow and colleagues (2016), in their review of definitions of resilience and urban resilience, identified tension in the conceptualisation of resilience regarding disturbances that induce the resilience process. This tension regards whether it is a question of resilience to a specific and known threat (i.e., 'specified resilience') or to known and unknown threats (i.e., 'general resilience') (Meerow et al. 2016: 44). Considering multiple known and unknown threats at an urban scale is preferred by most of the reviewed authors, and one urban system or city 'should not become highly adapted to current conditions at the expense of general adaptive capacity' (Meerow et al. 2016: 45).

One conceptual tension regarding so-called disturbances is, however, overlooked in the review and regards their origin, which is whether an external hazard or internal vulnerability is emphasised. The choice of referring to 'disturbances' can tend to favour the former as most definitions of disturbance refer to an interference, interruption, or action that upsets an accepted, peaceful, or normal state (Collins Dictionary 2019; Oxford Learner's Dictionaries 2019). This formulation tends to adopt an uncritical view of the current state and ignores what triggered the resilience process. In this regard, the disaster paradigm provides a more critical theoretical viewpoint.

A disaster is defined as 'a serious disruption of the functioning of a community or a society at any scale due to *hazardous events interacting with conditions of exposure, vulnerability, and capacity*, leading to one or more of the following: human, material, economic, or environmental losses and impacts' (UNDRR 2019: N.A., emphasis by author). Here, the origin of the disturbance is clearly indicated by the combination of a hazardous event and conditions of exposure, vulnerability, and capacity. Hazardous events can be natural, such as an earthquake, and become a disaster if combined with other risk factors. The 2010 earthquake in Haiti offers a powerful example (see Section 2.1).

Capacity, for the UNISDR, means 'the combination of *all the strengths, attributes, and resources available* within an organisation, community, or society to manage and reduce disaster risks and strengthen resilience' (UNDRR 2019: N.A., emphasis by author). When applied to resilience, it is, therefore, what is needed for the resilience process to occur. While local knowledge and manpower are key, particularly during and in the immediate aftermath of a hazard (Andresen 2017; Twigg and Mosel 2017), institutionalised governance and discrimination may favour providing resources and expertise to certain social groups over others and, hence, impact resilience.

Exposure is defined as 'the situation of people, infrastructure, housing, production capacities, and other tangible human assets *located in hazard-prone areas*' (UNDRR 2019: N.A., emphasis by author). In urban settings, this often relates to the location of low-income housing and infrastructure in areas prone to risks, such as on floodplains and steep slopes, and is a 'prevalent issue for many informal settlements' (da Silva et al. 2012: 128).

Vulnerability is defined by the UNDRR as 'the *conditions determined by physical, social, economic, and environmental factors or processes* which increase the *susceptibility* of an individual, a community, assets, or systems to the impacts of hazards' (2019: N.A., emphasis by author). Here, the inherent conditions, 'often chronic or permanent' (Chmutina et al. 2019: 5), are key factors and are often referred to as the 'root causes' of disasters (idem). Vulnerability is an inherent property of the system, 'becoming expressed/ revealed when the system is exposed to the perturbation' (Gallopín 2006: 297). In the

case of Haiti, low-quality construction and the non-enforcement of adequate building codes was notably and brutally exposed by the 2010 earthquake. Vulnerability is often linked to how resources and power are distributed in society (Wisner et al. 2004). As mentioned previously, lower-income groups in cities generally have reduced or limited access to the urban services available to higher income groups and, thus, incur additional costs, as in the documented case of water (Hughes and Wickeri 2011; World Bank 2013).

Disaster studies scholars, including those criticising the misnomer 'natural disaster', generally argue that the focus and attention should be directed towards conditions of exposure, vulnerability, and capacity (Chmutina et al. 2019). The key message from the report titled *Natural Hazards, UnNatural Disasters,* published by World Bank and the United Nations, is particularly clear: 'Although no single person or action may be to blame, death and destruction result from *human acts of omission*—not tying down the rafters allows a hurricane to blow away the roof—*and commission*—building in flood-prone areas' (UN and World Bank 2010: 23, emphasis by author). In particular, conditions of exposure (at least, at the urban scale) and vulnerability can be prevented (idem).

The built environment can be particularly influential in defining the extent of disasters as it can protect—or fail to protect—people and goods from hazards (da Silva and Morera 2014). Disasters, due to the collapse of the built environment, as in the 2010 earthquake, can result in the loss of life and cause injuries, loss of and damage to assets, disruption of activities, and reduction in existing capacities. Moreover, because of interdependence, da Silva et al. (2012) suggest that a localised direct impact could also 'indirectly affect very large numbers of people, as well as impose additional burdens on communities who are least able to cope' (da Silva et al. 2012: 128).

This thesis, therefore, takes the viewpoint of authors who refer to disaster resilience. It does so in an attempt to shift the analytical focus from the hazard event to the acts of omission and commission at the core of the inherent vulnerability of urban societies (referred to in this thesis as the lack of investment in and the deficient provision of marketplace infrastructure), which leads to the disaster and the subsequent process of resilience. This theoretical standpoint also contributes to the aim of the thesis, which is to convince researchers and practitioners to consider marketplaces as critical urban infrastructure in future research and practice in the cities of low- and middle-income countries.

2.3.4 Resilience process

The resilience process relates to the set of actions needed to maintain or rapidly return to desired functions and attributes in the face of a disaster, adapt to post-disaster change, and transform systems or structures that contribute to vulnerability and limit current or

future adaptive capacity. This definition also differs from Meerow and colleagues' (2016) definition by emphasising the resilience processes instead of abilities or capacities. The nuance, here, is the focus on *specific* actions taken, previous and current, instead of conditions or states where one *can* do something. These actions often relate to the use of and access to resources and assets during and in the aftermath of disasters (Sanderson 2000; Wisner et al. 2004; Gaillard J. C. 2010). Users and stakeholders (in this thesis, mostly traders and customers) act 'as far as they can strategise' (Lyons and Snoxell 2005: 1303), and therefore, the process can serve as an indication of the limits of their capacity.

One sub-group of actions refers to maintaining or returning rapidly to desired functions and attributes after a disturbance. Here, the emphasis is on safeguarding the system's desired functions so that it can continue to serve and support people and other systems that rely on the system during and after the disruption. Holling calls it 'engineering resilience' (1996: 33) because 'engineered systems, such as bridges and buildings, are (or should be) designed to handle large stresses, return to normal, and return quickly, when the stress is removed' (Martin-Breen and Anderies 2011:6). The loss or the interruption of critical infrastructure and services for some time, such as health, police and fire services, can have a catastrophic impact on the survival of populations and structures and, hence, the magnitude of the disaster. As demonstrated in the case of telecommunications and energy provision, the speed at which this infrastructure becomes functional after a disaster 'directly affects the degree, breadth and duration of impacts experienced' (Meerow et al. 2016: 46). In the worst cases, desired functions and attributes may be lost for some time when disruptions are unexpected, radical, and continuous. Then, 'the constancy of its behaviour becomes less important than the persistence of the relationships' (Holling 1973: 2), so return and recovery remain possible.

To avoid the loss or interruption of desired functions and attributes, actions are necessary prior to the disturbance and relate to the design and management of systems. One key engineering resilience principle is absorption, where 'the system shall be capable of absorbing the magnitude of the disruption that it encounters' (Jackson and Ferris 2013: 155). For instance, the built environment should be designed and maintained in such a way that it can cope with external forces, such as extreme wind in the case of hurricanes and tremors in the case of an earthquake. Inadequate robustness in such circumstances has a detrimental impact on human lives and equipment, as well as on the continuity of services hosted by these buildings (Graham 2010). There are, therefore, strong links with vulnerability, previously discussed in Section 2.3.3.

There are some restrictions when engineering resilience is the sole approach used. 'Restoring conditions', 'returning to normalcy', or 'bouncing back' to a 'previous functional state' are limiting concepts in urban and societal contexts because engineering resilience

capacity, actions, and enforcement can be weak and fallible, especially in cities with few resources and poor governance. The post-disaster environment is very likely to be impacted and therefore changed.

Hence, the second sub-group of actions in the resilience process relates to the 'adjustment to actual and expected changes and its consequences' (Chelleri et al. 2015: 187) after a disturbance. Folke (2006) explains this is why a growing number of academics studying complex adaptive systems avoid using the term 'recovery' and prefer other terms, such as 'regeneration' and 're-organisation' (Bellwood et al. 2004, in Folke 2006: 257). In societies, adapting to change means 'to increase (or at least maintain) the quality of life of its individual members in a given environment' (Gallopín 2006: 300) and, hence, 'the viability of social and economic activities' (idem). This, with the previous sub-group of actions, is similar to the definition of resilience formed by the Resilience Alliance, as 'the ability to absorb disturbances, to be changed and then to re-organise and still have the same identity (retain the same basic structure and ways of functioning)' (Moench 2014: 448).

The third group of actions within the resilience process regards the transformations required when the vulnerable status quo maintains or exacerbates disaster risks and limits current or future adaptive capacities, transforming systems or structures that contribute to vulnerability and limit current or future adaptive capacity. In this thesis, acts of adaptation are differentiated from those of transformation by their end goals. In the former, the focus is on maintaining desired functions and attributes by adapting to post-disaster changes. In the latter, the focus is on voluntarily changing an untenable state: creating 'a fundamentally new system' (Folke 2006: 262) with new desired functions and systemic relationships (Martin-Breen and Anderies 2011). Initially, it seems similar to ecological resilience, where 'instabilities can flip a system into another regime of behaviour' (Holling Crawford Stanley 1996: 33). However, from within the social or urban systems (as human agents), such transformations do not occur 'naturally' or by themselves. They are political; they aim at 'mobilising the power and the resources to change things' by looking 'to unlock resources claimed by the status quo' (Westley et al. 2006 in Ramalingam et al. 2008: 52). Importantly, they can cause conflict with those who benefit from maintaining the status quo. As cities are notably composed of dynamic networks and interests (Campanella, 2006), sometimes in conflict (Vale, 2014), it is likely that opposition to change will arise.

Martin-Breen and Anderies (2011:8) associate this stage of resilience with the 'humanitarian goal'. In this period, actions related to disaster risk reduction (DRR) and the establishment or reform of reconstruction strategies could be included, leading to building better approaches (Lyons 2009; Lizarralde et al. 2015). One key message, building from complex system theory and from humanitarian experience, 'is that change, order, and

resilience cannot be imposed from the outside or from the top down' (Ramalingam et al. 2008: 52; also see Sanderson and Sharma 2016). It 'requires people's genuine participation in assessing and enhancing their existing knowledge, skills and resources' (Chmutina et al. 2019: 7). Transformation should build on existing capacities, with the individuals operating throughout and depending on the systems to be transformed.

The resilience process is, therefore, neither a simple nor a linear process; it is highly complex, unpredictable, political, and multidimensional (Jordan and Javernick-Will 2013). The three sub-groups of actions overlap and multiple 'short-, medium-, and long-term resilience processes coexist as essential, sometimes conflicting, components of urban dynamics' (Chelleri et al. 2015: 188).

2.3.5 Disaster resilience in theory: the gaps

Building on the urban resilience literature and disaster studies, this section provided a conceptualisation of disaster resilience, one that is useful for the aim of the thesis. Disaster resilience is defined as all the overlapping processes of maintaining or rapidly returning to desired functions and attributes in the face of a disaster, adapting to change, and quickly transforming systems or structures that contribute to vulnerability and limit current or future adaptive capacity.

The section draws attention to three aspects that needed a theoretical discussion so that disaster resilience is framed in a useful way. The first aspect relates to the functions that are desired to be resilient. The thesis suggests that the exploration of desired functions should be expanded to include attributes of the urban system in question. The urban resilience definition by Meerow et al. (2016) appears to be too restrictive to be applied to an infrastructure that has a strong relational and socio-economic dimension, such as marketplaces. Specifically, considering the desired functions and attributes is more likely to lead to a more detailed analysis.

The second aspect relates to the origin of the disturbance that induces the resilience process. Here, particular attention is given to the vulnerable state of the infrastructure and its impact on traders and customers. This particular standpoint, coming mainly from the disaster literature, is more critical than the usual focus on a disturbance in most definitions of resilience and urban resilience (Meerow et al. 2016). As a way to use resilience more critically, the thesis focuses on infrastructural deficiencies and failure as the main cause of marketplace-related disasters. This more critical use of resilience as a concept in research remains to be discussed with an empirical case.

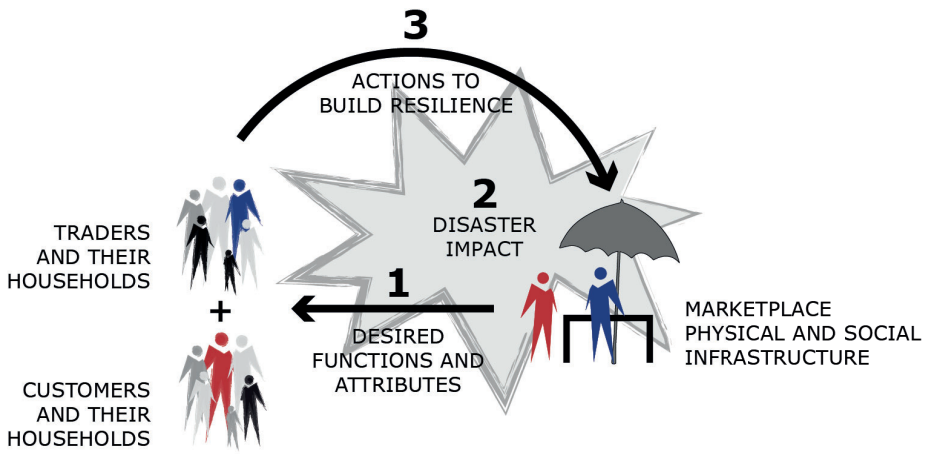
The third aspect relates to the resilience process, particularly transforming the detrimental status. For resilience to be meaningful in urban societies and to be applied to marketplaces,

it would be incomplete without the transformation of vulnerable conditions that led to the resilience process in the first place. This thesis, therefore, understands that resilience would be incomplete without the reduction of disaster risks, as well as the enhancement of adaptive capacities. The values of these theoretical standpoints and the application of resilience at the scale of urban space will be explored and demonstrated in subsequent sections of the thesis.

2.4 Marketplace resilience: an analytical framework

This section suggests an analytical framework, based on the previous theoretical presentation, that supports the formulation of the research questions presented initially in the introduction. The section also summarises the theoretical gaps to which the thesis is designed to respond, according to the research questions.

Figure 9 Marketplace resilience



Source: Adapted from Paper A (Smith 2019b: 3)

Combining the concepts of *marketplace infrastructure* (section 2.2.1) and *disaster resilience* (section 2.3.1) results in marketplace infrastructure being the object of disaster resilience. It is referred to as *marketplace resilience* in this thesis and is defined as

> *all the overlapping processes of maintaining or rapidly returning to the marketplace infrastructure's desired functions and attributes in the face of a disaster, adapting to change, and quickly transforming the marketplace's* systems or structures that contribute to traders' and customers' vulnerability and limit their current or future adaptive capacity.

As an analytical framework, *marketplace resilience* frames the exploration and analysis of the object of inquiry:

1. The desired functions and attributes of marketplaces for traders and customers (number 1 in Figure 9). In this thesis, particular attention is given to how these functions and attributes are embedded in the relationship between the socioeconomic dimension (interrelations among traders, between traders and customers, and with their respective households) and the physical dimension (interrelations related to the marketplace space and physical infrastructure). It also highlights the functions and attributes that should be maintained and reinforced in the resilience process.
2. The impacts of disasters, particularly the deficient provision of physical infrastructure (leading to the disaster), on the marketplaces desired functions and attributes for traders and customers (number 2 in Figure 9). In this thesis, particular attention is paid to how the functions and attributes that traders and customers rely on can be preserved or hindered in different marketplaces. Precisely, it allows the relationships between the social and the physical aspects of marketplaces to be uncovered by exploring how the former can be affected by the lack of or destruction of the latter.
3. The actions that traders, customers, and other stakeholders perform, omit, or are restricted from performing to build resilience (number 3 in Figure 9). In this thesis, particular attention is paid to how the actions differ depending on the marketplace traders and customers occupy or visit. Specifically, of interest is how collapsed or robust infrastructure impacts traders' and customers' resilience process in the immediate aftermath of a disaster and how improved or worsened infrastructure impacts resilience in the long-term. Doing so also contributes to shining a light on the hidden actions behind the apparent resilience of marketplaces during and after disasters, notably those by traders' and customers' households.

3 Methodological foundation

This chapter presents and explains the rationale for the methods used in the production of the papers included in the thesis. Firstly, the chapter introduces the epistemological position that underlines the methodological approaches. Secondly, the research design (mainly a combination of a literature review and a multiple-case study, as well as a combination of qualitative and quantitative methodological approaches) and the research process are explained and discussed. The systematic approach underlying the literature review and the choice of cases and units of analysis in the multiple-case study are explained further in the third and fourth sections, respectively. The data collection and analysis methods are also explained, and the chapter ends with a discussion on the ethical and fieldwork considerations and reflections on the research process.

3.1 Epistemological position

The epistemological position of the thesis largely builds on critical realism. This section elaborates on several significant principles and discusses implications for how it is linked to the study of the phenomenon of enquiry (i.e., marketplaces, infrastructure, and resilience) and how it supports the methodological approach explained in this section. The most relevant critical realist principles adopted in the thesis are summarised below.

1. 'The world exists independently of our knowledge of it'.
2. 'Our knowledge of the world is fallible and theory-laden'.
3. 'There is necessity in the world; objects—whether natural or social—necessarily have particular powers or ways of acting and particular susceptibilities'.
4. 'The world is differentiated and stratified, consisting not only of events, but objects, including structured, which have powers and liabilities capable of generating events'.
5. 'Science or the production of any kind of knowledge is a social practice'.
6. 'Social science must be critical of its object'. (all in Sayer 1992: 5)

Critical realism, with Bhaskar (1989) and Sayer (1992, 2000) being the most prominent contributors, is 'a realist epistemology that asserts that the study of the social world should be concerned with the identification of the structures that generate that world' (Bryman

2016: 690). A critical realist understands that the world exists independently of our understanding of it. Knowledge about the world, from a critical realist perspective, depends on the capacity of humans to theoretically and methodologically find the most suitable representations and approaches. The meaning of the word *critical* in critical realism is twofold. First, the study of the world 'out there' and of its structures often has a normative rationale, as humans should influence and transform detrimental structures. Second, a critical realist acknowledges that his or her understanding of the world will always be fallible. Knowledge (or theory) is a social construct and can always be surpassed by new knowledge if it better captures the world. This is probably the main difference from *empirical realism* (or *naïve realism*), as the latter fails to distinguish the objects of inquiry from the terms and methods used to describe and understand them (Bryman 2016).

The thesis advocates for considering marketplaces as critical urban infrastructure in future research and practice in the cities of low- and middle-income countries to explore the ways marketplace infrastructure support (and should support) trade for traders and customers in disaster and post-disaster contexts. Such a rationale, like in urban planning, presupposes that 'spatial/material structures of cities must influence human prosperity, actions and welfare and/or the natural environment' (Næss 2015: 1235). This particular understanding of structure-agency complies with a critical realist view that both structures (such as the social and physical infrastructure of marketplaces) and agents (such as traders, customers, urban planners, and humanitarian practitioners) have properties and influential powers[13].

Marketplaces, as structures, are socially produced and reproduced and can be altered and changed, often gradually, but sometimes rapidly, such as in the case of a disaster. As discussed previously (see Section 2.2.1), marketplace structures can be material or immaterial. It is in the view of critical realists that these socially constructed structures can, in turn, influence humans' experiences and behaviours (Næss 2015). The properties of marketplaces' physical and social infrastructure are mostly framed in this thesis in their desired functions and relational attributes. Agency is, thus, notably found in the actions, albeit limited, of traders and customers during and after disasters. As found in this thesis, marketplaces' social and physical structures can also resist alteration and change.

Researching marketplaces using the above rationale has methodological implications. In most if not all urban environments, the complex myriad of influential relationships that form the studied marketplaces suggest that for it to be 'useful' for urban and humanitarian

[13] Critical realists argue for using causal language to describe the world. I prefer to avoid causal terms due to the high complexity of urban environments, in general, and of marketplaces, in particular, which leads to always questioning whether causal relationships could have been be misattributed (Sayer, 1992). Causality is also often perceived by academics as belonging solely to quantitative research, an argument that is strongly refuted in a critical realist paradigm. 'Influential powers' and other synonyms are preferred in the thesis and in the articles as opening doors to a larger spectrum of relations and as being a less controversial position.

researchers and practitioners, the study should frame the inquiry in a transdisciplinary manner. Critical realism is advocated as an epistemological platform that accommodates and encourages the integration of multiple disciplines (Næss 2015). It is argued that each discipline provides a valuable perspective of the phenomena under study. This thesis builds on several disciplines and research areas, including food security studies, gender research on urban infrastructure, and disaster studies.

The complexity of the subject of inquiry and the need for transdisciplinary research also suggest that multiple research methods should be employed. Critical realists, along with other advocates of mixed methods (Creswell 2007) and case study research (Yin 2014), argue that integrating multiple research methods is often necessary to produce the most valid knowledge (Easton 2010; Næss 2015). Critical realists will typically argue, for instance, that the quantitative focus of positivists, if taken alone, can disregard the value of observations and individual perspectives that cannot lead to quantifiable data. Retrospectively, many socioeconomic practices in marketplaces could only be revealed inductively by observing transactions and questioning traders. Conversely, critical realists will also claim that findings based solely on social and cultural perspectives from open interviews, as found in 'pure' social constructivist studies, imply 'a blurring of the difference between the existence of social objects and the opinions and understanding of these objects among participating agents … direct[ing] the attention towards the cultural processes' (Næss 2015: 1235), and it would be difficult to say anything of scientific value about other disregarded facts. This thesis builds on the strengths of both qualitative and quantitative perspectives in a multiple-case study to, among others, explore the phenomena in comprehensively and overcome fieldwork and analysis challenges. This is further explained and discussed in the following sections.

The final point relates to how the phenomenon of inquiry is being studied and framed by the researcher. Here, the role of the researcher is acknowledged as being one that also constructs and influences an understanding of reality. The intention in this thesis is not to completely reject the objective and positivist perspective that science brings to factual reality, but to acknowledge the influence of the researcher's background, standpoint, scientific narrative, and rhetoric in theorising reality. In this thesis, I construct the concept of marketplace resilience based on the theory mentioned above. My research objective is to explore the ways marketplace infrastructure support (and should support) trade for traders and customers in disaster and post-disaster contexts. For this purpose, I chose to methodologically rely on a research approach (i.e., literature review and case study) and several data collection methods (e.g., structured and semi-structured interviews and observations) and present the findings in a narrative form. This influences how findings are presented and discussed: by identifying different themes and trends in the cases by

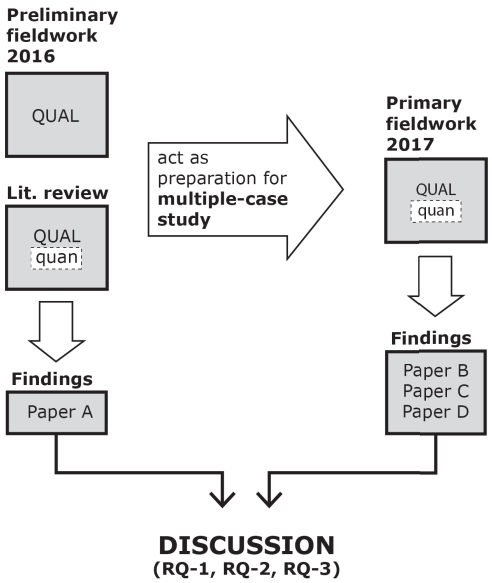
coding the data, presenting the frequency of individual perspectives supporting such themes and trends, and providing quotes to exemplify the perspectives as expressed by the interviewed social actors. Despite due methodological diligence, my scientific contribution may be fallible. Therefore, I welcome additional perspectives from other researchers and practitioners to refine the exploratory findings, provide pertinent alternatives, and highlight other relevant aspects related to the phenomena. The research limitations are elaborated further in Section 3.9.

3.2 Research design and the research process

This section introduces the research design that underlines the methods used in the production of the papers and argues for its appropriateness for the exploratory nature of the study. It also describes the research process and explains the contribution of the peer-review process and fieldwork to the findings of the thesis.

This research builds on a literature review (Paper A) and on a case study (Papers B–D) to explore marketplace resilience in disaster and post-disaster contexts. Table 3 presents an overview of the research design and the methods used in each article. As mentioned previously, the research is mostly exploratory in nature, as it aims to argue for and frame future research and practice on marketplaces infrastructure in low-income urban contexts, particularly in disaster and post-disaster situations. The literature review and the case study have been adopted specifically because of this exploratory nature of the study.

Figure 10 Research design



Source: Adapted from Bryman 2016 and Creswell 2014

Table 3 Overview of the publications and methods used

Thesis objective (partly introduced by the **Essay**): To explore, in disaster and post-disaster contexts, the ways marketplace infrastructure support (and should support) trade for traders and customers in the cities of low- and middle-income countries.				
	Paper A	**Paper B**	**Paper C**	**Paper D**
Title	Towards marketplace resilience: learning from trader, customer and household studies in African, Asian, and Latin American cities.	The relational attributes of marketplaces in post-earthquake Port-au-Prince, Haiti.	A risky business: the impacts of hazards on traders located in different marketplaces in Port-au-Prince, Haiti.	Unpacking an urban domino effect: marketplace infrastructure, traders, and resilience following the 2010 earthquake in Port-au-Prince, Haiti
Paper objectives	To identify, in the literature, marketplace attributes and aspects of resilience taking effect in the marketplace that influence the roles of its low-income traders and customers vis-à-vis their households.	To explore the interplay between social and physical aspects of food retail infrastructure in disaster and post-disaster contexts.	To explore how marketplace infrastructure affects exposure to hazardous events and conditions, as well as traders' actions to maintain or rapidly return to trade after facing hazardous events.	To explore the impacts of infrastructure failure and post-disaster infrastructure deficiencies on traders, as well as their actions and limitations in recovering, adapting to post-disaster change, and improving infrastructural conditions.
Design	Literature review	Multiple-case study	Multiple-case study	Multiple-case study
Sample	35 Peer-reviewed empirical articles 7 Reports	105 Traders 100 Customers 3 marketplaces	125 Traders 4 marketplaces	125 Traders 4 marketplaces
Data collection	Database searches Keywords Inclusion/ exclusion criteria	Structured interviews (traders and customers) Semi-structured interviews (traders and stakeholders) Participant observations Secondary data (reports)	Structured interviews (traders)	Structured interviews (traders) Semi-structured interviews (traders and stakeholders) Participant observations Secondary data (newspaper articles and reports)
Analysis	Coding/ content analysis	Coding and content analysis Frequency and contingency analysis	Coding and content analysis Frequency and contingency analysis	Coding and content analysis Frequency and contingency analysis

Both the literature review and the case study, despite being drawn from different methodological approaches (sections 3.3 and 3.4) and resulting in distinct publications, share common research design principles. These lead to a facilitated integration and discussion of the findings of the papers included in the thesis: Papers A, B, C, and D (Figure 10).

This relates to the exploratory nature of the study and results in abductive research where theoretical and empirical propositions are generated and refined as the research progresses. For instance, the case study used in Papers B to D 'test' the hypotheses assembled from multiple reviewed papers in Paper A (e.g., regarding the relational attributes and the disaster's impact on households) in the single urban context of Port-au-Prince, Haiti. However, the case study also explores and generates theoretical propositions, notably regarding the infrastructural dimension. The usefulness of the case study in generating theoretical propositions is linked to the case selection strategy (Flyvbjerg 2004; Yin 2014), further described in Section 3.4.

The research design and process rely on abductive reasoning. In abduction, cases are 'interpreted from a hypothetic overarching pattern, which, if it were true, explains the case[s] in question. The observation should then be strengthened by new observations (new cases)' (Alvesson and Sköldberg 2009: 4). Abduction is logical reasoning that fits particularly well with critical realism and research on complex phenomena, notably by its focus on the continuous and iterative process of adjusting and refining the theory with subsequent empirical analyses (Alvesson and Sköldberg 2009).

Abduction combines the characteristics of both deduction and induction. A deductive approach to research means that research is conducted with reference to theoretical propositions elaborated prior to collecting data (Bryman 2016). In abduction, the analysis of the empirical 'may very well be combined with, or preceded by, studies of previous theory in the literature; not as a mechanical application … but as a source of inspiration for the discovery of patterns that bring understanding' (Alvesson and Sköldberg 2009: 4). Both the literature review and the case study have in common a reliance on theoretical elements that frames the object of research and 'inspires' the discussion. For instance, marketplace infrastructure and marketplace resilience are concepts that were formulated and detailed in the publications, and they guide and 'inspire' original theoretical contributions to several research fields (each paper tends to focus on a single field or discipline).

Yin (2014) and George and Bennett (2005) recommend building on a deductive approach even in exploratory case studies, especially when the purpose is to develop theoretical propositions to be further researched or tested in practice. The exploratory study should

not be used 'too loose' and should not undermine standards of good case study research (George and Bennett 2005). According to (Yin 2014:39), 'even an exploratory case study should be preceded by statements about what is to be explored, the purpose of the exploration, and the criteria by which the exploration will be judged successful'. In the thesis, both the literature review and the preliminary fieldwork supported the development of the primary fieldwork by framing the scope and theoretical propositions to be researched in greater detail in the case study (Figure 10). Moreover, the results of the literature review and case study are structured in a similar fashion, as they are framed according to similar theoretical frameworks—although they evolved with the research process—and build on similar units of analysis. This is explicit in not only Papers A and D but also Papers B and C. This resulted in the structured organisation of the research questions (see Table 1) and in a facilitated discussion at the end of the thesis. This also contributed to enhancing quality standards (Section 3.7).

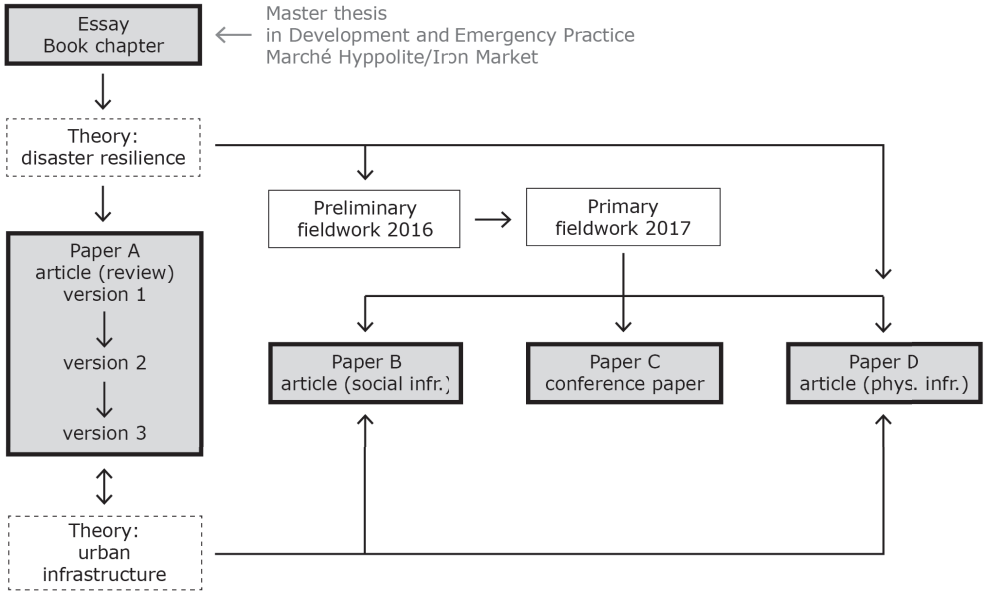
This research also possesses characteristics of induction in that theory is generated from empirical data. Silverman advises against over-theorising prior to collecting data, 'an ever-present danger' in many social science disciplines, and not letting the researcher 'be sufficiently challenged, even surprised' (2007:5) by the data or, as Wang and Groat put it, being able to use his or her 'intuition' in the fieldwork (2013:33). The rigorous establishment of theoretical propositions should not mean adopting an excessively rigid research design. Most of the findings of the case studies (Papers B and D) are inductive in nature—drawn from the data—and form the core theoretical propositions to be further researched and 'tested' in practice. He suggests addressing this issue by being open to alternative propositions that can, inductively, be relevant and contribute to theory development.

This is reflected in the research process (Figure 11), which is the sequence of research activities in time and space, and differs, at least partially, from the research design (Figure 10), and is focused on the logical reasoning of the research activities. The main differences between the research design and its actual implementation, the research process, relate to the peer-review processes of the publications and the flexibility needed to capture fieldwork opportunities and deal with fieldwork constraints, elaborated in Section 3.8.

Of particular prominence, both in research time and its overall influence on research, is the writing and peer-review process of Paper A, from the autumn of 2016 to the autumn of 2019 (Figure 11). The peer-review process particularly influenced the research activities by improving and making theoretical propositions and concepts used in the case study more precise and by revealing, in its last phases, the value of considering infrastructure as a core theoretical perspective. In this way, the subsequent re-writing phases of the review

paper contributed to the analysis and the writing of the case studies realised in-between the numerous phases of revising the review paper.

Figure 11 Main milestones of the research process



Source: Author

Also of importance are the two fieldwork stays in the metropolitan region of Port-au-Prince, Haiti. The preliminary fieldwork was conducted from 22 March 2016 to 17 May 2016. The preliminary fieldwork made it possible to achieve the following:

- Align the initial research questions and theoretical frameworks with reality.
- Select possible cases. The Iron Market, Marché Salomon and Marché La Coupe were selected as initial cases.
- Test data collection approaches and collect data in and around marketplaces in Port-au-Prince.
- Create links with non-governmental organisations, local and national government institutions, and universities. This resulted in conducting many key informant interviews and getting an understanding of some research opportunities and needs.
- Generate preliminary findings.

Based on the first version of the literature review (Paper A), research opportunities and constraints made explicit in the preliminary fieldwork, and preliminary findings, primary fieldwork was conducted from 6 July 2017 to 29 August 2017. The main activities were as follows:

- Build, train, and supervise a team of research assistants to interview traders and customers in the selected marketplaces.
- Make the final selection of cases, mostly with analytical and contextual rationales in mind (see Sections 3.4 and 3.8). The *Marché Salomon* and street markets needed to be dropped as cases because of security issues. *Lalue* and *Canapé-Vert* were added as cases following suggestions from the team.
- Continue with other data collections that have been perceived particularly fruitful in the preliminary fieldwork, mainly semi-structured interviews with key informants and observations (see Section 3.5).
- Test and adapt a new data collection method, the structured interview, explained in Section 3.5.
- Maintain relationships with key stakeholders and get updated information on policy and political contexts.

Reflections on the fieldwork are also discussed in Section 3.8.

3.3 Literature review

The rationale behind the literature review (Paper A) for the thesis is twofold. Firstly, Randolph (2009) argues that a literature review can establish the context and the factors and elements related to the topic. Here, the reviewed literature may not focus directly on the topic or use a similar analytical framework (marketplace resilience). The review makes a contribution by compiling factors and elements from separate publications and establishing the research context in which this thesis is positioned (trader studies and customer studies related to marketplaces in urban crises). Secondly, the literature review is appropriate for identifying recommendations for further research (Randolph 2009). In this case, the literature review establishes a foundation for further research by revealing overlooked aspects, such as those related to infrastructure.

The literature review (Paper A) takes the form of a narrative review that incorporates systematic review practices. Bryman (2016: 91) defines a narrative review as 'an examination of theory and research relating to [a] field of interest that outlines what is already known to [a] field and that frames and justify … research questions'. The practices of a narrative review are apparent in Paper A:

- The description and discussion of what is already known about and related to marketplace resilience and the rationale for further research (including but not limited to the case study research in this thesis),

- The presentation of the findings narratively, framed by an analytical framework and assembled by relating, discussing, and contextualising several statements from the literature.

Conducting a systematic review makes procedures used the review replicable, transparent, and explicit (Tranfield et al. 2003) and tends to be a stand-alone 'exercise in its own right' (Bryman 2016: 91). The systematic review practices apparent in Paper A are as follows:

- The use of a precise research objective, which is 'to identify the attributes of marketplaces, as well as the aspects of resilience taking effect in the marketplace that influence the roles of its low-income traders and customers vis-à-vis their households' (Smith 2019b: 2),
- The detailed description of the procedures concerning data sources, study selection, data extraction, and data synthesis and analysis so that they can be reproduced. The procedures are described on pages 4–6 of Paper A. Data analysis is further described in Section 3.6.
- The explicit and structured presentation of each reviewed publication, as well as the explicit and structured list of publications where the attributes of marketplaces as the aspects of resilience can be found, generally presented in the form of tables (see Tables 2–8 in Paper A). This adds a quantifiable aspect to the data (number of publications per element), with a rationale similar to frequency analysis (see Section 3.6).

The review, therefore, combines both approaches. It provides the rationale for conducting further research (i.e., the case study research resulting in Papers B–D) and provides a scientific contribution to knowledge in its own right (resulting in a peer-reviewed publication: Paper A; see also Figure 10).

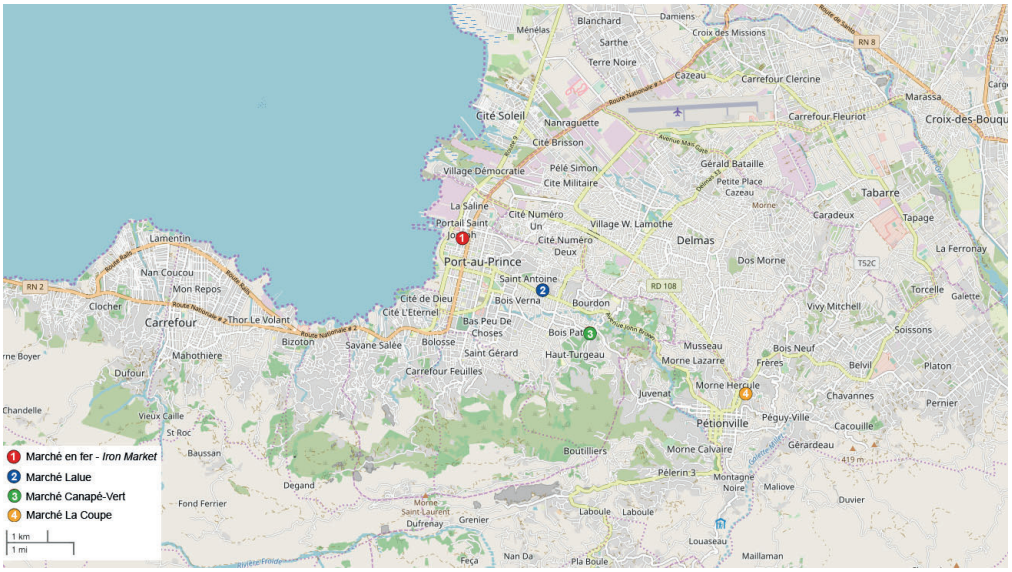
3.4 Multiple-case study

The case study approach (used for Papers B–D) explores marketplace resilience in the metropolitan region of Port-au-Prince, Haiti. Yin (2014), Creswell (2007), and George and Bennett (2005) argue that a case study is an approach or a method with its own research design rather than just 'a choice of what is to be studied' (Creswell 2007: 73, citing Stake 2005). The rationale behind choosing a case study approach comes from the research needs as expressed in the conclusion of the literature review, which are particularly well suited for a case study. For instance, the conclusion of the literature review states that 'a detailed analysis of the characteristics of marketplace infrastructure … remain to be realised, as much of the reviewed literature tends to overlook … physical and spatial features in their analysis' (Smith 2019b: 16). A case study is appropriate because it permits

the understanding of complex phenomena in a real-world context over which the researcher has no control (Yin 2014). The case study is particularly useful in abduction because it allows, as Flyvbjerg (2004) argues, falsifying pre-existing theoretical propositions. In this thesis, the findings from Paper A were nuanced and refined in the case study conducted for Papers B–D, and some initial ideas introduced in the previous chapters, for instance, regarding the so-called resilience of marketplaces, were also debulked.

The case study is organised around four cases, resulting in a multiple-case study design (Yin 2014). Yin (2014) and George and Bennett (2005) agree on the term 'case' being less a defined episode or geographic area and more a 'phenomenon of scientific interest' (George and Bennett 2005:18). In the present research, the cases are rather abstract: they are the sum of interrelations between marketplace infrastructure and its traders, customers, and respective households in disaster and post-disaster contexts. Each case relates to a specific marketplace location and infrastructure: *Marché en fer, Marché Lalue, Marché Canapé-Vert,* and *Marché La Coupe*. The cases include more than solely the marketplace location or marketplace's physical infrastructure. To simplify reading, however, the cases are often referred to by the name of the marketplace.

Figure 12 Position of the selected marketplaces in the metropolitan region of Port-au-Prince



Source: Adapted by the author from OpenStreetMap

The selected marketplaces are located in the municipalities of Port-au-Prince and Pétion-Ville. In contrast to random sampling, which aims for representativeness and generalisation, cases are selected based on the information they can provide. The selection of marketplaces for the case study is indeed not representative of all marketplaces in the

city. While fieldwork opportunities and constraints influenced the selection of cases, the final selection was mostly based on the research interest, which was to explore the ways marketplace infrastructure support (and should support) trade for traders and customers in disaster and post-disaster contexts. The choice of the cases in the research was based on principles of literal and theoretical replication, similar to what Flyvbjerg (2004) refers to as 'maximum variation cases'. Yin defines these principles in multiple-case studies as literal replication, meaning 'the selection of two (or more) cases … because the cases are predicted to produce similar findings' (2014: 239) and theoretical replication, that is 'the selection of two (or more cases) … because the cases are predicted to have contrasting findings, but for anticipatable reasons' (2014: 241). The selected cases, however, differ mainly in two dimensions: the physical infrastructure and the severity of disaster impact (Table 4).

The four selected marketplaces all offer retail goods that are normally present in urban marketplaces in Haiti, such as local fruits and vegetables, imported foodstuffs, meat, seafood, charcoal, and other basic commodities (Bazabas 1997), although in different proportions (see Table 1 in Paper C). The four marketplaces are also spatially organised by commodity, like a typical marketplace in Haiti. One can normally find similar products within the same zone, similar to supermarkets or department stores (Bazabas 1997). All the selected marketplaces are off-street and, therefore, excluded from the evictions and police harassment that come with the enforcement of street trade policies, which is the case mostly in Pétion-Ville. As such, the study shines the spotlight on infrastructural conditions in contexts where evictions and police harassment are not the main concerns of marketplace traders and customers.

In contrast to random sampling, which aims for representativeness and generalisation, cases are selected based on the information they can provide. The selection of marketplaces for the case study is indeed not representative of all marketplaces in the city. While fieldwork opportunities and constraints influenced the selection of cases, the final selection was mostly based on the research interest, which was to explore the ways marketplace infrastructure support (and should support) trade for traders and customers in disaster and post-disaster contexts. The choice of the cases in the research was based on principles of literal and theoretical replication, similar to what Flyvbjerg (2004) refers to as 'maximum variation cases'. Yin defines these principles in multiple-case studies as *literal replication*, meaning 'the selection of two (or more) cases … because the cases are predicted to produce similar findings' (2014: 239) and *theoretical replication*, that is 'the selection of two (or more cases) … because the cases are predicted to have contrasting findings, but for anticipatable reasons' (2014: 241). The selected cases, however, differ

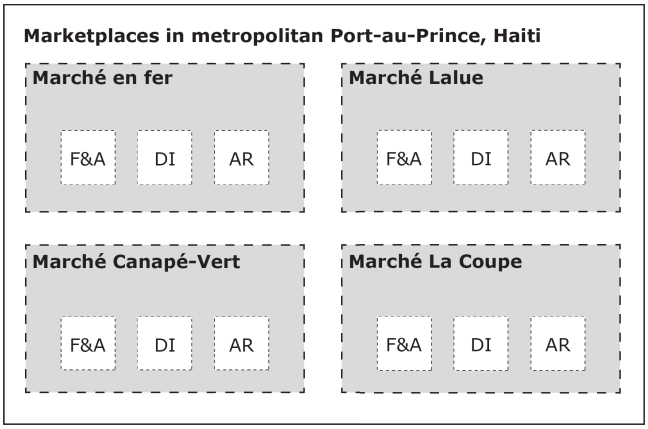
mainly in two dimensions: the physical infrastructure and the severity of disaster impact (Table 4).

Table 4 Initial conditions for multiple-case replication

	Marché en fer	Marché Lalue	Marché Canapé-Vert	Marché La Coupe	
				covered	open-air
Physical infrastructure	hall	open-air	hall	hall	open-air
Damage by earthquake	major	minor	minor	major	

The principles of literal and theoretical replication also relate to the need for rival explanations, which are 'a plausible alternative—different from a study's originally stipulated propositions—for interpreting the data or findings in a case study' (Yin 2014: 240). The alternatives, in this study, refer mostly to the contextual conditions of the marketplaces, such as the governance structure, and the neighbouring urban context. The marketplaces and their neighbouring contexts are further described in Paper A for the Iron Market (pp. 159–161), Paper B for the other marketplaces (pp. 5–9), and in Paper C for all marketplaces (pp. 2–4). Large satellite images and photos of the four markets are available in Appendix 6.

Figure 13 Multiple cases and embedded units of analysis



Caption: F&A= desired functions and attributes; DI= disaster impacts; AR= acts within the resilience process. Source: author.

The embedded units of analysis are quite similar to what Gobo (2008) calls 'dynamic sampling units' or what Strauss and Corbin (1990) name 'incidents and not persons per se' (cited in Gobo, 2008:417). These social acts and thoughts, 'the smallest building blocks of the social sciences' (Mikkelsen 2005:161), allow a more direct and deeper analysis of

the observed characteristics (Gobo 2008). The unit of analysis should not be confused with the unit of data collection, which is often a person in the case of an interview (Gobo 2008; Yin 2014). In the present research, the units of analysis constitute the possible interrelations present in the case, mostly in the form of perceptions, experiences, and actions, such as the attributes of relationships between traders and customers, the impacts of collapsed infrastructure on marketplaces' these relationships, and the shared acts of traders and their households intended to rapidly return to trade. The units of analysis are, therefore, closely related to the desired functions and attributes, the impacts and the acts within the resilience process presented in the analytical framework (Figure 13; see also Section 2.4).

3.5 Data collection

Yin defines the features of a case study as an inquiry that 'copes with the technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result benefits from the prior development of theoretical propositions to guide data collection and analysis' (2014: 17). By its emphasis on triangulating various ways of collecting and analysing data, it can be considered an 'umbrella-method', encompassing various data collection and analysis methods (Wang and Groat 2013). The multiple data collection methods are described in this section, and the application of the principle of triangulation is explained in the following section.

Figure 14 Relative importance of the data collection methods and data sources used

Source: Author.

The findings of the thesis are drawn, in order of relative importance, from structured interviews, semi-structured interviews, participant observation, photographs, and other secondary data sources, such as maps, satellite images, newspaper articles, and grey literature (Figure 14). The rationale behind the choice of data collection methods relates

to the form and content of the research questions, as well as fieldwork opportunities and constraints. The main data collection methods are explained below.

Structured interviews are usually conducted in a context of survey research where all interviewees are asked the same questions in the same order via a questionnaire (Bryman 2016). While some survey practices were used, statistical principles and practices were not employed due to the exploratory nature of the study and the non-positivist epistemological position. The approach remains primarily linked to the case study approach due to the emphasis on triangulation and the complementation of data sources and data collection methods (see section 3.6).

Structured interviews were conducted with the two main users of marketplaces, traders and customers, and constitute the main data collection method for this thesis. The reason for choosing structured interviews is based on the experience of conducting semi-structured interviews with traders in the preliminary fieldwork. The main challenges of the preliminary fieldwork related to the laborious interview process are partly due to the reliance on an interpreter[14] and the difficulty of reaching data saturation, mainly due to contradictions in the small sample (n= 25)[15].

In the structured interviews, questions were asked by a team of four bilingual students (Haitian, Creole, and French) taking a course in urban planning at the *Université d'État d'Haïti*. This resulted in reducing language barriers between the interviewer and the interviewee as the interview was conducted solely in Creole, although answers were written directly in French. This also resulted in more time-efficient interviews, so more topics could be covered within a single interview. The advantage of teamwork was also the ability to conduct more interviews in the same two-month time frame: 125 interviews with traders and 105 interviews with customers (Appendix 9). This was, perhaps, the most important advantage, as trends and exceptions could be identified and distinguished in the data. Trader interviews were generally one-hour long, and customer interviews were generally less than 30 minutes.

A few closed-ended questions were designed based on the preliminary fieldwork and on the literature review for topics where only a few variables are of interest and could be

[14] The interview processes were time consuming due to time taken to translate and to take notes (asking question in French, translation in Creole, answer in Creole, translation in French, taking handwritten notes) and as a result, often ended in the disinterest of traders in continuing the interview after some time. This was particularly the case in marketplaces other than the Iron Market as in the latter, traders were more used to seeing foreigners due to the international attention given to its reconstruction and because of the calmer conditions of the marketplace. The laborious interview processes resulted in short written notes. While some notes appeared to be valuable, most did not reflect the complexity of the experience of the interviewees. Traders were very reluctant in being recorded, and taking notes was still perceived as the most appropriate method to document their sayings.
[15] Interviews with traders were conducted in three marketplaces of the metropolitan region. Despite valuable insight, some interviewees' within the same marketplace responses appeared to be contradictory and a small sample did not allow neither to generate main trends nor to explore alternative reasons behind the contradictions.

defined[16]. This allowed reducing the length of interviews and easing the analysis of numerous interviews due to its pre-coded nature. However, the closed-ended questions formed only a part of the questionnaire and were supplemented by many open-ended questions. Open-ended questions were designed for topics where experiences and meaning, as well as the level of knowledgeability, are of interest. This allowed the interviewees to formulate their thoughts in their own way and increased the likelihood of capturing unexpected responses. Closed- and open-ended questions were designed to address the main areas of interest, following the preliminary fieldwork and the literature, in a triangulating and complementing fashion. It was, therefore, possible to cross-check and expand responses from closed-ended questions with open-ended questions. The final versions of the questionnaires are available in Appendices 7 and 8).

Semi-structured interviews were also used. They refer 'to a context in which the interviewer has a series of questions that are in the general form of an interview guide but is able to vary the sequence of questions' (Bryman 2016: 696). They were used with traders in the preliminary fieldwork (n= 25) and with key informants, such as market directors, mayors, members of governmental organisations and non-governmental organisations, academics, and professionals of the built environment (total n= 30; a list of key informants is provided in Appendix 10). Semi-structured interviews were used to mostly get the interviewee's position on particular aspects of the topic and capture, more often than not, contrasting viewpoints from the ones of traders and customers. All semi-structured interviews relied on interview guides. I conducted nearly all semi-structured interviews, except for trader interviews, in French or English and, therefore, without the assistance of a translator[17]. Most semi-structured interviews, except preliminary traders' interviews, were recorded on an audio recorder and transcribed. Interviews were generally one-hour long.

Moreover, participant observation was used in both the preliminary and primary fieldwork to document how traders and customers interact in the marketplace and how they occupy the marketplace and use the physical infrastructure. Participant observation refers 'to the observational aspect of ethnography' where 'the researcher immerses him- or herself in a social setting for an extended period of time, observing behaviour [and] listening to what is said in conversations' (Bryman 2016: 694). A simple aide-mémoire was developed and used to guide the observation. Interesting observations related to the research questions were accounted for and described in the field notes. It was particularly useful in triangulating and complementing structured interviews on trade-trader and trader-

[16] The more complex closed-ended questions of the questionnaire were removed in the early phase of data collection.
[17] When required, as with the market managers who do not speak French or English, I was assisted by one of the students for translation purposes.

customer socioeconomic relationships and what occurs during rainfalls. Participation was limited to being present and sharing the market space that traders and customers use and by interacting minimally with nearby traders and customers.

Other data sources were used to triangulate and complement findings from structured and semi-structured interviews and participant observation. Photographs were used to document the state of the marketplace infrastructure and its occupation and use by traders and customers. Satellite images from Google Earth were used to document the level of physical destruction and recovery following the 2010 earthquake. National newspaper articles (n= 150) from *Le Nouvelliste* and *Le National*, published online, were retrieved to document the impacts of various hazards on traders and the policy towards street trading in preliminary research phases and to cross-check information from structured and semi-structured interviews. Maps were used to position the marketplaces in relation to the location of traders' and customers' residences, based on data from the structured interviews, using Geographic Information Systems. Other literature, including empirical academic articles, books, a PhD thesis, and reports on Haitian marketplaces (total n= 14)[18] were also used to get a better understanding of the context, compare and contrast the findings of this thesis, and support the design of the questionnaire.

3.6 Analysis

The selected papers of the literature review (n= 42), questionnaires from the structured interviews (n= 240), transcripts and notes of semi-structured interviews (n= 30), fieldnotes, and secondary data were coded using qualitative data analysis software (Nvivo). Coding refers to 'the process whereby data are broken down into component parts, which are given names' (Bryman 2016: 689), which are also called codes.

The content of closed-ended questions of the structured interviews was coded deductively according to the given choice of answers[19] (pre-coding). The content of open-ended questions of the structured interviews, as well as semi-structured interviews and other textural data, such as in the case of the literature review, were coded inductively according to what could be found in the data. Samples of the coding frames used for the literature review and the questionnaires are presented in Appendix 11. The codes relate to the analytical framework and are closely linked to the units of analysis described in the case study approach. Codes were then aggregated and analysed according to the four cases. At

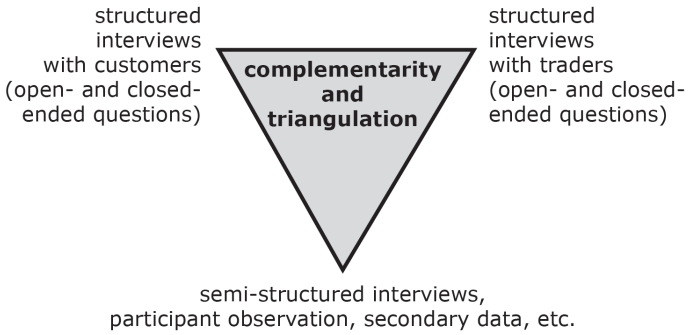
[18] The relatively low number of documents available on the subject reveals the difficulty of accessing documentation on and in Haiti.
[19] This intermediately step realized in Nvivo was necessary mostly because of the handwritten text. To avoid transcribing more than 3000 pages of questionnaires, each page of the questionnaires was scanned and coded as pictorial data.

this stage, coded texts were compared, and the most exemplary quotes were used in the presentation of the findings.

Quantifiable data from the structured interviews were exported to quantitative data analysis software (SPSS) for frequency and contingency analyses. Frequency tables and diagrams were used to illustrate the frequency of a function, attribute, disaster impact, or action within one case and in combined cases (see Appendix 12 for a sample). To observe variations across cases, contingency tables were used to identify patterns of association. Relying on frequencies and contingencies fits with the exploratory nature of the study and overcomes the challenges of reaching a degree of saturation in complex environments, such as the marketplace.

Findings were aggregated for triangulation and complementarity with the other available data sources described in the previous section (Figure 15). Yin (2014: 241) defines triangulation as 'the convergence of data collected from different sources, to determine the consistency of a finding'. Whenever possible, findings were compared in relation to the findings of other sources of data to support and illustrate or highlight different viewpoints. As mentioned previously, within each questionnaire (trader or customer) and between both questionnaires (trader and customer), questions were designed with the principle of triangulation in mind. For instance, the topic of many open-ended questions overlapped with those of many closed-ended questions.

Figure 15 Triangulation and complementarity



Source: Author.

However, many findings from the data sources do not overlap perfectly or match for triangulation. Then, findings are rather aggregated in a complementary fashion, as in mixed-methods studies (Yauch and Steudel 2003). This is particularly evident, in this study, when combining data sources that are quantitative in nature from those that are more qualitative. In this case, the quantitative aspect presents to what extent one element is present in the data, while the qualitative aspect presents tentative meanings and explanations.

3.7 Research quality standards

A set of naturalistic criteria, developed by Guba (1981 in Wang and Groat 2013) in response to positivist standards, have been considered to ensure the quality of the research. These criteria relate to credibility, transferability, dependability, and confirmability.

Credible research studies 'establish truth value by taking into account the natural complexities inherent in the situation or circumstance being studied' (Wang and Groat 2013: 38). In case study research, this largely relates to the use of multiple data sources and methods that are triangulated. In this research, given the high complexity of marketplace environments, particular attention was given to interviewing a relatively large number of traders and customers, whose accounts were coded and triangulated. Moreover, the peer-review process also enhanced the credibility of the findings. Most of the findings were presented in conferences and workshops, and feedback from experts was taken into consideration. All four papers, except Paper D, have been published following a thorough peer-review process.

Transferability, like the positivist equivalent generalisability or Yin's 'external validity' (2014: 48), concerns 'the extent to which the conclusions of one study can be applied to another setting or circumstance' (Wang and Groat 2013: 38). It is difficult, at the time of writing, to evaluate whether the findings of this thesis are transferable, especially due to the exploratory nature of the study and the importance of context in urban studies. After all, the intention behind the thesis is to provide a foundation for further research, hoping that further research will come to similar but more detailed findings in similar contexts in urban Haiti and highlight similarities and differences in other contexts. On the latter, however, the literature review (Paper A) brings interesting insights on whether the findings of the case study (Papers B–D) are transferable, particularly with regard to the attributes of marketplaces. This is an important part of the discussion, a discussion that is also facilitated by the structure of the research questions used in the papers (see Table 1). It is hoped that the description of the context and cases given in Sections 2.1 and in the papers is 'thick' enough that other researcher can adequately assess the similarities and differences of other research contexts.

The idea of dependability relates to the 'fundamental consistency within the data' (Wang and Groat 2013: 39) and to making explicit the instabilities or inconsistencies found in the data. Dependability is achieved in the thesis by making explicit the data collection, data analysis methods, and data sources in this chapter, the appendices, and the publications (Papers A–D); in presenting the occurrences, whenever relevant, behind the statements (the number and references of publications in Papers A and the number of interviewees in

Papers B–D); and in presenting the diverging ideas revealed by the process of triangulation.

The final principle relates to the confirmability of the researcher's findings. This 'can be achieved through a combination of triangulation and reflexivity on the part of the researcher' (Wang and Groat 2013: 39). The principle of triangulation, explained earlier, not only applies to establishing credibility but also contributes to confirmability. Reflexivity requires that the researcher explains his or her epistemological position and reflects on his or her influence on the research process. The emphasis, here, is on making explicit the triangulating process and the researchers' reflections on the process so that other researchers can better position and compare the research in a broader research landscape. It is hoped that the previous sections on the epistemological position and the research process and the following section on ethical and fieldwork considerations and methodological reflections contribute to establishing the confirmability of the research.

3.8 Ethical and fieldwork considerations

The research project was reported to the Norwegian Centre of Research Data (NSD; project number 54596), and advice and procedures were followed. This includes but is not limited to avoiding collecting and recording personal information whenever irrelevant (including for the structured interviews) and deleting or making anonymous all personal data and records at the end of the research project.

The project involved four research assistants, two women and two men, who were students in an urban planning module at the Université d'État d'Haïti at the time of data collection. Each research assistant signed a confidentiality agreement (Appendix 13) stating their duties, mainly regarding data collection, privacy, and protection, and their rights, mainly regarding financial compensations and personal safety. The research assistants were under my direct supervision.

In each marketplace, consent was sought from marketplace managers or leaders to undertake the study. Each time I entered a new area of the marketplace, I introduced myself and the research project and the future involvement of research assistants to nearby traders. It has been particularly important to stress the independence of the project by explaining that my team and I were not employed by governmental or non-governmental institutions and that we were not members of the press. This process took a considerable amount of time but appeared to be necessary and fruitful in the long-term, as traders were generally grateful to see my team and I later and eager to engage. Traders were generally very open to our presence, and I perceived that levels of trust increased as we spent more time in the marketplaces.

The project relied heavily on interviews with traders, customers, and other key informants. The research assistants and I mostly obtained oral consent from traders and customers (Appendix 14). Written consent was perceived as being inappropriate in the context due to their relatively low levels of literacy. Otherwise, from the other key informants, such as managers, government officials, and academics, written consent was obtained (Appendix 15).

The project involved taking photographs in public spaces. Most of the photographs were taken in a way that people are not identifiable (at a great distance). If people are identifiable in the photographs (at a close distance), oral consent was sought prior to taking pictures, and faces were blurred.

Other considerations were taken due to fieldwork conditions. The fieldwork was often pleasurable, engaging, and fruitful for the participants. However, security was of great concern and not taken lightly. Security measures were taken, respected, and prioritised over research interests at all times. The measures include but were not restricted to having an experienced Haitian man with us at all times, following the news on a daily basis, regularly asking how the research assistants feel, following Canadian and American travel advice and advisories, and avoiding demonstrations in our movements. This resulted in postponing or cancelling a few interviews, taking several route detours, and dropping one marketplace in the preliminary fieldwork and one selected marketplace in the primary fieldwork. Due to the presence of criminal groups in marketplaces, getting consent from managers, traders, customers, and anyone asking questions was a primary concern and was obtained. Some questions, such as those related to polarised political topics and the involvement of criminal gangs, while pertinent to the research, were avoided for security reasons.

3.9 Research limitations, reflections, and suggestions

The doctoral research process underpinning the thesis has limitations and prompted a series of reflections on the work. They are summarised below, and they provide a basis for suggestions for further research.

Notably, I have some reflections about the chosen data collection methods for the primary fieldwork. As mentioned previously, structured interviews were conducted with the assistance of Haitian research assistants, who followed a questionnaire composed of closed- and open-ended questions. Overall, despite logistical challenges, the approach was perceived as fruitful in terms of the number of interviews conducted and in terms of covering issues that were of research interest. During the primary fieldwork and after analysis, however, the approach also reveals its own limits: (a) interviewees were less

flexible than in semi-structured interviews in talking about what was of primary interest to them; (b) some closed-ended questions were too complex or not well formulated and had to be dropped; (c) answers to open-ended questions were consistently brief, limiting the explanations of the phenomena in question. In this context, allowing the research assistants to conduct semi-structured interviews and providing more training would have likely facilitated more natural conversation with the participants, producing richer explanations (Bryman 2016) while still being satisfactory in terms of coverage. If time and money were not an issue, adding a trial period where different interview approaches could have been tested and expanding or realising the third phase of fieldwork using semi-structured interviews would have improved the methods and enriched the findings.

The structured interviews with not only closed- but also many open-ended questions resulted in a methodological compromise: a hybrid quantitative and qualitative data. The work is not the same as a mixed-method study that combines a fully qualitative study (e.g., a discourse analysis of semi-structured interviews) and a completely quantitative study (e.g., statistical analysis of a representative sample). It resulted in a multiple-case study that is exploratory rather explanatory in nature. Therefore, the thesis calls for fully qualitative and quantitative research in the same and in other marketplaces of Port-au-Prince, Haiti, as well as in other cities in low- and middle-income countries, to confirm the trends identified in the thesis in larger samples and produce more detailed accounts and explanations.

Secondly, street markets and other types of marketplaces not under the responsibility of local governments, such as ravine markets, were not included in the multiple-case study research for security reasons. The selected cases are all off-street markets, and only one marketplace was self-provided. As mentioned previously, this has not impeded the objective of the research in exploring ways marketplace infrastructure support (and should support) trade for traders and customers in disaster and post-disaster contexts (Section 3.4). Furthermore, *Lalue* and *La Coupe* provide infrastructural conditions that appear to be similar to small street and ravine markets. One or two cases of street and ravine markets could have enriched the study, and thus, further research on the infrastructural conditions of other types of marketplaces present in urban Haiti (when it is safe to do so) is suggested, as well as further multiple-case study research in other urban contexts that include street markets as one of the cases studied.

Finally, the thesis did not specifically study governance and power relations in and on marketplaces other than briefly in Paper D. One reason was security due to the awareness of gang presence in Haitian marketplaces and political issues in Haiti. Still, governance and power relations are influential aspects, as interviews realised with governmental, non-governmental representatives, and academics made clear. One possible research path,

suggested by one of the interviewees, is to explore and explain the local and national governments' interests (or lack thereof) and limitations in building, maintaining, and managing urban marketplaces. For this purpose, many more actual and previous governmental and non-governmental stakeholders could be interviewed in more Haitian municipalities. This, at least in part, would provide perspectives on how to build better marketplaces in Haiti, a desire strongly expressed by the interviewed government stakeholders.

4 Findings

This chapter summarises the main findings of the papers published during the doctoral research or currently under review. Each paper responds to specific research questions related to marketplace infrastructure and resilience (see Table 1). Interrelations between the findings of each paper are discussed in the following chapter.

4.1 Paper A: *Towards marketplace resilience: learning from trader, customer, and household studies in African, Asian, and Latin American cities*

4.1.1 Purpose of the paper

Paper A positions the research in gender-related studies on infrastructure and formulates an initial version of the concept of marketplace resilience (a more recent and comprehensive version of the concept is explained in Section 2.4). It identifies the desired functions and attributes of marketplaces, the vulnerabilities and resilience strategies found in the literature on marketplaces in the cities of low- and middle-income countries. The paper also discusses their influence on traders' and customers' households. This is a review of the literature of 42 recent publications (2010–2016). The objective of the article is two-fold: to provide the state-of-the-art on what is currently researched in relation to *marketplace resilience* and provide new knowledge on interrelations between domestic and work infrastructure that are impacted or used in the resilience process.

4.1.2 Summary of findings

Building on the concept of marketplace resilience, the article explicitly poses three sub-research questions. The findings are summarised accordingly.

RQ-1a: What marketplace attributes contribute to (or hinder) the roles of traders and customers vis-à-vis their households?

- Marketplaces are locations where household income is generated and where basic commodities, such as food, are accessed by low-income inhabitants.

- Marketplaces possess socio-spatial attributes that can positively influence trade, and in turn, meet household needs:
    - Flexibility in customers' buying capacities and in traders' autonomy, vis-à-vis household and work duties.
    - Proximity as nearness in space and in the occurrence of socioeconomic interactions.
    - Stability in the regularity of income for traders.
- Attributes related to proximity, flexibility, and stability tend to be conditional on the maintenance of a fixed location.

RQ-2a: What are the shocks and stresses experienced by traders and customers in the marketplace, and how do they impact their respective households?

- Impacts of loss or damage to market assets, as well as a loss of trade location, for traders on customers and their dependents, following police harassment and evictions, can be summarised in the reduction of household buying power and in the reduction of productivity.
- Marketplace vulnerability to repressive local government policies impacts production and domestic reproduction.

RQ-3a: What are the strategies deployed by traders, customers, and their respective households to build marketplace resilience?

- Traders tend to persist trading over finding new sources of income when facing evictions and customers tend to favour access to food in informal markets over other sources of food.
- To maintain and restore trade requires trade-offs to be made in the household, not only to cope with reduced income but also to refinance businesses.
- Traders' and customers' limitations in securing trade due to the lack of power and control over the public space they occupy.

4.2 Paper B: *The relational attributes of marketplaces in post-earthquake Port-au-Prince, Haiti*

4.2.1 Purpose of the paper

Paper B positions the research mainly in urban food security research and explores the attributes of and the interrelations between the social and physical dimensions of food retail infrastructure, as perceived by traders and customers. It also explores the effects of disasters and post-disaster conditions on them and on the marketplace attributes. The

paper also discusses how the relational dimensions of food retail can inform better market support interventions and market modernisation agendas. The findings are based on a multiple-case study analysis of three different marketplaces in the metropolitan region of Port-au-Prince, Haiti: *Lalue, Canapé-Vert,* and *La Coupe* (see Section 3.4).

4.2.2 Summary of findings

The paper does not explicitly follow a resilience framework. For the sake of clarity and comparison between papers, the following questions were formulated. The findings are summarised accordingly.

RQ-1b: What are the relational attributes of marketplaces for traders and customers?

- For customers, sustained relationships with regular traders ease daily access to food.
- For traders, sustained relationships with regular customers stabilise their income and businesses.
- Sustained relationships among traders allow some flexibility in daily operations.
- Attributes in the relationships among traders and between traders and customers tend to be similar across marketplaces selling similar commodities.
- These relationships are based on the relational attributes of trust, reciprocity, proximity, and stability. These attributes contribute to easing and sustaining trade activities.

RQ-2b: What are the impacts of the 2010 earthquake and the changed post-disaster conditions in the marketplace on the relational attributes?

- The vulnerability of the physical infrastructure to hazardous events and the (post-disaster) hazardous conditions in the marketplace can erode the pre-conditions needed for sustaining relationships between traders and their regular customers and, in turn, the relational attributes.
- How social relationships and their attributes are affected by hazards vary according to the typology and level of robustness of the physical infrastructure in which traders are located.

RQ-3b: How does the social marketplace infrastructure contribute to or impede traders' and customers' resilience?

- Solidarity among traders tends to be limited to daily trading operations and support traders' household and care duties and do not extend to supporting the recovery of their businesses following urban disasters.

- Relational attributes among traders tend to only be restored when traders return to their locations, among their colleagues.

4.3 Paper C: *A risky business: the impacts of hazards on traders located in different marketplaces in Port-au-Prince, Haiti*

4.3.1 Purpose of the paper

Paper C, a conference paper, identifies the hazardous events and conditions faced by traders located in different marketplaces and explores the influence of marketplace physical infrastructure on traders' resilience based primarily on the frequency analysis of traders' structured interviews (see Section 3.6) located in four distinct marketplaces in the metropolitan region of Port-au-Prince, Haiti. This paper, in contrast to Papers C and E, frames the findings mostly in relation to variations in exposure to hazardous events and conditions and less in relation to variations in infrastructural vulnerability. This nuance is discussed further in Section 5.1.2.

4.3.2 Summary of findings

RQ-2c: How does the physical infrastructure of the marketplace influence traders' exposure to hazardous events and conditions?

- Trader reports of shocks and stresses vary according to different levels of quality and sufficiency in physical infrastructure provision. In other words, traders are exposed to different hazardous events and conditions according to the kind of marketplace infrastructure in which they are located or can access.

RQ-3c How does the physical infrastructure impact traders' actions to maintain or rapidly return to trade following a hazardous event?

- Traders' speed of recovery tends to differ according to the level of robustness of the marketplace infrastructure in which they are located or can access.

The contribution of this paper to urban disaster studies and research on informal working conditions is discussed in the following section.

4.4 Paper D: *Unpacking an urban domino effect: marketplace infrastructure, traders, and resilience following the 2010 earthquake in Port-au-Prince, Haiti*

4.4.1 Purpose of the paper

Paper D positions the research in urban infrastructure and urban disaster research by adopting a similar methodological approach to Paper B; however, the focus is on the role of physical infrastructure on traders' livelihoods and the impacts of its deficiency and failure. Paper D incorporates the findings from Paper C and illustrates the effect of marketplace infrastructure deficiency and failure on traders' livelihoods, as well as their actions and limitations to maintain or return to trade after disasters and improve infrastructural conditions. The difference between Papers C and D is the former emphasises 'external' hazards, while the latter frames the hazardous events and conditions as the results of 'internal' vulnerabilities, which are infrastructural deficiencies and failures. The paper also shines light on the 'domino effect' caused by the interdependencies between household needs and infrastructural conditions of the workplace and the hidden trade-offs behind the apparent resilience of petty trade to disasters. The paper mostly builds on the qualitative analysis of interviews conducted with traders in the four studied marketplaces in Haiti.

4.4.2 Summary of findings

RQ-1d: What are the functions and attributes of the marketplace physical infrastructure for traders?

- Marketplace physical infrastructure (including shelter, floor and drainage, display and storage, and water and sanitation) contribute to protecting traders' livelihoods and their wellbeing.
- Income generated in the marketplace is generally invested in domestic reproduction: addressing basic household needs, education, transportation, and housing.
- Traders' households are not necessarily located in the vicinity of the marketplace. Therefore, income generated in the marketplace can impact living conditions outside the marketplace neighbourhood.

RQ-2d: What are the impacts of collapsed physical infrastructure on traders?

- The financial impact of collapsed infrastructure on traders is three-fold:

    - Traders are affected by the direct loss of their commodities and individual structures.
    - Traders and their households are affected by the recovery of trade as recovery acts are mostly found in traders own productive capacities and support within the household and result in trade-offs in the domestic sphere.
    - Many traders are affected by the loss of productive time due to delays in returning to trade and not being able to generate income.
- Due to the dependency on the marketplace to sustain domestic reproduction, the triple impact has a domino effect on traders' capacities to provide for their families.

RQ-3d: How do robust, improved, and regressed physical infrastructure provision affect traders' actions in building resilience?

- Traders located in physical halls that resisted tremors tended to return more quickly to trade than their counterparts located in open-air markets after the earthquake.
- Better workplace infrastructure provision can place traders in a worse position with regard to their capacity to generate income due to the imposition of higher entry ceilings (generating unaffordable operational costs for traders, who need them to be kept at the absolute minimum) and spatial marginalisation (generating dead spots that clientele avoids due to difficult physical access).
- Traders' capacities to adapt to changed environments are limited to changing their spatial location (such as moving into the streets) while keeping the same mode of production, which is selling the same commodity.
- Deficient infrastructure can impact traders' health and safety and the continuity of trade on a daily basis and impede resilience.
- Self-help, municipal and private reconstruction, and management approaches to the reconstruction of marketplaces have their own limitations, and all seem to fail to sustain the provision of decent and robust infrastructure to all traders without impeding trade.

5 Discussion

This chapter discusses the findings of the four papers presented in the previous chapter (Papers A–D) in relation to the three main research questions of the thesis. The first section combines, compares, and contrasts the findings of each paper and discusses theoretical contributions with regard to Haitian and global literature on marketplaces and resilience in relation to the main research question. The second section argues for building on marketplace infrastructure in urban planning and humanitarian practice.

5.1 The role of infrastructure in marketplace resilience: summary of empirical findings and contributions to theory

The papers' findings are positioned in research fields where marketplaces tend to be overlooked as a focus of inquiry, including gender-related research on infrastructure, urban food security research, urban disaster research, and Haitian studies. Nevertheless, one central argument throughout the thesis is that marketplaces should be considered one of the most important urban infrastructures in the cities of Haiti and other low- and middle-income countries, particularly in disaster and post-disaster contexts. The following discussion on the three overreaching research questions of the thesis summarises and integrates the main findings from the papers and suggests the main theoretical contributions of the thesis.

5.1.1 The desired functions and attributes of marketplaces for traders and customers

The first question the thesis asked was the following:

> **RQ-1 What are the desired functions and attributes of marketplaces to be maintained or rapidly restored in disaster contexts for traders and customers?**

Desired functions of marketplaces tend to be universal across the marketplaces of low- and middle-income countries in the papers reviewed and across the four cases investigated in metropolitan Port-au-Prince. The Haitian multiple-case study supports the findings of

the review, based on fragmented segments of the literature, and a thorough examination of the desired attributes reveals further nuances.

Evidently, the main desired functions of marketplaces are to be the established location for generating livelihoods for traders and for customers to access basic commodities. As such, it is an important place for urban households. Income generated in marketplaces pay for the commodities and services needed by the households and, in the case of Haiti, appear to be particularly influential in young household members' access to education. The flow of household income for traders tends to be sustained over time due to the socio-spatial attributes that unfold in the marketplaces. In Haiti and in other cities of low- and middle-income countries, marketplaces are preferred over supermarkets as sources of food because they facilitate access to the basic commodities needed by urban populations. A marketplace is an infrastructure where the so-called urban poor are both providers and users and where trade is based on socioeconomic relationships that are mutually beneficial. Importantly, these relationships depend on spatial and physical conditions. They form the desired attributes of marketplaces: solidarity, reciprocity, proximity, stability, and safety.

The first two desired attributes are solidarity and reciprocity[20], which are present in the socio-economic relations among traders and between traders and customers. Solidarity refers to trust-based social relations, often leading to friendships and acts of care. For traders, this permits flexibility in working times and supports daily transactions. For example, traders would not hesitate to open a neighbouring stall and sell for a colleague if he or she is away performing household duties, without attempting to steal his or her clientele. Reciprocity, then, focuses on the balance of mutually beneficial advantages that these social relations should provide. For instance, the offer of traders to customers to buy on credit should lead to customers being loyal to the trader. This form of solidarity and reciprocity between traders and customers is called '*pratik*' or '*kliyan*' in Haiti. Observed in rural marketplaces and described by Mintz (1960) decades ago, the culture of '*pratik*' or '*kliyan*' is still very much alive in the urban marketplaces of today. Similar practices have been observed in African marketplaces (see for instance Lyons and Snoxell 2005; Asiedu and Agyei-Mensah 2008 in paper A) and lead to thinking that such practices may occur in many marketplaces located in low-income neighbourhoods across the world.

Another desired attribute of marketplaces is proximity. It relates to the physical distance between traders and between traders and regular customers. In Haitian marketplaces, solidarity is generally present among traders that are located close to each other, often generated by years of working alongside each other. This appeared as one of the main reasons traders often reject displacement, even within the same marketplace. Proximity

[20] It is referred to as 'proximity' in the review paper (Paper A) but 'reciprocity' is preferred as a more precise term than the 'social distance'.

to customers is also of vital importance within the neighbourhood and the marketplace. Proximity is the main factor for the interviewed Haitian customers in their choice of a marketplace, and most live within a 15-minute walking distance. The importance of the physical location of the marketplace to generate enough income was also stressed in multiple papers (see for instance Rengasamy et al. 2003; Riley 2014 in Paper A). However, Paper B is more revealing, as proximity appears a key condition for the trust-based and reciprocal relationships to exist because frequent interactions are necessary to maintain them over time. Therefore, physical access to and within the marketplace is crucial and should be effortless.

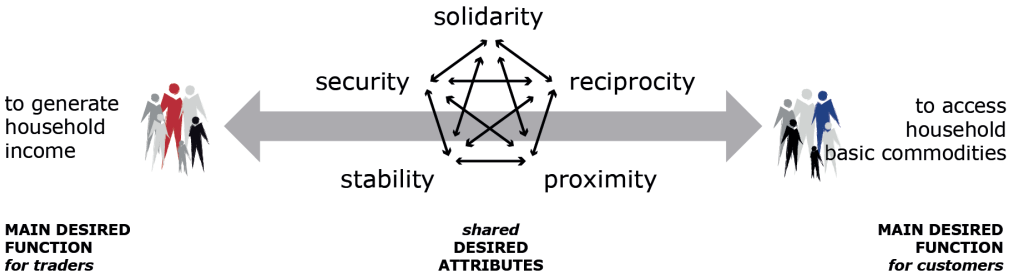
The third desired attribute is stability. It appears mainly in the need for a physical anchorage of trading locations. A fixed location is needed for frequent interactions to occur, as traders should remain close to colleagues, and customers should be able to find their regular traders easily. In Haiti, a trading spot well-known by customers was perceived as more important than many other infrastructural features in the marketplace. This may explain why traders, in Haitian marketplaces and marketplaces in the reviewed literature, persist in returning to previous locations after displacement is forced by a natural hazard or detrimental urban policies. On the latter, the role of regulations in legalising the presence of traders in the urban public spaces of the city has been stressed in many of the reviewed papers as contributing to this attribute (Paper A), and the Haitian multiple-case study confirms it. For example, it was impossible for market managers to obtain consent from traders to move them to another area of the marketplace. Stability can also be related to the steadiness of trade (resulting in stabilised income and stock management) as a result of the maintenance of economic activities due to solidarity and reciprocity between traders and customers.

The last main desired attribute is safety and relates to the protection of life, health, capital (i.e., money, merchandise, and stalls) and the previous attributes against possible threats. This is, perhaps, the one that remains the most 'desired', as it is yet to be fully realised in many reviewed marketplaces in the literature (Paper A) and in the multi-case study in Haiti (Papers B–D). The need for safety from arrest, police harassment, and the damage and confiscation of merchandise (Paper A), as well as from theft, fire, and natural hazards (Papers B to D) appeared strongly, but less in the demonstration of its robustness than in the impacts of its failure. In particular, the Haitian multiple-case study suggests that the provision and adequate maintenance of robust physical infrastructure plays a role in ensuring the continuity of trade in the face of natural hazards. This is discussed further in the following sections.

Also important to the following sections is understanding that these attributes are interdependent (Figure 16) in the same ways that the social and physical dimensions of

marketplaces are interrelated. One example, mentioned above, is that friendships leading to solidarity and reciprocity between traders and customers depends on the stability of a fixed location to be maintained over time. The apparent universalism of the presence of attributes in the marketplaces in the literature and the Haitian case studies researched in the thesis does not mean that they could not be affected directly by hazardous events or indirectly by hindered attributes. This interrelatedness has implications on how disaster impacts can be experienced in marketplaces, and the disaster impacts on the marketplaces' desired functions and attributes are further explained and discussed in the following section.

Figure 16 Interrelations between functions and attributes



Source: Author

The desired attributes of marketplaces, their social and physical dimensions, and their interdependency, have theoretical implications. In the literature on marketplaces and Haitian marketplaces, in particular, they contribute to a more constructive understanding of the various qualities that marketplaces have—or should have—for low-income traders and customers. Consequently, they nuance the more negative perspectives of local governments and the elite, who often understand marketplaces as a location of problems (Thérasmé 2011; Neiburg et al. 2012), and the common urban planning approaches to street trade aim to formalise, structure, and sanitise the market space (Bromley 2000; Roever and Skinner 2016).

The interrelated attributes, for traders and customers, also contribute to a more comprehensive portrait of marketplaces than what often describes the literature on marketplaces. For instance, much of the literature reviewed in Paper A completely overlooks the physical or spatial dimension in the analysis or, at best, puts these dimensions in the background of the study. Thus, this thesis complements and links studies that have rich theoretical contributions but focus mainly on one of the two dimensions of marketplaces, such as the book by Dewar and Watson (1990) for the physical dimension, and the article by Lyons and Snoxell (2005) for the social dimension.

This is also the case for food security and food desert research. The source of food, as a multidimensional object of analysis, tends to either be disregarded due to the traditional focus on households as units of analysis in food security research, as in an urban food security study in Haiti by the WFP (2016), or oversimplified, as in food desert research. Regarding the latter, the act of buying food in food desert research, mostly located in high-income countries, is often narrowed to merely monetary transactions, as is the case of supermarkets and their presence in neighbourhoods (Walker et al. 2010). The indications highlighted by Battersby (2019) and Tawodzera et al. (2012), for instance, that the social relationships customers have with traders matter and can be a factor contributing to food security is supported by the findings of the study. Reciprocity between traders and customers and linkages to the physical dimension also show how the advantages of marketplaces over supermarkets as a source of food in low-income contexts are not only attributed to social aspects and the physical location of marketplaces but also in the embeddedness of the social attributes in space and place. The prevalence and maintenance of these marketplace attributes, which are normally overlooked in household studies, could be additional factors to be considered and researched further in urban food security research.

For the disaster resilience and urban resilience literature, the very existence of these attributes expands what would otherwise be a narrow and functional conceptualisation of the object of resilience (resilience of what). In other words, a focus on desired functions alone, as is the case in many urban resilience conceptualisations, such as the definition proposed by Meerow et al. (2016) based on the review of 25 resilience definitions, can overlook the various socio-physical conditions needed for that very function to be resilient. This thesis shows that it is not enough, especially in low- and middle-income cities, to see if urban systems' functions are still 'off', back 'on', or have failed. Urban systems in low- and middle-income countries, such as the food supply, are more than technical in their dimensions. While the focus on functions alone might be relevant for engineered systems, deepening the exploration and analysis to a second, more subjective, level is particularly necessary in the case of resilience studies of urban infrastructure that are more social and less technical in their dimensions, such as marketplaces in low- and middle-income countries. This thesis is in line with McFarlane's argument and offers a partial response to his call for further research:

> The characterisation of cities in the Global South as synonymous with breakdown or failure ignores the complexity of urban life and recasts a developed/functional versus developing/dysfunctional dichotomy. This dichotomy does not help to move beyond the now staid debates on 'slum' as either a symbol of urban failure or malaise or as a skilful space of entrepreneurialism. There is a need for further work that extends the conceptions of the relations between informal settlements, infrastructure, and agency on an everyday basis (2010: 144).

Considering attributes in resilience studies on urban infrastructure could also be of value to other, typical urban systems and services, such as water provision, waste collection, and transportation, and therefore, as McFarlane suggests, further research on the social dimension of infrastructural provision would be needed.

5.1.2 The impacts of collapsed infrastructure on marketplaces' desired functions and attributes for traders and customers

The previous section stated the main desired functions of marketplaces, which is to be the established location for traders to generate livelihoods and for customers to access basic commodities. It also explored the desired attributes of marketplaces: solidarity, reciprocity, proximity, stability, and security. It discussed their dimensions (social to physical) and their interrelatedness. These desired functions and attributes are key to answering the second research question of the thesis:

RQ-2 How can marketplace infrastructure influence the impact of disasters on the desired functions and attributes for traders and customers?

The impacts can be categorised into two parts: (a) impacts on marketplace functions, discussed mainly around the impact of collapsed marketplace infrastructure on traders' livelihoods and households, and (b) impacts on the attributes of marketplaces.

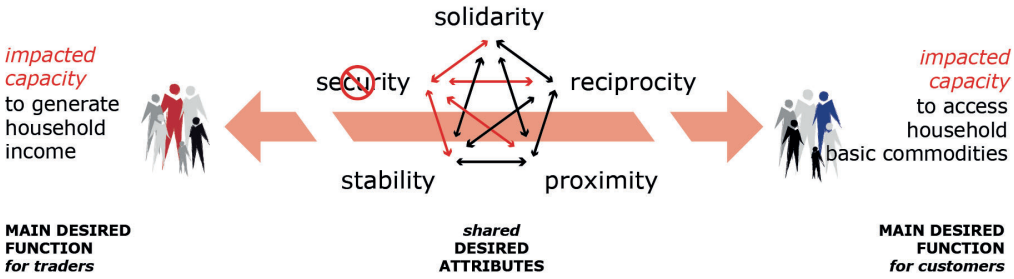
The direct financial impacts of collapsed marketplace infrastructure on traders, discussed mainly in Papers C and D, are three-fold. They refer to the loss of assets (merchandise and individual structures), the loss of productive time due to the delay in restarting economic activity, and the need to re-invest, often without external support other than from within the family. The financial impact is substantial and indirectly affects traders' capacities to sustain household needs, such as education. In other words, the main desired function of marketplaces for traders, which is to generate sustainable livelihoods for traders' households, is severely impeded until traders are able to return to their original location and reopen their businesses.

As such, this finding supports the idea that the separation between the informal economic unit (such as a trader' small commerce) and the household does not fully exist, as stated by the Haitian economist Lamaute-Brisson (2002) in her study on the informal economy in Port-au-Prince. The domestic sphere expands in the marketplace and vice versa, as testified by the dual role of women market vendors, which is domestic reproduction and production, and the predominance of savings and solidarity within the household for the maintenance of informal economic activity (Lamaute-Brisson 2002). Due to focusing on the failure of the marketplaces' physical infrastructure, this thesis spatialised and contextualised Lamaute-Brisson's findings. The Haitian multiple-case study focused on the impact of collapsed infrastructure, supports the statement made in the review paper (Paper

A), mainly based on the impacts of evictions, that 'household vulnerability also extends into the marketplace and vice-versa' (Smith 2019b: 16). In other words, the relationship between the workplace and the household behaves like a system of connecting vessels, regardless of the long distances that can separate traders' place of work from their place of residence, as it was particularly the case for traders located at the Iron Market and at La Coupe (Papers C and D).

Indirect impacts on traders and customers can also be discussed in relation to the impacts on desired attributes of marketplaces. When the physical structures of the marketplace collapse, or when they fail to secure traders and their investments against hazards, other interrelated attributes are eroded (Figure 17). Paper B explored 'the erosion of the preconditions needed for building and maintaining solidarity', particularly how 'physical proximity and spatial stability can be affected … indirectly impacting solidarity among food retailers and buyers' (Smith 2019a: 17-18). For instance, the paper showed how the loss of a trading location and the time taken to return to trade after a disaster are likely to affect beneficial reciprocal relationships between traders and customers, resulting in financial losses. This impedes traders' capacity to restart their businesses and provide for their households and customers' eased access to food in the aftermath of a disaster.

Figure 17 Disaster impact on interrelated desired functions and attributes



Source: Author

Overall, the exploration of impacts on marketplaces functions and attributes for traders and customers not only sheds light on the importance of robust infrastructure for trade but also nuances the perception that traders are necessarily better off under covered marketplaces. Traders who were in market halls that collapsed and their customers were affected more strongly by the earthquake than their counterparts in open-air markets. This could offer an interesting contribution to the conceptualisation of vulnerability in infrastructure that includes social dimensions, mostly characteristics of urban systems in cities of low- and middle-income contexts. As their attributes are mostly social and relational, so are the risks. The implementation of a physical element, such as a non-seismic proof market hall, may improve the wellbeing and safety of users and commodities against meteorological hazards. However, it could be detrimental to sustaining eased trade

activities and facing other hazards if it is not properly designed, built, and maintained. Socioeconomic practices anchored in marketplaces are inevitably affected by sudden changes in the physical and spatial environments of these marketplaces due to embedded vulnerabilities. This, in Paper D, is referred to as another application of an urban domino effect. While this effect is mostly documented in terms of impacts of failed hard infrastructure on other hard infrastructure and households that depend on them (Graham and Thrift 2007; Graham 2010; Wamsler and Brink 2016), this thesis illustrates one for an infrastructure that is socially connected.

Furthermore, the thesis has shown how exposure to hazards, and the resulting resilience, varied across the four different marketplaces according to the characteristics of their physical infrastructure (Paper C). To paraphrase the report titled *Natural Hazards, UnNatural Disaster*, although no single person or action may be to blame, the destruction of marketplaces and their impacts on traders, customers, and their households result from human acts of omission, by adopting a laissez-faire vis-à-vis traders' infrastructural needs, and commission, by building non-seismic-proof market halls (UN and World Bank 2010). In other words, the origin of the acts of resilience that followed, discussed in the following section, was not positioned in the hazard—an earthquake—but in the detrimental legislation and its enforcement, as is the case of most literature on street markets (Paper A), and the construction of non-earthquake resistant covered markets (Paper D). This shows that resilience to disasters and their root causes, instead of resilience to external disturbance or shocks, is, therefore, more appropriate, as the same natural hazard did not have the same impact on the four marketplaces. Further research could explore the root causes of the inadequate provision of infrastructure for traders in Haiti.

5.1.3 The influence of infrastructure on traders' and customers' resilience process

The previous section has shown how vulnerability can unfold in marketplaces of cities low- and middle-income countries and a disaster's impacts on traders, customers, and their households. It particularly highlighted how the desired functions and attributes of marketplaces for traders and customers were eroded when a market's physical structure collapses due to interconnected risks. The vulnerability and inadequacy of marketplace physical infrastructure serve as a point of departure for the last research question of this thesis:

RQ-3 How can marketplace infrastructure influence traders' and customers' resilience process?

The influence of marketplace infrastructure on traders' and customers' resilience is categorised in three overlapping processes: the influence on the acts of traders and

customers to maintain or return to desired functions and attributes to face the disaster (the general context following the collapse of vast parts of Port-au-Prince's built environment, as well as the collapse of the marketplace's physical infrastructure), the acts of adapting to changes in post-earthquake conditions (improvement or worsening of infrastructural conditions), and the actions taken and limitations in transforming marketplace systems or structures that contribute to traders' and customers' vulnerability and limit their current or future adaptive capacity.

First, the thesis revealed that restoring economic activities was one of the most important actions following the disaster. Traders with stalls under robust market halls and traders in open-air markets were advantaged, as they generally returned to trade after the earthquake faster than their counterparts in halls that collapsed. To restore trade however required, for the most impacted, significant trade-offs with other households needs, as external support was inexistent or limited for most traders. Paper D showed how behind the apparent resilience of traders and marketplaces reside trade-offs that may be detrimental to household poverty levels; these trade-offs are overlooked if the understanding of resilience is based solely on observations of marketplaces. Paper D states that 'the apparent "resilience" of traders and marketplaces evocated in the literature and the media following the 2010 earthquake is mainly due to the capacity of households, which may be located in distant neighbourhoods, to endure reduced income and financially support the recovery of their main livelihood. These sacrifices are likely to have had detrimental impacts on household poverty' (Paper D: 14). This is an additional illustration of the domino-effect mentioned earlier, but this time, in the other direction: household trade-offs supported the re-establishment of traders' economic activities. These trade-offs are invisible in the marketplace and provide a more nuanced view of the short-term resilience of traders than the accounts of some authors and reports (Markey 2010; Christian Aid 2012).

Moreover, research has also shown the limitations of solidarity and reciprocity among traders and between traders and customers in disaster contexts. These socioeconomic attributes are limited to usual and regular activities that concern traders, customers, and their families, and findings indicate that they are not 'tapped on' further in disaster contexts. In the urban disaster of the *12 Janvier*, household members and extended family were the main sources of financial support for traders. This finding nuances and complements the results of studies on marketplace social capital (for instance Lyons and Snoxell 2005) and the importance of social capital in disaster context (Norris et al. 2008). The thesis challenges the idea that existing solidarity within a spatially-bound community, such as among traders in a marketplace, necessarily leads to community resilience. The thesis shows that in times of high-magnitude disasters, such as the *12 Janvier* in Haiti,

solidarity within a marketplace community can be suspended *until* traders manage to return to trade. Only then can solidarity be restored. In order words, solidarity is generally restricted to the usual desired functions and attributes of marketplaces. The financial support that traders accessed could not be found within the marketplace community, but within households, regardless of whether they were located close to the marketplace.

Second, the thesis documented how traders and customers adapted to improved or worsened post-earthquake marketplace conditions following the reconstruction of two marketplaces. Findings show how unaffordable operational costs in the improved marketplace of the Iron Market and spatial marginalisation in the reconstructed market and the worsened conditions of *La Coupe* negatively affected traders who did return but struggled financially to maintain their activities (Paper D). Both support Dewar and Watson (1990) statement that better infrastructure can put traders in a worse economic condition. This thesis showed how traders could end up in lose-lose situations. The acts of 'adaptation' by traders to infrastructural changes appear to be limited to spatial strategies, which mainly involve moving into the streets to reduce operational costs and gain better physical access to clientele. This has negative consequences, however, as increased physical instability tends to affect their ability to maintain solidarity and reciprocity with their regular clients (Paper B), not to mention the detrimental impact on their health and safety as the streets are perceived as beholding more risks of vehicular accidents and harassment. That traders mainly deploy spatial strategies is also similar in the case of harassment and evictions in other urban marketplaces of low- and middle-income countries (Paper A) and indicates the limited portfolio of actions taken by traders to adapt to changing infrastructural or contextual conditions.

Third, the thesis also exposed the limited actions of traders and municipal and private stakeholders to improve traders' workplaces so that they become more resilient. That traders are limited to spatial strategies also indicates their limitations in transforming the detrimental systems and structures in which they are currently located. Paper D concludes that 'the current approaches mentioned in the study (i.e., self-help, as well as municipal and private reconstruction and management) have limitations, and all seem to fail at sustaining the provision of decent and robust infrastructure without impeding trade for all traders' (Paper D: 15). This alone shows that the presence of strong trade advocacy groups and unions, as accounted for in Johannesburg and Durban in South Africa (Çelik 2011; Bénit-Gbaffou 2016), Cusco in Peru (Mackie et al. 2014), and Ahmedabad in India (Roever 2016, all in Paper A) is not universal. In the Haitian context, where municipal authorities are considered weak, and the Haitian State does not intervene in the planning and management of the city (Thérasmé 2011), the establishment of a power relationship appears to be particularly difficult.

Consequently, perceiving trade, traders, and marketplaces as 'resilient' following the 2010 earthquake in Haiti, as one can suppose after reading accounts and seeing photos in the literature (for instance Katz 2013) and in some reports (for instance IRC and partners 2010; Clermont et al. 2011) is an overstatement. As highlighted, it overlooks the detrimental hidden trade-offs and other acts that traders can make to maintain trade, it overlooks the desired attributes that are hindered the process, and it overlooks the needed transformations that are yet to be realised to reduce disaster risk. In other words, in this case, resilience is suboptimal and incomplete, and, as Keck and Etzold (2013: 88) put it, 'refused' by the lack of robust and adequate provision of marketplace infrastructure by local and national governments and sufficient support from humanitarian actors.

Finally, these findings were the result of the critical use of resilience for urban infrastructure in a low- and middle-income context, framed as *marketplace resilience* in the thesis. The thesis demonstrated that it is possible to use the concept of resilience critically in academia. The thesis could serve as an exemplary case of a more critical use of resilience and one possible response to Béné et al. (2012), Andresen (2019), and others, who criticise the use of the concept of resilience in academic research. To make the use of resilience pertinent to urban infrastructure in low- and middle-income contexts, three amendments to the definition proposed by Meerow et al. (2016), based on the systematic review of definitions and frameworks, were necessary.

First, the subject and purpose of resilience (i.e., resilience 'to what' and 'for whom') must be approached from the perspective of the population and extended to more subjective elements to include the desired attributes of urban infrastructure. As mentioned previously, the sole focus on functions, as is the case in many urban resilience definitions (see Table 1 in Meerow et al. 2016: 41), can overlook important social and physical dimensions that are nevertheless significant to the people who take part in and depend on urban infrastructure. This is particularly true when urban infrastructure is composed of more social actors and networks than engineered elements and systems, as in much of the infrastructure in the cities of low- and middle-income countries (Simone 2004; McFarlane 2010).

Second, the object of resilience (resilience to what) must focus on the actual causes of disasters, which are the vulnerable conditions and processes on which the resilience process should be based. As discussed previously, most of the urban resilience definitions (see Table 1 in Meerow et al. 2016: 41) focus on a hazard, disturbance, or disruption while overlooking the inherent conditions and processes that make urban systems vulnerable. For instance, this thesis focused mainly on the consequences of non-robust and inadequate infrastructure provision on traders and customers and less on hazards. This position is in

line with those criticising the use of the misnomer 'natural disaster' (Chmutina et al. 2019) and the focus on natural hazards in disaster studies (Wisner et al. 2004).

Third, the process of resilience must include the transformation of vulnerable conditions that created the disaster. Several academics, such as Chelleri (2012) and Wamsler et al. (2013), argue that transformation should be included in the resilience process 'when a system is in a robustly undesirable state' (Meerow et al. 2016: 44). However, the definition resulting from the review by Meerow et al. (2016) suggests that the goal of transformation is to solely enhance adaptive capacity. This thesis shows how traders, customers, and institutional stakeholders do not succeed in transforming the marketplace into a less vulnerable place and, therefore, as mentioned previously, argues that resilience is incomplete. Specifically, it would be incongruous, considering the documented impacts of collapsed and inadequately provided infrastructure for traders and customers, to not call for the needed transformations required to reduce the vulnerability of marketplaces' desired functions and attributes to the following hazards. This has implications for practice, discussed further in the following section.

5.2 Building on marketplace infrastructure: implications for practice

The research findings suggest implications for practice. One central argument throughout the thesis is that marketplaces should be considered one of the most important components of urban infrastructure in the cities of Haiti and other low- and middle-income countries and should, therefore, be included in urban planning and humanitarian practice. This section presents a selection of practical and professional implications.

5.2.1 Building on marketplace infrastructure in architecture and urban planning: towards a more comprehensive typology of marketplaces

To architects and urban planners, the desired attributes of solidarity, reciprocity, proximity, stability, and safety offer a simple framework for investigating the needs of traders and customers in marketplaces and for considering the socioeconomic practices embedded in existing marketplaces in the programmes and designs aiming to improve marketplaces' physical infrastructure. As principles, these desired attributes complement the work of Dewar and Watson (1990), more focused on the spatial and physical typological aspects of marketplaces. For example, the desired attribute of stability can inform planners that marketplaces should not be moved without thorough consultation with traders, as advocated by Lyons and Snoxell (2005), and the desired attribute of proximity can inform planners and architects that new marketplaces should be placed within short walking

distance from potential customers and designed in such a way to avoid spatial marginalisation. Of particular relevance, per its emphasis in this thesis, is the desired attribute of security. New marketplace structures should be designed, built, equipped, and maintained to withstand the hazards to which it is exposed. The thesis has strongly demonstrated the impacts of failing to do so. It put traders who had placed their stands underneath fragile market halls in a worse position than their counterparts in open-air markets.

Still, marketplace infrastructure should not be built if it cannot be maintained and improved over time. Traders may not have the financial means and expertise to fund the maintenance of marketplace infrastructure, especially when infrastructure provision is advanced. The reconstruction of the Iron Market with outstanding infrastructural services for traders, the high subsidies from the company after its construction for its maintenance, and the departure of lower-income traders due to higher market fees demonstrate the difficulty in balancing traders' needs and the financial capacities of market users and stakeholders. This is, perhaps, a hard lesson for those who financed and praised the 12 million USD reconstruction of the Iron Market (see for instance Forbes 2011; Mone 2011; Vulliamy 2011), as the future of this marketplace remains uncertain following a devastating fire in 2018 and the restructuring of the telecommunication company that greatly subsidises its management and maintenance.

By its focus on understanding the infrastructural needs of traders and customers rather than the formalisation of informal trading practices, the thesis contributes to an alternative perspective to the control and management of trade in urban public spaces, summarised in Bromley (2000). Upgrading on-site infrastructure and moving away from spatial control is notably advocated by Dewar and Watson (1990). Although upgrading on-site infrastructure is a rare practice, the emergent practice of incremental upgrades is documented by Alfers L. et al. (2016) in the marketplaces of Durban, South Africa, and shows great potential. The thesis contributes to the rationale behind this approach by exploring the impacts of the absence of, deficiency in, and vulnerablity of infrastructure and calling for further practices and approaches that aim to improve existing marketplaces.

5.2.2 Building on marketplace infrastructure in humanitarian practice: towards better market support interventions in disaster contexts

The thesis can also offer lessons for humanitarian practitioners who desire to provide better market support interventions in disaster contexts. The thesis contributes to the 'growing consensus on the need to consider and support markets as part of humanitarian responses' (Juillard et al. 2017: i) and addresses the need for further 'research to document the influence of market support interventions' (idem: 45). While the thesis did not study

humanitarian interventions per se, its findings have implications for the ways market support interventions can likely be more effective. The success of these possible interventions deserves further documentation.

First, the findings offer an additional reason for cash-based humanitarian interventions (High Level Panel on Humanitarian Cash Transfers 2015), especially in the context of food insecurity. Solidarity and reciprocity between traders and their regular customers will likely be better supported by cash support than vouchers with limited options. Specifically, cash is more likely to support and safeguard existing mutual and beneficial relationships in the marketplace. Timely cash interventions for traders in disaster settings can not only help them return to trading more quickly but also avoid making trade-offs that are harmful to their households, such as no longer sending their children to school and reducing food consumption, due to the strong interrelation between traders' businesses and the capacity to meet household needs. Traders who have already re-established themselves in the marketplace can also benefit from cash support to overturn the 'invisible' trade-offs realised in the household.

Second, the thesis also contributes to identifying infrastructural elements that may influence food security. Several food security reports suggest that physical infrastructure probably has an influence and that physical interventions might be desirable, such as 'offering physical storage places or collective storage facilities to market actors' and 'rehabilitating a road to allow market actors access to the physical marketplace' (Juillard et al. 2017: 3). Findings in this thesis provide a more comprehensive list (see Paper D) and offer potential ideas for physical interventions for enhancing food security, especially those who reinforce the desired attributes discussed previously (see also Paper B). Again, such interventions should be realised with great parsimony to avoid undermining the relational attributes of marketplaces, as discussed in the previous sections.

Finally, market support interventions could be included in area-based approaches (Sanderson 2017), with the acknowledgement that customers and traders living or working in the targeted area (traders may or may not live in the area, as shown in the findings of Papers C and D) would benefit from interventions. Such an approach would likely be more effective at capturing and building on the desired functions and attributes of marketplaces and their social and physical dimensions than sector-based approaches, such as emergency market mapping and analysis (EMMA), which focus, essentially, on the economic dimension of supply chains (see for instance IRC and partners 2010). Including market support interventions in area-based approaches makes sense due to the interconnectedness and complexity of economic and socio-spatial relations among traders, customers, and their respective households and due to the links between household and marketplace conditions demonstrated in the thesis.

6 Conclusion

The objective of the thesis was to explore the ways marketplace infrastructure support (and should support) trade for traders and customers in disaster and post-disaster contexts. Such exploration was needed because marketplaces are overlooked by urban planners and humanitarian practitioners as infrastructure to finance, build, support, and rebuild in disaster and post-disaster contexts. Indeed, humanitarian stakeholders' attention is often centred on domestic spheres and residential neighbourhoods and tend to overlook areas where a large part of the low-income population works and accesses food and other basic commodities. Furthermore, most of the recent academic research on marketplaces in the cities of low- and middle-income countries relates the challenges and impacts of policies aiming to control or ban street trade on those who rely on trade for their livelihoods. Urban food security research and practice also tend to disregard the study of places where food is purchased.

In response, this thesis explored *marketplace resilience* in the reviewed literature (Paper A) and in metropolitan Port-au-Prince, Haiti (Papers B–D). The concept of *marketplace resilience* was developed as an analytical approach to explore the desired functions and attributes of marketplaces for traders and customers and the impact of deficient physical infrastructure (leading to the disaster), the marketplaces' desired functions and attributes for traders and customers, and the actions that traders, customers, and other stakeholders perform, omit, or are restricted from performing to build resilience. For this purpose, more than 42 papers were assessed in the literature review, and 125 traders and 105 customers were interviewed as part of a multiple-case study of four marketplaces in the Haitian metropolitan area: the Iron Market, *Lalue*, *Canapé-Vert*, and *La Coupe*.

One core statement resulting from the doctoral work thesis is that in disaster and post-disaster contexts, marketplaces should be considered one of the most important urban infrastructures for low-income urbanites in Port-au-Prince, Haiti, and in other cities in low- and middle-income countries. Building resilience in marketplaces calls for not only recognising and not hindering the vital functions and beneficial attributes for traders and customers that marketplaces already convey but also acknowledge deficiencies in the infrastructure and services provided. They are the established location for generating livelihoods for traders and accessing basic commodities for customers. For traders and

customers, marketplaces also have desired relational attributes of solidarity, reciprocity, proximity, stability, and security that are embedded in the marketplace's social and physical dimensions and that facilitate and sustain trade. Marketplaces are, therefore, much more than the location of retail trade; they are integral to the urban ways of living and working of many Haitian urbanites and urban citizens across the world.

These desired functions and attributes are critical and should be preserved in disaster and post-disaster contexts. However, as shown in the multiple-case study in Haiti, the vulnerability of the physical structures and the inadequacy of infrastructural provision have hindered traders' and customers' resilience following the 2010 earthquake, which refers to their capacity to maintain or rapidly return to trade, adapt to post-disaster changes, and transform their infrastructural conditions so that they are less vulnerable and more able to withstand future hazards. The thesis, therefore, calls for further research that considers marketplaces as belonging to the portfolio of urban infrastructures that should be supported and rebuilt in disaster and post-disaster contexts. Further research could potentially portray residents' and workers' infrastructural uses and needs in human settlements more comprehensively, in ways that inform better policy and approaches for urban planning and humanitarian practice.

Precisely, the thesis also calls for more research on the socio-spatial complexities and interrelations of urban infrastructures in low- and middle-income countries. The thesis uncovered the socio-spatial relations of food retail, the final link in the food supply chain, by exploring the relationships between traders, customers, and their respective households in disaster and post-disaster contexts. It contributed to identifying possible reasons why relations in marketplaces are more than mere economic transactions, as in formal shops and supermarkets. Further case study research would contribute to a better understanding of the socio-spatial complexities further up the food supply chain, as well as of other types of urban infrastructure that are less technical and more social (and informal) in their composition. This kind of research should transcend the traditional disciplinary boundaries of urban planning and food security and focus on residential settlements and households in low-income urban contexts. It should also better address the desired functions and attributes of food supply and other systems of provision on a regional scale.

The thesis also calls for acknowledging and responding to the needs of traders and customers in disaster and post-disaster contexts more effectively. Marketplaces have generally been off the radar of humanitarian practitioners and urban planners. This thesis shed some light on their realities and struggles in disaster and post-disaster contexts. It demonstrated the detrimental consequences for traders, customers, and their households of the collapse of marketplace structures and inadequate external support, in general, and the provision of marketplace infrastructure, in particular, following the 2010 earthquake in

Haiti. The solidarity witnessed in marketplaces among traders and between traders and customers is commendable but has limitations. The findings suggest it tends to be suspended during major disasters, such as the *12 Janvier*. Specifically, solidarity within marketplaces tends to be limited to typical economic activities and tends to be particularly ineffective in times of disaster. This is particularly evident in the case of traders who were located in market halls that collapsed following the earthquake. Similar logic also applies to the need for upgrading the infrastructural conditions within which traders practice, as traders and stakeholders in Haiti do not or are unable to bring substantial change in the marketplaces. Traders and customers in the marketplaces of Port-au-Prince and other cities in low- and middle-income countries deserve external support and to be listened to, so they can truly build resilience to future hazardous events.

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Appendices

Appendix 1

Essay

Smith D. 2016. Petty trade and the private sector in urban reconstruction: learning from Haiti's post-earthquake Iron Market. In: Sanderson D, Kayden J, Leis J, editors. Urban Disaster Resilience: New Dimensions from International Practice in the Built Environment. New York: Routledge, 157-181.

Appendix 2

Paper A

Smith D. 2020. Towards marketplace resilience: learning from trader, customer and household studies in African, Asian and Latin American cities. *International Journal of Sustainable Urban Development,* 12(1), pp. 14-33. DOI: https://doi.org/10.1080/19463138.2019.1666851

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Appendix 3

Paper B

Smith D. 2019. The relational attributes of marketplaces in post-earthquake Port-au-Prince, Haiti. *Environment and Urbanization*, 31(2), pp. 497–516. DOI: https://doi.org/10.1177/0956247819865701

The relational attributes of marketplaces in post-earthquake Port-au-Prince, Haiti

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ABSTRACT This paper explores the interplay between social and physical aspects of food retail in disaster and post-disaster contexts and discusses how it can inform better market support interventions and food retail modernization agendas. To this end, this paper draws on a case study analysis of three distinct marketplaces in metropolitan Port-au-Prince to explore aspects of food provision and access. The findings demonstrate the pertinence of beneficial reciprocal relationships among traders and between traders and customers, as well as the physical preconditions for the existence and maintenance of these relationships over time. The study also reviews the impacts of destroyed and changing physical infrastructure in disaster and post-disaster contexts on these social relationships. It concludes by calling for an acknowledgement of the interrelated attributes of solidarity, proximity and stability of existing marketplaces in urban planning and humanitarian practices in the efforts to improve urban food security and disaster recovery.

KEYWORDS customers / earthquake / food security / Haiti / hazards / infrastructure / marketplaces / traders / urban

I. INTRODUCTION

The collapse of and damage to Port-au-Prince's built environment triggered by the 2010 earthquake in Haiti caused extensive human and material losses,[1] as well as disrupted access to the urban services that city dwellers rely on for their daily needs and wellbeing. Food actors and infrastructure were not spared. To illustrate, an Emergency Market Mapping and Analysis (EMMA) of rice – a staple food in Haiti – estimated that 80 per cent of small wholesalers located downtown were inactive a few weeks after the earthquake, and many of those who survived lost their storage space.[2]

Several reports based on the evaluation of the humanitarian response in Haiti, as well as other subsequent urban disasters, argue in favour of building from and strengthening existing ways in which urban residents access commodities like food.[3] Despite the fact that retail is key in meeting urban dwellers' food needs,[4] Battersby argues that the very places where urban dwellers source food remain generally overlooked in food security studies because of a focus on individuals and households as units of analysis or as targeted beneficiaries.[5] This is also echoed in market support interventions, largely focused on the economic dimensions of

1. More than 300,000 buildings, mostly in the metropolitan region, were destroyed and 1.5 million people were displaced as a result of the earthquake on 12 January 2010. See IOM (2017), *Displacement Tracking Matrix Report - June 2017*, International Organization for Migration Haiti, page 4.

2. IRC and partners (2010), *The Market System for Rice in Haiti: Emergency Market*

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supply.[6] Juillard et al. labelled the issue an "institutional barrier", as there is – among relevant stakeholders – *"poor recognition of the role market actors play in meeting the needs of affected populations and in supporting economic recovery following a disaster, and the support needs of market actors (especially smaller businesses) who are also disaster affected"*.[7] For example, the 2010 EMMA report on Haiti is silent on the needs of food retailers after the earthquake,[8] and an urban food security report in 2016 excluded food retail from the assessment as well as the types of infrastructure that required improvement.[9]

The fact that urban and humanitarian planning practitioners tend to not understand or to disregard the need to support existing food retail infrastructure may be related to the lack of evidence on how this infrastructure functions and is affected by crises. This article emphasizes that, for most low-income city dwellers, access to and provision of food are relational in nature. They are influenced not only by the physical location in which trading activities occur (the physical infrastructure), but also by the interpersonal relationships among traders and between traders and customers (the social infrastructure). The fact that physical access is an important determinant of urban food security has been highlighted in food desert research[10] and recent studies of African urban food security.[11] Building on similar claims, several low- and middle-income countries have supported food retail modernization policies aimed at, according to Berger and van Helvoirt, the *"transformation of traditional and largely informal retailers to modern food systems. . . with supermarkets as one of its most prominent features"*.[12] Nevertheless, several studies demonstrate the limitations of supermarket-focused strategies because they disregard or undermine the social attributes of informal markets that are already present in these neighbourhoods.[13] In fact, Battersby, Crush and Frayne show that informal marketplaces continue to form a major food supply source in South African cities, despite the presence of supermarkets.[14] Advantages are found in the possibilities of negotiating small quantities and buying on credit.[15] For most low-income city dwellers, food retail has an inherent social dimension and is indeed similar to Simone's concept of "people as infrastructure",[16] a notion of an urban service that is directly linked to what people can produce with very few resources.[17] Food provision and access, as social infrastructure, are generally at odds with official regulations and are highly provisional because of the extensive labour required, the rich social networks involved, and the numerous challenges faced by providers and users to access and maintain urban services.[18] In the process, as Simone argues, service providers appropriate and transform urban spaces into essential "functional destinations".[19] The streets, squares, halls and other open spaces become places that are the preferred source of food. These are referred to as marketplaces in this paper.

In contrast to supermarket-focused strategies and to frequent but harmful regulatory and repressive policies on petty trade,[20] Berger and van Helvoirt argue that modernization of food retail in the cities of low- and middle-income countries must aim for supporting traditional ways of providing and accessing food.[21] Nevertheless, the rare projects that aim to build or improve infrastructure dedicated to petty commerce often fail because they do not seem to meet the conditions needed for trade.[22] In Haiti, research has demonstrated how the reconstruction of

Mapping & Analysis (EMMA) Report, International Rescue Committee, American Red Cross, Haitian Red Cross, International Federation of the Red Cross, Save the Children, Mercy Corps, Oxfam GB, ACDI/VOCA, World Food Programme and FEWS/NET, Port-au-Prince.

3. See for instance Clermont, C, D Sanderson, A Sharma and H Spraos (2011), *Urban Disasters–Lessons from Haiti: Study of Member Agencies' Responses to the Earthquake in Port au Prince, Haiti, January 2010*, Disasters Emergency Committee; also High Level Panel on Humanitarian Cash Transfers (2015), *Doing Cash Differently: How Cash Transfers Can Transform Humanitarian Aid*, Overseas Development Institute, London; and GAUC (2019), *Urban Profiling for Better Responses to Humanitarian Crises*, Global Alliance for Urban Crises.

4. Berger, M and B van Helvoirt (2018), "Ensuring food secure cities – retail modernization and policy implications in Nairobi, Kenya", *Food Policy* Vol 79, Iss C, pages 12–22; also Battersby, J and V Watson (2018), "Improving food security in African cities: critically assessing the role of informal retailers", in Y Cabannes and C Marocchino (editors), *Integrating Food in Urban Planning*, UCL Press and Food and Agriculture Organization, London and Rome, pages 186–208.

5. Battersby, J (2019), "The food desert as a concept and policy tool in African cities: an opportunity and a risk", *Sustainability* Vol 11, No 2, pages 1–15.

6. Juillard, H, L Mohiddin, M Péchayre, G Smith and R Lewin (2017), *The Influence of Market Support Interventions on Household Food Security: An evidence synthesis*, Oxfam GB, Oxford.

7. See reference 6, page 35.

8. See reference 2.

9. WFP (2016), *Haiti Urban Food Security Assessment: November 2016*, World Food Programme, Coordination National de la Sécurité Alimentaire d'Haiti.

the Iron Market, or Marché en fer, despite a positive impact on wellbeing and working conditions, did not successfully support the livelihoods of food traders.[23] The situation was similar at Fond-Parisien, where a public market constructed in 2014 has been deserted by customers.[24]

In response to the lack of understanding regarding how the social infrastructure and the physical infrastructure of food retail co-function and are affected by disasters, as well as to inform better market support and market modernization practices, this paper explores the relational dimensions of food retail in marketplaces of post-earthquake Port-au-Prince, Haiti. The paper focuses on the attributes of interpersonal relationships among traders and between traders and customers (the social infrastructure), as well as the relations to the marketplace in which trading activities occur (the physical infrastructure), to explore how hazardous events and conditions can impact such attributes.

II. METHODS

The paper is primarily a comparative study based on the analysis of structured interviews with 104 traders and 105 customers conducted in July and August 2017 in the marketplaces of Lalue and Canapé-Vert in Port-au-Prince, and La Coupe in the adjacent municipality of Pétion-Ville, Haiti. These particular marketplaces – described in the following section – are primarily focused on the sale of basic commodities to customers living in nearby low-income residential settlements (Maps 1 to 4 and Photos 1 to 3). These marketplaces were selected because they have very different physical settings (Table 1) and have been affected differently by hazardous events and conditions.

Traders were sampled in order to cover all areas and infrastructural conditions within each marketplace. Numbers of respondents were roughly proportional to the trader population of each market (Table 1). The interviewed traders sell food (66 of 104), cooking-related goods such as charcoal (9), and other commodities such as hygiene products (29). Thirty-five customers were also interviewed in each market in the dedicated food zones. In line with other studies on Haitian petty trade,[25] most interviewed traders (79 of 104) and customers (78 of 105) in these marketplaces are women, and a majority of traders (81 of 104) are the sole or main breadwinner of their households, with marginal differences across marketplaces.

Questionnaires were designed based on a literature review and preliminary fieldwork conducted in 2016. On average, the length of these interviews was 60 minutes for traders and 30 minutes for customers; the interviews were conducted in Creole by four students attending the Université d'État. Thereafter, the responses transcribed in French were analysed using qualitative data analysis software to perform content analyses and quantitative data analysis software to perform frequency analyses. Findings were triangulated with those from semi-structured interviews with traders located in several marketplaces of the metropolitan area (n=25), local and national governmental stakeholders (n=22), and Haitian academics (n=3). On-site observation, the literature on Haitian trade, newspaper articles, maps and aerial images were also used for triangulation.

10. The term "food desert" can refer to the lack of food stores in a given urban area. [Hendrickson, D, C Smith and N Eikenberry (2006), "Fruit and vegetable access in four low-income food deserts communities in Minnesota", *Agriculture and Human Values* Vol 23, No 3, pages 371–383.] It can also refer to an urban area *"where residents cannot buy affordable, healthy food"*. [Cummins, S and S Macintyre (2002), ""Food deserts"—evidence and assumption in health policy making", *BMF* Vol 325, No 7361, page 436.]

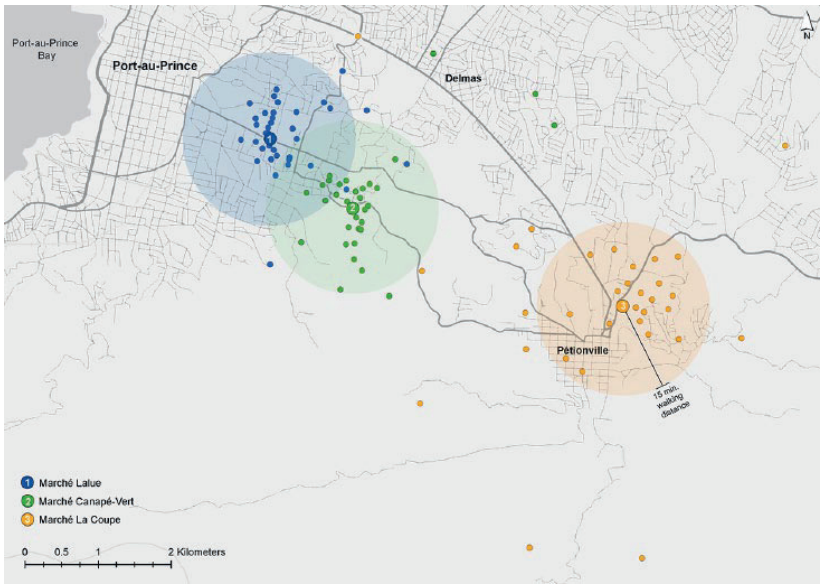
11. Rudolph, M, F Kroll, S Ruysenaar and T Dlamini (2012), *The State of Food Insecurity in Johannesburg*, Queen's University and African Food Security Urban Network, Kingston and Cape Town; also Battersby, J (2011a), *The State of Urban Food Insecurity in Cape Town*, Queen's University and African Food Security Urban Network, Kingston and Cape Town; and Tolossa, D (2010), "Some realities of the urban poor and their food security situations: a case study of Berta Gibi and Gemechu Safar in the city of Addis Ababa, Ethiopia", *Environment and Urbanization* Vol 22, No 1, pages 179–198.

12. See reference 4, Berger and van Helvoirt (2018), page 14.

13. See reference 5.

14. See reference 11, Battersby (2011a); also Crush, J and B Frayne (2018), "The 'supermarketization' of food supply and retail", in B Frayne, J Crush and C McCordic (editors), *Food and Nutrition Security in Southern African Cities*, Oxon and New York, Routledge, pages 168–197.

15. See for instance Tawodzera, G, L Zanamwe and J Crush (2012), *The State of Food Insecurity in Harare, Zimbabwe*, Queen's University and African Food Security Urban Network, Kingston and Cape Town; also Battersby, J (2011b), "Urban food insecurity in Cape town, South Africa: an alternative approach to food access", *Development Southern Africa* Vol 28, No 4, pages 545–561.



MAP 1
Residential locations of interviewed customers in relation to the marketplace

NOTES: Places of residence are approximate, and are based on names of streets or places given by interviewees. Walking distance is theoretical: 15-minute walking distance = 1,200 metres.

SOURCE: Map by the author.

III. SELECTED FOOD MARKETPLACES IN METROPOLITAN PORT-AU-PRINCE

While there are a dozen market halls in Port-au-Prince under the administration of the municipality, an estimated 100 informal marketplaces occupy the public spaces and interstices of the capital city,[26] where there is a considerable lack of formal space dedicated to petty commerce.[27] Places in market halls managed by the municipality are generally permanent; traders can buy a trading spot when a new marketplace is built, and the place is retained for the trader for life and passed through generations. In street markets, as well as in open-air markets such as Lalue and part of La Coupe, there is strict social control with regard to who can join the kin group of vendors and thereby access the vending space. It is next to impossible to begin vending in spaces that are already occupied, unless one is introduced by a family member.[28]

Like most marketplaces of basic commodities in Haiti, the three marketplaces of Lalue, Canapé-Vert and La Coupe are predominantly operated by women traders who generate income for their households.[29] To operate in formal or informal marketplaces, traders generally pay a range of fees or payoffs to municipal officers, service providers and others who claim authority over the public space. Market managers appointed by the municipality are generally limited to collecting municipal fees,

16. Simone, A (2004), "People as infrastructure: intersecting fragments in Johannesburg", *Public Culture* Vol 16, No 3, pages 407–429, page 411.

17. Amin, A (2014), "Lively infrastructure", *Theory, Culture & Society* Vol 31, Nos 7–8, pages 137–161; also Silver, J (2014), "Incremental infrastructures: material improvisation and social collaboration across post-colonial Accra", *Urban Geography* Vol 35, No 6, pages 788–804.

18. Larkin, B (2013), "The politics and poetics of infrastructure", *Annual Review of Anthropology* Vol 42, pages 327–343.

19. See reference 16, page 408.

20. For an overview, see Roever, S and C Skinner (2016), "Street vendors and cities", *Environment and Urbanization* Vol 28, No 2, pages 359–374.

TABLE 1
Overview of marketplace characteristics

	Marché Lalue (open-air)	Marché Canapé-Vert (covered)	Marché La Coupe (covered)	Marché La Coupe (open-air)
Trader population (approx.)	110	140	280	1,080
Number of interviewed traders	17	23	15	49
Area (approx. square metres)	1,920	2,130	2,940	8,060
Infrastructure	Wooden tables, tarps	Market hall, integrated concrete stalls	Market hall, wooden stalls	Wooden stalls, parasols, tarps, metal sheets

ensuring minimal security and collecting waste. At the time of fieldwork, the municipality of Port-au-Prince tended to adopt laissez-faire approaches to street markets, while the municipality of Pétion-Ville adopted a more repressive stand on street traders.[30] Moreover, as they are off-street, the selected marketplaces are not subject to evictions and harassment from official authorities.

The three marketplaces studied here offer retail merchandise present in every typical urban market in Haiti, such as local agricultural products, international foodstuffs, meat, seafood, charcoal, and other basic household necessities.[31] These three marketplaces are essentially dedicated to local consumption; 85 per cent of the interviewed customers were engaged in making purchases for their own households, which were located in the vicinity (Map 1).[32] The three marketplaces, like any typical market in Haiti, are also organized in zones of similar commodities.[33]

The marketplaces present substantial differences in the type and quality of physical infrastructure (see Table 1). Lalue Market (also called Ravine Pintade, Photo 1 and Map 2) occupies an abandoned plot in a mixed-use neighbourhood near the city centre. The neighbourhood is considered to have slightly above average relative wealth, and housing conditions and access to basic services are considered better than average.[34] However, the marketplace is in close proximity (approximately 200 metres) to an informal residential settlement built along the Ravine Pintade. This settlement was severely damaged by the 2010 earthquake.[35] Further, this market is not managed by the municipality; traders explained that they were unsure of the landowner's identity and claim to the land.

Canapé-Vert Market is a split-level covered market built in 2004, located in a mixed-use neighbourhood and in proximity to several informal settlements located on mountain slopes (Photo 2 and Map 3). The neighbourhood is considered to have low relative wealth. Although the houses may be in better condition than those in other informal settlements, they are not necessarily of good quality, and only a few houses have access to basic services.[36] Significant sections of this neighbourhood also suffered heavy damage and destruction due to the 2010 earthquake.[37] The eastern part of the market hosts food vendors. In the western part, the upper floor hosts cosmetics and clothing vendors, and the lower floor hosts mostly charcoal and food vendors as well as

21. See reference 4, Berger and van Helvoirt (2018).

22. Brown, A (2006), "Street trading in four cities: a comparison", in A Brown (editor), *Contested Space: Street Trading, Public Space, and Livelihoods in Developing Cities*, Intermediate Technology, Rugby, pages 175–196.

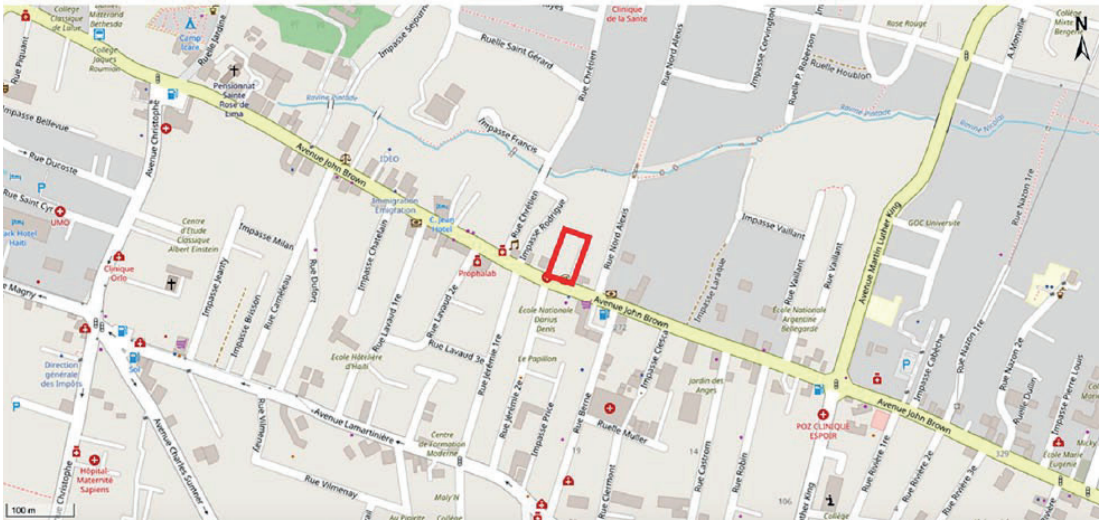
23. Smith, D (2016), "Petty trade and the private sector in urban reconstruction: learning from Haiti's post-earthquake Iron Market", in D Sanderson, J Kayden and J Leis (editors), *Urban Disaster Resilience: New Dimensions from International Practice in the Built Environment*, Routledge, New York, pages 157–171.

24. Based on a visit in 2017 and on Lambert, R (2019), "L'avenir de Gros marche mirak est menacé sans investissement", *Le Nouvelliste*, 13 May, accessed 17 May 2019 at https://lenouvelliste.com/article/201716/lavenir-de-gros-mache-mirak-est-menace-sans-investissement.

25. Neiburg, F, J L Sergo, J Fontaine, P Braum, R Montinard and B Coutinho (2012), *Les Marchés du Centre de Port-au-Prince*, NuCEC; also Thérasmé, K (2011), "Dynamiques sociales et appropriation informelle des espaces publics dans les villes du Sud : le cas du centre-ville de Port-au-Prince", PhD thesis, Université du Québec à Montréal, Montréal; Goulet, J (2006), "L'organisation des services urbains : réseaux et stratégies dans les bidonvilles

PHOTO 1
The informal marketplace of Lalue

© David Smith (2017).



MAP 2
The informal marketplace of Lalue

© OpenStreetMap contributors, adapted by the author.

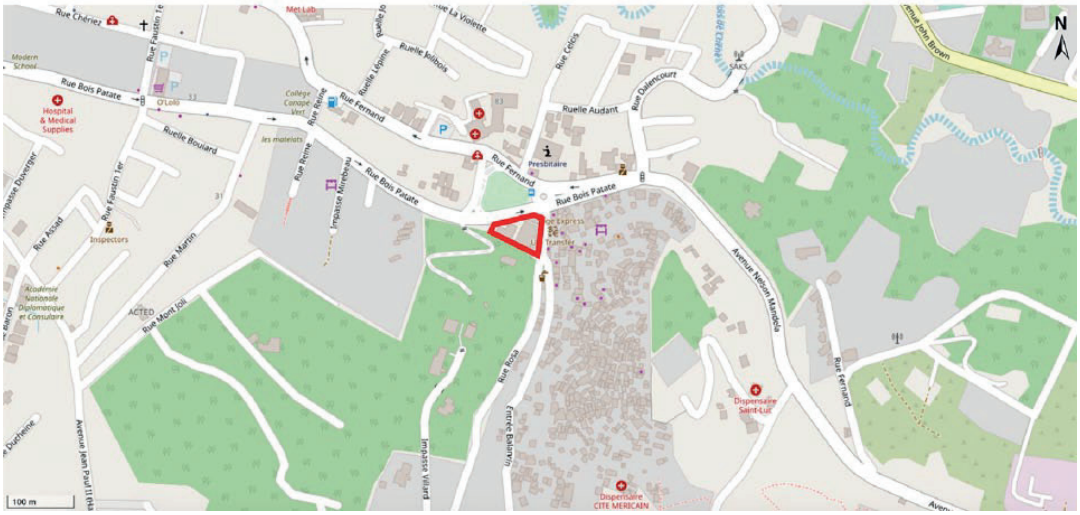
water and sanitation facilities. The marketplace is managed by the municipality of Port-au-Prince.

La Coupe Market, built on the slope of a ravine, was inaugurated in 2008 with the aim of relocating traders from the business centre of Pétion-Ville to its vicinity, a mixed-use neighbourhood close to informal residential settlements (Photo 3 and Map 4). The area is considered

de Port-au-Prince”, PhD thesis, Université du Québec à Montréal, Montréal; and Bazabas, D (1997), *Du Marché de Rue en Haïti: Le Système Urbain de Port-au-Prince à Ses Entreprises "D'Espace-Rue"*, Editions L'Harmattan, Paris.

PHOTO 2
The covered marketplace of Canapé-Vert

© David Smith (2017).



MAP 3
The covered marketplace of Canapé-Vert

© OpenStreetMap contributors, adapted by the author.

26. See reference 25, Neiburg et al. (2012).

27. See reference 25, Thérasmé (2011).

28. See reference 25, Thérasmé (2011).

29. See reference 25, Neiburg et al. (2012) and Thérasmé

to have low relative wealth.[38] The three-storey covered market was severely damaged by the 2010 earthquake and was rebuilt as a two-storey building by the municipality with the financial support of the US Agency for International Development. Many buildings also collapsed in the surrounding neighbourhoods, but were damaged to a lesser extent than those in the vicinity of other markets.[39] The halls house traders, of food, kitchen utensils and clothing, as well as butchers and poultry traders on

PHOTO 3
The marketplace of La Coupe

© David Smith (2017).

MAP 4
The marketplace of La Coupe

© OpenStreetMap contributors, adapted by the author.

the lower level. However, a majority of traders are located outside the covered market in a larger area of various terraces and alleys that link the market to the road above the slope. Most sell food items, but some sell charcoal, secondhand clothing and accessories. La Coupe is denser than the other selected markets and overflows onto the surrounding streets. While many stalls within market halls remain empty or are only used for

(2011); also Lamaute-Brisson, N (2002), *L'Economie Informelle en Haiti: De la Reproduction Urbaine à Port-au-Prince*, Editions L'Harmattan; and Blanc, B (1997), "Women vendors' work histories in

Port-au-Prince: What lessons can be learned for research and action?", *Environment and Urbanization* Vol 10, No 1, pages 187–199.

30. Pétion-Ville and its previous mayor were popular for the saying *"La rue aux voitures, les trottoirs aux piétons et les marchés aux marchands"* ("The streets to cars, the sidewalks to pedestrians and the marketplaces to traders").

31. See reference 25, Bazabas (1997), page 46.

32. Living in the vicinity is considered living within a 15-minute walking distance.

33. See reference 25, Bazabas (1997).

34. See reference 9, page 11 for methodology and page 17 for the map.

35. UNOSAT (2010a), *Intensity of Building Damage Across Port-au-Prince & Carrefour, Haiti: Damage Analysis of Individual Buildings Based on Post-Earthquake Areal Photos and Pre-Earthquake Satellite Imagery*, UN Institute for Training and Research.

36. See reference 9, page 17.

37. See reference 35.

38. See reference 9, page 17.

39. UNOSAT (2010b), *Atlas of Building Damage Assessment: Haiti Earthquake 12 January 2010*, Version 1.1 as of 23 February 2010, UN Institute for Training and Research, European Commission, Joint Research Centre, and World Bank.

40. Legerman, C J (1962), "Kin groups in a Haitian market", *Man* Vol 62, No 233, pages 145–149.

41. See reference 25, Bazabas (1997).

42. See reference 25, Thérasmé (2011).

43. See reference 25, Bazabas (1997), page 86, translated from French.

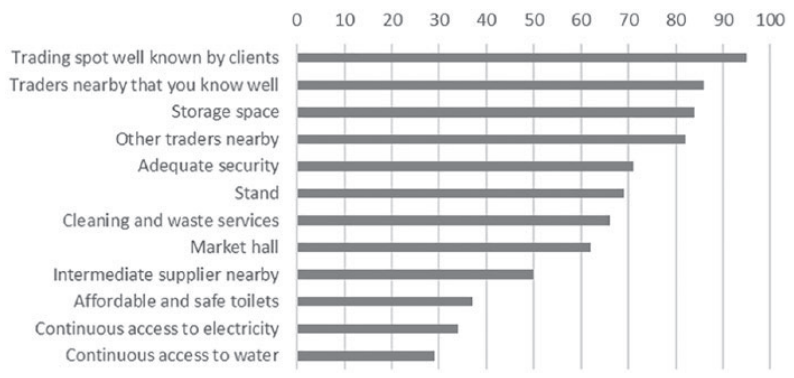


FIGURE 1
The infrastructural elements that traders viewed as significant or very significant for them and their businesses (% of traders reporting these)

NOTE: N = 104 traders.

storage, the alleys and terraces are fully utilized by traders. This issue is explored later, in the discussion of post-disaster market conditions. The entire area is under the responsibility of the municipality of Pétion-Ville, including the alleys where trade is allowed in practice.

IV. THE RELATIONAL ATTRIBUTES OF MARKETPLACES

a. Relations among traders in the marketplace

Despite being physically different, the three marketplaces have similar attributes in the relationships within trader communities as well as those between traders and customers. Solidarity tends to supplant competition among the community of petty traders in Haiti, a fact that was reported by Legerman in 1962,[40] Bazabas in 1997,[41] and Thérasmé in 2011.[42] These social relationships were often built on years of working in close proximity. Almost all the interviewed traders considered it significant or very significant to have traders they know well close to their trading spot (Figure 1). As Bazabas explains, *"the entrepreneur who creates and develops a petty street enterprise only looks to garner and maintain a relatively fixed market share without positioning himself as a competitor of his neighbours, who develop the same activity"*.[43] When asked to describe their relationships with their colleagues, most of the interviewed traders had a positive opinion (91 of 104). Many of them characterized the relationships as being good or enjoyable (56 of 104), and others described themselves as being a community or like a family (37 of 104):

> "We all are traders. We are all in the same boat. So, we live as a family." (Trader 59, Lalue)

As frequently observed in other Haitian marketplace studies, traders also mentioned that they would not hesitate to open a colleague's stall and serve his or her regular clients in the absence of the trader (42 of 104). The reasons for absence could include retrieving stock from a distant supplier, sickness, or taking care of family duties:

> "One of my friends was sick for a while. It was me who was selling for her and buying merchandise for her." (Trader 92, La Coupe [hall])

Other traders said that they help, support and look after each other (20 of 104). Other services involving daily operations, such as lending change, buying and transporting merchandise for others, and sending clients to other traders, were also repeatedly observed.

As in the streets,[44] many vendors occupying a trading spot in an open space – like in Lalue and in the alleys of La Coupe – said that they had secured their spot through a family member. As Thérasmé explains, this helps sustain solidarity in the marketplace: *"The interest that the liberated space is occupied by a relative relates to the reproduction of the social structure of the marketplace as an area of knowledge, reciprocity and proximity"*.[45] While traders generally pay to acquire a trading spot within market halls – for example, in Canapé-Vert or part of La Coupe – findings reveal that territories are socially maintained regardless of the market typology. One market manager, who wished to move traders within a market hall, explains:

> "[They will say] 'us, we form a small group here, I have my colleague here, I can't move without my neighbour.' We need to move them in groups . . . The previous manager wanted to use force, but also failed."

Traders also continue trading in the same location because of their reliance on regular customers to stabilize trade. Favours are offered by traders in exchange for frequent patronage and loyalty from customers, thereby becoming a reliable source of income. For this to happen, their trading location must be easily accessible and well known to customers. The importance of the trading location also became evident when the interviewed traders were asked why they cannot relocate:

> "I don't want to move, but if someone would make me, I would lose my clientele because all my *kliyans* know where to find me." (Trader 134, La Coupe [alley])

A well-known trading spot was identified by traders as the most important feature of the marketplace. Along with the proximity to well-known colleagues, this socio-spatial relationship was perceived as more important than other physical elements of infrastructure (Figure 1).

b. Customers' relations within and to the marketplace

The reciprocal relationships between traders and their regular customers and between customers and their regular traders, called *pratik*[46] in Haiti, were reported by Mintz in 1960.[47] As shown in this study, this subtle social custom is still common practice in Haitian marketplaces, although now often referred to as a *kliyan*.[48] In the present study, most traders

44. See reference 25, Thérasmé (2011).

45. See reference 25, Thérasmé (2011), page 291, translated from French.

46. According to the Haiti-Référence dictionary (https://www.haiti-reference.com/pages/creole/diction/index.php), the word *pratik* in Haitian

(91 of 104)[49] reported having at least one *pratik* or *kliyan*. The majority of traders who were able to count them[50] have more than five regular customers (31 of 57). Moreover, most of the customers (89 of 105) said that they have at least one regular trader and a majority of them have up to five regular traders. In all the marketplaces, most customers referred to their *pratik* or *kliyan* in positive terms: as being of great importance (38 of 105), having good relations with them (27 of 105), or being convenient and useful to them (25 of 105).

> "They are extremely important to me. They trust me. They are accustomed to sell to me." (Customer 38, Lalue)

Further, most customers visit marketplaces on a daily basis to buy the food they need (74 of 105), benefitting from the option of buying in small quantities. Customers benefit from additional advantages in trading regularly with the same traders – advantages that are not available in supermarkets. The most mentioned benefit (29 of 105) is the ability to get more food for the same price:

> "When I buy from the hands of these traders, they always give surpluses. They sell well and they are kind." (Customer 42, Lalue)

It has also been regularly observed that traders add an extra handful of beans or measure rice generously at no additional charge. Another advantage of customers having a regular trader is being able to buy on credit (23 of 105). With credit, a customer who is not able to buy food on a particular day would still be able to get food and pay for it the next day:

> "They are used to sell to me to pay after. If they were not there, I wouldn't be able to buy at the market." (Customer 38 at Lalue)

These benefits have been confirmed in interviews with traders, as most feel obliged to provide these favours to retain their regular clientele.

For almost all interviewed customers, physical proximity to the marketplace, mainly in relation to the customer's place of residence, is the most frequently mentioned reason for selecting a marketplace (98 of 105). Almost all customers at Lalue and Canapé-Vert were living within a 15-minute walking distance (approximately 1,200 metres, see Map 1). In the case of La Coupe, a larger marketplace, half of the interviewed customers walk to the marketplace, and it takes most of them over 15 minutes to travel there. Numerous customers stated that living close to the market allows them to spend less time and money on transportation. Other marketplaces may offer better prices but are located further away, thereby increasing costs:

> "I am used to go to Marché Salomon and to Marché en fer. There, traders sell at low prices. . . . [But] this market is close by. I don't need to pay a taxi to go buy. It is close to me." (Customer 83, Lalue)

Many customers (38 of 105) also mentioned that the market was the place of their *pratik* or *kliyan* and, therefore, where they had advantages and were able to save money:

Creole translates into practice, routine, praxis, experience, regular customer or regular patron. It can be used to describe both a person and an activity.

47. Mintz, S W (1960), *A Tentative Typology of Eight Haitian Marketplaces*, Centro de Investigaciones Sociales, Facultad de Ciencias Sociales de la Universidad de Puerto Rico.

48. According to the Haiti-Référence dictionary (https://www.haiti-reference.com/pages/creole/diction/index.php), the word *kliyan* in Haitian Creole means "customer" or "client". However, in the same dictionary, *kliyan* is used as a synonym of *pratik*. In the conversations with traders in 2016 and 2017, *kliyan* and *pratik* were used interchangeably to describe their regular customers. During the same fieldwork, customers also described their regular traders as *kliyan* or as *pratik*.

49. This number includes traders who have "too many" *pratik/kliyan* to be able to count them.

50. See reference 49.

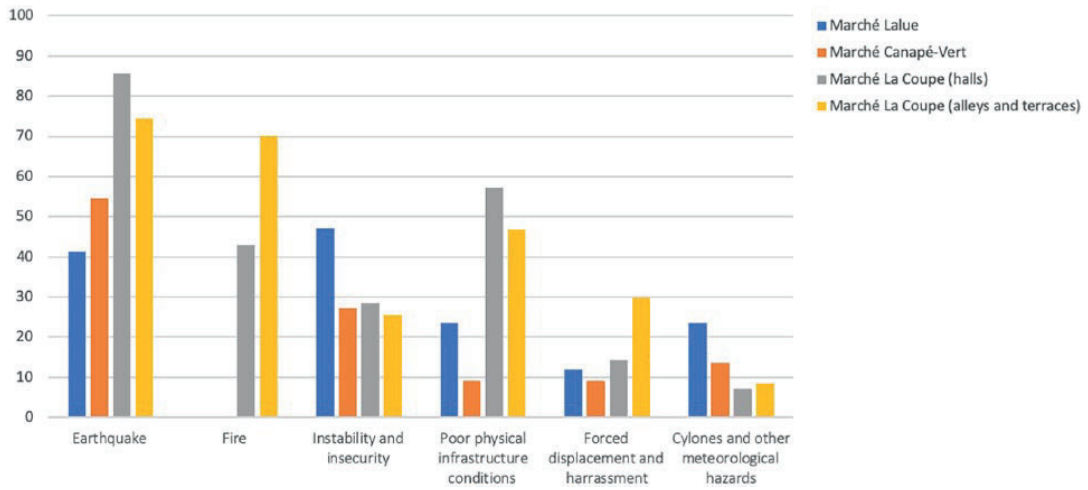


FIGURE 2
The main hazardous events and conditions mentioned by interviewed traders as affecting them (% of traders reporting these)

NOTE: N = 104 traders.

> "I live not too far so I come here because it is close by . . . I developed a certain practice of coming here, so it means I became good friends with the traders." (Customer 38, Lalue)

V. THE RELATIONAL ATTRIBUTES OF MARKETPLACES IN DISASTER AND POST-DISASTER CONTEXTS

a. Variations in infrastructural vulnerability and impact on traders' clientele

Traders have experienced hazardous events and conditions differently depending on the marketplace in which they are located (Figure 2). Hazards may originate from within the marketplace – such as fires, poor physical conditions and poor market management – or may come from outside the marketplace and impact a larger area, such as earthquakes and tropical storms. Many of the events and conditions experienced in the marketplace relate to hazardous conditions generated by infrastructure inadequacy, such as lack of sanitation, drainage and fire safety, as well as to the vulnerability of its physical infrastructure to external hazards.

In particular, the earthquake caused extensive damage to the market halls of La Coupe, while the covered market of Canapé-Vert and the open-air market of Lalue evaded serious damage. Despite the differences, traders in all three marketplaces said that they were affected by the earthquake. They mentioned that many clients died and that their remaining clients as well as they themselves became poorer, as financial constraints were

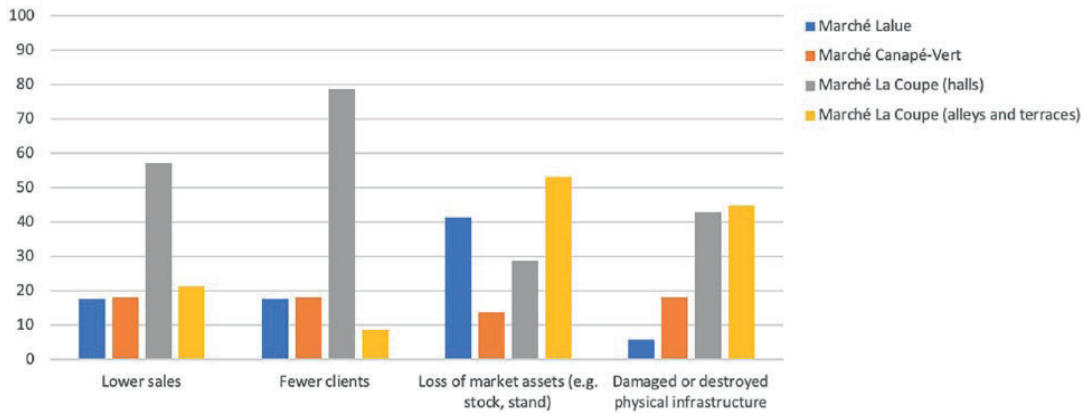


FIGURE 3
The main impacts of hazardous events and conditions mentioned by interviewed traders as affecting them (% of traders reporting these)

NOTE: N = 104 traders.

imposed on both traders and customers and the total amount of trade possible was reduced:

> "[Since the earthquake], we don't sell as much as we are used to. Trade decreased by a lot." (Trader 56, Lalue)

Losing clients has a detrimental impact on traders' livelihoods. Many vendors mentioned they had to reduce food expenditure and stop sending children to school in order to cope with the drop in income.

The earthquake and its aftermath also impacted the sustainability of the *pratik* and *kliyan* relationships, which varied across marketplaces. Of particular interest is that there was no significant difference between the informal marketplace of Lalue and the covered market of Canapé-Vert in terms of reported impact on their number of clients (Figure 3), despite worse working conditions, greater vulnerability to meteorological hazards, and higher exposure to unrest in Lalue. However, the situation appears to be significantly different in La Coupe, where the infrastructure's vulnerability and inadequacy has impacted the traders' clientele. Numerous traders said they lost regular clients there (41 of 64):

> "After the earthquake, many people left the marketplace and a lot of people did not want to come back because of the fact that the marketplace was destroyed." (Trader 70, La Coupe)

This outcome was nuanced and can be explained further by the longer recovery time for traders and the effect of the changes in its physical configuration and governance after the earthquake, which are explored in the following subsections.

While traders mentioned numerous hazardous events and conditions that they experienced in the marketplace, over half the customers (59 of 104) reported that there were no hazards in the marketplace that directly affected them. When questioned specifically about the impact of the earthquake, most customers who were living nearby at the time confirmed that they did not lose their regular traders in the aftermath of the earthquake. Contrary to expectations, for customers there were no significant differences between the Canapé-Vert and La Coupe markets, two marketplaces where traders experienced hazards very differently. Eight customers, of whom six were interviewed in Lalue, said they lost a few traders, mostly due to the collapse of traders' homes.

Further, the customers who mentioned being affected by events and conditions in the marketplace mostly expressed their compassion and sadness regarding the traders' losses. One customer explained how it has directly impacted his *pratik*:

> "There are *kliyan* who did not come back after a while, that I was used to buy from their hands. [They] lost family or their house. So, the new *kliyan* that I [had developed] did not sell me well, and later, they did not want to sell on credit." (Customer 33, Lalue)

The apparent discrepancy between the vulnerability of traders' relationships with their regular customers, and the robustness of customers' relationships with their regular traders, raises questions about the disparities of perspectives between the two groups. This difference can be explained in part by the limitations of the study, as interviews were conducted with traders and customers who were *still* present in the marketplace. For example, customers who used to come to the marketplaces studied here, but who now shop at a different location, were not interviewed. Moreover, internal migration was significant following the 2010 earthquake in Haiti.[51] The potential impact of this mobility on *pratik* or *kliyan* relationships was noted by several customers, for example:

> "If I quit the area to live somewhere else, I will not be able to come here." (Customer 47, Canapé-Vert)

While customers might have changed their sources of food because of intra-city migration, this probably did not affect the work locations of traders, as most do not live in the same neighbourhood as the marketplace (86 of 104).[52] A few traders (13 of 104) also mentioned that they moved to a different neighbourhood following the earthquake but continued trading in the same marketplace. In other words, for traders, proximity to the workplace does not appear to be as crucial as proximity to the source of food for customers.

b. Variations in disaster recovery and limits to trader communities' agency

Over 80 per cent of the traders in the selected marketplaces returned to their previous location after the earthquake, with little variation between marketplaces. However, the time traders took to return to trading at their marketplace varied, and this was related to the type and

51. Sherwood, A, M Bradley, L Rossi, R Gitau and B Mellicker (2014), *Supporting Durable Solutions to Urban, Post-Disaster Displacement: Challenges and Opportunities in Haiti*, Brookings Institution and International Organization for Migration; also Lu, X, L Bengtsson and P Holme (2012), "Predictability of population displacement after the 2010 Haiti earthquake", *Proceedings of the National Academy of Sciences* Vol 109, No 29, pages 11576–11581.

52. Determined by the number of traders taking more than 15 minutes to commute to the marketplace.

the robustness of the marketplaces' physical infrastructure. Most traders at the open-air market Lalue returned within one month, as the impact of the earthquake and the subsequent aftershocks on the infrastructure were minimal, allowing the locations of traders' businesses to remain intact. At Canapé-Vert, a covered market that withstood the shock, most traders returned within three months. Traders did not return as fast as at Lalue due to the fear that the structure might not resist aftershocks. Most traders at La Coupe returned after more than six months due to structural damage and the extended time and space needed for reconstruction. The proportion of traders who took more than 12 months to return to this market was much higher than that in other markets, with 13 traders of the 64 interviewed only coming back after one year, while only one trader (out of 17) took this long to return to Lalue, and none (of 23) to Canapé-Vert.

Most traders lost the majority of their *pratik or kliyan*, and this was true for all markets. However, the data suggest that the more time traders took to return to the marketplace after a shock, the more likely it was that they would lose even more regular customers. At Lalue and at Canapé-Vert, most of the traders who had lost only a minority of their customers were those who returned within three months (11 out of 17). Conversely, most of the traders who lost all or almost all of their regular customers, mainly at La Coupe, took at least six months to return (8 out of 11), and the trading spots that six of them had formerly used were located under the collapsed market halls. Therefore, these data suggest that the capacity to return to the original trading spot after a disaster, and the rapidity with which this happens, is likely to support the maintenance of *pratik* or *kliyan* relationships in post-disaster settings.

With regard to the relationships in the trader communities, friendships were reestablished after the disaster for most of the traders (69 of 104 traders). They explained that they regained kin-like friendships only when they returned among their neighbouring colleagues.

> "We were split for some time because we all had different issues to deal with, and after we found ourselves again." (Trader 34, La Coupe [alley])

While many traders reported "staying in contact" and that they "were happy" to see their colleagues after weeks or months of absence, most traders mentioned that marketplace friends did not help them return to their trade in substantial terms. The responses were similar across marketplaces:

> "It [the earthquake] has not affected our relationships . . . but we were in a situation where none of us could help each other, especially after the earthquake." (Trader 57, Lalue, who returned after two months)

This indicates that, while traders' relationships with their colleagues are useful at an operational level and to sporadically support individuals in need, community agency was limited in the recovery period due to the extent of the disaster's impact on the trading community.

c. Variations in post-disaster conditions: the impact of changes in infrastructure typology and governance

Another factor that can explain the difficulties in maintaining *pratik* and *kliyan* relationships in a post-disaster context relates to the changes in the physical and spatial conditions that traders returned to in their marketplaces. The context of the Canapé-Vert and Lalue marketplaces did not change significantly. In both sites, the characteristics of the infrastructure, its spatial organization, provision of services, and the management have remained, to a large extent, unchanged. At Canapé-Vert, the increase in the number of residents in its surroundings in the earthquake's aftermath, because of displacement, paralleled an increase in the number of traders selling in the market. These were absorbed within the existing covered space, which is still sufficiently large to host more traders. The increase in the number of traders did not come up as an issue in the interviews with traders and the manager. Similarly, a few traders who had been selling downtown moved to Lalue, which did not appear to be a concern either.

While conditions remained largely unchanged at Lalue and Canapé-Vert after the earthquake, La Coupe changed significantly. First, the particular physical configuration of La Coupe put many traders in disadvantageous positions. Many traders interviewed in the market hall stated that its hard-to-reach location at the bottom of a slope, with overcrowded and dangerous alleys and stairs, negatively impacts their ability to attract clients.

> "The roads are narrow and prevent clients to come here . . .There is a client who broke his foot in the stairs. People prefer to go in other marketplaces because the marketplace is located inside, too far for the clients." (Trader 106, La Coupe [terrace])

While the position of the covered area was similar prior to the earthquake, its surrounding alleys and terrace are now much denser, partly because the market halls were rebuilt with one floor fewer. With an increase in the trader population, more traders installed their shops closer to the main access points and on the nearby sidewalks. Many traders at the bottom of the slopes complained that competition with those closer to the entrances increased to a point where they began to lose clients and income. Consequently, several traders indicated that their colleagues left to sell in the streets, enduring worse conditions, while using their original location for storage purposes.

Further, many traders reported that the situation was better under the previous administration – before the earthquake – as coercion was used to "push traders back inside". According to them, this allowed the trading area to be restricted to the marketplace, and simultaneously reduced competition among zones selling similar commodities. After the earthquake, the appointed local administration[53] adopted a more laissez-faire approach towards street trading, putting the traders in the marketplace in a disadvantageous position in comparison to similar traders located near the entrance and on the streets, which was more convenient for customers. These findings show how unequal physical conditions in a single marketplace can, in the long run, introduce unfair

53. Between 2012 and 2016, the local governments of the municipalities of Port-au-Prince and Pétion-Ville were managed by municipal commissions appointed by the president. Elected mayors took office following the 2016 elections. During the fieldwork in the summer 2017, the media reported violent evictions on the streets of Pétion-Ville, as a strict policy towards street vending as enforced by the newly elected mayor. At the end of the fieldwork, several book traders moved into the market as a result.

competition between traders and interfere with the custom of *pratik* and *kliyan* relationships, particularly in large marketplaces such as La Coupe.

VI. DISCUSSION AND CONCLUSIONS

This paper highlights a lack of evidence in the literature on how food retail infrastructure functions and is affected by disasters in cities of low- and middle-income countries, and in Haiti in particular. Building on Simone's concept of "people as infrastructure" and on current discussions on market modernization, this paper aims at identifying the attributes related to the social and physical dimensions of food provision and access, as well as exploring how they can be affected by hazardous events and conditions. More case study research could strengthen the case for building on the relational attributes of marketplaces and could deepen the understanding of contextual particularities specific to Haiti and other cities in low- and middle-income countries. Moreover, combining studies of marketplaces with household studies in the surrounding neighbourhoods would also help to capture possible changes in preferred sources of food in post-disaster contexts, which is an object of research that could not be investigated with the focus on current users of marketplaces alone. Nevertheless, interviews conducted with traders and customers in three marketplaces in Port-au-Prince not only highlight beneficial social attributes for traders and customers, but also reveal their linkages to the marketplace and the social effects of gradual and sudden changes in that marketplace. These findings have implications for how marketplaces can be conceptualized in the cities of low- and middle-income countries and how they can be built upon in pre- and post-disaster contexts.

Further, the literature on food retail modernization in low- and middle-income countries, mostly in Africa, has mentioned the comparative advantage of informal markets over supermarkets based on making it possible for low-income consumers to purchase small quantities and, occasionally, buy on credit. The findings of this paper indicate that eased access to goods in Haitian marketplaces is mostly related to sustained relationships among traders and customers. The reciprocity and trust underlying that solidarity among food retailers and with customers is developed over repetitive interactions, regardless of marketplace typology. The fact that these social aspects of infrastructure were given more importance than other existing or desired physical features indicates how significant these relationships are for traders. It was found that the marketplace's proximity to customers is of relevance for building solidarity, in terms of both the distance to places of residence and ease of access within the marketplace. Friendships among traders are also based on immediate proximity and enable them to retain their regular clientele while traders themselves are on leave. Finally, solidarity among traders and customers relates to the maintenance of a stable position in the marketplace, as it is important for customers to be able to find their regular traders easily in crowded environments in order to maintain these reciprocal relationships over time.

Moreover, these advantageous relationships are not invulnerable, as findings show how hazardous conditions in the marketplace and its vulnerability to hazards can aggravate problems with food provision and access in a post-disaster context, due to the erosion of the preconditions

needed for building and maintaining solidarity. In other words, physical proximity and spatial stability can be affected during crises, indirectly impacting solidarity among food retailers and buyers. While relational attributes exist across different marketplaces, how they are impacted by hazardous events and conditions varies. This variation is due to the difference in the typology and the robustness of the physical infrastructure in which traders and customers operate. Specifically, the differences in traders' working conditions do not appear to impact relationships with their regular customers. However, if the physical infrastructure fails to safeguard the traders' trading position and if traders take too much time to return after a disaster, relationships between traders and customers are also likely to be affected. Similarly, if it becomes too laborious for customers to reach their regular traders due to a change in the organization of the marketplace or due to the extension of the marketplace onto the streets, these traders can become cornered in a disadvantageous position and, therefore, less likely to attract and maintain new regular clientele.

The existence of relational attributes and their exposed vulnerability have implications for conceptualizing food retail infrastructure in cities of low- and middle-income countries. As Battersby and Watson[54] indicate, marketplaces – where most urban low-income households source their food – possess characteristics that supermarkets do not. Distinctions are found in an understanding of marketplaces as social infrastructure,[55] as many advantages of choosing marketplaces as a source of food over supermarkets come from the interpersonal relationships between traders and customers. However, this is not to say that food retail infrastructure is solely social and deprived of physical and spatial dimensions, as these social relationships are embedded in a given *place*. In particular, this paper shows how changes in physical infrastructure and in the occupation of space, permanently or for a few months, can hinder the sustainability of these social relationships that take time to build. If proximity between customers and traders and among groups of traders is altered by a longer distance or by increased obstacles, and if the trading location is destroyed or unstable, the findings suggest that it is likely that solidarity among traders and with customers will be affected.

54. See reference 4, Battersby and Watson (2018).

55. See reference 16.

The findings also have implications for market support interventions and food retail modernization in Haiti, as well as in other cities of low- and middle-income countries. While household studies have shown that purchasing power remains the primary factor for food access among urban dwellers, findings in this paper show how the relational attributes of marketplaces can also alleviate food insecurity. For urban planning and humanitarian practices, the findings provide a further understanding of the value and limitations of market traders in meeting food needs in post-disaster settings. They also supply evidence of the need to improve a marketplace's physical infrastructure to facilitate and better protect valuable relationships. Recognizing the attributes of existing marketplaces related to solidarity, proximity and stability could be a step forward, ensuring that these attributes are not hindered and, in best cases, are strengthened in modernization projects. This paper supports Lyons and Snoxell's claim that *"the importance of marketplace friendships for survival and stability suggest that markets should not be relocated or removed in the process of formalisation, without thorough consultation"*.[56] However, if Lyons and Snoxell's study focuses on friendships among traders, this study shows that marketplace friendships extend to the relationships

56. Lyons, M and S Snoxell (2005), "Sustainable urban livelihoods and marketplace social capital: crisis and strategy in petty trade", *Urban Studies* Vol 42, No 8, pages 1301–1320, page 1318.

between traders and customers and that these could also be affected by involuntary relocations caused by disasters or changed marketplace conditions. For the same reason, traders and customers must be consulted rigorously in efforts to improve urban food security and disaster recovery.

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Appendix 4

Paper C

Smith D. (accepted for publication). A risky business: the impacts of hazards on traders located in different marketplaces in Port-au-Prince, Haiti. Conference proceedings of the 8th International Conference on Building Resilience (ICBR 2018): Risk and Resilience in practice: Vulnerabilities, Displaced People, Local Communities and Heritage, 14-16 November 2018, Lisbon, Portugal.

A risky business: the impacts of hazards on traders located in different marketplaces in Port-au-Prince, Haiti

David Smith

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Abstract

Overlooked in urban resilience and petty trade studies as well as in urban planning and humanitarian practice, this paper demonstrates that marketplaces are indeed important urban infrastructure in low- and middle-income cities. Based on the analysis of 125 trader interviews conducted in four distinct marketplaces in the Haitian capital, Port-au-Prince, this paper explores the influence of marketplace environments on traders' capacities to fulfill their needs and to maintain or rapidly return to trade after hazardous events. Findings suggest that traders located in a covered market that withstood shocks were better able than their counterparts in other markets to sustain their household needs and were able to restart trade relatively quickly. In contrast, traders in covered markets that collapsed were impacted the most. For these, the loss of market assets, absorbed within the domestic sphere and by their capacity to borrow, hindered their ability to meet household needs and induced longer recovery time. Findings also suggest that traders in open-air markets were less affected by the earthquake but endure worse working conditions and exposure to meteorological hazards. The results in this paper therefore provide evidence to better engage marketplace environments in urban resilience research and in strategies to build resilience for low-income citizens.

Keywords: marketplaces; traders; resilience; hazards; urban infrastructure

1. Introduction

On February 13, 2018, a fire ravaged the Iron Market, the most iconic marketplace of Haiti's capital, Port-au-Prince. The event, symptomatic of the vulnerability of marketplaces in many low- and middle-income cities across the world, impacted hundreds of petty traders. While the informal retail sector contributes significantly to urban employment in low-income cities across the globe (ILO, 2018), it often occurs in public spaces without basic infrastructure, services and legal protection (Chen and Beard, 2018). When such infrastructure exists, as in the case of the Iron Market, the marketplace can itself be exposed to hazards and its

destruction has disastrous consequences on its users. Yet, marketplaces – defined here as covered markets and other open public spaces hosting primarily petty trade activities – have to date been disregarded in research on city infrastructure (see Ferrer et al., 2018, Choguill, 1999), despite their importance as a source of income, food and other affordable commodities for low-income dwellers (ILO, 2018). Due to the role infrastructure plays in urban resilience (see Meerow et al., 2016), it is essential to better understand the impact of hazards on marketplaces and their users.

Precisely, current research on petty trade focusses mainly on harassment and evictions (e.g. Roever and Skinner, 2016) and rarely considers other hazards by which traders may also be affected. The spatial and physical characteristics of the market *place* and its infrastructure are also rarely taken into account in the literature despite their potential impact on protecting trade in times of crises (Alfers et al., 2016, Chen and Beard, 2018). Current research also neglects the indirect impacts of hazards in marketplaces and yet, the failure or interruption of an urban infrastructure could also indirectly affect a significant number of people far from the vicinity (da Silva et al., 2012).

This paper, in response, aims to explore the influence of marketplace infrastructure and environment on traders' capacities to fulfill their needs and to maintain or rapidly return to trade after facing hazardous events.

2. Methods

The paper is primarily based on the analysis of 125 structured interviews with traders conducted in 2017 in the Iron Market as well as in Lalue, Canapé-Vert and La Coupe markets in metropolitan Port-au-Prince (see Figure 1). All marketplaces host the retail trade of basic daily commodities (i.e. perishable and non-perishable food, as well as charcoal) and present different architectural characteristics. The comparison of the four cases allows the distinction between hazards and impacts that occur across different built environments from those that are market-specific. The study targeted fixed adult traders and covered a variety of commodity and stand typologies across the different markets. Questionnaires were designed based on a literature review of the risks faced by petty traders in low- and middle-income countries and on preliminary field work in 2016, and consisted of a mix of closed- and open-ended questions. Interviews were held in Creole and transcribed into French by four students attending the Université d'État under the direct supervision of the author. The responses were then analyzed using qualitative data analysis software for content analyses and quantitative data analysis software for frequency and descriptive analyses.

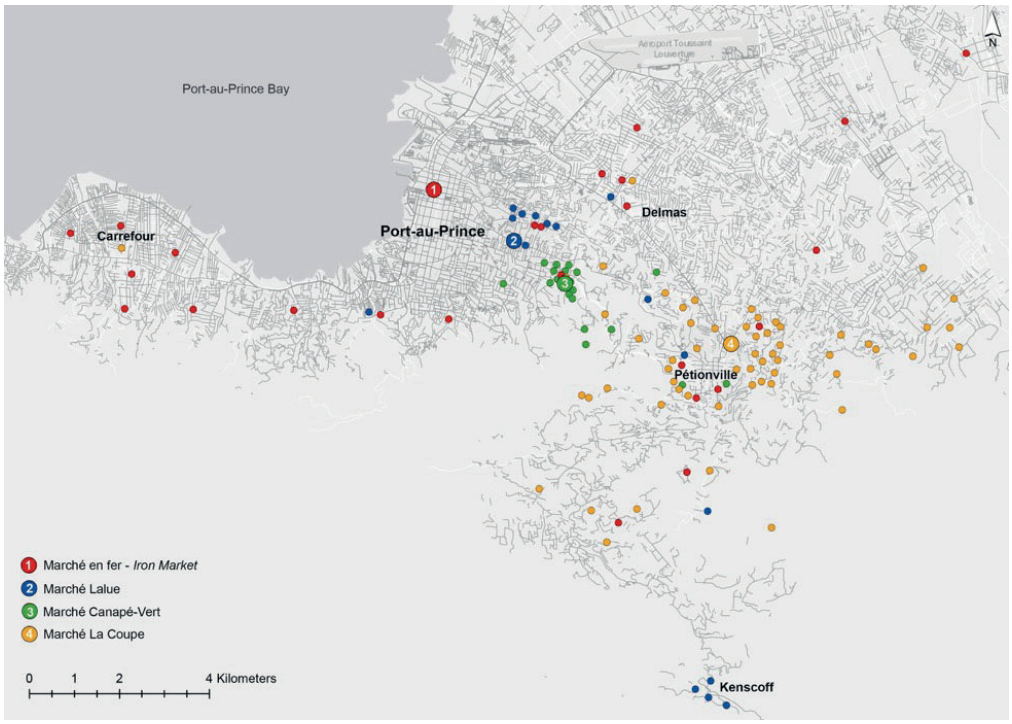

Figure 1: Location of marketplaces and place of residence of petty traders

3. Setting the scene: traders and their marketplace environments

In Haiti, where "70% of the population are either poor or vulnerable to poverty" (Herrera et al., 2014, own translation), petty trade is generally a response to the lack of formal jobs and the need to earn an income to survive and fulfill households needs (Lamaute-Brisson, 2002, Neiburg et al., 2012). In the metropolitan Port-au-Prince, 77.1% of employment is informal (Herrera et al., 2014) and in Haitian cities, "40 percent of the workers are employed in wholesale and retail trade—a large part of them in 'petty trade'" (Scot and Rodella, 2016, p. 19). Several studies have documented how petty trade is dominated by women in Haiti (Lamaute-Brisson, 2002, Blanc, 1997, Neiburg et al., 2012, Mintz, 1960).

Such documented role of trade and traders' gender predominance were confirmed in the study (Table 1). The research shows that besides the necessary maintenance of stock, traders – of which 81% were women – allocate most trade income to food, school fees, transport costs and other items and services for the household. These findings, confirmed by other studies (Thérasmé, 2011, Lamaute-Brisson, 2002), show that capital accumulation does not materialize in the streets but instead in the improvement of household conditions and human capital. In fact, because traders do not necessarily live in the neighborhood of the

marketplace where they work (see Figure 1), income generated in the market can influence living conditions far away from the market location. Moreover, the continuity in traders' places of residence and work suggest a stability in their environments.

In Haiti, petty traders practice their activities in various environments and in various ways (Bazabas, 1997). The four selected marketplaces, despite selling similar products and being predominantly constituted of fixed traders, present substantial differences in the type and quality of the infrastructure (see Table 2), as well as in relation to the surrounding context. Of particular relevance for this paper are the distinctions between a covered market that withstood major hazards, a covered market that collapsed and an open-air marketplace of individual structures.

Table 1: Trader profile

	Marché en fer (South hall)		Marché Lalue		Marché Canapé-Vert		Marché La Coupe (covered)		Marché La Coupe (open-air)		Total	
	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*	%	*N*
Female	85.2	23	82.4	14	81.8	18	92.9	13	73.9	34	81.0	102
Trade in basic daily commodities	55.6	15	88.2	15	72.7	16	46.7	7	65.3	32	63.3	81
Sole or main breadwinner	84.6	22	82.4	14	75.0	15	92.9	13	81.3	39	82.4	103
≥ 5 members in household	56.0	14	60.0	9	61.9	13	42.9	6	72.3	34	62.3	76
Live in the same neighbourhood since 2009	84.6	22	82.4	14	95.2	20	85.7	12	76.6	36	83.2	104
Work in the same marketplace since 2009	84.6	22	76.5	13	85.7	18	85.7	12	78.7	37	81.6	102

Figure 2: The four marketplaces

Table 2: Overview of the marketplace characteristics

	Marché en fer (South hall)	Marché Lalue	Marché Canapé-Vert	Marché La Coupe (covered)	Marché La Coupe (open-air)
Population (approx.)	220	110	140	280	1080
Area (approx. sqm)	2040	1920	2130	2940	8060
Proportion of traders in basic commodities	29%	91%	70%	51%	63%
Date of original construction	1890	N.A.	2004	2008	
Type	city market (retail and semi-wholesale)	local market (retail)	local market (retail)	city market (retail)	
Management	private company	self-managed	municipality of Port-au-Prince	municipality of Pétionville	
Infrastructure	market hall, integrated concrete stalls	wooden tables and tarps	market hall, integrated concrete stalls	market hall, wooden stalls	wooden stalls, parasols, tarps and metal sheets
Recent documented hazards	fires (2008, 2018) earthquake (2010)	N.A.	N.A.	earthquake (2010)	fires (2011, 2016)

The *Iron Market* is a historical covered market located in the business district of downtown Port-au-Prince, where street markets dominate the urban landscape. The market is constituted of two halls on each side of a central open space. The South traditionally hosted food traders but now predominantly hosts traders of non-food items for retail and semi-wholesale. Trading spaces consist of a dedicated concrete stall. Traders of non-food items often add wooden doors, shelves or panels. The North hall, excluded from this study, specializes in arts and crafts. The North hall was destroyed by a fire in 2008 and the remaining market area was severely damaged by the 2010 earthquake. Through the financial backing of the owner of a telecommunications company, the market was reconstructed in 2011 and has remained under the company's management since that time.

Lalue Market (or *Ravine-Pintade*) occupies an undeveloped plot in a mixed neighbourhood and close to an informal residential settlement. Most traders display their commodities on individual wooden tables or in baskets or on blankets laid directly on the ground. Tarps are strung to offer protection from the sun. This market is self-managed. No significant damage was reported following the earthquake and no fire has ever been reported.

Canapé-Vert Market is a covered market built in 2004, located in a mixed neighbourhood and close to several informal residential settlements. The western part of the market hosts mostly food vendors. In the eastern part, the lower floor hosts mostly charcoal

and food vendors and the upper floor hosts mainly cosmetic and clothing vendors. Trading spaces consist of concrete tables that offer integrated storage space underneath. Several traders extend their stands by adding wooden structures, but many traders display their commodities directly on the tables, or in baskets or on blankets on the floor. The market structure withstood the earthquake and no fire has ever been reported.

La Coupe Market was inaugurated in 2008 with the aim to relocate traders from the business center of Pétionville to its vinicity, a mixed neighborhood close to informal residential settlements. The three-storey covered market built in a ravine collapsed two years later and was rebuilt as a two-storey building. Today, the majority of traders are located outside the covered market, on the different plateaus and alleys that link the market to the road above the slope. Most stands within the halls and on the plateaus are made of wood and, when appropriate, a metal roof is mounted. Traders located in the alleys generally display their goods on wooden tables or in baskets placed directly on the ground. Tarps and parasols create protection from the sun. Fires swept through the marketplace plateaus in 2011 and 2016.

4. Shocks and stresses across different marketplace environments

Trader reports of shocks and stresses vary between marketplaces and consist of various events and conditions that are marketplace-specific (i.e fires, poor environmental conditions, forced displacement or harassment, quarrels with traders and clients and poor market management) or that are experienced over a larger area (i.e. earthquakes, tropical storms, instability and insecurity).

The 2010 earthquake caused the collapses of the Iron Market and La Coupe, and nearly all traders lost their commodities as well as their trading spot. Despite the market halls of Canapé-Vert withstanding the earthquake and Lalue evading serious damage, many traders in these markets (54.5% and 41.2% respectively) reported that they were affected by the earthquake. The main reasons given were that the earthquake imposed financial constraints on clients as well as on traders who lost relatives and homes. Many traders reported that “people got poorer” after the earthquake, thus the trade economy was impacted negatively.

Fires also broke out at the Iron Market in 2008 and at La Coupe in 2011 and in 2016 – both large markets located in or close to business districts. Traders and experts, similarly to Neiburg et al. (2012), mentioned that fires, as well as thefts and assassinations, often occur in marketplaces as a result of non-payment of dept, gang wars and political rivalry. The case of the Iron Market, located in an area renowned for such incidents (Neiburg et al., 2012),

shows that its surrounding environment influences traders' perception of risk, despite numerous security measures and available fire extinguishers. The armed robbery that caused one fatality in 2017 and the fire in 2018 give reason to the traders who fear such events. At La Coupe, where feelings of insecurity were also high, the fires destroyed many stands and commodities localized on the plateaus. Many traders that were not directly affected by the fires reported that their sales diminished following the events, as clients tend to avoid the area for some time after episodes involving fire and insecurity occur.

Less traders reported problems related to their working conditions in the covered markets of the Iron Market (4%) and Canapé-Vert (9.1%) than in the open-air markets of Lalue (23.5%) and La Coupe (46.8%). Traders were also more affected by meteorological events in uncovered markets, especially at Lalue and in the alleys of La Coupe. At La Coupe, the poor location, design and management were often mentioned as it generated a competitive disadvantage over other street markets in the area. Such findings therefore suggest that traders are exposed to different hazards and conditions according to the type of market environment they occupy.

5. Financial impact, self-recovery and time-to-return

The earthquake and fires impose a considerable financial burden on traders due to the loss of commodities and structures. Trader accounts of the value of their commodities varies significantly, from 500 to 50,000 gourdes (approx. 7.50 to 750 USD) in the case of traders of basic commodities, 69% of whom have a weekly turnover of more than 5,000 gourdes (approx. 75 USD). When uncovered by a market hall, the same trader spends 2,900 gourdes on average (approx. 45 USD) for his stand structure. The value of the loss of commodities or market structure is therefore substantial, as the average monthly income is of 7,620 gourdes (approx. 115 USD) for informal workers of the metropolitan area (Herrera et al., 2014).

When questioned about the aftermath of the 2010 earthquake, nearly half of respondents reported that they received no support, stayed home, or 'did nothing'. The others borrowed money from a bank, a micro-credit organization or a pawnbroker (22.8%) or received support from family (18.8%) or friends (9.9%). Other actions or sources of support were mentioned but reported only by a handful of traders, and for most, remained within the domestic sphere (e.g. selling household assets). In the case of fires in municipal markets, traders may also form associations to pressure authorities for financial compensations. However, very few interviewed traders mentioned they personally received money from the State (from 2,500 to 10,000 gourdes, approx. 40 to 150 USD) and most mentioned that they were for a limited number of traders.

These findings suggest that the financial shock caused by the destruction of market assets – particularly evident at the Iron Market and at La Coupe – is mostly absorbed through traders' productive capacities and by making compromises within their domestic environments. For instance, a few vendors mentioned they had to reduce food expenditure and stop sending children to school in order to cope with the drop in income. Several traders reported that the impact on some traders was so substantial that many "did not come back."

Moreover, recovery times following the 2010 earthquake also varied among marketplaces. Due to the inaccessibility of the marketplaces during reconstruction (twelve months in the case of the Iron Market) and the loss of market assets, time-to-return was longer in the markets severely affected by the shocks (Iron Market and La Coupe) than those in the least affected (Canapé-Vert and Lalue). There is also a difference in the pace of return between Canapé-Vert and Lalue. While the covered marketplace of Canapé-vert, which withstood the earthquake, was not used in the following month, as residents feared aftershocks, nearly all traders (92.3%) returned within three months. At Lalue, more traders were able to return within a month (58.4%). The numbers of traders increased over time, reaching 75% after three months and 83.4% returning after twelve months. These findings suggest that when commodities and infrastructure successfully withstand shocks, traders are able to return to trade relatively faster than traders in open-air markets.

6. Discussion and conclusion

This paper aimed to explore the influence of marketplace infrastructure on traders' capacities to fulfill their needs and to maintain or rapidly return to trade when facing hazardous events. Due to the exploratory nature of the study, primarily based on perceptions of a non-representative sample of 125 traders, the patterns highlighted in the analysis are indicative and should therefore be treated with caution. Other aspects explored in the research relating to working conditions and governance are also missing in the paper. Nevertheless, the study uncovered several ways in which the marketplace infrastructure may influence traders' capacities to face crises.

The study indicates that traders located in a covered market that withstand shocks were better positioned than counterparts in other markets to sustain their household needs, as they were able to restart trade relatively quickly. In contrast, traders who had stands and commodities in covered market that collapsed during the earthquake were impacted the most. Due to the lack of safety net, the financial shock was absorbed within the domestic sphere and the ability of traders to obtain and payback an essential loan. Time taken to return to the market was also the longest in the covered markets that collapsed, due to the time needed to

refinance their commodities and to rebuild the infrastructure. In many cases, this resulted in the reduction of traders' capacity to direct income into meeting household needs. The influence of the marketplace infrastructure however can be limited as other risks and threats come from the surrounding urban context.

These findings have implications for humanitarian and urban planning practices in low- and middle-income cities. The paper provides additional evidence suggesting the need for making immediate financial support available for traders, who may reside out of affected areas, following the collapse of marketplace infrastructure, as well as on the need for upgrading existing marketplace infrastructure, so as to increase their capacities to resume operation and to reduce their vulnerability to shocks and stresses. However, the aforementioned projects must fully engage traders in order to address their most pressing needs, as they can vary according to marketplace, and to reduce trade risks that may result from the changes. Marketplace management must also be carefully considered and supported to ensure appropriate maintenance over the long term. Furthermore, due to the links between traders' marketplace and household conditions, the paper challenges traditional levels of analysis and programming, focused mainly on households and their immediate environments (Earle, 2016). It calls, for instance, for including the main income providers' assets and workplace infrastructural conditions in assessments and projects aiming to reduce households' vulnerability and enhance their resilience.

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Appendix 5

Paper D

Smith D. (submitted for publication). Unpacking an urban domino effect: marketplace infrastructure, traders, and resilience following the 2010 earthquake in Port-au-Prince, Haiti.

This paper is awaiting publication and is not included in NTNU Open

Appendix 6

Aerial photographs and photos of the studied marketplaces in metropolitan Port-au-Prince, Haiti

Figure I Iron Market (aerial photograph)

Source: DigitalGlobe Google Earth 2019 (photo taken in 2019), adapted by author

Figure II Iron Market (entrance and central structure)

Source: Author, photo taken in 2016

Figure III Iron Market (inside the South Hall on a Sunday)

Source: Author, photo taken in 2016

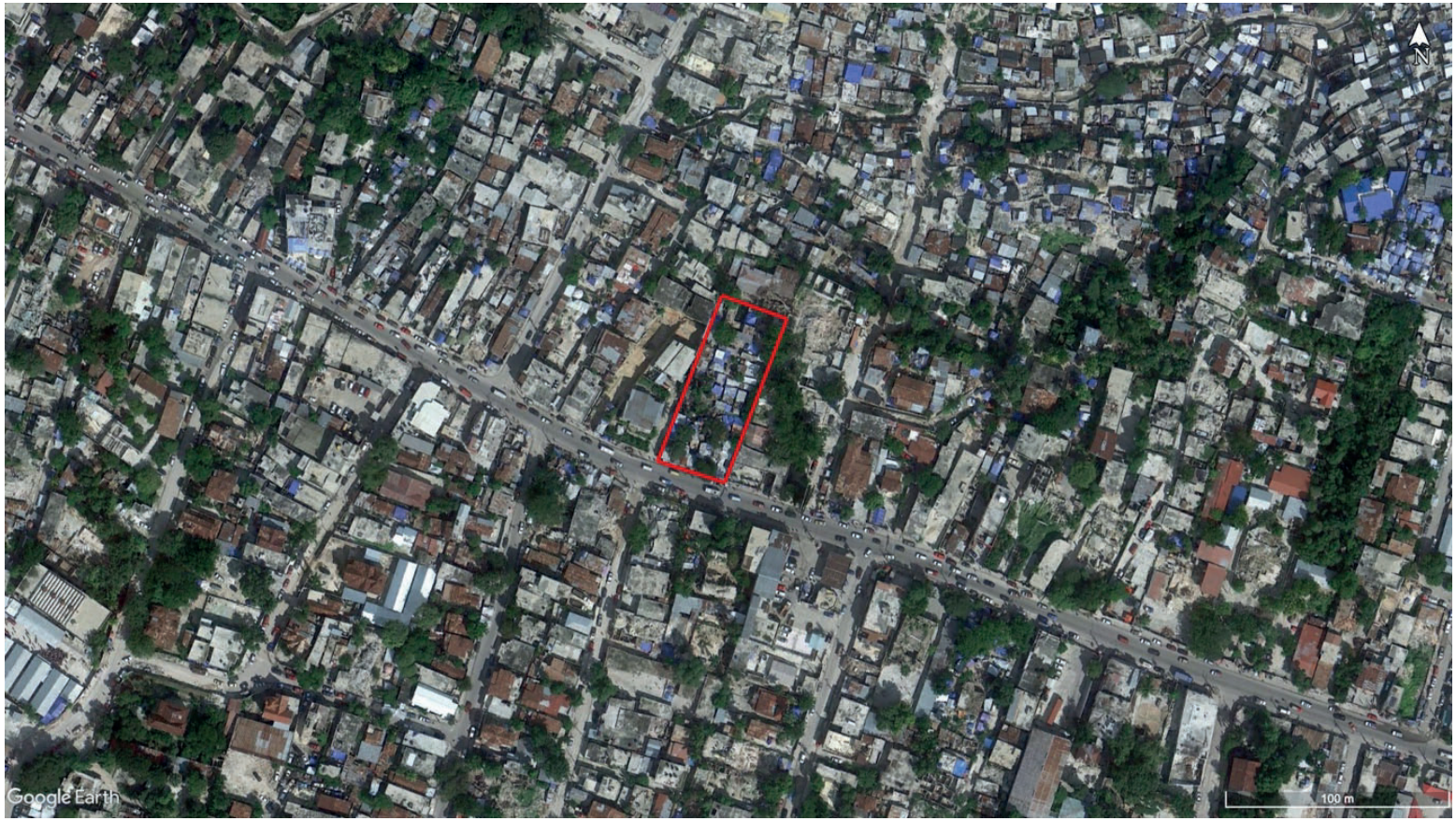
Figure IV Iron Market (stands of imported food commodities and grains)

Source: Author, photo taken in 2016

Figure V Iron Market (toilets on the site)

Source: Author, photo taken in 2016

Figure VI *Lalue* (aerial photograph)



Source: Google Earth 2019 (photo taken in 2010), adapted by author

Figure VII *Lalue* (entrance on John-Brown avenue)

Source: Author 2017

Figure VIII *Lalue* (view from the charcoal area)

Source: Author, photo taken in 2017

Figure IX *Lalue* (view from the second-hand clothes area)

Source: Author, photo taken in 2017

Figure X *Canapé-Vert* (aerial photograph)

Source: Google Earth 2019 (photo taken in 2010), adapted by author

Figure XI *Canapé-Vert* (entrances on Bois-Patate street)

Source: Author, photo taken in 2017

Figure XII *Canapé-Vert* (overview of East Hall – food area)

Source: Author, photo taken in 2017

Figure XIII *Canapé-Vert* (East Hall - food area)

Source: Author, photo taken in 2017

Figure XIV *Canapé-Vert* (ground level of West Hall - charcoal area)

Source: Author, photo taken in 2017

Figure XV *La Coupe* (aerial photograph)

Source: DigitalGlobe and Google Earth 2019 (photo taken in 2018), adapted by author

Figure XVI *La Coupe* (entrance and books area on de Frères road)

Source: Author, photo taken in 2017

Figure XVII *La Coupe* (overview of the plateaus and halls)

Source: Author, photo taken in 2017

Figure XVIII *La Coupe* (on one of the plateaus on a Sunday)

Source: Author, photo taken in 2016

Figure XIX *La Coupe* (under a hall on a Sunday)

Source: Author, photo taken in 2017

Figure XX *La Coupe* (shops and storage next to the halls)

Source: Author, photo taken in 2016

Figure XXI *La Coupe* (in the alley at the bottom on a Sunday)

Source: Author, photo taken in 2016

Figure XXII *La Coupe* (in the alley up to de Frères road)

Source: Author, photo taken in 2016

Appendix 7

Final questionnaire for traders

(translated into English)

Building on marketplace resilience: learning from petty traders and consumers in Port-au-Prince, Haiti
David Smith, PhD candidate, NTNU

Market trader questionnaire (translated from French) v31.07.2017

Reference number:
Date:
Interviewer:
Marketplace of interview:
Consent letter read and agreed?

Trader profile

Main commodities sold:
Location of trader: inside (covered) or outside (open-air)

Gender: F M
Age approx.: Young adult Mature adult Senior

Main questions

Trader experience, household profile and location

1. How long have you been working…
    a. as a trader?
    b. at this marketplace?
    c. at this trading location?

2. How often do you normally travel to this marketplace?
    a. Walk
       always often sometimes rarely never
    b. Moto-taxi
       always often sometimes rarely never
    c. Tap-Tap
       always often sometimes rarely never
    d. Bus
       always often sometimes rarely never
    e. Other: _____
       always often sometimes rarely never

3. How much time does it take to get to this marketplace?
    a. Less than 15 minutes.
    b. Less than 30 minutes but more than 15.
    c. Between 30 minutes and an hour.
    d. More than one hour.

4. In which neighbourhood do you live: _____
   and for how long?
   a. less than a year
   b. less than three years but more than a year
   c. from after the earthquake (less than 6 years and more than a year)
   d. from before the earthquake (more than 6 years)

5. How many people live in your household?

6. Would you consider yourself as the main breadwinner?
   a. This is the unique livelihood activity of the household.
   b. This is the main livelihood activity of the household.
   c. This is not the main livelihood activity of the household (only supplementary livelihood activity).

Marketplace daily and weekly services and expenditure

7. What are the services you use for your activity and personal needs at the market?
   a. Carrier
   b. Cooked food (manger-cuit)
   c. Water trader
   d. Toilet
   e. Shower
   e. Carpenter
   f. Wholesaler
   g. Storage
   h. Other : _____
   i. Other : _____

8. Can you estimate roughly the costs of the following fees per day or per week?
   a. Market fee (municipality or Digicel):
   b. Storage:
   c. Porteur:
   d. Cooked food (manger-cuit):
   e. Water:
   f. WC:
   g. Micro-loans:
   h. Supplier:
   i. Carpenter (stall):
   j. Security:
   k. Any other fee:

9. a) What portion of your profit you make in the marketplace do you use to:
   a. upgrade your stall?
      most of it a lot some a little not at all
   b. extend your stock?
      most of it a lot some a little not at all
   c. contribute to saving group you are a member of (if that is the case)?
      most of it a lot some a little not at all
   d. pay back loans (if you have a loan)?
      most of it a lot some a little not at all
   e. buy food for your household?
      most of it a lot some a little not at all
   f. pay other commodities or services for home (e.g. water, electricity, etc)?
      most of it a lot some a little not at all
   g. upgrade your home?
      most of it a lot some a little not at all
   h. pay for schooling?
      most of it a lot some a little not at all
   i. pay for leisure activities?
      most of it a lot some a little not at all
   j. pay for public transport (tap tap)
      most of it a lot some a little not at all
   k. other: _____

b) *Name the answers with highest score*. Can you confirm and/or precise?

10. a) Does your income vary over time? If yes, can you please give a few examples?
    b) Has your income changed after the earthquake (or a fire or a forced relocation)? How?

Physical environment and vulnerability

11. Please indicate the degree of importance of the following elements/services for you and your business:
    a. a market hall
       immensely very relatively a little not at all
    b. continuous access to electricity
       immensely very relatively a little not at all
    c. continuous access to water
       immensely very relatively a little not at all
    d. access to affordable toilets
       immensely very relatively a little not at all

e. continuous security services
   immensely very relatively a little not at all
f. cleaning and waste services
   immensely very relatively a little not at all
g. storage place
   immensely very relatively a little not at all
h. stall
   immensely very relatively a little not at all
i. nearby supplier
   immensely very relatively a little not at all
j. nearby vendors that you know well
   immensely very relatively a little not at all
k. nearby vendors
   immensely very relatively a little not at all
l. a known trading location for your good clients
   immensely very relatively a little not at all

12. What are the elements or services in the market that were affected by…
    a. the earthquake?
    b. a cyclone or storm?
    c. a fire?
    d. a forced relocation?

Marketplace stresses, impact on petty trade and strategies

13. Can you provide examples of challenges, stresses or threats you deal on a daily or weekly basis as a trader?

14. Please provide examples of the actions you take and whom you can rely on for support when facing those daily/weekly challenges, stresses and threats?

15. When facing daily/weekly stresses and threats in the marketplace, do you get support from:
    a. your family or household members
       immensely a lot some a little not at all
    b. your neighbours close to your home
       immensely a lot some a little not at all
    c. your extended family
       immensely a lot some a little not at all
    d. your family or friends living abroad
       immensely a lot some a little not at all
    e. your friends neighbouring your trading location
       immensely a lot some a little not at all

f. your friends in the marketplace
   immensely a lot some a little not at all
g. your other friends (outside marketplace and home neighbourhood)
   immensely a lot some a little not at all
h. your regular traders (*pratik*)
   immensely a lot some a little not at all
i. your regular suppliers (*pratik*)
   immensely a lot some a little not at all

16. a) When facing daily/weekly challenges, stresses and threats in the marketplace, do you get support from:
    a. the marketplace municipality manager
       immensely a lot some a little not at all
    b. the marketplace organisation
       immensely a lot some a little not at all
    c. a saving group you are member of
       immensely a lot some a little not at all
    d. a social or political association you are a member of
       immensely a lot some a little not at all
    e. a religious group or church you are a member of
       immensely a lot some a little not at all
    f. a micro-credit organisation or bank
       immensely a lot some a little not at all
    g. a formal bank
       immensely a lot some a little not at all
    h. the government
       immensely a lot some a little not at all
    i. an NGO
       immensely a lot some a little not at all
    j. other: _____
       immensely a lot some a little not at all

    b) *Name the answers with highest score from the last two questions*. Can you confirm and/or precise?

Marketplace shocks, impact on petty trade and strategies

17. In the last 10 years or so, what are the main events (shocks) this marketplace has experienced? How did it affect you, your business and your household

18. *Cancelled*.

19. Please give examples of the actions you took and whom you relied on for support when and after those shocks happened?

20. a) Were you able to return to your previous trading location after the earthquake?
    b) If yes, how would it affect your business if you had to move?
    If no, how has it affected your business?

21. a) How long did it take to come back to the marketplace or to be fully back in business after the earthquake?
    b) What did you do in the meantime?

22. In the aftermath of the earthquake (or another major event), did you seek support where you are used to do (*remember answers from questions 15 and 16).* If not, how was it different?

23. *Cancelled*.

24. In your opinion, what are the main threats and shocks this marketplace might face in the future and why?

25. If there is a disaster, such as following a fire or another earthquake, what do you think will happen to the market?

Cultural practice of pratik after marketplace shocks

26. a) Please estimate the number of regular clients you have (have a *pratik* with) and explain what they mean for your business.
    b) Please estimate the number of suppliers you have (have a *pratik* with) and explain what they mean for your business.

27. *Cancelled.*

28. Please estimate the proportion of clients that have been regular:
    a. from before the earthquake (more than 6 years)

almost all of them a majority a minority only a few no one

    b. from the reopening of the marketplace after the earthquake

almost all of them a majority a minority only a few no one

    c. more than a year

almost all of them a majority a minority only a few no one

    d. for between a month and a year

almost all of them a majority a minority only a few no one

    e. for less than a month

almost all of them a majority a minority only a few no one

29. Please name the 5 top reasons why a relationship with a regular client (*pratik)* has been lost or could be lost.

30. How many regular customers did you loose because of the earthquake?

almost all of them a majority a minority only a few no one

31. Please tell on how losing a regular client has affected / would affect you.

Marketplace change, governance and impact on trade

32. What are projects you are aware of or changes that have been implemented in the marketplace? If any, how have they impacted your business?

33. In your opinion, what top five projects should be implemented to improve the marketplace and your business? Please explain why.

34. Can you tell about the marketplace management? How well does it work?

35. Is there an association for traders here? How do it work?

36. Can you tell on what the marketplace management and the association did following the earthquake?

Marketplace social capital

37. Can you tell about your nearby colleagues and other friends at the marketplace?

38. a) What happened to these relationships following the earthquake?
    b) Are there actions you took collectively? What are they?

39. a) Are your friends in the marketplace located next to you?

almost all of them a majority a minority only a few no one

b) Do they sell the same things as you?

almost all of them a majority a minority only a few no one

Closing comments

Is there anything more you would like to add?

Is there something I can do to improve my next interview?

Thank you for your time. This was very useful.

Appendix 8

Final questionnaire for customers

(translated into English)

Building on marketplace resilience: learning from petty traders and consumers in Port-au-Prince, Haiti
David Smith, PhD candidate, NTNU

Market customer questionnaire (translated from French) v08.07.2017

Reference number:
Date:
Interviewer:
Marketplace of interview:
Consent letter read and agreed?:

Consumer profile

Gender:	F	M	
Age:	Young adult	Mature adult	Senior

Main questions

Marketplace proximity and frequency

1. How many times a week do you normally come to this market?
    a. More than once day
    b. Five times a week or more
    c. 2 to 4 times per week
    d. Once a week
    e. Less than once a week

2. How often do you travel to this marketplace?
    a. by walk
       always often sometimes rarely never
    b. by Moto-taxi
       always often sometimes rarely never
    c. by Tap-Tap
       always often sometimes rarely never
    d. Other: _____
       always often sometimes rarely never

3. How much time does it take to get to this marketplace?
    a. Less than 15 minutes.
    b. Less than 30 minutes but more than 15.
    c. Between 30 minutes and an hour.
    d. More than one hour.

4. In which neighbourhood do you live and for how long? _____
    a. less than 1 year
    b. less than 3 years but more than 1 year
    c. since the earthquake (less than 6 years and more than 3 years)
    d. since before the earthquake (more than 6 years)

Shopping behaviour within marketplace (zones) and preference

5. What do you normally do at this marketplace?
    a. Buy food for my family/household for the day
       always often sometimes rarely never
    b. Buy food for my family/household for more than one day
       always often sometimes rarely never
    c. Buy food for someone else (e.g. as domestic worker)
       always often sometimes rarely never
    d. Buy other basic commodities (e.g. charcoal, household products)
       always often sometimes rarely never
    e. Buy to resell elsewhere
       always often sometimes rarely never
    f. Buy specialized items (e.g. school items, utensils)
       always often sometimes rarely never
    g. Socialise with friends at the market
       always often sometimes rarely never
    h. Be informed about that is going on today (i.e. news)
       always often sometimes rarely never
    i. Other
       always often sometimes rarely never

6. Do you visit other marketplaces or shops?
   What for (or why not)?

7. What are the main reasons you choose to come to this market (and not another one market or shop)?

Stresses impacting buying capacity and coping strategies

8. Please name top factors that can impact your capacity to buy what you need at the marketplace. Explain briefly.

9. To access food for household and other basic commodities during bad times, how much can you get support from these people:
    a. your family or household
       immensely a lot some a little not at all
    b. your neighbours close to home
       immensely a lot some a little not at all
    c. your extended family
       immensely a lot some a little not at all

d. your family or friends living abroad
   immensely a lot some a little not at all
e. your friends in the marketplace
   immensely a lot some a little not at all
f. your other friends (outside marketplace and home neighbourhood)
   immensely a lot some a little not at all
g. your regular traders (*pratik)*
   immensely a lot some a little not at all
h. other:
   immensely a lot some a little not at all

10. a) To access food for household and other basic commodities during bad times, how much can you get support from:
    a. a saving group I am member of
       immensely a lot some a little not at all
    b. a social or political association I am member of
       immensely a lot some a little not at all
    c. a religious group or church I am member of
       immensely a lot some a little not at all
    d. a micro-credit organisation or bank
       immensely a lot some a little not at all
    e. a formal bank
       immensely a lot some a little not at all
    f. the government
       immensely a lot some a little not at all
    g. an NGO
       immensely a lot some a little not at all
    h. other: _____
       immensely a lot some a little not at all

    b) *Name the answers with highest score from questions 9 and 10*. Can you confirm and/or precise?

Marketplace shocks and impact on consumer

11. a) Is there been an event (earthquake, fire, forced relocation) that happened in the market that affected you? How?
    b) What did you do?

12. What do you think are the main threats this marketplace might face in the future? Explain.

13. If there is another disaster, such as caused by a fire or an earthquake, what do you think will happen to the market?

Cultural practice of pratik after marketplace shocks

14. Please estimate the number of traders you see regularly (have a *pratik* with) and explain their importance for you.

15. Please name the main reasons why a relationship with a regular trader (*pratik)* has been lost or could be lost.

16. Did you lose regular traders (*pratik*) following the earthquake?
almost all of them a majority a minority only a few no one

17. Please tell on how losing a regular trader has affected / would affect you.

Marketplace change and impact on consumers

18. In your opinion, what are the most important projects that should be implemented to improve the marketplace? Explain.

Closing comments

Is there anything more you would like to add? Is there something I should have asked but forgot to ask?

Thank you for your time. This was very useful.

Appendix 9

List of interviewed traders and customers (structured interviews)

Traders				
Code	**Gender**	**Marketplace**	**Commodity**	**Date**
Co1	*Cancelled*			
Co2	*Cancelled*			
Co3	F	MeF	Vegetables	21-07-2017
Co4	*Cancelled*			
Co5	F	MCV	Food items	21-07-2017
Co6	F	MCV	Food items	21-07-2017
Co7	F	MCV	Food items	21-07-2017
Co8	*Cancelled*			
Co9	*Cancelled*			
Co10	*Cancelled*			
Co11	*Cancelled*			
Co12	F	MLC	Food items	25-07-2017
Co13	F	MLC	Food items	25-07-2017
Co14	F	MLC	Food items	25-07-2017
Co15	F	MLC	Food items	25-07-2017
Co16	F	MCV	Food items	26-07-2017
Co17	F	MCV	Food items	26-07-2017
Co18	F	MCV	Food items	26-07-2017
Co19	F	MCV	Food items	26-07-2017
Co20	F	MeF	Spices	27-07-2017
Co21	F	MeF	Beauty products	27-07-2017
Co22	*Cancelled*			
Co23	F	MeF	Food items and alcohol	27-07-2017
Co24	F	MeF	Food items	27-07-2017
Co25	F	MeF	Food items and spices	27-07-2017
Co26	F	MeF	Hair extensions	27-07-2017
Co27	F	MCV	Charcoal	28-07-2017
Co28	F	MCV	Charcoal	28-07-2017
Co29	M	MCV	Charcoal	28-07-2017
Co30	F	MCV	Charcoal	28-07-2017
Co31	M	MCV	Charcoal	28-07-2017
Co32	F	MCV	Food items	28-07-2017
Co33	F	MLC	Food items	02-08-2017
Co34	F	MLC	Food items	02-08-2017
Co35	F	MLC	Food items (semi-wholesale)	02-08-2017
Co36	M	MLC	Food items	02-08-2017
Co37	F	MLC	Vegetables	02-08-2017
Co38	F	MeF	Alcohol and syrup	03-08-2017
Co39	F	MeF	Beauty products and hair extensions	03-08-2017

Traders				
Code	**Gender**	**Marketplace**	**Commodity**	**Date**
Co40	F	MeF	Fruits	03-08-2017
Co41	F	MeF	Alcohol and leaves	03-08-2017
Co42	F	MeF	Beauty products and hair extensions	03-08-2017
Co43	F	MeF	Fruits	03-08-2017
Co44	F	MLL	Vegetables and fruits	04-08-2017
Co45	F	MLL	Vegetables and spices	04-08-2017
Co46	F	MLL	Vegetables and spices	04-08-2017
Co47	F	MLL	Food items	04-08-2017
Co48	F	MLL	Food items	04-08-2017
Co49	F	MLL	Vegetables and fruits	04-08-2017
Co50	M	MLL	Charcoal	04-08-2017
Co51	*Cancelled*			
Co52	M	MLL	Charcoal	09-08-2017
Co53	F	MLL	Vegetables	09-08-2017
Co54	F	MLL	Vegetables	09-08-2017
Co55	M	MLL	Poultry	09-08-2017
Co56	F	MLL	Vegetables	09-08-2017
Co57	F	MLL	Food items	10-08-2017
Co58	F	MLL	Vegetables	10-08-2017
Co59	F	MLL	Beauty products	10-08-2017
Co60	F	MCV	Fruits and vegetables	11-08-2017
Co61	F	MCV	Fruits and vegetables	11-08-2017
Co62	F	MCV	Clothes	11-08-2017
Co63	F	MCV	Beauty products	11-08-2017
Co64	F	MCV	Food items (semi-wholesale)	11-08-2017
Co65	M	MCV	Food items (semi-wholesale)	11-08-2017
Co66	F	MLC	Clothes	14-08-2017
Co67	F	MLC	Clothes	14-08-2017
Co68	F	MLC	Clothes	14-08-2017
Co69	F	MLC	Clothes	14-08-2017
Co70	F	MLC	Clothes	14-08-2017
Co71	F	MLC	Luggage	14-08-2017
Co72	F	MLC	Vegetables	14-08-2017
Co73	F	MLC	Vegetables	14-08-2017
Co74	M	MLC	Charcoal	14-08-2017
Co75	F	MLC	Food items	14-08-2017
Co76	F	MeF	Hair extensions	15-08-2017
Co77	M	MeF	Beauty products	15-08-2017
Co78	F	MeF	Beauty products	15-08-2017

Traders				
Code	**Gender**	**Marketplace**	**Commodity**	**Date**
Co79	F	MeF	Utensils	15-08-2017
Co80	F	MeF	Jewellery	15-08-2017
Co81	M	MeF	Electronics	15-08-2017
Co82	M	MeF	Meat	15-08-2017
Co83	M	MeF	Electronics	15-08-2017
Co84	F	MeF	Hair extensions	15-08-2017
Co85	F	MLC	Clothes	16-08-2017
Co86	M	MLC	Clothes	16-08-2017
Co87	F	MLC	Clothes	16-08-2017
Co88	F	MLC	Clothes	16-08-2017
Co89	F	MLC	Clothes	16-08-2017
Co90	F	MLC	Fruits and vegetables	16-08-2017
Co91	F	MLC	Clothes	16-08-2017
Co92	F	MLC	Utensils	16-08-2017
Co93	F	MLC	Fruits and vegetables	16-08-2017
Co94	F	MLC	Clothes	16-08-2017
Co95	F	MLC	Fruits and vegetables	16-08-2017
Co96	F	MLL	Food items	17-08-2017
Co97	F	MLL	Food items (semi-wholesale)	17-08-2017
Co98	F	MCV	Beauty products	18-08-2017
Co99	M	MCV	Electronics	18-08-2017
Co100	F	MCV	Meat	18-08-2017
Co101	F	MCV	Vegetables	18-08-2017
Co102	F	MLC	Food items	22-08-2017
Co103	F	MLC	Fruits and vegetables	22-08-2017
Co104	F	MLC	Fruits and vegetables	22-08-2017
Co105	F	MLC	Clothes	22-08-2017
Co106	M	MLC	Botanica (religious items)	22-08-2017
Co107	F	MLC	Vegetables	22-08-2017
Co108	F	MLC	Food items	22-08-2017
Co109	M	MLC	Botanica (religious items)	22-08-2017
Co110	F	MLC	Meat	22-08-2017
Co111	F	MLC	Fruits	22-08-2017
Co112	M	MLC	Food items	22-08-2017
Co113	M	MLC	Books	23-08-2017
Co114	M	MLC	Books and school bags	23-08-2017
Co115	M	MLC	Books	23-08-2017
Co116	F	MLC	Clothes	23-08-2017
Co117	M	MLC	Shoes	23-08-2017

Traders				
Code	**Gender**	**Marketplace**	**Commodity**	**Date**
Co118	M	MLC	Books	23-08-2017
Co119	M	MLC	Shoes	23-08-2017
Co120	F	MLC	Beauty products	23-08-2017
Co121	F	MLC	Food items	23-08-2017
Co122	F	MLC	Vegetables	23-08-2017
Co123	F	MLC	Fruits	23-08-2017
Co124	F	MLC	Vegetables	23-08-2017
Co125	F	MLC	Vegetables	23-08-2017
Co126	F	MLC	Vegetables	23-08-2017
Co127	F	MLC	Fruits and vegetables	23-08-2017
Co128	F	MLC	Vegetables	28-08-2017
Co129	F	MLC	Vegetables	28-08-2017
Co130	F	MLC	Fruits	28-08-2017
Co131	F	MLC	Fruits and vegetables	28-08-2017
Co132	F	MLC	Vegetables	28-08-2017
Co133	M	MLC	Fruits	28-08-2017
Co134	F	MLC	Food items (semi-wholesale)	28-08-2017
Co135	F	MLC	Food items	28-08-2017

Customers

Code	Gender	Marketplace	Date
Cl1	F	MCV	26-07-2017
Cl2	F	MCV	26-07-2017
Cl3	F	MCV	26-07-2017
Cl4	F	MCV	28-07-2017
Cl5	M	MCV	28-07-2017
Cl6	M	MCV	28-07-2017
Cl7	M	MCV	28-07-2017
Cl8	F	MCV	28-07-2017
Cl9	F	MCV	28-07-2017
Cl10	F	MCV	28-07-2017
Cl11	F	MCV	28-07-2017
Cl12	F	MCV	28-07-2017
Cl13	F	MCV	28-07-2017
Cl14	F	MCV	02-08-2017
Cl15	*Cancelled*		
Cl16	*Cancelled*		
Cl17	*Cancelled*		
Cl18	*Cancelled*		
Cl19	F	MLL	04-08-2017
Cl20	F	MLL	04-08-2017
Cl21	F	MLL	04-08-2017
Cl22	F	MLL	09-08-2017
Cl23	F	MLL	10-08-2017
Cl24	F	MLL	10-08-2017
Cl25	F	MLL	10-08-2017
Cl26	F	MLL	10-08-2017
Cl27	F	MLL	09-08-2017
Cl28	*Cancelled*		
Cl29	F	MLL	17-08-2017
Cl30	F	MLL	17-08-2017
Cl31	F	MLL	17-08-2017
Cl32	M	MLL	17-08-2017
Cl33	F	MLL	17-08-2017
Cl34	F	MLL	17-08-2017
Cl35	F	MLL	17-08-2017
Cl36	F	MLL	17-08-2017
Cl37	F	MLL	17-08-2017
Cl38	M	MLL	17-08-2017
Cl39	F	MLL	17-08-2017

Customers

Code	Gender	Marketplace	Date
Cl40	F	MLL	17-08-2017
Cl41	F	MLL	17-08-2017
Cl42	F	MLL	17-08-2017
Cl43	M	MCV	18-08-2017
Cl44	F	MCV	18-08-2017
Cl45	F	MCV	18-08-2017
Cl46	F	MCV	18-08-2017
Cl47	F	MCV	18-08-2017
Cl48	F	MCV	18-08-2017
Cl49	F	MCV	18-08-2017
Cl50	F	MCV	18-08-2017
Cl51	M	MCV	18-08-2017
Cl52	F	MCV	18-08-2017
Cl53	M	MLC	23-08-2017
Cl54	M	MLC	24-08-2017
Cl55	F	MLC	24-08-2017
Cl56	F	MLC	24-08-2017
Cl57	F	MLC	24-08-2017
Cl58	F	MLC	24-08-2017
Cl59	F	MLC	24-08-2017
Cl60	F	MLC	24-08-2017
Cl61	F	MLC	24-08-2017
Cl62	F	MLC	24-08-2017
Cl63	M	MLC	24-08-2017
Cl64	F	MLC	24-08-2017
Cl65	M	MLC	24-08-2017
Cl66	F	MLC	24-08-2017
Cl67	F	MLC	24-08-2017
Cl68	M	MLC	24-08-2017
Cl69	F	MLC	24-08-2017
Cl70	F	MLC	24-08-2017
Cl71	M	MLC	24-08-2017
Cl72	M	MLC	24-08-2017
Cl73	F	MLC	24-08-2017
Cl74	F	MLC	24-08-2017
Cl75	M	MLC	24-08-2017
Cl76	F	MLL	25-08-2017
Cl77	F	MLL	25-08-2017
Cl78	F	MLL	25-08-2017

Customers

Code	Gender	Marketplace	Date
Cl79	F	MLL	25-08-2017
Cl80	F	MLL	25-08-2017
Cl81	F	MLL	25-08-2017
Cl82	F	MLL	25-08-2017
Cl83	F	MLL	25-08-2017
Cl84	M	MLL	25-08-2017
Cl85	F	MLL	25-08-2017
Cl86	F	MLL	25-08-2017
Cl87	F	MLL	25-08-2017
Cl88	F	MLL	25-08-2017
Cl89	F	MCV	25-08-2017
Cl90	F	MCV	25-08-2017
Cl91	M	MCV	25-08-2017
Cl92	M	MCV	25-08-2017
Cl93	M	MCV	25-08-2017
Cl94	F	MCV	25-08-2017
Cl95	F	MCV	25-08-2017
Cl96	F	MCV	25-08-2017
Cl97	M	MCV	25-08-2017
Cl98	M	MCV	25-08-2017
Cl99	F	MCV	25-08-2017
Cl100	M	MLC	28-08-2017
Cl101	F	MLC	28-08-2017
Cl102	F	MLC	28-08-2017
Cl103	M	MLC	28-08-2017
Cl104	F	MLC	28-08-2017
Cl105	M	MLC	28-08-2017
Cl106	F	MLC	28-08-2017
Cl107	M	MLC	28-08-2017
Cl108	F	MLC	28-08-2017
Cl109	F	MLC	28-08-2017
Cl110	F	MLC	28-08-2017

Appendix 10

List of key informants (semi-structured interviews)

Code	Gen-der	Organisation	Position or profession	Name	Date
KI1	M	Centre national de l'information géo-spatiale (CNIGS)	*Position withheld*	*Name withheld*	07-04-2016
KI2	M	Unité de Construction de Logements et de Bâtiments Publics (UCLBP)	Engineer-architect	*Name withheld*	11-04-2016
KI3	F	Iron Market/ Digicel	Manager	*Name withheld*	14-04-2016
KI4	M	N.A.	Candidate for the local government elections	*Name withheld*	15-04-2016
KI5	M	Université d'État d'Haïti (UEH)	Professor	*Name withheld*	15-04-2016
KI6	M	Marché Salomon	Manager	*Name withheld*	18-04-2016
KI7	M	Organisation withheld *(consulting company)*	Urban planner	*Name withheld*	19-04-2016
KI8	M	Iron Market/ Digicel	Manager	*Name withheld*	20-04-2016
KI9	M	Iron Market/ Digicel	Security chief	*Name withheld*	21-04-2016
KI10	M	UCLBP	Architect	*Name withheld*	22-04-2016
KI11	F	ONU Habitat	Advisor	*Name withheld*	25-04-2016
KI12	F	Entrepreneurs du Monde	Specialist in micro-finance	*Name withheld*	26-04-2016
KI13	F M	Comité interministériel d'aménagement du territoire (CIAT)	Urban planner Technical advisor	*Name withheld* *Name withheld*	27-04-2016
KI14	M	Université Quisqueya	Professor	*Name withheld*	28-04-2016
KI15	F	SODADE	Architect	*Name withheld*	01-05-2016
KI16	F	SODADE	Architect	*Name withheld*	01-05-2016
KI17	M	Mairie de Port-au-Prince	Market magager (street market)	*Name withheld*	02-05-2016
KI18	F M	Direction de la Protection Civile	Programme director Technical advisor	*Name withheld* *Name withheld*	04-05-2016
KI19	M M	UEH	Professor and lecturer	*Name withheld* *Name withheld*	06-05-2016
KI20	F	Ministère de l'Intérieur et des Collectivités territoriales	*Position withheld*	*Name withheld*	09-05-2016
KI21	F	N.A.	Economist	*Name withheld*	11-05-2016
KI22	M	Mairie de Pétion-Ville	*Position withheld*	*Name withheld*	13-05-2016
KI23	M	Mairie de Port-au-Prince	*Position withheld*	*Name withheld*	16-05-2016
KI24	M	Université Fondwa	Professor	*Name withheld*	06-08-2017
KI25	M	ONU-Habitat	Consultant	*Name withheld*	08-08-2017
KI26	F	Ministère de l'Intérieur et des Collectivités territoriales	*Position withheld*	*Name withheld*	10-08-2017
KI27	M	Mairie de Port-au-Prince	*Position withheld*	*Name withheld*	15-08-2017

Code	Gen-der	Organisation	Position or profession	Name	Date
KI28	M	Marché Canapé-Vert	Manager	*Name withheld*	25-08-2017
KI29	M	United Nations Development Programme (UNPD)	Project manager	*Name withheld*	28-08-2017
KI30	M	Marché La Coupe	Manager	*Name withheld*	29-08-2017

Appendix 11

Example of coding in NVivo

(literature review and interviews with traders)

Accueil | Créer | Données | Analyser | Requête | Explorer | Disposition | Affichage

Rechercher

Élément: Obtenir des informations
Presse-papiers: Couper, Copier, Coller
Format: Texte :
Paragraphe
Styles
Édition: Sélectionner, Rechercher, Insérer, Supprimer

DONNÉES
- Fichiers
  - Grey literature
  - LR food security
  - LR PTM trading
- Classifications du fichier
- Externals

CODES
- Nodes
  - On PTM
    - 1. PTM users' perspective
    - 2. PTM system
    - 3. PTM vulnerability
      - 3a. Sensibility (S)
      - 3b. Exposure (E)
      - 3c. Shock and stress i...
    - 4. PTM resilience
    - Z. Background
    - Z. Dimensions
    - Z. dossier de travail - bl...
  - Theory and methodology
    - Approach towards PTM...
    - Data collection method
    - Definitions
    - Reasons for...
    - Theoretical approach

CAS
- Cases
  - City, Country
  - Commodities
  - PTM user

Nom	Fichiers	Référen...
1 BE (I)	13	32
1 Market typology & equipment (I)	8	16
1 Damage or destruction of trading...	7	15
2 Loss of storage space	1	1
2 House typology & equipment (I)	3	8
1 Damage or destruction of house	3	8
3 Location (I)	9	17
1 Loss of trading location	7	10
2 Loss of house location and displa...	3	6
Z Streets blocked	1	1
2 ECO (I)	28	148
1 Income and assets (I)	20	50
1 Loss livelihood activity	2	3
2 Loss or reduced income	17	31
3 Loss or damage to supplies	7	19
2 Expenditure (I)	19	100
1 Food insecurity	19	100
3 Context and other economic factor...	0	0
3 SOC POL (I)	4	5
1 Social capital (I)	4	5
1 Disrupt social networks	3	4
Z Lost life	1	1
2 Local stakeholders (I)	0	0
3 State institutions and other actors (I)	0	0

2 Loss or reduced income — Encodage — Annotations

Relevé | Référence

Fichiers\\LR PTM trading\\Benit-Gbaffou, C.; (2016) - 3
1 référence encodée, couverture 0.23%

Référence 1: couverture 0.23%

Operation Clean Sweep, and the disruption of thousands of families' livelihoods, were halted thanks to those two street trading organisations – SaITf and SaNTra, plus aTO to some extent – being at the forefront of the confrontation with the City, leading the litigation. They might have fought for narrow interests ('legal traders'), out of an efficient legal strategy or in response to their main members' immediate interests, but the victory was for all, as stated by GIda.

Fichiers\\LR PTM trading\\Husain, S.;Yasmin, S.;Islam, M. S.; (2015) - 10
1 référence encodée, couverture 0.15%

Référence 1: couverture 0.15%

Due to inclement weather, strike majority of the vendors of Dhaka city are reported to have suffered a loss in their income.

Fichiers\\LR PTM trading\\Lyons, M.;Snoxell, S.; (2005) - 12
1 référence encodée, couverture 0.19%

Référence 1: couverture 0.19%

However, even where such a developmen-
tal approach is adopted, formalisation policies are rarely entirely successful (Lyons et al., 2001), and often fail entirely, as informal traders return to occupy public space, formal market buildings stand empty and traders often lose their livelihoods.

Interviews traders (NVivo 12)

Accueil | Créer | Données | Analyser | Requête | Explorer | Disposition | Affichage

Rechercher

Fermer tout | Fermer | Zoom | Fenêtre de travail | Bandes d'encodage | Surligner | Nœud | Matrice de croisements | Classification

Application | Fenêtre | Encodage | Fenêtre de travail

- Fichiers
- Caractéristiques du fichier
- Alias

CODES

- Nœuds
  - 1 Expérience, profil et emplacement
  - 2 Services et dépenses
  - 3 Environnement physique et vulnérabilité
  - 4 Stress et impact
  - 5 Chocs et impact
  - 6 Pratiques commerciales et culturelles
  - 7 Changement et gouvernance
  - 8 Capital social
  - Autre
  - Z Fréquences et temps
  - Z Nombre et ordre importance

CAS

- Cas
- Caractéristiques de cas

COMMENTAIRES

RECHERCHER

- Requêtes
- Résultats
- Matrices de croisements
- Ensembles

CARTES

ÉLÉMENTS OUVERTS

si on les vend mal ou ne donne pas de surplus

Nom	Référen...
26.a) nombre clients pratik et importance	124
28. nombre clients pratik	122
29. Raisons pour perdre client pratik	122
mauvais comportement mauvais accueil	82
mauvais qualité de marchandise ou de service	32
prix trop élevés ou vend cher	29
si on les vend mal ou ne donne pas de surplus	27
dette non-payée ou crédit non payé	20
mort ou maladie	12
quitter le quartier ou le pays ou déménagement	14
choisi un autre marché	11
si ne peut accéder au marché (pas de route)	6
s'il trouve tout à l'extérieur	3
préférence d'un autre marché	2
si on ne réussi pas à l'attirer	1
si on n'accepte pas de vendre à crédit	8
mauvais produit	5
si mon emplacement change de palce	5
si le client n'a plus les moyens d'acheter	3
autre	2
je n'ai jamais perdu de client	2
si le marché ou emplacement devient trop sale	2
si tu voles ou ne donne pas la monnaie	2
client trop pressé	1
incendie	1
insécurité	1
mauvaises odeurs	1
si le marchand ne résou pas son problème ave...	1
si on encadre pas le client	1
situation économique	1

si on les vend mal ou ne donne pas de surplus — Encodage — Annotations

Relevé | Référence

Fichiers\\Co121-130_Page48
1 référence encodée, couverture 3.85%

Référence 1: couverture 3.85%

Fichiers\\Co131-135_Page14
1 référence encodée, couverture 8.92%

Référence 1: couverture 8.92%

Fichiers\\Co131-135_Page31
1 référence encodée, couverture 5.18%

Référence 1: couverture 5.18%

Fichiers\\Co21-30_Page146
1 référence encodée, couverture 2.30%

Référence 1: couverture 2.30%

CODES › Nœu › 6 Pra › 29. Raisons pour perdre client pratik › si on les vend mal ou ne donne pas de surplus

Appendix 12

Example of frequency analysis in SPSS

(structured interviews with customers)

customers_stats.sav [DataSet1] - IBM SPSS Statistics Data Editor

	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	Cas	String	10	0		None	None	10	Left	Nominal	Input
2	Genre	Numeric	1	0		{1, Female}...	0	5	Right	Nominal	Input
3	Age	Numeric	1	0		{1, Young adult}...	0	7	Right	Nominal	Input
4	Marché	Numeric	1	0		{1, MeF}...	0	9	Right	Nominal	Input
5	Infrastructure	Numeric	1	0		{1, Covered by hall}...	0	7	Right	Nominal	Input
6	Q1	Numeric	2	0	Frequency of visit	{1, More than once ...	0	11	Right	Ordinal	Input
7	Q1b	Numeric	8	0	Frequency of visit	{1, More than once ...	0	8	Right	Ordinal	Input
8	Q2	Numeric	2	0	Mode of transport	{1, Walk}...	0	11	Right	Nominal	Input
9	Q2b	Numeric	8	0	Mode of transport	{1, Walk}...	0	8	Right	Nominal	Input
10	Q3	Numeric	2	0	Travel time	{1, Less than 15 mi...	0	11	Right	Ordinal	Input
11	Q3b	Numeric	8	0	Travel time	{1, Less than 15 mi...	0	8	Right	Ordinal	Input
12	Q2_3	Numeric	8	0	30 min walking distance	{1, 30 min walking ...	0	8	Right	Nominal	Input
13	Q4	Numeric	2	0	History of residence in n...	{1, Less than a year...	0	11	Right	Ordinal	Input
14	Q5a	Numeric	2	0	Buy food for household f...	{1, Always}...	0	11	Right	Ordinal	Input
15	Q5b	Numeric	2	0	Buy good for household ...	{1, Always}...	0	11	Right	Ordinal	Input
16	Q5c	Numeric	2	0	Buy food for someone else	{1, Always}...	0	11	Right	Ordinal	Input
17	Q5d	Numeric	2	0	Buy other basic commod...	{1, Always}...	0	11	Right	Ordinal	Input
18	Q5e	Numeric	2	1	Buy commodities for res...	{1,0, Always}...	,0	11	Right	Ordinal	Input
19	Q5f	Numeric	2	0	Buy more specialized co...	{1, Always}...	0	11	Right	Ordinal	Input
20	Q5g	Numeric	2	0	Socialize with my friends	{1, Always}...	0	11	Right	Ordinal	Input
21	Q5h	Numeric	2	0	Get to know what is goi...	{1, Always}...	0	11	Right	Ordinal	Input
22	Q6	Numeric	2	0	Do you visit other marke...	{1, Yes}...	0	11	Right	Nominal	Input
23	Q9a	Numeric	2	0	Close family or household	{1, Very large supp...	0	11	Right	Ordinal	Input
24	Q9b	Numeric	2	0	Neighbours	{1, Very large supp...	0	11	Right	Ordinal	Input
25	Q9c	Numeric	2	0	Extended family	{1, Very large supp...	0	11	Right	Ordinal	Input
26	Q9d	Numeric	2	0	Family or friends living a...	{1, Very large supp...	0	11	Right	Ordinal	Input
27	Q9e	Numeric	2	0	Friends at the market	{1, Very large supp...	0	11	Right	Ordinal	Input
28	Q9f	Numeric	2	0	Other friends or contacts	{1, Very large supp...	0	11	Right	Ordinal	Input

Data View | Variable View

IBM SPSS Statistics Processor is ready | Unicode:ON

Infrastructure * Frequency of visit * Marché

Crosstab

Count

Marché			Frequency of visit: More than once a day	Once a day	More than once a week	Once a week or less	Total
MLL/MRP	Infrastructure	Uncovered by hall	6	17	3	8	34
	Total		6	17	3	8	34
MCV	Infrastructure	Covered by hall	7	18	6	2	33
	Total		7	18	6	2	33
MLC	Infrastructure	Covered by hall	1	5	0	2	8
		Uncovered by hall	5	8	5	7	25
	Total		6	13	5	9	33
Total	Infrastructure	Covered by hall	8	23	6	4	41
		Uncovered by hall	11	25	8	15	59
	Total		19	48	14	19	100

Appendix 13

Confidentiality agreement with research assistants

(in French)

Entente de confidentialité

J'ai, en tant qu'assistant(e) de recherche volontaire, été sélectionné(e) pour effectuer des entrevues en créole sous la supervision directe de David Smith, *chercheur* et candidat au doctorat, ainsi que la traduction et transcription écrite à la main et à l'informatique en français des verbatim des entrevues.

Je, soussigné, accepte de :

1. garder toutes les informations qui me sont partagées confidentielles, en ne discutant ou en ne partageant l'information de la recherche, de n'importe quel format ou forme que ce soit (par ex. : verbalement, notes manuscrites, transcription informatique, etc.), qu'avec le *chercheur*.

2. garder toutes les informations de la recherche, de n'importe quel format ou forme que ce soit (par ex. : notes manuscrites, transcription informatique sur clé USB ou par courriel, etc.), de manière sécuritaire quand ils sont en ma possession.

3. retourner toutes les informations de la recherche, de n'importe quel format ou forme que ce soit (par ex. : notes manuscrites, transcription informatique, etc.), au *chercheur* quand j'aurai complété les tâches de recherche demandées.

4. après l'accord du *chercheur*, effacer ou détruire toutes les informations liées à la recherche, de n'importe quel format ou forme, qu'il est impossible de retourner au *chercheur* (par ex. : information sur le disque dur d'un ordinateur, dans la corbeille, dans la boîte de réception, d'envoi ou des messages effacés du service de courrier électronique, etc.).

Je, soussigné, comprends que je suis en tout temps entièrement responsable de ma propre sécurité. S'il y a lieu, je m'engage à communiquer mon sentiment d'insécurité ou d'inconfort au *chercheur.* Je reconnais avoir le droit de refuser de poursuivre le travail de terrain, et ce à tout moment, lorsque je sens que ma sécurité est menacée.

Je comprends aussi que mon travail sera compensé financièrement par le *chercheur* à raison de 15 USD par journée complète de travail, avec possibilité d'augmentation si le travail est effectué professionnellement dans des délais raisonnables et à la satisfaction du *chercheur*.

Le *chercheur* s'engage également, dans la mesure de ses disponibilités et de ses capacités, à m'épauler dans mes démarches universitaires et professionnelles (par ex. lettre de recommandation).

Nom de l'assistant(e)	Signature	Date	Lieu
Nom du *chercheur*	Signature	Date	Lieu

Appendix 14

Oral consent agreement with traders and customers

(in Haitian Creole)

Ranfòse « rezilyans » mache yo ak ti machann yo : etid nan rejyon metropolitèn Pòtoprens, Ayiti.

David Smith, candidat au doctorat, david.smith@ntnu.no

Université norvégienne des sciences et technologies (NTNU)

M ap fè yon rechèch sou mache piblik yo ak mahce ki fèt nan lari yo nan Pòtoprens. M ap chèche konprann kòman yo fonksyone e kisa nou fè, savledi reyaksyon nou menm machann yo nan sitiyasyon difisil tankou : lè gen dife, lè lameri deplase nou, elatriye.

M ap fè yon etid pou doktora nan **Université norvégienne des sciences et technologies**. M pa asosye ak okenn antrepriz komèsyal, laprès, gouvènman peyi d Ayiti ou peyi aletranje, Oganizasyon non-gouvènmantal (ONG), elatriye. M gen akò direktè a men m pap fè ankèt pou li.

M vle mande w konsantman w pou m fè yon ti koze avè w. Sa w ap di m yo antanke machann oubyen kliyan, k ap itilize mache a, enpòtan anpil pou mwen anpil nan kad reyalizasyon travay mwen an.

Kesyon m yo ap chita prensipalman sou eksperyans ou nan mache a tankou machann. M ap fè yon ti koze avè w pandan anviwon 60 minit. Mwen menm ak asistan m yo ap itilize lang kreyòl pou ti koze sa a e n ap pran nòt yo an fransè. Mwen garanti w mwen pa p sèvi ak non w nan travay mwen an, sèlman enfòmasyon yo m bezwen. Pèson p ap ka idantifye w nan dokiman pwojè sila a. M ap ekri non w nan yon lòt kaye sizoka m ta vle rankontre w yon lòt fwa pou kèlke kesyon ankò e kaye sa a se mwen selman k ap sèvi ak li.

Patisipasyon w volontè, ou ka deside nenpòt moman sispann kolabore ak mwen, m pa p poze w pyès kesyon si w ta fè sa. Ou ka deside pa reponn yon kesyon si l deranje w, mande m mete yon bout ak ti pale a oubyen mande m mete l nan yon lè ou plis dispoze. Si toutfwa ou deside kite pwojè a nèt, m ap mete sou kote tout enfomasyon w te ban mwen yo.

Nan finisman travay mwen an, map mete tout enfòmasyon ki pwòp ak ou yo sou kote. Dat ki kenbe pou n mete bout ak pwojè sa a se 1er oktob 2018.

Eske w dakò m fè ti pale avè w ak kondisyon sa a yo ?

Appendix 15

Written consent agreements for key informants

(in French and Haitian Creole)

Renforcer la résilience des marchés de petit commerce :
le cas de Port-au-Prince, Haiti

David Smith, candidat au doctorat, david.smith@ntnu.no
Université norvégienne des sciences et technologies (NTNU)

Le projet de recherche concerne les marchés publics et les marchés de rue avoisinants à Port-au-Prince et à Pétion-Ville, Haïti. Le projet a pour objectif de comprendre comment fonctionnent les marchés de petit commerce et comment ils sont utilisés par les petits commerçants et leurs clients.

Le projet de recherche est indépendant, c'est-à-dire qu'il est associé à aucune agence gouvernementale ou non-gouvernementale (ONG), compagnie commerciale ou agence de presse. La recherche est financée à même le budget de recherche pour doctorants de l'université à laquelle je suis attaché.

Je vous demande donc cordialement votre consentement pour une entrevue. Votre point de vue en qualité d'expert(e), manager ou fonctionnaire sur la question des marchés est important pour mener à bien cette recherche.

Les questions porteront principalement sur le phénomène des marchés de petit commerce, les évènements qui les affectent ainsi que les actions et projets qui les concernent. Un entretien type dure moins de 60 minutes et comporte une vingtaine de questions. Vous êtes invité à fournir autant d'information que possible ainsi que des exemples lorsque pertinent.

Avec votre consentement, l'entretien sera enregistré. Je garantie en tant que chercheur l'anonymat et la confidentialité des informations que vous êtes prêt(e) à me transmettre. Vous ne serez donc pas identifiable dans aucune publication. Votre nom et vos coordonnées seront liés à un code de référence, le tout noté séparément dans le but de pouvoir vous contacter ultérieurement au besoin. Moi seul aura accès à ce document.

La participation à ce projet est volontaire et vous avez le droit de retirer à tout moment votre consentement, et ce sans explication. Vous pouvez également refuser de répondre à une question en particulier et vous pouvez demander l'arrêt de l'entrevue et/ou de son enregistrement à tout moment. Vous pouvez également remettre la poursuite de l'entrevue à plus tard. Si vous décidez de vous retirer complètement avant la fin du projet, toutes vos informations personnelles seront détruites ou rendues anonymes.

Autrement, lors de la publication partielle ou finale de la thèse de doctorat, toutes les informations personnelles seront détruites ou rendues anonymes. La date prévue pour la fin du projet de recherche est fixée au 1er octobre 2018. Le projet de recherche (no 54596) a été notifié à une agence norvégienne de protection des données scientifiques (Data Protection Official for Research, Norwegian Centre for Research Data).

J'ai lu et comprend les informations ci-dessus et je consens à participer à l'entrevue.

_____	_____
Nom	*Date*
_____	_____
Signature	*Lieu*

Ranfòse « rezilyans » mache yo ak ti machann yo : etid nan rejyon metropolitèn Pòtoprens, Ayiti.

David Smith, candidat au doctorat, david.smith@ntnu.no
Université norvégienne des sciences et technologies (NTNU)

M ap fè yon rechèch sou mache piblik ak mache ki fèt nan lari a nan zòn Pòtoprens, Petyonvil, Ayiti. Pwojè a gen pou objektjif konprann kòman mache yo fonksyone, fason ti machann ak kliyan yo itilize l e relasyon ki devlope ant ti machann yo ak kliyan yo.

Pwojè rechèch sa a endepandan, savledi, li pa asosye ak okenn antrepriz komèsyal, laprès, gouvènman peyi d Ayiti ou peyi aletranje, Oganizasyon non-gouvènmantal (ONG). Rechèch sa a finanse ak kòb Inivesite m ladan l lan rezève pou doktoran l yo.

M vle mande w konsantman w pou m fè yon ti koze avè w. Sa w ap di m yo antanke ekspè, otorite k ap jere mache a, enpòtan pou mwen anpil nan kad reyalizasyon travay mwen an.

Kesyon yo ap chita sou femonèm mache ti komèsan yo, evènman ki konn frape yo e aksyon ak pwojè konn fèt apre sitiyasyon sa yo. Ti koze m ap fè avè w la p ap plis pase 60 minit e m ap poze w 20 kesyon yo konsa. Li t ap bon anpil si w ban nou plis enfòmasyon posib ak kèlke ekzanp ou wè ki kapab ede nou reyalize travay sa a.

Si w dakò, ti pale nou an ap anrejistre. Mwen garanti w antanke pwofesyonèl k ap fe rechèch, m ap gade enfomasyon w pral transmèt mwen yo sekrè. Mwen pa p sèvi ak non w nan travay mwen an, sèlman enfòmasyon yo m bezwen. Pèson p ap ka idantifye w nan dokiman pwojè sila a. Non w ak enfòmasyon pesonèl ou yo ap nan yon kaye sizoka m ta vle rankontre w yon lòt fwa pou kèlke kesyon ankò e kaye sa a se mwen selman k ap sèvi ak li.

Patisipasyon w volontè, ou ka deside nenpòt moman sispann kolabore ak mwen, m pa p poze w pyès kesyon si w ta fè sa. Ou ka deside pa reponn yon kesyon si l deranje w, mande m mete yon bout ak ti pale a/anrejistreman an oubyen mande m mete l nan yon lè ou plis dispoze. Si toutfwa ou deside kite pwojè a nèt, avan l rive nan bout li, m ap mete sou kote tout enfomasyon w te ban mwen yo.

Depi m fin pibliye pasyèlman oubyen tout pwojè « thèse » doktora m nan, map mete tout enfòmasyon ki pwòp ak ou yo sou kote. Dat ki kenbe pou n mete bout ak pwojè sa a se 1er oktob 2018. Pwojè rechèch sa a ki gen (no 54596) deja nan men yon ajans nan peyi Novèj « Agence norvégienne de protection des données scientifiques (Data Protection Official for Research, Norwegian Centre for Research Data)».

Mwen li e konprann enfòmasyon ki ekri anwo a, e m dakò ba w tout enfomasyon w bezwen yo.

_____ _____

Non *Dat*

_____ _____

Siyati *Zòn*