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Containerization of Urban Space: Implications for Spatial and Urban Transformation

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Abstract

Jonathan Woetzel, Jan Mischke, and Sangeeth Ram once wrote a comprehensive policy paper in the Harvard Business Review that the world's housing crisis doesn't need a revolutionary solution. Assuredly, what the world needs is an innovative solution to the housing crisis. Though urban researchers have long been concerned with the transformation of the urban fabric, less attention has been paid to the unraveling of the materiality of urban processes. With state intervention in housing and critical infrastructure provision far from sight, urban dwellers, especially in the global south, are turning to alternative strategies to deal with the realities of urban life. The container has effectively transcended its core mandate as the facilitator of global trade. Against this backdrop, this thesis deconstructs containerization from the global political economy to critical urban studies, a link, frequently ignored, in mainstream literature. More specifically, this thesis investigates the normalization of urban anomalies, such as the containerization of urban space. The thesis also explores the negative effects of container urbanism, mostly the risk to spatial planning and sustainable urban development. The containerization of urban space is an epoch-defining process and a watershed moment in the urban dynamic of Ghana. Fundamentally, the container anthropomorphizes the urban condition. The container perfectly analogizes bare life and exposes the lived realities of a large section of the urban population within the logic of glocal neoliberal governance. This thesis subscribes to the notion that the concepts of disruption, momentum, and risk are useful for understanding the mechanisms and framework for theorizing the materiality of urban processes such as the containerization of urban space. The thesis adopts both qualitative and quantitative approaches, using six neighborhoods within the Accra Metropolitan Area of Ghana as the primary case study. The thesis draws further comparative cases from cities in the United Kingdom, South Africa, and the United States of America. The empirical strategy also consists of secondary data drawn from various sources. The analysis shows that whereas container urbanism serves as an expressive symbology of architectural grandeur, monumentalism, and an ostentatious display of environmentally conscious living in the western urban discourse, such interventions in the global south are genuine attempts by low-income households to claim the right to the city. This thesis shows that the crisis and the ethos of rage against the traditional property market have accelerated and magnified the transition towards experimentation with 'containers' as an alternative process of urban housing and livelihood. The spatiotemporal neighborhood-level analysis reveals that material durability, affordability, and a sense of immediacy underpins the allure of container improvisation. For many, the improvisation of the container has reduced some uncertainties of urban life by ensuring a stable transition into the formal property market. The analysis also shows that container improvisation in Accra is a consequence of fragmentations

in the economic and social order. If this thesis has been clear on one singularity, it is that container improvisation is no longer a fringe process in the urban built environment, but increasingly becoming normalized, and hegemonized. The thesis also discusses the implications of container urbanism on the de-professionalization of urban design and the illusion of control by local authorities regarding the incremental and disorderly manifestation of informal urban processes.

Keywords: Accra, Containerization, Disruption, Ghana, Urban space

Abstract (Italian)

Jonathan Woetzel, Jan Mischke e Sangeeth Ram hanno dichiarato nel loro documento politico completo sull'Harvard Business Review che la crisi immobiliare nel mondo non ha bisogno di una soluzione rivoluzionaria, ma di una soluzione innovativa alla crisi degli alloggi. Sebbene i ricercatori urbani si siano a lungo interessati alla trasformazione del tessuto urbano, meno attenzione è stata prestata allo svelamento della materialità dei processi urbani. Con l'intervento statale nella fornitura di alloggi e infrastrutture critiche lontano dalla vista, gli abitanti delle città, specialmente nel sud del mondo, si stanno rivolgendo a strategie alternative per affrontare le realtà della vita urbana. Il container ha effettivamente trasceso il suo mandato principale come facilitatore del commercio globale. In questo contesto, questa tesi decostruisce la containerizzazione dall'economia politica globale agli studi urbani critici, un collegamento, spesso ignorato, nella letteratura tradizionale. Più specificamente, questa tesi valuta la normalizzazione delle anomalie urbane, come la containerizzazione dello spazio urbano. La tesi esplora anche gli effetti negativi dell'urbanistica dei container, in particolar modo il rischio per la pianificazione spaziale e per lo sviluppo urbano sostenibile. La containerizzazione dello spazio urbano è un processo epocale e un momento di svolta nella dinamica urbana del Ghana. Fondamentalmente, il contenier antropomorfizza la condizione urbana. Il contenitore analizza perfettamente la nuda vita ed espone le realtà vissute di un'ampia fascia della popolazione urbana all'interno della logica del governo neoliberale locale. Questa tesi sottoscrive l'idea che i concetti di interruzione, slancio e rischio siano utili per comprendere i meccanismi e la struttura per la teorizzazione della materialità dei processi urbani come la containerizzazione dello spazio urbano. La tesi adotta approcci sia qualitativi che quantitativi, utilizzando sei quartieri all'interno dell'area metropolitana di Accra del Ghana come caso di studio principale. La tesi attinge ad ulteriori casi comparativi prendendo in considerazione città del Regno Unito, Sud Africa e Stati Uniti d'America. La strategia empirica è costituita anche da dati secondari tratti da varie fonti. L'analisi mostra che mentre l'urbanistica dei container funge da simbologia espressiva di grandezza architettonica, monumentalismo e ostentata dimostrazione di una vita rispettosa dell'ambiente nel discorso urbano occidentale, tali interventi nel sud del mondo sono tentativi genuini da parte delle famiglie a basso reddito di rivendicare il diritto alla città. Questa tesi mostra che la crisi e l'ethos della rabbia contro il mercato immobiliare tradizionale hanno accelerato e amplificato la transizione verso la sperimentazione dei "conteiner" come processo alternativo di abitazione e sostentamento urbano. L'analisi spazio-temporale a livello di quartiere rivela che la stabilità e resistenza del materiale, l'accessibilità economica e un senso di immediatezza sono alla base del fascino dei container. Per molti, l'istallazione dei container ha ridotto alcune incertezze della vita urbana garantendo una transizione stabile nel mercato immobiliare formale. L'analisi mostra anche che tale fenomeno ad Accra è una conseguenza della frammentazione nell'ordine economico e sociale. Grazie a questa tesi è stato dimostrato come lo sviluppo dei conteiners non è più un

processo marginale nel tessuto urbano, ma sta diventando sempre più normalizzato ed egemonizzato. La tesi discute anche le implicazioni dell'urbanistica dei container sulla deprofessionalizzazione della progettazione urbana e l'illusione del controllo da parte delle autorità locali riguardo alla manifestazione incrementale e disordinata dei processi urbani informali.

Parole chiave: Accra, Containerization, Disruption, Ghana, Urban space

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Chapter One: Introduction

1.1. Background

The world is increasingly becoming more urbanized (UN, 2014; Lefebvre, 1970; UN-HABITAT, 2016; Myers, 2011; Jenkins et al. 2007). Empirically, urbanization has been strongly associated with fundamental transformations of the earth's surface. David Harvey, an authority on Marxist urban discourse, remarked in *Justice, Nature & the Geography of Difference* that "The future of the most of humanity now lies, for the first time in history, fundamentally in urbanizing areas" (Harvey, 1996, p. 403). Davis (2006) suggested that about 10% of the world's population was urbanized at the beginning of the twentieth century. By 1975, the urban population already accounted for a third of the world's population. Urban population is expected to reach 56 percent by 2030 (Davis, 2006). Compared to the rest of the world, the trend of urbanization is accelerating much faster in low-income countries. From 1950 to 2000, the urban population in low-income countries increased from 18 to 40 percent (UN-HABITAT, 2007). Fundamentally, urban growth has allowed many low-income countries to achieve relative economic development and lift people out of poverty through job creation. However, many people are missing out on basic amenities, durable and affordable housing, and the right to the city, as urbanization continues to rise in these countries.

What makes an urban space or city distinctive? Borden et al. (2000, p. 14) remarked that: "cities are complex systems of representations, in which space and time are understood and experienced in the form of a representation". Historically, urbanization has been associated with other important economic and cultural changes, which have brought greater geographic mobility, lower fertility, longer life expectancy, and population aging. Cities are like a double-edged sword, on one hand, they are important drivers of development and poverty reduction in both urban and rural areas, as they concentrate much of the national economic activity, government, commerce and transportation, and provide crucial links with rural areas, between cities, and across international borders (UN, 2014). On the other hand, the rapid urban population growth and migration rate threaten sustainable development when the necessary infrastructure policies are not implemented to ensure that the benefits of city life are equitably distributed. Hall (2006) also argued that the growing level of inequality in cities and understanding the processes that sustain such inequalities necessitated the study of urban geography. Despite the fact that cities

account for 80% of global GDP (UN-HABITAT, 2016), an equally incremental exclusion of the majority of the urban population is visible across both developed and less developed countries. The reduction of the built environment in cities as a speculative instrument for financial accumulation has contributed to this widespread marginalization.

Cities in the global south are increasingly becoming growth poles of investment, endemic poverty, and systemic inequality (Obeng-Odoom, 2015, p. 555). The rising demand for urban space has fueled high rent prices and predatory practices of landowners (Obeng-Odoom, 2015). Harvey (1974) referred to this process as a 'class-monopoly rent' where people are deliberately excluded and discriminated against in the housing market through the house price inflation. Consequently, high rents pushed the majority of the urban poor into the margins and contributed to the development of urban slums and other cost-effective housing schemes. These settlements are, however, characterized by limited security of tenure, poor sanitation, overcrowding, and poor access to safe drinking water (UN-HABITAT, 2006). Studies have found a significant relationship between urban population growth and slum development (UN-HABITAT, 2016). Progress has been slow to address inequality and housing needs of the urban poor, despite a significant drop in the number of people living in urban slums (urban slum population in Ghana declined by 16% between 2000 and 2010) (UN-HABITAT, 2016; Ministry of Local Government and Rural Development, 2015). This trend shows that the attainment of the Sustainable Development Goal (SDG 11) is untenable. Furthermore, the implementation of neoliberal policies in Low-Income Countries produced uneven development at both national and urban levels. Trade liberalization and structural adjustment policies introduced in the 1908s re-enforced and entrenched this unevenness at multiple scales. The institutionalization of neoliberal policies in low-income countries hegemonized postcolonial capitalism which contributed to poor spatial planning, rapid population growth, low expansion of housing units, weak urban administration and governance system (Ardayfio-Schandorf et al., 2012; Gillespie, 2016; Grant, 2009; Owusu, 2008;2012; Yeboah & Obeng-Odoom, 2010; Sanyal, 2007).

1.2. Research Problem

"The real problems of prefabrication—as a means of providing more homes more quickly and at a lower cost— (is that) ……….. If you were homeless you would regard one as heaven; if you were a housing manager, you would see them as a confession of failure" (Ward, 1979, p. 45)

According to UN-HABITAT (2016), 90% of urban housing in Ghana is provided by the informal sector (consistent with the overall trend in low-income countries). On a global scale, an estimated 18% of all urban housing units in the world are a product of non-durable building materials (UN-HABITAT, 2006). These non-durable housing units violate building codes and regulations and are prone to disasters such as landslides, floods, and pollution (UN-HABITAT, 2006).

Grant's (2009) treatise on *Globalizing Cities: The Urban and Economic Transformation of Accra, Ghana* requires considerable attention when conceptualizing urban transformation in Ghana. According to Grant (2009, p. 7), an urban environment in a globalizing city is "fragmented, chaotic, and spatially messy. It does not fit neat categories and/or simple compartmentalizations into traditional and modern, formal and informal". Urban areas in Ghana are associated with pronounced deterioration of infrastructures, poor housing environment and deficit, and the demand for shopping and retail space (Ardayfio-Schandorf et al., 2012; Gillespie, 2016; Obeng-Odoom, 2009). These shortcomings and the resourcefulness of urban dwellers in Ghana have necessitated the adoption of innovative materials such as the Steel Containers, as an alternative mode of production (Grant, 2009). Fundamentally, these containers are much cheaper, less time consuming, and happens on the blind side of the law. The wave of container adoptions in urban space accelerated the institutionalization of container structures within the general classification of a house. For instance, at the time of the census, the Ghana Statistical Service (2012:11) defined a house as any shelter used as living quarters, such as a hut or group of huts enclosed as a compound, kiosks, containers, and tents. The standard shipping container has effectively transcended its core mandate as the facilitator of global trade. The conversion of the standard shipping container to suit a variety of applications in construction, modular and transportable factories, pop-up shops and retail centers, medical, temporal, and emergency shelters have increased tremendously in recent years. The results from the 2000 and 2010 population and housing census indicated that the proportion of containers (largely categorized under impoverished homes) in the Greater Accra region alone, the capital of Ghana increased from 3.7% to 6.1% between 2000 and 2010 respectively (Ghana Statistical Service, 2012). According to the Bank of Ghana (2007, p. 11), improvised houses (Kiosks/containers) are widespread in urban areas of the Greater Accra and Ashanti regions. The Bank of Ghana (2007) stressed that the proliferation of these improvised houses (Kiosks/containers) is as a result of rural-urban migration. These improvised houses are especially for commercial and residential

purposes (Bank of Ghana, 2007). A large number of scholarships concerning urbanization in Ghana are directed specifically towards the examination of rural-urban migration and corresponding implication (Addo, 1969; Caldwell, 1969; Bobo, 1974; Aryeetey, and Aryeetey, 1992; Ardayfio-Schandorf et al., 2012; Davis, 2006), urban governance and land use administration (Awuah and Hammond, 2014; Adarkwa, 2013; Mohan, 1996; Laryea-Adjei, 2000; Grant, 2009; King et al., 2001; Yeboah and Obeng-Odoom, 2010;2013a; Owusu, 2008;2012; Owusu and Kotey, 2010; Gough, and Yankson, 2000; Yeboah, 2000) the growing influence of urban gentrification (Eduful and Hooper, 2015; Amoah, 2012; Adarkwa and Oppong, 2005) the informal sector as a catalyst for urban growth, and studies relating to demographic transition of urban population (Adaawen and Jorgensen, 2012; Arguello et al., 2013; Benneh et al., 1990; Oteng-Ababio, 2012; Obeng-Odoom 2010a; 2011;2012; Gillespie, 2015;2016;2017; Grant and Oteng-Ababio, 2016; Oteng-Ababio and Arguello, 2014; Yankson, 2000). Most of these studies have often failed to empirically address the fundamental question of how certain innovation processes such as the Steel Containers are transforming the urban landscape of Ghana. In essence, the proliferation of steel containers as an innovation process is usually ignored in urban geography literature in the global south even though the innovation has created a blind spot of startling proportions. Furthermore, context-specific studies on the application of containers are limited to disaster and post-disaster situations (Cai and Hu, 2017; Pena and Schuzer, 2012; Zhang et al. 2014; Gionvinazzi et al., 2011; Nigg et al., 2006). For instance, Hong's (2017) study explored the application of the container as a temporary housing solution in disaster areas. Hong (2017) argued that the container provides both temporary shelter solutions for disaster victims and easily recyclable. Lee (2012) also noted that the container can be assembled within a short time and at a lower cost compared to steel frames, prefabricated houses, and conventional brick and mortar structures. Exploring the sustainability dynamics of the container, Hong (2017) further argued that the environmental cost of using the container is minimal, contributes towards the recycling of industrial materials, propel the proliferation of circular economy, because housing is a human right and the application of the container ensures the provision of affordable infrastructure for the poor and marginalized. Hong (2017) also acknowledged the comparative diversity of container improvisation between continental Europe and North America. Oppong et al.'s (2015) study on *Containerisation, Portable Architecture, and the Image of Ghanaian Cities* offer an insight into the container paradigm in Ghana, despite

lacking significant theoretical framing. This thesis is particularly significant because it constitutes a clear departure from the analysis of containerization in mainstream architecture and international trade. In this research, containerization is perceived through the lenses of the city and how the container shapes the morphology of urban life.

Based on this analogy, this thesis explores the link between alternative urban processes and sustainable urban development. Furthermore, the study addresses significant theoretical gaps for understanding emerging urban processes in African cities. Mainstream urban research in low-income countries often fails to conceptualize the relationship between or the impact of emerging urban processes on spatial transformation. Western models still dominant contemporary discourse on urban scholarship in the global south despite calls for an African agency for understanding social and spatial configurations of cities (Freund, 2007; Myers, 2003;2011; Pieterse, 2008a;2010; Robinson, 2004;2006; Simone, 2004). Myers (2011) and Pieterse (2008a) shows, for example, how scholars such as Henry Lefebvre, Doreen Massy, Manuel Castells, David Harvey, and Saskia Sassen write off the African urban struggle in urban theory production. In light of the epistemological and ontological contradictions on the right frame of reference for African cities, Locatelli and Nugent (2009, p. 4) proposed that:

African urbanism, therefore, must be understood as a phenomenon involving the interrelations between global forces, which influence development on a worldwide scale, and local reactions and initiatives that vary according to social, political, and cultural patterns in a specific context and period of time. This approach facilitates the identification of the nature of old and new competing claims on urban spaces and the understanding of how city dwellers forge their own way of dealing with expansion.

This research builds on Gillespie's (2016) conceptualization of the spatial practices of informal urban proletariats in Accra through his analogy of quiet encroachment to a bold appropriation of urban space. Gillespie (2016, p. 979) proposed that the exclusion of informal proletariats from formal wage labor and the property market has produced a very uneven urban geography and resulted in the appropriation of urban space. Gillespie (2016) further observed how informal traders create urban commons by transforming public space into vibrant improvised marketplaces. Gillespie (2016) identified spatial practices such as the proliferation of unauthorized structures along roads and public spaces by squatters and hawkers as a form of quiet encroachment. Fundamentally, the bold appropriation of urban space in Ghana by hawkers and squatters is a form of collective organization (referring IHVAG and GHAFUP) (Gillespie, 2016). This thesis departs from the widely accepted analogy that the processes of urban

appropriation are *quiet, individual, and gradual* (Bayat, 1997, p. 58; Gillespie, 2016). This thesis instead floats the idea that the appropriation of urban space is *disruptive, gaining momentum, and risky*.

It is hardly surprising that astute researchers continually conceptualize African cities as chaotic. Förster and Ammann (2018, p. 5) argued that "writings on urbanization in Africa tend to be normative; many views are either overly optimistic or pessimistic while balanced perspectives seem to be the exception." Such simplistic generalizations point towards the real crisis in both contemporary theory and practice. To achieve the prerequisite theoretical framework, this research assembles an interdisciplinary constellation of theories to contextualize the container paradigm in urban space.

1.3. Research Objectives

This research seeks to understand how the social and spatial dimensions of the built environment in cities in Low-Income Countries are appropriated and transformed by technological innovations such as the container. Put differently, this present study concerns the problematization of urban transformation through the prism of the container.

1.3.1. Research Questions

Pathway 1: Regarding Containers
   a. What factors propel the adoption and innovation diffusion of Steel Containers as an option for retail and dwelling space in urban areas?

Pathway 2: On the transformation of urban space
   a. How are containerized spaces produced, co-produced, experienced, perceived, and contested?
   b. Does the innovation diffusion of Steel Containers in urban areas exhibit any spatial structure?
   c. Does the innovation diffusion of Steel Containers have an impact on urban planning and sustainable urbanism?
   d. Does the adoption of steel containers affect urban social interactions?

1.4. Why Containers? An Ontological Rendition

Klose (2015) posed a set of questions to guide researchers on how to conceptualize containerization. Klose (2015) specifically, draws our attention to questions such as, what are the requirements for thinking about containerization? What order of things and discourses accompanies an age of containers?

Simply put, a container as defined by in Cambridge dictionary is

a hollow object, such as a box or a bottle, that can be used for holding something, especially to carry or store it:
an airtight container, a plastic drinks container
or
a very large metal box used for transporting goods:
a container ship/lorry

Containers are either aluminum or steel (Rodrigue et al., 2006). In 1934, Italian politician and entrepreneur, Silvio Crespi published a treatise in the inaugural edition of *Der Behälter* that laid the foundation for the epistemic conceptualization of the container (Klose, 2015). Titled What is a Container? Crespi explained that:

In the broadest sense, the word "container" (cadre or Behälter) denotes everything which holds objects of any kind. Thus, for instance, boxes were used since remote antiquity as a means of transportation. Wild………… The modern container … is no normal crate, but rather the mobile box of the carriage, divided into subunits. In this sense, the container divides the carriage and the truck into two parts: first, a portion that we will call the secure portion, and which is formed by the wheels, the springs, and the platform, and second, the box. This box forms the mobile portion, can be detached from the secure portion and can be transferred readily from one means of transport to another.… In this way, the container makes possible international house-to-house transport via multiple modes of transport. Reloading is kept to a minimum, and the goods within the container are not touched at all.… In order to clarify the nature of the modern container, the Italians call it the "cassa mobile" (mobile box).… This view of the mobile truck body is always on our mind in our advertising for the container.… (Klose, 2015, p. 39).

The focus on the container as the main object of study in this research might seem a bit trivial to some observers. A critical look at the materiality, however, offers a multitude of possibilities regarding the evolutionary dimension of the technology and the impact on society and, more specifically, on the transformation and morphology of cities. Crucially, this study embarks on an expedition to unravel the role of the container in urban transformation. To achieve this goal, the

study consults the philosophical writings of Martin Heidegger, and the materialist school of thought to offer some guidance and a moderating perspective. Although a frustratingly complicated read, Heidegger's abstraction of *The Thing,* offers an insight into understanding the materiality of the container. A material describes the physical characteristics of things (Hong, 2003). In the course of constructing a theory of material culture and the theory of things, Miller (2005, p. 5) concluded based on his analysis of the works of sociologist Erving Goffman (1975) and art historian E. H. Gombrich (1979) that:

Objects are important not because they are evident and physically constrain or enable, but often precisely because we do not "see" them. The less we are aware of them, the more powerfully they can determine our expectations by setting the scene and ensuring normative behavior, without being open to challenge. They determine what takes place to the extent that we are unconscious of their capacity to do so.

Although objects are key determinants of social behavior and identity, they are seldom hidden and inconsequential within our subconscious (Miller, 2005). The sustenance of the material life of society is tremendously influenced by the container. Bourdieu (1977), also used the object to draw an analogy of the organization of society. Clearly, it is paradoxical to reduce materiality to mere 'objects and artifacts' (Miller, 2005). Various interpretations have been ascribed to Heidegger's complex philosophical work. Whiles his ontological exploration of 'the thing' offers little relevance towards the general context and orientation of this study per se, his explanation of what constitutes a 'thing' and an 'object' and their relationship with the environment is essential towards conceptualizing and contextualizing the containerization of urban space. Heidegger reminds us that everyday objects such as the container "are conceptual constructs designed in conformity with our utilitarian interests" (Howe, 1993, p. 94). The objectification of the container thereof lies in the value of its utilization. Klose (2015) captured the utility value of the container by writing that "It seems that containers play as decisive a role in the organization of people, programs, and information as they do in that of goods. They not only physically appear in every imaginable place in the city (such as subway stops and airports) and in rural areas, they also appear in such cultural domains as architecture and urban planning". Conceptualizing the utility value of the container offer a gateway for understanding the object's interlinkage with cities and the global economy. Furthermore, if Turner's (1973, p. 152) assertion that: "Housing problems are defined by material standards, and housing values are judged by the material quantity of related products, such as profit or equity", is to be taken seriously, then the materialist conceptualization of the container is imperative.

The container is becoming a continually dominant feature in Adhoc practices. Adhocism was put forward by Charles Jencks and Nathan Silver in their 1972 book on *Adhocism: The Case for Improvisation*. Largely grounded in architectural discourse, Adhocism relates to the practice of applying "an available system in a new way to solve a problem quickly and effectively" or using "old systems with a few supplementary clip-ons" (Jencks and Silver, 2013). The Adhocist principle is characterized by mass-customization and the infusion of hybrid specialization (Jencks and Silver, 2013). The concept of Adhocism is accurately exemplified through the Adhocist manifesto (Figure 1). According to Jencks and Silver (2013), Adhocism transcends beyond the conventional heddles of bureaucratic and hierarchical norms as well as emancipate an individual or a collective group of people to fulfill their purpose. Jencks advocated for the plurality of actual needs, against restrictive and orthodox norms that organizations and society impose. The centrality and universality of need among all living things underpin the transformation of preexisting environmental subsystems (Jencks and Silver, 2013, p. 1). Adhocism is distinguishable from other forms of activities because it involves a "general and loose approach to a problem rather than a tight and systemic one" (Jencks and Silver, 2013, p. 2). Adhoc practices increasingly rely on the ability to combine redundant materials into purposeful possibilities, for instance, the conversion or prefabrication of out of service shipping containers into housing (temporary, emergency, and permanent) and pop-up shops. No longer a minority affair (Jencks and Silver, 2013), the container has become an integral part of mainstream urban design and transformation. Standardization, however, presents a considerable impediment to Adhocism. Jencks and Silver posited that standardization is intended as a strategy to purge competitors and guarantee maximum returns to corporations (in the case of technology) in the guise of innovation.

An Adhocist Manifesto

1. If necessity is the mother of invention, then combining previous systems is the father, and adhocism is the creative offspring. This is true in both nature and culture.

2. In culture, combinations that display themselves, and explain their use and origins, are especially adhocist.

3. Thus adhocism is the style of eureka. It is the origin moment of new things, when the forms are typically hybrid, and like all creative instants, the conjunction of previously separated systems. Hence, the style must remain heterogeneous to be understood. Like the best surrealism when seen for the first time, it is experienced as an incongruous marriage; often the copulation of incommensurable things. But as species and things evolve, their ad hoc attachments become supplementary, conventional, and usually simulated. Fully evolved this heterogeneity is integrated and non-ad hoc. Yet an evolved time-city can be an intentional palimpsest of layers, as with New York's High Line.

4. At a populist level adhocism is radically democratic and pragmatic, as in the first two stages of revolution. It is also evident after catastrophes such as Hurricane Katrina, or the earthquake in Haiti, when people make do with whatever is at hand.

5. At an elitist level it is efficient and perfected in the parts. Like the Mars space program, where each Rover is assembled from the best subsystem without prejudice of stylistic unity, there is tolerance, even love, of mongrel beauty.

6. Adhocism badly done is a lazy put-together of diverse things. It steals from the bank of the world's resources, pays nothing back, and devalues the currency. Plagiarism and theft are redeemable if acknowledged, and if there is added value: the improvement of either the subsystems or the whole. Palladian, as well as Modern, architecture is based on stolen goods duly footnoted. Academics are usually trained in this confessional art.

7. Philosophically, adhocism tends to be open-ended like an additive list and encyclopedia. Thus it is first cousin to eclecticism, defined as "deriving ideas, tastes, style, etc., from various sources." This is from the Greek eclect, "I chose or select" this part from anywhere. Looking for improvement, we choose the best part without trying to stay within a single canon.

8. If misusing a knife as a screwdriver is forgivable adhocism, then the Swiss Army Knife is its customized, evolutionary offspring. Droog Design is the commercial version, the Japanese Tea Ceremony is the ritualized usage, and Frank Gehry's house for himself typifies the informality. The heterogeneous and informal characterize the cultural genre.

9. Try a thought experiment with the smallest atom; hydrogen or deuterium. Even these simple bodies are a historical smash-up of different units—the proton, electron, and neutron. Only quarks and leptons seem to be non-ad hoc. Evidently the rest of the world coalesced from difference.

10. If most everything on earth comes from something else and is compound, then we *live in* a pluriverse. Although the laws may be uniform in our universe today, they evolved during the first microseconds, and may be the bylaws of an ad hoc multiverse.

Figure 1: An Adhocist Manifesto.

Source: Jencks and Silver, 2013

The writings of Colin Ward, John Turner, and Italian architect Giancarlo de Carlo offer a radical divergence for understanding the containerization of urban space. A cautious elaboration on the principle of dweller control and self-help offers some insight into understanding the containerization of urban space. The principle of dweller control as proclaimed by John Turner (cited in Ward, 1979, p. 8), relates to the freedom of dwellers to take control of the decision-making process of their housing in the built environment. Using the Italian context as an example, Giancarlo de Carlo (1948) stressed that despite the availability of techniques and new

construction materials and processes, capitalism 'was not building' for the masses. De Carlo (1948) further argued that the masses lacked the necessary purchasing power to advance the capitalists' extractive logic and profitability. The contrast with 21st capitalism is instructive: accumulation by dispossession. In Giancarlo de Carlo's view, since the state cannot be a liberating agent, the task rests on the individual to directly take action to address their housing needs (Ward, 1979, p. 9). In *Dialectical Materialism,* Lefebvre (2009, p. 59) remarked that "the state is an 'illusory community' but based on existing connections: it intervenes in the class-war as a referee, by claiming to represent the general interest, whereas it really represents the interests of the social group which wields the political power". The rigidity of regulatory frameworks and building codes have given much impetus to individuals and communities to circumvent the normative. Citing examples in cities across the U.S., Turner (1972) complained that owner-buildings are not permitted under administrative building codes; housing that the urban poor urgently needs. Turner (1972, p. 150-151) again reminds us that:

If governments cannot, or will not, make up the difference between what housing laws require and what the effective demand can purchase, then why do they create these problems? Why is the common-sense solution of allowing and encouraging people to make the best use of what they have treated as subversive nonsense by the technocratic and bureaucratic authorities? Why do these authorities and the institutions they control refuse to let people live and move between the extremes of neglected, dangerous slums and residences suitable for middle-class Joneses?

According to Ward (1979), self-help buildings are collaborative and occur among an individual's social network. Ward (1979) further identified upgrades to sub-standard shanty buildings over time as a form of self-built housing. In fact, the notion of self-help housing and infrastructural schemes are not restricted to the Global South. Studies have also investigated the proliferation of self-help schemes among the low-income population in the United States (Sullivan and Olmedo, 2014; Durst and Ward, 2014; Durst and Wegmann, 2017; Durst, 2016;2018; Ward, 2004;2007; Ward and Peters, 2007). Moreover, in continental Europe, self-help schemes such as the "baraccati", i.e., those who live in "barache/shacks", are widespread in Rome, Italy (Ferrarotti, 1974; Forgacs, 2014). Ward and Peters (2007), proposed that self-help housing serves as a strategy for poor households to transition into the property market.

1.6. Structure of the Thesis

The thesis is organized around nine chapters. On both theoretical and practical levels, chapter one provided an overview of the urban question in Ghana through the prism of the container. Accordingly, the chapter identified gaps in the literature concerning innovative attempts to addressing the urban crisis in African cities in general and Ghanaian cities in particular. The study is unique in the sense that it investigates the link between sustainable urban transformation and container urbanism, a connection previously ignored in mainstream urban research, especially in the global south.

Chapter 2 of the thesis provides a comprehensive history of the shipping container, firstly, its invention in the 1950s, then the container's role in the globalization of trade, and finally, the relationship between the container and the urban question. The chapter explores the economic, legal, political, social, cultural, and environmental dimensions of the container. More precisely, the chapter dislodges the uni-dimensional conceptualization of the container as a facilitator of global trade. For instance, the chapter dissects the contradictions of the container as an instrument of power, resilience, and vulnerability. Significantly, this chapter calls into question the militarization of the container: as an instrument of warfare, as a tool for the legal and illegal arms trade, and for the detention of enemy combatants. In recent years, shipping containers have become a symbol used to amplify the trade tension between the world's two largest economies: The United States and China. Furthermore, the container embodies a tool for perpetrating unspeakable crimes and violence such as illicit drug trade and smuggling, human trafficking, and torture. The chapter also examines the environmental fallouts of the shipping container market exemplified through the pollution of the ocean, threat to biodiversity, and climate change in general. More importantly, chapter two explores the background of container architecture through the seminal works of Le Corbusier, Walter Gropius, and their contemporaries. The chapter provides insights into how the early pioneers rationalized the assembly-line mass production of affordable modular housing to promote the right to the city. The study shed significant light on how container homes and shops emerged from the shipping container industry, and how cities became the forefront of container culture and communities. From container art exhibitions to the dystopic representation of container communities in popular

culture, the chapter offers a glimpse into epoch-defining and the heterotopic composition of the container.

In chapter 3, the thesis proposes a framework for conceptualizing emerging processes of urban transformation in cities in the global south. More importantly, this thesis contributes to existing approaches for understanding the unraveling of disruptive projects in urban space. Consequently, the theoretical framework serves as a bridge between the hugely elaborate manifestation of formal and informal disruptions in cities both in the global north and south. Paradigmatically, the chapter builds upon Christensen's disruptive innovation concept and de Carla and Falletti's (2013) socio-spatial theorization of disruption. Accordingly, the chapter proposes a framework based on the premise that as more individuals embrace disruptive projects as an alternative process of production of urban environments, especially in the global south, the risk to sustainable urban development also rises sharply. Put differently, the high socio-spatial momentum of disruptive projects such as container urbanism reinforced by social validation invariably increases the risk to sustainability irrespective of environmental, political, cultural, and economic dispensation.

Chapter 4 discusses the general research design and analytical framework used to unravel the various dynamics of the containerization of urban space. The thesis adopts a case study approach, involving an integrated research design. The advantage of case studies includes a combination of multi-methods to collect data from a variety of sources. Consequently, the study uses a qualitative, quantitative, and spatial approach to gather data from a variety of stakeholders involved in the containerization of urban space. This methodological approach is necessary to provide more dynamic aspects of the container. The primary case study for the thesis is the city of Accra, Ghana, followed by selected cities in the United States, Africa, and the United Kingdom. The choice of Accra as the primary case study is in line with the new waves of informalization in African cities characterized by the "rising importance of unregistered social networks in the built environment, livelihood strategies, social reproduction, cultural organization, or political mobilization" (Myers, 2011, p. 73).

Chapter 5 describes the urbanization process in Ghana in general and reflects on the transformation of Accra. The chapter explores how a variety of factors such as colonization, population growth, migration, poor spatial and urban planning, urban bias and fragmentation

policies, and neoliberal governance have contributed to the rise of the informal sector and alternative modes of urban housing production. Put differently, the chapter discusses the long history of policy failures to address the myriad of urban challenges in Ghana at large and the city of Accra in particular. The chapter also shows how elitism thrives in Accra's evolution from a colonial to a globalized city. More crucially, the chapter describes how elitism in urban planning policies over the decades pushed the majority of urban dwellers into the margins.

Chapters 6, 7, and 8 lays out the empirical analysis of the data. Using in-depth interviews, chapter 6 explores the container home market to understand the key stakeholders in the innovation diffusion of container urbanism in cities across the global north and south. The main reason for examining these dynamics is to understand the opportunities and challenges in the global container home market. Chapter 7 explores the dynamics of container urbanism from the perspective of container users in selected neighborhoods of Accra. Chapter 8 focuses on the neighborhood and institutional responses to the innovation diffusion of the containerization of urban space in Accra. Chapter 9 draws the relevant conclusions and the theoretical and policy implications of the containerization of urban space.

Chapter Two: Epistemological Deconstruction of Containerization from Global Political Economy to Critical Urban Studies

This chapter departs from the nuanced characterization of containerization in mainstream literature. As we shall see, the chapter reflects on the broader role of the container in both international trade and the urban question.

2.1. Containerization within the Global Political Economy

For a long time, the recurrent motif of the container in the systemic network was prevalent in the container stories—a kind of flow chart of transport with the container as an image of itself and simultaneously as a symbol of the overarching structure carried by it—an icon of logistics. Recently, however, the container has increasingly become an object on which to project other meanings. In a modern retelling of the myth of Pandora's box, the shipping container is broadly subordinated to containing evil things. The containers have been transformed from black boxes of globalization into Pandora's steel boxes (Klose, 2015, p. 317).

The container is one of the 50 things that made the modern economy (Harford, 2017). From a classic political economy perspective, Cowen (2014, p. 104) citing Reifer (2011) speculates that "Marx might have begun Capital by noting that the wealth of nations in the 21st century increasingly appears as an immense collection of containers. Thus, Marx might have begun his analysis of capital by analyzing the container, its contents, and the network of global social relations of which it is an integral part", although she downplayed the prospects of Marx using such analogy. The world is made from the container. Containerization has transformed international trade and the circulation of capital (Cowen, 2010;2014; Griffin, 1969; Heins, 2015; Klose, 2015; Levitt, 1983; Levinson, 2006; Martin, 2014; Neise 2018; Knight, 2003; Kim and Sachish, 1986; Rodrigue et al., 2006; Rodrigue, 2010;2012; Stopford, 2009; Saxon and Stone, 2017; Trace, 2001; Talley, 2002; Willis and Ortiz, 2004; van Ham and Rijsenbrij, 2012). The concept is further reinforced by the emergence of the neoliberal order. The container Heins (2015) observes, was crucial (to some extent) towards attaining global unity. Historically, the containerization of global trade can be traced to the emergence of shipping in the 3rd century BC. For more than half a century, international trade revolved around what Levinson (2006, p. 1) described as "a soulless aluminum or steel box held together with welds and rivets, with a

wooden floor and two enormous doors at one end". The modern shipping container is also synonymous with innovation, securitization, disaster, and risk. According to Klose (2015, p. 4), the container promulgated the emergence of globalization and the diffusion of capital by creating production systems and consumption across the globe. Levinson (2006), also argued that the container enabled the mobility of capital by way of lowering the cost of shipping. In her 2013 book on *Deep Sea and Foreign Going: Inside Shipping, the Invisible Industry That Brings You 90% of Everything*, Rose George argues that containerization revolutionized shipping to the extent that it "makes more financial sense for Scottish cod to be sent 10,000 miles to China to be filleted and then sent back to Scottish shops and restaurants, than to pay Scottish filleters" (George, 2013). Since its invention, the shipping container propagated the transportation of goods at a much faster and cost-effective way to the far reaches of the known world (Containerisation International, 1970; Rodrigue et al., 2006 Forgash, 1963).

Rodrigue (2012, p. 6) summarized the importance of the container within the following context: "Among the factors that lead to the usage of containers to ship commodities are trade imbalances providing a pool of empty containers for backhaul movements, the rising long term price of commodities making containerization an increasingly cost-effective proposition, and intermodal transport systems that have extended market coverage". van Ham and Rijsenbrij (2012, p. 3) also argued that the advent of the container reduced transportation costs and promoted competitiveness. Attesting to the adaptability and potentiality of the container, Saxon and Stone (2017, p. 11) remarked that "the flexibility of the container trade makes it resilient: one product may go out of fashion but another will come along to fill the box". Cargo shipping containers generate enormous economies of scale by reducing transit time and packaging as well as the labor required at the ports (Strom, 1972; Hall, 2009; Levinson, 2006; Rodrigue and Notteboom, 2008; Rodrigue et al., 2006; van Ham and Rijsenbrij, 2012). Economies of scale, however, generated challenges such as the inability of harbors to handle the emergence of larger containerships (Rodrigue, 2010). Cowen (2014, p. 112-113) reports that "containerization reshaped work dramatically across the logistics sector; the slow, dirty, and physically intensive labor of moving bulk cargo was quickly transformed into the fast and dangerous work with metal and machines." Containerization enabled the proliferation of just-in-time (JIT) production techniques (Cowen, 2014; Cidell, 2011; Levinson, 2006; Parker, 2013). For instance, Levinson (2006:10) discovered that the combination of the container and the computer equipped

companies like Toyota and Honda to develop JIT which linked customers and suppliers. Global production systems have evolved and been transformed to accommodate the adoption of the container. The container meanders through and adapts to the various transportation systems and infrastructure on a global scale (Heins, 2013;2015). Containerization is, therefore, a second-order system (Heins, 2015, p. 347; Van der Vleuten, 2004, p. 404–406). Every stage of the freight distribution system is dominated by the containerization process (Rodrigue et al., 2006). Furthermore, the success of intermodal technological has been profoundly influenced by the advent of the container (Cowen, 2014; Rodrigue and Notteboom, 2009). The container transformed the production and physical distribution process from a push to a pull logistics system (Rodrigue and Notteboom, 2008). Unlike other tools, the container is inherently self-sustaining because it requires no manipulation and functions automatically (Sofia, 2000).

Containerization has indeed transformed the global economy by removing the old production and distribution system (Farley and Roberts, 2011, p. 48). The container increased trade in both containerized goods like auto parts and non-containerized products such as assembled automobiles (Bernhofen et al., 2013, p. 4). For instance, the containerization of automobiles remained stable at 25% over the past decade (Saxon and Stone, 2017). It is certainly true that containerized trade has changed the mass consumer culture around the world (Klose, 2015; Levinson, 2006; Rodrigue and Notteboom, 2008). In other words, the shipping container is fundamental to the social organization of life. Rodrigue et al. (2006, p. 145) observed that the shipping container enabled easy access to resources and low-cost labor. Van Ham and Rijsenbrij (2012, p. 3) also highlighted that the emergence of containerization reduced voyages for maritime cargo. For instance, Bernhofen et al. (2013, p. 10), documented how containerization reduced the journey between Europe and Australia from 70 to 34 days. Rodrigue (2012) acknowledged that economies of scale in maritime shipping, container shipping rates, and changes in commodity prices are key drivers for sustaining containerized trade.

The intermodal container originated from the United Kingdom in the 18th century (Fenton et al., 2018). The modern standard shipping container, however, emerged in the 1950s through the ingenuity of Malcolm McLean, a North Carolina trucking magnate. McLean contracted Keith Tantlinger, a container engineer to design an aluminum container as well as repurpose a decommissioned tanker to haul the new container (Martin, 2014). The premise behind the use of

'containers' (not the standard shipping container) in the 1800s was to protect goods from the 'elements' (Strom, 1972). Before standardization, companies' purpose-built containers created compatibility issues such as the corner fittings (Levinson, 2017). Furthermore, transporting goods by ship in the 1800s was very expensive. Rodrigue and Nottenboom (2008) and Rath (1973) also argued that the application of containerization during the early years was limited in scope and considerably risky endeavor. The process of standardizing the shipping container began in 1958 (Egyedi, 1999; Levinson, 2017). Standardization also coincided with the diffusion of container technology across the world (Bernhofen et al., 2013). The standardization of container sizes was adopted in the mid-1960s based on the twenty-foot equivalent unit (TEU) or 20' × 8' × 8'6'' (length × width × height), and the forty-foot equivalent unit (FEU) container configurations (Rodrigue and Notteboom, 2008; Rodrigue, 2010; Meisel, 2009). Standardization was initiated to ensure efficiency in the shipping container industry (Neise, 2018). For instance, standardization improved speed within the value chain at the origin and destination of the cargo (Neise, 2018). Standardization also ensured effective coordination between the various stakeholders in the industry to ensure the fluid flow of cargo (Neise, 2018).

In 1956, 58, 35-feet containers of Malcolm McLean's Ideal-X (Figure 2) embarked on its maiden voyage on the *SS Ideal X* stocked with tons of petroleum from Newark, New Jersey to Houston, Texas (Cudahy, 2006). The full integration of containerization in international trade began in 1966 (Bernhofen et al. 2013). McKinsey rightly predicted (in their two reports between 1966 and 1967) that "Now that standardized containers have been introduced in the shipping industry, the rush to 'get on the bandwagon' will probably lead to substantial overexpansion" (Saxon and Stone, 2017). According to McKinsey, the container shipping industry will be dominated by a disruptive digital ecosystem over the next 50 years (Saxon and Stone, 2017).

Figure 2: First Containership Ideal X.

Source: Maersk/SeaLand.

Van Ham and Rijsenbrij (2012) argued that the profitability of containerization which emerged from the materialization of the transport market propelled investments in container capacity. Market trends also show a general shift towards the adoption of bigger container carrier vessels in a drive to improve efficiency (Neise, 2018). Fenton et al. (2018) noted that the capacity of shipping liners reached 21,000 TEUs in 2017 (Figure 3), representing a significant increase of 1000 TEUs during the maiden voyage of the first cellular container ships. For example, major shipping container firms such as Maersk integrated design elements such as economies of scale, environmental sustainability, and energy efficiency during their vessel expansion strategy (Neise, 2018). Furthermore, low oil prices on the global market contributed to the growth and demand for larger container ships (Neise, 2018). Container ships are generally classified into five different groups based on the nature of their evolution (Neise, 2018; Rodrigue et al., 2013). These comprise of the early container ships based on modified bulk vessels in 1956 to the fully cellular container ships in the 1970s, the Panamax container ships between 1980 and 1985, the Post-Panamax and Post-Panamax I and II from 1988 to 2000, the new Panamax introduced in 2014, and the Post new Panamax and Triple E container ships introduced in 2006 and 2013 respectively (Neise, 2018, p. 75-76).

Container-ship capacity has grown massively since the *SS Ideal X*, a converted World War II oil tanker, first sailed, in 1956.

Maximum container-vessel capacity, TEU[1]

Year of introduction	Vessel size, meters	Company	Capacity
1956		Pan-Atlantic Steamship	58
1964		Associated Steamship	~1,000
1981		Hapag-Lloyd	3,050
1985		US Line	4,458
1996		Maersk	6,000
1997		Maersk	7,226
2003		OOCL	8,063
2004		China Shipping	8,468
2005		MSC	9,200
2006		Maersk	14,770
2012		CMA CGM	16,020
2013		Maersk	18,270
2014		China Shipping	19,100
2015		MSC	19,224
2017		OOCL	21,413

[1]Twenty-foot equivalent unit.
Source: McKinsey analysis

Figure 3: Scale and Temporal Dynamics of Containership Capacity

Source: McKinsey, 2017

Shipping accounted for approximately 90% of all international trade volume in 2006, with the container dominating all seaborne trade (Cowen, 2014). Willis and Ortiz (2004, p. 1), Heins (2015), Romero, and Timmons (2006) also reported that 90% of global cargo is containerized. In 2015, 1.5 billion tons of cargo were transported in containers (Neise, 2018). The contribution of containerized trade to global GDP is unparalleled, accounting for two-thirds of the value of global trade (World Shipping Council, 2017). Before the 1950s, the export of raw materials such as iron ore, oil, and wheat dominated international trade (Rodrigue et al., 2006). Between 1950-2003, however, the container substantially contributed to the global export of manufactured goods from 53.2% in 1963 to 75.5% in 2003 (Rodrigue et al., 2006).

The shipping container industry is believed to have created over 1.1 million direct and indirect jobs in the United States contributing an estimated 100 billion dollars to the country's Gross Domestic Product (Thibault et al., 2006; World Shipping Council, 2004). According to Cowen (2014), global container traffic gained momentum across the Atlantic in 1966. Container traffic began in the Americas and the Caribbean and later extended to other parts of the world. On the European continent, the first container vessel began operations in Hamburg in 1967 (Meisel, 2009). In the years that followed, containerships sailed the oceans to and from ports in the Middle East, India, and the African coast (Cowen, 2014). Global container trade volume consistently grew from 2000 to 2016, exemplified through container port traffic (Figure 4). Such growth was, however, mirrored by volatilities in the global economy, specifically, the global financial crisis between 2007 and 2008 (Neise, 2018). For instance, dominant container shipping lines lost an estimated 1.5 billion US dollars in revenue in 2009 (Beddow, 2010).
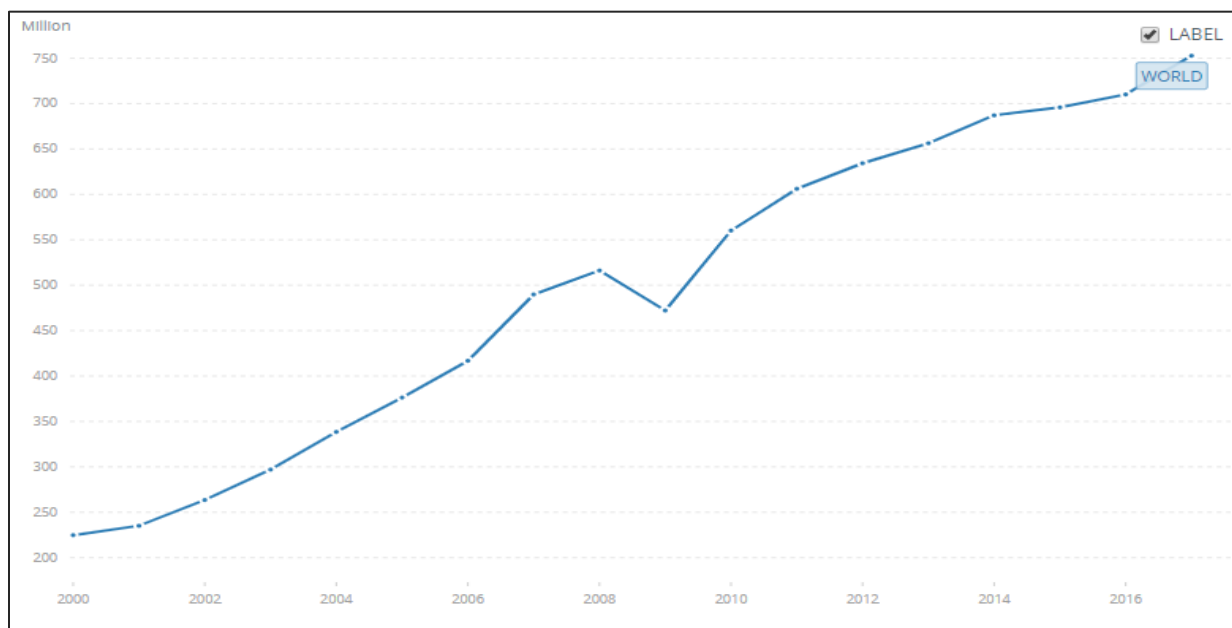
Figure 4: Global Container Port Traffic

Source: World Development Indicators, UNCTAD (Note: *Port container traffic measures the flow of containers from land to sea transport modes., and vice versa, in twenty-foot equivalent units (TEUs), a standard-size container. Data refer to coastal shipping as well as international journeys. Transshipment traffic is counted as two lifts at the intermediate port (once to off-load and again as an outbound lift) and includes empty units*, World Bank, 2017)

Astonishing visual evidence from Kiln and the UCL Energy Institute shows the scale of containerization in international trade. Rodrigue (2012, p. 20) claims that approximately 62% of global ISO container fleets are owned by maritime shipping companies. These companies provide a wide range of services and networks of operators and shipping lines. As Figure 5 portrays, millions of shipping containers were freighted across the ocean destined for different geographic locations and consumers. These shipping trade routes comprise nearly 500 liner shipping services transporting goods across various ports (World Shipping Council, 2018). For instance, the top eight containerized trade routes based on the twenty-foot equivalent units (TEUs) in 2017 comprised of the Asia-North America route. The Asia-North America route accounted for the top position, with a total of 26 million TEUs (East and Westbound) (World Shipping Council, 2018). Shipping liner services also dominate the Asia-North America route with the Asia-West Coast North America route constituting the majority of services (54 liner services as of 2017). In recent years, innovators in the shipping container industry have emerged to disrupt the market (Ciddel, 2012).

Figure 5: Continental shipping routes in 2012

Source: (shipmap.org)

China and the United States dominate the global containerized port traffic and cargo trade (Fig.6). Data from the World Trade Services and UNCTAD show consistent growth in the export of containerized goods from ports in China (31.3 million TEUs in 2010 to 36.0 TEUs in 2014). The United States is the second net exporter of containerized cargo, despite marginal growth (11.2 million TEUs in 2010 to 11.9 million in 2014). According to Neise (2018), the global demand for containerized transport from China decreased by 53 percent in 2016. On the European continent, Germany and Italy dominate the containerized export cargo landscape. The import dynamics of global containerized cargo trade also portrays a dominant United States-China nexus. Rodrigue et al. (2006, p. 147), asserted that the Trans-Pacific trading route is growing faster than the Trans-Atlantic with China playing an active and dominant role. For instance, the ports in Guangdong province in China handle twice as many containers compared to all ports in the United States (Rodrigue et al. 2006, p. 150). According to Saxon and Stone (2017), the container helped propel China as the World's factory through the production of manufactured goods and the importation of significant quantities of natural resources.
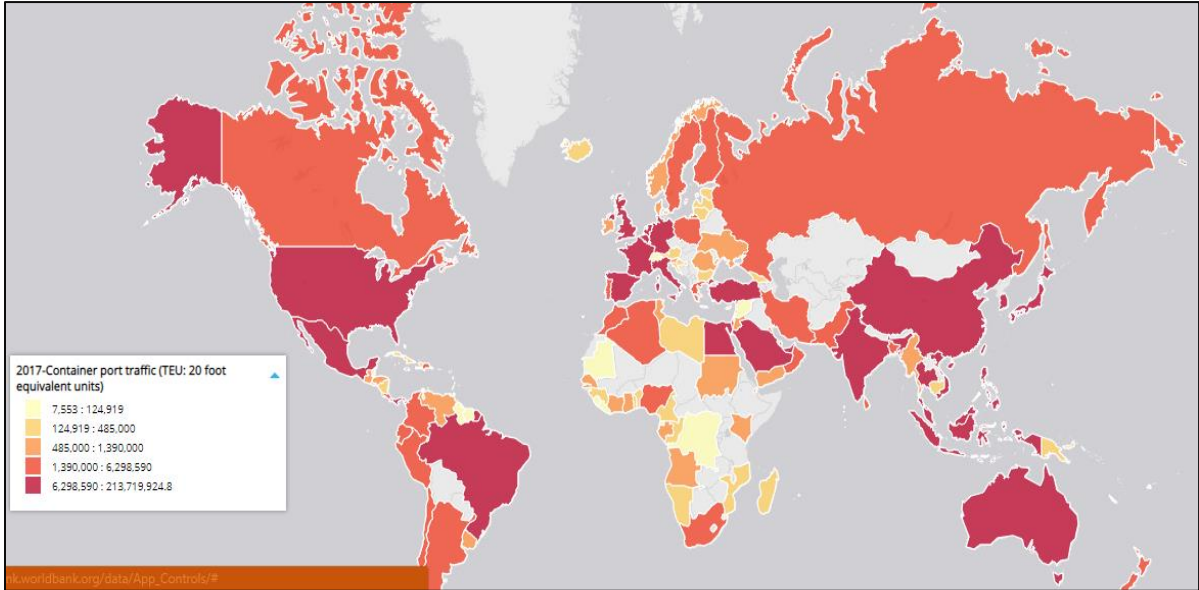
Figure 6: Container port traffic by country in 2017

Source: World Development Indicators, UNCTAD

(Hall, 2009; Hesse, 2006; Klose, 2015). Containerized cargo ships emit significant quantities of carbon dioxide (CO_2), and other greenhouse gases into the atmosphere (Rodrigue et al., 2006). Ben-Hakoun et al. (2016) observed that containerized cargo ships from Far-East Asia, North America, and Europe are the largest emitters of carbon gases. Shipping accounts for 10% of global carbon dioxide emissions in the transportation sector. Cidell (2012, p. 240), reports that "containers in motion cause problems because of the vehicles on which they ride. Trucks take up road space, produce noise and air pollution, and create more wear and tear on local roads, especially those connecting distribution centers and freight terminals to major highways". Also, there exists a correlation between containerized cargo shipping and water quality. Put differently, the growing demand for shipping services has a devastating impact on water quality. Waste discharges and dredging dominate marine emissions. Dredging, in particular, modifies marine biodiversity and hydrology despite its relevance for port accessibility and operation (Rodrigue et al. 2006). According to Ben-Hakoun et al. (2016), the economic and environmental impact of international shipping will reach 356% by 2030 if the industry retains the business as usual (BAU) trend.

Freight containers pose a significant health risk to dockworkers and communities close to port cities and container yards or depots. Baur et al.'s (2010) study of 2113 contaminated freight containers at the port of Hamburg demonstrated the risk of toxic chemicals on human life. They found that 70% of the containers were contaminated with toxic chemicals above the chronic reference exposure levels (Baur et al. 2010). They further argued that 30% of these contaminated containers exceeded the required exposure thresholds (Baur et al., 2010). Their groundbreaking research shows how toxic industrial chemicals generated from the fumigation of freight containers directly affect human health. Fumigation of freight containers causes accidents, diseases, and sometimes death (Baur et al., 2010).

The tragedy of the MSC Napoli, a United Kingdom-flagged container ship Mediterranea Shipping Company-MSC, constitute one of the greatest maritime and environmental disasters in modern history (Figure 7). The vessel with 2300 containers and 3,800-tonnes of oil on board was on a voyage heading down the English Channel from Antwerp, Belgium to Durban, South Africa, when a storm battered the vessel on the 18th of January 2007 off Brittany near the coastal village of Branscombe in Devon. It is, however, surprising how a 62,000-tonne cargo vessel was

humbled by the vagaries and unpredictability of the open sea. On the tenth anniversary of the MSC Napoli disaster, the UK government in an official press release described the incident as a nightmare scenario that lasted for 924 days at a cost no less than 120 million pounds during the international salvage operation (UK Government, 2017). As Klose (2015, p. 27) perfectly puts it: "each lost container has the potential to bring about a variety of incidents and accidents: pollution of the environment and poisoning of people through transported hazardous materials; containers causing collisions with ships; loss of the transported goods, whether a container cannot be found or recovered, it breaks open and loses its cargo, or it is plundered". Swamps of tourists and visitors descended on the picturesque coastal village of Branscombe either to witness the devastation or to plunder (UK Government, 2017). The cargo vessel was assorted with goods such as wine, coffee, explosives, fertilizer, weed killers, perfumes, car engines, and vodka. The wreckage and spillage had a detrimental impact on marine life (UK Government, 2017).
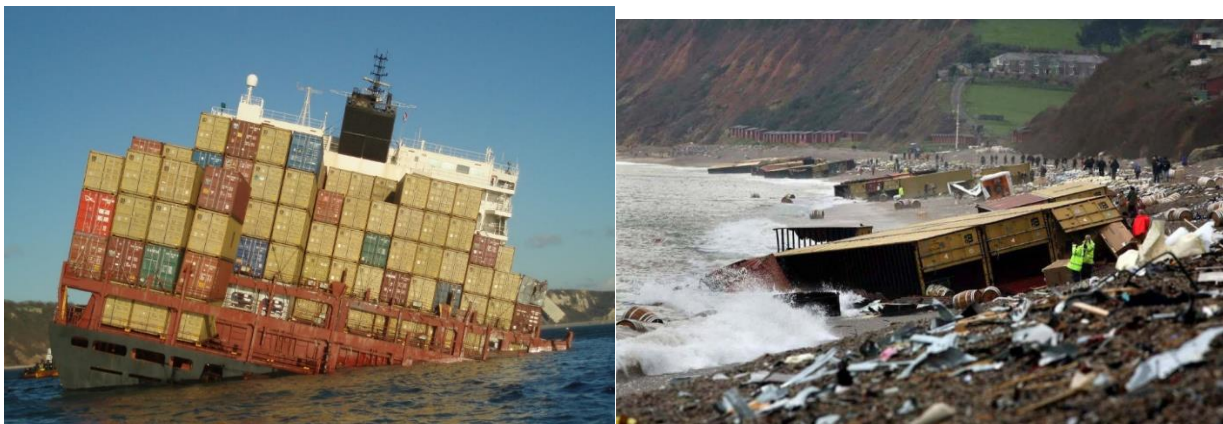
Figure 7: MSC Napoli Shipwreck Disaster

Source: UK Government, 2017.

In *Moby-Duck: The True Story of 28,800 Bath Toys Lost at Sea & of the Beachcombers, Oceanograp hers, Environmentalists & Fools Including the Author Who Went in Search of Them,* Donovan Hohn (2011) writes that:

"Fall overboard and no one would miss you. You'd inhale the ocean and go down, alone. Nevertheless, there you are, not a goner yet, gazing up at the shipping containers stacked six-high overhead, and from them, cataracts of snowmelt and rain are spattering on your head. There you are, listening to the stacked containers strain against their lashings, creaking and groaning and cataracting with every roll, and with

every roll, you are wondering what in the name of Neptune it would take to make stacks of steel—or for that matter aluminum—containers fall."

The irony of this scenario is rapaciously depressing. Retrospectively, Hohn (2011) tracked some major misfortunes involving freight containers at sea in the 1990s and the greater part of the 2000s. He draws our attention to an incident in 1990 involving the Hansa Carrier which was battered by a storm somewhere south of the Alaskan Peninsula (Hohn, 2011). He described how several containers loaded with Nike sneakers fell overboard the freighter and were discovered months later washed up along Vancouver Island (Hohn, 2011). Two years later another cargo ship loaded with "a shipment of 29,000 rubber bathtub toys including ducks, beavers, turtles, and frogs, fell overboard from a container ship" (Hohn, 2011). The rubber toys were later discovered on the shores of Alaska, Greenland, and the Atlantic Ocean (Hohn, 2011). Clearly, George (2013) was right when she said, ships were at the mercy of the sea. Farley and Roberts (2011, p. 49) argued that most of these containers and essential cargo lost at sea are "destined to float for eternity, pulled by the currents, endangering shipping. Written-off beyond rescue, these surreal time capsules are cut loose."

Containerization and securitization are inextricably linked. Security constitutes a component of the container shipping system alongside speed, cost, and reliability (Willis and Ortiz, 2004). According to Knight (2003, p. 17), the dynamic of container securitization at the beginning of the 21st century focused on bombs in containers. Knight documented the hysteria that emerged from the security establishment and the mainstream media about the dangers sealed in containers (Knight, 2003). According to Klose (2015), the US government vigorously pursued awareness campaigns about potential scenarios of bombs in containers (Figure 8). Klose (2015, p. 313) eschewed that: "As icons of globalization, they no longer stand only for the omnipresence of the capitalist system but now also stand for the dangers and fears that the worldwide consolidation of commercial and cultural spaces conjures up." The United States accordingly spearheaded the standardization of the global logistics chain security (Cowen, 2014). Realizing the growing security implications of the container, *The Container Security Initiative* was instituted to inspect and clear containerized cargo at the ports before shipment to the United States (Willis and Ortiz, 2004, p. 4). Knight (2003:17) described the Container Security Initiative as an insurance policy against terrorism. The shipping container hegemonized maritime terrorism (Farrell, 2007; Willis and Ortiz, 2004; Thibault et al., 2006). Willis and Ortiz (2004) and Thibault et al. (2006) further

argued that before September 11, 2001, port securitization was mainly directed towards combating stowaways, smuggling, cargo theft, and misrouting, however, after the terrorist attack, port security architecture in the United States, in particular, were upgraded and strengthened. Thibault et al. (2006) cited some incidences, such as the 1985 *Achille Lauro* hijacking and the merchant shipping attacks by the Tamil Tigers in the 1990s as a precursor for the major overhaul in post-9-11 securitization of shipping containers and ports of operations. The probability that the container might be compromised during transit further reinforced the fear of terrorist attacks (Thibault et al., 2006). In 2006, the US Congress passed a law requiring all containers destined for American ports to undergo rigorous scanning to detect any dangerous materials or unlawful cargo. The law, however, encountered some drawbacks. For instance, the Economist (2014) acknowledged that scanning steel was both expensive and dangerous. Rodrigue et al. (2006, p. 138) also emphasized that without X-ray scanning, the manual inspection of the entire container was both time consuming and virtually impossible task. Knight (2003, p. 17-18) also documented a specific incident in the United States on the Anniversary of the September 11 attack as follows:

On September 9, with New York straining under surveillance for the anniversary of the September 11 attacks, the Iiberian-registered Senator Palermo steamed into port. Strange noises were coming from the ship and US customs, noting that it had called at Gioia Tauro, a port on the Straits of Messina in southern Italy famous for smuggling and arms trading, diverted it to Newark. Only then was it realized that the Palermo was emitting traces of radiation. The ship was towed six miles out to sea and three days after arriving in New York, Navy SEALs and the Nuclear Emergency Search Team were still scouring it with Geiger counters, searching through the 2600 containers of mixed general cargo. The radiation was being emitted naturally by a container of clay tiles.

Figure 8: Which one's got the bomb in?

Source: Knight, 2003:17.

A crucial component of port securitization relates to the experimentation with so-called smart containers, or high-tech shipping containers. In *High-Tech Shipping Containers: Boxing Clever*, The Economist (2014) reported that:

One idea Dr. Lechner proposed is to make containers out of carbon-fiber composites. Such containers would be easier to use, because they would be lighter and also—if designed appropriately—might be folded flat when empty, saving space. Dr. Lechner reckons a carbon-fiber container would need to travel only 120,000km (three times around the Earth) to prove cheaper than its steel equivalent. It would also be more secure because it would be easier to scan without being opened.

The adoption and normalization of carbon-fiber containers will have implications on the job security of custom officials (The Economist, 2014). McKinsey also predicts that by 2067, "Autonomous 50,000-TEU ships will plow the seas—perhaps alongside modular, dronelike floating containers—in a world where the volume of container trade is anything from two to five times greater than it is today" (Saxon and Stone, 2017). Waldrop (2007) also envisages the future of cloud computing in shipping containers. He proclaimed that "The next steel shipping container you see being hauled by a truck or train might not stow the usual mass of lumber, textiles, or foodstuffs. It might hold 10 tons of finely interlaced computer servers, ready to be deposited in a parking lot to serve 10,000 employees at a corporate headquarters—or 10,000 people on the

Internet" (Waldrop, 2007, p. 90). According to Waldrop (2007), the shipping container will replace corporate data centers and transform the computing experience. Waldrop (2007) was referring to *Project Blackbox*, an initiative by Sun Microsystems (Figure 9).

Figure 9: Shipping Container Data Center

Source: Waldrop, 2007.

The rise of containerized trade affects the sovereignty of nations. A clear demonstration is the militarization of the Gulf of Aden to address rising pirate activities (Cowen, 2014). On May 15, 2012, the sovereignty of Somalia was infringed when the EU Naval Force deployed maritime aircraft and attack helicopters to bombard a village along the Central Coastline of Somalia alleged to be the den for pirates (Cowen, 2014). Moreover, stakeholders in the maritime sector perceive piracy around the Horn of Africa from a supply chain security perspective rather than from food insecurity and unemployment dimension (Cowen, 2014, p. 135).

The shipping container is also a symbol of criminal activities such as smuggling, trafficking, and murder. For instance, Knight (2003, p. 18) demonstrated how human traffickers and other crime syndicates exploit the container system for criminal activities. A clear example was the discovery of the bodies of fifty-eight Chinese asylum seekers in transit from Zeebrugge to Dover inside a shipping container (Knight, 2003, p. 18). Roberto Saviano (2008) also detailed similar patterns of human trafficking and organized crime in *Gomorrah: A Personal Journey into the Violent International Empire of Naples' Organized Crime System.* According to Parker (2013, p. 368-

369), Saviano described an incident where "one container breaking free of its crane, lurching wildly in the air as the doors break open and it tips the frozen bodies of Chinese women, men, and children, down onto the concrete where they break on the ground. They were identifiable only by tags around their necks, migrant workers who had died in Italy and wished to be buried back in China". Saviano (2008) himself described in detail the harrowing experience and psychological scar imprinted in the memory of the port crane operator who witnessed the incident firsthand. Saviano (2008) writes, "the port crane operator covered his face with his hands as he told me about it, eyeing me through his fingers. As if the mask of his hands might give him the courage to speak (…….) He still couldn't believe it and hoped he was hallucinating, due to too much overtime". Containers can contain anything was Parker's (2013, p. 369) conclusion to the unimaginably horrifying and haunting incident at the port of Naples. Klose (2015, p. 314) also declared that the container in the above story "becomes a somewhat unearthly place of disappearance into a superhuman context". The container also embodies the horrifying tales of Stowaways on containerized cargo ships. For decades, determined and desperate migrants burdened by the constraints of reality embark on dangerous journeys to seek greener pastures in Western countries as stowaways. These stowaways conspicuously hide onboard the containers of cargo ships at the port of origin and transit. According to Knight (2003, p. 18), the shipping industry applies measures such as carbon dioxide probes to protect containers and deter stowaways.

Intermodal depot and container yards are characteristic of the containerization process. The Intermodal Association of North America IANA (2018) defines an intermodal depot or container yard as a location for storing shipping containers. These yards are either located within the premises of rail and marine terminal or an off-site location (IANA, 2018, p. 9). These yards are used for storing empty containers or for holding units in transit (IANA 2018, p. 9). These storage locations are also used to run container repair and maintenance services. *In Flows and Pauses in the Urban Logistics Landscape: The Municipal Regulation of Shipping Container Mobilities,* Cidell (2012), explored the implication of container yards on cities and communities. Cidell (2012, p. 240) argued that these informal container storage areas are difficult to regulate due to the constant fluidity of motion of individual container boxes.

2.2. The Container and the Urban: A missing link? (Towards a Container Revolution?) (The Urbanization of the Container)

"*Containers are coming to a street near you*" (Farley and Roberts 2011, p. 51)

How has containerization been studied? Much of the analysis on containerization is dominated by fields such as management, international trade, logistics, transport, and economic geography. The sociological and human geographical analysis of containerization, on the other hand, emerged in the 1960s, focusing on the impact of the container on labor relations at seaports. The geographical conceptualization of containerization coincided with the quantitative revolution in the 1960s. In recent years, scholars like Klose (2015), and Parker (2013), have challenged the narrow interpretation of containerization to logistics and international trade and transportation. Klose (2015), in particular, cautioned against the confinement of containerization to the transportation of goods and logistics. Instead, Klose (2015, p. 326) speaks of the emancipation of the container from modern consumer capitalism to the socioeconomic and spatial configuration of cities (Fig.10). Klose (2015, p. 305) described how construction workers live in cheap temporary stacked containers on expensive inner-city plots.

Making the case for an expansive conceptualization of containerization, Parker (2013, p. 369) argued that "containers, as a mobility-system, can be demonstrated to produce complex and paradoxical effects. As materials, they are in a moving relation with heterogeneous and multiple spaces, always being entangled in trajectories that make new relations." This research builds on Parker's exposition and explores how the container creates new relations in cities. Parker (2013, p. 369) further reflected on the fact that, in as much as, the standardization of the shipping container rationalized global trade, it also brought about crime, art, and housing. Parker (2013, p. 369) referred to Massey's (2005, p. 9) evocation on space to justify the imperative for an epistemic shift to conceptualizing containers.

Figure 10: The World from the Container

Source: Klose 2015: 299

Marc Levinson's book on *The Box: How the Shipping Container Made the World Smaller and the World Economy Bigger* offer a significant point of reference for conceptualizing containerization. Levinson (2006) used the box as a euphemism to explain how the modern-day standard shipping container became an integral part and dominating force in global trade. Containerization dominates a growing body of transdisciplinary research on mobilities (Anim-Addo et al., 2014; Cowen, 2014; Steinberg, 2013; Sheller and Urry, 2006; Jaržemskiene, 2007). For instance, Hayut (1981) explored the impact of containerized transport systems on port structure and operation. Using container ports in North America as a case study, Hayut (1981) concluded that the dimensions of the local logistical landscape, such as the size of the local market, market accessibility, the nature of port management, the localization of the port, and how adaptable the ports are to new systems significantly affect the port structure and operation of containerization and transport systems. From an explorative approach, Weldon (1958), systematically analyzed the likelihood of Matson Navigation Company adopting a cargo-container shipping service as part of its operation. Weldon's study showed how firms proceed to adopt the container technology during the early decades of its invention. Weldon (1958, p. 649), however, found limited guidelines for the design of optimal containerization systems.

In *Containerization: A Pandora's Box in Reverse?* Strom (1972), challenged the portrayal of the container as the solution to problems within the transportation and distribution system. Strom (1972), stressed that literature on containerization only portrays a part of the whole concept. For example, Hall (2009), found a limited association between the implementation of containerization and the earnings of port-logistics workers. Using the port of Baltimore in the United States as a case study, Hall (2003) further examined the impact of technological change on institutions. Herod's (1998) study on *Discourse on the Docks: Containerization and Inter-Union Work Disputes in US Ports, 1955-85* also explored the implication of the container technology on port union relations. Additionally, according to Notteboom and Rodrigue (2009), the future development of containerization will depend on macroeconomic, operational, and governance perspectives. Studies by Talley and Schwarz-Miller (1998), Hirsch and Macpherson (1998), Chadwin et al. (1990), Talley (2002) also found that the implementation of containerization reduced the demand for dockworkers and overall wages. For instance, the demand for dockworkers declined by 40 to 60% in some countries (Zarocostas, 1996).

Airriess (1993), also explored the relationship between the diffusion of container technology and the structural transformation of port operations in ASEAN countries. Crucially, container technology transformed the manufacturing sector of ASEAN countries. According to Kim and Sachish (1986), the implementation of containerization contributed to an 85% growth in the Total Factor Productivity (TFP) of ports. The impact of container adoption on port productivity is not uniform across space. Using Canadian ports as a case study, Wallace (1975) concluded that low port traffic, delays, and competition from the United States hinder the containerization adoption process. Hall et al. (2006) also found an asymmetrical relationship between container adoption and perceived economic benefits such as employment.

Citing the works of (Hayut, 1981; McCalla et al., 2004; Notteboom and Merckx, 2006; Fowler, 2006), Cidell (2011) also critiqued the overemphasis on infrastructure in the conceptualizing containerization-metropolitan areas relations. Cidell (2011), instead proposed the analysis of the impact of containerization on land-use and socio-economic processes. Cidell (2012), accordingly, argued that shipping containers create problems for municipalities and communities irrespective of the nature of their mobility or immobility.

Other studies have explored the impact of adverse weather conditions at sea on container safety. For example, Acanfora et al. (2017) found that unprecedented weather conditions cause significant container losses at sea annually. Average annual shipping container losses at sea range from 59 to 2000 (Morris, 2017). Aside from economic loss and environmental damage, container adrift present real concerns such as navigational problems and the risk of collision with other container ships.

In a feminist twist to the container paradigm, Sofia (2000) elaborated on the intelligible relationship between femininity and the maternal dimensions of container technologies. Drawing on Lewis Mumford's (1934) *Technics of Civilization*, Sofia (2000, p. 187), claimed that containers are generically feminine because the "female body provides our first sheltering container and source of supply." Sofia (2000) insisted that the biological constitution of the human body, such as the skin, mouth, stomach, bowel, can be likened to a container. She further argued that men are particularly associated with container technologies because "some men may be particularly interested in technologies of containment as compensations for their own relative deficiency in the reproductive container department" (Sofia, 2000, p. 187). Sofia's (2000) scholarly work dispels the masculine (re)constitution of container technologies. Lee (2010) also stated that as a tool of concealment, the human body epitomizes the container. Lee (2010) explored the concept of the container more generically, citing portable containers such as backpacks, purse, suitcases, etc). Lee (2010) used the human body as a euphemism to challenge the legality of the *Container Doctrine*. The Supreme Court of the United States defined the container as the capacity of an object to hold another object (Lee, 2010, p. 1414). Lee argued that the definition was contradictory because a car, a house, and the human body can be considered as containers "since it too is an object capable of holding another object." According to Lee (2010), a paradox emerged from the Supreme Court's more expansive definition of the container. On the one hand, Lee argued that the court failed to distinguish 'worthy and unworthy container' (Lee, 2010, p. 1414). In practice, however, the court treats containers differently under the Fourth Amendment protection against state interference (Lee, 2010).

Agamben's concept of the state of exception is instructive for understanding the relationship the container and civil liberties. Refugee centers and deportation camps are clear symbols of the state of exception (Figure 11). Klose (2015, p. 305) argued that "the most underprivileged of the global

distribution system—the refugees without money or papers and without the prospect of returning to their countries of origin—are forced into container camps or similar internment and regulatory architectures". Agamben's reflection on bare life is useful and appropriate for understanding the relationship between containers and various forms of incarceration. Klose (2015, p. 306) eerily likened the devaluation of people to bare life in containers to house pets and even slaves. Conflicts and post-disaster situations in recent decades embody the materialization of bare life through the container. For instance, the Syrian conflict shows how families fleeing war and persecution live in shipping containers in neighboring countries like Turkey, Lebanon, and Jordan (Weinthal, 2013). For example, the so-called *Container City*, located in the Turkish province of Kilis, hosts Syrian refugees under a temporary protection programme. The success of the container city in Kilis resulted in the construction of other container settlements in the provinces of Şanlıurfa and Gaziantep (Güçer et al., 2013).

The controversial and infamous Guantanamo prison camp in Cuba offers a possible pathway for conceptualizing the state of exception and the container. Under the guise of national security and trapped in absolute obscurity, Guantanamo Bay detainees were stripped of their rights in a post-September 11 terrorist crackdown. The dark machinations of supervised institutionalized torture and the degradation of the basic human dignity of Guantanamo detainees transpired in containers. The container operates within a legal vacuum created by the ascendency of biopolitical governance (Klose, 2015). The case of Guantanamo Bay shows how the degree of separation emboldens the modern police-state to engage in dehumanizing infractions of detainees in shipping containers. Moreover, the general population often fail to confront the proximity of container installations because of the perceived temporality of these settlements or detention centers (Klose, 2015, p. 209).
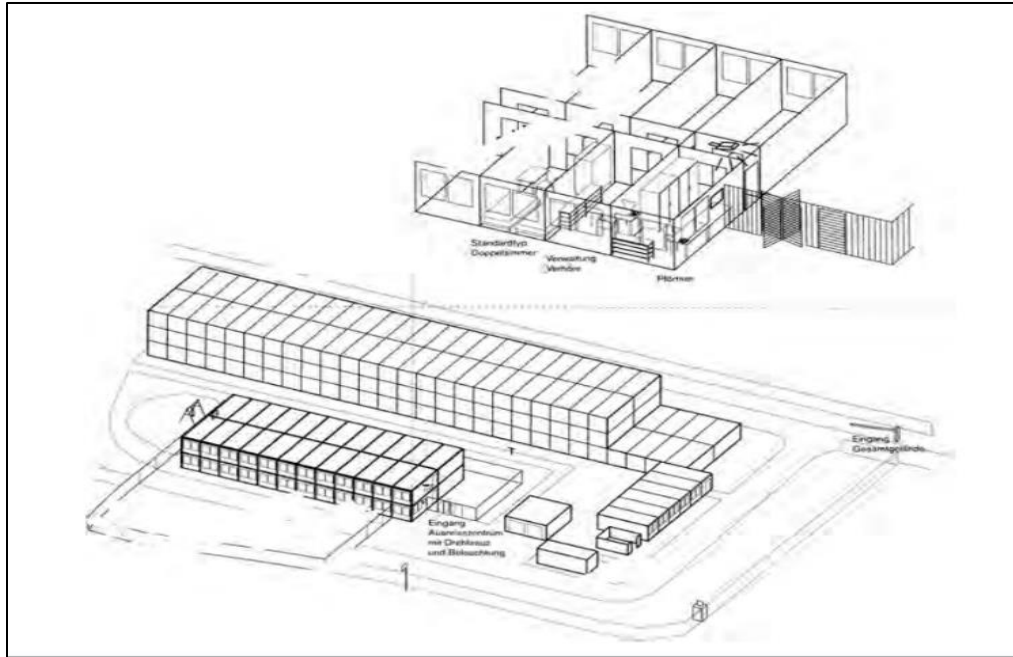
Figure 11: A Container Camp for Refugees and Asylum Seekers in Fürth

Source: Klose, 2015, p. 307.

Interestingly, Michael Sorkin (2001) addressed the 'container question' in his book on *Some Assembly Required*. Michael Sorkin produced an extensive body of work on architecture and urbanism. Sorkin (2001, p. 185) summarized his perception of the container by suggesting that "I have a bad reaction to the idea of containers." As an instrument of despair, the container raises anxiety about leakage, the uncontained, and spontaneous events (Sorkin, 2001, p. 185). Sorkin (2001, p. 185) cited the Chernobyl disaster to explain how containers produce cataclysmic consequences such as thousands of lingering deaths, territorial destruction, and abandonment. Furthermore, the focus of much of US foreign policy against the Soviet Union was the 'containment policy' which places the container at the center stage of international relations and global politics (Sorkin, 2001). On the integration of the container into mainstream urban design, Sorkin (2001, p. 186) described how the poor and marginalized in society are housed in containers to satisfy the democratic purpose. As an instrument to ensure people and things are in their place, the container can be a dominant force of social control (Sorkin, 2001, p. 187). Klose (2015:336) also drew a parallel between the container as an instrument of social control and Michel Foucault's disciplinary society. Klose (2015, p. 336) further asserted that the spatial

organization of the container ensures the efficient operationalization of social control of the individual. Sorkin (2001) proposed that concerns about the container should be directed at the character of its membrane. For Sorkin (2001), the container is a double-edged sword. On the one hand, it keeps things out, and on the other hand, it assumes the role of pouring-in (Sorkin, 2001). The container paradigm coincided with the rise of consumer culture. According to Sorkin (2001), the case of Walter Hudson epitomizes the impact of containerization on postmodernity. Sorkin (2001, p. 188) argued that: "Hudson simply makes visible a containerization to which we are all susceptible, the idea that the body, positioned at a nexus of surveillability, immobilized by the possibility of continuous observation and regulation, becomes the modularized degree-zero of architecture." Hudson died in 1991 of Myocardial infraction weighing 1,200 pounds. A section of the house was torn down to forklift his corpse (Sorkin, 2001).

2.3. Living in a Box: A Resurgence of Container Living?

A great epoch has begun.
There exists a great spirit.
Industry, overwhelming us like a flood which rolls on towards its destined end, has furnished us with new tools adapted to this new epoch, animated by the new spirit.
Economic law unavoidably governs our acts and thoughts.
The problem of the house is the problem of epoch. The equilibrium of society today depends on it
(Le Corbusier, 1986, in *Towards a New Architecture*)

Steven Spielberg's 2018 adaptation of Ernest Cline's 2011 bestseller dystopic fictional novel offers some insight into the potentiality of normalized container settlements. Described by Rubin (2018) as teetering settlement of stacked blight, *Ready Player One* portrays settlements comprising containers and trailers stacked on top one another conveniently referred to as *The Stacks*. The film is set in 2045 and depicts a disadvantaged and marginalized population of Columbus, Ohio. There appears to be a parallel to be drawn from the unraveling of container improvisations in cities and the heterotopic dystopia dramatized by Spielberg. Klose's (2015, p. 333) popular culture reference of Aki Kaurismaki's film titled *The Man without a Past* also place the container at the center of the social organization of life. The film tells a story of how a man found refuge among a community of homeless people in empty container units in Helsinki. The film uniquely depicts loss, love, death, inequality, and dispossession.

Is "Less is More" (a mantra that emerged in the 1960s and attributed to Mies van der Rohe and Walter Gropius), socially and spatially constructive? The allure of rational, and cheap mass-produced housing is rooted in the works of architects Le Corbusier and Walter Gropius (Klose, 2015; Birch, 2011). Le Corbusier made his mark on architecture through bespoke buildings that dominate the landscapes from Paris to India. According to Curtis (1986, p. 12), Corbusier's buildings provide a sense of order and complementarity. Corbusier's utopian dream accrued from his idealization of institutions (Curtis, 1986). Corbusier (1986, p. 234) questioned the rationality for excluding the construction of factories for mass production of housing while factories exist for making airplanes, cannons, lorries, and wagons. Corbusier believed in the utility value of modern architecture has to offer (Smith, 2010). Crucially, the post-war housing shortage in France inspired Corbusier on the importance of mass production houses (Curtis, 1986). Corbusier championed the idea of an 'architectural cell' (Figure Corbusier) as a metaphor to explain how people will be dwelling in the smallest living units, such as prison cells or modern ship's cabin (Klose, 2015, p. 249). Corbusier's work introduced and normalized Taylorist and Fordist mode of house production (Curtis, 1986; Klose, 2015). For Corbusier, a fundamental step towards addressing societal problems revolved around the mass production of housing (Smith, 2010). Corbusier's time with industrial architect Peter Behrens and Parisian architects Auguste and Gustave Perret placed a role in his interest in mass-production houses (Klose, 2015). Corbusier firmly believed in scaling-down on classical orders for the epoch of the time: for a machine age (Curtis, 1986). For Corbusier, then, a house is a machine for living in (Curtis, 1986, p. 53). Corbusier insisted that architecture must be machine-like and functional (Hall, 2014:239). Corbusier (1986, p. 229) cited a proposal to build 500,000 dwelling units in France by MM. Loucheur and Bonnevay as a massive step towards standardized and cheap mass-production housing. Corbusier (1926, p. 243) emphasized that "We must never, in our studies, lose sight of the perfect human cell, the cell which corresponds almost perfectly to our physiological and sentimental needs. We must arrive at the house-machine, which must be both practical and emotionally satisfying and designed for a succession of tenants. The idea of the old home disappearing and with it, local architecture, etc., for labor will shift about as needed and must be ready to move, bag and baggage". The design of Citrohan House epitomizes Corbusier's house-machine proposition (Smith, 2010).

Setting the tone for his argument, Corbusier proposed the mass-production state of mind as a pre-requisite for any mass-production housing programme. He went on to argue that without the right state of mind for living in mass-production housing, the initiative will be fraught with challenges (Corbusier, 1986). He wrote that: "if once the mass-production spirit came to life, everything will quickly be begun" (Corbusier, 1986). The current state of the housing and real estate market has re-ignited interest among scholars and city authorities about Corbusier's proposition on mass production. The formal property market in many parts of the world has transformed the notion of the house as a speculative tool on the global market. Rent-seeking landlords and developers in their quest to maximize profit exclude the average everyday urban dweller from the property market. He complained at length about how most of the materials necessary for the mass production of houses were not even ready (Corbusier 1986, p. 232). He emphasized that despite the availability of new material such as cement and limes, steel girders, and sanitary fittings, the cost and labor involved meant the production of half and half solutions (Corbusier, 1986:232). He conceded that due to the general disapproval of mass production houses by architects and the general public alike, the possibility of examining the various components of such initiative becomes very problematic (Le Corbusier, 1986, p. 232). According to Klose (2015, p. 250), Corbusier conceived of the container stacking principle in architecture long before gaining momentum in the transportation sector (Figure 12).

LA MAISON STANDARDISÉE

1 fenêtre

½ fenêtre

¼ fenêtre

1 cellule   ½ cellule   2 cellules   4 cellules
                                  1 demi-cellule sur pilotis   2½ cellules

LA MAISON STANDARDISÉE. — Le plan standardisé a conduit Le Corbusier à fixer l'élément de base de « Pessac ». La construction rationnelle par cubes ne détruit pas l'initiative de chacun. Il n'y a qu'à en jouer suivant ses goûts.
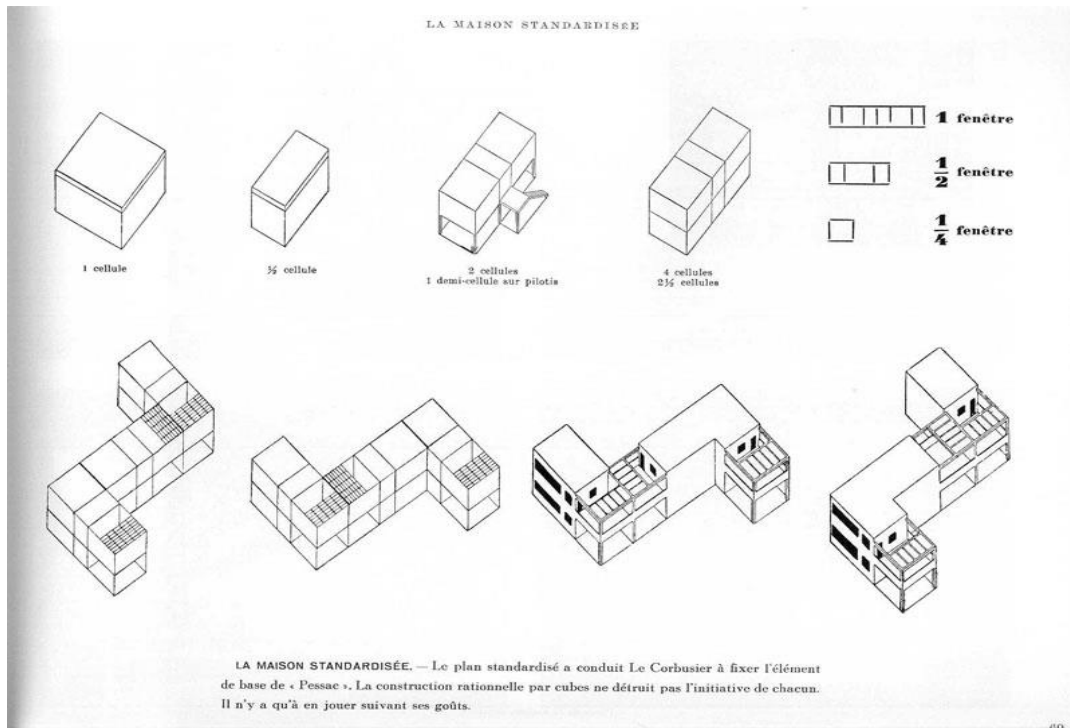
Figure 12: Le Corbusier's Standardized room module

Source: Klose, 2015.

The German architect Walter Gropius was another pioneer of mass production housing in architecture. Gropius founded the Bauhaus movement and rationalization of architecture (Seelow, 2018). The purpose of the Bauhaus movement is to ensure the masses have access to basic infrastructure. Gropius advocated for standardization and mass production of small houses as well as comprehensive plans to finance them (Pevsner, 1960, p. 38). He proposed an offsite fabrication strategy to reduce the high cost of housing (Smith, 2010). Contrary to van de Velde's call for individualism in architecture, Gropius followed Hermann Muthesius' stance on standardization (Pevsner, 1960). In Gropius's (1965) view, standardization is a prerequisite for the advancement of civilization. The standardization of housing also has significant economic benefits (Gropius, 1965). Unfortunately, Gropius's ideas did not proceed beyond the conceptual stage despite his role as the father of the modernist architectural school and a champion of social equality (Smith, 2010). According to Pevsner (1960, p. 214), Gropius insisted that "the architect, to represent this century of ours, must be colder, cold to keep in command of mechanized

production, cold to design for the satisfaction of anonymous clients." In the *New Architecture and the Bauhaus*, Gropius denounced what he referred to as the propensity to "borrow our styles from antiquity and perpetuate historical prototypes in decoration" (Gropius, 1965, p. 24). Gropius (1965, p. 25) bemoaned the rigidity of traditional raw materials in construction in favor of new synthetic substances-steel, concrete, and glass. On the logic of industrial production, Gropius proposed the creation of a flexible construction kit and assembly line serial production (Seelow, 2018, p. 2). Gropius favored the Americanization of production culture, specifically the Fordist and Taylorism mode of production (Klose, 2015; Seelow, 2018). Gropius argued that the Americanization of production systems would reduce the infrastructural shortages in postwar Germany (Seelow, 2018). Upon his arrival in the United States, Walter Gropius and Konrad Wachsmann proposed the mass production of 'Packaged House' to reduce the housing deficit in the during wartime (Smith, 2010).

Of immense importance to this present study relates to Walter Gropius' proposed Honeycombs (Figure 13) and the Steel House by his proteges: Georg Muche and Richard Paulick. The Honeycomb construction kit "consists of a basic module that derives its great variability from the honeycomb-like addition and attachment of linked space cells according to the number of heads and the needs of the inhabitants" (Seelow, 2018, p. 9). The honeycomb is a euphemism for representing the organization of society (Klose, 2015). Building on this, Gropius (1965, p. 37) asserted that "As the cellular unit of that larger unit, the street, the dwelling-house represents a typical group-organism. The uniformity of the cells whose multiplication by the streets forms the still larger unit of the city is there calls for formal expression." Gropius's honeycomb system found an ally in Walter Rathenau, a German politician and industrialist who believed that new cities comprising honeycombs cast in concrete were undergoing construction (Klose, 2015, p. 261). The integration of a dry-assembly method and its modern design contributed to the success of the Steel House (Seelow, 2018, p. 14).

On the rationalization of mass production, Gropius (1965, p. 39) envisioned an epoch where ready-made houses are mass-produced in factories and delivered from the stock to customers. With rationalization in a full circle, Gropius placed the assembly-line doctrine to the test in 1928 by constructing 130 houses in 88 days. (Seelow, 2018). Gropius's dream of mass production housing has gained considerable interest among housing advocates in recent decades. For

instance, disruptors have emerged in the real estate market, providing cost-effective and affordable modular housing units made of prefabricated shipping containers and other materials. Small and middle firms such as SG Blocks, Inc., LOT-EK, Tempo Housing, Container City™, and Cargotecture are providing alternative business models that challenge the traditional real estate market. These market disruptors commercialize the economic and sustainable dimension of shipping container architecture. For this reason, the Modular Building Institute (2017) provided an instructive manual for container improvisation titled *Safe Use and Compliance of Modified ISO Shipping Containers for Use as Buildings and Building Components*. The Modular Building Institute is an international non-profit trade association founded in 1983 to promote modular construction. Members of the institute consist of stakeholders of the building and construction industry as well as service providers. The institute's mission is in line with Walter Gropius's dream of the offsite construction of high quality and innovative modular structures for various uses.
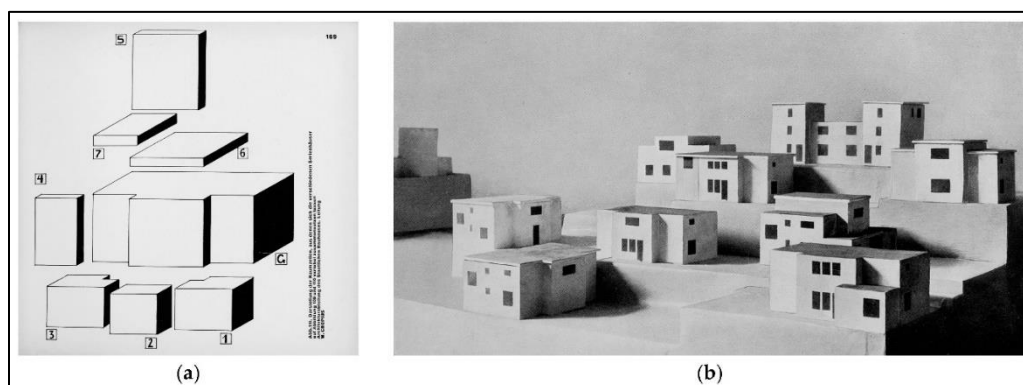
Figure 13: Honeycomb System

Source: Seelow, 2018.

The proliferation of container homes and shops in recent years is driven by the price of steel (the material for manufacturing shipping containers) and the structure of the shipping container industry (Parker, 2013). As a result of this, it is comparatively cheaper for exporting companies and countries to manufacture new containers as opposed to shipping back empty container boxes (Parker, 2013, p. 376). Parker (2013) emphasized that the comparatively low cost of manufacturing shipping containers generates surpluses and deficits in some countries. Parker

(2013, p. 376) observed that: "This has led to a huge variety of innovations with the use of containers for housing, office space, pop-up events, and so on." Parker (2013) observed that the most common types of container developments are riverside or dockland housing projects. Parker (2013) noticed a parallel between container housing projects and Corbusier's 'Dom-ino' system. Container development projects such as the Habitat 67' project in Montreal-Canada, the 'Container City' in London, and other multi-purpose container projects in cities in South Korea, the Philippines, Vietnam, Ukraine, the United States, and Hungary show the utility value of the box (Parker, 2013, p. 376).

Steve Dietz and Gunalan Nadarajan's 2006 research also confirms the emergence of a container subculture. The *Container Culture* initiative was an exhibition developed by the Curatorial Working Group to promote shipping container artwork across different port cities (Dietz and Nadarajan, 2006). The authors explored the role of the shipping container as a medium for promoting transnational art and culture (Dietz and Nadarajan, 2006, p. 291). The container culture initiative offers an alternative narrative of the container as the white cube for exhibitions (Dietz and Nadarajan, 2006). Dietz and Nadarajan (2006, p. 291) emphasized that containers are "spaces that mimic the white cube as an empty container, even while potentially enabling the subversion of the white cube's immobility by their portability; of its transcendence by their quotidian-ness; of its neutrality by their border crossing." The container culture traveling exhibition captured cross-cultural encounters and exchanges in a complex socio-economic, political, and art-historical landscape (Dietz and Nadarajan 2006). The exhibitions were colloquially themed to correspond with a country or a city. For instance, *The China Container, The Hong Kong Container, The Singapore Container, The Vancouver Container, The Seoul Container, and the New Zealand Container* (Dietz and Nadarajan, 2006). Curated by Zhang Ga, the China Container (from China) explored the cultural globalization of the container from an artistic perspective. The China Container exhibition acknowledged the tremendous role of the box as a facilitator of trade and sustenance of life. The installation observed that: "The container records history; its trajectory reveals the global tides of political intricacies, economic speculations, human mishaps, and the collective unconsciousness" (Dietz and Nadarajan, 2006, p. 292). The China Container displayed artworks such as an artistic paper trail of accounting record transactions documenting the activities of the British American Tobacco Company in China. The China exhibition also explored issues such as the import of electronic waste from the

West, cultural fragmentations, and time capsules. The Vancouver container culture exhibition, on the other hand, described the mobility of capital, goods, and migration of people "through the ports and public spaces of Vancouver, Canada, and San Jose, California" (Dietz and Nadarajan, 2006, p. 297). The Singapore Container showcased the work of two Singaporean artists named Margaret Tan and Shirley Soh (Dietz and Nadarajan, 2006). The exhibition explored the internationalization of trade in Singapore through the prism of containerization. Themed as *Sticking Point*, the art installations showcased the Free Trade Agreement between the United States and Singapore (Dietz and Nadarajan, 2006). The installation comprised of a 10 ft meter blob of chewed-up gum transported in a 20ft container from Singapore to the United States (Dietz and Nadarajan, 2006).

Farley and Roberts (2011) also explored how the culture of the container encompasses everyday life in the city. They articulated the memetics of the box (Farley and Roberts, 2011). More specifically, they called attention to the container, becoming a meme. After all, culture is best studied through the prism of memes (Kilpinen, 2008, p. 218-219). On the memetics of the container, Farley and Roberts (2011, p. 50-51) wrote:

Some use it as temporary storage, some as an off-board attic. Some use it as a playroom, or hobby room. But now there's a new twist. Some of these containers are being rented out as start-up offices. Simple and cheap, they offer a place to site, an internet connection, a phone and a small space of your own, until your business grows and you can move in to one of the multi-occupancy office buildings in the nearby business park (…………) Think of budget hotels with rooms as small and bare as containers, or garden offices for the self-employed, or modular urban housing. Containers are coming to a street near you. And to the Southern Ocean. Shipping containers once enjoyed a second life as mobile shops on housing estates. Easy to secure at night, and difficult to broach without serious cutting gear, they superseded the Luton vans or caravans propped up on bricks that had formerly been used to serve a community of a few streets and squares.

In his 1994 book on *How Buildings Learn: What Happens After They're Built,* Steward Brand offers a brilliant abstraction architecture and material improvisation. Framed within the scope of architectural history (Bluestone, 1995), the book focuses on how various stakeholders such as homeowners, contractors, and architects adapt to the evolution of buildings. A firm believer in vernacular architecture, Brand (1994) provided a fascinating account of his own experience in a container structure, offering a meticulously temporal dimension of his stay. Brand provided aesthetic delectation of his container experience between 1990 and 1993. Brand (1994) explained that:

My research library was in a shipping container twenty yards away—one of thirty rented out for self-storage. I got the steel 8-by-8-by-40-foot space for $250 a month and spent all of $1,000 fixing it up with white paint, cheap carpet, lights, an old couch, and raw plywood work surfaces and shelves. It was heaven. To go in there was to enter the book-in-progress—all the notes, tapes, 5 × 8 cards, photos, negatives, magazines, articles, 450 books, and other research oddments laid out by chapters or filed carefully. When the summer sun made it too hot for work, I sawed a vent in the wood floor, put a black-painted length of stovepipe out of the ceiling, and slathered the whole top of the container with brightly reflective aluminum paint-end of heat problem. That's how Low Road buildings are made livable: just do it.

Brand (1994) repeatedly mentioned *Low Road Buildings* to highlight the depth of his container experience. Low road buildings are low-visibility, low-rent, no-style, and high-turnover (Brand, 1994). Brand (1994) argued that new users easily adjust to life in low road buildings. He also believed that creativity flourishes in low road buildings (Brand, 1994).

Chapter Three: Theoretical Approaches to Critical Urban Studies

This chapter constructs an interdisciplinary theoretical paradigm for understanding the transformation of urban space through the prism of containers. The chapter interrogates three theoretical dispositions by shifting the debate from a purely Marxist preoccupation with political economy to an Avant-garde, socio-techno-materialist hegemony. Embedded in these theories lie significant paradigmatic adaptability that this present study seeks to convincingly utilize to deconstruct the dynamics of container urbanism in critical urban studies.

3.1. The right to the city (Revisiting the Orthodoxy)

……over the last decade, the idea of the right to the city has undergone a certain revival……………………………. the idea of the right to the city does not arise primarily out of various intellectual fascinations and fads (though there are plenty of those around, as we know). It primarily rises up from the streets, out from the neighborhoods, as a cry for help and sustenance by oppressed peoples in desperate times (Harvey, 2012, p. xi-xiii).

Published in 1968 and described by Merrifield (2006) and Harvey (2012), as a 'provocative text' Henry Lefebvre's illuminating essay on *The Right to the City* (Le Droit à la Ville) is a thrilling and fulfilling conceptualization of the city. David Harvey and Edward Soja are credited for reviving Lefebvre's quintessential formulation on the city in English speaking discourse (Saunders, 1981, p. 105). In formulating the right to the city, Lefebvre rejected class reductionism and economism (Purcell, 2014, p. 145). In place of class reductionism, Lefebvre (1991) proposed "a more holistic understanding of social life, one that is always attentive to the many aspects of human experience." Lefebvre's thought on the city has been variously analyzed and with equal measure criticized for homogenization and generalization. Lefebvre's ideas are sometimes highly speculative, self-consciously utopian, and lacking in academic rigor (Saunders, 1981, p. 105-106). Lefebvre also failed to clarify what those rights constitute. Many scholars also questioned the impracticality of Lefebvre's abstraction (Attoh, 2011; Moore, 2009; Mitchell, 2003). Despite criticism from numerous scholars and commentators, Lefebvre's abstraction of the city is still relevant for conceptualizing the urban question.

Over the years, urban justice movements have emerged using Lefebvre's concept to externalize the struggles of everyday life in the city (Harvey, 2012). Lefebvre (1968, p. 158) cautioned against the return to traditional cities. In his characterization of the city, Lefebvre called for a new humanism (based on his critique, and a stark departure from the old humanism); proposing a new right, the right to an œuvre, the right to the city (Harvey, 2012; Marcuse, 2009; Merrifield, 2006, p. 71; Lefebvre, 1996, p. 149). He exquisitely illustrated that "The city historically constructed is no longer lived and is no longer understood practically; It is only an object of cultural consumption for tourists, for aestheticism, avid for spectacles and the picturesque" (Lefebvre, 1996, p. 148). The individual's responsibility for shaping their density is at the heart of the right to the city. Merrifield (2017, p. 14) confirmed this by stating that "The urban as a whole should be yours, yours to move in, yours to explore, possess, feel you have a stake in—should you want it."

A recurring theme in Lefebvre's (1996) characterization of the right to the city is the concept of an oeuvre (Parker, 2004:20). He described the œuvre as the manifestation of creative activities. Lefebvre believed that the city should transcend the sheer production and consumption of material goods. According to Lefebvre (1996:75), œuvre is a form of use-value. Lefebvre (1996, p. 148) insisted on "places of simultaneity and encounters, places where exchange would not go through exchange value." In Lefebvre's (1996, p. 127) view, the city traded its oeuvre, its character of appropriation for mass mobility, and consumerism.

The city can reclaim its œuvre through 'revolutionary initiatives' from groups of social and fractional class (Lefebvre, 1966, p. 154). The right to the city is a cry and demand for the right to centrality (Lefebvre 1996; Merrifield, 2017). The right to centrality implies the geographical proximity to the center of the city (Merrifield, 2017). Lefebvre passionately insisted that the city cannot exist without centrality (Merrifield, 2006, p. 71). Interestingly, the back to the city movement in the 1990s has brought the notion of centrality back into the debate of urban citizenship. The back to the city movement, however, resulting in gentrification, touristification, dispossession, financial centers (Merrifield, 2017). The right to the city empowers outsiders to get inside (Merrifield, 2017). With growing urbanization, however, the notion of centrality has become increasingly irrelevant. Merrifield (2017, p. 14) asserted that "Today if we were to

reframe creatively the right to centrality, we would see it less as a geographical right than as an existential and political right."

Lefebvre believed that the right to the city is symptomatic of the transformation and renewed right to urban life (Lefebvre, 1996, p. 158). Harvey (2012) agreed by asserting that the cry for a right to urban life is amplified by the crisis of everyday life in the city. In essence, the right to the city lay to bear the struggle of everyday urban life (Attoh, 2011). The demand for urban life is a recognition of the inherent crisis in cities (Harvey, 2012). Marcuse (2009, p. 190) weighed in by arguing that the cry for the right to the city represents those alienated, and the demand seeks to address the needs of those excluded from attaining the material necessities of urban life. According to Lefebvre, maximizing opportunities for the poor through inclusive governance guarantees the right to the city (Merrifield, 2006, p. 77). Harvey believed that:

The right to the city is, therefore, far more than a right of individual or group access to the resources that the city embodies: it is a right to change and reinvent the city more after our hearts' desire. It is, moreover, a collective rather than an individual right, since reinventing the city inevitably depends upon the exercise of a collective power over the processes of urbanization" (Harvey, 2012, p. 4).

The right to the city lacks direct legal precedence (UN, 2008). After all, the state is the sole guarantor of rights (Harvey, 2009). Marcuse (2009, p. 192) insisted that the right to the city "is not meant as a legal claim enforceable through a judicial process today (although that may be part of the claim as a step in the direction of realizing the Right to the City)." The right to the city transcends individual liberty to claim urban resources and relates more to a collective of transformation (Harvey, 2008). From a human right argumentation, Harvey (2008;2012, p. 5) acknowledged that the right to the city relates to the "freedom to make and remake our cities and ourselves." The ongoing contention between use-value (the city and urban life) and exchange value (spaces bought and sold, the consumption of products, goods, places, and signs) has necessitated the informal and sometimes forceful claim to the right to the city (Lefebvre, 1996, p. 87). Marcuse (2009, p. 189) substantially dissects Lefebvre's theoretical essay by asking relevant questions such as: Whose Right are we talking about? What Right is it we mean? What City is it to which we want the right? Harvey (2012, p. 4) also questioned the practicality of these rights. Marcuse (2009, p. 190) maintained that certain beneficiaries such as the working class, small business owners, capitalists, and the intelligentsia risk exclusion from the right to the city initiatives. Lefebvre effortfully devoted a fair number of pages to clarify his position on what constitutes rights (Lefebvre, 1996). Lefebvre believed that the externalization of the Judeo-

Christian legal framework into formal legal rights was untenable. Formal legal rights Lefebvre argued are "never God-given, nor are they natural rights that the framers of constitutions simply write down" (Purcell, 2014, p. 146). These rights are earned through political struggles; through the mobilization of collective claims to citizenship (Purcell, 2014).

The right to the city concept has amassed considerable following over the decades. International organizations such as the UN-HABITAT (Fig.14) and UNESCO have endorsed and rallied behind The Right to the City (Purcell, 2014; Soja, 2011). According to UN-HABITAT (2008), the right to the city represents a concrete strategy for bridging the urban divide. They reiterated that the right to the city is connected to the economic, cultural, political, social inclusivity in the city (UN-HABITAT 2008). The *World Charter for the Right to the City*, the *European Charter for Human Rights in the City*, and the *Montreal Charter of Rights and Responsibilities* are legislative instruments proposed to promote the right to the city (Purcell, 2014, p. 141). The HABITAT 2 conference put forward the idea about the right to shelter and access to land, despite considerable contestations on what constitutes rights (Thorns, 2010, p. 7; UNCHS, 1996). The World Charter for the Right to the City promotes the rights to habitat, social cohesion, and the collective construction of the city, live with dignity in the city, co-existence, influence, and access to the municipal government, equal rights (Mathivet, 2010, p. 23). The Brazilian Constitution of 2001 stipulated a clause that guarantees the right to the city, further elevating and cementing Lefebvre's credentials as a quintessential authority in urban theory production (Harvey, 2012). Established in January 2007 from the alliance of 30 organizations in the United States, The Right to the City Alliance seeks to "build local power toward a national agenda for our cities. So that, one day, we can build enough power to stand with our brothers and sisters in the global South and demand global justice for humanity" (Perera, 2008, p. 12). The goal of the alliance adopts a twelve-point principle for achieving the right to the city. These principles consist of the rights to land and housing, land ownership, economic justice, indigenous justice, environmental justice, freedom from police and state harassment, immigration justice, services, and community institutions, democracy and participation, reparations, internationalism, and rural justice (Perera, 2008, p. 13).

Dikec (2002) also epitomized the political dimensions of Lefebvre's concept of the right to the city in his essay on *Police, Politics, and the Right to The City*. Purcell (2002) also called for the

reexamination of the notion of urban democracy of the right to the city. In fact, Marcuse's (2010, p. 87) synthesis of Lefebvre's theory conceived of the right to the city as a "political slogan, intended to broaden the scope of demands for social change to encompass a vision of a different society." Dikec (2002, p. 96) insisted that the right to the city should not be reduced to the right to urban space but should be perceived as a political space as well. The democratization of rights involves the participation of urban citizens in everyday life (Dikec, 2002, Gilbert and Dikec, 2008). Participation in everyday urban life implies the unrestrained access to the means of production. Dikec (2002, p. 96) claimed that the participation in urban life does not imply a quantitative engagement in urban life and struggle but "lies in its potential to generate a peculiar relationship to the political order of things by constituting the city as a space of politics." According to Dikec (2002), the state plays a secondary role in articulating the participation in the everyday urban struggle. He spoke of the "possibility of the formation of voices, of political subjectivization", of urban citizenship as against the formal participation in urban life (Dikec, 2002, p. 96). Merrifield (2017, p. 14) also emphasized that the right to the city does not imply a total immersion in the everyday politics of the city.
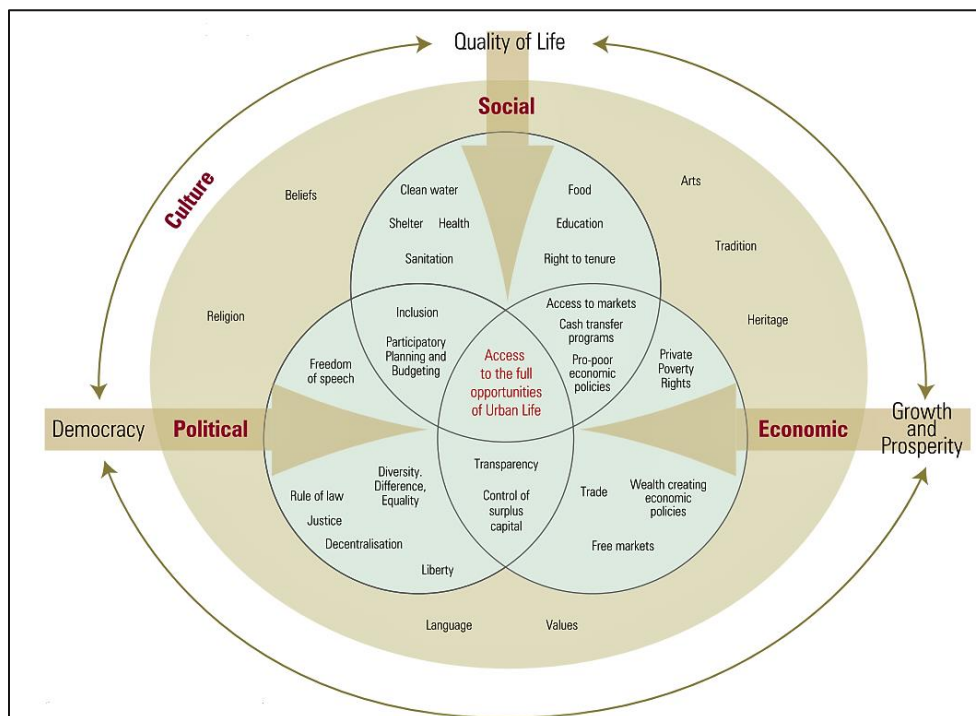
Figure 14: The Right to the City

Source: UN-HABITAT City Monitoring Branch 2009.

The right to the city also illustrates the struggle against the neoliberal order (Harvey, 2008). Neoliberalization has brought along increased privatization, limited access to land and services, speculation, restrictive urban planning processes (Sugranyes and Mathivet, 2010). For instance, the privatization of social housing in the UK spearheaded by Thatcherian neoliberal policies have created "a rent and price structure throughout metropolitan London that precludes lower-income and even middle-class people from access to accommodation anywhere near the urban center" (Harvey, 2008, p. 36). What the right of the city seeks to achieve is to roll back the catastrophic effects of neoliberalization through the promotion of equity and solidarity.

According to Purcell (2002, p. 100), the right to the city assumes a hegemonic role against capitalism and liberal-democratic citizenship. The unquestionable danger in the over-romanization of the right to the city lies in its ability to produce new urban political paradigms in the city. This Purcell (2002, p. 100) emphasized: "could also work to re-inscribe new forms of domination." Harvey (2003) also concurred that promoting the right to the city could upset the balance of social processes. He illustrated this by drawing a comparison to the right to private property as a juridical construction of individual rights (Harvey, 2003, p. 940). Harvey (2003) further argued that private property owners invoke bourgeois virtues such as open market, individual responsibility, limited state interference in the market economy to make a case for the individualization of rights. The contradiction here is those free-market principles encourage limited accountability and fairness (Harvey, 2003). Harvey (2003) used property rights in the Rio Favelas to illustrate how power relations in cities the universality of the right to the city.

Soja (2011) proposed that a 'critical spatial consciousness' is required to materialize the right to the city. Soja (2011, p. 2) emphasized that spatial awareness facilitates political mobilization and activism towards equality and social justice. According to Perera (2008), a more proactive claim is imperative to transform the power dynamics in the city. Mitchell (2003, p. 5-6), concurred that the right to the city involves the right for marginalized groups to actively take public spaces. Building on this, Boyer (2014, p. 173) also proposed a complete overhaul to the power relations in the production of urban space and governance.

The right to the city has been applied in a wide range of settings to investigate the viability of Lefebvre's theory. More interesting is the operationalization of the concept in global south cities in general and African cities in particular (Gillespie, 2016;2018; Huchzermeyer, 2011; Oteng-

Ababio and Grant, 2019), despite numerous critiques of its western disposition. Crucially, some of the propositions of the theory are in the constitution of most democratic countries in Africa. Scholars have only relatively and reluctantly applied certain aspects of the concept due to the lack of clarity on the composition of the theory. For instance, Gillespie (2016;2018), Oteng-Ababio, and Grant (2019) found parallels between the right to the city and urban policies in Ghana. Gillespie (2018) examined the manifestation of collective rights to the city in the form of self-help and financial inclusion in informal settlements. Gillespie (2018) focused on the *Amui Djor Housing Cooperative* in a peri-urban area of Accra to illustrate the collective self-help initiative. The successful scheme helped low-income residents' secure mortgages from financial institutions to construct a three-story housing block as well as slum upgrading (Gillespie, 2018; Oteng-Ababio and Grant, 2019). The practicality of the right of the city raises a question that is relevant to this present study. For instance, disruptive urban practices may negate the necessity of collective rights proposed by Lefebvre. Oteng-Ababio and Grant (2019, p. 4), in particular, questioned whether the right to the city promotes an incremental rights agenda.

3.2. Conceptualizing Urban Space

Urban space gathers crowds, products in the markets, acts, and symbols. It concentrates all these and accumulates them. To say 'urban space' is to say center and centrality, and it does not matter whether these are actual or merely possible, saturated, broken up or under fire, for we are speaking here of a dialectical centrality (Lefebvre, 1991, p. 100).

The logic of space is inescapable in the conceptualization of the city. According to Schmid (2008, p. 121), "space is on the agenda like never before." This study falls back on yet another seminal work by Henri Lefebvre to theorize the spatial dynamics of containerization. The Production of Space (*La Production de I'espace*) was published in 1974 and translated into English in 1991. The theoretical abstraction and empirical manifestation of the production of space took considerable time to diffuse into mainstream urban discourse (Schmid, 2014; Stanek, 2011). Lefebvre's conceptualization of space is regarded by many observers as an original abstraction of the dynamics of everyday life. Lefebvre described how space is perceived, lived, and (re)produced. Lefebvre's conception of space revolutionized our understanding of the dynamics of urban spatial dialectics (Borden et al., 2000; Gottdiener, 1985; Lefebvre, 1991). Lefebvre's notion of space is fundamentally important for understanding urban morphology and

transformation. According to Gottdiener (1985), community relations and social life are impossible with space. The significance of Lefebvre's conception of space in social theory lies in its integration of space and the urban in unraveling spatial processes at different configurations (Schmid et al., 2014, p. 4-5; Schmid, 2008, p. 27-8). Edward Soja used the 'socio-spatial dialectic' to formulate the relationship between space and society (Borden et al., 2000). Soja's abstraction examined the codependence between places and people (Borden et al., 2000). Ultimately, Soja's socio-spatial dialectic seeks to sanitize the myriad of "systematic misrepresentation of Lefebvre in the Anglo-American tradition" (Smith, 2008, p. 124). According to Lefebvre (2009:186), the production of appropriated space provides meaning to life and society. Three fundamental elements are quintessential to the theory of the production of space (Schmid, 2008). These consist of material production; the production of knowledge; and the production of meaning (Schmid, 2008, p. 41). Lefebvre hoped that the production and dialectic of space were would promote Marxist traditions in conceptualizing space (Kipfer et al., 2008, p. 9). Smith (2008, p. 111) also agreed that Marxist theorists have often failed to conceptualize space in their abstraction of capital.

Lefebvre passionately promoted a neo-capitalist conceptualization of space, where space is produced by occupying it (Lefebvre, 1991; Smith, 2008). Exploring the neo-capitalist narrative, Lefebvre believed that space is the final frontier for the machination of capital (Smith, 2008, p. 123). Lefebvre (2009, p. 174) rightly predicted the conflicts inherent in the overproduction of space as follow:

The old scarcities were bread, the means of subsistence, etc. In the great industrial nations, there is already a concealed overproduction of those necessities of life that were formerly scarce, and whose scarcity produced horrific struggles. Now, not in every country, but virtually on a planetary scale, there is an abundant production of these things; however, new scarcities emerge-such as water, air, light, and space, over which there is an intense struggle.

The silver lining of his prognosis is collective management and ownership of means of production shaped by social needs (Lefebvre, 2009). He further proclaimed that the politicization of space results in a divergence from the capitalist mode of production to a social production of space. Elden et al. (2009, p. 185) also argued that space is a dominant process of capitalist development. In *Social Justice and the City*, Harvey (1973, p. 13) also contended that space becomes absolute when it transcends matter.

Lefebvre introduces his book on the *Production of Space* by tracing the evolution of the concept of space. Lefebvre (1991, p. 1) maintained that the concept of space was traditionally transcendental or, at most, a mental abstraction. However, the pioneering work of Descartes ushered in a paradigm shift from the traditional metaphysical thinking where space and to an extent, time was "among those categories which facilitated the naming and classing of the evidence of the senses" (Lefebvre, 1991, p. 1). Logics such as an absolute, relative, and relational spaces constitute this epistemic shift in the understanding of space. Harvey (1973, p. 13) argued that human activities, not absolute, relative, and relational abstraction dictates the understanding of space. Harvey (1973, p. 13) proposed that we should move beyond the quest for the definition of space and focus on "how is it that different human practices create and make use of different conceptualization of space." Instead of a more formal and logical understanding of space, Lefebvre (2009, p. 172) proposed the examination of social practices. Grounded in Newtonian and Cartesian traditions, absolute space centers on the fixed nature of space (Harvey, 2005). From a social perspective, absolute space is the accumulation and rationalization of private property as well as where 'bounded territorial designations' manifest (Harvey, 2005, p. 94; Lefebvre, 1991, p. 85). Relative space, on the other hand, is predominately non-Euclidean and associated with physicist Albert Einstein (Harvey, 2005). Relative space "depends crucially upon what it is that is being relativized and by whom" (Harvey, 2005, p. 95). Capital embodies the production of relative space (Smith, 2008, p. 113). Absolute space is crucial for understanding the production of space (Smith, 2008). Absolute space produces relative space (Smith, 2008, p. 113). Spatial activities are identified based on their scale (Smith, 2008, p. 118). The spatial scale, therefore, is contingent on the relationship between absolute and relative space (Smith, 2008).

For Lefebvre, space is ideological, historical, strategic, and political (Lefebvre, 2009). He conceptualized space as a social construction, and not comparable to the production of the commodity of an object (Lefebvre, 2009). Use value occurs in social space (Gottdiener, 1985). Of course, there exists some form of relationship between the production of space and things (Lefebvre, 2009). After all, space is a product of a œuvre: of human creation (Lefebvre, 2009, p. 173). As social beings, people are responsible for shaping activities in space (Schmid, 2008, p. 29). The formulation of the production of space is an analytical rather than a historical endeavor (Borden et al., 2000, p. 6; Stanek, 2011; Schmid, 2008;2014; Lefebvre, 1991).

Lefebvre proposed a three-dimensional understanding of space (Schmid, 2014). These dimensions are spatial practices (perceived space), representations of space (conceived space), and spaces of representation (lived space) (Lefebvre, 1991 The three-dimensional dialectics of space draws from Hegelian, Marxian, and Nietzsche's abstractive configurations (Schmid, 2014; Stanek, 2008). Spatial practices involve the production and reproduction of material life (Borden et al., 2000, p. 6; Schmid, 2014, p. 37). According to Borden et al. (2000), spatial practices involve activities that constitute everyday life in the city. These spatial activities range from single rooms, subsidized housing to large urban projects (Lefebvre, 1991, p. 38; Borden et al., 2000, p. 7).

Representations of space constitute professional cohorts such as planners, scientists, and urbanists (Lefebvre, 1991, p. 38). Lefebvre (1991, p. 50) acknowledged the dominance of social relations in spatial practices. Representations of space dominate the mode of production of society, subject to a conscious codification of space (Borden et al., 2000, p. 7). Furthermore, Representations of space are symbolic and aesthetic in manifestation (Lefebvre, 1991, p. 42).

Representational spaces, on the other hand, are "directly lived through its associated images and symbols, and hence the space of 'inhabitants' and 'users'" (Lefebvre, 1991, p. 39). Representational spaces, thus, the lived experiences of everyday life, are dominated by the representations of space (Zieleniec, 2018). Representational spaces are sites of contestations, resistance, and liberation (Borden et al., 2000). Humanizing representational spaces, Lefebvre (1991, p. 42) argued that this space is dynamic, full of experience, alive, and fluid. The nature of these spaces (Representational space) implies that they are both experienced and imagined (Lefebvre, 1991; Borden et al., 2000; Schmid 2008;2014; Stanek, 2011; Smith, 2008). From a phenomenological disposition, social space is not limited to the concrete material abstraction of space but extends to lived experiences as well (Schmid, 2008, p. 41). The three-dimensional theory has, however, generated some confusion of interpretation. Schmid (2014, p. 41), in particular, identified some core 'dialectical confusions' related to the conceptualization of Lefebvre's three-dimensional theory. Schmid (2014) showed how the work of influential scholars such as Harvey, Soja, Shields, and Elden has fallen into the trap of ambiguity in the interpretation of the theory.

This thesis operationalizes the production of space to understand the containerization of urban space. It is possible to see the unraveling of urbanization in Ghana through the lenses of Lefebvre's theory. I am a bit cautious, and to some extent complicit, in the transfer of western theoretical paradigm to conceptualize urbanization in the global south. Yet, his ideas concerning space are too ingenious to ignore. It provides a near-universalistic understanding of the dynamics of urban space. According to Lefebvre (1991, p. 165), the appropriation of space occurs when natural space is transformed to address the needs of people. Appropriated space can range from a site, square, or a street (Lefebvre, 1991). The appropriation of space must encompass the totality of the city- it must be on an urban scale (Lefebvre, 1991a;1991b; Stanek, 2011, p. 70). The appropriation of space helps us understand how new spaces such as the containerization of urban space are produced (Lefebvre, 1991, p. 167). Gillespie (2016) observed that the shift towards an entrepreneurship-based approach to urban governance in Accra, Ghana created the intense commodification of urban space (Table 1). Space has become a theatre of accumulation for both capitalist and working-class urban dwellers as a result of the deployment of entrepreneurial governance strategy. According to Gillespie (2016, p. 70), these strategies constitute the commodification of land, forced evictions, displacements, and siege on street hawkers. However, the hegemonic practice involves a scenario whereby working-class urban residents are excluded from the formal land market through the expropriation of land meant for the commons to private property developers (Gillespie, 2016). The ideological manifestation of the historical and political production of space, in many African cities, can be traced to colonial and post-colonial urban processes and practices. Representations of space were used as an instrument under colonialism to expropriate communal land for so-called developmental purposes, which in the end benefited the ruling elites.

Table 1: The Price per square meter of residential property in the 10 most expensive African cities in 2017, ranked.

City	Per Square Meter in US$
Cape Town (Bantry Bay and Clifton)	6100
Durban (Lagoon Drive in Umhlanga)	2900
Johannesburg (Central Sandton)	2800
Nairobi	1900
Marrakesh	1800
Tangier	1800
Mombasa	1700
Luanda	1700
Casablanca	1500
Accra	1200

Source: Source: New World Wealth, 2018.

3.3. Neoliberalization

The unfolding of neoliberal practices in urban areas is a direct consequence of the global political-economic system. The market economy is overwhelmingly dominated by the private ownership of the means of production (Lefebvre, 2009). The massive accumulation of capital and property embodies neoliberal practices. The outcome of neoliberal practices through the insistence on the individual rather than the collective means of production has created the following scenario where Duchrow and Hinkelammert (2004, p. 5) described as follows:

The boundless accumulation of money creates the illusion in the individual person of accumulating infinite 'means of sustenance' and means of pleasure and thereby living forever. That means that the striving for more property, provided by monetary mechanisms, is based on the desire, transcending the individually desired object, for eternal life. Chasing after this illusion, the individual destroys community.

The neoliberal project idealizes socio-economic development through the liberalization of the economy and competition (Peck et al., 2009, p. 50). A precursor to neoliberal policies was free-market utopianism and Keynesianism from the 1940s to the 1960s.

An outcome of individualization is the production of social incoherence (Harvey, 2005). New forms of consumption, commodification, and gentrification emerged as urban areas increasingly

became attractive (Hamnett, 1989; Thorns, 2002). As a result of these flexible regimes of accumulation, urban housing and the land market became unaffordable for many in Low-Income countries. Based on his reflections on neoliberal practices in China, Harvey (2006, p. 39) argued that:

informal land and property markets had arisen particularly in peripheral urban areas. This was accompanied by powerful waves of primitive accumulation. Commune leaders for example frequently assumed de facto property rights to communal land and assets in negotiations with foreign investors and these rights were later confirmed as belonging to them as individuals, in effect enclosing the commons to the benefit of the few and to the detriment of the mass of the population.

Low-income countries also endured the wave of global economic restructuring and deindustrialization in the late 1970s and throughout the 1980s. Low-income countries were unable to resist neoliberal reforms compared to their European counterparts (Harvey, 2005). Accumulation by dispossession became the dominant practice. By accumulation by dispossession, Harvey (2005, p. 32) implied the privatization of land, commodification, and neocolonial processes. Neoliberal policies emerged in Ghana in the 1980s through the implementation of structural adjustment policies by the World Bank and IMF. These liberalization policies resulted in the total restructuring of the economy by facilitating the accumulation of means of production under a largely state-dominated mode of production. Privatization became institutionalized, creating "accumulation through the valorization of urban space" Gillespie (2016, p. 70).

For so long urban wealth has been concentrated in cities of the global north. Whiles this trend persists, neoliberalism and globalization have transferred some wealth from cities in the global north to the south. The shift in global production systems from the West to the East has contributed to this transfer of wealth. It has been widely argued that wealth and inequality under capital go hand in hand (Adam, 2004, p. 159).

Table 2: Top 10 wealthiest countries and cities in Africa by total wealth, 2017

Country	Total Wealth (US$bn)	City	Total Wealth (US$bn)
South Africa	722	Johannesburg	276
Egypt	330	Cape Town	122
Nigeria	253	Cairo	140
Morocco	122	Lagos	108
Kenya	104	Durban	55
Angola	81	Nairobi	54
Ghana	63	Luanda	49
Tanzania	60	Pretoria	48
Ethiopia	60	Casablanca	42
Ivory Coast	46	Accra	38

Source: New World Wealth, 2018.

3.4. Sustainability

Equally significant to the conceptualization of containerization is the impact on urban sustainability. Sustainability is at the heart of urbanism (Davidson, 2010). Sustainability is a crucial component in urban studies through renewed calls for the implementation of sustainable measures (Cohen, 2017; Wu, 2014). Renewed calls for sustainable development come at the time of the rise of capitalism and extractive logic in cities (Davidson, 2010). Yet, historically, a significant focus on both research and practice is directed to environmental sustainability at the expense of social, political, and economic components. Lee and Kim (2015, p. 8241) observed that achieving these goals simultaneously ensures comprehensive sustainable development. The direct implication of the concept relates to the fact that developmental activities aimed at ensuring sustainability should strike a balance between the needs of present and future generations with regards to the exploitation of economic, environmental, and social resources. The dimensions of sustainability have significantly expanded since the Brundtland Commission's (1987) report on *Our Common Future* to include cultural, institutional, energy, integrative, technological, and material (Cohen, 2017). Cities are essential components in the United Nations 2030 Agenda for Sustainable Development (UN, 2015). More specifically, goal 11 seeks to make cities inclusive, safe, resilient, and sustainable through slum upgrades and

affordable housing provision by 2030 (UN, 2015). Various scholars have, however, questioned the feasibility of these goals in low-income countries considering widespread pre-existing structural and institutional challenges. The building sustainability assessment systems provide a holistic approach to understand the relationship between containerization and sustainable urban development. Sustainability assessment is a tool used to evaluate and understand urban sustainability (Cohen, 2017; Wu, 2017). There are two parallels to conceptualizing the impact of the containerization of urban space on sustainability. On the one hand, the chemical compositions of the standard shipping container constitute harmful chemicals such as phosphorous, chromate, and some lead-based paints (Pagnotta, 2011) that are considered harmful to the health and safety of humans. On the other hand, repurposing containers for home or office space are considered energy efficient and a safe refuge for eventualities such as lighting. In defense of the application of the container for low-income housing, Cai and Hu (2017) characterized the material as corrosion-resistant, waterproof and insulated, recyclable, and waste efficiently, and economically efficient.

3.5. Informal Urbanization: Contrasting Theoretical Paradigms

Human life is recognized as having both a formal and an informal side. At the individual level, informality is understood here as a way of life. At the personal level, it is a reflection of human freedom, an implicit or explicit choice that an individual actor makes to locate himself or herself in a retreat position vis-á-vis the formal apparatus of society (Laguerre, 1994, p. 8).

More specifically, cities in the global south are playing a crucial role in urban theory production. Additionally, commentators have noted that the future of urbanization does not lie within western cities but in the global south (Myers, 2011; Roy, 2005; Robinson, 2006; Simone, 2005; van Gelder, 2013). The legacy of colonialism through theatres of accumulation is characteristic of many cities in the global south (Armstrong and McGee, 1985). These cities are spaces of multiple contestations and appropriation. Schindler (2017) departs from the classic political-economic characterization of cities in the global south, arguing instead for the conceptualization of these cities through the prism of human settlement. Unlike cities in the global north, southern urbanism shows a complete 'disconnect between capital and labor' as well as a 'discontinuous, dynamic and contested' (Schindler, 2017, p. 54). Roy (2011, p. 308) also argued that southern cities comprise of large megacities without power while first-world urbanism exerts considerable control over the global economy. Thus, cities of the global south are characteristic of

underdeveloped nations with flexible means of capital accumulation (Roy, 2011). Southern cities are endlessly entangled in conditions that affect their ability to develop on their own, despite the concentration of labor and other resources, that when given the commensurate attention, have the potential to propel economic growth and social development (Roy, 2011).

David Clark wrote extensively on how the emergence of the new economic order created rapid urbanization of the periphery (Table 3) (Clark, 2003, p. 100). According to Clark (2003, p. 100), the shift in global production systems from the developed world has propelled the integration of peripheral countries into the world economic system. Clark (2003) observed that the developed world depends on low-cost manufacturing and agricultural products from the peripheries. At the core of these dynamics is the circulation of transnational corporate capitalism and investment, in manufacturing which, according to Clark (2003, p. 100), directly had an impact on urban growth and indirectly on subsistence and farming systems. Clack (2003) attributed the rapid level of urbanization in Southern America, Asia, and Africa to the interplay of these factors. The dynamics of the global economy is not sufficient to explain urbanization processes in the global south. Other factors, such as urban bias policies in many post-colonial countries diverted, critical infrastructural investments to cites at the expense of rural areas (Clark, 2003, p. 103; Freund, 2007; Riddell, 1996; Simon, 1996). Urban bias policies created rapid rural-urban migration of people to secure employment opportunities and welfare (Clark, 2003). Political and economic factors at the macro level are also limited employment opportunities and created weak 'social redistribution' in urban areas of the global south (Jenkins, 2013, p. 14).

Table 3: Features of the new economic order

Development	Agencies
Globalization of manufacturing	Transnational corporations, newly industrializing countries
Globalization of consumption	Brand management, advertising, marketing, and merchandizing agencies
Globalization of food supply	Supermarket chains, newly agriculturalizing countries
Globalization of finance	Banks, securities houses, exchange dealers, brokers, insurers
Globalization of corporate services	Advanced producer service providers
Globalization of personal services	Insurance companies, banks, travel agencies, hotel chains

Source: Clark, 2003, p. 90.

The process of urbanization in the global south is informal. Data indicates that the global informal urban population will reach approximately 1.4 billion by 2020 (UN-HABITAT, 2010; van Gelder, 2013). As a rule, informal developments are depicted as a black hole, despite decades in existence (Harris, 2018, p. 267). Pieterse (2008, p. 1) also argued that mainstream literature on southern cities either focuses on an apocalyptic perspective or irrepressibly optimistic disposition. Cities in Sub-Saharan African, in particular, are labeled as chaotic and disorderly (Jenkins, 2013, p. 21). Accordingly, this makes the transfer of physical order from the global north an impossible task.

It will be helpful to look at the rise of informal cities through the prism of the informal sector or the informal economy (Myers and Murray, 2006; Myers, 2011). The informal sector emerged in the 1970s from the African urban studies school (Hansen and Vaa, 2004, p. 10; Myers and Murray, 2006; Myers, 2011, p. 71). A useful starting point for the conceptualization of the informal sector is through Keith Hart's 1973 groundbreaking paper on *Informal Income Opportunities and Urban Employment in Ghana*. Hart (1973) explored the emergence of the informal sector in Accra by examining a migrant group from the North of the country to the urbanizing South. Hart argued that some defining features of informal economic activities include precarious working conditions, low wages, and subject to the state of exception (Lindell, 2010; Roy, 2005). In his account of Hart's work, Myers (2011, p. 71-72) described the informal sector as an autonomous, unregulated, often illegal, small-scale, low technology arena. In fact, before Hart's seminal paper, the International Labor Organization published a document in 1972, providing ample evidence on the dynamics of employment and inequality within the formal and informal sectors (Table 4). Pieterse (2008, p. 2) also noted that informal practices operate outside the normative of formal governance systems. In the absence of services and welfare, the informal sector is a safety net for the urban poor in many countries of the global south (Clark, 2003, p. 113). Another essential characteristic of the informal sector is its inherent vitality and dynamism (Clark, 2003, p. 113). Furthermore, informality occurs across the streets in almost all cities in the global south. The precarious nature of certain informal activities implies that the standards of working are invariably low. Sanitation, waste management, safety, and hygiene are usually in abysmal conditions (Clark, 2003). The sector is also known for the exploitation of women and children (Clark, 2003).

The informal sector is in clear contradistinction to the formal sector, which is characterized by the production of goods and services for the professional class (Sinclair, 1976, p. 697). Scholars such as Myers (2011), AlSayyad and Roy (2004), and AlSayyad 2004) documented the unraveling of urban informality in Latin American discourse in the late 1970s. Compared to other low-income countries, the extent of the informal sector in Latin American and the Caribbean is much limited (Perry and Maloney, 2007, p. 1). The influential studies by Milton Santos (1979) and Portes et al. (1989) shows the dynamics of urban informality in Latin America (Myers, 2011). Santos showed how the formal and informal sectors in Latin America are interdependent (Myers, 2011). Profound compartmentalization exists in the conceptualization of urban informality. For instance, Hart (2005, p. 459-460) observed the lack of comparative analysis in Soto and Portes seminal work on informality in Latin America. Clark (2003, p. 116) observed that the informal sector in South American cities takes the shape of a pyramid. At the hierarchy of the pyramid is a form of quasi-informal sector businesses characterized by reasonably steady sources of income and employment (Clark, 2003, p. 116). At the bottom of the pyramid are where the majority of informal sector activities occur. The activities at this stage are high risk, low turn-over, and uncertainty. Nestled between the pyramid is the possibility for either an upward or downward economic mobility in the market (Clark, 2003, p. 116). Clark (2003) and Portes et al. (1989) raised some ethical issues concerning the linkage between the formal and informal sectors. According to the scholars, in an attempt to extract more capital and reduce cost, transnational corporations subcontract part of the manufacturing process to the informal sector (Clark, 2003, p. 113-114; Portes et al., 1989, p. 309; Perry and Maloney, 2007; Henken, 2005, p. 367). While some may argue that these generate employment opportunities for the urban poor, research has consistently shown the existence of widespread exploitation as well (Clark 2003). Furthermore, there exists a linkage between urban informality and development (Perry and Maloney, 2007; Roy, 2005; UN-HABITAT, 2008). The key promoters of the developmental approach to urban informality are NGOs and multinational agencies (Hart, 2005, p. 460). The developmentalists perceive urban informality as a stage in the developmental process (Perry and Maloney, 2007, p. 19). Significantly, decades of developmental assistance failed to curb the rise of informal settlements and slums in Sub-Saharan Africa (Jenkins, 2013, p. 16).

For decades, urban informality has proven to be quite a resilience system (Clark, 2003). Efforts to restrict the informal sector by force has yielded little result. Clark (2003), argued that populist

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local politician tends to rally behind the informal sector. Economists also regard the informal sector as a poverty reduction strategy (Clark, 2003; Cubitt, 1995).

Table 4: Characteristics of the formal and informal sectors

Formal	Informal
difficult entry	ease of entry
frequent reliance on overseas resources	reliance on indigenous resources
corporate ownership	family ownership of enterprises
large scale of operation	small scale of operation
capital-intensive and often imported technology	labor-intensive and adapted technology
formally acquired skills, often expatriate	skills acquired outside the formal school system
protected markets (through tariffs, quotas and trade licenses)	unregulated and competitive markets

Source: ILO (1972, p. 6)

In the early decades of its conceptualization, much attention was placed on the economic analysis of informal activities, relegating the social, political, and environmental dimensions (AlSayyad, 2004; Harris, 2018; Myers, 2011; Roy, 2005; Konings et al., 2006; Lindell, 2010). Harris (2018) and Hansen and Vaa (2004) also found that literature on the built environment is limited in the analysis of informalization. Harris (2018, p. 270) proposed that informality is a *necessary* 'conceptual tool' for understanding urban development. According to Lindell (2010, p. 1) and Pieterse (200), urban areas are experiencing new waves of informalization. This wave takes the form of globalization, rising urban population and migration, and the institution of structural adjustment policies. Moreover, most informal developments, at least, in Africa are the relics of colonialism and fall within the framework of 'Afro-pessimism' (Freund, 2007). The so-called 'Afro-pessimist' often argue that African cities are 'beyond redemption' (Myers and Murray, 2006, p. 2; Gberie, 2005; Schwab, 2002). Informality across African cities is the gateway for understanding how the constellation of 'cultural and social mechanisms' such as religion, ethnicity, racial identities unravel at the neighborhood level (Myers and Murray, 2006, p. 16). Harris (2018:269) noted that colonization produced new forms of landed property ownership that challenged the traditional system. On the relationship between land development and urban informality, Harris (2018, p. 268) explained that:

Urban land is distinctive in that social and economic pressures almost compel it to become real estate—a commodity. Then, too, proximity increases the impact of externalities, which requires the regulation of

land use, construction, and occupancy. Regulation requires a greater role for the state and, by extension, more potential informality. In a village, amateur builders are unexceptional; in a city, they may become unacceptable. The change often begins, and may be most apparent, in peri-urban or suburban contexts where rural land is dragged, sometimes kicking and screaming, into the urban fold (Harris, 2018:268).

Myers (2011) also agreed that land is central to informal settlement development. Unfortunately, residents in informal settlements often face uncertainties and constant threats of eviction due to limited security of tenure (Myers, 2011, p. 83). Building on this, Myers (2011) argued that urban land use has shifted from traditional/communal to Western/individualistic (Myers, 2011). Informal settlements are usually an illegal occupation land that either violates individual or communal property rights and violates planning regulations and building codes (Hansen and Vaa, 2004, p. 9).

Laguerre (1994, p. 11) described informal behavior as a social construct. The state also influences informal behavior (Harris, 2018, p. 269; Laguerre, 1994, p. 14; Roy, 2005, p. 149). The state (ill)legitimizes informality through legal instruments (Roy, 2005; Harris, 2018). People engaged in informal activities are wary of state involvement due to the nature of the operation-illegal and unregulated (Bayat, 2000; Harris, 2018). Informal settlements exist through a system of 'legal pluralism' (Harris, 2018, p. 269; Simon, 1992; Benton, 1994; Teubner, 1991; van Gelder, 2013). According to Harris (2018, p. 271), legal pluralism occurs in the urban fringes where conflicts and compromises manifest. Simon (1992) noted a contradiction inherent in the conceptualization of informal settlements. Informal settlements are often illegal in the eyes of Western law and accepted within customary law (Simon, 1992, p. 109; Harris, 2018, p. 269). Laguerre (1994, p. 13) argued that commentators should tread cautiously in the misrepresentation of informal cites because these urban areas emerged from aggression and marginalization. The politics of informality is crucial for understanding how the informal economy operates (Lindell, 2010, p. 25). The urban landscape comprises of a diverse group of actors and stakeholders competing for control over urban space. For years, these actors have mobilized to collectively represent the interest of the poor and vulnerable in urban areas (Lindell, 2010, p. 25).

Contrary to widely held assumptions, informal urban developments are not exclusively a global south phenomenon (Roy, 2005). In fact, these developments are global (Harris, 2018). Earlier studies by Hall and Pfeiffer (2000) have shown the emergence of 'informal hypergrowth cities' in the developed world (Roy, 2005, p. 148). They argued that the growth in migration from

developing countries has resulted in the informalization of cities in the developed world. Hall and Pfeiffer (2000, p. 129) uncharacteristically referred to this trend as the invasion of some cities of the developed world by the developing world. Several scholars have challenged Hall and Pfeiffer's fatalistic conceptualization of informal cities (De Soto, 1989;2000; Hart, 1973; Fields, 1990; Portes and Schauffler, 1993; Portes et al., 1989). More specifically, Hart does not consider urban informality as necessarily bad (Perry and Maloney, 2007). De Soto described urban informality as 'heroic entrepreneurship' resulting from the inability of the state to provide basic necessities for the masses (Roy, 2005, p. 148). Studies have shown the existence of informal settlements in North America (Goff, 2016; Jindrich, 2016; Mukhija, 2012; Mukhija, and Loukaitou-Sideris, 2014; Neuwirth, 2006; Ward, 1999;2004; Way, 2010). More specifically, studies have linked informal urban housing to building permit code violations in the United States (Rosen, 1986; Harris, 2018, p. 273; Listokin and Hattis, 2005). Informalization in developed countries coincided with neoliberalization (Gaffikin et al., 2011; Harris, 2018). Deregulation measures increased the cost of housing, created illegal housing renting, and the *Airbnb-nization* of urban neighborhoods (Harris, 2018). King (2009, p. 4) also drew attention to the ethnic and racial composition of informal urban dwellers in the global north. King (2009) linked this dynamic to the economic, political, and cultural effects of imperialism. He explained how almost 20% of the entire population in London are foreigners from postcolonial countries in continents such as south-east Asia, Ireland, and Africa (King, 2009).

Furthermore, the general assumption that informal cities are the sole preserve of the poor is misguided Hansen and Vaa, 2004; Myers, 2011). Hansen and Vaa (2004, p. 7) acknowledged that some well-off of the urban population engage in informal activities such as illegal land occupation and extracting rent from sub-standard housing.

In relative terms, a consequence of informal urbanization is the development of slums. For observers of global south urbanization, Mike Davis's (2006), celebrated book on *Planet of Slums* is a repository of an intellectually dynamic position on slum developments in cities across the global south. There is, however, confusion over the distinction between informal settlements and slums in mainstream academic discourse. First and foremost, Myers (2011, p. 75) made it clear that not all informal settlement slums and vice versa. Furthermore, the UN-HABITAT (2003, p. 196) highlighted that slums were initially built with proper urban planning and zoning

requirements. Informal settlements, on the other hand, are illegal, often occupied by squatters, and lack the necessary building certifications.

Myers (2011) argued that urbanization in Africa has always been informal. Citing the work of Knight (1992), Myers (2011) found no distinction between a formal and informal institution in pre-colonial African cities. These subdivisions occurred during colonialism (Laguerre, 1994, p. 13). Infrastructure was inclusion and exclusionary measure to distinguish the colonizer from the colonized (Pieterse, 2008, p. 25). After gaining independence, many of these African cities failed to implement colonial planning regimes. Freund (2007, p. 165) described this stage as the clash of ideas concerning the direction of the governance and management of African cities. Realistically, however, colonial policies did not entirely disappear in the planning processes in many postcolonial cities (Stock, 1995; Riddell, 1996). In fact, postcolonial governments implemented some planning and legislative instrument inherited from colonial administrations (Riddell, 1996, p. 132).

The implementation of structural adjustment policies by the International Monetary Fund and the World Bank (IBRD) induced the growth of informal urbanization processes in the 1980s (Riddell, 1996). The SAP transformed the dynamic of the urban economy by reducing the regenerative power of the city. As SAP policies kicked-in, African cities no longer become 'theaters of accumulation' (Armstrong and McGee, 1985; Riddell, 1996). Mass-underdevelopment ensued, embodied by the high cost of living, poor housing conditions, reduction in wages, a rollback on essential services such as health and education, food shortages, the weak value of currencies, capital flight, brain-drain, and trade liberalization (Riddell, 1996, p. 142-142). The informal sector provided a lifeline for many, as the standard of living declined (Riddell, 1996). Furthermore, public sector housing declined, paving the way for the proliferation of informal low-income shelter (Obudho, 1996, p. 28). Consequently, state planning institutions turned a blind eye to the proliferation of slums by adopting a 'non-demolition policy' of squatter settlements (Obudho, 1996).

The crisis of urbanization continued throughout the 1990s and 2000s through the focus on 'good governance' of formal institutions and civil societies (Koonings and Kruijt, 2009). The process, however, failed to strengthen informal institutions, despite the rise of informal urbanization. The 'good urban governance' approach also failed to address the needs of the urban poor (Koonings

and Kruijt, 2009). The dynamics of informal urbanization in recent decades is reflected in the rise of urban grassroots movements, pro-poor activism, social mobilization, and political participation (Koonings and Kruijt, 2009). Furthermore, low-income countries are increasingly prioritizing urban development infrastructure to attract foreign investment. These projects, however, come at the cost of the needs of the local urban population (Pieterse, 2008; Laguerre, 1994, p. 19). Pieterse (2008, p. 26) argued that the focus on 'project-based infrastructure investment' has resulted in the rollback of comprehensive urban planning. The persistent diversion of urban infrastructure projects to incentivize multinational corporations resulted in the expansion of informal settlements in low-income countries (van Gelder, 2013).

3.6. Beyond Homogenization: Theorizing Urban Materiality.

Much of the dynamism in urban theory comes from finding disruptive exceptions – to normative expectations, to hegemonic orders, to old models and taken-for-granted assumptions, to business-as-usual conditions. (Peck, 2015, p. 163)

This thesis shifts from coarse generalization and homogenization to finding a disruptive exception to conventionality. Jenkins et al. (2007) warned against the simplistic transfer of theory, policy, and practice from the so-called urbanized world to rapidly urbanizing, mostly developing countries. The emergence of postcolonial discourse or the southern turn in urban studies is increasingly challenging the western, often universalistic hold on theory production (Peck, 2015; Roy, 2009; Roy and Ong, 2011; Robinson, 2006;2011;2014; McFarlane, 2011; Nijman, 2007). This diversification in urban theory production has significantly challenged the neoliberal, global political-economic overgeneralization and fundamentalization in critical urban research and energized scholars in the global south. By taking a more unorthodox approach, this research looks at the role of mundane and rudimentary technological innovations in mainstream urban debate. Of course, Manuel Castells, on his part, explored these concepts more broadly in his books on *The Urban Question: A Marxist Approach*, *The Rise of the Network Society,* and *The Informational City: Economic Restructuring and Urban Development*. However, questions still linger concerning the unraveling of these dynamics in cities in the global south in general and African cities, in particular. Moreover, a tear in the Marxian critique of political economy unfolds when conceptualizing the materiality of urban processes. On the materiality of the shipping container and the configuration of urban processes, Klose (2015, p. ix-x) wrote that:

The basic material quality of containers, the fact that they can be emptied just as easily as they can be filled, also seems to reveal an effect on the semantic level of stories and images. Thus, one finds containers not only in the business sections of newspapers and television broadcasts but also in films, plays, and novels. Because of their versatility as modular spaces and because they can be assembled and disassembled comparatively easily, containers have also been nearly ubiquitous in residential areas for many years: as temporary accommodations and storage for people and materials, as business or office spaces, and as kindergartens or kiosks.

For decades, materiality occupied the margins in mainstream urban sociology and geographic research. There is still a general misconception that materiality is limited to the physical objects that make up the city. In *Morphology of Landscape,* Carl Sauer (1925) offers an insight into the material nature of urban processes. Sauer theorized that cultural activities diffuse through material things such as buildings and tools (Latham et al., 2009, p. 63). Sauer's approach has, however, drawn criticism for conceptualizing materiality as a brute matter rather than a dynamic process (Latham et al., 2009, p. 62-3).

The adaptive reuse of the standard shipping containers or the fabrication of steel for various purposes in cities is possible through the process of urban mining. Unlike the traditional form of mining, urban mining relies on secondary raw materials that are ubiquitous in cities (Grant, 2016, p. 22; Grant and Oteng-Ababio, 2016; Labban, 2014). For cities, urban mining alleviates the reliance on natural resources as well as reduce air and water pollution (Arora et al., 2017, p. 211). Developing countries are at the forefront of urban mining practices. Metropolitan areas in Africa are hubs for dumping e-waste and other materials used by a connected network of informal recyclers and scrap dealers to produce affordable container structures for the majority of the urban population (Grant, 2016). For instance, Grant (2016) asserted that cities like Accra, Lagos, Nairobi, and Johannesburg have high concentrations of urban minefields. The materials extracted from these urban minefields are useful for the improvisation of containers for affordable housing and pop-up shops.

3.6.1. The Container as Technology: Decolonizing Technological Innovation

The "users" in urban struggles are demanding certain "qualities of space," thereby producing the qualitative. (Lefebvre, 2009, p. 207)

Technological innovation is no longer the preserve of advanced capitalist societies. The struggles of everyday life have resulted in the manifestation of ingenuity from users of the urban built environment. The dispossessed in the global south are no longer innocent bystanders in the struggle for urban space; they are taking a stand against mass accumulation and exploitation by

the new generation of indigenous neoliberal elites. British Israeli architect Eyal Weizman remarked that the decolonization of technology seeks to subvert normativity (VICE, 2017). The basis of decolonization of existing praxis all along is to prevent the normalization of western concepts in non-western contexts. Using the Israeli-Palestinian conflict as an example, Eyal Weizman proposed the conversion of suburban settlements into open public institutions to explain the decolonization of architecture (VICE, 2017). Indeed, the subversion of the container, a tool of global trade, to critical urban studies in the global south is at the heart of decolonizing technological innovation.

To what extent is the container a technological innovation? There is a general misconception about what constitutes technology. According to Hecht and Allen (200, p. 13), narrowly exclusive concepts such as complex machines and computer-related objects usually define what technology entails Freeman (1982) also asserted that the complexity of an object should not be the hallmark for defining technological innovation. A parallel exists between the subjectivization of technological innovation and materiality. After all, some things are more material than other things (Miller, 2005, p. 3). Building on this, the materiality of the container subjectively falls within the spectrum of technological innovation. From an organizational perspective, technological innovation improves competitiveness and growth (Mentz, 2006). Mentz (2006, p. 11) further argued that any attempt to conceptualize technological innovation must consider factors such as *Invention* (To conceive and produce a new solution to a real or perceived need), *Realization* (To develop this solution into a viable and producible entity), and *Implementation*.

3.6.2. The triadic conception of the containerization of urban space (Container Paradigm): Disruption, Momentum, and Risk.

The container paradigm constitutes parts of the built environment increasingly shaped by the activation and normalization of the shipping container. Put differently, the container paradigm relates to the configuration, synchronization, and integration of 'containers' into mainstream urban design and practices. In essence, the container paradigm is a heterotopic membrane. On the one hand, the omnipresence of the container facilitates the globalization of trade. On the other hand, the activation of these heterotopic spaces risk normalizing bare life and the spatial organization of cities.

Disruption

The considerable deficit and speculation in the housing and real estate market have driven up the price of housing in urban areas in developing countries such as Ghana. This form of primitive accumulation and excessive extraction of capital has dispossessed and excluded the majority of the urban population in the formal real estate market, propelling a shift towards innovative approaches to appropriate the urban built environment. Disruption is emerging everywhere. Disruptions challenge traditional market models that are often out of reach of ordinary people. This present century has witnessed significant advancements in technology that are more accessible to the majority of the population. A significant proportion of these technological advancements are taking place in the housing and real estate market in cities. For instance, market disruptors such as Airbnb are restructuring the urban economies across the world. Christensen describes this dynamic as a disruptive innovation. Joseph Bower and Clayton Christensen first laid out the foundation of the theory in an article titled *Disruptive Technologies: Catching the Wave*, in 1995. In its traditional form, the concept describes a situation where "new technologies can create new markets or radically change, or disrupt, the status quo in existing markets" (Nagy et al., 2016, p. 119). The theory of disruptive innovation has come a long way since Bower and Christensen's 1995 work. In the years that followed, Christensen and other management experts published a series of articles on the misrepresentation and misinterpretation of the theory (Christensen et al., 2015; Christensen et al., 2016). To clarify the inherent contradictions of disruptive innovation, Christensen et al. (2015) wrote that:

a process whereby a smaller company with fewer resources is able to successfully challenge established incumbent businesses. Specifically, as incumbents focus on improving their products and services for their most demanding (and usually most profitable) customers, they exceed the needs of some segments and ignore the needs of others. Entrants that prove disruptive begin by successfully targeting those overlooked segments, gaining a foothold by delivering more-suitable functionality—frequently at a lower price. Incumbents, chasing higher profitability in more-demanding segments, tend not to respond vigorously. Entrants then move upmarket, delivering the performance that incumbents' mainstream customers require, while preserving the advantages that drove their early success. When mainstream customers start adopting the entrants' offerings in volume, disruption has occurred.

Christensen (1997) hypothesized that technological change (Christensen later changed the typology from disruptive technology to disruptive innovation) manifest in two ways: either disruptive or sustaining. Sustaining innovations usually focus on improving the performance of an existing product that is popular with mainstream customers (Dijk et al., 2016). Disruptive

innovation, on the other hand, introduces a product onto the market, which has been largely ignored by more established firms. Dijk et al. (2016) recognized the overlapping relationship between endogenous and exogenous structural conditions that are imperative for the diffusion of disruptive innovations. The endogenous conditions consist of six factors, namely: increasing returns to scale, learning from the market, learning from users, cultural taste formation, learning by doing, and competition (Dijk et al., 2016). Innovation is either a new-market or low-end market innovation. According to Dijk et al. (2016, p. 78), "Low-end market innovations are those that do not result in better product performance; they serve users who are attracted by low prices" whiles "new market innovations are those serving new users."

This study explores both institutional and non-institutional dynamics (role of informal stakeholders in the city) in the production and utilization of disruptive innovations such as shipping container homes and shops. Traditionally, readers and commentators often examine disruptive innovations from a formal/institutional perspective (Adner and Zemsky, 2005; Christensen and Raynor, 2003; Christensen, 1997; Dijk et al., 2016; Feder, 2018). However, how informal actors drive the momentum of disruptive innovations is not addressed in mainstream research. The emerging trends in disruptive innovation in the global construction industry, according to Clark-Reynolds and Pelosi (2016:13), are characterized by mass customization, products becoming services, and vice versa, the separation of ownership and use, the sharing economy, agile design, and construction, and agile planning. Prefab modular housing with materials such as the shipping containers are becoming more mainstream in the building and construction industry. These prefab modular housing units are cost-efficient and economically scalable and are the emerging disruptors in the real estate market.

The disruptive innovation theory has significant implications for critical urban research regardless of its confinement to the field of business and management. The same logic can be applied to the container paradigm and within the framework of the property market crisis evident in major cities in Ghana and other low-income countries. For instance, the predatory practices of the traditional real estate market have resulted in the adoption of disruptive innovations such as containers. This alternative mode of production reduces poverty and housing inequality as well as ensures the right to the city. Furthermore, a significant scarcity of affordable housing has normalized the adoption of disruptive innovations such as the container (Dijk et al., 2016).

Momentum

Is the container as a technological innovation gaining momentum in urban space? What frame of reference should this momentum be analyzed? Technology historian Thomas Hughes introduced the concept of technological momentum in his 1969 seminal article on *Technological Momentum in History: Hydrogenation in Germany 1898-1933* and subsequent publications between 1983 and 1994. Hughes (1983) detailed the enthusiasm for the polyphase system to explain technological momentum. Hughes (1983, p. 140) noted with detailed precision that:

During the 1890s the polyphase system gathered momentum. Because it encompassed the old contenders in "the battle of the systems" (direct current versus single-phase alternating current), the new system gained widespread support from men and institutions in the rapidly grow in g field of electrical engineering, science, and industry. A supportive context, or culture, formed rapidly. Men and institutions developed characteristics that suited them to the characteristics of the technology. And the systematic interaction of men, ideas, and institutions, both technical and non-technical, led to the development of a supersystem—a sociotechnical one—with mass movement and direction. An apt metaphor for this movement is "momentum." So, reinforced by a cultural context, and interacting in a systematic way with the elements of that context, the universal system, like high momentum mailer, tended in time to resist changes in the direction of development. Development proceeded along lines that could be extrapolated. The universal system gathered a conservative momentum. Its growth generally was steady, and change became a diversification of function.

This research argues that Hughes's theory of momentum is not the preserve of skilled decision-makers in management positions but highly dependent on everyday users of urban space. Shields (2007, p. 4) posed a similar question in his dissertation on *Theory and Practice in the Study of Technological Systems*, which is relevant to the above assessment of technological momentum. More specifically, Shields (2007, p. 4) argued for a consumer-driven analysis of momentum and how these dynamics affect social change at the family level. Hughes applied momentum to study large technological systems (Kirkman, 2004). According to Heins (2013), technological momentum represents the fourth phase of Hughes's conceptualization of large technical systems in the *Network of Power*. The hallmark of his idea relates to the interconnectivity between technical, political, economic, and social factors within the framework of a technological system or a socio-technical system (Sovacool and Sawin, 2010). Conventional analysis of technology systems often ignores the social dimensions and rather embrace the study of technology within the extreme spectrums of social constructivism and social determinism (Kirkman, 2004, p. 130). Unlike the crude conceptions of social constructivism 'the notion that social and cultural forces determine technical change (Hughes, 1994, p. 102)' and social determinism 'the belief that technical forces determine social and cultural changes (Hughes, 1994, p. 102)', technological

momentum allows social and political forces to determine whether a technology is accepted or rejected (Sovacool and Sawin, 2010). Put intimately technological momentum, expressly portrays a symbiotic entanglement between technology and social development (Hecht and Allen, 2001; Kirkman, 2004; Hughes, 1994, p. 102). Scholars in the fields of sociology and history tend to appreciate Hughes's conception of momentum because of the de-emphasis on the technology itself and more on the culture surrounding the technology. At the momentum phase, technological innovation moves beyond the intricate technicalities and embraces the usefulness and applicability of the technology (Heins, 2013). The technology is available on a spatial scale, and user adoption is rapid at the momentum phase.

Hughes's concept of momentum provides a subtle juxtaposition to the containerization of urban space, regardless of its predominantly large technological system disposition. Heins' (2013) dissertation on containerization examined technological momentum despite his theoretical and analytical focus on infrastructure and transportation. This research, on the other hand, takes a more critical urban approach towards conceptualizing momentum. The momentum of disruptive innovations is increasingly manifesting in informal settlements. The relative affordability of disused shipping containers implies that everyday users of urban space have more access to this alternative mode of production. Moreover, in comparison to traditional building technologies, prefabrication of modular shipping container units is more efficient and environmentally sustainable. Key stakeholders such as container and steel suppliers, welders and fabricators, informal urban proletariats, landowners, and state institutions determine the high or low momentum of containers in urban space. This research follows Bakker and Farla (2015:2) and examines both the supply-side and associated policies, and the demand-side and related policies to understand container diffusion in urban space. On the momentum of electric vehicles, Bakker and Farla (2015) found that policies such as financial incentives, free parking space, to designated bus lanes encourage consumers to adopt this particular innovation. On the momentum of container urbanism, flexible planning policies such as the 'malleability' of building codes promote the diffusion of the container. Also, the existence of a legal and regulatory vacuum may propel the improvisation and diffusion of container urbanism. For instance, an examination of the Local Government Legislative Instruments in Ghana reveals the lack of provisions for 'container architecture' and other modular structures. The technological system generates a reverse salient as a sort of control and pushback against momentum. A reverse salient in the

proliferation of containers relates to institutional bottlenecks in the form of planning and regulatory frameworks that may impede the diffusion of such innovation. Urban planners, landowners, for instance, represent a form of reverse salient to the momentum and subsequent innovation diffusion of improvised disruptive technologies such as the container.

Risk

It is possible to observe the transpiration of a container society through the prism of risk. Indeed, the globalization of the container is directly associated with risk. According to Mythen (2004), risks are the gateway to understanding the dynamics of modernity. Risk is also synonymous with threat and harm (Lupton, 1999, p. 8). Fundamentally, risks are like a double-edged sword. On the one hand, the concept centralizes the ecological manifestation of the phenomenon by invoking a sense of fear and uncertainty. On the other hand, risk simultaneously becomes a 'very elastic concept' (Levitas, 2000, p. 200). Before proceeding to address the elephant in the room: *Ulrich Beck's Risk Society*, a general dialectic about risk is imperative. The etymology of risk is multidimensional (Mythen, 2004; Levitas, 2000). For Beck, risks are anthropological, socio-psychological, and governmental (Mythen, 2004). Mary Douglas played a crucial role in conceptualizing the anthropological dimension of risks in the late 1960s to the early 1990s (Mythen, 2004, p. 4). The anthropological approach to risk unravels the variations in risk patterns and perception between individuals and groups (Mythen, 2004, p. 4). Proposed by Paul Slovic, the social psychology of risk applies psychometric methods to examine the individual cognition of risk (Mythen, 2004, p. 4). This approach measures an individual's perception of risk and harm (Mythen, 2004, p. 4). The third paradigm of risk centered on governmentality, which was promoted by Michel Foucault, Robert Castel, Mitchell Dean, and Pat O'Malley (Mythen, 2004, p. 5). The governmentality approach examines the mechanisms and roles played by institutions in the formulation of risk. This approach also unpacks how these institutions weaponize risk to shape human behavior (Mythen, 2004, p. 5). Risk society constitutes the fourth paradigm of conceptualizing risks. Ulrich Beck and Anthony Giddens are the notable theorists of the risk society perspective (Mythen, 2004). In the view of Ulrich and Giddens, risks are endemic in everyday life. Thus, uncertainty is the cornerstone of the conceptualization of risk.

Beck (1992, p. 20) acknowledged that the process of modernization is creating hazardous side effects on a large scale. Under modernization, technological processes increase the probabilities

of physical harm to people (Beck, 1992, p. 4&21). Furthermore, risks are non-compensatory under modernization. As the world moves from a class-based society to a risk society, the production and distribution of risk become much more uniform (Levitas, 2000). In addition to exploring the 'social reconfiguration' of risk on modernity, Beck explored the human-environment relationship and the effects of institutional change on social experience (Mythen, 2004, p. 6). This study approach risk from a micro-scale, involving the negative effect of emerging processes of urbanization on everyday life. This research also examines how risks affect urban sustainability and social cohesion. Furthermore, what implications does the shipping container have on bare life as the innovation becomes hegemonized in the public sphere? More specifically, what are the impacts on the lived experiences of refugees, asylum seekers, enemy combatants, and everyday producers of urban space?

Alongside the notion of risk, another critical foundation of risk society relates to the concept of 'reflexive modernity' (Beck, 1992; Beck et al., 1994). According to Mythen (2004, p. 17), reflexive modernity describes the "way in which patterns of cultural experience are uprooted and disembedded by underlying changes in social class, gender, the family, and employment." In reflexive modernity, individualization takes center stage of critical decision-making processes (Beck and Beck-Gernsheim, 2002). The failure of state institutions to produce structural certainties creates reflexive modernity (Mythen, 2004, p. 17). A characteristic of reflexive modernity in cities across the global south is structural adjustment policies. The liberalization of trade and the subsequent decline of formal institutional capacity reduced access to decent employment, right to housing, education, healthcare, and politics for many urban dwellers. The emergence of self-help ideology in the wake of the crisis of urban planning in many African cities confirms this. It is possible to draw an analogy between socio-spatial risk and container urbanism. The environmental impact of the containerization of urban space is also pervasive. It is interesting to note that container improvisation transforms the spatial configuration of cities through the transfer of health and safety risks to the general urban population.
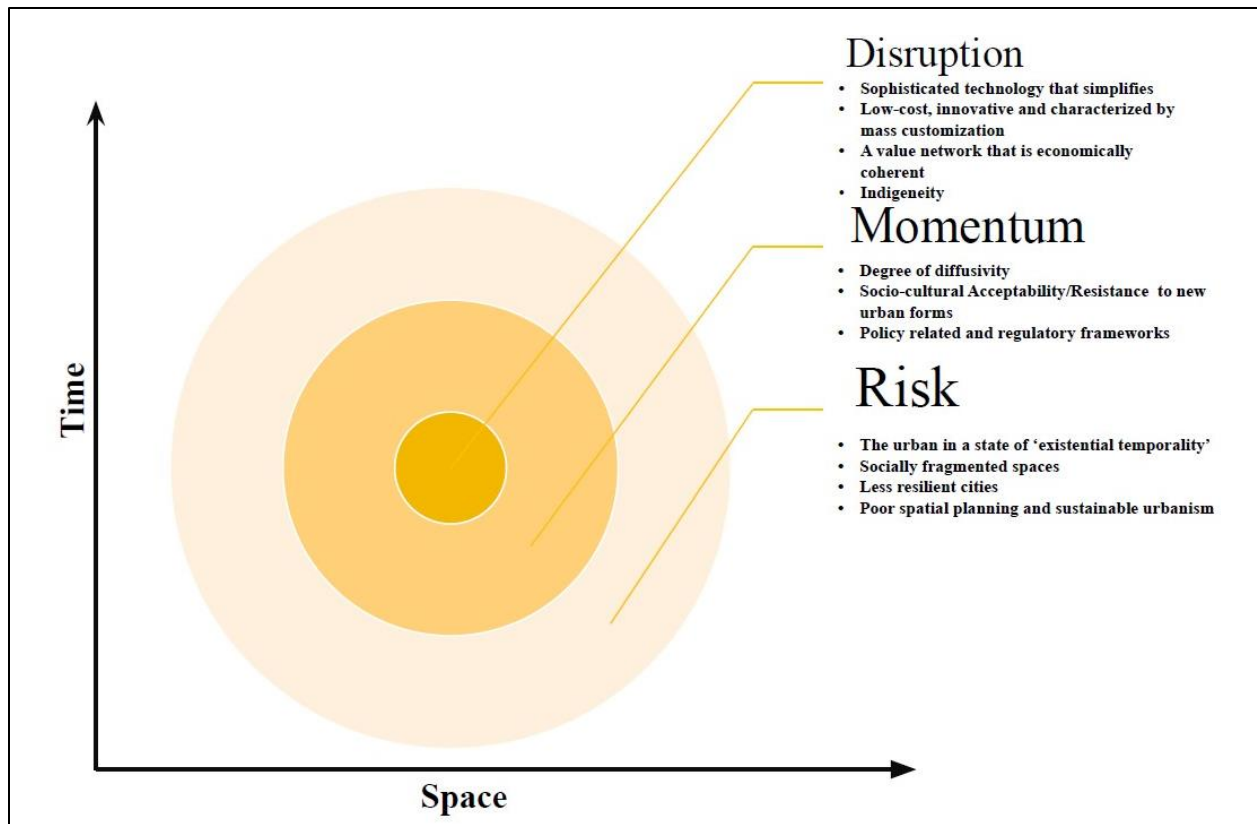
Figure 15: Disruption, Momentum, and Risk

Source: Author's construction.

Chapter Four: Methodology

The chapter details the unit of analysis and how data for this study was collected and analyzed. The data collection covered a wide range of issues relevant to understanding the containerization of urban space. The study collected both primary and secondary data from various sources spanning a specific period. The methodology also draws attention to the actors and stakeholders relevant to the governance and management of urban space in Ghana.

4.1. Research Design

Undertaking a research project involves following a logical plan. However, the research process does not always follow a logical path. The literature on the research design is ubiquitous and equally contradictory. Consequently, the study consults the work of Howard Becker and his colleagues to guide the research project. Reflecting on the dilemma encountered in their research problem, Becker et al. (1961, p. 17) wrote that:

In one sense, our study had no design. That is, we had no well-worked-out set of hypotheses to be tested, no data-gathering instruments purposely designed to secure information relevant to these hypotheses, no set of analytic procedures specified in advance. Insofar as the term 'design' implies these features of elaborate prior planning, our study had none.

Research design in the social sciences has come a long way from Kaplan's (1964, p. 206) infamous assertion that "if you can measure it, that ain't it!". Upon reflection on the components and features of research design, this research adopts a multiple case study approach that involves an integrated research design. In simple terms, an integrated research design "closely meshes and integrates qualitative with quantitative approaches. The different approaches are integrated interactively and dynamically along all stages of the research process" (Hollstein, 2014, p. 15). According to Vogt et al. (2012, p. 110), case study research combines multiple methods to gather data on a plethora of issues. Creswell (2007), Yin (2003), De Munck (2009), and Berg (2001) also put forward a strong argument that case studies can overwhelmingly integrate a wide range of evidence. Some other scholars, however, cautioned against extending the multi-method design to the use of different methods within other paradigms (Snape and Spencer, 2009, p. 17). According to Snape and Spencer (2003, p. 17), mixing methods may sometime create irreconcilable analytical issues. Despite this, mixed method upholds a more pragmatic view of understanding the world.

4.2. Case Study: Site Selection

Decisions about where to carry out a piece of research, and on whom to focus, lie at the very heart of research design. The process of making these decisions depends largely on imagination, ingenuity, and a capacity for lateral thinking rather than the straightforward application of scientific principle (Bechhofer and Paterson, 2000, p. 43).

A case study defines the unit of analysis or the entity of the research (Putney, 2010, p. 116). This study uses cities as the unit of analysis. The core study area for this research is the city of Accra in Ghana. The research also drew other cases (controlled cases) from cities in the United States, the United Kingdom, and South Africa to understand the global dynamics of container urbanism. Why Accra? Answering the question of Why Africa's Cities Matter, Myers (2011, p. 104-104) argued that African cities are multifaceted and not loosely based on obvious factors such as neoliberalism, informalization, and governance structures. According to Richard Grant, an authority on urbanization in Africa and more specifically Ghana:

Accra is a very different city from the "typical" African city conceptualized primarily in local and regional terms in the earlier nationalist era. This more internationally oriented city represents an incomprehensible city to government policymakers and others who fail to grasp the extent of the transformation, and who instead still situate Accra in national, national regional, and local terms (Grant, 2009, p. 3).

The city of Accra represents the perfect case study to unravel the dynamics of the containerization of urban space. The choice of Accra centers on socio-economic and political considerations. Accra is one of the fastest-growing cities in West Africa. For instance, the population of Accra grew 35 times larger between 1901 and 1970 (Bobo, 1974). Recent statistics indicate that Accra has a population of around two million people (Grant, 2009; Ghana Statistical Service, 2012). The study uses neighborhoods in the Accra Metropolitan Assembly as the unit of analysis (Figure 16 and Appendix Six). The neighborhoods in the metropolis were selected based on the average income levels.
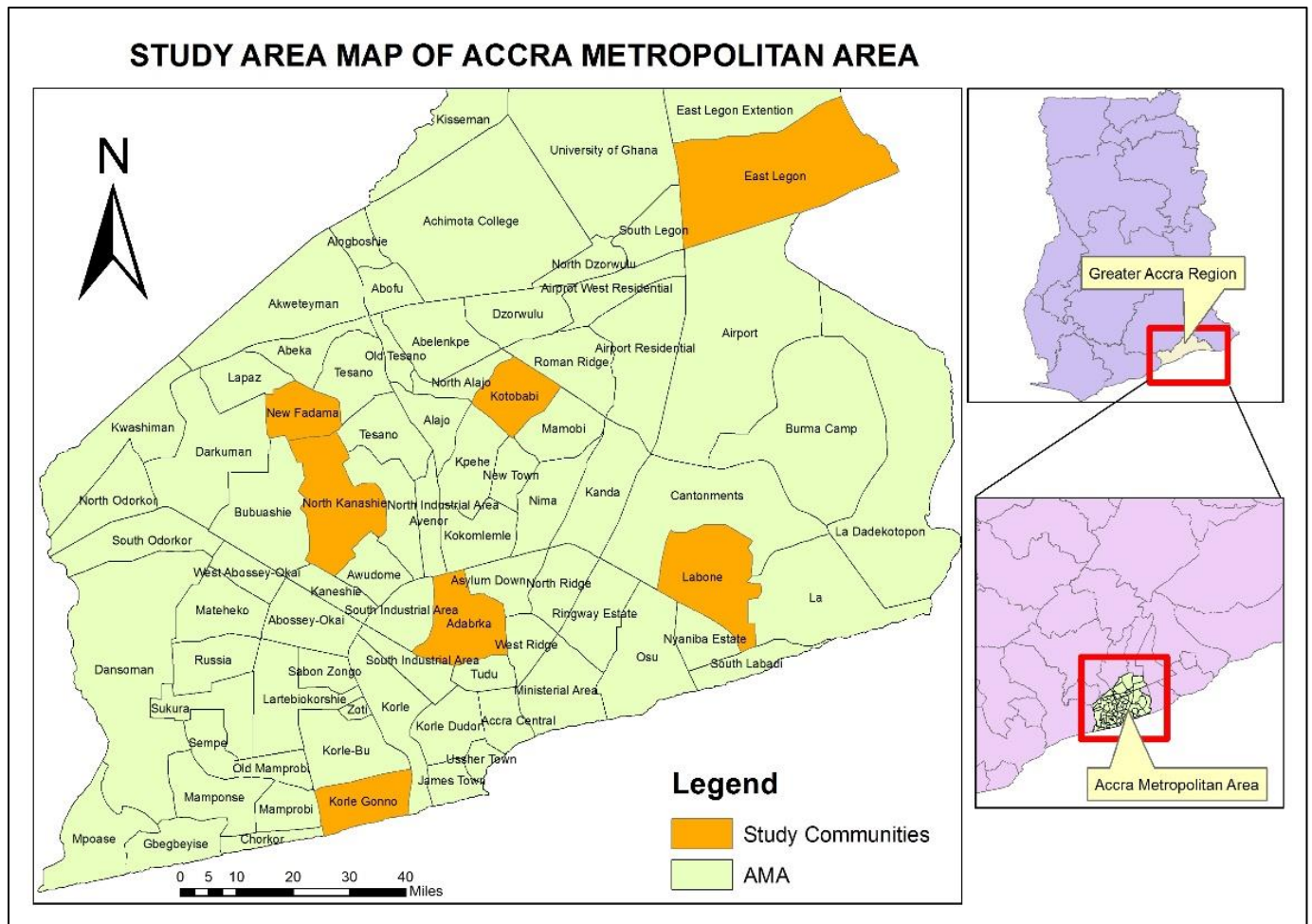
Figure 16: Map of the Study Area

Source: Author

4.3. The Sampling Frame

The sampling frame (Figure 17) for this study captures the key actors and stakeholders in the containerization of urban space. The sample includes institutional actors at the local and national levels responsible for urban planning and development, service providers, NGOs, container adopters and non-adopters, construction companies, and landowners.
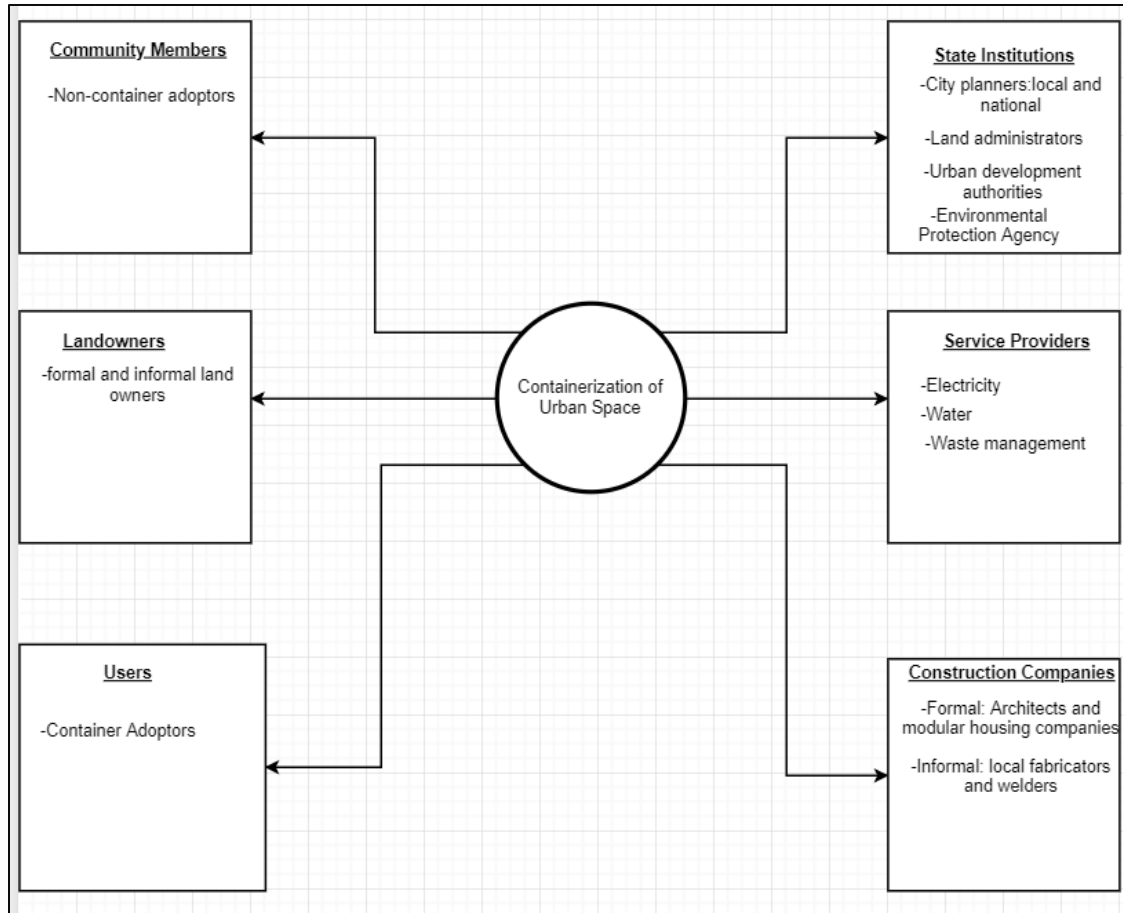
Figure 17: Sample frame

Source: Author

4.4. Qualitative Method

Creswell (2007, p. 11) highlighted the importance of qualitative research inquiry for understanding social and human processes. This study focused on the interpretivist position of qualitative methodology to explain the containerization of urban space. The interpretivism position of qualitative research takes into consideration the historical and social experiences of people (Snape and Spencer, 2003, p. 7). Interpretivism in social research explores the lived experiences of people to understand and historize their social and cultural connections (Snape and Spencer, 2003, p. 7). Clearly, the interpretivist position is in line with the underlying objectives of this study, which seeks to understand the lived experiences of urban dwellers (improvisation of containers). According to Creswell (2007, p. 24), interpretivism is suitable for

studying marginalized and underrepresented groups. This study utilized three qualitative methods: in-depth interviews, ethnography, historical documents, and text analysis.

4.4.1. In-depth Interview

Who or which group of people govern the urban landscape in Ghana? How do these groups promote or inhibit urban processes such as informality? In-depth interviews offer a significant reference point for answering these questions (Yin, 2003, p. 92). For the in-depth interviews, I approached ministries, departments, and agencies in Ghana by sending a formal letter explaining my research and requesting the opportunity to conduct an interview(s) on the institutional dynamics and the relationship between urban planning and containerization (Table 5). Sending a formal request for an interview is one of the best ways of establishing rapport (Berg, 2001, p. 83). It is important to note that access to institutional actors to conduct in-depth interviews is relatively difficult. According to Lindsey (1997, p. 35), arranging interviews can be challenging because of the busy schedule of most people. In-depth interviews are also ideal for busy people (Lewis, 2003:59). Moreover, a common-sense approach is required when interviewing key stakeholders, such as policymakers (Lewis, 2003, p. 59). In-depth interviews are also ideal for situations of power or status (Lewis, 2003, p. 60). An interview guide was attached to the letter to ensure the participants are ready for the interview. Interview guides create a structure for the interview session (De Munck, 2009, p. 140).

Some of the participants were anxious about recording the interview session. The highly politicized dimension of urban governance in Ghana might be a reason for this. The fear of politicians or 'party foot soldiers' gaining access to these recordings and distorting the contents for propaganda purposes is quite common in the political landscape of Ghana. Recent events such as undercover investigative journalism works have also contributed towards a general distrust in recordings. Lindsey (1997, p. 35) cautioned against the use of hidden take recorders during interview sessions. Yin (2003) also raised some ethical issues surrounding recording interview sessions. Yin (2003, p. 92) forewarned that recording should be avoided when the interviewee is uncomfortable in the presence of one, or when the recording may act as a distraction to the interview process. In all the interviews conducted with policymakers, only two outrightly asked not to be recorded. Consequently, the study switched recording for notetaking. On average, each of the interview sessions lasted for an hour.

Table 5: Institutional Actors in the production of urban space in Ghana

Policymakers	Institutional level	Position of Person Interviewed	Number Interviewed
Ministry of Spatial Planning (Town and Country Planning)	National/local	Director Senior Spatial Planner	2
Lands Commission	National	Director of Public Vested Lands Land	2
Ministry of Lands and Natural Resources		Director of	1
Accra Metropolitan Assembly	Local	Deputy Director	2
Environmental Protection Agency	National/local	Deputy Director	1
National Development Planning Commission	National	Director and Deputy Director	2
Ministry of local government	National/local	Director of	2
Ministry of Transport	National/local	Director of	1

Source: Field Survey, 2018

The study also utilized a snowballing sampling technique to interview local informal operators in the container prefabrication sector. Interviews with local welders and vulcanizers occurred their 'workshops' in order to observe the process of fabricating the container firsthand. The study sampled workers with more than five years of professional experience in container prefabrication. The rationale behind this was that those with 'higher experiences' understand the temporal dynamics of the container market and will be able to provide much more useful information. These interviewees were usually referred to as 'seniors' or 'boss' to reflect their status and expertise in the workshops.

The study also applied a purposive sampling technique to interview companies engaged in container prefabrication (Table 6). Accordingly, the study drew samples from the Modular Building Institute (MBI) and the Container Traders and Innovators Association (CTIA). The MBI is an international non-profit organization with a vast network of member companies ranging from dealers and contractors, manufacturers, owners and developers, and associates. CTIA, on the other hand, represents the interest of container traders and conversion specialists (CTIA, 2019). I contacted individual member companies directly dealing in containerized structures through emails obtained freely from the website of the MBI and CTIA. I formally

requested the opportunity to administer a short interview on their business model and the construction and real estate market in their various cities of business.

Table 6: Mapping Global disruptive innovation of the container

Firms	City/Country	Position of person Interviewed
BOXMAN STUDIOS	Charlotte/United States	Marketing Strategist
CONTAINER CONVERSIONS	Pretoria/South Africa	Sales Manager
customCONTAINERliving	Kansas City/United States	Owner
QED	Brighton/United Kingdom	Marketing Manager
SEA BOX – Intermodal Concepts · ISO Shipping Containers	Philadelphia, Pennsylvania/United States	Director of Modular Buildings
TEMPOHOUSING	Accra/Ghana	Business Development Manager
truth box inc.	Providence/United States	Principal
TAYNR CONTAINER HOME BUILDER SACRAMENTO CA	Sacramento/United States	Project Manager/Client Development

Source: Field Survey, 2018

4.4.2. Ethnography

According to Berg (2001, p. 134), ethnography captures the social dynamics between people and groups. An ethnographic method combines various field observations, including interviews,

document analysis, and listening (Berg, 2001, p. 6). Ethnography allows for an intimate and in-depth exploration of attitudes and behaviors. I embedded myself into the everyday life of container users in the study areas to better understand the lived experiences of these quasi-heterotopic spaces. For the ethnographic method, I approached three families with the help of close acquaintances. After explaining my research, I requested the opportunity to observe (through participation) their lived experiences firsthand without compromising their living arrangement and routine. The 'getting in' stage of the ethnography was not fraught with challenges. This process requires significant caution (Berg, 2001; Shaffir et al., 1980; Shaffir and Stebbins, 1991; Spencer, 1991). According to De Munck (2009, p. 179), participant observation ensures a better understanding of the social realities of people. Participant observations occurred within three weeks, with one week spent with each family. The study adopted a problem-based ethnographic approach due to time and logistical constraints. I spent the first week with a family of five in New Fadama, an informal, low-income settlement in Accra. The family owns a 15ft locally prefabricated container. The family uses the container to generate income by selling household provisions. I stayed with the first family for at least an hour a day for one week. I carefully observed and took field notes on their activities and how they interact with their surroundings. I also participated in the family's activities in my capacity as both a researcher and a temporary guest. After a week with the first family, I moved on to the second family, who resides in a middle-income neighborhood of Adabraka. The young family of three owned a 10ft dual-purpose container: thus, used for retail during the day and as a dwelling space at night. To avoid unnecessary stress and discomfort to the family, I spent two hours a day for one week. The third participant for the ethnographic procedure was a single male living in a 20ft locally prefabricated container in the urban neighborhood of Korle Gono. During the data collection process, I religiously adhered to Creswell's (2007, p. 24) advice to respect and acknowledge the power imbalance between the research and participants.

Ethnography presents challenges and limitations despite its merits. Schrank (2009, p. 60) was right when he said, "ethnography can also be deeply frustrating." A shortcoming of the ethnography process is the limited time involved. Dedicating three weeks to the ethnography was wholly inadequate, no matter how justifiable. The whole process felt rushed to meet the strict time schedules proposed for the data collection. Furthermore, funding for undertaking a more

comprehensive ethnography was limited. Moreover, ethnography raises numerous ethical issues such as breach and intrusion of privacy.

4.5. Quantitative Method

The challenges that qualitative methods present necessitated the integration of a quantitative approach. An Ethnographic approach, in particular, requires a certain degree of reflexivity from the researcher, which is seldom lacking. Quantitative data collection, on the other hand, is significant on many grounds. The study utilized a survey-based method to analyze the dynamics of containerization in urban space. The obvious imperative of quantitative surveys is the ability to make objectified inferences from the general population. The study drew the sample for the questionnaire survey from household heads and container users at the neighborhood level. The study classified households as non-container users in the neighborhoods. A pilot survey was conducted in one of the neighborhoods to understand the property ownership structure. The pilot survey also aims to avoid repetitive sampling. The underlying assumption was that some of the households may own containers themselves and may, therefore, be biased in their response to their perceptions of container improvisation. Since the objective was the understand the contradictions and contestations across various social groups at the neighborhood level, it felt prudent to sample households who did not improve containers.

4.5.1. Questionnaire Survey

Probability sampling in survey research allows for generalizability (Creswell, 2007; Merriam, 2009; Patton, 2002; Vogt et al., 2012). Since this research seeks to understand the overall dynamics of containerization across space, it was prudent to apply a random sampling approach, a component of the probability sampling procedure. A simple random sampling process ensures that each member of the population has an equal chance of being selected in the sample (Vogt et al., 2012, p. 122). Random sampling suppresses bias in the selection process (Vogt et al., 2012, p. 122). The questionnaire survey addresses the demand side of the proliferation of container urbanism. At the forefront of these dynamics are residents, on the one hand, and container adopters, on the other hand. Table 7 shows the distribution of respondents across neighborhoods. Data collection took place between October 2018 and February 2019. The research reached out to 6 people in each of the study neighborhoods through community organizations and close acquaintances. Crucially, these individuals had significant knowledge of the power dynamics in

these areas as well as rapport with most of the community members. The selection criteria for the research informants include longer duration of residence in those neighborhoods and adequate educational background. Households for the survey were randomly sampled based on their proximity to the containers and vice versa. The questionnaire surveys used KoboToolbox: a free and open-source software designed for collecting large scale field data. The unique feature of the software is the capacity to integrate an interdisciplinary approach to data collection. The survey questions covered a range of issues such as livelihood strategies and lived experiences of participants in the study areas.

Table 7: Summary of the questionnaire sample frame

Site	Residential Category	Number of Participants (Container adopters)	Number of Participants (Household survey/non-container adopters)
East Legon	High Income	62	45
North Kaneshie	Middle Income	85	128
Adabraka	Middle Income	94	51
Korle Gonno	Low Income	47	60
Kotobabi	Low Income	46	-
New Fadama	Low Income	168	53

Source: Field Survey, 2018

4.5.2. Spatial Approach

Spatial data collection involves multiple data points with the potential for evidence-based decision making (O'Brien, 1992, p. 8). Shen and Guo (2014) also argued that the application of geographic information systems facilitates the examination of urban sustainability patterns from a spatial perspective. Referring to innovation diffusion, Parker and Asencio (2009, p. 142) stated that "mapping the adoption of these new forms and practices can help us to understand the process, the factors that might influence it, and the differences to be seen when comparing one innovation to another." The study used spatial data generated from the questionnaire survey to conduct spatial analysis and produce heatmaps. This research also incorporated Unmanned Aerial Vehicles (UAVs) to collect high-resolution imagery for a quantitative and qualitative assessment of the various dimensions of containerization. Despite the ongoing controversy surrounding the application of Unmanned Aerial Vehicles (UAVs), the technology provides opportunities for land use planning, visualization of the cityscape, and the environmental

mapping and monitoring (Lucieer et al., 2014). In addition to providing high-resolution imagery, the utilization of UAVs optimizes sampling procedure concerning spatial resolution and sensor type (D'Oleire-Oltmanns et al., 2012; Klemas, 2015, p. 1265; Lucieer et al. 2014; Valente, 2019, p. 2). There is indeed a growing interest in the application of drones in understanding environmental monitoring in Ghana (Owen, 2016). For instance, studies conducted by Appeaning Addo et al. (2018), and Appeaning Addo (2016), utilized a drone for monitoring coastal areas. The images captured using the UAV is significant for understanding the spatial and temporal dimension of urban transformation. This study used a DJI Phantom 4 Advanced drone to collect aerial photos in the study areas between April and May 2019. The DJI Phantom 4 Advanced drone (weighing 1368g) has a 1-inch 20-megapixel CMOS sensor and a camera resolution of 4K (up to 4096x2160p/60fps/100Mb/s) as well as a flight time of 30 minutes. The images were processed using Agisoft PhotoScan and analyzed with ArcGIS (Figure 18). The study compared the drone images with historical data to visualize urban change through the prism of the container.
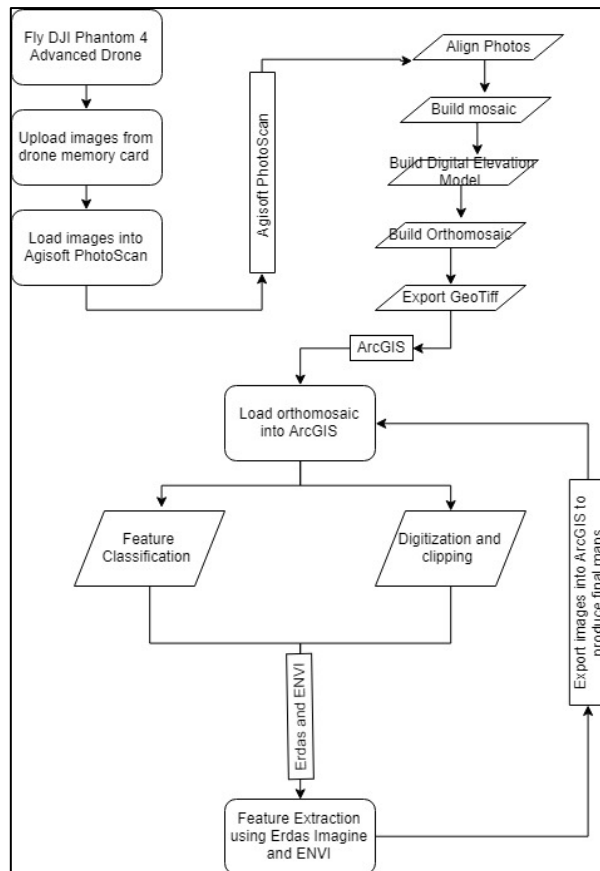
Figure 18: Workflow for Image Processing

Source: Author's construction

4.6. Positionality

Combining more than one research approach can be a daunting task. Careful consideration went into the adoption of an integrated research approach. More specifically, the objective of the study demands the adoption of an integrated research approach to capture both qualitative urban practices and quantitative spatial paradigms. Neutrality and objectivity are seemingly impossible to achieve in conducting research. However, it is the position of the researcher to navigate through these complexities and minimize bias through reflexiveness. For neutrality and objectivity, the study ensured that community participation in the research process was paramount. The participatory approach seeks to give a voice to respondents in the research process.

4.7. Ethical Consideration

It is the position of every researcher to establish the line between objective curiosity for knowledge and the violation of an individual's privacy. Objectivity and neutrality in ethnographic techniques are especially problematic to navigate. Yin (2003, p. 94), in particular, stated that most of the time, researchers "assume positions or advocacy roles contrary to the interests of good scientific practices." Furthermore, using UAVs in human-populated areas and urban centers presents several ethical problems. For instance, the low altitude of drone flights and noise generated by the propellers drew the attention of most residents. Moreover, some residents were justifiable upset about a drone hovering over their homes. Accordingly, the study made significant efforts to minimize the violation of the privacy of residents. These included drawing flight plans at higher altitudes that focus on buildings and vegetation.

4.8. Limitations

Conducting field study in some of the neighborhoods was especially problematic. The research team encountered numerous challenges gaining access to high- and middle-income residential areas, especially during household surveys. These residential areas are mostly gated communities. Moreover, residents in most of these neighborhoods are usually were often

reluctant to participate in the survey. In cases where participants agreed, responses were short and lacked depth and substance. Consequently, the study approached domestic workers and security guards in these high-income neighborhoods, most of whom dwell in containers and other improvised structures.

Chapter Five: Urbanization in Ghana in Retrospect

This chapter explores the historical dimensions of spatial planning policies in Ghana and Accra in particular.

5.1. Urbanization Trends in Ghana

Urban planning and policy thus provide an entry into the investigation of current African problems specifically from the point of view of city dwellers. When posited within the framework of the political economy of African countries, urban planning and policy enable us to better appreciate the nature of the forces ranged together within African cities and the character of their interrelations (Mabogunje, 1990, p. 123).

Estimates show that urban areas in Sub-Saharan Africa will increase at a rapid rate in the next two decades. This rapid urbanization coincides with uncontrolled population growth and urban sprawl. The pattern of urbanization in Ghana illustrates this. Ghana was a predominately rural country for the better part of the 19th century (Peil, 1972). Crucially, for economic and political reasons, the urban population occurred in few towns such as Accra, Kumasi, and Sekondi. Since then, the urban population in Ghana increased from 9% in 1931 to 43.8% in 2000 (Yankson and Bertrand, 2012, p. 25). According to the 2010 Population and Housing Census, approximately 50.9% of Ghanaians live in urban areas. The World Bank (2015, p. 5) also argued that ate of urban growth in Ghana between 1990 and 2013 far exceeded the West African average. Urbanization in Ghana, however, failed to deliver the necessary development (World Bank, 2015; Korah et al., 2019).

Furthermore, urban growth in Ghana is not uniform across space (Ghana Statistical Service, 2012). The major urban centers in Ghana are Accra-Tema and few regional capitals such as Kumasi, Sekondi/Takoradi, and Tamale (World Bank, 2015; Yankson and Bertrand, 2012, p. 25). For instance, urbanization rates in Ghana range from 90.5% in the Greater Accra region to 16.6% in the Upper West region (Table 8). A characteristic of the growth of urbanization in Ghana relates to the physical expansion of the cities or peri-urbanization (Yankson and Bertrand, 2012). Metropolitan areas in major cities in Ghana expanded beyond their legal boundaries resulting in their integration into the wider administrative region for efficient service provision (Yankson and Bertrand, 2012). The growth of peri-urban areas in Ghana is emblematic of the

rising cost of living, rapid population growth, congestion, and overcrowding in the urban core as well as a rising middle class with disposable income.

Table 8: Trends in Urbanization as a percentage of the total population in Ghana, 1960–2010

Region	1960	1970	1984	2000	2010
Western	24.7	26.9	22.6	36.3	42.4
Central	28.0	29.1	28.8	37.5	47.1
Greater Accra	72.6	85.3	83.0	87.7	90.5
Volta	13.1	16.0	20.8	27.0	33.7
Eastern	21.1	24.6	27.7	34.6	43.4
Ashanti	25.0	29.7	32.5	51.3	60.6
Brong Ahafo	15.6	22.1	26.6	37.4	44.5
Northern	13.0	20.4	25.2	26.6	30.3
Upper East	3.9	7.3	12.9	15.7	21.0
Upper West	5.0	6.7	10.9	17.5	16.3
All Regions	23.1	28.9	32.1	43.8	50.9

Source: Ghana Statistical Service, 2010 Population and Housing Census

What are the drivers of urbanization in Ghana? Urbanization in Ghana is a direct result of demographic urbanization. For instance, the United Nations Department of Economic and Social Affairs revealed that approximately two-thirds of Africa's population growth would be a consequence of the natural increase in population (UNDESA, 2015). Demographic urbanization occurs by factors other than a radical transformation in agricultural sector activities and industrial revolutions (Songsore, 2003). Factors that determine demographic urbanization in Ghana include the reclassification, rural-urban migration, natural increase (Songsore, 2003). Yankson and Bertrand (2012) explained that fertility rates in Ghana over the years accounted for the natural increase of the urban population. The Ghana Statistical Service (2014) argued that Ghana is in the third stage of the demographic transition model, characterized by static fertility rates and declining mortality rates. Yankson and Bertrand (2012) also suggested that the declining

morbidity and mortality rates were a result of the concentration of health facilities in urban areas compared to the rural areas. Infant mortality rates in Ghana have declined since the late 1980s. For example, under-five mortality rates declined in both rural and urban areas (GSS, 2013). Estimates show that natural population induced urbanization will rise in the next decade (Fig. 19). By 2035, the population of Greater Accra and Ashanti regions, in particular, are expected to increase by 19% and 21%, respectively (GNSDF, 2015).
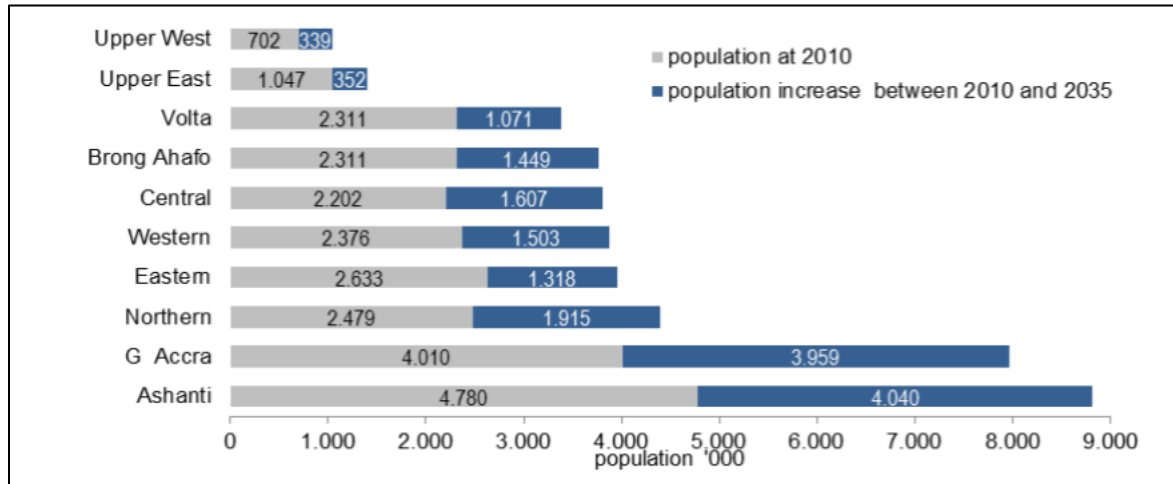
Figure 19: Projected Population Increase in Ghana, 2010-2035

 Source: NSDF, 2013.

Besides the natural population increase, migration from rural areas to urban centers also accounts for the past and current level of urbanization in Ghana. According to the GSS (2008), migration induced urbanization was 54.5% between 1960-1970. Migration rates, however, declined by 29.5% between 1970-1984 before rising to 37.4% between 1984-2000 (GSS, 2008). Migration has not always resulted in urban population growth. For instance, Simon (1996) noted that Accra and other major cities in Ghana experienced a net outmigration during the early 1980s. Consequently, migration from rural areas replaced significant outmigration from cities during the economic crisis in the 1970s and 1980s. The Greater Accra region consistently received the highest inflow of migrations from other parts of Ghana (GSS, 2014). Evidence shows that the net in-migration to urbanization in Ghana will increase the year 2035. The contribution of net-migration to urban growth will be 68% and 23% in the Greater Accra and Ashanti regions,

respectively (GNSDF, 2015). The implications of these trends include a housing crisis in Accra and Kumasi (GNSDF, 2015).

The reclassification of towns and rural areas offer insights into the urbanization process in Ghana. According to the GSS (2014, p. 3), all localities with 5,000 or more population engaged in non-primary economic activities are urban areas. The reclassification of towns increased in the 1980s through the decentralization policy. Among other things, the policy seeks to bridge the rural-urban divide by shifting decision making from a top-down approach to sub-national jurisdictions. The decentralization programme resulted in the demarcation and the elevation of areas with the 5,000-population threshold into district capitals (GSS, 2014).

Departing from the demographic urbanization debate, Korah et al. (2019) argued that urban patterns in Ghana are a manifestation of a fragmented urban configuration. Socioeconomic and ethnic divisions define a fragmented urban space (Kozak, 2008, p. 256). Korah et al. (2019, p. 3) argued that urban fragmentation manifests at the individual level, or through neoliberal and laissez-faire developmental strategies. Unlike Western cities characterized by well-defined spatial organization, cities in the global south are socially, economically, and politically fragmented (Balbo, 1993, p. 24). The visible and invisible power of colonialism is the common denominator for explaining the fragmentation of Ghanaian cities (Balbo, 1993, p. 25). For example, calculatingly deceptive belief by the Europeans that mosquitoes cause the spread of yellow fever resulted in the segregation of the black and white population in cities across Francophone Africa during the era of colonialism (Balbo, 1993, p. 25).

5.2. Urban planning and Policy Transformation in Ghana

Spatial planning in Ghana falls within the lenses of colonialism, nationalism, and globalism (Grant and Nijman, 2004, p. 50). During the pre-independence era, spatial planning in Ghana was influenced by the British (Fuseini and Kemp, 2015; Acheampong and Ibrahim, 2015; Wood, 1970). The first spatial planning framework in Ghana was the Towns Ordinance of 1892. However, small population clusters in tows during that time limited the implementation of the 1892 ordinance (Wood, 1970, p. 81). Decades later, Gordon Guggisberg, the colonial governor of the Gold Coast (now Ghana), commissioned a more comprehensive National Development Plan. The Guggisberg Plan (1920-1930) prioritized infrastructural and institutional development (Fuseini and Kemp, 2015, p. 312). The plan was bold and revolutionary during that time, despite

its Eurocentric characteristic (Adarkwa, 2012). Guggisberg's plan integrated spatial planning with economic development strategies. Overall, the plans significant infrastructural development such as roads, railways, and the establishment of some notable institutions (Fuseini and Kemp, 2015). Guggisberg's plan also established the Dispossessed Persons' Housing Schemes of 1923 to support displaced individuals and households (Arku, 2009; Konadu-Agyemang, 2001; Njoh, 2006).

Guggisberg's plan was instrumental for the subsequent adoption of the Town and Country Planning of 1945, also known as CAP84. Described as a 'comprehensive spatial planning framework' (Fuseini and Kemp, 2015, p. 312), CAP84 was commissioned in the aftermath of the second world war to align British Planning Frameworks (the English Act of 1932) with that of its colonies (Wood, 1970). The framework made provisions to address the growth in the urban population and to provide basic amenities and services to veterans returning from the war (Fuseini and Kemp, 2015; Wood, 1970; Otiso and Owusu, 2008). The 1945 plan resulted in the establishment of the Town and Country Planning Department supervised by Town and Country Planning Boards (Fuseini and Kemp, 2015). Researchers, most notably Mabogunje (1990, p. 122), argued that the establishment of planning departments were containment strategies by colonial administrations to curb the surge of nationalism in the colonies after the second world war. The implementation of the so-called comprehensive spatial planning framework was uneven across geographic space. These spatial plans focused on resource-endowed areas, which were the breadbasket of the British empire (Wood, 1970). The colonial administration systematically exploited resources from the so-called *Golden Triangle* represented by Accra, Kumasi, and Takoradi through infrastructural development for the sole advancement of the empire (Adarkwa, 2012; Fuseini and Kemp, 2015). The failure to implement spatial planning in other parts of the country fueled widespread migration to regions in the Golden Triangle. Towns constituting the Golden Triangle recorded a remarkable increase in population in the late 19th century throughout the 20th century (Table 9). According to Wood (1970), the TCP board had limited financial capacity to implement spatial planning policies in the whole country resulting in the concentration of projects in Accra. Aside from the limited financial capacity, Wood (1970, p. 90) argued that CAP84 was too abstract and required modifications during every stage of implementation. Citing the work of Sutherland (1958), Wood (1970) asserted that the 1945 ordinance required residential areas to adopt a minimum building standard, which was expensive

for the average urban dweller in Ghana. According to Wood (1970, p. 91), the minimum wage of the average Ghanaian worker at the time was low, resulting in the development of urban slums and squatter settlements in clear violation of the ordinance. Consequently, a regulation relaxed buildings standards in certain areas to include traditional and low-cost building materials (Wood, 1970, p. 91).

It is important to note that as the urban population grew, property rent rose, which resulted in the enactment of the Defence (Rent Restriction) Regulations of 1942, criminalizing exploitations by landlords (Malpezzi et al., 1990). The regulation of the rental market in Ghana continued through rent control measures such as The 1952 Rent Control Ordinance, The Rent Control (Amendment) Act, 1960, The Rent Act, 1963, AFRCD 5, 1979, and the Rent Control Law, 1986 (Malpezzi et al., 1990). According to Acheampong (2019, p. 34), although stakeholder participation was encouraged under the 1945 ordinance, the actual implementation of participatory instruments was reserved for the elite. Moreover, the 1945 ordinance provided a legal framework for development control to tackle rural-urban migration and population induced urbanization in the towns of Accra and Kumasi (Acheampong, 2019). Furthermore, unlike Kumasi, where traditional social and land distribution structures survived, the legacy of colonialism remained in urban centers such as Accra (Simon, 1996, p. 2).

Table 9: Population size of the four towns, 1891-2010

Year	Accra	Kumasi	Sekondi-Takoradi	Tema
1891	16,267	3,000	1,276	-
1901	14,842	6,280	4,095	-
1911	19,582	18,853	9,122	-
1921	38,049	20,268	9,500	-
1931	60,726	35,809	22,421	898
1948	133,771	71,436	43,898	1,932
1960	337,820	180,642	75,450	30,261
1970	633,880	342,986	161,071	102,838
1984	969,195	496,628	188,203	190,917
2000	1,658,937	1,170,270	369,166	447,472
2010	1,848,614	2,035,064	559,548	633,011

Source: Peil (1972:5); Ghana Statistical Service (2014:29)

On the implementation of spatial planning in the Golden Triangle, Peil (1972, p. 4-5) wrote that:

The British moved the capital of the colony from Cape Coast to Accra in 1877 and thus stimulated its development as a commercial and transportation center. Though limited by an open roadstead from which goods had to be landed through the surf in canoes, Accra remained an important port until the Tema harbor was opened in 1962. The railway line from Accra to Kumasi was completed in 1923. It was used mainly for forwarding imported goods since most of the cocoa and all the minerals and timber were exported through Takoradi.

The implementation of the planning ordinance in Accra become particularly necessary after the 1939 earthquake, which crippled the urban infrastructure and created a housing shortage (Figure 20). The colonial administration embarked on infrastructural development projects, more specifically, the construction of housing estates in the 1940s to provide shelter for the victims of the earthquake (Peil, 1972). The colonial government introduced proactive measures such as the Accra Earthquake Victims' Housing Scheme of 1939 to provide housing for affected households (Njoh, 2006, p. 66; Konadu-Agyemang, 2001). Njoh (2006, p. 67) described the residential facilities in these pro-poor housing schemes as extremely basic, comprising of single attached rooms, communal toilets, a kitchen, and a courtyard. The well-planned housing estates were, however, distributed to the middle class at the expense of the poor who needed it the most. For instance, local elites and Europeans received large plots of land in new residential areas. Furthermore, the local elites and European bureaucrats resided in these housing developments on a rent-free basis (Njoh, 2006, p. 67). Fuseini and Kemp (2015, p. 312-313) asserted that colonial planning institutionalized and enforced segregation policies in various areas based on the ratio of expatriates and the indigenous population. Property disparities (Figure 21) among various social classes in Ghana, more specifically, in Accra is evident in the Layout Property Survey of 1945 (Basel Mission Archives, 1945). Unable to secure decent shelter, the poor settled in urban fringes such as Nima (Peil, 1972). Under CAP 84, the Town and Country Planning Department constructed New Towns' to address the housing crisis and population growth. The country adopted the New Town policy for the redistribution of economic opportunity (Wood, 1970).

A: Accra earthquake 1939: Upper part of a house which has collapsed   B: The side wall (of a building) has collapsed

C: Shelter at Gbese

D: UTC-Showroom, Accra

Figure 20: The Accra Earthquake of 1939

Source: Basel Mission Archives, 1939
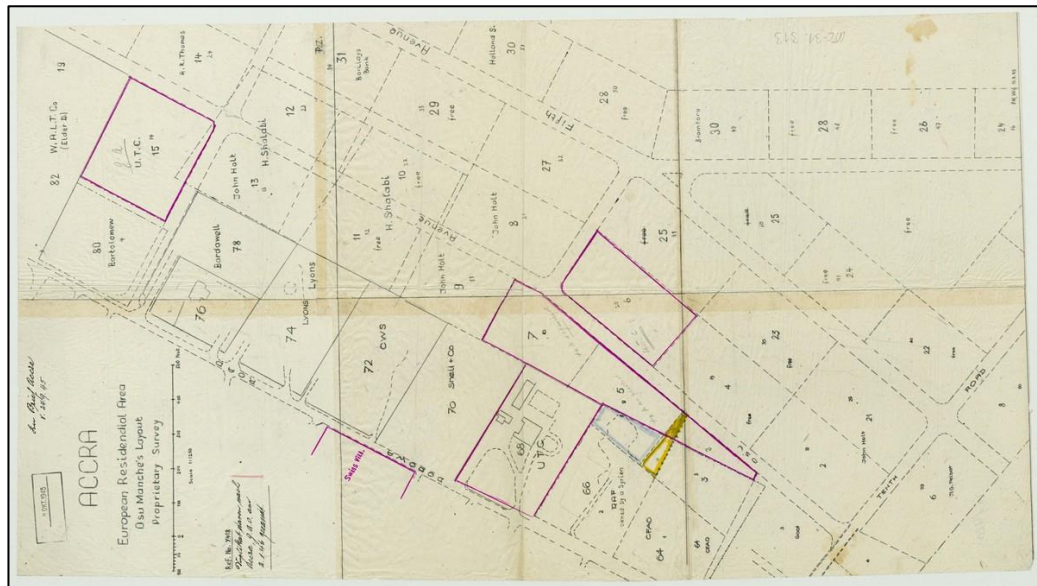
Figure 21: European Residential Area: Osu Manche's Layout Proprietary Survey (Accra)

Decades after independence, housing shortages still dominate the urban landscape of Ghana (Table 10. Poor government policies evident through low investment in public housing, high cost and accessibility to land, high cost of building materials, limited access to credit, lack of monitoring and evaluation, outdated buildings codes coupled with rapid urbanization has created a housing deficit in many urban centers (GoG/MWRWH, 2015, p. 9). Homeownership has also declined, with approximately 60% of all urban households occupying a single room (UN-HABITAT, 2011, p. 2). This trend is troubling because one-third of the total housing stock in Ghana are in urban areas (UN-HABITAT, 2011, p. 8).

Table 10: Population and housing in Ghana, 1960 to 2020

Year	Population	Urban Population	Housing demand	Housing supply (dwelling units)	Housing deficit	Person per House
1960	6,726,815	1,551,174	-	636,198	-	10.6
1970	8,559,313	2,472,456	1,678,296	941,639	736,657	9.1
1984	12,296,081	3,934,796	2,410,096	1,226,360	1,184,636	10.0
2000	18,912,079	8,274,270	3,708,250	2,181,975	1,526,275	8.7
2010	24,233,431	12,545,229	7,417,607	5,817,607	1,600,000	7.3
2020*	30,043,278	17,336,000	-	-	-	-
2030**	34,715,384	22,565,000	-	-	-	-

Source: (UN-HABITAT, 2009; 2011, p. 2), Ghana Statistical Service (2005, p. 22; 2012*; GOG, 2012**)

Kwame Nkrumah's Seven-Year Development Plan (1963–1970) dominated spatial planning practices during the independence era in Ghana. The plan seeks to promote self-reliance (Grant and Nijman, 2004, p. 50). Nkrumah adopted socialist ideas to restructure the economy. For Nkrumah, a building a socialist state was a pathway towards reconstruction and development (Adarkwa, 2012, p. 7). Addressing the member of the National Assembly during the official launch of the seven-year development plan, Nkrumah remarked that:

The main tasks of the Plan are firstly, to speed up the rate of growth of our national economy. Secondly, it is to enable us to embark upon the socialist transformation of our economy through the rapid development, of the State and cooperative sectors. Thirdly, it is our aim, by this Plan, to eradicate completely the colonial structure of our economy (Office of the Planning Commission, 1964, p. ix).

Nkrumah's plan involved import substitution industrialization and modernization of the agriculture sector (Grant and Nijman, 2004, p. 50; Fuseini and Kemp, 2015). The colonial approach to urban planning did not disappear after independence, despite Nkrumah's nationalistic predispositions (Korah et al., 2017). For instance, components of CAP 84 were amended in 1958 and 1960 while maintaining the fundamental principle of CAP 84 (Fuseini and Kemp, 2015). Of relevance to the study is the National Physical Development Plan (1963-1970), a component of the seven-year strategy. The National Physical Development Plan was a long-term strategy for a coherent economic, social, political, and physical dimension of development (Acheampong, 2019, p. 36). As the first independent physical development strategy, the plan set out to ensure adequate investment and annual budgetary allocation for the implementation of the programme as well as a blueprint for development plans for cities in Ghana (Acheampong, 2019, p. 36). Despite the recognition of housing shortages, the seven-year plan conceded the fact that providing adequate housing needs for the masses was not feasible (Office of the Planning Commission, 1964, p. 192). Contrarily, a significant social policy objective of the plan was to control the growth of slums in the cities (Office of the Planning Commission, 1964). To address the housing deficit and the proliferation of informal settlements, the government established the State Housing Corporation (SHC) and the Tema Development Corporation (TDC) with the express purpose of developing housing for workers in urban centers (Adarkwa, 2012, p. 11). In fact, the policy direction of the government during the post-independence era, specifically, from the 1950s to 1980, was state involvement in housing provision and rent control measures (GSS, 2014, p. 7). The government also earmarked funds for community members to construct houses and improve existing building conditions. The government achieved through the establishment of the Bank for Housing and Construction (BHC) and schemes such as the Roof Loan Scheme (Adarkwa, 2012; GSS, 2014).

Spatial planning policies in the 1980s to the early 1990s were influenced by globalization through the introduction and implementation of structural adjustment policies and a decentralization programme. In the 1970s and the early 1980s, the economy of Ghana was in a crisis (Figure 22). Low industrial output caused by poor economic management and volatility in the global

economy triggered a slowdown in the Ghanaian economy. Also, the urban economy was affected by the influx of people from rural areas. The assumption that the mass influx of migrants from rural areas to urban centers contributes to widespread urban unemployment is misleading, at least in the case of Ghana. The World Bank (2015, p. 3) noted that urban migration in Ghana occurred without creating widespread unemployment. For instance, urban unemployment fell by 1.5%, despite a rise in rural-urban migration between 2000-2010 (World Bank, 2015). Furthermore, GDP growth peaked at an average of 5-6% between 1984 and 1991 and reached an average of 7.8% from 2005 to 2013 (Grant and Nijman, 2004, p. 51; World Bank, 2015, p. 3).
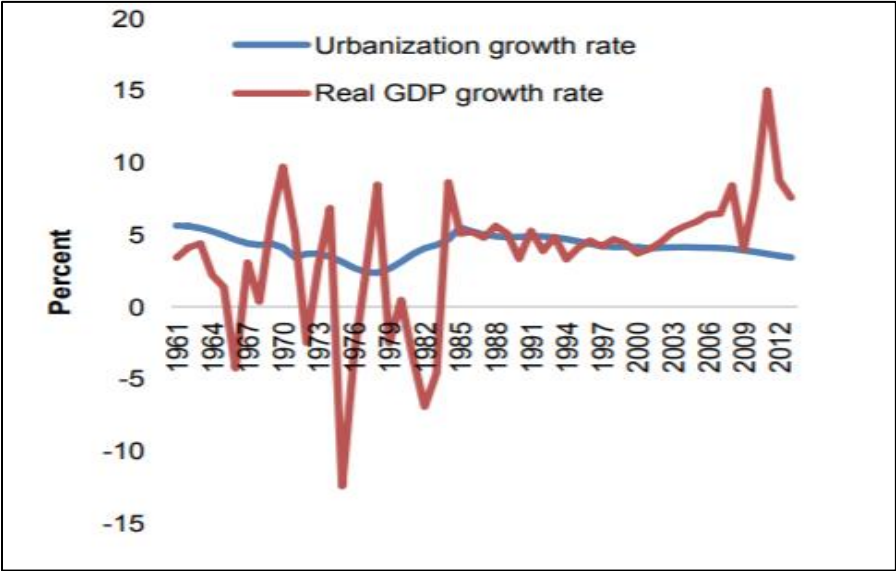
Figure 22: GDP Growth and Urbanization in Ghana

Source: World Bank, 2015 (WDI; World Bank staff calculations)

The 'Ghana Must Go' revolution further compounded the economic crisis in the late 1970s and the early 1980s. The Nigerian government deported over 1 million Ghanaians who subsequently moved into the crisis-ridden urban centers of Accra and Kumasi. The deportation of Ghanaians generated a lot of pressure on local authorities, infrastructure, and amenities and contributed to significant shortages in housing in Accra and Kumasi. The majority of these returnees established themselves in the informal sector and camped out in informal settlements, characterized by precarious living conditions and poor access to basic amenities. In addition to the economic crisis in the 1970s and 1980s, political instability in the form of military coups from 1966 to 1991

affected the smooth and sustainable implementation of critical urban development policies and strategies.

One of the preconditions of the structural adjustment policies was the liberalization of the real estate market through the privatization of housing. Consequently, the state prioritized private sector participation in housing production (GSS, 2014, p. 7). Accordingly, private real estate developments emerged in urban areas such as Accra and Kumasi. These well-planned residential housing developments, however, focused on the middle- and upper-class population (Obeng-Odoom, 2010, p. 369-370). Moreover, the establishment of a National Housing Policy and Action Plan (1987-1990) and the National Shelter Strategy, Vol. 1&2 (1993) to provide affordable housing and upgrade urban slums during the economic liberalization era did not proceed to the implementation stage (GSS, 2014, p. 7).

Spatial planning practices in Ghana in recent years relates to the downward spiral of the professionalism of planning practices, on the one hand, and the normalization of alternative urban processes, on the other hand (Korah et al., 2017, p. 363). In the era of self-organization, urban planners have become transition managers of the built environment (Korah et al., 2017, p. 363). The proliferation of informal settlements in Ghana shows the normalization of self-organization (Korah et al., 2017; Nunbogu & Korah, 2016). According to the World Bank (2015, p. 25), land market friction, poor transport connectivity, insufficient financing, and weak institutions are useful frameworks for analyzing the challenges confronting urbanization in Ghana. Since returning to democratic governance in 1992, successive governments pursued short and medium-term urban development policies such as the Ghana Poverty Reduction Strategy I (2003-2005), Growth and Poverty Reduction Strategy II (2006-2009), Land Use Planning and Management Project (LUPMP) (2007-2010), and the Ghana Shared Growth and Development Agenda (2010-2013). A crucial component of these policy strategies is the provision of affordable housing and slum upgrading/urban regeneration (GSS, 2014, p. 9). The implementation of these policies was, however, limited. Consequently, the state established national urban policy frameworks such as the National Urban Policy Framework (NUPF) (2012), the Draft National Housing Policy (2013), and the Land Use and Spatial Planning Act (Act 925, 2016) to ensure a comprehensive urban development strategy. The National Urban Policy Framework was instituted in part to sanitize the chaos in urban development and governance in

Ghana. The NUPF seeks to "promote a sustainable, spatially integrated and orderly development of urban settlements with adequate housing, infrastructure and services, efficient institutions, and a sound living and working environment for all people to support the rapid socio-economic development of Ghana" (NUPF, 2012, p. 21). The policy framework seeks to sustainably develop urban areas and towns by contextualizing socio-economic, environmental, spatial, and political factors. The policy framework is a roadmap towards a comprehensive decision making concerning urban growth at the national and local levels (MLGRD, 2012). The NUPF responds to the complex and diverse urban problems such as the over-concentration of growth and development in few cities such as Accra and Kumasi; the rapid deterioration of the environment evident through ineffective land use and waste management, flooding, and weak environmental protection; weak urban economy characterized by the dominance of informal activities and deindustrialization; limited infrastructure and services; uncontrolled urban sprawl; growing urban insecurity; endemic urban poverty and slum development; poor urban transport planning and management; weak urban governance and inadequate urban investment and financing (MLGRD, 2012). The NUPF consists of 12 key policy objectives, some of which include:

i.   To facilitate balanced re-distribution of urban population.
ii. To promote a spatially integrated hierarchy of urban centers.
iii. To promote urban economic development.
iv. To improve environmental quality of urban life.
v.   To ensure effective planning and management of urban growth and sprawl, especially of the primate cities and other large urban centers.
vi. To ensure efficient urban infrastructure and service delivery. vii. To improve access to adequate and affordable low-income housing.

Despite a well-thought-out set of initiatives for the implementation of the NUPF, researchers (Fuseini and Kemp, 2015; Obeng-Odoom, 2013) have cast considerable doubt about the practicality of the framework. For instance, Fuseini and Kemp (2015, p. 316) convincingly argued that redistributing the urban population by creating new growth poles does not translate to good governance and service provision. Aside from the NUPF, it is also crucial to bear in mind the relevance of the Land Use and Spatial Planning Act (Act 925, 2016) to urban development. Labeled as a new spatial planning system, Act 925 revolves around three spatial

planning instruments, namely, the National Spatial Development Framework (NSDF), the Regional Spatial Development Framework (RSDF), and the District Spatial development Framework (DSDF) (Acheampong, 2019:109). The spatial planning law is an updated version of the Town and Country Planning Ordinance (CAP 84) of 1945, which seeks to address contemporary urban and spatial planning challenges. The Act proposes to:

revise and consolidate the laws on land use and spatial planning, provide for sustainable development of land and human settlements through a decentralized planning system, ensure judicious use of land in order to improve quality of life, promote health and safety in respect of human settlements and to regulate national, regional, district and local spatial planning, and generally to provide for spatial aspects of socio-economic development and for related matters. (Land use and Spatial Planning Act 925, 2016).

The city of Accra is the perfect environment to explore the complex dynamics of these urban policies. Spatial planning frameworks in urban areas in Ghana are re-emerging after decades of dormancy and fragmentation. This revival is exemplified through the restructuring of national urban development institutions, the establishment of ministries tasked with spatial planning and urban development, as well as reforms of decades-old planning acts and legislations. It is crucial to point out that the revival of spatial planning policies is bound to generate tensions between formal and informal institutions.

5.3. Accra: Profile of a City (A city of Multiple Contradictions)

Accra is a primate city not only in terms of the size of its population; its primacy also manifests in every respect: political, economic, and cultural (Yankson and Bertrand, 2012, p. 25)

Since its elevation from a small coastal fishing village to the capital city of the Gold Coast by the colonial administration in 1877 (Figure 23), Accra quickly rose through the ranks to become a truly global city. In addition to its administrative role, Accra concurrently assumed the mantle of the commercial center of Ghana, a status previously held by the coastal town of Cape Coast. Acquah (1958, p. 25) argued that Accra would have remained a small town had Cape Coast remained the capital. During the late 1950s, the government falsely predicted that the establishment of a new port town of Tema, which was 17 miles to the east of Accra, would result in the decline of the city's position as a commercial and distributive center (TCPD, 1958, p. 4). According to Njoh (2006, p. 64), the relocation of the colonial administration to Accra increased the population of the city. Njoh (2006, p. 57) further attributed Accra's rise to prominence to the localization of forts built during the period of European trade and commerce.

a. Part of Accra with the sea in the background   **b.** Street in Accra
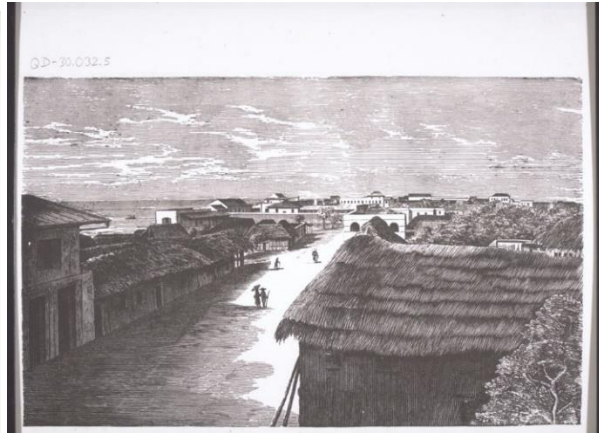
c. Part of the town of Accra seen from the east

Figure 23: Accra in the 1880s

Source: Basel Mission Archives

The Accra Metropolitan Assembly is one of the 16 Metropolitan, Municipal and District Assemblies (MMDAs) in the Greater Accra region (GSS, 2014, p. 3). Established in 1898, the AMA is situated to the North of the Ga West Municipal, to the West by Ga South Municipal, the

South by the Gulf of Guinea, and to the East by the La Dadekotopon Municipal Assembly (Fig. 24) (GSS, 2014, p. 1). With a total land area of 139.674 km2, the AMA extends from latitudes 5°5′27″ N to 5°28′2″ N and stretches between longitudes 0°4′58″ E to 0°37′2″ W (Akubia and Bruns, 2019). According to Grant and Yankson (2003, p. 65), "The city of Accra is defined as the continuously built-up area of AMA and the town of Tema. Broader definitions of Accra also exist, such as the Greater Accra Region that includes AMA, Ga, Tema, Dangme West, and Dangme East." Before the arrival and subsequent colonialization of Accra by the Europeans, the indigenous group of the area were/are Ga(s) (GSS, 2014). The Ga people first settled in James Town (Ngleshie) and later settled in Nungua, La, Osu (Christiansburg), Teshie, and Tema (GSS, 2014, p. 3). In fact, the AMA expanded from these earlier settlements, historically referred to as 'Old Accra' (Grant and Yankson, 2003). The city of Accra has emerged as one of the fastest-growing urban centers in Sub-Saharan Africa and the world. For instance, between 1991-2000, the average annual population change in Accra was 7.2% compared to the subregion's rate of 7.8% and a world average of 4.5% (Atlas of Urban Expansion, 2016).
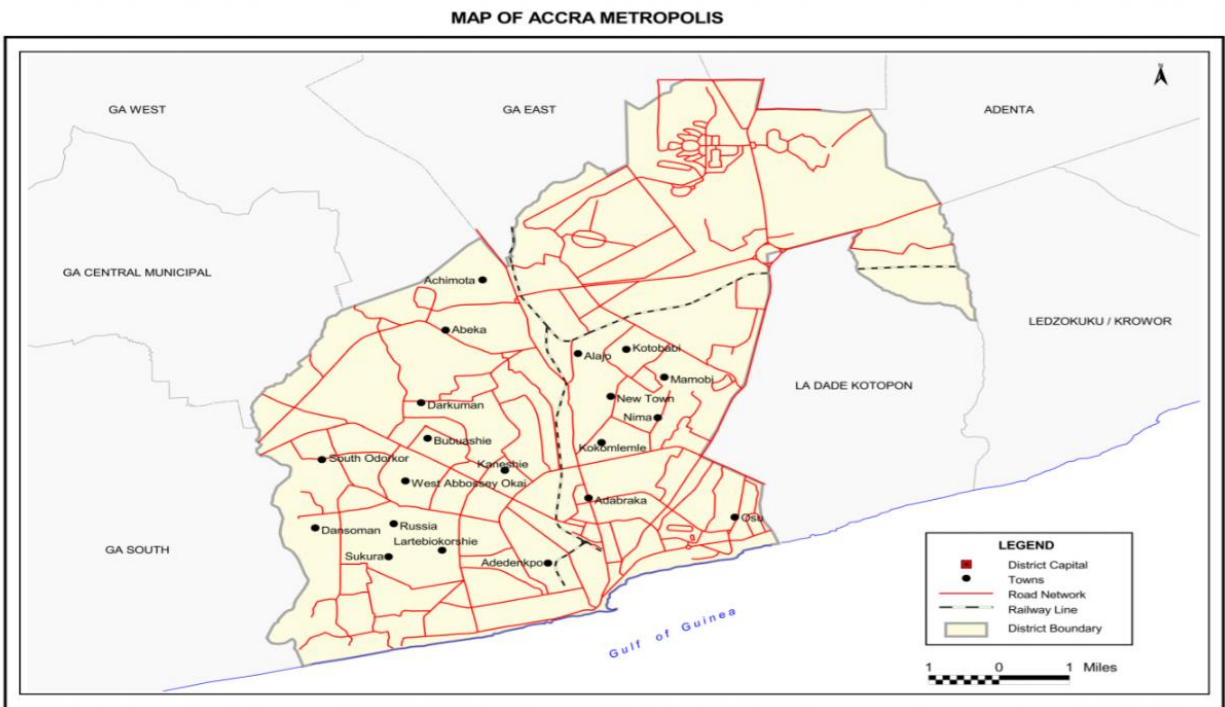
Figure 24: Map of the Accra Metropolitan Assembly

Source: Ghana Statistical Service, 2014

A defining characteristic of Accra's urban landscape relates to the rate of spatial expansion (Fig. 25). Analyzing the spatial expansion of African cities, Dodman et al. (2017) singled out Accra as one of the urban areas with a significant land cover increase between 1985 and 2000. The urbanization process in Accra is expansive compared to a compact urban dynamic in other African countries (Seto et al., 2011). For instance, the total built-up area of Accra grew by 4.6% between 1991 and 2014 (Atlas of Urban Expansion, 2016). The urban extent of Accra increased by 5.3% between 2000 and 2014, constituting a sharp decline from an annual average of 12.4% between 1991 and 2000 (Atlas of Urban Expansion, 2016). The rapid expansion of Accra is a result of the decline in population densities in the inner city and the central business districts. In the 1958 Master Plan for Accra, the government took pride in the existence of open urban spaces. They attributed the 'satisfactory position' of open spaces in Accra to government ownership of large areas of land as well as town planning control brought about by rapid urban development (TCPD, 1958, p. 23). Open urban spaces have declined in Accra in recent decades. The rate of spatial expansion has reduced the size of open spaces in the city (Figure 25).
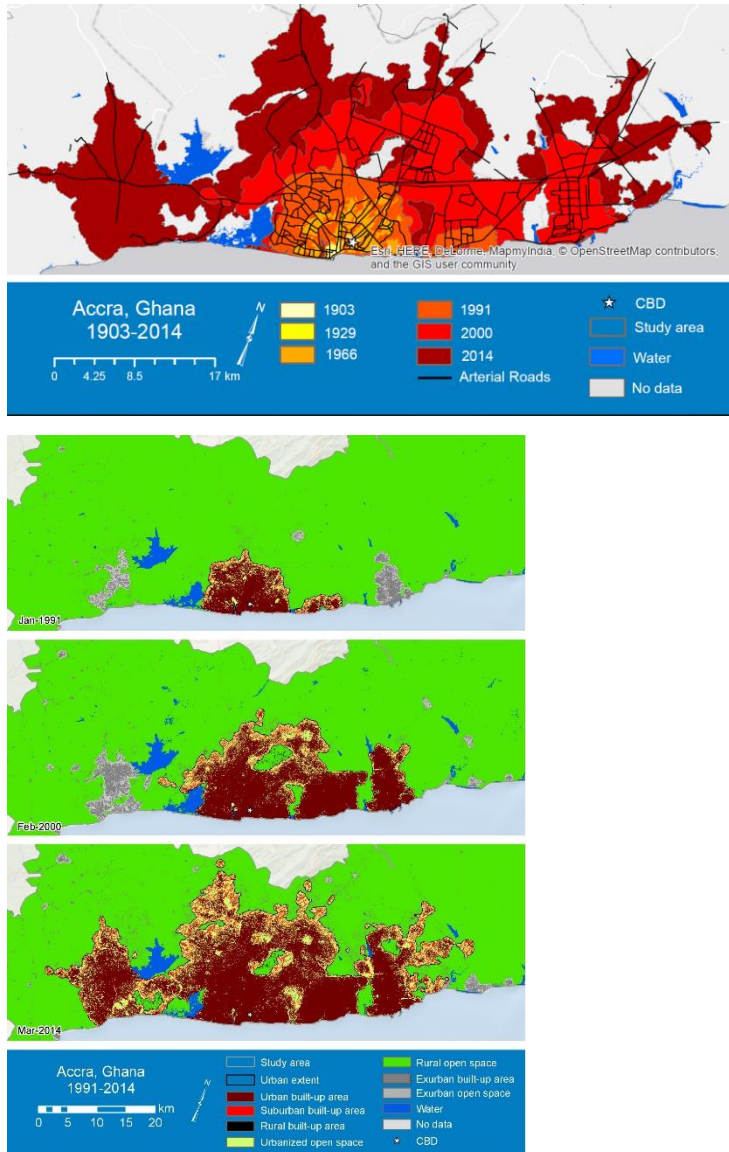
Figure 25: Spatial Expansion of Accra (1903-2014)

Source: Atlas of Urban Expansion 2016

Accra still serves as the economic center of the country. Estimates show that Accra accounts for about 25 percent of the GDP of Ghana (Cities Alliance, 2016), with a 2.21 percent annual growth rate between 1985 and 2000 (Angel et al., 2005). The city also attracts more than 80 percent of all foreign direct investment in Ghana (World Bank, 2016). Compared to other parts of the country, the economy of Accra is highly diversified with people engaged in both primary and secondary sectors such as fishing, farming, trading, construction, services, manufacturing, etc.

(GSS, 2014; Grant and Yankson, 2003). The economic growth of the city of Accra particularly expanded rapidly in the aftermath of SAP. Despite occupying a relatively small land cover area, Accra has the highest concentration of financial institutions, manufacturing industries, and other secondary and tertiary sector industries (GSS, 2014; Obeng-Odoom, 2011; Grant and Yankson, 2003; Grant, 2007). The localization of these fundamental sectors generated employment opportunities and fuelled migration into the city. The AMA has the highest concentration of urban employment, with the formal sector accounting for about 20% and the informal sector representing 70-80% (City Alliance, 2016). Since independence, successive governments have institutionalized the concentration of the national economy in Accra at the expense of other cities and towns (Grant and Yankson, 2003). The high level of remittance from Ghanaians living abroad further contributed to the growth of AMA. Remittances are estimated to exceed the foreign direct investment in the overall growth of the city (Buckley and Mathema, 2007; Bank of Ghana, 2007; Obeng-Odoom, 2011; Quartey, 2006, Yeboah, 2000;2003; Diko and Tipple, 1991; Grant, 2007). Buckley and Mathema (2007) argued that these remittances are particularly driving growth in the real estate market in Accra. Studying the role of remittances on urban real estate in Ghana, Obeng-Odoom (2010) found that Ghanaian migrants in Sydney, Australia, save about 33% of their incomes to build houses in Ghana and Accra in particular. Remittances to the housing sector in Accra is so pervasive that Yeboah (2003, p. 117) asserted that "Ghanaians living abroad now own half of all the new housing stock in Accra." These investments, however, focused on developments in gated communities, which contribute to the rise of inequality and gentrification in Accra (Cities Alliance, 2016). Globalization has also created opportunities for market speculators to dominate the real estate market in Accra with significant power on issues of spatial planning and development. According to Cities Alliance (2016), speculation in the real estate market in Accra is driven by local developers with Ghanaians in the diaspora as clients. The real estate and construction sector in the city also experienced steady growth in recent decades. The annual growth rate of the construction sector is comparatively higher than many cities in the Sub-Saharan African region (UN-HABITAT, 2015). The boom in the real estate sector is the result of economic liberalization policies in the 1980s. According to Yankson and Bertrand (2012), trade liberalization facilitated easy access to building and construction materials, contributing to the expansion of Accra. Yankson and Bertrand (2012) further argued that rent control laws in the housing market faltered under SAPs. The lack of rent control laws

was mostly felt by low-income households, who sank deeper into poverty as rental prices soured (Yankson and Bertrand, 2012). The Ghana Living Standards Survey (GLSS 3) reflected the rise in the urban population in Accra during that time (Grant and Yankson, 2003).

The Accra Plan of 1958, officially known as *Accra: A Plan for the Town,* was a turning point for the spatial planning and development of Accra. As the first postcolonial master plan of its kind in Ghana, the Accra Plan was designed to guide the long-term development of towns and cities in Ghana (Acheampong, 2019, p. 37). The purpose of the 1958 Master Plan was to complement the 1944 plan and decolonize the development agenda. Per the Master Plan, the government was apprehensive towards the mass industrialization of Accra and instead preferred to describe the city in the following way:

Already the city can boast perhaps the finest University in West Africa, a museum, a large luxury hotel, Achimota College, the Supreme Court, many other fine cultural, administrative and commercial buildings, and the best retail shops in the country. It would be a pity if the obvious mantle that Accra is assuming should be marred by large industries which in themselves could enjoy better facilities in the developing port (referring to the Port city of Tema) (TCPD, 1958, p. 4).

It is important to note that the Master Plan lacked full implementational capacity. Weeks et al. (2009, p. 3) attributed the failure to poor and fragmented planning. Weeks et al. (2009) perfectly sum up the spatial organization and social structure of Accra during the various stages of the city's transformation: from a colonial, post-colonial, and a global city. According to Weeks et al. (2009, p. 3), Accra was characterized by:

(i)   Race-based town planning until 1923;

(ii)   The development of elite areas populated largely by Europeans, including the military cantonments;

(iii)   Older villages dominated by different ethnic groups and which are now incorporated into the larger city;

(iv)   Parts of the city such as "New Town" that have been reception areas for migrants into the metropolis; and

(v)   An incompletely implemented urban plan, leading to wide disparities in neighbourhood formality and infrastructure.

Zoning and land use planning laws enforced a strict spatial and social structure of Accra (Table 11) (Adarkwa, 2012, p. 6). The segregation of residential areas affected the indigenous

population of Accra (Adarkwa, 2012). Housing in Accra is one of the most inequitable in Africa (Grant, 2007, p. 32; UN-HABITAT, 2003). Despite accounting for 80 percent of the share of housing stock nationwide (Bank of Ghana, 2007, p. 19), and recording a 108 percent rise in housing stock between 1984 and 2000 (Grant, 2007, p. 32), the majority of urban households in Accra dwell in substandard and congested living conditions (UN-HABITAT, 2011). For decades, successive governments have failed to improve the housing stock in Accra (Awanyo, 2008; GSS, 2014; Buckley and Mathema, 2007; Obeng-Odoom, 2011). For instance, the housing stock in the city was 131,355 in the year 2000, serving 365,550 households (GSS, 2005, p. 55). The number of houses however, marginally increased to 149,689 in 2010 for a total of 450,794 households (GSS, 2014, p. 41). Furthermore, between 2000 and 2010, only 1.48 dwelling units were built per thousand people (UN-HABITAT, 2011). Consequently, the World Bank (2015, p. 24) argued that "how Ghana tackles its housing development problems will become critical for growth of urban areas in the coming decades." The vacuum created in the housing sector has contributed to the rise of informal housing arrangements. It is, therefore, not surprising that 91 percent of urban housing in Ghana is informal (UN-HABITAT, 2011). For instance, the share of residential areas in housing projects in Accra decreased from 16 percent between 1903-1929 to 0 percent between 1991-2014 (Atlas of Urban Expansion, 2016). At the same time, the share of residential areas in informal land subdivisions increased from 24 percent to 45 percent during the same period (formal land subdivisions decreased from 18 percent to 7 percent during the same period) (Atlas of Urban Expansion, 2016). The housing situation in Accra was so precarious to the extent that between 1948 and 1960, the average occupancy of one-third of the city's residents was 20 persons per house with an average of 2.5 persons per room (Office of the Planning Commission, 1964, p. 191). Describing the living arrangements and building conditions in certain parts of Accra in the 1950s, Acquah (1958, p. 46) observed that:

In Adabraka and other suburbs, windows are usually large and ceilings relatively high. In Ussher Town and in the other old parts of the municipality, windows are usually small and ceilings low. Consequently, households who occupy only one room in Adabraka or the other suburbs have a healthier environment than those occupying one room in Ussher Town irrespective of the floor space.

Furthermore, the complicated land tenure system in Accra has pushed quite a significant number of residents into the housing rental market. The dominance of a traditional land tenure system implies that family members control land resulting in landless urban dwellers (Grant and

Yankson, 2003). For instance, indigene housing land price per acre in urban areas such as Accra increased by 611.8% between 1995 and 2005 while migrant housing land price increased by 785.3% during the same period (GSS, 2014, p. 16).

Table 11: Characteristics of Residential Areas in Accra

Type of Residential Area	Characteristics
High-Density Indigenous Sector (HDIS)	The oldest sections of Accra mainly occupied by "indigenous" Ga people. Family and compound housing houses are very common. The communities share similar history and culture. Population is very dense; growth rates are now low. Low incomes, many from fishing. Very poor levels of infrastructure. Examples are Old Dansoman, Chorkor, Old Teshie, and Nungua.
High-Density Low-Class Sector (HDLCS)	Areas are characterized by very high densities, low-income population; many of the people are migrants. Ethnically diverse. Extremely poor infrastructure conditions. High growth rates. Most areas are low-lying and easily flooded. Housing is sometimes temporary wooden shacking. Examples include New Town, Nima, Russia, Sukura, and Maamobi
Medium Density Indigenous Sector (MDIS)	Shelters people who otherwise have been living in the HDIS but have moved out because their lot has improved. Incomes are marginally higher, but densities are not as high as in HDIS. Many migrants. Infrastructure is poor and inadequate. Examples include Abeka, Mamprobi, Kpehe, Mataheko, and Bubuashie.
Medium Density Middle-Class Sector (MDMCS)	Started as LDHCS but has been overcome by rapid urbanization. Residential quality and services are good. Housing people with primary education or better; incomes are medium but slightly lower and densities are higher than LDHCS or LDMCS. Examples include Asylum Down, Avenor, Alajo, and Kotobabi.

Low-Density Medium Class Sector	Started as state-owned estates for government staff. With time the quality of the estates has deteriorated. Densities are relatively low, as are growth rates. Population is middle income; infrastructure conditions are adequate. Examples include Dansoman Estates, North Kaneshie, and Tesano
Low-Density High-Cost Sector (LDHCS)	This area is populated by high-income people with high levels of education and wealth. Its as low density, low growth, and infrastructure are adequate. Examples are Cantonments, Airport Residential and Ridge
New Developing Low-Density Sector (NDLDS)	Newly developing settlements usually on the city fringe. Evidence of lack of basic infrastructure but housing facilities is usually adequate. Rapid growth rate. Examples include Achimota and Mpeasem.

Source: (UN-HABITAT, 2011:10)

Another feature of urbanization in Accra relates to the development of urban slums (Cities Alliance, 2016; Grant and Yankson, 2003; Arku, 2006; Awanyo et al., 2016). Statistics show the existence of 78 slum settlements across the city of Accra, with the majority located close to risk-prone areas such as flood zones, railway corridors, and transmission lines (Cities Alliance, 2015;2016).

5.4. Chapter Conclusion

The city of Accra offers a myriad of social, political, economic, and environmental conditions to explore the contradictions inherent in how formal and informal institutional arrangements discretely or otherwise account for the proliferation and normalization of the containerization of urban space. Going back to the 1970s, Keith Hart seminal work on the informal sector idealizes Accra as a unique setting for 'southern' urban theory production. The city reinforces the notion of the power of improvisation in the face of precarity. These are quite interesting for a city that once "replaced London as the center of accumulation" (Adarkwa, 2012, p. 7). The city is undoubtedly fraught with multiple contradictions. Consequently, the questions raised by Buckley and Mathema (2007) about whether Accra is a Superstar City is still relevant today. Buckley and Mathema (2007, p. 2) posited that: "could Accra's real estate boom lead to both deteriorating

housing conditions for many, as well as have broader adverse effects on the economy?" Despite accounting for about 80% of all foreign direct investments and real estate developments in Ghana, the property market in Accra is expensive, with high rents and poor living conditions. These conditions are more precarious when compared to most poor urban dwellers in other African cities (Buckley and Mathema, 2007). This trend is at the backdrop of higher average monthly income per capita and higher expenditure on housing and services compared to other African cities (Buckley and Mathema, 2007). In fact, social inequality and unemployment have risen in recent decades. Furthermore, rent the payment of rent advances in Accra has reduced the income of many households (Table 11). Moreover, despite a slowing rate of urbanization, a decline in the density of the built-up area (Atlas of Urban Expansion, 2016), as well as the concentration of housing, Accra still faces a significantly higher housing deficit.

Chapter Six: Global Container Urbanism

This chapter tries to provide answers to a fundamental question raised by Parker (2013, p. 373): What is it about the container that is so important? Klose's essential suppositions on what constitutes a home also speak to the conception of container urbanism. He famously proposed the questions: What is a house? …. What is needed to transform a simple container into a home? And what becomes of the category "home" with such logistical container dwellings? (Klose, 2015, p. 292). Containerization is transforming the configuration of cities (Klose, 2015, p. 300). Accordingly, this chapter seeks to understand the importance of the container, transmutation, and hybridization of the city. Strom (1972, p. 46) was right when he said literature addresses only a microcosm of the concept of containerization. For some time now, it has become clear that the traditional construction industry from which the real estate and housing market emerge are polemically antiquated concerning the sustainable development of cities. More than ever, innovation solutions such as containerization are needed to make cities inclusive, safe, resilient, and sustainable.

The case for containerization becomes massively tangential when perceiving issues of sustainability in the traditional construction sector. Strategic imperative aside (Iacoboaea et al., 2019), the preoccupation with value extraction has rendered the traditional construction industry massively unsustainable. Writing about the emerging crisis in the U.S. construction industry, the Modular Building Institute (MBI) (2019) explored the substantial waste generated by the traditional construction sector. Examining data from the U.S. Environmental Protection Agency (EPA), the MBI (2019, p. 7) argued that the U.S. construction industry generated about 138 million tons of construction and demolition (C&D) materials in 2015. The EU, on the other hand, generated thrice as much construction and demolition waste. The application of sustainable materials such as the shipping container, however, ensures waste reduction through material reuse (MBI, 2019). In *How Buildings Work: The Natural Order of Architecture*, Allen (2005, p. x) argued that buildings "place a heavy burden on the earth's resources, most of which are nonrenewable and finite, and they jeopardize the health and welfare of humanity. Thus, it is increasingly urgent that we learn to build and operate buildings in a sustainable manner."

6.1. The Container Home Market

Containers dominate. They abound. (Martin, 2016, p. 16).

But there were many modern technologies—less dramatic than the railroad, more personal than a cofferdam—that, in their seemingly mundane insignificance, passed relatively unnoticed by the public or un-regulated by the state, their presence only marginally attested to in newspapers and photographs, or in the incidental, background material to novels and short stories (Arnold, 2013, p. 11).

Arnold's (2013) exposition is an undeniable juxtaposition of the container revolution unraveling in cities across the globe. Everyday technologies have uniquely disruptive tendencies (Arnold, 2013). Significantly, disruptive innovations are occurring everywhere. In *Disrupting the Regional Housing Market: Airbnb in New Zealand*, Campbell et al. (2019) observed how the controversial accommodation/home-sharing platform, Airbnb, is disrupting the rental market in New Zealand. By exploring the spatial distribution of accommodation listings, Campbell et al. (2019) found significant growth in Airbnb listings across tourist hotspots in New Zealand, thereby challenging the rental market. Martin (2016, p. 4) inferred that "they [containers] are omnipresent, but so often they are taken for granted." The evolutionary process of modern-day capitalism offers an insight into the innovation diffusion of containers in urban space. Exploring the work of Joseph Schumpeter, Madanipour (2017, p. 41) argued that innovation, competition, and destruction are the cornerstones of this evolutionary process. Crucially, Schumpeter (2003) explored how innovation in the free market economy is generating new methods, markets, and forms of production- containerization of urban space.

Reflecting on Cove Park, a series of 'architectural experiments' dominating the landscape of the west coast of Scotland, Martin (2016, p. 3) argued that the studio spaces repurposed from shipping containers are "comparatively cheap, particularly in comparison with bespoke architectural structures. Their design, including the shape, scale, and size makes them ideal spaces for human usage." Martin (2016) further used the term 'amphibious object' to herald the innovative dimension of the shipping container. By this, he implied the ability of the container to permeate different landscapes of encounter (Martin, 2016:3).

Most recently, specifically, in a 2019 opinion piece for the New York Times, Richard J. Williams, a professor of contemporary visual cultures, wrote quite decidedly and scathingly on the globalization of containerized architecture in cities. For skeptics such as Williams (2019):

These container environments inadvertently perpetuate a sense of a Darwinian world in which only the tough survive. That brutality can be fun if it's about creating a landscape for weekend partying; at

Amsterdam's shipyard, you can live out your "Mad Max" fantasies for 24 hours before heading back to the suburbs……………… But the harsh landscape of the shipping container is a terrible shorthand for modernity…………………… And it's that the shipping container suggests a world in which everything is contingent and temporary, and humans are doing little more than camping. That's not the way to produce good offices, or housing, or cities.

Williams's critique and skepticism are undoubtedly accurate concerning the utopic/dystopic milieu containerization as a disruptive innovation has come to symbolize. For instance, the glamorization of containerized architectural projects such as the *Container City I and II* (Figure 26) has reduced the container to an ornamental value rather than an iconic representation of the everyday struggle of urban dwellers.

Figure 26: Lionization of the Container

(a) Mill Junction, stacked container student residences in Johannesburg; (b) A Proposed Shipping Container Micro Housing Project for people living in the City of the Dead in Cairo; (c) Freitag Flagship Store, Zurich; (d) ContainerCity, a mixed housing, offices and recreational facilities in London; (e) Tempohousing, world's largest container development for student accommodation in Amsterdam. Source: Firms' website.

A report released by the Children's Commissioner for England further legitimizes Williams's critique of containerization. The 2019 report titled *Bleak Houses: Tackling the Crisis of Family Homelessness in England* found a tremendous rise in the number of homeless children growing up in repurposed shipping containers. The report made it conspicuously clear that housing families in these temporary shipping container accommodations risk the health and wellbeing of the children. Describing the poor conditions in these container accommodations, the report admitted that:

The units are typically one or two-bedroom and small in size, meaning that overcrowding can be an issue. The containers become very hot in summer - one mother told us she had to sleep with the front door wide open and that her baby got heat rash - but are too cold in the winter. They are often not properly designed with children in mind. Ovens and other dangers can be too close to the ground so that they are in reach of very young children (Children's Commissioner for England, 2019, p. 10).

The report further highlighted the rise in antisocial behavior among children housed in these shipping container structures. As a 3-year resident in one of these temporary accommodations bleakly puts it: *"I don't like it here"* (Children's Commissioner for England, 2019, p. 12). Despite the challenges inherent in the application of the shipping container, the report acknowledged that this particular mode of accommodation is more cost-effective compared to other emergency temporary arrangements and has proved popular among councils in England (Children's Commissioner for England, 2019).

Despite the opposition and challenges of container urbanism, entrant firms and Do-it-Yourself (DIY) urban movements are increasingly embracing this alternative urban process. These innovators are slowly but systematically disrupting the housing market in cities. For example, projections show that the global container housing market will grow by 6.5% between 2018 and 2025, with significant growth expected in the Asia-Pacific region (Figure 27) (Bigmarket Research, 2019). Furthermore, governments around the world are increasingly promoting green building concepts, which in the process creates a market for container homes. Madanipour (2017, p. 2) documented how pop-up retailing, specifically, the use of shipping containers, is becoming a global trend among small businesses and large corporations. It, therefore, comes as no surprise that firms and individuals disenchanted with the current system of the production of urban space are reviving Le Corbusier and Walter Gropius's vision of Fordist and Taylorist assembly line

concept of housing production. Standardization, as put forward by Hermann Muthesius (1861-1927), essentialized the proliferation of mass customization in architecture.

In recent years, industry players in the modular housing sector are taking significant steps to disrupt the traditional housing market. A key strategy towards achieving this goal is through the organization of fairs and workshops for members across the globe. For instance, one of the key highlights of the 9th China Prefab House, Modular Building, Mobile House & Space Fair (PMMHF, 2019) was the gathering of container home suppliers. The annual fair, considered one of the largest prefabricated building exhibitions in the world, fittingly amplified the relevance of container homes to the Chinese market and the world. More exactly, the exhibitors acknowledged the comparative advantage of the container home model in relation to cost, efficiency, and environmental protection. Furthermore, at the backdrop of the 4th Container Traders & Innovators Association (CTIA) Members Meeting held in London in 2018, members deliberated on the opportunities and challenges confronting the container housing market. Some delegates explored how urban regeneration strategies can integrate shipping containers through the concept of Meanwhile Use. Other delegates reflected on how the application of containers is helping tackle the homelessness crisis in the UK, specifically in Brighton and Hove. The demand for temporary accommodation in the UK has created a significant niche market for container converters and innovators. Other highlights at the CTIA Members Meeting included the criteria and methodologies for converting shipping containers, as well as strategies for improving public acceptability of container housing (CTIA, 2018).
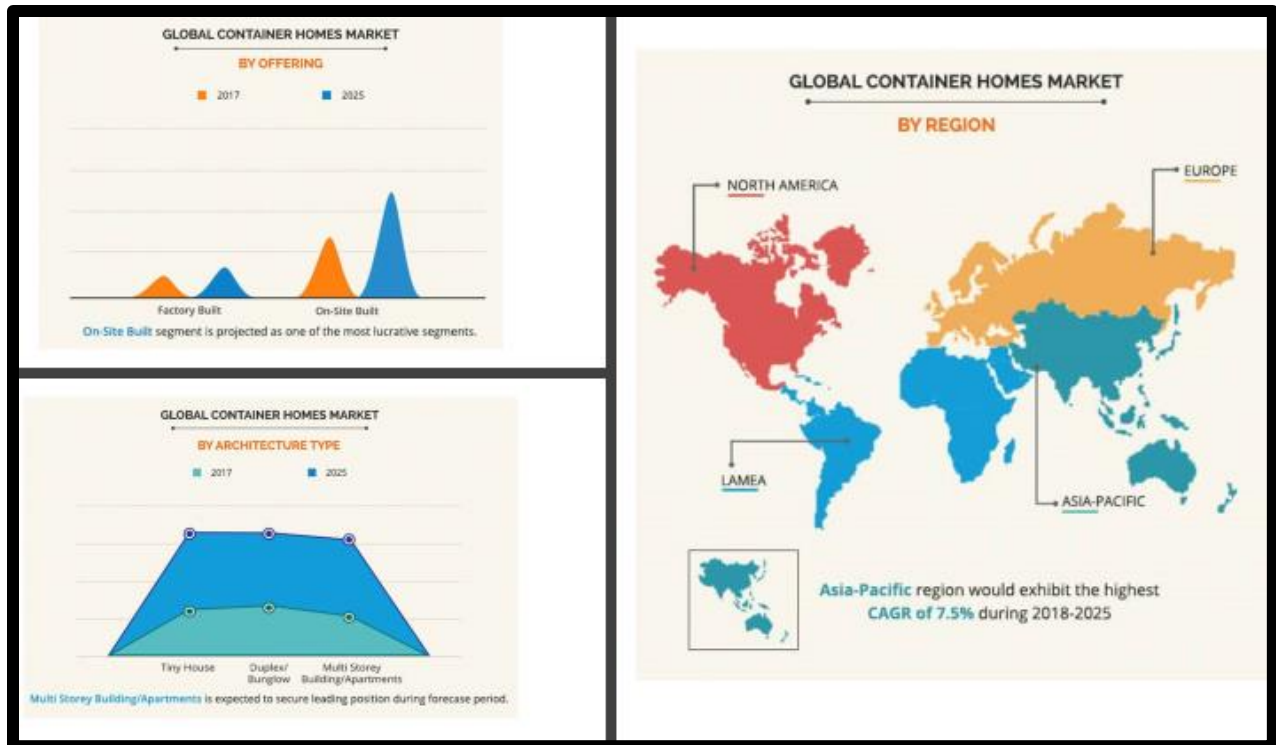
Figure 27: Global Container Home Market by 2025

Source: Allied Market Research, 2019.

Similarly, containerization, as a disruptive innovation, has consolidated the co-production of urban space through the activities of DIY movements. Afterall, DIY movements signify the transformation of urban space through incremental interventions by everyday urban dwellers (Talen, 2015). An extraordinarily noteworthy facilitator of container induced DIY movements was the *Spontaneous Interventions: Design Actions for the Common Good,* which featured 124 projects at the 13th International Venice Architecture Biennale (2012). The theme of *Spontaneous Interventions'* exhibition revolved around "provisional, improvisational, guerrilla, unsolicited, tactical, temporary, informal, DIY, unplanned, participatory, opensource" (Lang Ho, 2013). The curators of Spontaneous Interventions believed that deploying such unconventional strategies promotes accessible, inclusive, and sustainable cities (Lang Ho, 2013). One of the interventions exhibited was the *Periscope Project*, which is a co-produced space built from four shipping containers in San Diego, California. The Periscope Project marshaled artists, designers, scholars, and community advocates to create a space for networking, cultural exchange, and activism. The project created a space that "functions as a public amenity and a living

visualization of alternative urban land use, exploiting temporary-use zoning loopholes as an opportunity to realize a new paradigm of urban citizenry – one engaged at the level of the built environment" (Lang Ho, 2013). Another crucial manifestation of container inspired co-production of urban space relates to the *Camiones, Contenedores, Colectivos* (Trucks, Containers, Collectives) initiated by Recetas Urbanas (Volont, 2019). A collaboration between Recetas Urbanas, the City Council of Zaragoza, community members, and other activists' groups utilized 12 empty containers to distribute "among different communities, social service associations, housing collectives, and DIY organizations..." (Volont, 2019, p. 268). Exploring the concept of tactical urbanism, Benfield (2011) argued that container use in public spaces epitomizes temporality, informal urban innovations, low-tech, and low-cost. Semi-structured interviews with the selected firms (Table 12) yielded considerable insights into the innovation diffusion of container urbanism within the context of urban transformation and sustainable development.

Table 12: Characteristics of the Firms Interviewed

Name of Company	Type of firm	Business model	Services Provided	Years in the real estate market	Container units built as of 2018.	Major Clients
Container Conversions (Pty) Ltd	For-profit	To be the preferred supplier of temporary facilities in Southern Africa	Rental and sale of converted containers, Park homes, and Flatpacks - Offices, ablutions, stores, accommodation, kitchens, libraries, classrooms, etc.	35	3500	Builders
QED Sustainable Urban Developments	For-profit	QED's vision is one of a mobile, diverse and sustainable built-environment. We are delivering this by bringing brownfield land back into productive use; with our	Property Development and Mixed-use	5	285	The Government

		buildings routinely constructed from a kit of re-usable component parts.				
Sea Box, Inc.	For-profit	To be the premier modifier of ISO steel Shipping Containers in the World.	All forms of container modification	35	7000	Architects
Boxman Studios	For-profit	We create remarkable experiences.	Design, Develop, Deploy	10	200	Experimental Marketing, Food Service, Retail
Custom Container Living	For-profit	To provide single and double container structures (homes, offices, bedrooms, cabins, etc.), pre-built and delivered to anyone within the continental U.S.	Building container structures.	4	50	Homeowners
Tempohousing Ghana Ltd.	For-profit	To solve housing needs with prefabricated modular containerized building systems	Turn-key design-build contacting	2	30	Builders
Truth Box, Inc.	For-profit	Sustainable design and development for the same cost as conventional construction	Architectural services and real estate development	12	0	Architectural clients (fee for service), tenants (real estate development)
TAYNR	For-profit	To provide a finished product that surpasses clients' expectations.	We manufacture homes out of Shipping containers & also steel framing. We build in a warehouse & deliver to the client	4	6	Homeowners, Contractors & Developers

Source: Field Survey, 2018/2019

Cities are at the forefront of the housing crisis unraveling in many parts of the globe. On the question of the nature and characteristics of the real estate and housing market, the firms

bemoaned the lack of affordable housing, chronic homelessness, rising property values, and the pricing out of low and middle-income households from the urban core. Describing the traditional housing market in Pretoria, South Africa, the Sales Manager of Container Conversions (Pty) Ltd explains that:

"We have a very diverse population with a very wide gap between those living in poverty and those on a high earning rate. A majority of citizens do not own property but aspire to, and with the assistance of government are being allocated low-cost housing free of charge, but at a very slow rate. The middle class is growing with a 50/50 mix of owning or renting a property and the top 10% of citizens own one or multiple properties. Property sales are slow but mainly due to proposed changes to the constitution with regards to property ownership and distribution linked to Apartheid and the atrocities associated with it" (CG 17/09/2018).

Inequality in South Africa has only gotten worse since the end of Apartheid in 1994. In fact, South Africa is considered one of the most unequal countries in the world (World Bank, 2018). Poverty and inequality are highly visible along racial lines. For instance, poverty among Black South African households post-Apartheid was 47% in 2015 compared to 1% among White South African households (World Bank, 2018, p. 13). Reviewing the territorial dynamics of the city-region of Gauteng in South Africa, the OECD (2011), argued that despite significant investment and delivery of public housing, and the disbursement of housing subsidies, house affordability is still a major impediment to the right to the city. Furthermore, residents in the Gauteng city-region experience a higher cost of housing per income ratio compared to other OECD cities (OECD, 2011). This fact is further compounded by a significant housing backlog, social mobility stagnation, growing polarization, as well as an inefficient formal and secondary housing market (OECD, 2011). These widespread inequalities in the city-region culminated in what the OECD (2011, p. 21) described as "ghettoization that has trapped communities in sub-optimal employment circuits and reinforced the spatial mismatch between employment and residences."

In the UK, the Marketing Manager of QED Sustainable Urban Developments based in the city of Brighton indicates that:

"The UK is suffering from a housing crisis, although we have ambitious Government targets for house building, we are consistently missing these targets. We need a variety of short, medium, and long-term solutions to fix the accommodation crisis and to build homes quicker......, a challenge offsite manufacturing can help to resolve" (HS 17/09/2018).

The proliferation of container urbanism can, therefore, be decisively conceived of as the consequence of the crisis inherent in the traditional housing market, or as Hoffman-Axthelm conspicuously puts it: "a measure of a city in crisis…...in the shadow of globalization" (Klose, 2015, p. 291). The container, according to Schwarzer (2013), has transitioned from a utopian idea drawn on paper to a heterotopic paradigm that has positioned the city as an "aggregate work in progress whose dimensions are varied" rather than a unidimensional system. The proposed Cairo Necropolis (Dezeen 2019) in the heart of Cairo (Figure 26) reinforces the heterotopic framework of containerization epitomized by Schwarzer (2013).

The nature of the urban property market greatly altered the business model of the firms interviewed. Explaining the reason for the choice of the shipping container structures as the core business strategy, the marketing manager of QED Sustainable Urban Developments in the city of Brighton, United Kingdom states that:

"*Modular solutions offer the flexibility to meet immediate needs (quickly) and for the future. Today's requirements may not be the same as tomorrow so using modular, especially movable modular solutions allow us to make use of land today whilst retaining the flexibility to deliver future ambitions. Another key consideration for using adopting modular solutions is speed. By using modular solutions, we can quickly activate a site and test viability and understand its potential as a place for longer-term projects. Modular solutions for urban areas also speed up the construction process and projects are not disrupted as much by external factors such as the weather. Finally, because the modular units are constructed in a factory-controlled environment, the quality can be monitored and assured before the units reach the consumer*" (HS 17/09/2018).

In the North American market, specifically, the United States, the Principal of Truth Box Inc., a modular container prefabrication firm based in Providence explains that "*I thought they (referring to the shipping container) would be less expensive than conventional construction materials (brick and mortar) and that they had an appealing aesthetic*" (PG 11/03/2019). Moreover, the 2008 global financial crisis bolstered the demand for container architecture and other temporary modes of accommodation, particularly in the United States. The subprime mortgage and foreclosure crisis accelerated the housing crisis thereby increasing the demand for containerized modular units.

Picture this: in a single night in America, over half a million of the population go homeless (White House, 2019). This statistic is especially troubling for the largest economy in the world. In their latest report on the *State of Homelessness in America*, the White House (2019, p. 1)

identified factors such as the higher price of housing resulting from overregulation of housing markets, poor sleeping conditions on the street, inadequate supply of homeless shelters and individual characteristics as some of the causes of homelessness. While recognizing the chronic homelessness crisis, the report, however, signaled a shift towards a more punitive approach to addressing the homelessness crisis in America rather than increasing the supply of affordable housing by way of adopting innovative solutions such as modular housing in direct consultation with a vibrant modular housing industry. One such punitive approach is the repurposing of former correctional facilities into homeless shelters which received fierce opposition from housing advocacy groups. Another measure relates to the criminalization of tent encampments in major cities. A notable potential casualty of the criminalization measure is the Skid Row which is arguably one of the largest unhoused population in Downtown Los Angeles and the United States, in general. Despite an intervention by a circuit court blocking the criminalization of homeless encampments, the administration has equally taken measures to curb federal funding to address homelessness at the state level (Capps, 2019).

In Spain, however, the Barcelona City Council has taken decisive steps to address the housing crisis and chronic family homelessness. Described as the first public housing in Spain built from shipping containers (El Pais, 2019), the initiative consists of 12 homes designed to provide temporary accommodation to families evicted by predatory landlords and the unforgiving property market. Officially referred to as *Alojamientos de Proxinidad Provisionales* (APROP) or (Provisional Proximity Accommodations), the government seeks to provide accommodation to vulnerable families between two and five years as permanent solutions are pursued. The Mayor of Barcelona described the APROP as a "sustainable and effective technique that allows public housing to be built within a year and a half" since "it allows us (the city) to provisionally take advantage of empty lots not intended for housing and without making urban modifications" (El Pais, 2019). The architects of APROP also praised the housing project as exceeding the highest building standard, attaining an AA sustainable building qualification (El Pais, 2019). Furthermore, plans are underway to build 600 containers homes in the city of Sheffield to address the homelessness emergency in the United Kingdom (Big Think, 2019). The construction of these container homes across the UK will be tied to social rent which has dropped by a staggering 80 percent over the past decade (Big Think, 2019). The concept of social rent is linked to the local income and housing cost of a given population.

Making a Business Case for *Shipping Containers in Land Development*, Boxman Studios (2017), a container prefabrication firm based in the United States argues that the ability of the shipping container to reduce construction timeframe by 30%-50% while conforming to building codes makes the innovation ideal for integrated urban development. The firm further states that developers adopt shipping container structures as part of their core business strategy because of its enablement of mobility, brand alignment benefits, as well as tax benefits accessed through the IRS Publication 946. Analysis by SG Blocks (2017), another key container modular firm listed on NASDAQ also found that containers reduce the construction time by 40% and save 10-20% on construction cost compared to the traditional construction sector. Boxman Studios (2018) further suggests that the efficiency of the shipping container is rooted in its ability to add value to commercial real estate in urban areas by increasing the occupancy and rental rates while decreasing the overall overhead through cost savings. Staying on the issue of containerization and value creation, SG Blocks (2017) highlights how containers are increasing the value of expensive urban mid-size markets. Describing itself as the first recipient of the Evaluation Service Report (ESR) from the International Code Council (ICC), SG Blocks (2017) further argues that the certification of an ESR significantly heightened the normalization of containers fabrication in the construction sector. The Stack, a container park in the heart of Newcastle, is yet another evidence of container-inspired urban real estate value creation. Opened in 2018 and officially referred to as *The Stack Newcastle*, the temporary container park comprises of 54 repurposed shipping containers used as retail spaces "for small businesses before they move to bigger premises" (BBC, 2019). For many small businesses, the container park is a cheaper alternative compared to high rental costs in prime locations in the city. In fact, Stack Newcastle is part of a growing trend of the so-called 'creative container community' manifesting in cities across the UK (Financial Times, 2018). The container park comprises a dozen bars, shops, and food outlets which are particularly popular among millennials. By providing independent businesses with cheaper annual leases, the Stack Newcastle breathes a new lifeline to these small businesses in an increasingly expensive retail space market. Moreover, as an urban regeneration strategy, councils regard containers as a "way to revitalize vacant plots relatively quickly" (Financial Times, 2018).

When asked about who they perceived as disruptors in the modular construction sector, most of the firms identified themselves and their main competitors notably, Boxman Studio, Lot-Ek,

Urban Space Management, and Cargotecture. To gain deeper insights into the potentiality and normalization of container urbanism, the firms were asked to assess the future of mass-produced container structures within the framework of urban development. All but one of the firms were optimistic about the future of mass-produced container homes in cities. In the South African market, in particular, "*There is a future, but the pricing is currently competing with brick and mortar buildings. Container housing is not cheaper than regular building methods in South Africa, mainly because our raw materials and labor are well priced while used shipping container prices are rising consistently" (CG 17/09/2018)*. The Financial Times (2019) also argued that the cost of switching to container modules was economically unsustainable. On the question of the social and environmental sustainability of the container, one of the firms explains that:

"*There is a role of repurposed shipping containers in the future of cities, however, this should be part of short, medium- and long-term strategies. The movability of containers makes them ideal for certain applications" (HS 17/09/2018)*. Another respondent thought that "*the trend will continue [referring to container urbanism], albeit slowly. I do not foresee a boom overnight…., but progressively be accepted due to the practicality of container buildings" (LH 01/10/2018)*.

Some of the firms initially focused on millennials and the urban middle-class as their core customer base. A comprehensive assessment of market dynamics, however, resulted in the incorporation of a diverse group of urban dwellers in the marketing of container homes. As the owner of Custom Container Living explains, "*At first, we thought it would be Millennials, however, we find the demographic to span all age ranges and socio-economic classes" (LH 01/10/2018)*. The sales manager of Container Conversions also explains that: "*We predominantly operate in the Business to Business arena however when we do sell directly to private end-users who are mostly married and above 30 years" (CG 17/09/2018)*.

6.2. Mail-Order Housing and the Urban Landscape

Mail-order housing is bravely making a prolific and triumphant comeback after decades of sharp decline. Klose (2015:286) documented how retailers such as Sears, Roebuck, and Company dominated the mail-order housing market in the early twentieth century. Elaborating further and rebuking the fantasization with architecture in the early twentieth century, Klose (2015, p. 286) made it clear that: "the normal people for whom all the grand architectural programs were

supposedly developed did not want architecture; they wanted a home." Klose's (2015) spirited extrapolation of the basic need and practicality of housing encapsulates the appeal of container urbanism.

The advent of the internet has radically transformed mail-order housing in general and container urbanism in particular. The firms interviewed highlighted their reliance on the internet and social media to reach out to their core target group. A report by the Financial Times (2019) confirmed that: "Now pre-fix your search with "cool" for examples of "container appropriation" and "lateral living". Picture after picture of metal residences stacked crazily on mountainsides; cantilevered precariously over water; nestled snugly into dunes and towering defiantly in desert landscapes, will send your imagination racing. Before you know it, you will be searching the web, your bank balance, and your back yard for somewhere to put one". Indeed, the mail ordering of container units for housing and pop-up shops can be conceived through the lenses of Harvey's Space-time compression hypothesis and Heidegger's elaboration on planetary technology. These scholars explored how advances in technology such as containerization in the transport sector and more recently high-speed internet have significantly reduced the distance of transporting goods and services. Klose (2015, p. 298) was, however, of the view that "Heidegger [on planetary technology] feared that with the loss of distances and differences, there would be a loss of all possibility of intensive communality and local development". On the question of advertisement, sales, and marketing (Figure 28) to urban dwellers, some of the respondents highlighted that:

"We market our product via a sales team, our web site & social media, and branding our rental units. We offer short lead times, temporary or long-term options that can be relocated when necessary, less disruption on the site as 90% of the construction and prefabrication is performed on our premises and then transported to site" (CG 17/09/2018).
"We market mainly through our website and have used home shows in the past. Our value proposition is that we build our customers a stronger, higher quality, more durable home than they can get anywhere else . . . and, we do this in a customized manner. Our niche is that we build each home or structure based on individual preferences, just how the customer wants it" (LH 01/10/2018)
"...people find our web site as well as leaving us messages from which I personally answer them…" (TG 20/03/2019).

Afterall disruptive innovations create new value propositions through the exploration of 'new markets or reshape existing markets' (Christensen et al., 2004).

The responses of the firms are reminiscent of Martin's (2016, p. 97) argument that: "Why construct a workshop from scratch, for example, when you can simply buy one readymade, have it delivered, kit it out and use it immediately-particularly a workshop that needs to be moved

about to a variety of locations?" The firms usually depict the container as a cost-effective, energy-efficient, and ecologically sustainable alternative to traditional building materials. Prices of a fully equipped container unit vary but range between US Dollar 45,000-70,000. According to some industry players, container modular construction is about half and two-third the cost of traditional buildings (Financial Times, 2019). The words 'standardization' and 'customization' kept coming up during the interviews with the firms. According to the firms, prices of container modular units vary considerably as a result of the preference of customization over standardization. Moreover, the repurposing of existing shipping containers implies that homes and pop-ups reduce their overall carbon footprint. Sustainability does not always take center stage in the business strategy of some of the firms. As one respondent frames it: "*Sustainability isn't a pivotal value proposition for our clients, although it tells a nice story*" *(EP 21/09/2018)*.

A   B
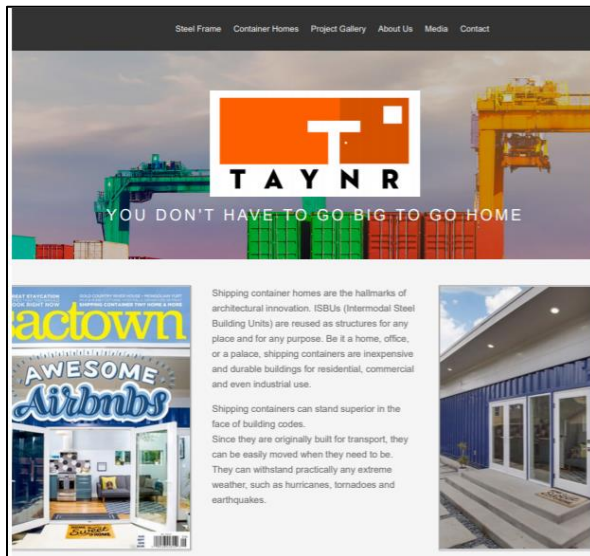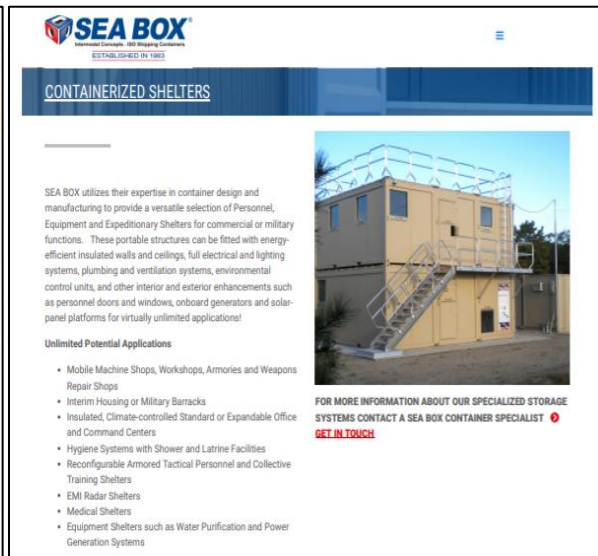
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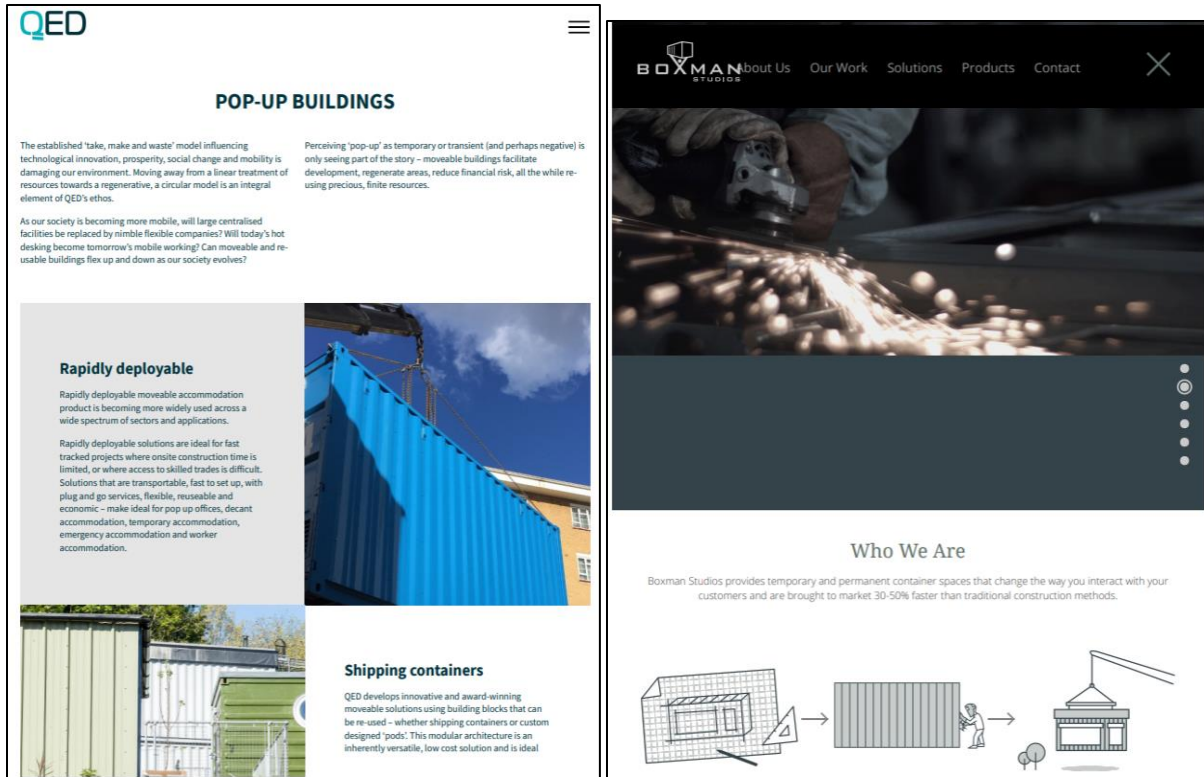
Figure 28: Marketing container urbanism (ordering modular homes online)

(a) Taynar, Sacramento; (b) Sea Box, Philadephia; (c) QED, Brighton; (d) Boxman Studios, Charlotte. Source: Respondents.

The much bespoke LOT-EK Mobile Dwelling Unit (MDU) (Figure 29) comes into the fore in questions relating to the marketing strategies adopted by the firms. The much-acclaimed 1999 experimental project by LOT-EK, a design studio based in New York proposed the construction of dwelling units from shipping containers for co-location purposes. The MDU was targeted at highly mobile individuals around the world. Providing some crucial context, the architects of LOT-EK Ada Tolla and Giuseppe Lignano envisaged that "The MDU travels with its dweller to the next long-term destination, fitted with all live/work equipment and filled with the dweller's belongings. However, it is easily configured for permanent residency" (Scoates et al., 2003). The container MDU was to be equipped with all the basic amenities such as a portable kitchen, a sleeping area, and a washroom.

Figure 29: LOT-EK's Mobile Dwelling Unit (MDU)

Source: Scoates et al. 2003.

The revival of innovative-driven containerized mail order housing in urban space is further exemplified through the Office of Mobile Design (OMD) (Figure 30). Proposed by Jennifer Siegal, the project was intended as a strategy to provide eco-friendly and portable housing. Elaborating on the Office of Mobile Design, Jennifer Siegal affirmed that:

harkening back to original prehistoric models of shelter and dwelling, the Portable House adapts, relocates, and reorients itself to accommodate an ever-changing environment. It offers an eco-sensitive and economical alternative to the increasingly expensive permanent structures that constitute most of today's housing options. At the same time, the Portable House calls into question preconceived notions of the trailer home and trailer park, creating an entirely new option for those with disposable income but insufficient resources for entering the conventional housing market (Jodidio, 2004, p. 339).

Important elements of the design included the capacity to assemble and dis-assemble these portable homes and office units with ease.

Figure 30: Portable House and Ecoville

Source: Philip Jodidio and Jennifer Seigal, 2004.

Successfully competing with incumbent businesses is the key characteristic of all disruptive small firms (Christensen et al., 2015). The firms interviewed maintain a competitive edge in the urban real estate market through cost-saving and customization. To stay competitive, the firms stated that:

"By providing a w*ide range of rental units with competent mobile repair teams that attend to faults typically within 48 hours*" (CG 17/09/2018)

"We are focused on creating genuinely affordable housing on brownfield lands which are leased to local authorities. Our model is unique compared to our competitors" (HS 17/09/2018).

"We customize. Competitors work on standardization of product" (FJ 14/01/22019).

The firms also stay competitive by creating up-market sustaining innovations for consumer and retail giants such as Puma, Nike, Tesla, and Starbucks. Crucially, the demand for container modular units differs considerably based on the urban setting. For instance, in cities such as Brighton in the UK, the core demand comes from the local government, who purchase temporary container home units from firms such as QED. Most of the container units purchased by local councils are used to provide accommodation for the homeless and low-income families (HS

17/09/2018). In other cities particularly in the United States, demand is largely driven by small entrepreneurs disenchanted by high rental values. These entrepreneurs rely on container prefabrication firms such as Boxman Studios, Taynar, and Sea Box, to provide cost-effective units to kickstart their businesses.

6.3. Barriers to the Innovation Diffusion of Containerization in Urban Space

Most of the firms complained about clients' indecisions as a significant bottleneck to the sustenance of the shipping container modular sector in cities. Other crucial issues raised by the firms included high government duties and taxes, unavailability of durable containers, logistical constraints, lack of skilled workers, and design standardization. As one respondent puts it: "*As each solution is often bespoke the cost of design is high for each project, we would like to see the standardized design of units which can be deployed in a variety of configurations" (HS 17/09/2018)*. Schwarzer (2013) also noted a shift in the consumer society and more specifically, container urbanism from a predominantly industrial standardization to artisanal customization. The preference for customization compared to mass-produced standard container units, Brysch (2019, p. 333) argued was to "avoid a repetitive and impersonal building complex" in urban space. The challenges confronting the firms are consistent with recent results of a report on off-site construction commissioned by the National Institute of Building Sciences. Industry players highly rated insufficient industry knowledge and skills, late design changes, lack of details and specification standards, and transportation as some of the key barriers confronting the off-site construction sector (National Institute of Building Sciences, 2018). According to the firms, labor-related issues such as expertise in insulation, metal cutting, chemical, and lead control were in short supply.

A very interesting dynamic of container urbanism across the globe is the subsidiarization of container prefabrication firms in cities in the global south. Of the firms disrupting the traditional property market across the globe, few come closer to Tempohousing, an international company with headquarters based in Amsterdam, The Netherlands. The firm was founded in 2004 with clients ranging from governments, large and medium-sized companies, and individual homeowners. One of the firm's quintessential developments was the Tempohousing student accommodation in Amsterdam which inspired "architects and housing organizations looking for low-cost solutions to housing shortages in cities around the world" (The Guardian, 2015).

Originally intended as a temporary solution, the city authorities in Amsterdam went ahead and granted permanent status to the container housing development based on the popularity and acceptability. Taking note of the container phenomenon in the global south, specifically, in Africa, the firm established branches in countries such as Ghana, Nigeria, and South Africa. The Business Development Director of Tempohousing Ghana Ltd. acknowledged the enormous potential of containerization in addressing the housing crisis confronted by the major urban areas in Ghana (Figure 31). The firm is currently based in Accra and plans to build a factory to produce and standardize container homes at affordable rates for both low and middle-income households as well as businesses in Ghana. According to the Director, "*Factory-built products are predictable in terms of time to deliver, quality and imperative considering the inefficient and expensive nature of the real estate market in Accra" (FJ, 14/01/2019).* He further argues that high government duties and taxes have resulted in the focus on middle-class urban dwellers and businesses. The firm hopes that financial investment and government subsidies will go a long way to break the bottleneck of expanding container urbanism in Accra and other urban areas in Ghana.
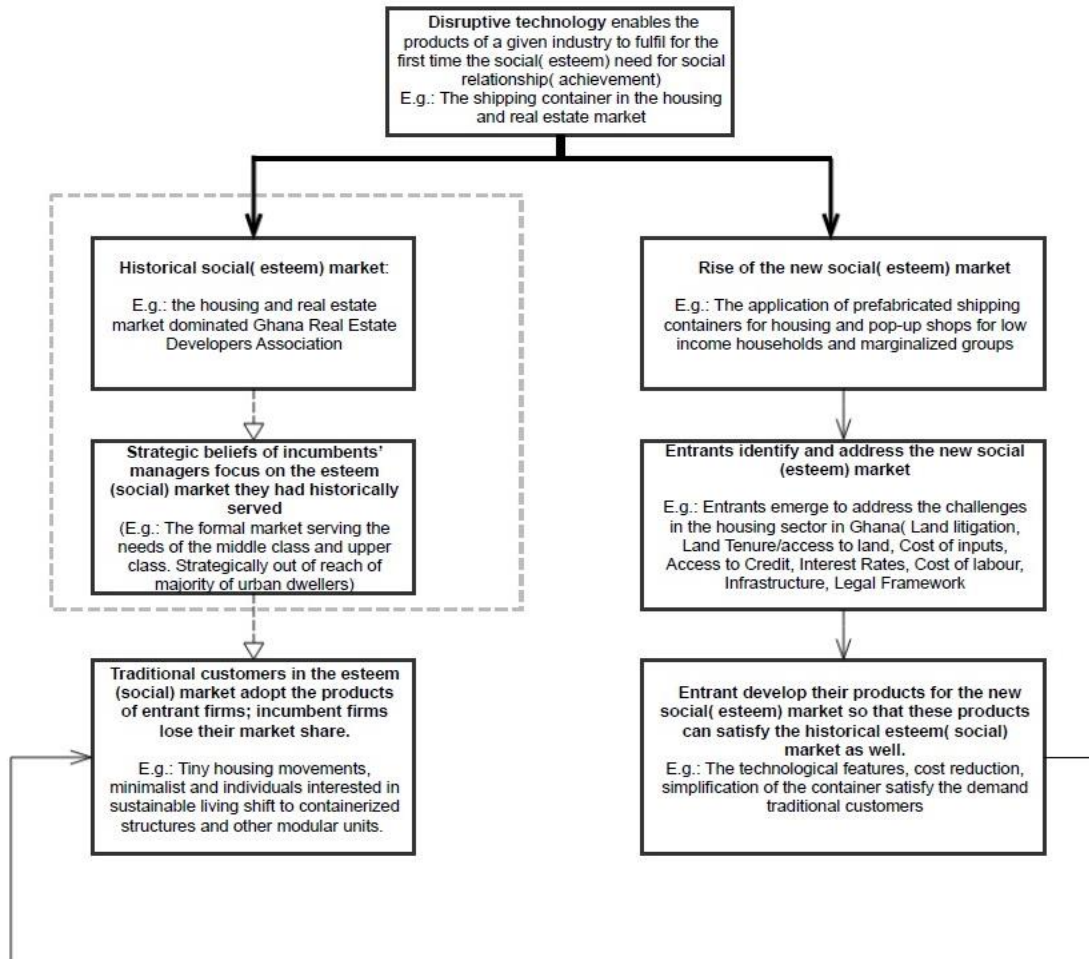
Figure 31: A framework for disrupting Ghana's Real Estate Market

Adapted from Vecchiato, (2016).

6.4. Chapter Conclusion

The fixation with container urbanism is inscribed in the concept of *Existenzminimum*. According to Brysch (2019), *Existenzminimum* has morphed from the preference of larger spaces to a more atomized form of living. Brysch (2019, p. 335) further deduced that contemporary conceptualization of *Existenzminimum* is deeply rooted in the minimalist and tiny housing movements which encompass "minimum quality standards in a more versatile and flexible way." The firms all exhibit the key characteristics of a disruptive innovation proposed by Christensen and his colleagues: an innovation that is simple, cheap, and revolutionary (Christensen et al., 2004). The container exemplifies the tenets of disruption since the firms interviewed "use

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relatively simple, convenient, low-cost innovations to create growth and triumph over powerful incumbents- the traditional housing market" (Christensen et al., 2004).

The analysis carefully shows a particularly messy and uncoordinated entanglement ensuing between firms and individuals interesting in affordable housing and ecofriendly living on the one hand and special interest and city authorities on the other hand. It is clear that most of the firms are struggling to remain competitive with the traditional construction industry which is provided with subsidies and fairly limited regulation in the production of housing and other real estate developments. The Stack Newcastle, in particular, became a casualty of the pushback of the traditional real estate market on the innovation diffusion of container urbanism. The traditional real estate sector is increasingly weaponizing loopholes in planning permitting systems as a form of reverse salient to the momentum of creative container communities. For instance, the Financial Times (2018) reported that "Opponents of The Stack's planning application included Intu Properties plc, which has recently greatly expanded the food and drink offer at its Eldon square development, Newcastle City center, and entrepreneur Joe Robertson….Once a major force in Newcastle's bar sector, Mr. Robertson is a shareholder in Endless Stretch Ltd, which spent £3.5m fitting out premises occupied by Harry's Bar in elegant Grey St, a one-minute walk from The Stack…Mr. Robertson pursued an appeal against The Stack's planning permission, arguing that the council had not fully considered its impact." Container homes are subjected to stricter building codes and standards due to the chemical and lead compositions evident during the production process. These regulations add up to slow down the innovation diffusion of container urbanism.

Chapter Seven: Containerization and the Creative Destruction of the Urban Proletariat

This chapter turns its attention to the dynamics of container urbanism in the global south focusing explicitly on the city of Accra, Ghana. I proceed accordingly to informalize and spatialize the diffusion of disruptive innovations in the city of Accra. Container urbanism has traditionally been spruced up in western urban and critical housing discourses. This chapter significantly diverges from the over-formalization of disruptive innovations and conceptualize how these innovations gain momentum across urban landscapes in the global south. The outcome will shed some light on and consolidate the eminence of the 'Accra School' of urban scholarship as a truly disruptive exception.

7.1. Demographic and Socio-Economic Profile of Container Users in Accra

The demographic characteristics of container users are summarized in table 13 below. The demographic profile of the respondents varied considerably along the lines of gender, age, and ethnicity. About 65% of the respondents sampled were females and 35% were males, which reflects the overall gender profile of the Accra Metropolitan Assembly. Female container users concurrently constituted the majority of the respondents across all the 6 neighborhoods sampled averaging about 60%. An overwhelming majority of the female respondents were recorded in the neighborhoods of Korle Gono (81%) and New Fadama (70%). It is important to point out that a significant majority of household heads were males (52%). This is not surprising considering the fact that on a cultural level, the majority of Ghanaian households are headed by males (GSS, 2014). Retrospectively, the high proportion of female respondents can be directly attributed to the fallout from the structural adjustment policy which according to Aryeetey et al., (2000), Manuh, (1997), and Oberhauser and Yeboah (2011) reduced the participation of females in the formal sector. Overall, a significant proportion of the respondents (80%) were in their mid-20s and mid-40s. Concerning education, only, 5% of all the respondents received no formal education. The highest educational attainment of the majority of container users was primary/basic (22%) and secondary school education (44%) which is unsurprising because the AMA has one of the highest literacy rates in the country. The findings, however, showed higher

education attainment among males compared to their female counterparts. The median household size of the respondents is between 1-4 comprising of both nucleus and extended family members.

Table 13: Demographic Profile of Container users in Accra

Key Attribute	Adabraka		North Kaneshie		New Fadama		Korle Gono		East Legon		Kotobabi	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
GENDER												
Female	54	57	51	60	118	70	38	81	34	55	32	70
Male	40	43	34	40	50	30	9	19	28	45	14	30
AGE												
16-24	1	1	7	8	14	8	0	0	4	6	1	2
25-34	31	33	45	53	76	45	18	38	28	45	15	33
35-44	44	47	24	28	63	38	23	49	18	29	16	35
45-54	17	18	9	11	13	8	5	11	11	18	11	24
55-64	1	1	0	0	2	1	1	2	1	2	3	7
EDUCATION												
No Education	8	9	1	1	10	6	0	0	0	0	6	13
Primary/ Basic	24	26	18	21	40	24	3	6	6	10	19	41
Secondary	35	37	41	48	81	48	18	38	38	61	10	22
Tertiary	13	14	12	14	22	13	14	30	13	21	3	7
Vocational Training	14	15	13	15	15	9	12	26	5	8	8	17
MARITAL STATUS												
Divorced/widowed/separated	1	1	0	0	2	1	0	0	0	0	3	7
In a relationship	7	7	4	5	6	4	2	4	5	8	4	9
Married	72	77	51	60	97	58	28	60	40	65	32	70
Single	14	15	30	35	63	38	17	36	17	27	7	15
Number of Respondents	94	19	85	17	168	34	47	9	62	12	46	9

Source: Field survey, 2018/2019

The significant majority of residents in the city of Accra are from diverse ethnic groups despite the Ga ethnic group constituting the indigenous community of the city. Accordingly, the great proportion of container users were from the Ashanti-Akan (34%), Ewe (14%), and the Fante (8%) ethnic groups. A small group of non-Ghanaians mostly from neighboring West African countries such as Nigeria, Togo, and Ivory Coast represented about 1% of container users. Similarly, in-migration accounts for a significant percentage of the residential status of most of the respondents. Approximately 25% originated from the Ashanti region while 25% were either native-born of Accra or migrated from other parts of the Greater Accra region. Heterogeneity in

Accra's ethnic composition can be attributed to rural-urban migration which consists of about 47% of all the inhabitants in the metropolis (GSS, 2014). Drawing on the concept of accumulation by dispossession, Gillespie (2016, p. 68) argued that rural-urban migration to Accra is as a result of the "the separation of rural peasants from the land, either directly through the erosion of communal tenure by market forces or indirectly through the underdevelopment of the countryside." Ethnic composition, however, varied across the neighborhoods of study. For instance, a large segment of native-born respondents from the Greater Accra region was concentrated in the indigenous core neighborhoods of Korle Gono and Adabraka (Table 14). The survey found little evidence of ethnic segregation, despite the dominance of some specific ethnic groups in certain neighborhoods. Most of the respondents self-identified as informal sector workers (88%) with the majority engaged in petty trading, food vending, beauticians, tailors, and seamstress. The small proportion of formal sector owners (12%) of containers attests to the dominance of the informal sector in the metropolis which accounted for about 74% of all workers according to the 2010 population and housing census (GSS, 2014). More than half of the respondents have been engaged in informal sector activities for over 4 years.

Table 14: Residential and Income Profile of Respondents

Key Attribute	Adabraka		North Kaneshie		New Fadama		Korle Gono		East Legon		Kotobabi	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
REGION OF ORIGIN												
Ashanti	16	17	27	32	40	24	6	13	28	45	8	17
Brong Ahafo	0	0	2	2	6	4	2	4	0	0	0	0
Central	3	3	9	11	24	14	7	15	2	3	1	2
Eastern	3	3	8	9	41	24	8	17	4	6	1	2
Greater Accra	53	56	21	25	14	8	13	28	15	24	7	15
Northern	4	4	2	2	10	6	1	2	1	2	10	22
Upper East	1	1	3	4	7	4	1	2	1	2	6	13
Upper West	0	0	1	1	4	2	1	2	0	0	0	0
Volta	13	14	10	12	19	11	4	9	11	18	13	28
Western	1	1	2	2	3	2	4	9	0	0	0	0
LENGTH OF RESIDENCE IN ACCRA												
Over 4 years	35	37	50	59	123	73	19	40	37	60	35	76
2-4 years	8	9	10	12	24	14	10	21	12	19	0	0
1-2 years	0	0	5	6	5	3	11	23	0	0	2	4
6-12 months	0	0	1	1	3	2	1	2	0	0	0	0
Under 6 months	0	0	1	1	6	4	0	0	0	0	4	9
This is my hometown	51	54	18	21	7	4	6	13	13	21	5	11
ANNUAL H.H INCOME												
GHS 40,000 or more	0	0	0	0	0	0	0	0	9	15	1	2
GHS 10,000-30,000	21	22	28	33	26	16	12	26	20	32	4	9
GHS 6,000-9,000	58	16	39	46	75	45	15	32	32	52	6	13
GHS 2,000-5,000	15	62	18	21	67	40	20	43	1	2	35	76

Source: Field survey, 2018/2019

7.2. Spatial Distribution of Containerized Structures in the Study Areas

Where are container structures more localized? The survey of 502 container users (see appendix three) in selected areas of Accra between 2018 and 2019 shows that containerized structures are more likely to be localized in low-income and informal neighborhoods. Low-income neighborhoods such as New Fadama are characterized by small irregular buildings (World Bank, 2017) (Figure 32). Most of these irregular structures are overcrowded, with approximate dimensions between 30m2 to 100m2, and narrow pathways (World Bank, 2017).
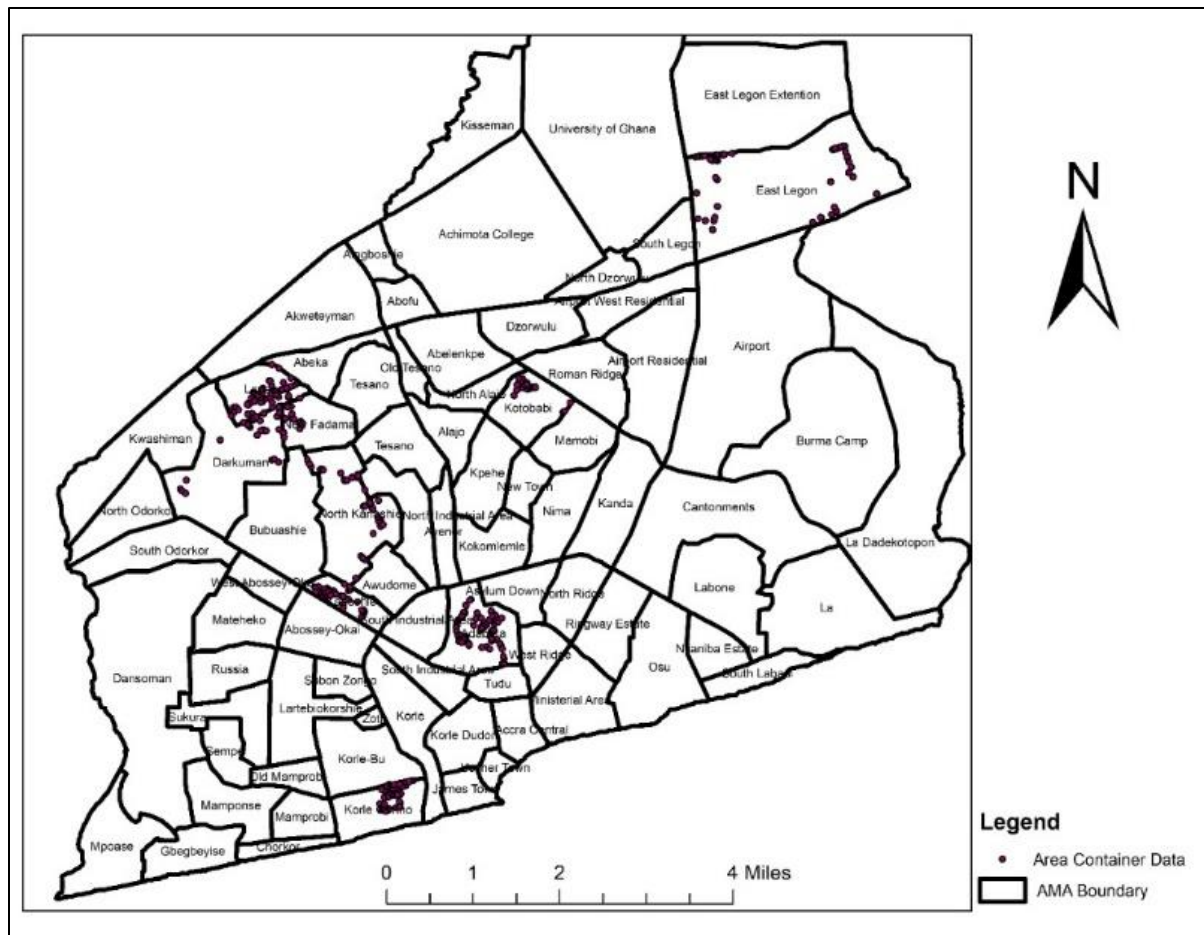
Figure 32: Map showing container locations

Source: Author's construction

Thus, a container hotspot analysis shows a high concentration of containerized structures in the informal and low-income neighborhoods of New Fadama, followed by Adabraka (Figure 33). In contrast, high-income neighborhoods such as East Legon characterized by planned residential buildings and low housing density recorded no container hotspots (cool spots). A spatial analysis of container distribution between 2009 and 2019 also show a rise in container concentration in middle-income neighborhoods. For instance, container adoption rose by 33.1% in North Kaneshie between 2009 and 2019 (Appendix Seven).
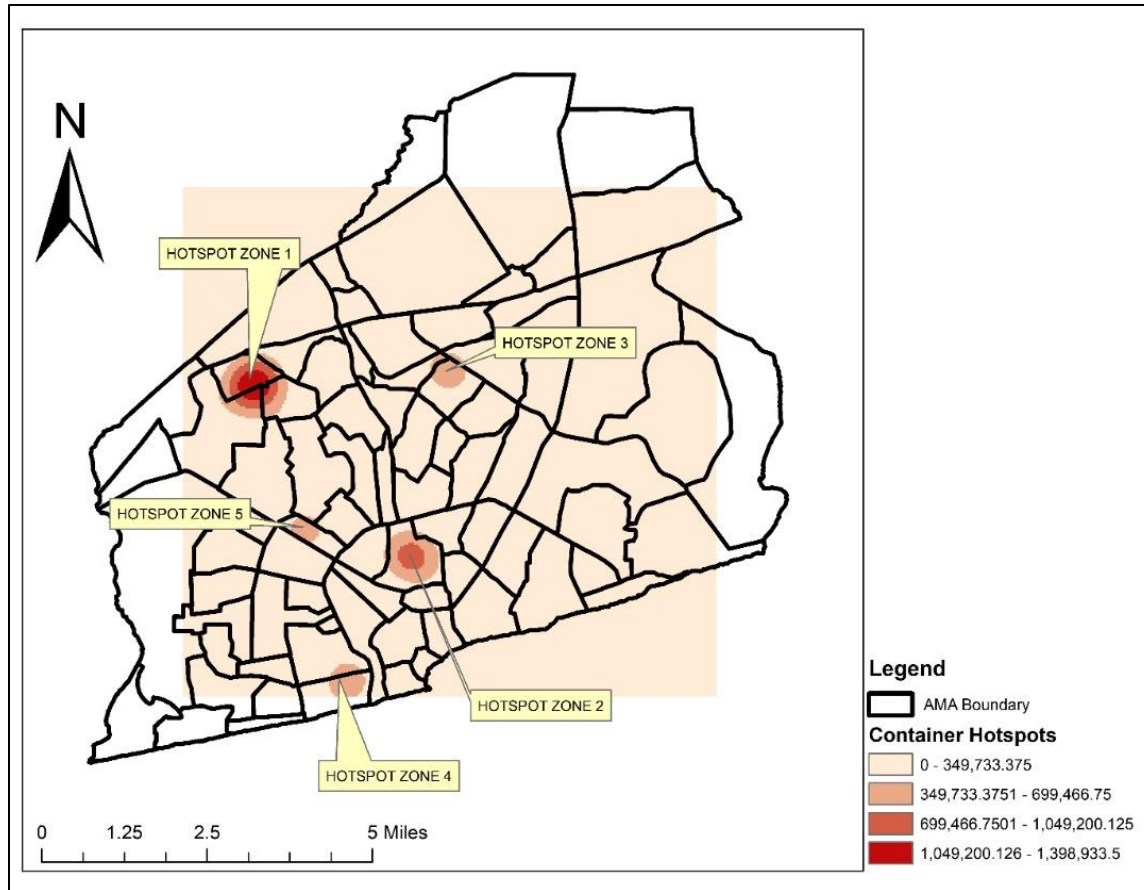
Figure 33: Map showing container hotspots

Source: Authors construction

Is there a spatial pattern in the distribution of container units in Accra? Figure 34 shows the result of the average nearest neighbor analysis for container locations in the six neighborhoods of study. According to Rossbacher (1986, p. 104), nearest-neighbor analysis, "determine how much a pattern departs from an expected random pattern." We observe from Figure 3 that container distribution in the study areas is spatially clustered given the fact that the R-value is less than 1 (R= 0.14; z-score= -37.59; p-value= 0.00). This result is consistent with assertions by the respondents regarding the importance of container location close to roadsides, markets, and close to other containers. Overall, the result of the nearest neighbor analysis illustrates the relevance of location choice for the majority of container users in the city. A spatiotemporal analysis further reveals an expansion diffusion of container distribution in some neighborhoods. In North

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Kaneshie, for instance, container distribution expanded from the north to the south between 2009 and 2019 (Appendix Seven).
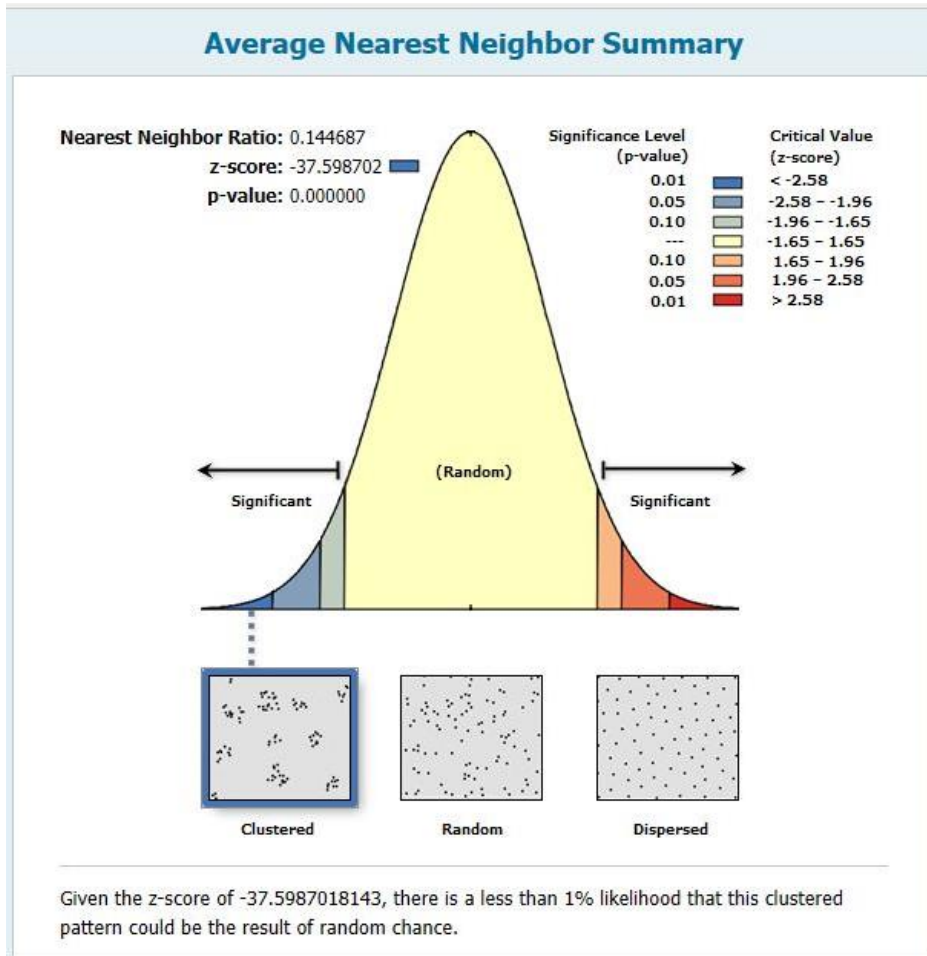
Figure 34: Nearest Neighbor Analysis of Container Distribution

Source: Author's construction

7.3. Is container adoption a manifestation of the crisis of urbanization and fragmentation in Ghana or a harbinger of emerging urban configurations?

For most residents, the container is far more than just an enabler of globalization. For many, this particular innovation is a mechanism to bridge the urban inequality gap through social mobility and the right to the city. The study found an overwhelming preference for locally prefabricated containers (80%). The preference for local steel containers as against the standard shipping container revolves around the issues of accessibility and cost. Locally prefabricated containers are designed in different configurations and available in 10, 20, 30, and 40ft dimensions (For the

purpose of analysis, I distinguish between four main container configurations- 10ft, 20ft, 30ft, and 40ft). The majority of the respondents prefer the 10ft and 20ft locally prefabricated containers due to affordability. Regarding the purpose of the container, four-fifth of the respondents (82%) primarily improvise the container for commercial purposes (Figure 35), more specifically to engage in retail activities. Others spontaneously improvise the container for both retail and dwelling purposes (15%)- as a place of business by day and a dwelling place by night. Using the container for dwelling purposes ensures that: "Low-income people find the cheap accommodation helpful in their need to keep housekeeping costs low enough to afford" (UN-HABITAT, 2003, p. 62). A great deal of considerations goes into the design specification of container units. At the request of the respondents, the majority of the container units are designed to be movable and transformable (90%) attesting to the general precarity and the bane of regulation on the spatial adoption and diffusion of improvised structures containers. Fixed container units are attached to houses and used for retail purposes.

| Dwelling purpose only | Both dwelling and retail purpose | Retail purpose only |

Figure 35: Pictures of containers by purpose

Source: Photo by the author, Field survey, 2018/2019.

All the containers used by most of the respondents were designed by welders (100%), although a large proportion if not all of these welders lacked the necessary certification and expertise to

prefabricate a container structure. Moreover, about 89% of the respondents opined that containers should be designed and built by welders as against architects and professional fabricators. Furthermore, the containers were designed without a climate-adaptive mechanism. According to Shen et al. (2020, p. 8), climate-adaptive building mechanisms are preliminary design solutions that ensure human thermal comfort and energy-efficient measures. It is, however, not surprising that most users failed to integrate climate-adaptive mechanisms considering the fact that the majority of buildings in the city of Accra violate building codes (Act 480). Most of the materials for container prefabrication are locally obtained.

According to a 43-year-old body-welder operating in the neighborhood of North Kaneshie, it takes approximately three days to prefabricate a 12 by 8-dimension container. He stated that:

"*I have been in the body welding business for more than 27 years... My business has shifted significantly over the years from welding vehicle parts to prefabricating containers. In these past few years, I have seen a tremendous increase in the demand for container structures. I once got an order to prefabricate between 10-15 container units within the space of one week… Welders like me with significant years of experience secure most of the contracts. Most people prefer the locally prefabricated container because the price of the standard shipping container is very high*" (Interview with a welder in North Kaneshie, 2018).

Container ownership and size are intrinsically gendered. Figure 36 shows the relationship between gender, ownership, and cost of container units. Female respondents predominate container ownership. Averagely, it cost about 49% of the respondents between GHS 1000-2000 to purchase a container unit. Furthermore, the data shows the likelihood of females to use the container for both retail and dwelling purposes compared to males. At the neighborhood level, ownership of container among females is higher within migrant communities such as New Fadama compared to traditional indigenous communities of Korle Gono. Despite higher container ownership among women in the study areas, the current data suggest that men are more likely to purchase a much large size of a container at reasonable rates compared to women. As a consequence of this, female respondents preferred the 10ft and 20ft locally prefabricated containers which cost considerably less than the much larger dimensions. For instance, the survey found that men owned 67% of all the 40ft container units. On the other hand, females owned approximately 64% of all 10ft containers in the study communities. Cost differentials can be attributed to direct involvement in the design of the container during the prefabrication stage. Male respondents were more involved in the design decisions and worked closely with welders

and vulcanizers resulting in good price negotiations. These findings reaffirm the gendered dynamics of wealth and property ownership in Ghanaian society in general. At the neighborhood level, the cost of a container unit was higher for all the women sampled except for East Legon were gender disparities in purchasing power was relatively uniform.
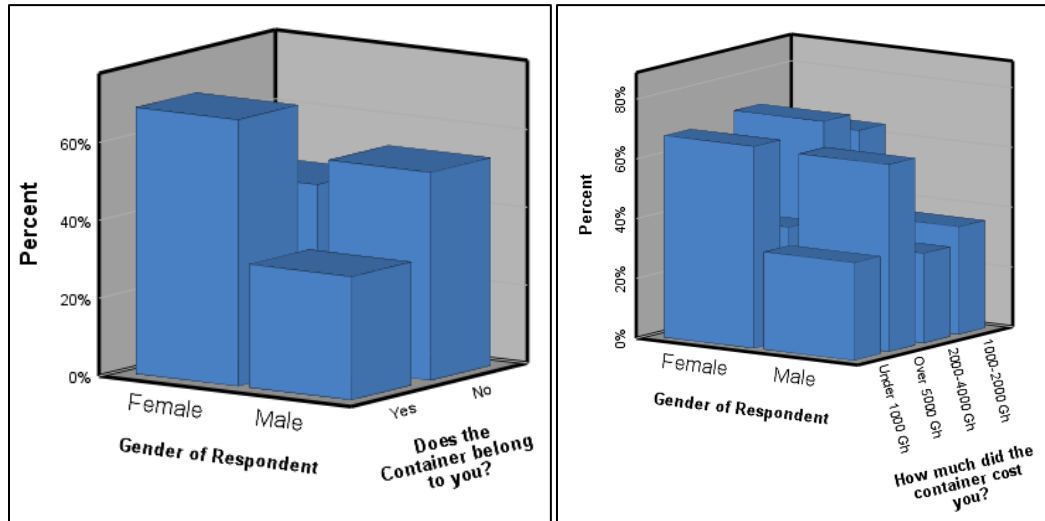
Figure 36: Container ownership by gender

 Source: Field Survey, 2018/2019.

For reasons revolving around insufficient funds and access to land, some of the respondents (15%) who did not own a container unit resorted to renting units at an affordable market rate. About 59% of the respondents who do not own container units rent below GHS 100 a month. The majority of container unit renters are mostly new migrant arrivals to Accra with an average residential status of 6 months. The generally low-cost of container units ensure that: "low-income households can survive and be ready to work in the city's economy" (UN-HABITAT, 2003, p. 62). The low rental cost of container units offers a fair and relatively minimal distribution of risks for most of the respondents. Moreover, the relatively low cost of rent of container units offer a safety net for the poor and prevents exploitation from predatory landlords. Additionally, renting a container unit provide respondents with enormous flexibility in the event of a transition to the traditional real estate market (Donner, 2012).

Furthermore, respondents were asked to rate the affordability of their container units using a scale of 1 (strongly agree) to 5 (strongly disagree). Container affordability was measured as a

percentage of the respondents' household income spent on purchasing or renting a container unit. Close to half of the respondents (49%) agreed that their container units were affordable (Figure 37). The relative affordability of the container exemplifies the underlying principles of the disruptive innovation theory. After all, the purpose of a disruptive innovation whether the low-end or new market is to make it "easier for people to do something that historically required deep expertise or great wealth" (Christensen et al. 2004: xvii). Perceptions about container affordability varied considerably by neighborhood. The results show that respondents in the high-income neighborhood of East Legon considered their containers affordable compared to their counterparts in the low-income neighborhoods of Korle Gono and New Fadama. Writing on *Why Shipping Containers Are Cool, But Not Affordable Housing*, Robertson (2017) argued that: "the easy availability, low cost and industrial strength of containers as building material have been their main selling points……" however, "it's the rest of the retrofit—plumbing, electrical, heating and cooling, all the stuff that makes a home more than just a box—that can boost the final price well into the hundreds of thousands of dollars, making the final product less of a solution to the affordable housing crisis than one might think at first."
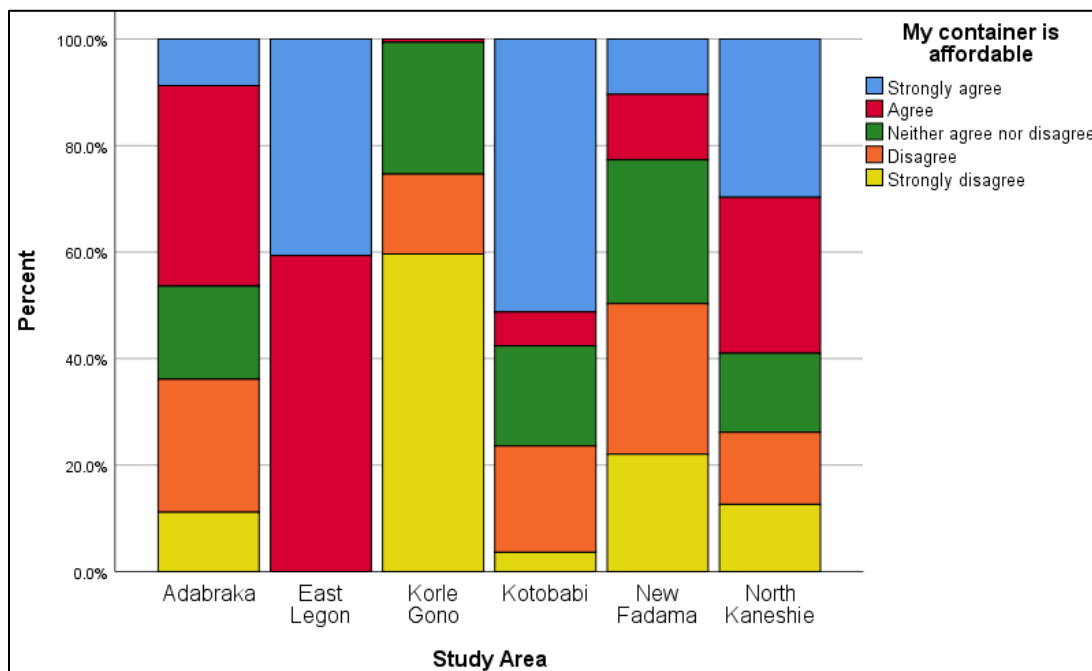
Figure 37: Container affordability

Source: Field survey, 2018/2019

7.4. Does container improvisation lead to a reduction in urban poverty and inequality?

Poverty is a multidimensional concept and access to a decent source of livelihood plays a significant role in the poverty alleviation process. When asked whether container improvisation reduces the risk of poverty, the proportion of respondents who agreed ranged from a high of 31% in New Fadama to a low of 5% in East Legon. Overall, container improvisation results in a corresponding decline in poverty (Figure 38). At this juncture, we are tempted to invoke the spatial mismatch theory proposed by Kain (1965) to explain the relationship between container improvisation and poverty reduction. The spatial mismatch theory explored the intersection between unemployment, poverty, and inequality among racial minority groups, particularly African Americans in inner cities in the United States (Kain, 1994). The spatial mismatch theory explains the mechanisms by which African Americans face significant challenges in residential choice, proximity to steady jobs, and low wages (Kain, 1994, p. 371). The affordability of the container units expands housing and commercial opportunities for low-income and low-skilled respondents thereby increasing their rights to the city and offsetting against the spatial mismatch.
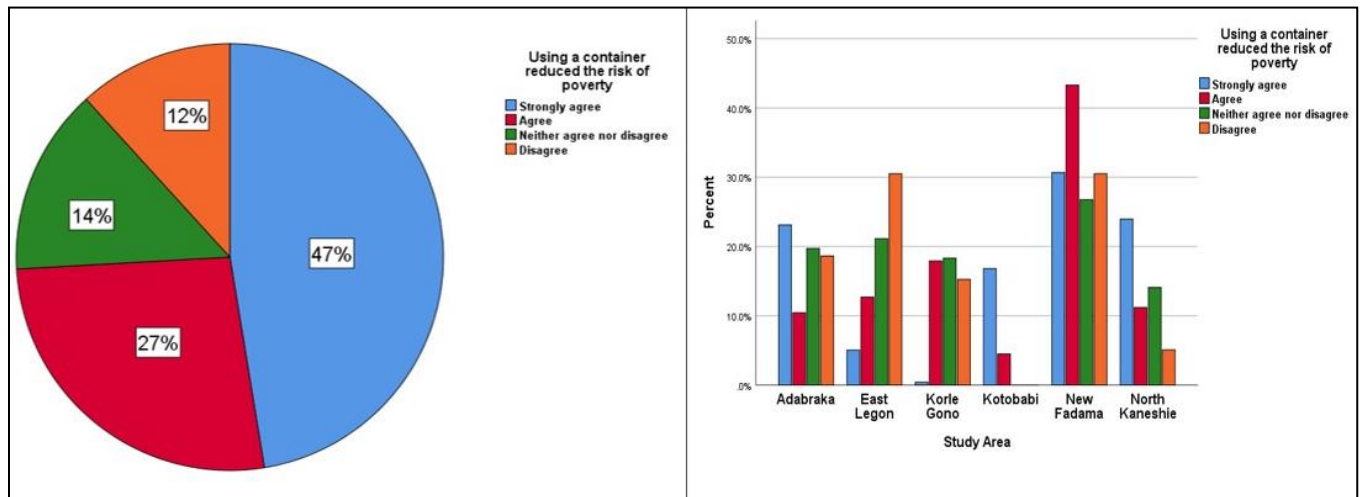
Figure 38: Container improvisation and the risk of poverty

Source: Field survey, 2018/2019.

Under what circumstances will respondents discontinue the use of containers for commercial and dwelling purposes? Responses revolved around six main themes: rent control, the security of tenure, fear of crime, financial stability, deterioration of health, and pressure from city

authorities. Some of the respondents provided the following conditions that would deter their continued improvisation of the container.

"I will stop using the container if the heat inside it [the container] becomes too unbearable- I sometimes find it difficult to breathe inside the container..... I am managing, for now, despite the excessive heat" (Female respondent).

"I will reconsider container use If the landowner increases the land rent or evicts me from the land" (Female Respondent, East Legon).

"If I secure a permanent place to build a brick and mortar structure" (Female respondent, Adabraka).

'I will stop using the container If I secure a decent and cheap place to rent for me and my family" (Male respondent, Korle Gono).

"I think armed robbery and dust will dissuade me from using this container.... if armed robbers continue to attack my shop which happened more than once....." (Male respondent, New Fadama).

"I think I will rethink [container use] If rent charges are regulated by the government...... Also, If the city authorities pass a law to prevent containers in the city environment" (Female respondent, Kotobabi).

Figure 39 shows the overall relationship between the age of respondents, the purpose of the container, and the marital status of the respondents on top and the neighborhood distribution of marital status, age, and container purpose at the bottom. The appropriation of containers for retail purposes was high among respondents who were single and in a relationship within the age cohorts of 25-34 and higher still among divorced/separated/widowed male respondents between the 45-54 age cohorts. The high proportion of container adoption for both retail and dwelling purposes by young people within the 25-34 age cohort shows the exploitative and exclusionary dynamics of the traditional housing market in Accra. Furthermore, respondents in a relationship were more likely to use the container for only retail purposes in most of the neighborhoods except for New Fadama and North Kaneshie (Figure 39).
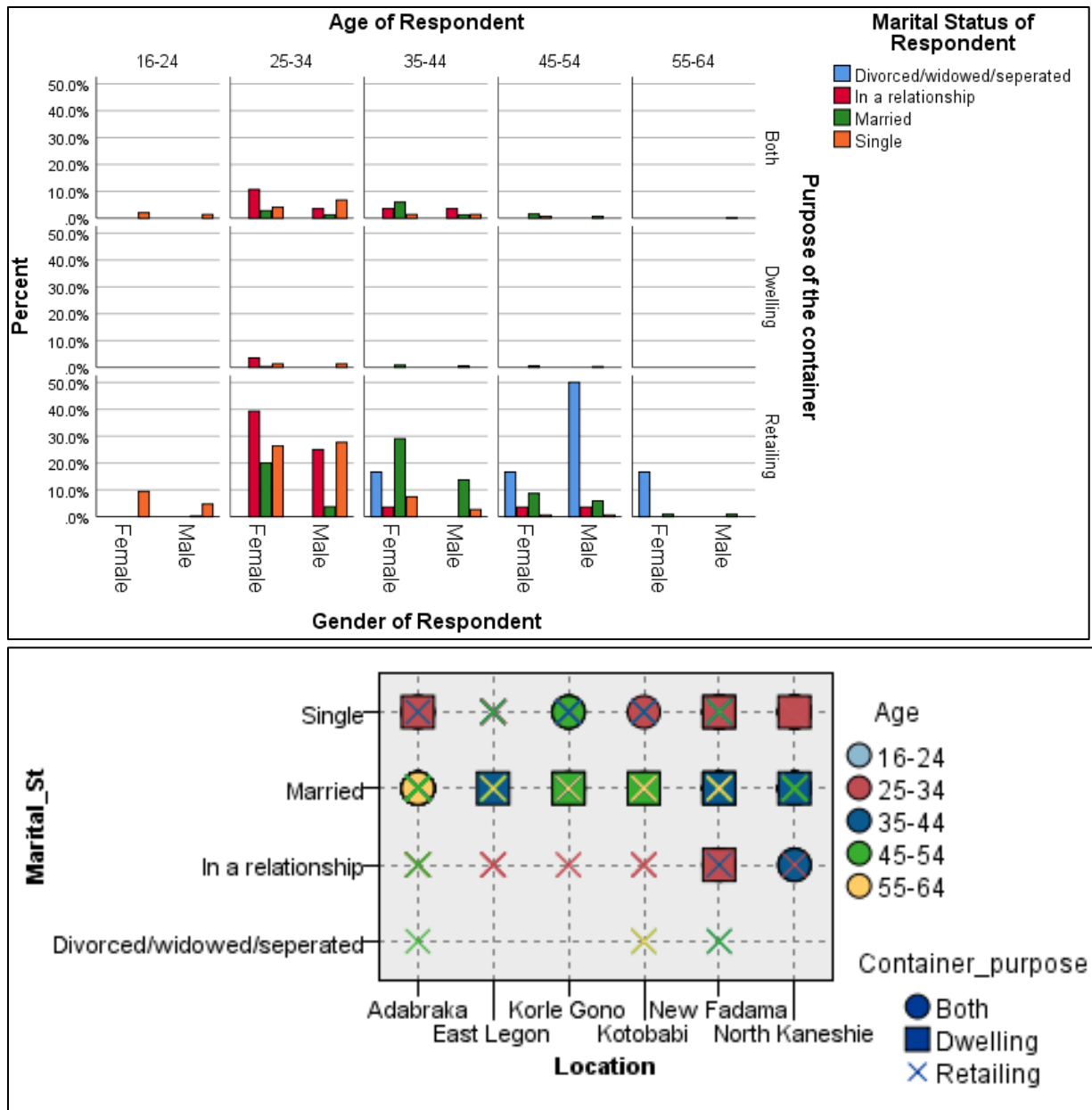
Figure 39: Marital Status, Age, and Purpose of the Container

Source: Field Survey, 2018/2019

Relatedly, the majority of respondents who use the container for both retail and dwelling space are within the low and middle-income groups (Figure 40). For instance, roughly 50% of the respondents within the low-income threshold in New Fadama appropriate the container for retail purposes only while 11% of low-income earners in the same neighborhood use the container for

both retail and dwelling purposes. The proportion of respondents who appropriate the container for both retail and dwelling space was exceptionally high among both the low-income and middle earners in North Kaneshie. Similar patterns were evident in the neighborhood of Adabraka (Figure 40).

Presciently, the monthly income level of the respondents was essential for container ownership and the size of prefabricated containers. Respondents with monthly incomes above a GHS 1000 were more likely to afford a 20-40-foot container unit. Results show a high probability of respondents with income above GHS 1000 owning a container unit compared to renting.
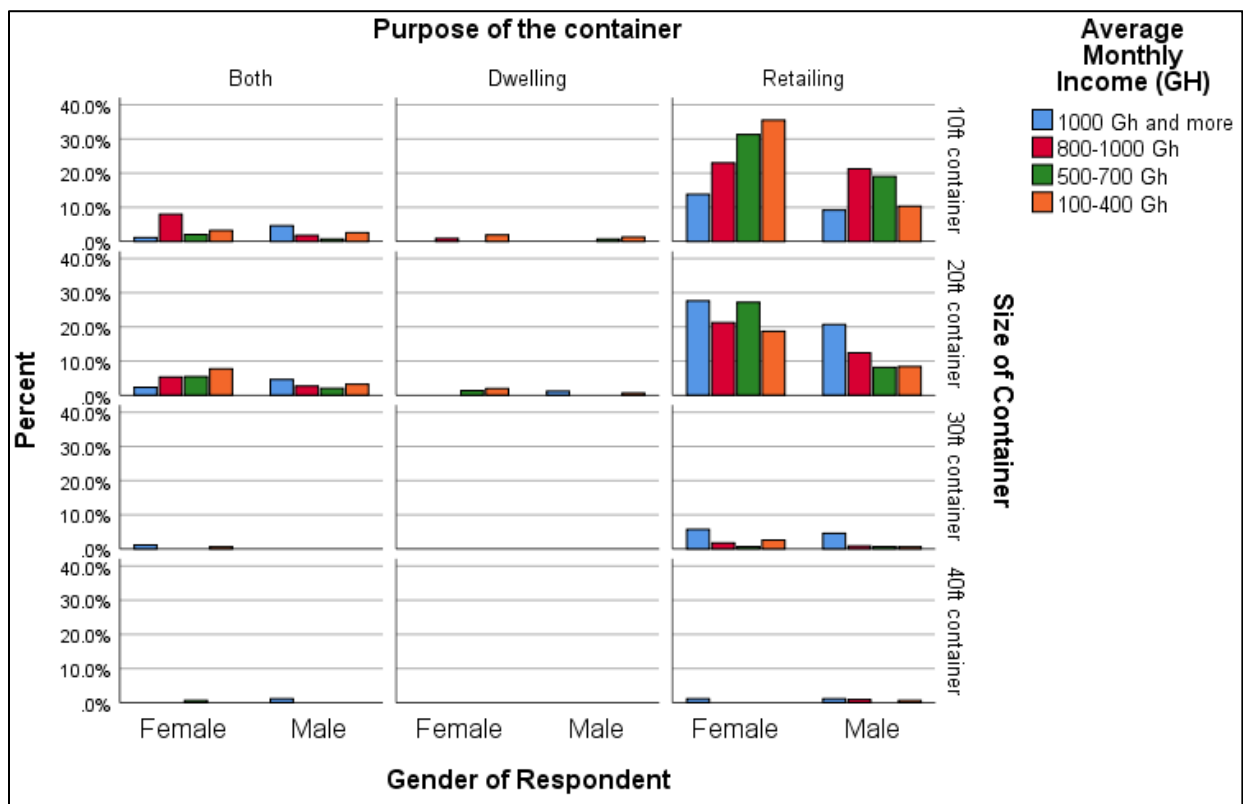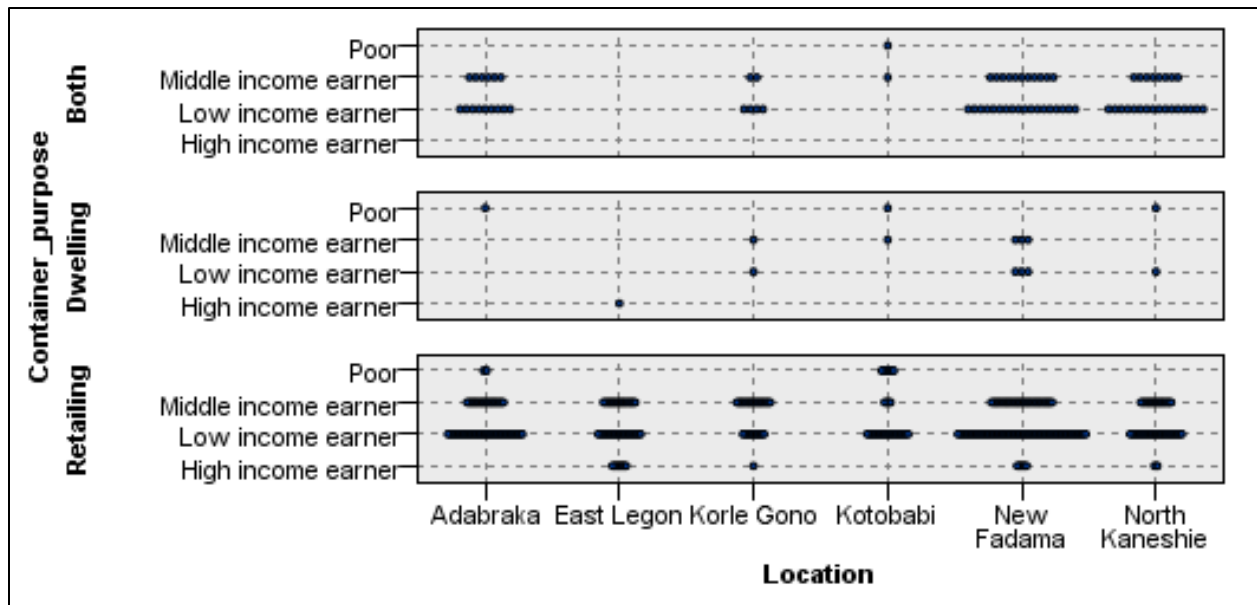
Figure 40: Income group of respondents by the purpose of the container

 Source: Field survey, 2018/2019.

Approximately 94 percent of the respondents used 10ft and 20ft containers. The occupancy rate was considerably higher for the 10ft and 20ft locally prefabricated containers in most of the study areas (Figure 41). The occupancy rate was especially high within the central business district of Adabraka and the high-income neighborhood of East Legon. For instance, the 10ft container which represents the small unit of locally prefabricated container units has an average occupancy rate of 2-3 people at a given time. The occupancy rate increases as users adopt a much larger size and dimensions of the container, as exemplified in the high-income neighborhood of East Legon (Figure 41). This shows a clear sign of over-crowding in these container units irrespective of the purpose of use. Overcrowding in container units may exacerbate psychological stress among users, a phenomenon well documented by Gabe and Williams (1986) in their quintessential study on the relationship between household crowding and psychological stress among women in West London. An interview with a local container fabricator in New Fadama revealed that the high demand for containers has created a shortage of space to locate these structures in informal neighborhoods resulted in the preference of small size containers among the vast majority of users in the area.
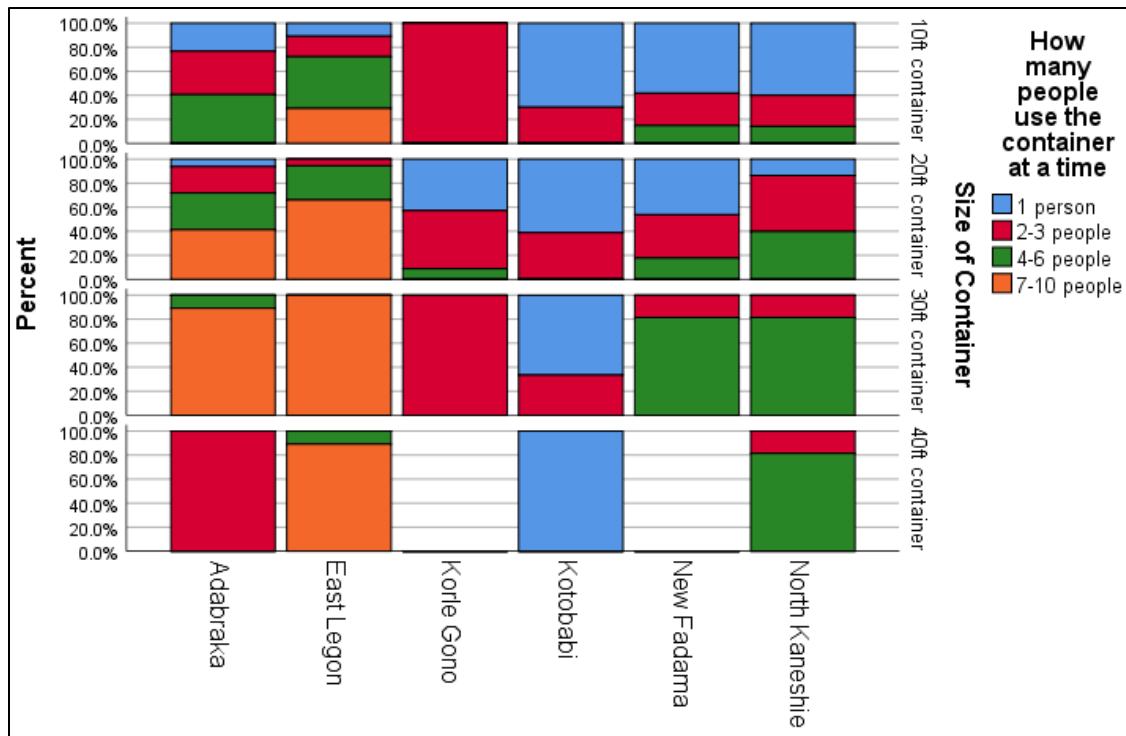
Figure 41: Container occupancy rate by the neighborhood of residence

Source: Field survey, 2018/2019

Moreover, the average occupancy rate for respondents who improvise containers for both retail and dwelling purposes was 2-3 people at a given time. This pattern reflects the general occupancy rate for conventional buildings in the metropolitan area, the majority of which are single rooms with 65% of urban households in the metropolis occupying these units (Ghana Statistical Service, 2014). High container occupancy rate was against the backdrop of slow improvements in the percentage of living area, and materials used in buildings housing in Accra (Table 15)

Table 15: Percentage of households with access to basic services in Accra between 1993-2016

Year	Improved Water	Improved Sanitation	Sufficient living area	Durable roof material	Durable wall material	Durable floor material
1993	99.9	47.1	63.4	-	-	99.2
1998	99.9	43.7	66.8	-	-	99.1
2003	99.2	76.2	-	-	-	99.2
2008	99	93.9	71.8	99.4	96.8	96
2014	99.8	92.2	70.9	99.6	90.4	98.8
2016	99.9	95.7	68.8	99.9	88.5	89

Source: UN-Habitat_MICS (2020)

The findings suggest that respondents were more likely to use the container as a temporary solution (almost half of the respondents use appropriate the container temporarily) (Figure 42). At the neighborhood level, the small proportion of the respondents who strongly agreed (6%) on the temporal dimension of container use were concentrated in New Fadama (around 62%). The findings further suggest that respondents who disagreed on the temporality of use of the container are more likely to use the container for more than 6 years compared to those who expressly appropriate the container as a strictly temporal solution (Figure 42). The temporality of use is, however, strongly associated with the length of residence in a particular neighborhood and space on which the container units are located.
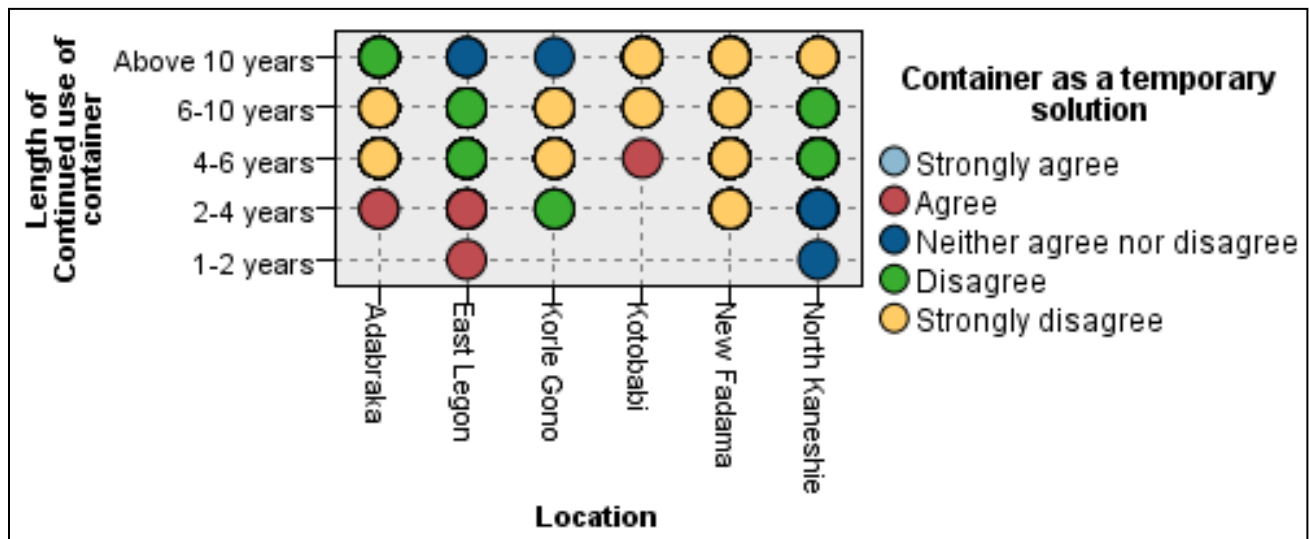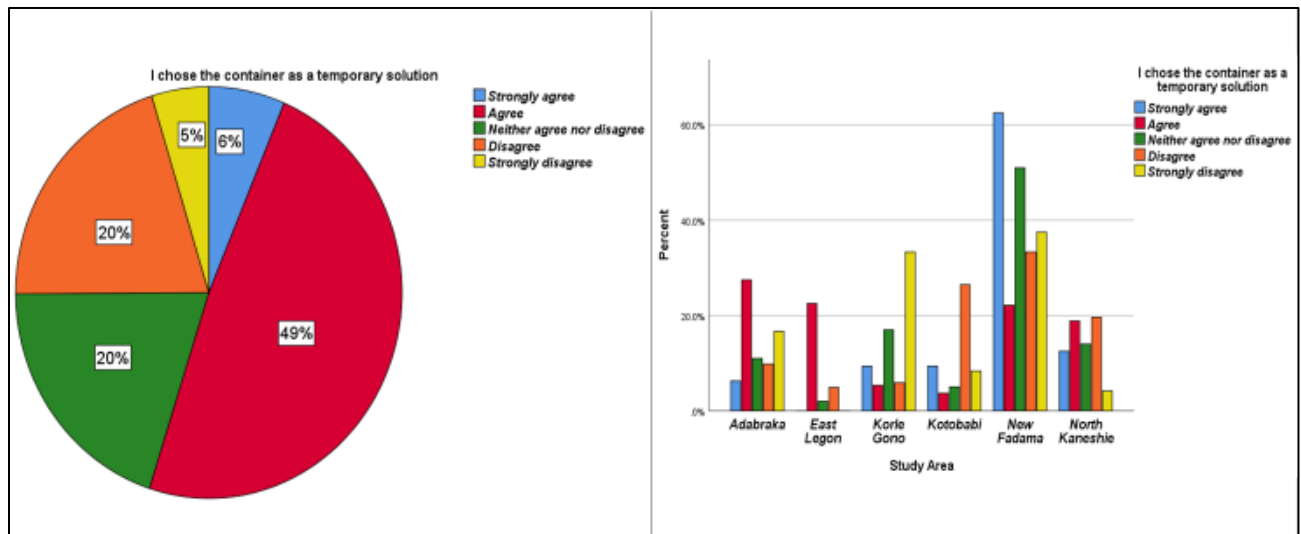
Figure 42: The container as a temporary solution

Source: Field survey, 2018/2019.

Furthermore, container localization is contingent on access to land. Respondents were asked to assess the ease with which they secured land to locate their container units based on a 5-point Likert scale. The responses on accessibility to land was accordingly scaled between 1 (very easy) to 5 (don't know). Option 5 (don't know) was targeted at respondents who rented the container units and therefore had no outstanding issue with accessibility. Interestingly, respondents in the high-income neighborhood of East Legon secured land easily followed by Kotobabi and North Kaneshie (Figure 43).
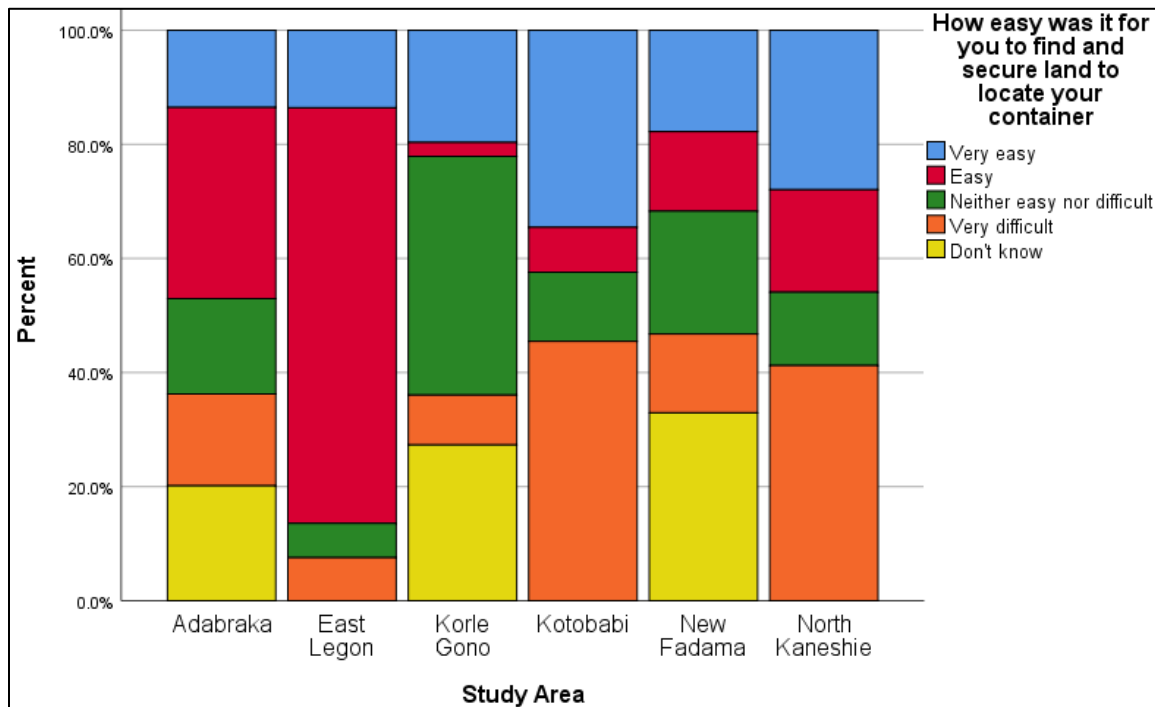
Figure 43: Access to land

Source: Field survey, 2018/2019.

Container users were asked to assess how confident they were that container units will not be subjected to demolition/eviction by city authorities. Respondents were very confident that their container will be not be demolished by city authorities. The extreme confidence level was as high as 52% in New Fadama to 77% in Korle Gono (Figure 44). Confidence further increased by the security of tenure, the length of container use, and the number of years in a specific neighborhood. Respondents with long term residential status in a particular neighborhood and prolonged use of a container are more likely to be more confident about non-eviction/demolition by city authorities. Short-term respondents in neighborhoods such as Adabraka and North Kaneshie were less optimistic about their continued use of the container unlike their counterparts in New Fadama. Conversely, renting land from landowners offer relative stability and security of tenure compared to containers located on family lands and open spaces. Space for container localization is further complicated by the land tenure system in Ghana. Generally, non-container users show little resistance to the localization of containers in their neighborhoods. Just under 4% of the respondents said they received a direct complaint from their neighbors (non-container

users) regarding the location of the container. The little resistance of non-container users is an indication of social efficacy among members of the community.

The removal of unauthorized container structures is increasingly gaining momentum in Accra. According to an official of AMA, a taskforce was instituted to ramp up evictions of containerized structures without the necessary permit. The official affirmed that: "*The taskforce was especially effective a few years ago…. The number of evictions/removal notices involving containers gained momentum between 2014 and 2017,*" (AMA official, 2018). Furthermore, the survey found that membership to a community association among the large section of the respondents was considerably low (about 14% of all respondents were part of a community association). Interestingly, membership to a community association rises with the length of residence in a particular neighborhood. Membership to a community association or a non-governmental organization ensures community mobilization and reduces the risk of eviction by state planning authorities. In exhaustive detail, Afenah (2010) draws attention to community mobilization efforts against forced evictions in Accra. Afenah (2010, p. 160), argued that a neoliberal urban planning approach adopted by municipal authorities in Accra have normalized illegal forced evictions. In response to the activation of a neoliberal planning paradigm, the urban poor in Accra has organized and mobilized community-based and non-governmental organizations to address the concerns of the marginalized groups in the city (Afenah, 2010, p. 159). A significant majority of the respondents registered and frequently pay taxes and levies for container use to city authorities despite the constant threats of eviction and demolition. Juggling between the security of tenure and institutional siege has been especially challenging and stressful for some of the respondents.
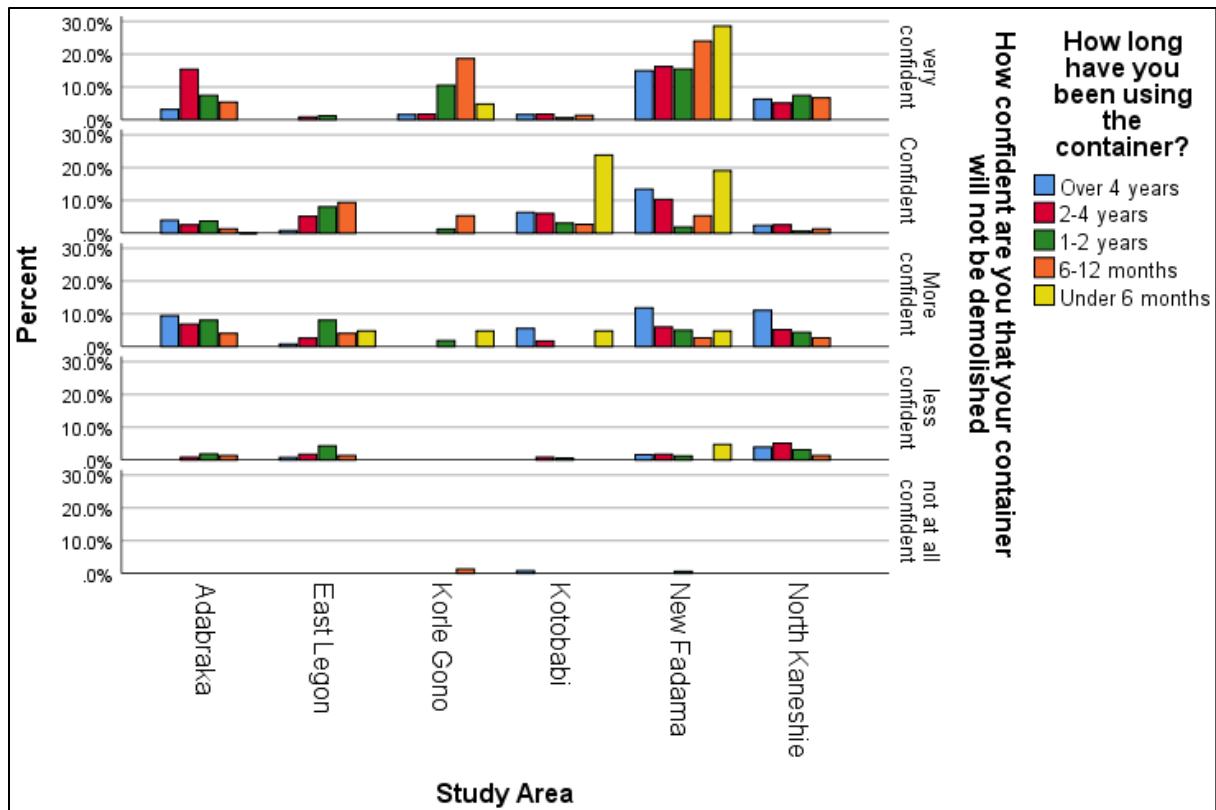
Figure 44: Relationship between the length of container use and fear of eviction/demolition

Source: Field survey, 2018/2019.

A key challenge confronted by container users is the cost of maintaining container units. More than half of the respondents (58%) perform regular maintenance of their container units such as welding to prevent corrosion; spraying and painting; and fumigation to reduce the risk of pests. The cost of maintenance is further compounded using sub-standard aluminum steel to fabricate container units.

7.5. Container Improvisation and Fear of Crime

On the question of safety and security, almost half of the respondents were very worried about their container been burglarized (42%). Responses, however, varied by gender, previous rates of victimization, and the location. For instance, female respondents were very worried about container burglaries while their male counterparts were not very worried. Furthermore, close to one-third of the respondents (34%) surveyed believed that using the container exposes them to a

high risk of victimization. The largest share of container burglaries is against operators of mobile money services in the city. Respondents particularly complained about the rise in armed robbery and assault against mobile money operators. For instance, in the year 2018, reports emerged of a horrific murder of a mobile money operator by armed robbers at Asylum Down, a neighborhood at the heart of Accra. This brazenly aghast crime occurred just some few hours after sundown- at exactly 7:30 pm (GhanaWeb, 2018). As a consequence of the increasing wave of crime against container users, most of the respondents' lock-up early, mostly at 8 pm due to the fear of crime (Fig. 45). At the neighborhood level, fear of crime was more pronounced in New Fadama consequently culminating in early container closures (Figure 46). A female container user in New Fadama argued that: "*in recent years, some area boys [unemployed young males] have been causing a lot of trouble in the area, usually at night…. So, most of us do not operate late into the night*." Writing decades earlier about the organization of households in Adabraka, Sanjek (1982, p. 59-60) noted that: "in the evening…….on the street in front of houses around the kerosene-lamp-lit tables of women selling prepared food visions until as late as 10:00 or 11:00 P.M." Fear of crime in recent years has significantly reduced the late hour commercialization of activities in certain parts of Accra.
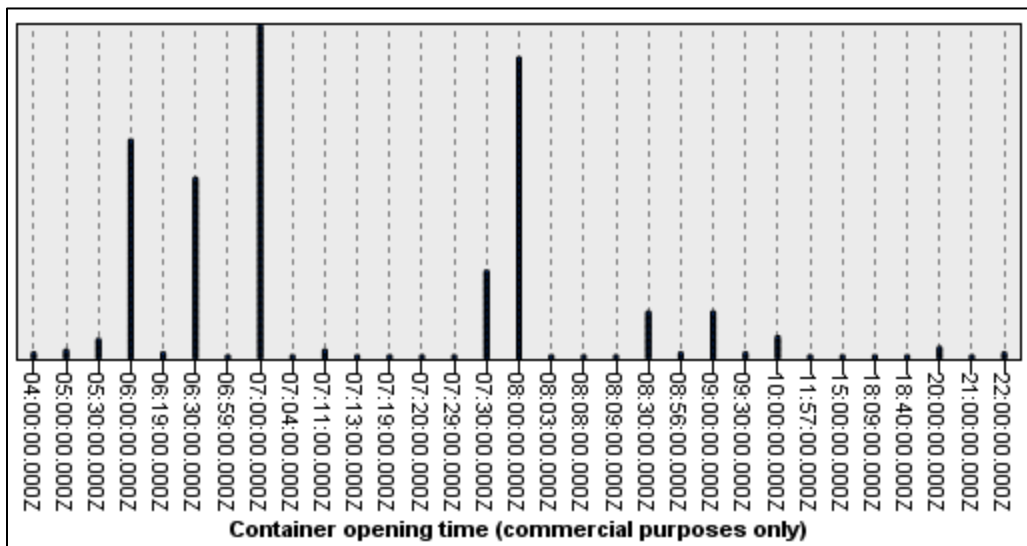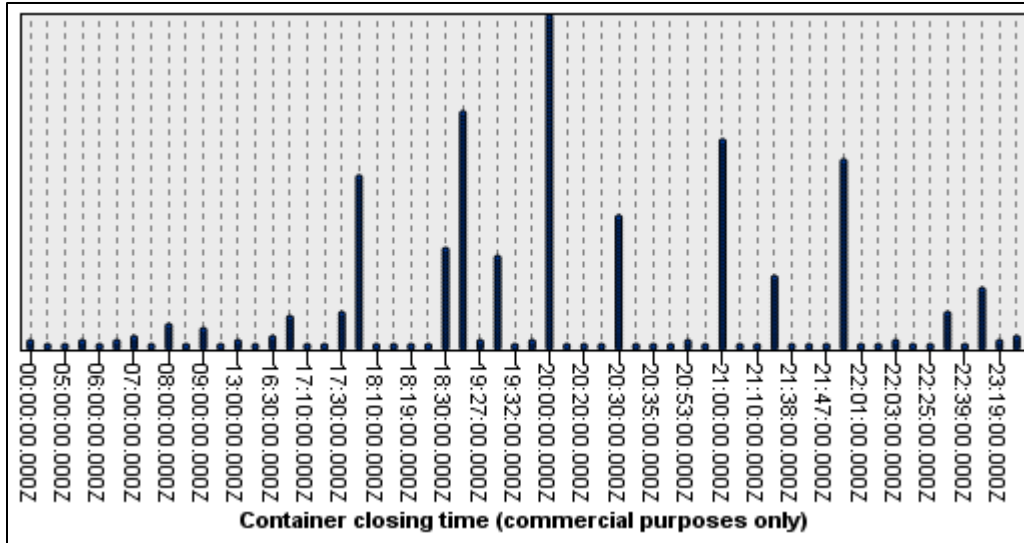
Figure 45: Container opening and closing time

Source: Field survey, 2019

Figure 46: Photos of container security measures

Source: Field survey, 2018/2019

7.6. Container Improvisation and Accessibility to Essential Services

Significantly, Thiessen polygons and multiple ring buffer analysis show a remarkable spatial variation in respondents' accessibility to essential services such as the Police and fire

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departments as well as the hospital. According to Yamada (2017, p. 1), Thiessen polygons are "generated around a set of points in a given space by assigning all locations in that space to the closest member of the point set. Any location in a Thiessen polygon is closer to the corresponding point inside it than to any other member of the point set." The results from the Thiessen polygon analysis show that except for respondents in Adabraka and North Kaneshie, most of the container users were outside the coverage area of essential services in the event of burglaries and fire outbreaks. Crucially, proximity to these essential services ensures the reduction in travel time and rapid response in case of emergencies. The multiple ring buffer further sheds light on the level of distance decay from these services. For instance, most of the respondents inside the 100-meter hotspot area in New Fadama are within the risk zone due to limited access to essential services (Figure 47). On the other hand, respondents inside the hotspot zones (100-meter buffer zone) in Adabraka and to a lesser extent East Legon is within the safe zone characterized by easy access to essential services (Figure 48).
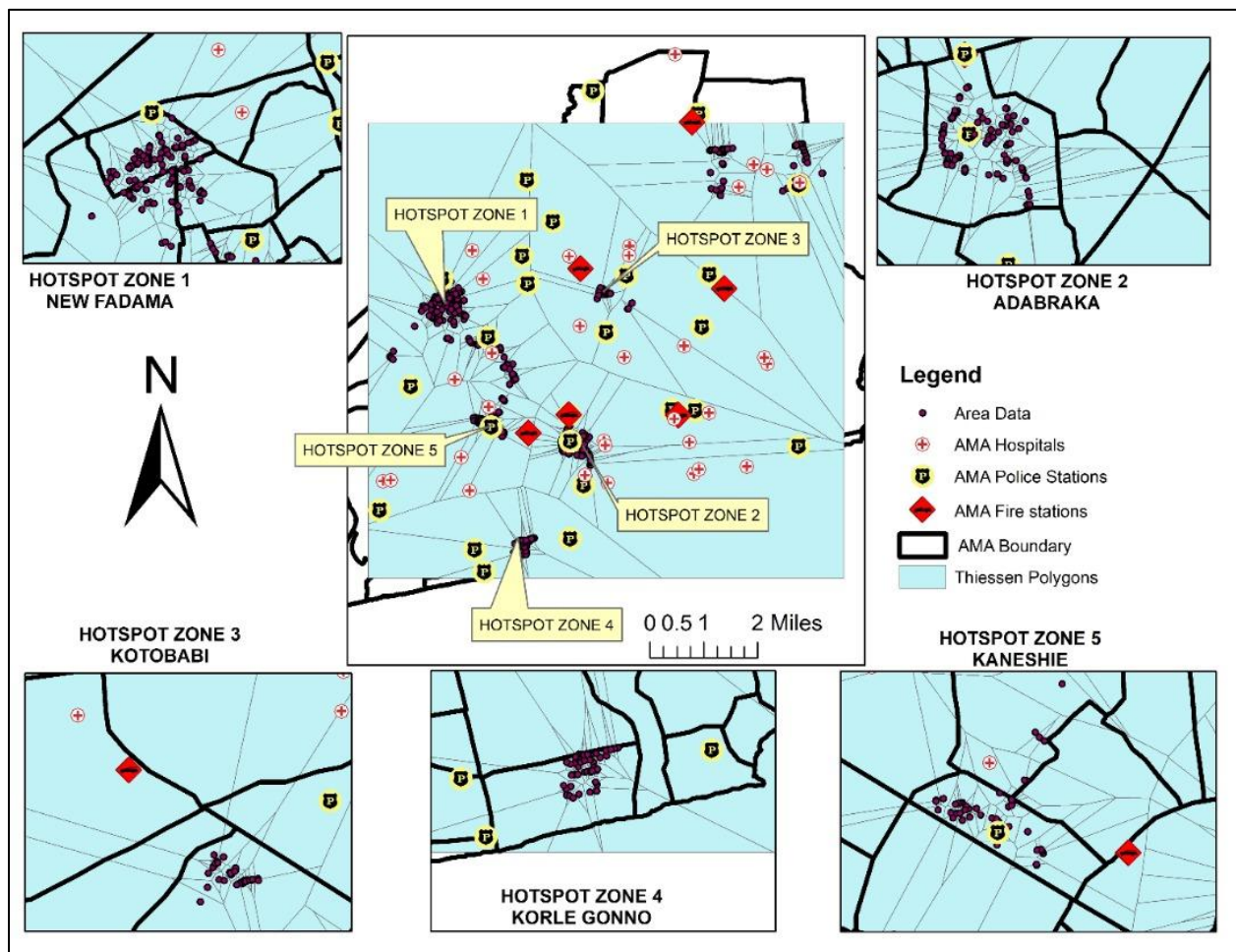
Figure 47: Thiessen Polygons analysis of container use and essential services
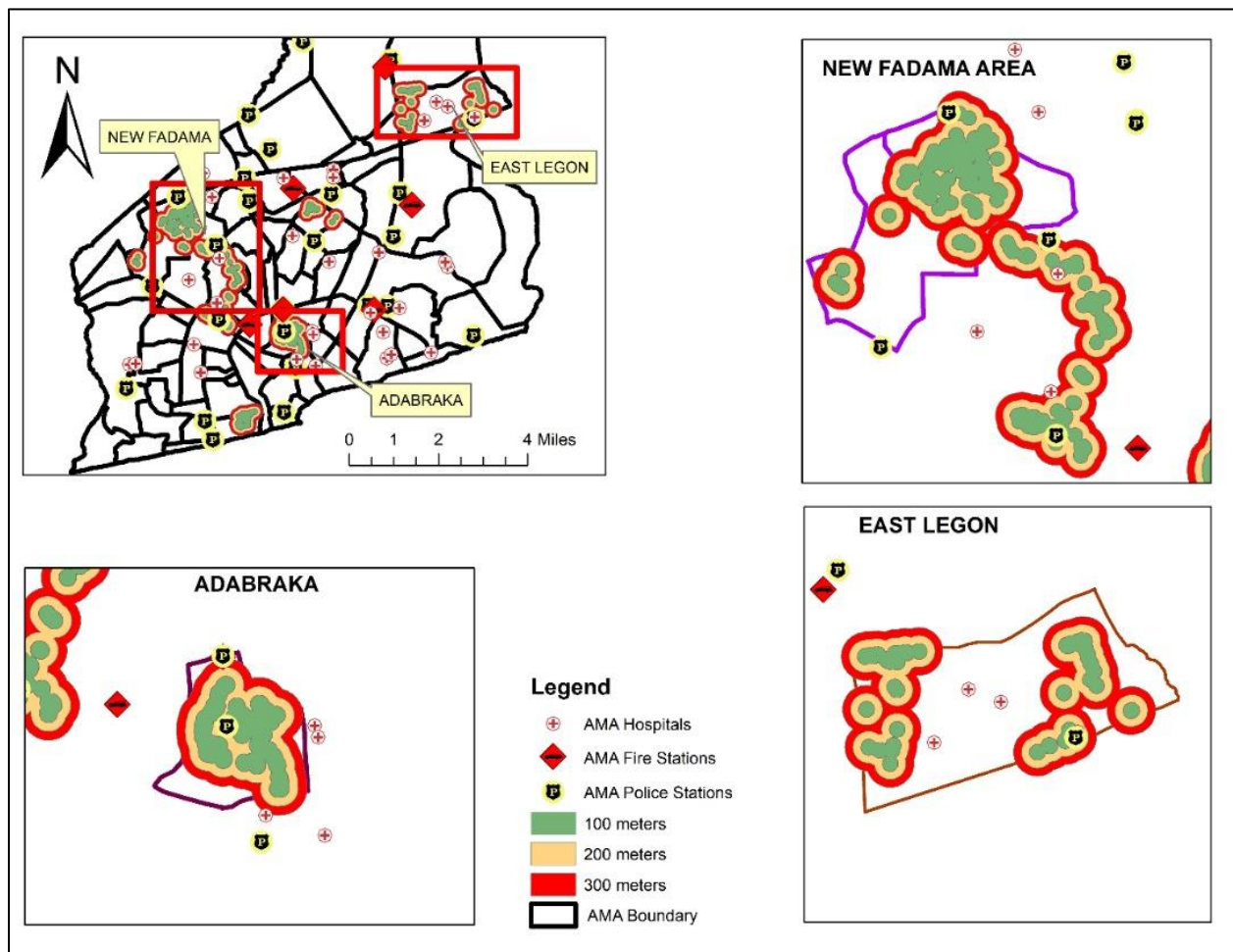
Figure 48: Multiple Ring Buffer of container use and essential services

7.7. Container improvisation and Health

Moreover, there is a causal relationship between the average daily hours spent in a container and the deterioration of health (Table 16). Exposure to particulate matter (PM), high ozone (O3) concentrations, and nitrogen dioxide (NO2) in enclosed and poorly ventilated spaces such as improvised containers increases the risk of cardiovascular and lung diseases, cancer, and heart attacks (WHO, 2016). The proportion of respondents who spend a daily average of between 10-12 hours in their containers were more likely to complain about health issues such as heat rashes, fatigue, and respiratory diseases. Of the small proportion of respondents who linked container

improvisation to deterioration of health, the majority were concentrated in the neighborhood of New Fadama (6%), followed by North Kaneshie (0.6%) and Adabraka (0.4%). Most of the respondents especially complained about heat rashes and minor breathing problems from the persistent use of the container. The respondents' susceptibility to heat rashes can be attributed to high daily temperatures and poor ventilation of some container units.

Table 16: Have you experienced any health challenges ever since you started using the container?

Neighborhood	Yes	No	Total
Adabraka	2	92	94
East Legon	0	62	62
Kotobabi	0	46	46
New Fadama	30	138	168
North Kaneshie	3	82	85
Korle Gono	0	47	47
Total	35	467	502

Source: Field survey, 2018/2019

7.8. Containerization and urban social interaction.

"*People no longer feel they have to stay inside their homes and are increasingly looking for other places that can satisfy their demands, places able to receive them. It is a question of moving from one container to another*," (Sepe, 2013, p. 31).

How does container use affect social interaction across the various neighborhoods? Container improvisation provides an essential function as an enabler of social interaction within the neighborhoods. The creative destruction of the container for commercial and dwelling purposes creates spaces in deprived neighborhoods where residents and container users alike can interact. Correlation analysis found a positive association between perceived prejudice against container use, container agglomeration, and relationships between both container users and non-users. As presented in Table 17, respondents were more likely to converge around other container users to reduce prejudice that may transpire from the general population. The results further show a

positive correlation between container agglomeration and relationships with other container users and non-users which were significant at the 0.01 level (Table 17). Conviviality among container users and residents in the study neighborhoods is essential for continuity of use. Interestingly, the study found a close association between the size of the container and social interaction. Crucially, respondents with small container configurations (59% of the respondents with 10ft container units agreed that it was important that container units were located close to other container units) were more likely to locate their container units close to other containers. On the other hand, respondents with large container dimensions (20ft) were less likely to locate their container close to other containers (75% of the respondents with 20ft container units strongly disagreed on the importance of container agglomeration). At the neighborhood level, respondents in Adabraka (18.0% agreed) and East Legon (17.1% agreed) with 10ft container units were more likely to locate their container close to other containers. The majority of the respondents with 10ft container units in New Fadama (37.7% neither agreed nor disagreed) were, however, indifferent to the localization of their containers to other container units.

Table 17: Containerization and Social Relations

		I feel prejudiced against for using the container	It is important to me that my container is close to other containers	Number of years in this neighborhood	I have a good relationship with other container users	I have a good relationship with neighbors/non-container users
I feel prejudiced against for using the container	Pearson Correlation	1	.244**	-.114*	.100*	.089*
	Sig. (2-tailed)		.000	.011	.024	.047
	N	502	502	502	502	502
It is important to me that my container is close to other containers	Pearson Correlation	.244**	1	-.147**	.257**	.238**
	Sig. (2-tailed)	.000		.001	.000	.000
	N	502	502	502	502	502
Number of years in this neighborhood	Pearson Correlation	-.114*	-.147**	1	-.053	-.012
	Sig. (2-tailed)	.011	.001		.234	.790
	N	502	502	502	502	502
I have a good relationship with other container users	Pearson Correlation	.100*	.257**	-.053	1	.464**
	Sig. (2-tailed)	.024	.000	.234		.000
	N	502	502	502	502	502
I have a good relationship with neighbors/non-container users	Pearson Correlation	.089*	.238**	-.012	.464**	1
	Sig. (2-tailed)	.047	.000	.790	.000	
	N	502	502	502	502	502

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Moreover, many container users actively participate in community activities such as naming ceremonies, funerals, weddings, attending church, and the mosque. Interactions at these various community events promote social interaction and cohesion among container users and the wider residents. Oner et al. (2020, p. 4) argued that: "participation and engagement within specific social

networks can minimize some of the effects of precarity, and it can also open up possibilities for proactive mobilization to respond to conditions."

7.9. Assessment of Container Urbanism and Sustainable Urban Development. (Environmental Vulnerability and Container Urbanism)

The significant majority of the respondents agreed (56%) that the proliferation of containers harmed the urban environment. Respondents were, however, divided over how to balance the right to the city and protecting the urban environment. In fact, most of the respondents strongly believed that the economic and social benefits of utilizing the container outweigh the cost to the urban environment. Essentially, container improvisation and environmental impact is a cost-benefit decision for most of the respondents. Much of the responses concerning the container-environment nexus on urbanization revolved around three main themes: the incompatibility of containerized structures in cities, the economic justification for container adoption, and the lack of coherent regulatory frameworks.

In an acerbic tone, one of the respondents simply stated that: "*the container has given me a job, so I don't think there is a negative impact on the environment and the city for that matter,*" (Male respondents, Adabraka).

"*The concentration of containers in one place generates a lot of waste. In my neighborhood, for instance, some containers located along roadsides dispose of waste into gutters generating a considerable quantity of filth which is bad for the urban environment,*" (Female respondent, North Kaneshie).

"*It depends on the location of the container and the purpose……….. containers located on unauthorized places can cause fire outbreaks and flooding,*" (Female respondent, Kotobabi).

"*Containers create a slum-like environment. It also creates traffic congestion which increases pollution from vehicles. Moreover, containers make the city congested especially in the markets,*" (Male respondent, New Fadama).

"*Containers create slums and prevent the circulation of fresh air in our environment and my neighborhood in particular,*" (Female respondent, New Fadama).

"It depends on where the container is located…… If a container is located on a flood plain it can harm the environment," (Female respondent, Korle Gono)

"I believe there are too many containers in the city which are likely to have a long-term impact on the urban environment," (Male respondent, East Legon).

How do educational attainment and income level of respondents' shape perceptions about container use and environmental harm? Table 18 below presents the results of the relationship between certain socioeconomic variables and environmental harm as it relates to container improvisation. At a significant level of 0.05, we can conclude that there is a positive correlation between the educational attainment of the respondents and their perceptions about the negative impact of container improvisation on the urban environment (Table 18). Similarly, at a significant level of 0.01, we can further conclude that there exists a positive correlation between average monthly income level and perceptions about the negative impact of container improvisation on the urban environment. The correlation coefficients show that as educational attainment and average monthly income rises, so does the negative perceptions of container improvisation on the urban environment. At the neighborhood level, respondents in Kotobabi and New Fadama with no educational background were more likely to assert that container did not pose any negative impact on the urban environment.

Table 18: Correlation between Educational Attainment, Income level, and environmental Impact

		Education Background of Respondent	Average Monthly Income (GH)	Income Status of Respondent	Aesthetically, do you think containers are good for the city	Do you think the container harms the urban environment?
Education Background of Respondent	Pearson Correlation	1	.040	.027	-.011	.102*
	Sig. (2-tailed)		.376	.548	.803	.022
	N	502	502	502	502	502
Average Monthly Income (GH)	Pearson Correlation	.040	1	-.121**	.028	.206**
	Sig. (2-tailed)	.376		.006	.530	.000
	N	502	502	502	502	502
Income Status of Respondent	Pearson Correlation	.027	-.121**	1	-.059	-.078
	Sig. (2-tailed)	.548	.006		.184	.080
	N	502	502	502	502	502
Aesthetically, do you think containers are good for the city	Pearson Correlation	-.011	.028	-.059	1	-.180**
	Sig. (2-tailed)	.803	.530	.184		.000
	N	502	502	502	502	502
Do you think the container harms the urban environment?	Pearson Correlation	.102*	.206**	-.078	-.180**	1
	Sig. (2-tailed)	.022	.000	.080	.000	
	N	502	502	502	502	502

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The surveyed participants (container users) were asked to rate their satisfaction with key environmental variables as it relates to the utilization of the container. Based on a scale of 1 (Good) to 3 (Poor), respondents were asked to rate 18 variables namely: air quality, space, cleanliness, temperature, sanitation, light, dust, noise, and odor conditions inside and within the immediate surroundings of the container (Appendix 8). Overall, respondents were satisfied with environmental conditions despite significant variations across the neighborhood, size, and dimension of the container, and the number of years of container utilization. Environmental quality in the neighborhoods was analyzed using a Cluster Weighted Modeling (CWM) (Figure 49). The CWM is a "mixture model with random covariates that allows, or flexible clustering/classification and distribution estimation of a random vector composed of a response variable and a set of covariates," (Punzo and Ingrassia, 2016). The neighborhoods were used as

the input cluster while the 18 environmental covariates were used as the output cluster. The cluster of environmental variables by neighborhood in figure 49 visualizes the extent of correlation on a spatial scale. The cluster of environmental variables in most of the neighborhoods shows the intersection of responses regarding conditions inside and within the immediate surrounding of the container. The exception, however, was North Kaneshie where most of the responses were distinct and dispersed signifying a relatively strong impact of environmental conditions on container users in that neighborhood. Furthermore, the impact of environmental variables is highly dependent on the size of the container. For instance, respondents with 10ft and 20ft containers rated factors such as air quality, temperature, and space poorly compared to users with larger container configurations (Figure 49). An explanatory factor for the strong correlation in North Kaneshie relates to the neighborhood's direct proximity to the North Industrial Area which is characterized by pollution (air, noise, water). The persistent exposure to high daily temperature levels in a 10ft container increases the risk of fatigue, respiratory diseases, skin, and other infectious diseases. High risk to human health is further complicated by the number of dust particles and general sanitary conditions inside and within the immediate surroundings of the container.
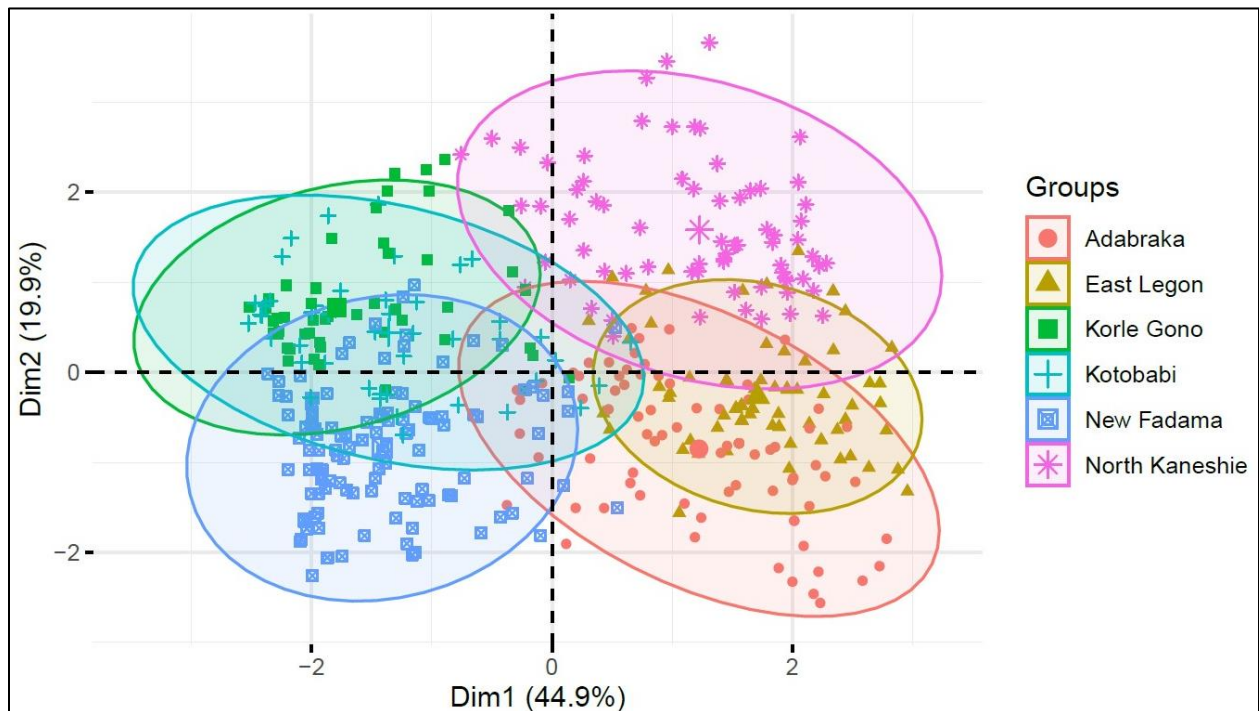
Figure 49: Cluster Weighted Modelling of 18 Environmental Variables by Neighborhood

7.10. Container Urbanism and Fire Hazards

More problematic is the relationship between fire hazard and electricity connectivity inside containerized structures. Fire extinguishers are usually the first line of defense against fire outbreaks in informal settlements and structures built with non-durable materials. The risk of fire disaster in informal settlements is especially pronounced due to the general inaccessibility to these settlements, high building density, and flammable building materials (Gibson et al., 2019). Sadly, a disproportionate number of container users did not have fire extinguishers (90%) despite an equally significant percentage (91%) of the respondents connecting their container to electricity. Out of the respondents who did not install a fire extinguisher, a significant proportion was concentrated in the low-income neighborhood of New Fadama (32%) followed by Adabraka (18%) and North Kaneshie (17%). A small proportion of respondents in the core indigenous area of Korle Gono (7%) installed fire extinguishers in their containers. A recurrent characteristic of fire outbreaks in urban areas in Ghana and within informal settlements, in particular, relates to the illegal connection of electricity. The fact that most container units are connected illegally increases the risk of fire outbreaks with its attended consequences (Figure 51). Furthermore, about half of the respondents agreed (50%) on the importance of the localization of their container units in a marketplace (Fig. 50). The concentration of these container structures in marketplaces increases the risk of fire.
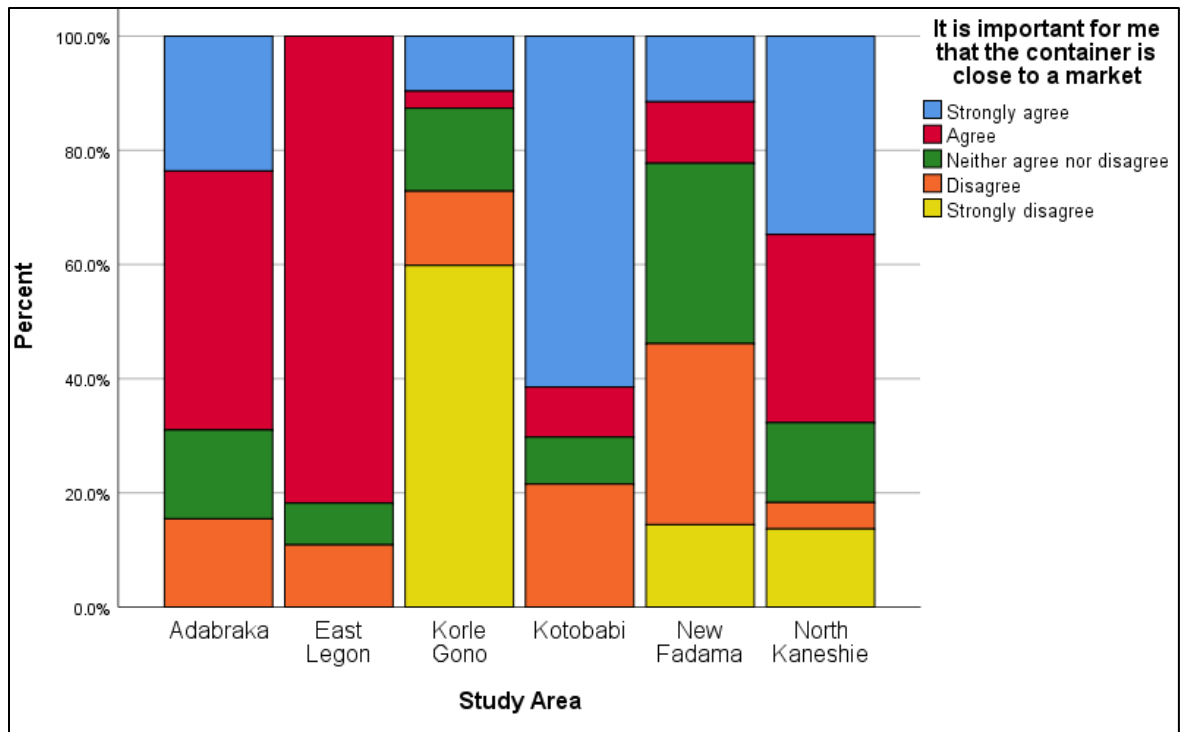
Figure 50: The importance of container location in a marketplace

Source: Field survey, 2018/2019

Figure 51: Drone image of container clusters and the risk of fire at New Fadama

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Source: Field data, May 2019.

Not all the respondents, however, agreed on the impact of container agglomerations on fire outbreaks. According to one container user in the informal settlement of New Fadama: "*unlike the wooden kiosk, containers are safer because they are more resistant to fire*" (Female Respondent). As another respondent in Kotobabi pointed out: *"It is [container] safe compared to a wooden kiosk which is prone to fire outbreaks. I previously used a wooden kiosk and I was always afraid that it would catch fire. I know family members and friends whose wooden kiosks were destroyed by fire......they lost everything,"* (Female respondent).

One of the downsides of containers to the urban environment can be found in its inherently intrinsic characteristic- modularity and movability. The fact that containers are designed to be mobile implies that the relocation of container units along different urban configurations such as waterways and sidewalks exacerbates disaster risk such as flooding. Accordingly, some of the respondents linked the proliferation of containerized structures to the aggravation of the perennial flooding in Accra. As presented in Figure 52, container users in Adabraka, East Legon, and Korle Gono were more likely to be affected by flooding due to their proximity to waterways. The majority of container units are built without concrete foundations which further increases the risk of destruction and destitution during heavy downpours in the city. Moreover, most of the container units lacked proper waste disposal mechanisms. Consequently, some respondents resort to dumping waste into gutters- choking drains and compounding the flooding situation in the city.

Furthermore, the modularity of the container is gradually contributing to the sedentarization of settlements in Accra, a phenomenon largely attributed to the highly mobile Gypsy/Roma population (San Roman-Espinosa and Lopez-Catalan, 2012). The shift towards sedentarization in Accra is particularly reinforced by the fact that 15% of the respondents once relocated their container from one neighborhood to another. Respondents cited security of tenure, eviction notice by city authorities, fire, and flood.
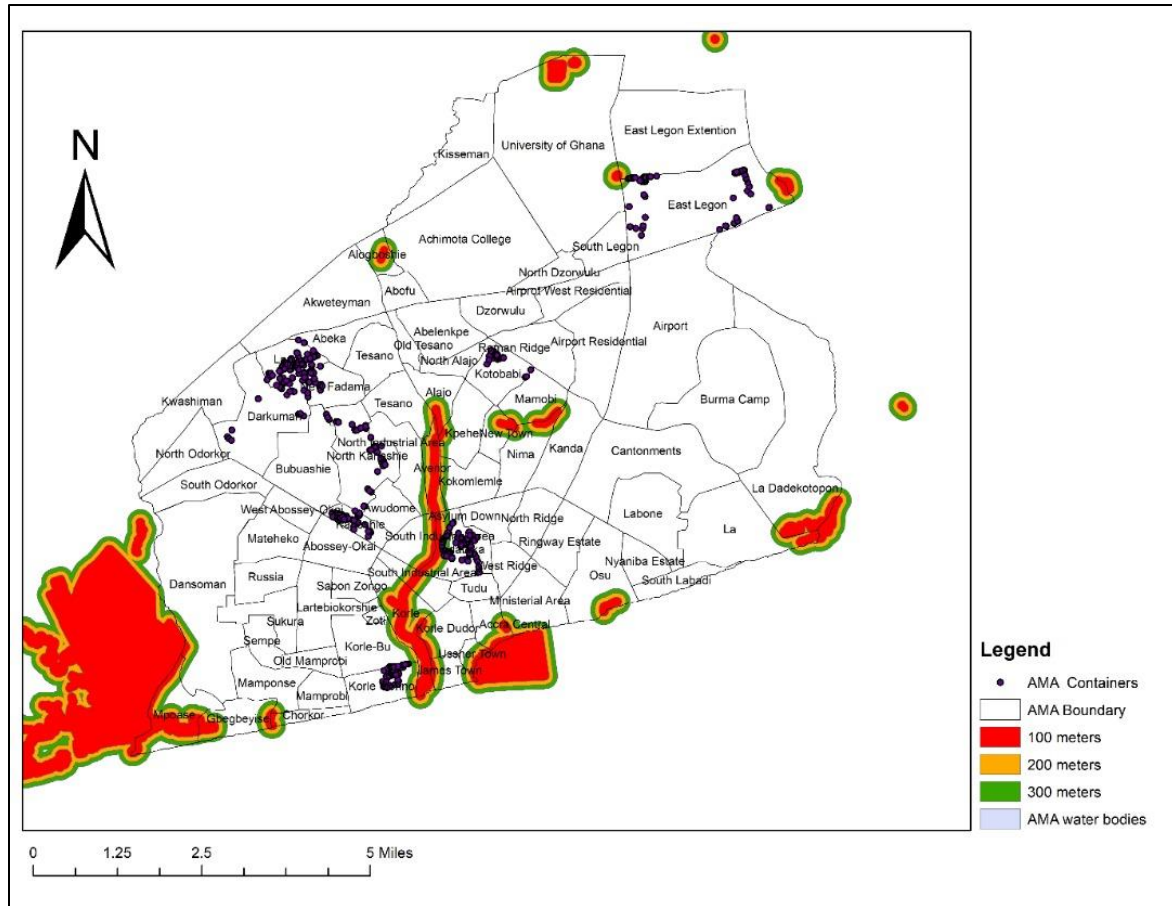
Figure 52: Multiple Ring Buffer of Container location and flood risk

7.11. Container Urbanism and De-pedestrianization

One of the strategies in Ghana's National Urban Policy Revision Guideline is to invest in safe pedestrianization (Ghana Urbanisation Think Tank (GUTT), 2019). The containerization of urban space is precipitating the de-pedestrianization of sidewalks (Figures 53 and 54). The desire to locate containerized structures along road networks and marketplaces has gradually shrunk the size of sidewalks in major parts of the city of Accra. The congestion of sidewalks with containers has a corresponding effect on pedestrian mobility, traffic, and road safety. The disappearance of sidewalks is especially detrimental for children in inner cities due to the risk of road accidents and injuries. Reports emerged of frequent hit-and-run accidents involving taxis, motorbikes (*Okada*), and '*Trotro'* (local public transports) within the suburbs of Accra. A report by the Accra Metropolitan Assembly found an increase in road traffic crashes from 68% in 2018 to 77% as of April 2019 within the metropolis (AMA, 2019). The report further found that a

significant proportion of road crashes within the metropolis are caused by speeding (AMA, 2019).
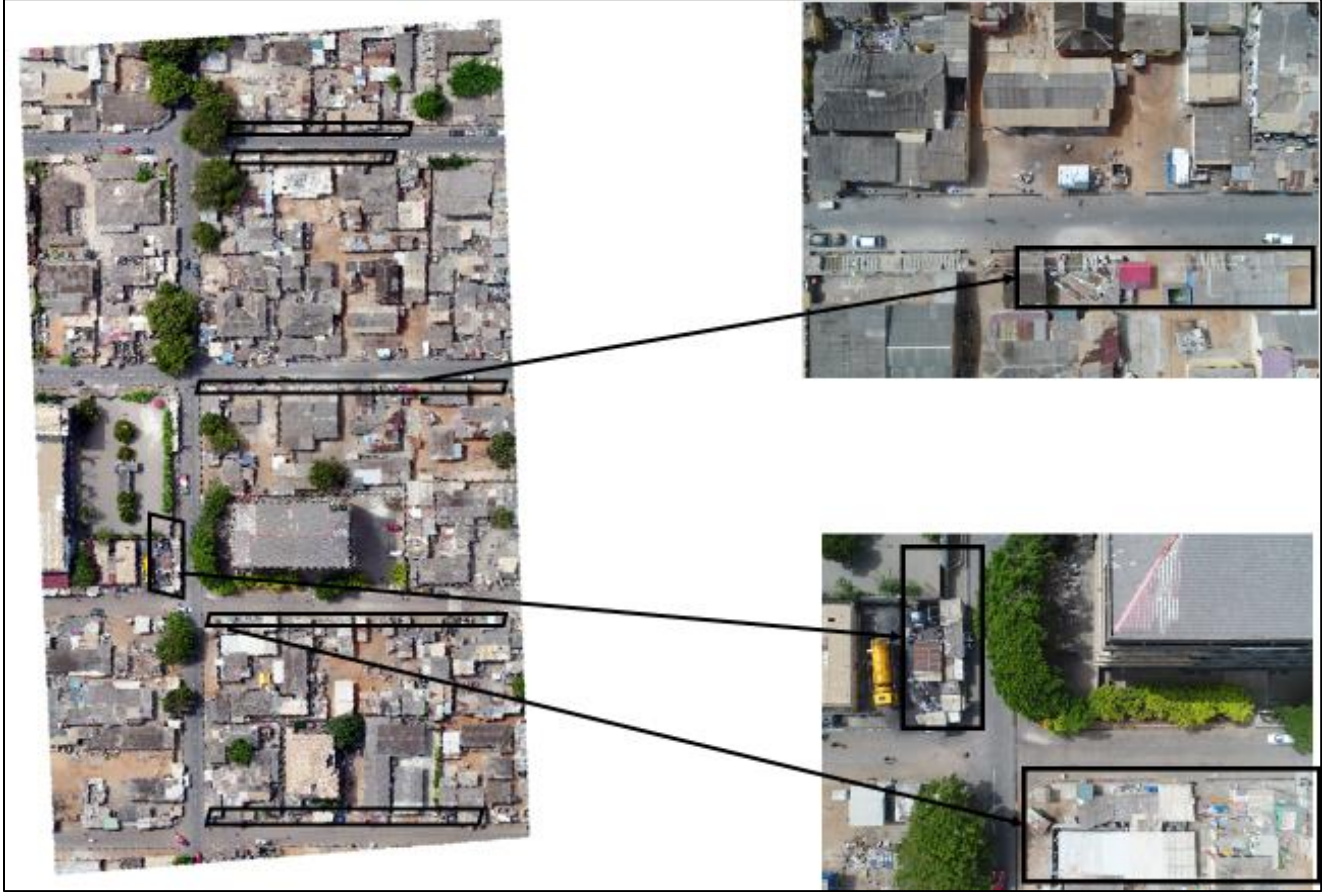
Figure 53: Drone image of container localization and de-pedestrianization in Korle Gono

Source: Field data, 2019

Figure 54: Drone image of container localization and de-pedestrianization in Kotobabi

Source: Field data, 2019

The de-pedestrianization of sidewalks is especially re-enforced by the desire of a significant proportion of container users in certain neighborhoods to concentrate container units near roadsides. Of the 62% of the respondents who agreed on the importance of the localization of container units near the roadside, the majority are concentrated in East Legon, Kotobabi, and North Kaneshie (Figure 55).
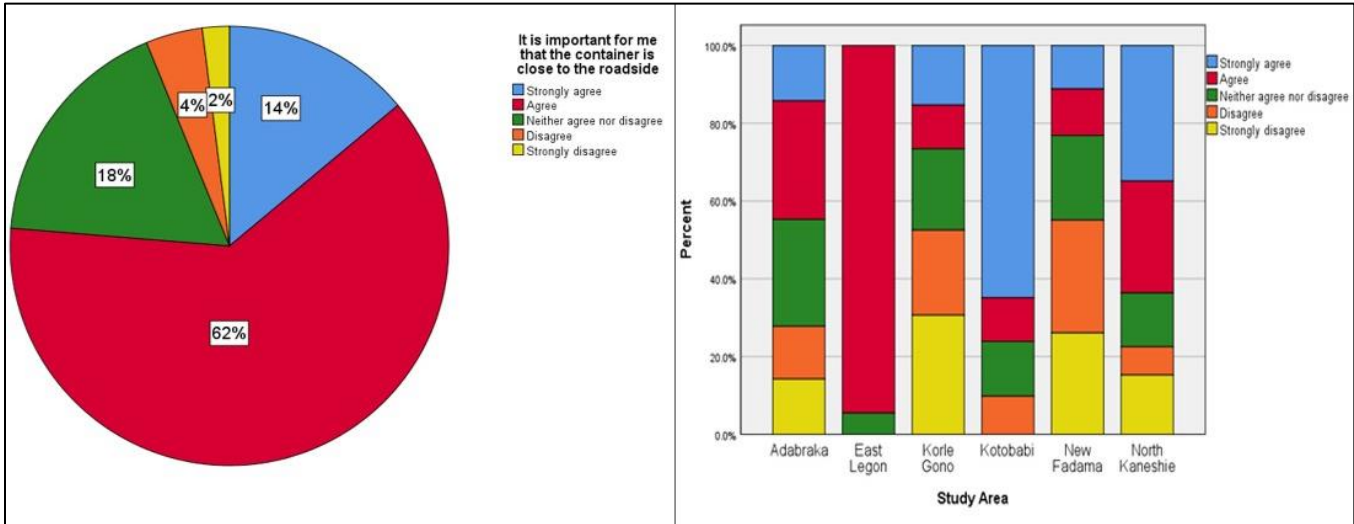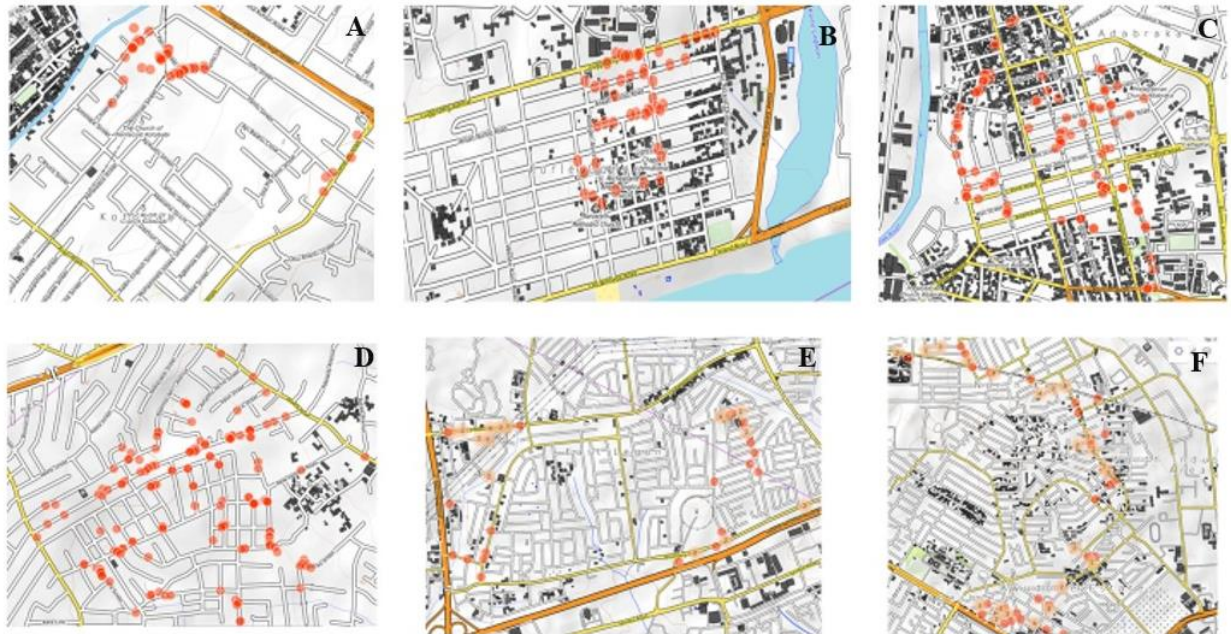
Figure 55: The importance of container location near a roadside

 (A) Kotobabi (B) Korle Gono (C) Adabraka (D) New Fadama (E) East Legon (F) North Kaneshie. Source: Field survey, 2018/2019

7.12. Chapter Conclusion.

This chapter embodies how disruptive innovations dissolves into the everyday lives of urban dwellers in Accra, Ghana. The chapter explores the informalization, adoption, and the spatial diffusion of containerization across different urban configurations. It remains true from the results of container adoptions that the informal sector and more specifically, informal housing is the entry point for many households into Accra's housing market (Gunter, 2014). For many respondents, the container's main purpose is to fulfill an urgent economic and social prerogative rather than an expressive symbology of architectural grandeur, and monumentalism. Crucially, containerized structures are far more than an ostentatious display of environmentally conscious living; or of the mantra 'less is more' epitomized in the contemporary tiny house and minimalist movements. For some, the utilization of containerized structures, in effect, is a poverty reduction strategy as exemplified in the case of Accra. Container improvisation as a self-help strategy can be perceived as a consequence of fragmentations in the economic and social order, creating what

Karpat (1976, p. 3) described as a "relation of economic marginality between the city and the low-income groups."

As long as the existing real estate and housing market (sustaining innovation) continue to exclude a large section of the urban population from the formal market, low-end and new-market disruptive innovations such as the container will upend the hegemony of rent-seeking interests. Additionally, as long as rent control measures and curbs on mortgages are not enforced and affordable housing programs are not instituted, container urbanism will inexorably gain momentum across multiple urban configurations inadvertently bringing Madanipour's (2017) prediction of cities undergoing a state of 'existential temporality' to fruition. In other words, the majority of urban dwellers will continue to improvise the container to participate in the everyday life of the city as long as the predatory practices of the traditional real estate and housing market persist. The default aspiration for the traditional housing market is to cater to the needs of its consumer base- middle to high income, formal sector, educated. As these aspirations continue to fester, low-end, and new-market disruptive innovations such as the container will likely gain momentum for a large section of urban dwellers- informal sector, low income, low educational attainment.

Chapter Eight: Socio-Spatial Patterns of Institutional and Communities Response to the Disruptive innovation of the Containerization of Urban Space in Accra, Ghana.

This chapter addresses the role of different stakeholders such as local government, NGOs, and the community in the containerization of urban space. Crucially, the spatial diffusion of container urbanism requires collaboration and support of urban institutions and the wider urban population. The disruptive innovation of container urbanism has however presented a torrent of issues for urban institutions and the general urban populace to contend with. How the aforementioned stakeholders deal with these emerging forms of urbanization will define the momentum: high or low, of container urbanism.

8.1. Socio-Demographic Characteristics of Household Heads

The household survey was conducted to explore the threat or otherwise of non-container users to the spatial diffusion of container urbanism. This was achieved by capturing the perceptions of household heads on the various dimensions of container urbanism in their neighborhood of residence and the wider urban landscape. Most of the household heads were females (55%) between the age cohorts of 35-44 years. Many of the household heads were married (66%), except for New Fadama where the proportion of divorced/widowed/separated (17%) was comparatively higher. Only 3% of the household heads in all the neighborhoods had no education; as low as 6% in the low-income neighborhood of New Fadama and 2% in the high-income neighborhood of East Legon. Furthermore, the average household size in all the neighborhoods surveyed was between 1-6 (Table 19). Of the household heads who had an average household size above 7 (18%), 31% were concentrated in Adabraka and 27% in Korle Gono.

Table 19: Demographic Profile of Household Heads

Key Attribute	Adabraka		North Kaneshie		New Fadama		Korle Gono		East Legon	
	No.	%	No.	%	No.	%	No.	%	No.	%
GENDER										
Female	34	67	69	54	25	47	24	40	35	78
Male	17	33	59	46	28	53	36	60	10	22
AGE										
16-24	2	4	6	5	5	9	9	15	4	9
25-34	18	35	39	30	17	32	21	35	9	20
35-44	21	41	56	44	15	28	14	23	19	42
45-54	8	15	22	17	11	21	11	18	11	25
55-64	2	4	5	4	5	9	4	7	2	4
65+	0	0	0	0	0	0	1	2	0	0
EDUCATION										
No Education	2	4	2	2	3	6	1	2	1	2
Primary/ Basic	4	8	12	9	8	15	4	7	2	4
Secondary	23	45	27	21	15	28	24	40	26	58
Tertiary	10	20	61	48	18	34	22	36	7	16
Vocational Training	6	12	7	5	0	0	4	7	5	11
Other	6	12	19	15	9	17	5	8	4	9
MARITAL STATUS										
Divorced/widowed/separated	1	2	6	5	9	17	4	7	0	0
In a relationship	1	2	3	2	0	0	1	2	1	2
Married	36	71	92	72	27	51	36	60	31	69
Single	13	25	27	21	17	32	19	31	13	29
HOUSEHOLD SIZE										
1-3	21	41	54	42	14	26	14	23	36	80
4-6	14	28	56	44	29	55	30	50	9	20
7+	16	31	18	14	10	19	16	27	0	0
Number of Respondents	51	15	128	38	53	16	60	18	45	13

Source: Field survey, 2018/2019

The household survey revealed that the majority of the household heads (28%) were born in Accra or from other parts of the Greater Accra region. This was followed by the Ashanti (16%) and Volta (14%) regions. The survey also found a small proportion of foreign-born (4%) household heads in all the neighborhoods except Korle Gono. Accordingly, a significant proportion of household heads born in the Greater Accra region were concentrated in the indigenous core neighborhoods of Korle Gono and Adabraka. Over 71% of the household heads were residents in their neighborhoods for more than 4 years (Table 20). Furthermore, most of the household heads were renters in compound houses which constitutes the main source of housing

for many urban dwellers in Ghana. The survey found that most of the owner-occupied household heads were concentrated in East Legon and North Kaneshie. Furthermore, most of the households were within the middle (41%) and low (41%) income groups, followed by high-income earners (12%). Only 2% of household heads considered themselves poor; 6% were concentrated in Adabraka followed by North Kaneshie (2%). All the household heads surveyed were engaged in some economic activity. Most of the household heads worked in the informal sector (69%) and were involved in occupations such as petty traders, food vendors, and entrepreneurs.

Table 20: Socio-Economic Profile of Household Heads

Key Attribute	Adabraka		North Kaneshie		New Fadama		Korle Gono		East Legon	
	No.	%	No.	%	No.	%	No.	%	No.	%
REGION OF ORIGIN										
Ashanti	6	11	22	17	13	25	12	20	0	0
Brong Ahafo	1	2	5	4	3	6	1	2	5	11
Central	5	10	11	9	5	9	5	8	6	13
Eastern	2	4	14	11	6	11	4	7	9	20
Greater Accra	20	39	31	24	13	25	25	41	7	16
Northern	2	4	8	6	5	9	0	0	3	7
Upper East	0	0	1	1	0	0	0	0	3	7
Upper West	0	0	0	0	0	0	0	0	3	7
Volta	8	16	19	15	6	11	9	15	4	9
Western	5	10	8	6	0	0	4	7	4	9
Non-Ghanaian	2	4	9	7	2	4	0	0	1	2
LENGTH OF RESIDENCE IN NEIGHBORHOOD										
Over 4 years	38	74	74	58	46	87	44	73	36	80
2-4 years	12	24	37	29	3	5	10	17	8	18
1-2 years	1	2	12	10	2	4	2	3	1	2
6-12 months	0	0	2	1	1	2	4	7	0	0
Under 6 months	0	0	3	2	1	2	0	0	0	0
INCOME LEVEL										
Rich	0	0	8	6	1	2	1	2	0	0
High-Income Earner	2	4	28	22	5	9	5	8	1	2
Middle-Income Earner	22	43	51	40	19	36	28	47	20	45
Low-Income Earner	24	47	38	30	28	53	26	43	24	53
Poor	3	6	3	2	0	0	0	0	0	0

Source: Field survey, 2018/2019

Household heads perceived container improvisation as a function of choice, temporality, and affordability. Responses concerning these key variables were rated using a Likert scale of 1

(strongly agree) to 5 (strongly disagree). Overall, about 45% of household heads agreed that container improvisation was linked to affordability (Figure 56). The percentage of household heads who strongly agreed that people improvise containers because it was affordable was higher in the low-income neighborhoods of New Fadama (47%), and Korle Gono (28%). Respondents in the middle-income neighborhood of North Kaneshie (20%) and the high-income area of East Legon (67%) strongly disagreed that container improvisation was as a result of affordability (Figure 56). Similarly, most of the household heads were of the view that people generally improvise containers as a temporary solution. Perceptions concerning temporality of container improvisation ranged as high as 57% (agreed) in Korle Gono to as low as 11% (agreed) in East Legon. Household heads were, however, divided over perceptions concerning whether container improvisation was because of the lack of alternative mode of urban production. Crucially, about 30% of household heads agreed that people improvise containers because they had no choice. A similar proportion of household heads equally disagreed (29%) that container improvisation was because of the lack of choice (Figure 56). The perceptions of household heads regarding container affordability, temporality and choice reinforce class divisions where the "dominant class has control over the instruments of production to which the dominated one has access only through the surrender of part of its labor-force or product" (Meillassoux, 1970, p. 103).
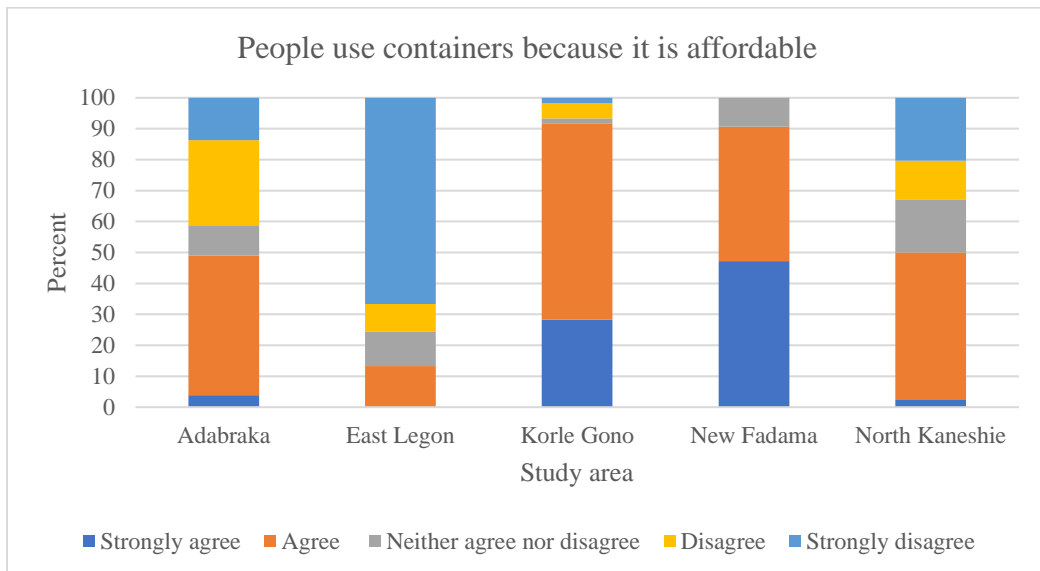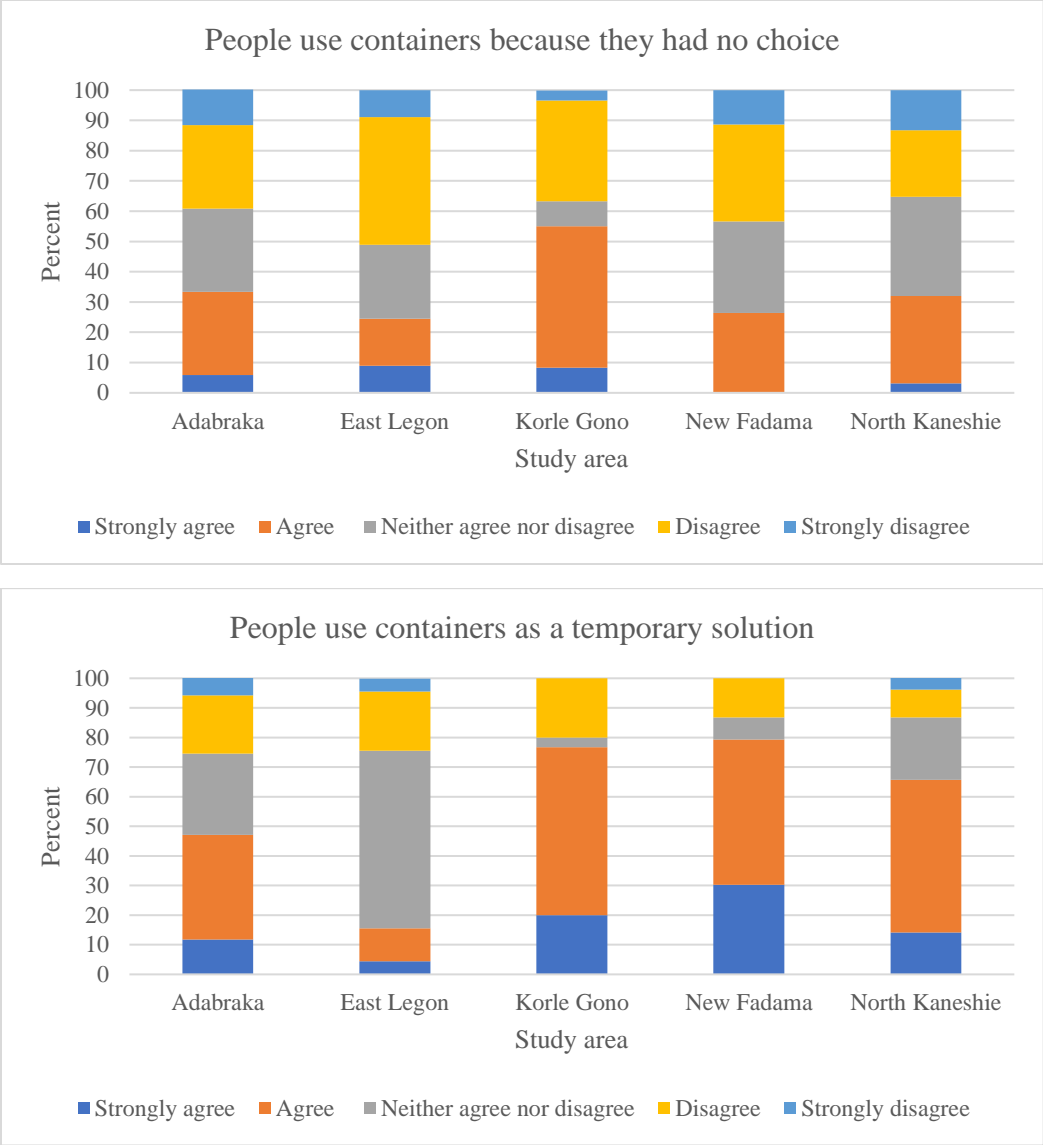
Figure 56: Container Affordability, Choice, and Temporality

8.2. Containerization, passive civic resistance, and urban citizenship

When household heads were asked if they knew someone who owns or uses a container unit, 79% said yes and 21% said no. Of the respondents who said yes, the majority were concentrated in New Fadama (94%), followed by Adabraka (90%) and Korle Gono (87%). Relatively few household heads in the middle-income neighborhood of North Kaneshie (34%) and the high-income neighborhood of East Legon (22%) said they did not know someone who owns or uses a container unit (Figure 57). By its nature, East Legon, characterized by the dominance of gated

communities and clear land ownership were more likely to have few container concentrations. Moreover, when respondents were asked what their relationships with most of the container users were, the majority said neighbors, followed by church members and next of kin.
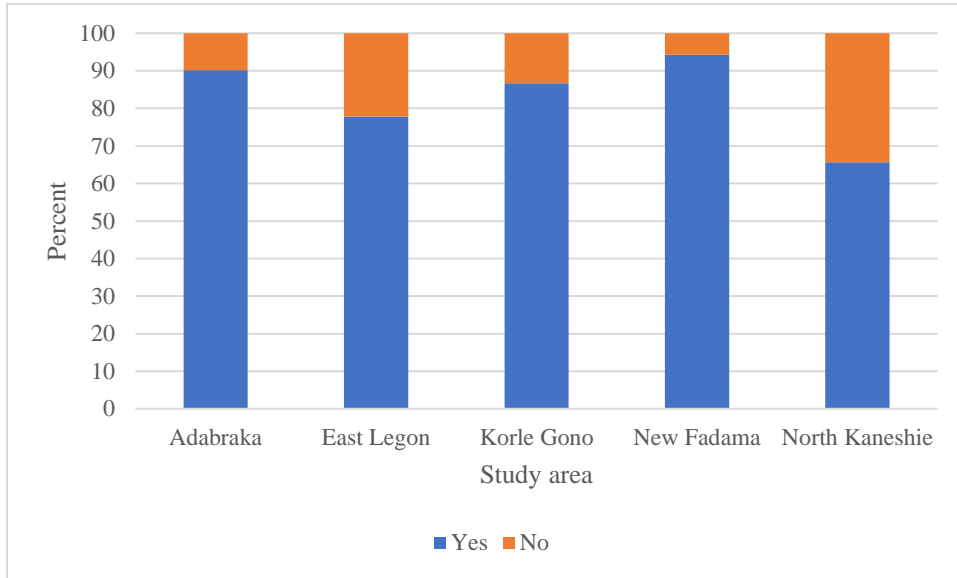
Figure 57: Do you know someone who owns or uses a container?

Furthermore, according to more than half of the household heads surveyed (57%), the majority of container users were not 'traditional' members of their community. For instance, about 76% of household heads in Adabraka, 64% in North Kaneshie, and 60% in New Fadama claimed that the majority of container users were either new migrant arrivals or came from other parts of Accra (Figure 58). This is consistent with the results from the survey of container users which shows that the majority were new migrants with shorter lengths of residence in Accra. The finding shows how containerization has reinforced the social divisions in urban space through the *othering* of certain socioeconomic groups of people (Bayón and Saraví, 2017, p. 292).
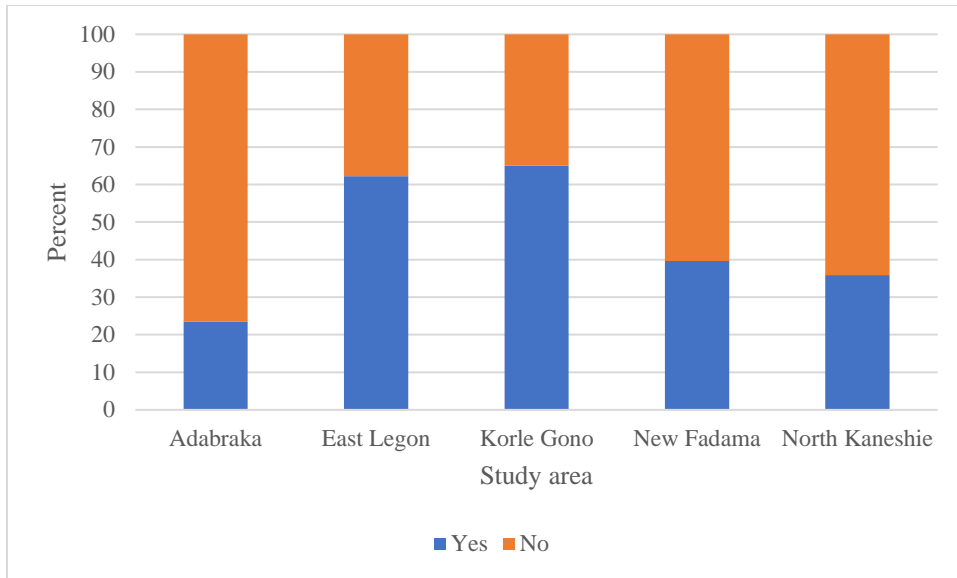
Figure 58: Are the majority of container users' members of your neighborhood?

8.3. NIMBY (not in my backyard): From Passive to Organized Resistance?

How do household heads perceive container-environment relations? A 5-point Likert scale (1-strongly agree to 5- strongly disagree) was used to measure the perceptions of household heads regarding container-environment nexus. Over a third, (36%) of the household heads across all the neighborhoods of study agreed that container improvisation was good for the city and urban environment. Perceptions, however, appear to vary considerably by neighborhood. For instance, household heads in the traditional core area of Korle Gono (60%) and the informal neighborhood of New Fadama (45%) agreed that container improvisation was good for the urban environment (Figure 59). The survey also found, for example, in the high-income neighborhood of East Legon that household heads were more likely to disagree on the benefits of container improvisation to the urban environment. Similarly, household heads in the low-income area of Adabraka were more likely to perceive container improvisation as harmful to the urban environment.
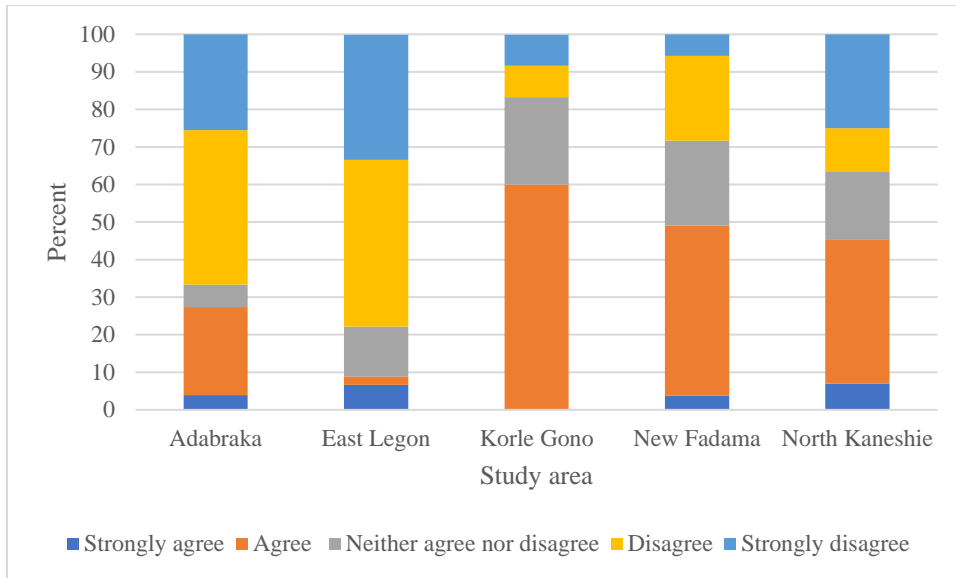
Figure 59: Containers are good for the urban environment

The survey found profoundly strong support for the regulation of containerized structures across all the study areas. Relatively few respondents (1.5%) opposed the regulation of containerized structures. By regulation, respondents implied state control over the spatial diffusion of container urbanism. The overwhelming support for the regulation of container urbanism was against the backdrop of perceptions concerning the ubiquity of containers in urban space (Figure 60). For example, the survey found that the majority (about 54% strongly agreed) of household heads in all the study areas felt that there were too many containers in their neighborhoods. Crucially, the majority of household heads unequivocally linked container urbanism to residential neighborhood change. The respondents were especially more concerned about the emergence of 'container congestion' and the disappearance of open spaces in their respective neighborhoods. Furthermore, the majority of household heads indicated that environmental sanitation and quality has reduced considerably as a result of the proliferation of container urbanism. Moreover, household heads support the regulation of container urbanism irrespective of educational background, occupation, and level of income. These findings tally with research conducted by Arguello et al. (2013) which found a sustained transformation of neighborhoods in urban Africa. The researchers documented the deterioration of the old traditional neighborhood of Korle Gono in Accra (Arguello et al., 2013). Additionally, about 36% of household heads reported that they know a container user evicted by a landlord or notified by the city authorities to remove their

container. A small percentage of household heads were keenly sensitive to questions concerning how they felt about the eviction of container users in their neighborhoods. The majority, however, were indifferent, i.e., neither happy nor sad.
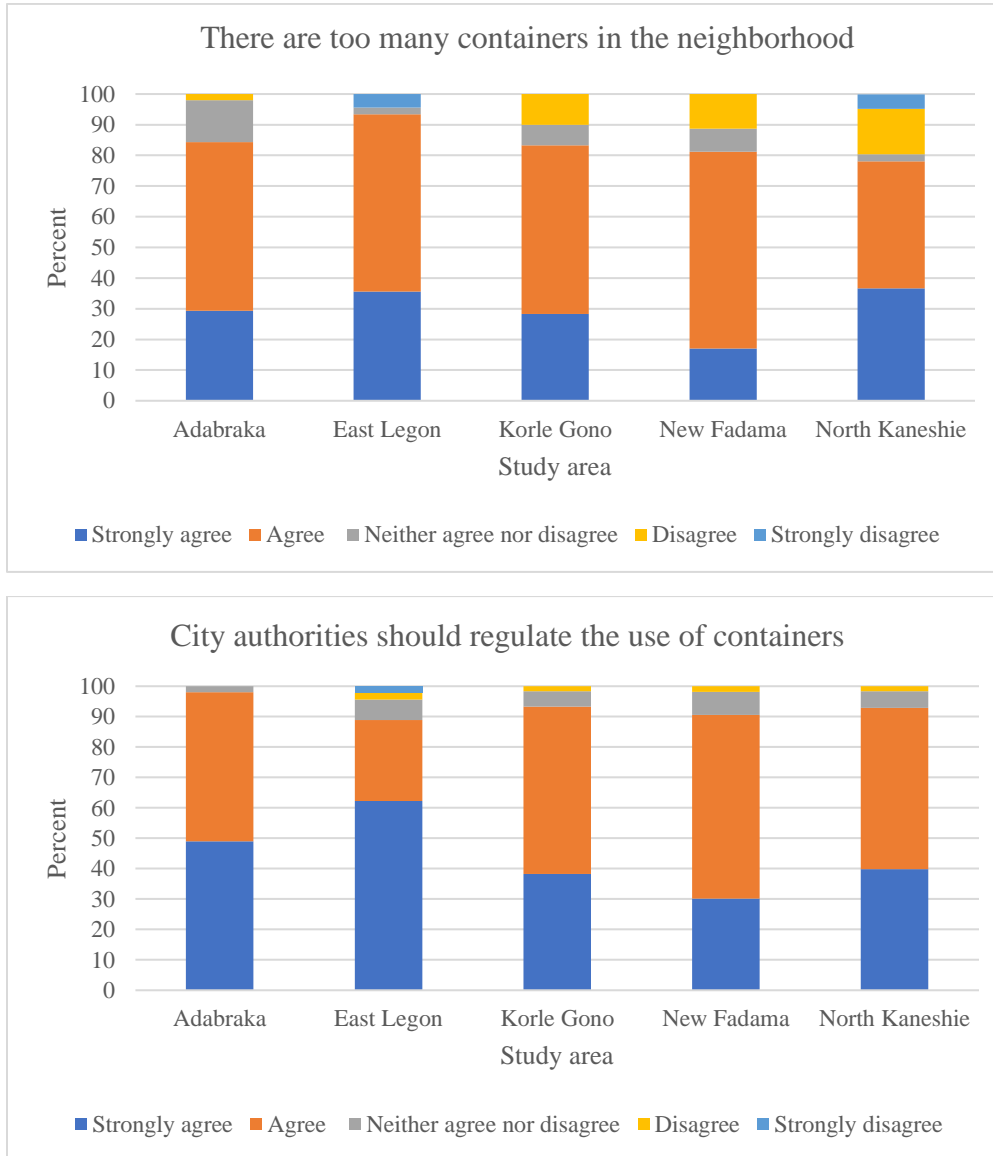
Figure 60: Container ubiquity and regulation

Membership of a neighborhood association across all the study areas was generally low (30%), except for East Legon (76%) (Table 21). The survey, however, found that household heads were more likely to join a neighborhood association if they reside in a neighborhood for a longer period. In a certain sense, membership of a neighborhood association is indicative of strong

social integration and may likely evolve into community mobilization and organized resistance against neighborhood change brought about by the spatial diffusion of new forms of urbanization. After all, a 'collective constellation of actors' is a recipe for both 'oppositional set-ups' and the 'plurality of ideas and techniques' (Delz, 2018, p. 209). Furthermore, in an overly politicized landscape in Ghana, membership of a political party at the neighborhood level is more likely to influence the normalization of container urbanism. According to Pieterse (2008, p. 137), an effective political voice for the masses reinforces participatory democratic systems, which may ultimately affect the decision-making process and priorities of local governments. A significant proportion of household heads (68%) said they were members of a political party in Ghana (Table 21). Invariably, household heads with party affiliation are more likely to exercise political influence at the municipal and district level to regulate the spatial diffusion of container urbanism. In *Defending the city, defending votes: campaign strategies in urban Ghana*, Klaus, and Paller (2017, p. 687) argued that: "Being in power at the constituency level provides a legitimizing mechanism, providing the party with a mandate based on holding the popular support of the majority local population. This enables party officers to pursue anti-outsider policies and strategies by subscribing to the will of the people." Political party membership was high in the high-income and the middle-income neighborhoods of East Legon (96%) and North Kaneshie (73%) respectively (Table 21). On the other hand, political party membership was moderate among respondents in low-income neighborhoods: 42% in Korle Gono and 57% in New Fadama. The relatively low political party membership among low-income respondents is an indication of the general discontentment and alienation from the political system in the country. According to Gillespie (2016), the 'perception of disenfranchisement' is deeply rooted in the large section of the urban population in Accra. The threat of containerization of urban space to neighborhood transformation may reduce socio-political detachment and passiveness, ultimately resulting in social organization and community engagement. Increase community members' involvement in neighborhood associations and political patronage may lead to the actualization of NIMBY syndrome. In broad terms, NIMBY refers to the "intense, often emotional and usually organized opposition to siting proposals that residents of a local community believe will result in adverse impacts" (Wexler, 1996, p. 92). On the housing question, NIMBY concerns "people who oppose subsidized dwellings, group homes, and shelters for the homeless" (Pendall, 1999, p. 112). Residents' opposition to new developments

such as containerized structures can be explained by the fear of property value depreciation and quality of service (Pendall, 1999). Residential groups can lobby politicians to enforce regulations.

Table 21: Percentage of Household Heads with affiliations and relationships with key stakeholders.

Study area		Member of a neighborhood association	Member of a political party	A close relationship with Member of Parliament of the area	A close relationship with Assembly Member of the area	A close relationship with MCE/DCE of the area	A close relationship with opinion leaders/community leaders of the area	A close relationship with a municipal or district assembly official
Adabraka	Yes	23.5	78.4	0	29.4	21.6	17.6	37.3
	No	76.5	21.6	100	70.6	78.4	82.4	62.7
East Legon	Yes	75.6	95.6	13.3	15.6	15.6	48.9	28.9
	No	24.4	4.4	86.7	84.4	84.4	51.1	71.1
Korle Gono	Yes	25	41.7	1.7	11.7	0	11.7	18.3
	No	75	58.3	98.3	88.3	100	88.3	81.7
New Fadama	Yes	26.4	56.6	0	5.7	1.9	34	9.4
	No	73.6	43.4	100	94.3	98.1	66	90.6
North Kaneshie	Yes	21.1	72.7	0.8	28.1	4.7	29.7	26.6
	No	78.9	27.3	99.2	71.9	95.3	70.3	73.4

Source: Field Survey, 2018/2019

8.4. What is the institutional response to the pervasiveness of the containerization of urban space in Ghana?

"*We [the government] seek to take advantage of technologies of container homes and condominium high-rise buildings on limited spaces to house large numbers of citizens*" (Mr. Samuel Atta Akyea, Minister for Works and Housing, August 2018).

The containerization of urban space has entered public discourse in Ghana. A newspaper panel discussion on Metro TV's Good Morning Ghana programme in August 2018 laid out the political, policy, and moral divisiveness of the containerization of urban space. The panel which

comprised of a senior government official and a managing editor of one of Ghana's major news media groups reacted to a proposal by the Minister for Works and Housing to build 'container homes, condominiums to reduce housing deficit' in the country (Goldstreet Business, 2018). The managing editor outrightly opposed the normalization of container urbanism and argued for a long-term solution to the housing crisis in the country instead of the quick fix proposed by the government. Arguing purely on economic and social grounds, the senior government official vigorously defended the minister's proposal as a strategy for providing affordable housing. Crucially, the managing editor's skeptical disposition and the government official's observably defensive proclivity is reminiscent of Ward (1979, p. 45) treatise about prefabrication as a mode of housing production.

The facts are obvious, most urban dwellers in Accra improvise containers for the right to the city, the right to centrality. Even clearer is the fact that informal urbanism in Ghana has supplanted the supremacy of the state as the progenitor of urban materialism i.e., basic infrastructural services and housing. This is not surprising because urbanization in Ghana has reduced poverty and contributed to the development of human capital (World Bank, 2015). The analysis of institutional actors was mostly informed by the contradictions inherent in the instrumentalization of urban planning processes in Ghana. Conflicting urban policy trajectories is seemingly exemplified through the institutionalization of a top-down and neoliberal urban planning approach. For instance, the government has long perceived informal settlements such as Old Fadama which is strategically located within the Central Business District as a hindrance to the neoliberal urban planning agenda (Afenah, 2010). The consolidation and juxtaposition of state and local actors' neoliberal urban planning approach and container urbanism was made abundantly clear when a senior officer of the Urban Development Unit at the Ministry of Local Government and Rural Development (MLGRD) revealed that: "*Most people are not aware of this, but the unregulated use and localization of containers devalue the surrounding property as well as results in the under-utilization of the land*" (Interview, 2018). Relatedly, another senior official at the Ministry of Land and Natural Resources stated that: "*Aside from the environmental effects and health issues, locating containers all over the place underutilize and undervalues the land*" (Interview, 2018). The commodification of state land and the prioritization of a neoliberal urban planning agenda will inevitably render container users vulnerable to evictions and regularization.

The proliferation of container urbanism has unquestionably gained the attention of institutional actors responsible for spearheading Ghana's urban development strategy. As expected, urban institutional actors took a more didactic approach to the issue of the pervasiveness of the containerization of urban space. Urban institutions conceptualize the containerization of urban space based in its 'momentary existence', and in the process, essentializing containerized structures as a form of aberration. Institutional actors also acknowledged that the containerization of Accra's urban space is a consequence of the widespread inequality and poverty. It was emphasized that:

Containers are part of the landscape, not just on government land… it is a means of survival for the people... it is just a few places where we are able to control them [containers], but they are everywhere. People moved into containers because they were more secure. Without containers and the informal sector in general, the unemployment situation would have been disastrous. Even though we have the right to sack them from the area [government lands], we are not motivated to do that because it is their means of survival…. And some of our markets are not well developed to accommodate everyone" (Senior Officer, Public Vested Lands, Lands Commission, 2018)

I think it [containers] serves as a form of improvisation. It is a quick way of securing space in the urban environment. It is also a way of addressing the housing deficit in the city. Most of the containers can be easily removed and moved from one place to the other. Also, they place these containers along the road to attract people. There are some advantages since it is less expensive and can also serve as a temporal structure (Senior Officer, Urban Development Unit, MLGRD, 2018)

People use containers because of convenience. It is already built so they just build a platform, create a roof then they have a property. It is easy to construct or prefabricated and you can move it from one place to the other. It does not occupy too much space so you can site it along the road (Senior Officer, Ministry of Land and Natural Resources, 2018)

It is an eyesore. These structures [containers] are not supposed to be used. I do not know where the idea came from, but I believe it is less expensive compared to bricks and mortar…. And most of them are in a place where you cannot put a permanent structure. The temporality is a factor. The wooden structures are easily broken into, so they want it to be a bit secure, so they went for the container… (Senior Land Registration Officer, Lands Commission, 2018)

In an attempt to create a utopian vision of a so-called 'proper community', characterized by 'acceptable housing' (whatever that means) devoid of informal structures, urban planning institutions are often eager to formalize informal, irregular, or illegal settlement (Watson, 2003, p. 396). It is, therefore, understandable why most planners in African cities make assertions about a "better life for all in bricks and mortar" (Myers, 2011, p. 96) in their resolve to formalize informality. This study agrees, broadly with the notion that container regulation and control as espoused by urban institutional actors in Ghana is a manifestation of the 'clash of rationalities'

in urban planning. Studying planning practices in South Africa, Watson (2003, p. 401) suggested that the notion of 'proper communities' eschewed by urban managers are in constant conflict with "the rationality which informs the strategies and tactics of those who are attempting to survive, materially and politically, in the harsh environment of Africa's cities." In a recent editorial for Urban Design International, Hou (2020) argued that: "At a fundamental level, guerrilla urbanism [such as container urbanism] represents disruptions and challenges to the rationalist, technocratic, and post-political paradigm of planning and design that tends to dominate professional discourses and practices." Institutional actors emphasized the need for spatial order as far as containerization was concerned. The institutionalization of spatial order has long dominated the urban development and policy agenda in Ghana (Steel et al., 2014; Spire and Choplin, 2018; Fält, 2016; Gillespie, 2016; Government of Ghana, MLGRD, 2012; Yankson, 2000). The basic crucible of spatial order relates to the illegalization of unauthorized structures such as containers and restrictions on petty trading in the city of Accra (Fält, 2016). Retrospectively, a comprehensive spatial order plan was put into motion in a by-law passed in 2011 and bolstered by the 2014 Accra development plan (Fält, 2016). More significantly, the legitimization of spatial order triggers the exertion of punitive planning regulations such as forced evictions and dispossession. Spatial order can be construed as a tool for the rationalization and fortification of the neoliberal urban planning approach by city authorities. Urban Institutional actors argued that:

The issue is that it [containers] should be properly planned, and designed, to follow the laws and regulations. This is because people are building structures with wood so if containers are materials that can be used for structures then it should be managed and controlled. (Senior Officer 1, National Development Planning Commission, 2018)

The most important thing is the planning of these containers. If the containers can be properly planned and placed at the appropriate places, then there should be no problem. It will just be like having a permit for any structure that is in the form of an office building or homes. (Senior Officer 2, National Development Planning Commission, 2018)

There should be a ban on the use of containers. The Standards Board should come out with very standardized low-cost housing and special street design. Also, containers should be recycled. In my opinion, I think it should be banned or used for industrial purposes (Senior Officer, MLGRD, 2018)

Unsurprisingly, discussions about the proposal by the Minister of Works and Housing to build container homes came up during interviews with urban institutional actors. Reacting to the proposal, a senior officer of the MLGRD further explains that:

It is not a good idea for people to live in containers no matter the design. Living in containers is not good for health. They are supposed to carry goods not human beings. If they can reconstruct it or use other building materials, it will be better than using containers. Maybe it is because it is in abundance, so they want to recycle and use them. Thus, if they want to use it [containers] for housing then an architect must redesign and improve on its quality. They must also make sure to provide the right location and the right conditions within the environment. I am not saying it is impossible but if we get the proper technology it will be better this way. Building the container just for people to sleep in should not be allowed. I think formally, it should be redesigned properly to meet the housing code. You can even use part of the material or other materials that will make the building conducive to live in. We have building regulations, codes, and standards that must be adhered to and enforced (Interview, 2018)

A senior officer at the Ministry of Land and Natural Resources also stated that:

Sometimes, policymakers make mistakes. What is the level of consultation that was done and what is the level of acceptability? Is that what people want? People are poor but it does not mean they want to live in it [containers]. (Interview, 2018)

Evidence suggests that greater land-use regulations emphasized by most urban institutional actors increase housing costs which further reduces the prospects of low-income households to access the housing and property market (Dowall, 1979; Gabbe, 2017; Ihlanfeldt, 2004; 2007).

Furthermore, the growing politicization of spatial and urban planning have relegated key urban institutions into passive actors in the unraveling of emerging forms of urbanization (Abdulai and Hickey, 2016; Gillespie, 2020). Political interference in instances of demolition and eviction invariably undermines the operationalization and enforcement of planning legislative instruments. Furthermore, some urban institutions are rubber stamps of the government and may lack effective authority to enforce existing regulations. The World Bank (2015) proffered that: "Land use planning [in Ghana] is negatively affected by political and institutional constraints related to coordination and Metropolitan, Municipal and District Assemblies (MMDA) capacity, including an unresponsive legislative framework, undue political interference, acute human resource shortages, and inadequate financial resources." A senior spatial planner expressed his frustration with the superficiality of regulatory frameworks, stating that:

"Sometimes, politics also plays a role in the containerization of urban space. In certain cases, when district assemblies go and stop people from putting their containers in unauthorized areas, the politicians intervene and stop them from doing so since they see them as poor people who just want to make a living. Moreover, some of the district assemblies are not proactive regarding the regulation of these containers. Therefore, politics and negligence of the technical staff within district assemblies contribute to these problems" (Senior Spatial Planner, Land Use and Spatial Planning Authority, 2018)

Arguing along similar lines, a senior officer at the Lands Commission states that:

I think it is the failure of the government to solve this problem. I believe there should be more regulation. These containers are located indiscriminately, and they destroy the beauty of the urban space (Interview, 2018)

Moreover, the pervasiveness of containerized structures can be attributed to the lack of legislative instruments to regulate this form of urbanization. An official explains that:

"our existing regulations do not make provisions for these developments [containers]. There are no clear-cut guidelines as far as I am concerned. What the law basically says is that every physical development must be regulated and the way this law defines physical development……even the tilling of land is considered as physical development so certainly putting up a container becomes a physical development….. I want to believe that the new regulation will make room for things such as containers. So once this law makes provisions for all physical developments, I believe the LI's will make provisions for containers or kiosks or whatever. It is the prerogative of the assemblies to enact by-laws to regulate how these things happen in the urban environment. I know the assemblies have building by-laws which make provisions for such developments, but these are left for discretion as far as I am concerned" (Senior official, AMA Physical Planning Department, 2018)

Furthermore, poor inter-jurisdictional coordination among urban institutions such as the 'fragmentation of assemblies' in Ghana (World Bank, 2015:45) may likely undermine a concerted framework for the regularization of the containerization of urban space. Additionally, poor inter-jurisdictional coordination will most certainly hinder the implementation of facilitative institutional arrangements (Mooya and Cloete, 2007, p. 155), such as securing property rights that may alleviate the plights of container users, and other informal urban stakeholders (Myers, 2011). According to Watson (2003, p. 397), a collaborative urban planning decision-making process ensures that all stakeholders are treated fairly and equally. Decades earlier, Wildavsky (1973, p. 127) talked about the burden of planning where "the planner has become the victim of planning. Planning has become so large that the planner cannot encompass its dimensions." Crucially, the hybridization of urban institutional arrangements in African cities and Accra, in particular, has created an illusion of control where urban institutional actors acknowledge that: "*the current improvisation of containers are largely determined by the users contrary to urban planners*", but staunchly believe that: "*city managers should determine where containers should be placed and enforce regulations and by-laws*" (Senior Officer 2, National Development Planning Commission, 2018). The blame for the pervasiveness and unregulated use of containerized structures lied squarely with the sub-metropolitan district, zonal and town councils.

The prudentialization of regulatory frameworks and the widespread chorus to ban containerized structured by institutional actors have made the activities of grassroots groups and civil society organizations ever more important. Civil society organizations play a crucial role in the co-production of urban space as well as essentialize a bottom-up approach in upgrading informal settlements (Delgado et al., 2020; Grant, 2006). One such group is the People's Dialogue on Human Settlements (PD) in Ghana. The organization is affiliated to the Shack/Slum Dwellers International (SDI) with networks across three continents (African, Asia, and Latin America). PD was established in 2003 to build the capacity of the urban poor in Ghana. The organization morphed from its primary objective to fight against the imminent threat of eviction among informal settlers in Old Fadama, Accra. With over 80,000 members, PD ensures that the poor and marginalized are adequately represented in the urban decision-making process in Ghana. A senior community advocate at PD explains that: "*almost all the government agencies and some international organizations such as the UN and the World Bank interested in engaging with the community reach out to us because our organization has a lot of influence at the community level*" (Salifu, 2019). The container has increasingly become the preferred mode of urban production for most members of the PD. According to Salifu (2019), "*for most of our members, the container serves a dual purpose: a place for doing business and a home to raise their families. The container is also a safeguard against destitution*". Fundamentally, PD provides support and information concerning land tenure and accessibility to services in informal settlements. Furthermore, PD negotiates with local authorities to pushback against the eviction of container users and informal settlers in general. Civil society organizations such as PD have a history of preventing unlawful forced evictions and engaging in productive dialogues with authorities to address challenges confronted by the urban poor (Afenah, 2010). Data collection constitutes a quintessential component of the activities of PD and other civil society groups championing the rights of informal urban dwellers. Through its community mobilization process, PD collects and catalogs data on various aspects of residents in informal settlements. Datafication has proven very useful in the creation of partnerships with relevant organizations as well as ensures constructive dialogues with local authorities in the decision-making process (Salifu, 2019).

Civil society organizations such as PD are sometimes caught in the crossfire of the clash of rationalities in Accra's urban governance process. Salifu of PD explains that:

"*I support the regulation of containers in the city as long as the rights of users are respected. Our organization, however, does not support forced evictions and demolitions which are usually the case in Accra. We sometimes coordinate with relevant local authorities to ensure an orderly removal of container users in clearly dangerous and hazardous locations where the conditions are deplorable. For instance, we recently coordinated with city authorities in the eviction of container users along the Accra-Tema Motorway due to the dangers the siting posed to the health, safety, and security of our members and informal urban dwellers in general*" (Interview, 2019).

Fält (2016, p. 477) insisted that local authorities in Ghana justify the regulation of informal urban processes by focusing on the poor living conditions and health hazards posed by these settlements to the city. Special attention was drawn to the environmental impact of the containerization of urban space. According to urban institutional actors, if the proliferation of container urbanism remains unencumbered, the environmental impact will be consequential. The environmental impact of the containerization of urban space in Accra is linked to the challenges inherent in the transformation of planning and sustainability policies in practice. According to a senior officer at the Ministry of Land and Natural Resources,

Developments in urban areas and Ghana at large do not conform to the plan. The usual assumption is that planning schemes are not necessary. This can be attributed to the system of bureaucracy whereby securing a land title or a permit from the Lands Commission is a major problem. On the issue of security of land title, most people are scared that someone might take their land away, so they start something that the planning scheme does not prohibit (Interview, 2018)

The analysis of the perceptions of institutional and everyday urban dwellers was to understand resistance and the future of the containerization of urban space. The general disapproval of containerized structures by both urban institutions and the wider urban population may pose a risk to the spatial diffusion of the containerization of urban space. Furthermore, widespread opposition from the various stakeholders in Accra may exclude vulnerable and low-income households from improving the quality of their everyday life with far-reaching consequences for urban citizenship and the right to the city.

Chapter Nine: Summary and Conclusion: Containerization of Urban Space with Ghanaian Characteristics

9.1. Summary of Study

This thesis is primarily concerned with addressing the 'container question' within the context of urbanization. More fundamentally, what exactly constitutes the containerization of urban space? Do the container paradigm warrant theorization and empirical validation? How prolific is the container paradigm in the global urban landscape in general and African cities in particular? The overall objective of this thesis has been to understand the impact of emerging urban processes, such as the containerization of urban space on the transformation of the built environment. Accordingly, the study examined the containerization of urban space from the global political-economic perspective to critical urban studies. Firstly, this thesis described how containerization hegemonized consumer society through globalization. The study went ahead to explore the global container home market through the prism of disruption, momentum, and risk. The study perceived the containerization of urban space within the framework of the commodification, critical housing studies, urban inequality, poverty, and the right to the city. This research has shown that the container is a metaphorical juxtaposition of the lived experiences of urban dwellers.

Cities in the global south are undergoing fundamental changes and re-invention, in the process becoming sites of transformation (Robinson, 2006). African cities, in particular, manifest these transformations through, "their potential for imaginative reconfiguration, as their physical fabric and collective life, are open to reinvention, even if their outward form remains difficult to change, or simply decays" (Robinson, 2006, p. 255). In recent years, container urbanism has contributed to these transformations occurring in African cities and Ghanaian cities in particular. The distinctiveness of this radical spatial and social transformation is at the core of the conceptualization of the urban question in African cities.

9.2. Summary of Key Findings

To better understand the various aspects of the containerization of urban space, it is crucial to revisit the research questions posed at the beginning of the study.

9.2.1. What factors propel the adoption and innovation diffusion of Steel Containers as an option for retail and dwelling space in urban areas?

The value of the container, as a mode of urban production, serves three main purposes for many urbanities in African cities, namely the container functions as dwelling space, for commercial purposes, specifically for retailing goods and services, and finally multipurpose: for both retail and dwelling space. The study, consequently, identified three categories of container adopters. Firstly, there are those from low-income backgrounds (Table 22). Secondly, there are new migrants' arrivals in Accra from other parts of the country with urgent housing needs. Thirdly, there are those in middle and high-income neighborhoods confronted with an astronomical cost of rental space. The availability of construction and building materials influence the adoption and spatial diffusion of containers in urban space in Ghana. UN-HABITAT (2011) noted that the construction and building materials in Ghana have been in short supply in recent years despite a steady growth of the construction industry. This growth experienced by the construction industry, however, caters to the needs of the formal real estate and housing market with limited opportunities for a large section of the urban population. Ironically, construction sector growth was at the backdrop of a housing crisis in Accra. Arguably, the formal housing sector received ample support from successive governments such as tax breaks, subsidized land, and favorable loan condition (UN-HABITAT, 2011). For so long, the state assumed limited responsibility in the provision of affordable housing despite its capacity to mobilize resources and investment to "provide low-income housing or support for in situ upgrading of slums [and] enforce new standards, which in turn can be used to leverage larger marketwide shifts in consumer and investor preferences" (Pieterse, 2008, p. 140-141). The pervasive dollarization of the rental market in Accra has reinforced the exclusivity of the formal property and housing market.

The study has shown that container adoption in the global south context is tightly linked to the spatial, sociodemographic, and economic characteristics of the urban population. The container's role in the built environment reflects the spatial meanings, the temporal and social organization of urban processes. Container adoption was a function of affordability, temporality, choice, risk of poverty. Social networks and information acquisition are crucial for the adoption of container structures. Surprisingly, the results show that social networks play a limited role in the adoption of containers. Consequently, container adoption was based on an individual's own decision. Economic factors revolving around issues of cost and affordability were a fundamental

determinant for container adoption in Accra (Alexander et al., 2001; Valente, 1996; Valente et al., 1997; Valente and Davis, 1999). This finding has important implications for understanding how disruptive innovations diffuse over time in cities in the global south. Crucially, the results about container adoption depart from the assumption that social influencing processes, rather than economic factors account for the adoption of innovations.

Crucially, women were more likely to improvise the container for various purposes compared to their male counterparts. Additionally, bargaining power and the patriarchal nature of Ghanaian society determine the purchasing power and subsequent adoption of container units. The disparities in bargaining power show the slow progress in the dismantling of traditional gender roles and attitudes in Ghana. Results from the study also indicate that young people were more likely to adopt disruptive innovations due to their inability to gain a foothold in Accra's exploitative rental market. The study found that the price range and value of the container were within the reach of many low-income families. The cost of renting a dwelling or retail unit from the traditional housing market was unreasonably high for most of the respondents sampled. Furthermore, most container adopters in the city of Accra seemed content with the poor conditions of the containerized units. Residential histories were tied to container improvisation. For example, newly arrived migrants to Accra were more likely to adopt the container. Moreover, income and access to land is a key determinant to decisions regarding owning or renting a container. Container renters are more likely to be individuals with low average monthly income and new migrant arrivals.

Table 22: Summary of the innovation diffusion process of container urbanism

Urban Orientation	cities	Innovation driver	Technological Standards	Innovation actor	Innovation adopters	Innovation momentum
Global North	Brighton, Philadephia, Sacramento, Kansas City, Providence, Charlotte	Formal sector	Advanced	Venture capitalists, banks, national and local governments, architects, Modular building associations,	Contractors and developers, local governments, multinational corporations, homeowners, startups, minimalist, tiny housing movements	Regulated and legitimate (low momentum)
Global South	Accra	Informal sector	Elementary	Welders, informal sector operators, civil society organizations	Low-income households, new migrant arrivals	Unregulated (high momentum)

Source: Derived from Fieldwork, 2018/2019

9.2.2. Does the innovation diffusion of Steel Containers in urban areas exhibit any spatial structure?

The basic spatial organization of a typical container unit consists of a rectangular steel structure with a single room without any clear subdivision. The structure also consists of a steel roof, a small window for ventilation, and a concrete foundation to protect against floods and secure the plot of land. Furthermore, a typical locally prefabricated container unit comes in 10ft, 20ft, 30ft, and 40ft configurations. Cities thrive on centrality- the convergence of economic and urban life in a central space. The study found that locational decisions were paramount to the spatial diffusion of containers. The spatial structure and distribution of the container phenomenon are directly linked to the economic and social divisions of urban space in Accra. Crucially, container location decisions have a significant impact on evictions, the security of tenure, and access to consumers. The study found that hierarchical spatial diffusion accounted for the spatial structure of container distributions in the city of Accra. The hierarchical spatial diffusion was accordingly masked by socioeconomic determinants resulting from exclusionary practices in the formal/traditional urban real estate market. The container hierarchically diffused from the

economically marginalized class in informal settlements and low-income neighborhoods to the economically dominant class in middle and high-income neighborhoods who are disenchanted by the high cost of living and rental space. In effect, the container urbanism reduces the utility maximization of urban space and normalizes low-rise living.

A noteworthy and observable spatial structure of the containerization of urban space in Accra relates more precisely to the agglomeration effect. Effectively, container locations were not randomly distributed but located close to each other. Agglomeration effect guarantees a sense of security, community, and safeguards against state-sanctioned eviction practices. Location preferences are fundamentally determined by the cost of container units, attractiveness to consumers, the land tenure structure, and the risk of eviction by local authorities and landowners. The findings indicate a strong relationship between access to land and quiet encroachment practices (Pieterse, 2008).

The findings further show that the probability of container agglomeration decreases with the size of container units. Consequently, as urban dwellers adopt larger container configurations, choice probabilities of agglomeration decreases. Furthermore, the preference for container concentration, especially those improvised for retail purposes can be explained by the fact that "customers are distance sensitive and that the probability of visiting a store, ceteris paribus, decreases with increasing distance" (Timmermans, 2004, p. 135). Another key discernable spatial organization of the containerization of urban space is the clustering of containers around the main road. The rising competition for space to site containers has resulted in the peripheralization of container structures. This spatial process is rapidly manifesting in peri-urban areas around the city of Accra. Similarly, the size of the containers become larger as one moves from the core urban neighborhoods to the peri-urban areas.

9.2.3. How are containerized spaces produced, co-produced, experienced, perceived, and contested?

Interviews with container prefabrication and distribution firms at the macro level reveal a growing interest in the container home market. Strong evidence suggests that local authorities in certain cities are turning to the container home market to address the housing deficit confronting major urban centers in the world. Further analysis shows that global conglomerates and brands are embracing containerized architecture in cities as part of the transition towards environmental

and sustainable climate futures. Similarly, a growing group of environmentally conscious urban dwellers actively involved in the tiny housing and minimalist movements is shoring up the container home market as an alternative mode of urban housing production. The sector is, however, fraught with challenges emanating from state regulations, and bureaucracy, customer indecisions, and fierce competition from the traditional housing and real estate market.

The containerization of urban space in Accra is (co)-produced collectively, through a network of social organization, ranging from landowners and landlords, traditional and state institutions, family ties, and the technical knowledge of informal sector operators. The majority of container adopters participate in the decision-making prefabrication process. More specifically, adopters make decisions about the size, modularity, security, and safety of container units. Unsettlingly, the containerization of urban space is consistent with assertions made by Myers (2016:94) that the majority of residents in Accra, dwell in 'nonpermanent houses' characterized by limited infrastructure and services. If we are to subscribe to the notion that an architectural object "enlarges our power to live and to continue living in accord with our most authentic nature" (Schwarz, 2014, p. 209) then a containerized object at least in the Ghanaian context falls short of the symbolic meaning of architecture. Containers for dwelling purposes are embedded in residential areas for access to existing amenities such as toilets, baths, water, and electricity. The limited space in most containerized units exemplified through the square foot area leaves little room for installing basic household amenities.

The containerization of urban space in Accra challenges the notion of the lawfulness of choice in the urban built environment. According to Rapoport (1977, p. 15), the choices made regarding activities in the built environment "tend to be lawful, to reflect sets of rules, so that one way of looking at culture is in terms of the most common choices made." Contrarily, the containerization of urban space permeates through the logic of illegality and exception. For local authorities and the wider urban population, the adoption of the container has many trappings of impermanence. Collectively, however, there was a general perception among the wider urban population that container improvisation was detrimental to the built environment. The low social acceptability accrued from the spatial structure and organization of container agglomeration effects in the city of Accra. The social acceptance of containers, however, consolidated class hierarchies through the *othering* of container adopters. Class hierarchies were strengthened by perceptions of

household heads that most container users were not members of their community. Although there appears to be little resistance from the wider community, the overconcentration of containers in neighborhoods risk community mobilization against the spatial diffusion and normalization of container urbanism.

The aesthetic appreciation of the proliferation of containers is implicitly and explicitly representative of its impact on the built environment. From a design perspective, the container lacks aesthetic ostentations, regard for the urban environment, and conformity with existing buildings and regulations. Also, the aesthetic experience and judgment of container improvisation in Accra is rooted in class subdivisions. For instance, the governing class represented by local authorities and elites perceive the container in more austere disposition. Emblematized in a state-sponsored coterie are efforts to regulate the proliferation of container urbanism through the institutionalization of legislative and emergency decrees.

A spate of container burglaries in Accra in recent years is of great concern for most urban dwellers. The operationalization of containers for mobile money outlets, in particular, have exposed most container adopters to security risks such as assault, theft, armed robbery, and even homicide. The results of the study have shown that fear of crime among container adopters was high, despite the relative safety and durability of containerized structures compared to wooden shacks. Fear of crime has affected the opening and closing times of containers in most neighborhoods, which ultimately impact urban social interaction.

Container improvisation leads to a moderate improvement in the living conditions of many urban dwellers. The findings show that the low cost of container units has a strong influence on life satisfaction despite the size and design of most container structures. The relative improvements in the quality of life are evident through the reduction in the risk of poverty and destitution for many low-income families. The findings show that those who improvise the container for both retail and dwelling purposes reduces the income spent on commuting to other parts of the city to work. Furthermore, the dynamism of the container, more specifically, the use for both commercial and dwelling purposes, shows the linkage between productive and non-productive space in Accra.

The study, however, found that the overall quality of life of container users correlated with environmental conditions. The environmental wellbeing of container users varied by

neighborhood. Environmental parameters were measured to ascertain the impact of container improvisation of overall life satisfaction. Consequently, the analysis of environmental parameters such as air quality, dust, noise, sanitation, temperature, show that container users were generally satisfied with their overall environmental wellbeing except for a few outliers in certain neighborhoods with heavy industrial activities. Furthermore, the benefits of container improvisation supersede environmental externalities associated with damages to the urban built environment. Put differently, the economic justification of container improvisation outweighs the cost to environmental sustainability.

9.2.4. Does the adoption of steel containers affect urban social interactions?

Ideally, a building's socio-spatial configuration enhances or hinders human interaction (Lindsay, 2014). By design, the container meets the requirements for promoting social interaction in the conventional sense, due to spatial, economic, and social enablers in the dynamics of urbanization in Ghana. The study found a positive correlation between the size of containers and social interaction. For instance, container users with smaller container sizes were more likely to be in residential areas, consequently facilitating social interaction. Furthermore, container users were more likely to agglomerate around other container users to promote interaction among social groups and safeguard against prejudice from the wider urban population. The study found that strong social ties contributed to the continued use of containers in Accra. Long-term container users are more likely to make friends with their neighbors and integrate into the community. This safeguards against eviction and complaints from neighbors (non-container users). Additionally, negative social interaction with other container users and neighbors is more likely to hinder continued use space in neighborhoods. The results further show that container users' engagement in community activities such as funerals, attending church, mosque foster social interaction with the general neighborhood population. These cognitive and behavioral dimensions of social interaction have an impact on the social isolation of container users. The generally small size of most container units and high occupancy rates, however, leaves little room for privacy and self-expression. For this reason, the container is devoid of the luxury of solitude enjoyed by many in the traditional housing sector.

9.2.5. Does the innovation diffusion of Steel Containers have an impact on urban planning and sustainable urbanism?

The relationship between the containerization of urban space and sustainable urban development gets proper attention in this thesis. The findings indicate that the incremental move towards a container society affects sustainable urban development. From an environmental sustainability point of view, the reuse or recycling of containers for either dwelling or commercial purposes has a strong impact on reducing the overall ecological footprint of an individual and the community at large. In the long run, the reduction in emissions due to container improvisation ensures the micro stability and mitigation of the climate. From a social justice perspective, the containerization of urban space serves as a symbol of economic and social identity for marginalized groups. Moreover, from a social sustainability standpoint, container adoption ensures community development through the creation of inclusive communities for low-income and vulnerable households. The case study of Accra shows that the containerization of urban space provides street vendors with safety and security against the vagaries of the weather and fire outbreaks, which are rampant with wooden shacks and kiosks.

Undoubtedly, the flooding situation in Accra has worsened because of the normalization and unregulated use of containerized structures. Confoundingly, all the key stakeholders in the study agreed that container improvisation harmed the built environment and sustainable urban development. Furthermore, the findings show that containers located along waterways increase the risk of flooding, and ultimately the loss of life. Consequently, the unregulated localization of containers and the risk of flooding plunges low-income families deep into poverty and derails the prospects of their upward social mobility.

A significant derivative of this study relates to the contested impact of the containerization of urban space on urban spatial planning and policy. On the institutional front, legislative instruments give local authorities exceptional power to exclude 'undesirable' urban processes all in the crucible of proper spatial planning. Consequently, urban institutional actors expressed deep concern about the gradual de-professionalization of urban design and the technical order for an incremental and disorderly manifestation of urban processes. In some regard, institutional opposition to container urbanism is a consequence of the clash in rationalities in urban planning in Ghana. Pieterse elaborated candidly about urban development policy trajectories as it relates

to the urban poor. He spoke of the inclination of urban policymakers to prescribe solutions to urban problems without "a deep consideration or appreciation of the agency, skill, endurance, and effort that go into the survival and consolidation strategies of the urban poor," Pieterse (2008, p. 113). This thesis argues that imposing limitations on the containerization of urban space will adversely affect the livelihood strategies of low-income families and neighborhoods. Without any formal mortgage finance plan and affordable housing scheme for the most marginalized and vulnerable groups in African cities, the transition towards a more sustainable urban development will be far from sight. A noticeable advocate for container users in Accra is grassroots and civil society organizations. Grassroots organizations such as People's Dialogue have spearheaded the globalization of local development resulting in the change of governments' attitude towards forced evictions in Accra (Grant, 2009). Grant (2009) further argues that international pressure evident through international delegations into informal settlements as well as dialogues between local authorities and international NGOs helps to advance the interests of the urban poor. Grassroot organizations create and consolidate partnerships with local communities to ensure that the interests of the urban poor are taking into consideration in local politics and governance.

In a broader sense, the genuine desire by many urban dwellers to improvise the container has been eclipsed by the unfortunate de-pedestrianization of sidewalks. Describing the evolution of Oxford Street in Accra, Quayson (2014, p. 14) indicated how "the sidewalk progressively became not the broad strip specifically designed for pedestrians to traverse but merely the stripped-down extension of the interior of the many commercial enterprises along the street." It was evident through the study that the containerization of urban space has significantly narrowed the streets in all the neighborhoods, and as a result, minimizing accessibility and walkability.

9.3. Future Research Directions

The conclusions drawn in this thesis raises an array of questions of considerable importance that require further empirical research. Firstly, longitudinal research is needed to ascertain whether the disruptiveness of container urbanism has a corresponding effect on rent in the traditional housing market. More importantly, further research is necessary to explore whether rising container adoption leads to the rent stabilization in Accra. Moreover, studies are required to explore the tensions between traditional property developers and the (co)-producers of the containerization of urban space. Also, this thesis invites additional analysis into the impact of

external predictors, such as the cost of container prefabrication materials, the global supply and demand for shipping containers, the infusion of global capital and speculation, the consolidation of neoliberal urban governance, internal political dynamics, and proposed legislation instruments on container adoption and spatial diffusion. Future research is also required to model the impact of climatic factors on container adoption in the global south. More specifically, additional studies should explore the impact of seasonal variation in average temperature, wind, and rainfall on the structural stability (adaptability and scalability) and durability of the container. The purpose of a climatic model is to improve upon the design structure and feature of the container. This process legitimizes the containerization of urban space in the institutional cycle and ensures the containers' suitability to extreme weather conditions in the global south.

Secondly, it is especially relevant to understand the long-term diffusion process of the container as an urban innovation in the global south. A longitudinal inquiry into the diffusion process of the containerization of urban space will offer important insights for the understanding of the resistance to adoption and the socio-spatial momentum of the container. Of great importance is how a longitudinal study will be crucial in understanding the temporal pattern and mechanisms of the diffusion process.

Thirdly, further studies are necessary to understand the long-term psychological effects and health risks of container improvisation among various socio-demographic groups at the neighborhood level. For instance, does environmental pollution at the neighborhood level affect the long-term health and safety of container users?

9.4. Conclusion

This thesis raises deep questions about the discursive formations of the containerization of urban space. Accordingly, this thesis provides theoretical and empirical accounts of the transformation of urban space in Accra through the prism of the shipping container. The thesis meticulously theorized the materiality of urban processes in the global south by reflecting on the works of de Carla and Fallatti (2013), and Christensen et al. (2015; 2016). In exhaustive detail, de Carla and Falletti (2013, p. 14) argued that: "disruption is about the centrality of innovation, and the capacity for identifying and multiplying 'anomalies' in the on-going processes of production of urban environments." The center of gravity of de Carla and Falletti's and Christensen's conception of disruptions lies in the challenge to the status quo, the normative and dominant

force in the production of urban environments. Naturally, disruptive projects and interventions such as container urbanism "operate as skillful deceptions – allowing insights into the existing windows of opportunity for doing things differently, and thus into the possibility of fostering transformative change" (de Carla and Falletti, 2013, p. 14). This study has shown that any inquiry into the transformation of the built environment in cities in the global south should consider the normalization of disruptive projects and interventions. The study also postulates that the theoretical foundation of disruptive projects such as container urbanism should consider how the said phenomenon gains momentum across various socio-spatial configurations and the risk to sustainable urban transformation. The disruption, momentum, and risk framework used in this thesis was validated in Accra based on the fact that the containerization of urban space was made possible out of economic necessity, an anomaly, the right to the city, and the genuine attempt to promote an alternative production of the urban built environment. In effect, the containerization of urban space with Ghanaian characteristics contradicts the rule guiding the organization of space. These rules are characterized by neoliberal governance and deterministic planning processes. The innate counter-hegemony of container urbanism incrementally upsets the balance of power in the production of the built environment.

Bibliography

Acanfora, M., Montewka, J., Hinz, T. and Matusiak, J. (2017). On the Estimation of the Design Loads on Container Stacks due to Excessive Acceleration in Adverse Weather Conditions. *Marine Structures*, 53, pp.105–123.

Abdulai, A.-G. and Hickey, S. (2016). The Politics of Development Under Competitive Clientelism: Insights from Ghana's Education Sector. *African Affairs*, 115(458), pp.44–72.

Accra Metropolitan Assembly (2019). *Speeding; Leading Cause of Road Crashes in Accra- 2nd AMA Road Safety Report*. Accra: Accra Metropolitan Assembly, October 2019.

Adams, P. (2010). Action Research. In: N.J. Salkind, ed., *Encyclopedia of Research Design (Volume 1)*. California: Sage, pp.4–9.

Adams, W.M. (2004). *Green Development: Environment and Sustainability in the Third World*. London: Routledge.

Adarkwa, K. and Oppong, R. (2005). Gentrification, Use Conversion and Traditional Architecture in Kumasi's Central Business District – Case Study of Odum Precinct. *Journal of Science and Technology (Ghana)*, 25(2), pp.80–90.

Adarkwa, K.K. (2013). The Changing Face of Ghanaian Towns. *African Review of Economics and Finance*, 4, pp.1–29.

Addo, N.O. (1969). *Dynamics of Urban Growth in South-Eastern Ghana*. Unpublished Ph.D. dissertation, University of London.

Adner, R. and Zemsky, P. (2005). Disruptive Technologies and the Emergence of Competition. *RAND J. Econ*, 36(2), pp.229–254.

Afenah, A.A. (2010). (Re)claiming Citizenship Rights in Accra: Community Mobilization Against the Illegal Forced Eviction of Residents in the Old Fadama Settlement. In: A. Sugranyes and C. Mathivet, eds., *Cities for All: Proposals and Experiences Towards the Right to the City*. Habitat International Coalition.

Allen, M.T. and Hecht, G. (2001). *Technologies of Power: Essays in Honor of Thomas Parke Hughes and Agatha Chipley Hughes*. Cambridge, Mass.: MIT Press.

Akubia, J.E.K. and Bruns, A. (2019). Unravelling the Frontiers of Urban Growth: Spatio-Temporal Dynamics of Land-Use Change and Urban Expansion in Greater Accra Metropolitan Area, Ghana. *Land*, 8(9), p.131.

Alexander, C., Piazza, M., Mekos, D. and Valente, T.W. (2001). Peer Networks and Adolescent Cigarette Smoking: An Analysis of the National Longitudinal Study of Adolescent Health. *Journal of Adolescent Health*, 29, pp.22–30.

Allen, E. (2005). *How Buildings Work: The Natural Order of Architecture*. 3rd ed. Oxford; New York: Oxford University Press.

Angel, S., Chabaeva, A., Gitlin, L., Kraley, A., Parent, J. and Perlin, M. (2005). *The Dynamics of Global Urban Expansion*. Washington, D.C.: World Bank.

Appeaning-Addo, K., Jayson-Quashigah, P.-N., Codjoe, S.N.A. and Martey, F. (2018). Drone as a Tool for Coastal Flood Monitoring in the Volta Delta, Ghana. *Geoenvironmental Disasters*, 5(1).

Appeaning Addo, K. (2016). Drone Footage of Community Flooding and Coastal Erosion in the Volta Delta. *The DECCMA project*. http://www.deccma.com/deccma/projects_database/features/?action=story&id=82

Arku, G. (2009). Housing Policy Changes in Ghana in the 1990s. *Housing Studies*, 24(2), pp.261–272.

Aryeetey, E., Harrigan, J. and Nissanke, M. (2000). *Economic Reforms in Ghana: The Myth and the Mirage*. Trenton, Nj: Africa World Press.

Aryeetey, E. and Aryeetey, A.J.R. (1992). Planning for a Distressed City. In E. Aryeetey ed., *Planning for Africa's Growth and Development: Some Current Issues*. Legon: ISSER/UNDP.

Armstrong, W.R. and Macgee, T.G. (1985). *Theatres of Accumulation Studies in Asian and Latin American Urbanization*. London [U.A.] Methuen.

d'Auria, V. (2016). More than Tropical? Modern Housing, Expatriate Practitioners and the Volta River Project in Decolonising Ghana. In: R. Craggs and C. Wintle, eds., *Cultures of*

Decolonisation: Transnational Productions and Practices. Manchester: Manchester University Press, pp.196–221.

Amoah, S. (2012). *Gentrification and Urbanization in Ghana: The Case of the Central Business District of WA in the Upper West Region*. Saarbrücken: Lap Lambert Academic Publishing.

Ardayfio-Schandorf, E., Bertrand, M. and Yankson, P.K.W. (2012). *The Mobile City of Accra: Urban Families, Housing and Residential Practices = Accra, Capitale en Mouvement*. Dakar: Codesria.

Arora, R., Paterok, K., Banerjee, A. and Saluja, M.S. (2017). Potential and Relevance of Urban Mining in the Context of Sustainable Cities. *IIMB Management Review*, 29(3), pp.210–224.

Aryeetey, E. and Aryeetey, A.J.R. (1992). Planning for a Distressed City. In: E. Aryeetey, ed., *Planning for Africa's Growth and Development: Some Current Issues*. Legon: ISSER/UNDP.

Asiedu, A.B. and Arku, G. (2009). The Rise of Gated Housing Estates in Ghana: Empirical Insights from Three Communities in Metropolitan Accra. *Journal of Housing and the Built Environment*, 24(3), pp.227–247.

Attoh, K.A. (2011). What Kind of Right is the Right to the City? *Progress in Human Geography*, 35(5), pp.669–685.

Atlas of Urban Expansion (2016). Accra. http://atlasofurbanexpansion.org/cities/view/Accra

Awuah, K.G.B and Hammond, F.N. (2014). Determinants of Low Land-Use Planning Regulation Compliance Rate in Ghana. *Habitat International*, 41, pp.17–23.

Awanyo, L., McCarron, M., & Morgan Attua, E. (2016). Affordable Housing Options for all in a Context of Developing Capitalism: Can Housing Transformations Play a Role in the Greater Accra Region, Ghana? *African Geographical Review*, *35*(1), 35-52.

Bakker, S. and Farla, J. (2015). Electrification of the Car- Will the Momentum Last? *Environmental Innovation and Societal Transitions*, 14, pp.1–4.

Baur, X., Poschadel, B. and Budnik, L.T. (2009). High Frequency of Fumigants and Other Toxic Gases in Imported Freight Containers- An Underestimated Occupational and Community Health Risk. *Occupational and Environmental Medicine*, 67(3), pp.207–212.

Bank of Ghana (2007). The Housing Market in Ghana: Prospects and Challenges. *Ghana Policy Briefing Paper*. Accra: BoG

Bayat, A. (1997). Un-civil Society: The Politics of the "Informal People." *Third World Quarterly*, 18(1), pp.53–72.

Basel Mission Archives (2001). *Various Issues*. Basel Mission Archives/Mission 21, https://www.bmarchives.org/

Beck, U. (1992). *The Risk Society: Towards a New Modernity*. London: Sage.

Beck, U. and Beck-Gernsheim, E. (2002). *Individualization*. London: Sage.

Beck, U., Giddens, A. and Lash, S. (1994). *Reflexive Modernization Politics, Tradition and Aesthetics in the Modern Social Order*. Stanford: Stanford University Press.

Beddow, M. (2010). The Only Way Up. *Containerization International*, pp.61–65.

Ben-Hakoun, E., Shechter, M. and Hayuth, Y. (2016). Economic Evaluation of the Environmental Impact of Shipping from the Perspective of CO2 Emissions. *Journal of Shipping and Trade*, 1(1).

Benneh, G., Nabila, J.S., Songsore, J., Yankson, P.W.K. and Tesfay, T. (1990). *Demographic Studies and Projections for Accra Metropolitan Area (AMA)*. Accra: Government of Ghana, Ministry of Local Government/ UNDP/UNCHS/TCPD/APDP.

Bernhofen, D.M., El-Sahli, Z. and Kneller, R. (2013). *Estimating the Effects of the Container Revolution on World Trade*. Working Paper 2013:4, Lund University.

Balbo, M. (1993). Urban Planning and the Fragmented City of Developing Countries. *Third World Planning Review*, 15(1), pp.23–35.

Bayón, M.C. and Saraví, G.A. (2017). Place, Class Interaction, and Urban Segregation: Experiencing Inequality in Mexico City. *Space and Culture*, 21(3), pp.291–305.

Bechhofer, F. and Paterson, L. (2000). *Principles of Research Design in the Social Sciences*. 1st ed. London: Routledge.

Becker, H.S., Geer, B., Hughes, E.C. and Strauss, A.L. (1961). *Boys in White: Student Culture in Medical School*. Chicago: Chicago University Press.

Benfield, K. (2011). New York's Low-Tech, Low-Cost, High-Style DeKalb Market. *The Atlantic, https://www.theatlantic.com/national/archive/2011/08/new-yorks-low-tech-low-cost-high-style-dekalb-market/243298/*.

Benton, L. (1994). Beyond Legal Pluralism: Towards a New Approach to Law in the Informal Sector. *Social & Legal Studies*, 3(2), pp.223–242.

Berg, B.L. (2001). *Qualitative Research Methods for the Social Sciences*. 4th ed. Boston: Pearson.

Betjemann, C. (1965). *Combination Shipping Container and Showcase-Patent US3182424A*.

Bigmarket Research (2019). *Container Homes Market Report 2019-2025*. Bigmarket Research.

Blanchar, C. (2019). Barcelona Estrena Los Primeros Pisos Sociales Fabricados con Contenedores de Barco. *El Pais. https://elpais.com/ccaa/2019/12/16/catalunya/1576490911_461954.html*.

Brysch, S. (2019). Reinterpreting Existenzminimum in Contemporary Affordable Housing Solutions. *Urban Planning*, 4(3), p.326.

Buckley, R. and Mathema, S. (2007). *Is Accra a Superstar City?* Policy Research Working Paper 4453, The World Bank Finance Economics and Urban Department.

Birch, E.L. (2011). From CIAM to CNU: The Roots and Thinkers of Modern Urban Design. In: T. Banerjee and A. Loukaitou-Sideris, eds., *Companion to Urban Design*. London: Routledge.

Bluestone, D. (1995). How Buildings Learn: What Happens after They're Built Stewart Brand. *Journal of the Society of Architectural Historians*, 54(2), pp.235–236.

Borden, I., Rendell, J., Kerr, J. and Pivaro, A. (2000). Things, Flows, Filters, Tactics. In: I. Borden, J. Rendell, J. Kerr and A. Pivaro, eds., *The Unknown City: Contesting Architecture and Social Space*. MIT Press.

Bourdieu, P. (1977). *Outline of a Theory of Practice*. New York: Cambridge University Press.

Boulos, J. (2016). Sustainable Development of Coastal Cities-Proposal of a Modelling Framework to Achieve Sustainable City-Port Connectivity. *Procedia - Social and Behavioral Sciences*, 216, pp.974–985.

Boyer, M.C. (2014). Reconstructing New Orleans and the Right to the City. In: L. Stanek, C. Schmid and A. Moravansky, eds., *Urban Revolution Now Henri Lefebvre in Social Research and Architecture*. Farnham, UK: Ashgate, pp.173–188.

Bobo. B.F. (1974). *Economic Factors Influencing Migration and Urban Growth and Structure, Accra, Ghana*. unpublished Ph.D. dissertation, University of Califonia, Los Angeles.

Brand, S. (1994). *How Buildings Learn: What Happens After They're Built*. Penguin Books.

British Transport Docks Board (1967). *Containerization: The Key to Low-Cost Transport. A Report by McKinsey & Company, Inc. for the British Transport Docks Board.* London.

Bujra, J. (2000). Risk and Trust: Unsafe Sex, Gender and AIDS in Tanzania. In: P. Caplan, ed., *Risk Revisited*. London: Pluto Press, pp.59–84.

Cai, D. and Hu, Z. (2017). Application of Containers to Low-Income Housing in Context of New Urbanization. *Journal of Landscape Research*, 9(3), pp.70–72.

Caplan, P. (2000). *Risk revisited*. London: Pluto Press.

Capps, K. (2019). Trump's Plan to Criminalize Homelessness Is Taking Shape. *CityLab, https://www.citylab.com/equity/2019/12/trump-policy-homeless-executive-order-city-services-shelters/603670/*.

Caldwell, J.C. (1969). *Rural–Urban Migration: The Movement to Ghanaian Towns*. Canberra: Australian National University Press.

de Carli, B. and Falletti, M. (2013). Formal/Informal Interplays: Spatial Tensions and Design Practices. In: F. Chiodelli, B. De Carli, M. Falletti and L. Scavuzzo, eds., *Cities to be Tamed? Spatial Investigations across the Urban South*. Newcastle upon Tyne: Cambridge Scholars Publishing, pp.2–25.

De Carlo, G. (1949). The Housing Problem in Italy. *Freedom*, *9*(12), 2.

Children's Commissioner for England (2019). *Bleak Houses: Tackling the Crisis of Family Homelessness in England*. London: Children's Commissioner for England.

Christensen, C.M., Anthony, S.D., and Roth, E.A. (2004). *Seeing what's Next: Using the Theories of Innovation to Predict Industry Change*. Boston, Mass. Harvard Business School Press.

Cities Alliance (2016). *Future-Proofing Cities: Metropolitan Cities in Ghana*. https://www.arup.com/perspectives/publications/research/section/future-cities-africa.

Clark, D. (2002). *Urban World, Global City*. 2nd ed. London: Taylor & Francis.

Clark, P.C. (1989). *Method for Converting one or more Steel Shipping Containers into a Habitable Building at a Building Site and the Product Thereof-Patent US4854094A*.

COHRE (2004). *A Precarious Future: The Informal Settlement of Agbogbloshie, Accra, Ghana*. Accra: The Centre on Housing Rights and Evictions (COHRE).

Creswell, J.W. (2007). *Qualitative Inquiry and Research Design: Choosing Among Five Traditions*. 2nd ed. Thousand Oaks: Sage.

CTIA (2018). *The 4th CTIA Members Meeting-The Container Housing/Conversion Summit*. Central Hall Westminster – Monday 23 April 2018: CTIA.

Cubitt, T. (1995). *Latin American Society*. London: Longman.

Chadwin, M.L., Pope, J.A. and Talley, W.K. (1990). *Ocean Container Transportation: An Operational Perspective*. New York: Taylor And Francis.

Christensen, C., McDonald, R., Altman, E.J. and Palmer, J. (2016). Disruptive Innovation: Intellectual History and Future Paths. *Harvard Business Review*, Working Paper 17-057.

Christensen, C.M. (1997). *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Boston, Massachusetts: Harvard Business Review Press.

Christensen, C.M. and Raynor, M.E. (2003). *The Innovator's Solution: Creating and Sustaining Successful Growth*. Boston, Massachusetts: Harvard Business Review Press.

Christensen, C.M., Raynor, M.E. and McDonald, R. (2015). What Is Disruptive Innovation? *Harvard Business Review*, pp.44–53.

Cidell, J. (2011). Distribution Centers among the Rooftops: The Global Logistics Network Meets the Suburban Spatial Imaginary. *International Journal of Urban and Regional Research*, 35(4), pp.832–851.

Cidell, J. (2012). Flows and Pauses in the Urban Logistics Landscape: The Municipal Regulation of Shipping Container Mobilities. *Mobilities*, 7(2), pp.233–245.

Clark-Reynolds, M. and Pelosi, A. (2016). *When did Disruption Become a Good Thing? Emerging Business Models in the Construction Industry*. External Research Report, Report ER12.

Containerisation International (1992). *Various Issues, 1970-1992*. London: National Magazine Co. Ltd.

Corbusier, L. (1981). *The Ideas of Le Corbusier on Architecture and Urban Planning*. New York: George Braziller.

Cowen, D. (2010a). A Geography of Logistics: Market Authority and the Security of Supply Chains. *Annals of the Association of American Geographers*, 100(3), pp.600–620.

Cowen, D. (2010b). Containing Insecurity: Logistics Space, U.S. Port Cities, and the 'War on Terror.' In: S. Graham, ed., *Disrupted Cities: When Infrastructure Fails*. Abingdon: Routledge, pp.69–83.

Creel, L. (2003). *Ripple Effects: Population and Coastal Regions*. Population Reference Bureau.

Davis, M. (2006). *Planet of slums*. London Verso.

Davis, M. (2019). The U.K.'s Solution for Affordable Housing? Shipping Containers. *Bigthink.com/politics-current-affairs/shipping-container-homes*.

Davidson, M. (2010). Social Sustainability and the City. *Geography Compass*, 4, pp.872-880.

De Munck, V. (2009). *Research Design and Methods for Studying Cultures*. Plymouth, UK: AltaMira Press.

De Soto, H. (1989). *The Other Path: The Invisible Revolution in the Third World*. New York: Harper and Row Publishers.

De Soto, H. (2000). *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else.* New York: Basic Books.

Delgado, G., Muller, A., Mabakeng, R. and Namupala, M. (2020). Co-producing Land for Housing through Informal Settlement Upgrading: lessons from a Namibian municipality. *Environment and Urbanization*, 32(1), pp.175–194.

Delz, S. (2018). Addressing Contextual and Spatial Indifference in Design, Urban Planning and International Cooperation: A Case Study from Addis Ababa. In: C. Ammann and T. Förster, eds., *African Cities and the Development Conundrum*. Leiden; Boston: Brill, pp.189–212.

Dezeen (2019). Shipping-container Micro-housing Proposed for City of the Dead in Cairo. *Dezeen Magazine.https://www.dezeen.com/2019/03/28/sheltainer-shipping-containers-cairo-micro-homes-architecture/*.

Dodman, D., Leck, H., Rusca, M. and Colenbrander, S. (2017). African Urbanisation and Urbanism: Implications for Risk Accumulation and Reduction. *International Journal of Disaster Risk Reduction*, 6, pp.7–15.

Donner, C. (2012). Housing Agents and Housing Submarkets. In: S.J. Smith, ed., *International Encyclopedia of Housing and Home*. Elsevier Ltd.

Douglas, J. (2019). Shops in a Box: The Rise of Shipping Container Retail Parks. *BBC. Retrieved from https://www.bbc.com/news/business-47030302*.

Dowall, D.E. (1979). The Effect of Land Use and Environmental Regulations on Housing Costs. *Policy Studies Journal*, 8(2), pp.277–288.

Dietz, S. and Nadarajan, G. (2006). Container Culture. *Leonardo*, 39(4), pp.290–303, 327–330.

Dijk, M., Wells, P. and Kemp, R. (2016). Will the Momentum of the Electric Car Last? Testing a Hypothesis on Disruptive Innovation. *Technological Forecasting and Social Change*, 105, pp.77–88.

Dikeç, M. (2002). Police, Politics, and the Right to the City. *GeoJournal*, 58(2/3), pp.91–98.

Duchrow, U. and Hinkelammert, F. (2004). *Property for People, Not for Profit: Alternatives to the Global Tyranny of Capital*. London: Zed Books.

Durst, N.J. (2016). The Nature and Extent of Self-help Housing in Texas: From Colonias to Model Subdivisions. *Journal of Planning Education and Research*, 36(2), pp.145–157.

Durst, N.J. (2018). Informal and Ubiquitous: Colonias, Premature Subdivisions and other Unplanned Suburbs on America's Urban Fringe. *Urban Studies*, 56(4), pp.722–740.

Durst, N.J. and Ward, P.M. (2014). Measuring Self-help Home Improvements in Texas Colonias: A Ten-year 'Snapshot' Study. *Urban Studies*, 51(10), pp.2143–2159.

Durst, N.J. and Wegmann, J. (2017). Informal Housing in the United States. *International Journal of Urban and Regional Research*, 41(2), pp.282–297.

Eduful, A, and Hooper, M. (2015). Urban Impacts of Resource Booms: The Emergence of Oil-led Gentrification in Sekondi-Takoradi, Ghana. *Urban Forum* 26 (3): 283-302.

Farrell, R. (2007). Maritime Terrorism: Focusing on the Probable. *Naval War College Review*, 60(3), pp.46–60.

Farley, P. and Roberts, M.S. (2011). *Edgelands: Journeys into England's True Wilderness*. London: Vintage.

Fält, L. (2016). From Shacks to Skyscrapers: Multiple Spatial Rationalities and Urban Transformation in Accra, Ghana. *Urban Forum*, 27(4), pp.465–486.

Fernandes, E. and Varley, A. (1998). *Illegal Cities: Law and Urban Change in Developing Countries*. London; New York: Zed Books.

Ferrarotti, F. 1974. *Vite di Baraccati (Lives of Slum Dwellers).* Napoli: Liguori.

Feder, C. (2018). The Effects of Disruptive Innovations on Productivity. *Technological Forecasting and Social Change*, 126, pp.186–193.

Fenton, C., Storrs-Fox, P., Joerss, M., Saxon, S. and Stone, M. (2018). *Brave New World? Container Transport in 2043*. McKinsey&Company.

Fields, G.S. (1990). Labour Market Modelling and the Urban Informal Sector: Theory and Evidence. In: D. Turnham, B. Salomé and A. Schwarz, eds., *The informal sector revisited*. Paris: Organisation for Economic Co-operation and Development.

Forrest, A. (2015). Living in a Steel Box: Are Shipping Containers Really the Future of Housing? *The   Guardian.   Retrieved   from* [*https://www.theguardian.com/cities/2015/oct/09/living-steel-box-shipping-containers-future-housing*](https://www.theguardian.com/cities/2015/oct/09/living-steel-box-shipping-containers-future-housing).

Forgacs, D. (2014). *Italy's Margins: Social Exclusion and Nation Formation since 1861* (Cambridge Social and Cultural Histories). Cambridge: Cambridge University Press. doi:10.1017/CBO9781107280441

Förster, T. and Ammann, C. (2018). African Cities and the Development Conundrum: Actors and Agency in the Urban Grey Zone. In: C. Ammann and T. Förster, eds., *African Cities and the Development Conundrum*. Boston: Brill, pp.3–25.

Fowler, C.S. (2006). Reexploring Transport Geography and Networks: A Case Study of Container Shipments to the West Coast of the United States. *Environment and Planning A: Economy and Space*, 38(8), pp.1429–1448.

Freund, B. (2007). *The African City: A History*. New York: Cambridge University Press.

Freeman, C. (1982). *Economics of Industrial Innovation.* 2nd ed. London: Frances Printer.

Frémont, A. and Soppé, M. (2005). Transport Maritime Conteneurisé et Mondialisation. *Annales de Géographie*, 114(642), pp.187–200.

George, R. (2013). *Deep Sea and Foreign Going: Inside Shipping, the Invisible Industry that Brings you 90% of Everything*. London: Portobello Books.

Ghana Statistical Service (2012). *2010 Population and Housing Census National Analytical Report, Greater Accra Region*. Accra.

Ghana Urbanisation Think Tank (GUTT) (2019). *Cities as a Strategic Resource: Guideline for Ghana's National Urban Policy Revision*. London: Paper for the Coalition for Urban Transitions. Available at: https://urbantransitions.global/publications/.

GhanaWeb (2018). Armed Robbers Kill Mobile Money Vendor at Asylum Down. *GhanaWeb, August 2018*.

Gabbe, C.J. (2018). How Do Developers Respond to Land Use Regulations? An Analysis of New Housing in Los Angeles. *Housing Policy Debate*, 28(3), pp.411–427.

Gabe, J. and Willliams, P. (1986). Is Space Bad for Your Health? The Relationship Between Crowding in the Home and Emotional Distress in Women. *Sociology of Health and Illness*, [online] 8(4), pp.351–371. Available at: https://onlinelibrary.wiley.com/doi/abs/10.1111/1467-9566.ep11340458 [Accessed 9 Aug. 2019].

Gaffikin, F., Perry, D.C. and Kundu, R. (2011). The City and Its Politics: Informal and Contested. In: D.R. Judd and D. Simpson, eds., *The City, Revisited: Urban Theory from Chicago, Los Angeles, and New York*. Minneapolis: University of Minnesota Press, pp.305–31.

Gaudoin, T. (2019). Think Outside the Box with a Container Home. *Financial Times. Retrieved from https://www.ft.com/content/18e35630-4999-11e9-bde6-79eaea5acb64*.

Gberie, L. (2005). Africa: The Troubled Continent. *African Affairs*, 104(415), pp.337–342.

van Gelder, J.-L. (2013). Paradoxes of Urban Housing Informality in the Developing World. *Law & Society Review*, 47(3), pp.493–522.

Gillespie, T. (2020). The Real Estate Frontier. *International Journal of Urban and Regional Development*, DOI: 10.1111/1468-2427.12900.

Gibson, L., Engelbrecht, J. and Rush, D. (2019). Detecting Historic Informal Settlement Fires with Sentinel 1 and 2 Satellite Data - Two Case Studies in Cape Town. *Fire Safety Journal*, 108, p.102828.

Giovinazzi, S., Stevenson, J., Mason, A., & Mitchell, J. (2011). Assessing Temporary Housing Needs and Issues Following Christchurch Earthquakes. *New Zealand, Christchurch: University of Canterbury*, 107.

GNSDF (2015). *Ghana National Spatial Development Framework 2015-2035 Volume II: Overall Spatial Development Strategy*. Accra: GoG.

Goff, L. (2016). *Shantytown, USA: Forgotten Landscapes of the Working Poor*. Cambridge, Massachusetts: Harvard University Press.

Goffman, E. (1975). *Stigmate: Les Usages Sociaux des Handicaps*. Paris: Les Éditions De Minuit.

Gombrich, E.H. (1979). *The Sense of Order: A Study in the Psychology of Decorative Art*. Ithaca, N.Y.: Cornell University Press

GoG/MWRWH (Government of Ghana/Ministry of Water Resources, Works & Housing) (2015). *National Housing Policy*. Accra: GoG/MWRWH.

Goldstreet Business (2018). Container Homes, Condominiums to Reduce Housing Deficit – Works & Housing Minister. *Goldstreet Business, August 1, 2018*.

Government of Ghana, Ministry of Local Government and Rural Development (2012). *National Urban Policy Framework*. Accra: Government of Ghana.

Gilbert, L. and Dikeç, M. (2008). Right to the City: Politics of Citizenship. In: K. Goonewardena, S. Kipfer, R. Milgrom and C. Schmid, eds., *Space, Difference, Everyday Life: Reading Henri Lefebvre*. New York: Routledge, pp.250–263.

Gillespie, T. (2015). Accumulation by Urban Dispossession: Struggles over Urban Space in Accra, Ghana. *Transactions of the Institute of British Geographers*, 41(1), pp.66–77.

Gillespie, T. (2016). From Quiet to Bold Encroachment: Contesting Dispossession in Accra's Informal Sector. *Urban Geography*, 38(7), pp.974–992.

Gillespie, T. (2017). Collective Self-Help, Financial Inclusion, and the Commons: Searching for Solutions to Accra's Housing Crisis. *Housing Policy Debate*, 28(1), pp.64–78.

Gionvinazzi, S. J., Mitchell, J. and Mason, A. (2011). *Temporary Housing Issues following the 22nd Christchurch Earthquake, NZ.* Christchurch, 2012 NZSEE Conference.

Gough, K.V. and Yankson, P.W.K. (2000). Land Markets in African Cities: The Case of Peri-urban Accra, Ghana. *Urban Studies*, 37(13), pp.2485–2500.

Grant, R. (2009). *Globalizing City: The Urban and Economic Transformation of Accra, Ghana*. Syracuse, N.Y.: Syracuse University Press.

Grant, R. (2016). The "Urban Mine" in Accra, Ghana. *RCC Perspectives*, (1), pp.21–30.

Grant, R. and Oteng-Ababio, M. (2016). The Global Transformation of Materials and the Emergence of Informal Urban Mining in Accra, Ghana. *Africa Today*, 62(4), pp.3–20.

Grant, R. (2006). Out of Place? Global Citizens in Local Spaces: A Study of the Informal Settlements in the Korle Lagoon Environs in Accra, Ghana. *Urban Forum*, 17(1), pp.1–24.

Grant, R. and Nijman, J.B.F. (2004). Globalization and the Hyper-differentiation of Space in the Less Developed World. In: J. O'Loughlin, L. Staeheli and E. Greenberg, eds., *Globalization and its Outcomes*. New York: Guilford Press, pp.45–66.

Gropius, W. (1965). *The New Architecture and the Bauhaus*. Cambridge, Mass.: MIT. Press.

Güçer, M., Karaca, S. and Dinçer, B.O. (2013). *The Struggle for Life Between Borders: Syrian Refugees" Fieldwork*. USAK Report No: 13-04, USAK Publications.

Gunter, A. (2014). Renting Shacks: Landlords and Tenants in the Informal Housing Sector in Johannesburg South Africa. *Urbani izziv*, 25(Supplement), pp. S96–S107.

Hall, P. (2014). *Cities of Tomorrow an Intellectual History of Urban Planning and Design since 1880*. 4th ed. Somerset: Wiley Blackwell.

Hall, P.V., Hesse, M. and Rodrigue, J.P. (2006). Guest Editorial: Re-exploring the Interface Between Economic and Transport Geography. *Environment and Planning A*, 38(8), pp.1401–1408.

Hall, P. and Pfeiffer, U. (2000). *Urban Future 21: A Global Agenda for Twenty-first Century Cities*. London: Taylor & Francis.

Hansen, K.T. and Vaa, M. (2004). *Reconsidering Informality: Perspectives from Urban Africa*. Uppsala: Nordiska Afrikainstitutet.

Harding, P. and Jenkins, R. (1989). *The Myth of the Hidden Economy: Towards a New Understanding of Informal Economic Activity*. Philadelphia: Open University Press.

Harris, R. (2018). Modes of Informal Urban Development: A Global Phenomenon. *Journal of Planning Literature*, 33(3), pp.267–286.

Hart, K. (1973). Informal Income Opportunities and Urban Employment in Ghana. *The Journal of Modern African Studies*, 11(1), pp.61–89.

Hart, K. (2005). Reviewed Work(s): Reconsidering Informality: Perspectives from Urban Africa by Karen Tranberg Hansen and Mariken Vaa. *Journal of Southern African Studies*, 31(2), pp.459–460.

Henken, T.A. (2005). Entrepreneurship, Informality, and the Second Economy: Cuba's Underground Economy in Comparative Perspective. *Annual Proceedings, The Association for the Study of the Cuban Economy*, 15.

Ho, C.L. (2013). Spontaneous Interventions: Design Actions for the Common Good. *Retrieved from http://www.spontaneousinterventions.org/statements*.

Hollstein, B. (2014). Mixed Methods Social Networks Research: An Introduction. In: S. Domínguez and B. Hollstein, eds., *Mixed Methods Social Networks Research: Designs and Applications*. New York: Cambridge University Press, pp.3–34.

Hou, J. (2020). Guerrilla Urbanism: Urban Design and the Practices of Resistance. *URBAN DESIGN International*.

van Ham, H. and Rijsenbrij, J. (2012). *Development of Containerization: Success through Vision, Drive and Technology*. Amsterdam: Ios Press, Cop.

Harvey, D. (1966). *Justice, Nature and the Geography of Difference*. Oxford: Blackwell.

Harvey, D. (1973). *Social Justice and the City*. London: Edward Arnold.

Harvey, D. (1974). Class-monopoly Rent, Finance Capital and the Urban Revolution. *Regional Studies*, 8(3–4), pp.239–255.

Harvey, D. (2003). The Right to the City. *International Journal of Urban and Regional Research*, 27(4), pp.939–941.

Harvey, D. (2005a). Reading the Right to the City. *New Left Review*, 53, pp.23–40.

Harvey, D. (2005b). *Spaces of Neoliberalization: Towards a Theory of Uneven Geographical Development*. Stuttgart: Franz Steiner Verlag.

Harvey, D. (2009). The Right to the Just City. In: P. Marcuse, J. Connolly, J. Novy, I. Olivo, C. Potter and J. Steil, eds., *Searching for the Just City*. London: Routledge, pp.40–51.

Harvey, D. (2012). *Rebel Cities: From the Right to the City to the Urban Revolution.* London: Verso.

Harford, T. (2017). *Fifty Things that Made the Modern Economy*. Little, Brown Book Group.

Hamnett, C. (1989). The Political Geography of Housing in Contemporary Britain. In: J. Mohan, ed, *The Political Geography of Contemporary Britain*. Basingstoke: Macmillan, pp. 208-223.

Hayut, Y. (1981). Containerization and the Load Center Concept. *Economic Geography*, 57(2), pp.160–76.

Heins, M. (2015). Globalizing the Nation-State: The Shipping Container and American Infrastructure. *Mobilities*, 10(3), pp.345–362.

Heins, M.W. (2013). *The Shipping Container and the Globalization of American Infrastructure*. PhD Dissertation, University of Michigan.

Henri Lefebvre (2003). *The Urban Revolution*. Translated by R. Bononno. Minneapolis: University of Minnesota Press.

Herod, A. (1998). Discourse on the Docks: Containerization and Inter-Union Work Disputes in US Ports, 1955-85. *Transactions of the Institute of British Geographers*, 23(2), pp.177-191

Hirsch, B.T. and Macpherson, D.A. (1998). Earnings and Employment in Trucking: Deregulating a Naturally Competitive Industry. In: J. Peoples, ed., *Regulatory Reform and Labor Markets*. Boston: Kluwer Academic Publishers, pp.61–112.

Hohn, D. (2011). *Moby-duck: The True Story of 28,800 Bath Toys Lost at Sea and of the Beachcombers, Oceanographers, Environmentalists, and Fools, Including the Author, who went in Search of Them*. New York: Viking.

Hong, J. (2003). Material, Materiality. Available at: https://csmt.uchicago.edu/glossary2004/material.htm.

Howe, L.W. (1993). Heidegger's Discussion of "The Thing": A Theme for Deep Ecology. *Between the Species*, pp.93-97

Huchzermeyer, M. (2011). *Cities with Slums: From Informal Settlement Eradication to a Right to the City in Africa*. Cape Town: UCT Press.

Hughes, T.P. (1969). Technological Momentum in History: Hydrogenation in Germany 1898–1933. *Past and Present*, 44(1), pp.106–132.

Hughes, T.P. (1983). *Networks of Power: Electrification in Western Society, 1880-1930.* Baltimore: Johns Hopkins University Press.

Hughes, T.P. (1987). The Evolution of Large Technological Systems. In: W.E. Bijker, T.P. Hughes and T.J. Pinch, eds., *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*. Cambridge, MA: MIT Press, pp.51–82.

Hughes, T.P. (1994). Technological Momentum. In: M.R. Smith and L. Marx, eds., *Does Technology Drive History? The Dilemma of Technological Determinism*. Cambridge, MA: MIT Press, pp.101–113.

Intermodal Association of North America IANA (2018). *Intermodal Factbook: An Introduction to Intermodal Freight Transportation*. Intermodal Association of North America.

International Labour Organization (2002). Women and Men in the Informal Economy: A Statistical Picture. *ILO*.

Iacoboaea, C., Aldea, M. and Petrescu, F. (2019). Construction and Demolition Waste- A Challenge for the European Union? *Theoretical and Empirical Researches in Urban Management*, 14(1), pp.30–52.

Ihlanfeldt, K.R. (2004). Exclusionary Land-use Regulations within Suburban Communities: A Review of the Evidence and Policy Prescriptions. *Urban Studies*, 41(2), pp.261–283.

Ihlanfeldt, K.R. (2007). The effect of Land-use Regulation on Housing and Land Prices. *Journal of Urban Economics*, 61(3), pp.420–435.

ILO (1972). *Employment, Incomes and Equality: A Strategy for Increasing Productive Employment in Kenya*. Geneva: International Labour Office.

Jaržemskienė, I. (2007). The Evolution of Intermodal Transport Research and its Development Issues. *Transport*, 22(4), pp.296–306.

Jenkins, P., Smith, H., and Wang, P.Y. (2007). *Planning and Housing in the Rapidly Urbanizing World*. London: Routledge.

Jenkins, P. (2013). *Urbanization, Urbanism, and Urbanity in an African City: Home Spaces and House Cultures.* New York: Palgrave Macmillan.

Jenks, M., Kozak, D. and Takkanon, P. (2008). *World Cities and Urban Form: Fragmented, Polycentric, Sustainable?* Abingdon, Oxon; New York: Routledge.

Jencks, C. A., & Silver, N. (2013). *Adhocism: The Case for Improvisation*. London: The MIT Press.

Jodidio, P. (2004). *Architecture Now! 3: Architektur Heute / L'architecture d'aujourd'hui*. 2nd ed. Cologne: Taschen.

Kain, J.F. (1964). *The Effect of the Ghetto on the Distribution of Nonwhite Employment in Urban Areas*. Washington, DC: National Academy Press.

Kain, J.F. (1994). The Spatial Mismatch Hypothesis: Three Decades Later. *Housing Policy Debate*, 3(2), pp.371–460.

Karpat, K.H. (1976). *The Gecekondu: Rural Migration and Urbanization*. Cambridge: Cambridge University Press.

Kearnes, M.B. (2003). Geographies that Matter- The Rhetorical Deployment of Physicality? *Social & Cultural Geography*, 4(2), pp.139–152.

Kerr, D. (1992). *Book Review: Production of Space (Donald Nicholson-Smith trans.)*. Oxford: Basil Blackwell.

King, A.D. (2009). *Postcolonial Cities*. New York: State University of New York.

Kim, M. and Sachish, A. (1986). The Structure of Production, Technical Change and Productivity in a Port. Journal of Industrial Economics, 35(2), pp.209-23

Klaus, K. and Paller, J.W. (2017). Defending the City, Defending Votes: Campaign Strategies in Urban Ghana. *Journal of Modern African Studies*, 55(4), pp.681–708.

Klemas, V.V. (2015). Coastal and Environmental Remote Sensing from Unmanned Aerial Vehicles: An Overview. *Journal of Coastal Research*, 31(5), pp.1260–1267.

Klose, A., & Marcrum, C. (2015). *The Container Principle: How a Box Changes the Way We Think*. Cambridge, Massachusetts; London, England: The MIT Press.

Konadu-Agyemang, K. (2001). *The Political Economy of Housing and Urban Development in Africa: Ghana's experiences from colonial times to 1998*. Westport, CN: Praeger.

Koonings, K. and Kruijt, D. (2009). Introduction. In: Koonings and D. Kruijt, eds., *Megacities: The Politics of Urban Exclusion and Violence in the Global South*. Zed Books, pp.1–7.

Korah, P.I., Cobbinah, P.B. and Nunbogu, A.M. (2017). Spatial Planning in Ghana: Exploring the Contradictions. *Planning Practice & Research*, 32(4), pp.361–384.

Kozak, D. (2008). Assessing Urban Fragmentation: The Emergence of New Typologies in Central Buenos Aires. In: M. Jenks, D. Kozak and P. Takkanon, eds., *World Cities and Urban Form: Fragmented, Polycentric, Sustainable?* New York: Routledge.

Kilpinen, E. (2008). Memes versus Signs: On the Use of Meaning Concepts About Nature and Culture. *Semiotica*, 2008(171), pp.215–237.

Kipfer, S., Goonewardena, K., Schmid, C. and Milgrom, R. (2008). On the Production of Henri Lefebvre. In: K. Goonewardena, S. Kipfer, R. Milgrom and C. Schmid, eds., *Space, Difference, Everyday Life: Reading Henri Lefebvre*. New York: Routledge, pp.1–23.

Kirkman, R. (2004). Technological Momentum and the Ethics of Metropolitan Growth. *Ethics, Place & Environment*, 7(3), pp.125–139.

Knight, S. (2003). The Bomb in the Box. *The World Today*, 59(2), pp.17–18.

Labban, M. (2014). Deterritorializing Extraction: Bioaccumulation and the Planetary Mine. *Annals of the Association of American Geographers*, 104(3), pp.560–576.

Latham, A., McCormack, D., McNamara, K., & McNeill, D. (2009). *Key Concepts in Urban Geography*. U.K: Sage.

Laguerre, M.S. (1994). *Informal City*. New York: St. Martin's Press.

Laryea-Adjei, G. (2000). Building Capacity for Urban Management in Ghana: Some Critical Considerations. *Habitat International*, 24(4), pp. 391-401.

Lee, C. (2010). Package Bombs, Footlockers, and Laptops: What the Disappearing Container Doctrine Can Tell Us About the Fourth Amendment. *J. Crim. L. & Criminology*, 100(4).

Lewis, F. (2003). Design Issues. In: J. Ritchie and J. Lewis, eds., *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. London: Sage, pp.49–71.

Lindell, I. (2010). Introduction: The Changing Politics of Informality–Collective Organizing, Alliances and Scales of Engagement. In: I. Lindell, ed., *Africa's Informal Workers: Collective Agency, Alliances and Transnational Organizing in Urban Africa*. London: Zed Books, pp.1–30.

Lindsay, J.M. (1997). *Techniques in Human Geography*. London: Routledge.

Lindsey, M. (2014). Social Interaction. In: A.C. Michalos, ed., *Encyclopedia of Quality of Life and Well-Being Research*. Dordrecht: Springer.

Listokin, D. and Hattis, D. (2005). Building Codes and Housing. *Cityscape*, 8(1), pp.21–68.

Lee, Y.-C. and Kim, K.-H. (2015). Attitudes of Citizens towards Urban Parks and Green Spaces for Urban Sustainability: The Case of Gyeongsan City, Republic of Korea. *Sustainability*, 7(7), pp.8240–8254.

Lefebvre, H. (1968). *Le Droit a la Ville*. Paris: Anthropos.

Lefebvre, H. (1991a). *Critique of Everyday Life, Volume 1*. Translated by J. Moore. London: Verso.

Lefebvre, H. (1991b). *The Production of Space*. Translated by D. Nicholson-Smith. Oxford: Blackwell.

Lefebvre, H. (1996). Right to the City. Translated by E. Kofman. and Translated by E. Lebas. In: E. Kofman and E. Lebas, eds., *Writings on Cities: Henri Lefebvre*. Oxford: Blackwell Publishing, pp.61–181.

Lefebvre, H. (2009). *State, Space, World: Selected Essays*. Minneapolis: University of Minnesota Press.

Levitas, R. (2000). Discourses of Risk and Utopia. In: B. Adam, U. Beck and J. van Loon, eds., *The Risk Society and Beyond: Critical Issues for Social Theory*. Sage, pp.198–211.

Levitt, T. (1983). The Globalization of Markets. *Harvard Business Review*. May.

Lucieer, A., Jong, S. M. de, & Turner, D. (2014). Mapping Landslide Displacements Using Structure from Motion (SfM) and Image Correlation of Multi-temporal UAV Photography. *Progress in Physical Geography: Earth and Environment*, Vol.*38*(1), pp.97–116.

Luhmann, N. (1993). *Risk: A Sociological Theory*. New York: Aldine/de Gruyter.

Lupton, D. (1999). *Risk*. London: Routledge.

Martin, C. (2016). *Shipping Container*. Bloomsbury Publishing.

Martin, C. (2014). The Packaging of Efficiency in the Development of the Intermodal Shipping Container. *Mobilities*, 9(3), pp.432–451.

Massey, D. (2005). *For Space*. London: Sage.

Manuh, T. (1997). Ghana: Women in the Public and Informal Sectors Under the Economic Recovery Programme. In: N. Visvanathan, L. Duggan, L. Nisonoff and N. Wiegersma, eds., *The Women, Gender and Development Reader*. London: Zed Books, pp.277– 84.

Mabogunje, A.L. (1990). Urban Planning and the Post-Colonial State in Africa: A Research Overview. *African Studies Review*, 33(2), pp.121–203.

Madanipour, A. (2017). *Cities in Time: Temporary Urbanism and the Future of the City*. London: Bloomsbury.

Malpezzi, S., Tipple, A.G. and Willis, K.G. (1990). *Costs and Benefits of Rent Control: A Case study in Kumasi, Ghana*. Washington, D.C.: World Bank.

 Meillassoux, C. (1970). A Class Analysis of the Bureaucratic Process in Mali. *The Journal of Development Studies*, 6(2), pp.97–110.

Modular Building Institute (2019). *The U.S. Construction Industry: A National Crisis Looming*. Modular Building Institute White Paper.

Mooya, M.M. and Cloete, C.E. (2007). Informal Urban Property Markets and Poverty Alleviation: A Conceptual Framework. *Urban Studies*, 44(1), pp.147–165.

Mohan, G. (1996). Neoliberalism and Decentralized Development Planning in Ghana. *TWPR*, 18 (4), pp. 433-55.

Mukhija, V. (2012). Informal Housing: Colonias in the United States. In: S. Smith, ed., *International Encyclopedia of Housing and Home*. Amsterdam, The Netherlands: Elsevier, pp.63–69.

Mukhija, V. and Loukaitou-Sideris, A. (2014). *The Informal American City: From Taco Trucks to Day Labor*. Cambridge, Massachusetts: The MIT Press.

Murray, M.J. and Myers, G.W. (2006). *Cities in Contemporary Africa*. New York: Palgrave Macmillan.

Myers, G. (2011). Why Africa's Cities Matter. *African Geographical Review*, 30(1), pp.101–106.

Mccalla, R.J., Slack, B. and Comtois, C. (2004). Dealing with Globalisation at the Regional and Local Level: The Case of Contemporary Containerization. *The Canadian Geographer/Le Geographe Canadien*, 48(4), pp.473–487.

McFarlane, C. (2011). *Learning the City*. Oxford: Wiley-Blackwell.

Meisel, F. (2009). *Seaside Operations Planning in Container Terminals*. Dordrecht: Physica-Verlag.

Melara Arguello, J.E., Grant, R., Oteng-Ababio, M. and Ayele, B.M. (2013). Downgrading – An Overlooked Reality in African Cities: Reflections from an Indigenous Neighborhood of Accra, Ghana. *Applied Geography*, 36, pp.23–30.

Mentz, J.C. (2006). *Developing a Competence Audit for Technological Innovation*. Dissertation (M Eng (Technology Management), University of Pretoria.

Merrifield, A. (2006). *Henri Lefebvre: A Critical Introduction*. New York; London: Routledge.

Merrifield, A. (2017). *Fifty Years on: The Right to the City. In the Right to the City*. Verso Books.

Ministry of Local Government and Rural Development (2015). *Habitat III National Report*. Accra: MLGRD.

Mitchell, D. (2003). *The Right to the City: Social Justice and the Fight for Public Space*. New York; London: Guilford Press.

Miller, D. (Ed.) (2005). *Materiality*. Durham; London: Duke University Press.

Morris, H. (2017). Lost Cargo and Rubber Ducks: Inside the Curious World of Container Shipping. *https://www.telegraph.co.uk/travel/travel-truths/lost-container-ships-bizarre-world-of-global-shipping/*

Moore, G. (2009). *State, Space, World: Selected Essays* (Brenner N. & Elden S., Eds.). Minneapolis; London: University of Minnesota Press. Retrieved September 30, 2020, from http://www.jstor.org/stable/10.5749/j.ctttsrv7

Mumford, L. (1962). *Technics and Civilization.* New York Harcourt, Brace & World.

Myers, G. (2003). *Verandahs of Power: Colonialism and Space in Urban Africa*. Syracuse, N.Y: Syracuse University Press.

Myers, G. (2011). *African Cities: Alternative Visions of Urban Theory and Practice*. London; New York: Zed Books Ltd.

Nagy, D., Schuessler, J. and Dubinsky, A. (2016). Defining and Identifying Disruptive Innovations. *Industrial Marketing Management*, 57, pp.119–126.

National Institute of Building Sciences (2018). *Report on the Results of the 2018 Off-Site Construction Industry Survey*. Washington, DC: National Institute of Building Sciences.

Neuwirth, R. (2006). *Shadow Cities: A Billion Squatters, a New Urban World*. New York: Routledge.

Nunbogu, A.M. and Korah, P.I. (2016). Self-organisation in Urban Spatial Planning: Evidence from the Greater Accra Metropolitan Area, Ghana. *Urban Research & Practice*, 10(4), pp.423–441.

Neise, R. (2018). *Container Logistics the Role of the Container in the Supply Chain*. London Kogan Page.

New World Wealth (2018). *The AfrAsia Bank Africa Wealth Report 2018*. Mauritius: New World Wealth.

Nijman, J. (2007). Introduction—Comparative Urbanism. *Urban Geography*, 28(1), pp.1–6.

Nigg, J., Barnshaw, J. and Torres, M. (2006). Hurricane Katrina and the Flooding of New Orleans: Emergent Issues in Sheltering and Temporary Housing. *The Annals of the American Academy of Political and Social Science*, 604, p. 113.

Notteboom, T. and Merckx, F. (2006). Freight Integration in Liner Shipping: A Strategy Serving Global Production Networks. *Growth and Change*, 37(4), pp.550–569.

Notteboom, T. and Rodrigue, J.-P. (2009). The Future of Containerization: Perspectives from Maritime and Inland Freight Distribution. *GeoJournal*, 74(1), pp.7–22.

Nugent, S. (2000). Good Risk, Bad Risk: Reflexive Modernisation and Amazonia. In: P. Caplan, ed., *Risk Revisited*. London: Pluto Press, pp.226–47.

Obeng-Odoom, F. (2010). Abnormal Urbanization in Africa: A Dissenting View. *African Geographical Review*, 29(2), pp.13–40.

Obeng-Odoom, F. (2010). Urban Real Estate in Ghana: A Study of Housing-related Remittances from Australia. *Housing Studies*, 25(3), pp.357–373.

Obeng-Odoom, F. (2011). The Informal Sector in Ghana under Siege. *Journal of Developing Societies*, 27(3–4), pp.355–392.

Obeng-Odoom, F. (2012). Neoliberalism and the Urban Economy in Ghana: Urban Employment, Inequality, and Poverty. *Growth and Change*, 43(1), pp.85–109.

Obeng-Odoom, F. (2013). *Governance for Pro-poor Urban Development: Lessons from Ghana*. Abingdon: Routledge.

O'Brien, L. (1992). *Introducing Quantitative Geography: Measurement, Methods and Generalized Linear Models*. London: Routledge.

d'Oleire-Oltmanns, S., Marzolff, I., Peter, K. et al. (2012). Unmanned Aerial Vehicle (UAV) for Monitoring Soil Erosion in Morocco. *Remote Sensing*, 4, pp.3390–3416

Obudho, R.A. (1996). Urbanization in Africa under Economic Conditions: Problems and Potentials. In: *Spring Symposium on Space. Culture and Society in Africa, Centre for African Studies, University of Illinois at Urbana-Champaign. 28-30 March 1996.*

Oberhauser, A.M. and Yeboah, M.A. (2011). Heavy Burdens: Gendered Livelihood Strategies of Porters in Accra, Ghana. *Singapore Journal of Tropical Geography*, 32(1), pp.22–37.

Oner, A.C., Durmaz-Drinkwater, B. and Grant, R.J. (2020). Precarity of Refugees: The Case of Basmane-İzmir, Turkey. *Journal of Ethnic and Migration Studies*, pp.1–20.

OECD (2011). *Territorial Reviews: The Gauteng City-Region, South Africa*. OECD Publishing.

Office of the Planning Commission (1964). *Seven-Year Development Plan for National Reconstruction and Development, 1963/64 to 1969/70*. Accra: Office of the Planning Commission.

Otiso, K.M. and Owusu, G. (2008). Comparative Urbanization in Ghana and Kenya in Time and Space. *GeoJournal*, 71(2–3), pp.143–157.

Owen, B. (2016). *Drones on the Delta: In Ghana's Volta River Delta, the Remotely Operated Aerial Vehicles are Going Where Researchers can't to Help Study Coastal Erosion, Flooding and Migration*. http://idrc.canadiangeographic.ca/education/docs/ghana-drones-delta-workbook.pdf.

Olukoju, A. (2010). Coastal Urban Development. In: J. Zumerchik and S.L. Danver, eds., *Seas and Waterways of the World: An Encyclopedia of History, Uses, and Issues*. California: ABC-CLIO, LLC.

Oppong, R.A., Essel, C., Quagraine, V. (2015). Containerisation, Portable Architecture and the Image of Ghanaian Cities. IISTE, 5(21), pp.143-153

Oteng-Ababio, M. and Arguello, J.E.M. (2014). Paradigm of Mediocrity: Poverty and Risk Accumulation in Urban Africa – The Case of Korle Gonno, Accra. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 7(1), pp.45–61.

Owusu, G. (2008). Indigenes' and Migrants' Access to Land in Peri-urban Areas of Accra, Ghana. *International Development Planning Review*, 30(2), pp.177–198.

Owusu, G. (2012). Coping with Urban Sprawl: A Critical Discussion of the Urban Containment Strategy in a Developing Country City, Accra. *Planum*, 26, pp.1–17.

Parker, S. (2004). *Urban Theory and the Urban Experience: Encountering the City*. London: Routledge.

Parker, R.N., Asencio, E.K. (2009). *GIS and Spatial Analysis for the Social Sciences: Coding, Mapping, and Modeling (1st Edition)*. New York: Routledge.

Pagnotta, B. (2011). The Pros and Cons of Cargo Container Architecture, Available from: *http://www.archdaily.com/160892/the-pros-and-cons-ofcargo-container-architecture/*

Peck, J. (2015). Cities beyond Compare? *Regional Studies*, 49(1), pp.160–182.

Peck, J., Theodore, N., and Brenner, N. (2009). Neoliberal Urbanism: Models, Moments, Mutations. *SAIS Review*, 29(1), pp.49–66.

Peck, J., Theodore, N., and Brenner, N. (2010). Postneoliberalism and its Malcontents. *Antipode*, 41, pp.94–116.

Peil, M. (1972). *The Ghanaian Factory Worker: Industrial Man in Africa*. Cambridge: Cambridge University Press

Perera, G. (2008). Claiming the Right to the City: A Question of Power. *Race, Poverty & the Environment*, 15(1), pp.12–13.

Pevsner, N. (1960). *Pioneers of Modern Design: From William Morris to Walter Gropius*. Thetford, Norfolk: Penguin Books.

Pendall, R. (1999). Opposition to Housing. *Urban Affairs Review*, 35(1), pp.112–136.

Pena, J. & Schuzer, K. (2012). Design of Reusable Emergency Relief Housing Units Using General Purpose Shipping Containers. *International Journal of Engineering Research and Innovation*, 4(2), pp. 55-64.

Perlman, J.E. (2010). *Favela: Four Decades of Living on the Edge in Rio de Janeiro*. New York; Oxford: Oxford University Press.

Perry, G.E., and Maloney, F.W. (2007). Overview. In: *Informality: Exit and Exclusion*. Washington D.C: World Bank.

Pieterse, E. (2008). *City Futures: Confronting the Crisis of Urban Development*. London; New York: Zed Books; Cape Town.

PMMHF (2019). The 9th China Prefab House, Modular Building, Mobile House & Space Fair (PMMHF, 2019). Guangzhou Poly World Trade Center Expo, May 15th-17th, 2019

Portes, A., Castells, M. and Benton, L.A. (1989). *The Informal Economy: Studies in Advanced and Less Developed Countries*. Baltimore, Md.: Johns Hopkins University Press.

Portes, A. and Schauffler, R. (1993). The Informal Economy in Latin America: Definition, Measurement, and Policies. In: G.K. Schoepfle and J.F. Pérez-López, eds., *Work Without Protections: Case Studies of the Informal Sector in Developing Countries*. Washington, D.C: U.S. Government Printing Office, pp.3–40.

Putney, L.G. (2010). Case Study. In: N.J. Salkind, ed., *Encyclopedia of Research Design*. London: Sage.

Punzo, A. and Ingrassia, S. (2016). Clustering Bivariate Mixed-type Data via the Cluster-weighted Model. *Computational Statistics*, 31(3), pp.989–1013.

Purcell, M. (2002). Excavating Lefebvre: The Right to the City and its Urban Politics of the Inhabitant. *GeoJournal*, 58(2/3), pp.99–108.

Purcell, M. (2014). Possible Worlds: Henri Lefebvre and the Right to the City. *Journal of Urban Affairs*, 36(1), pp.141–154.

Quayson, A. (2014). *Oxford Street, Accra: City Life and the Itineraries of Transnationalism*. Durham: Duke University Press.

Rapoport, A. (1977). *Human Aspects of Urban Form. Towards a Man-Environment Approach to Urban Form and Design*. Oxford: Pergamon Press.

Riddell, B. (1996). Structural Adjustment Programs and the City in Africa. In: *Spring Symposium on Space. Culture and Society in Africa, Centre for African Studies, University of Illinois at Urbana-Champaign, 28-30 March 1996*.

Robertson, D. (2017). Why Shipping Containers Are Cool, But Not Affordable Housing. *Politico Magazine, July 20, 2017*.

Rubin, P. (2018). Ready Player One Is a Virtually Empty Good Time. *WIRED, March 29, 2018*.

san Román-Espinosa, T. and López-Catalán, Ó. (2012). Gypsy/Roma Settlements. In: S.J. Smith, ed., *International Encyclopedia of Housing and Home*. Elsevier Ltd, pp.316–322.

Rossbacher, L.A. (1986). Nearest-Neighbour Analysis: A Technique for Quantitative Evaluation of Polygonal Ground Patterns. *Geografiska Annaler. Series A, Physical Geography*, 68(1/2), p.101.

Robinson, J. (2006). *Ordinary Cities*. London: Routledge.

Robinson, J. (2006). Inventions and Interventions: Transforming Cities—An Introduction. *Urban Studies*, 43(2), pp.251–258.

Robinson, J. (2011). 2010 Urban Geography Plenary Lecture—The Travels of Urban Neoliberalism: Taking Stock of the Internationalization of Urban Theory. *Urban Geography*, 32(8), pp.1087–1109.

Robinson, J. (2014). New Geographies of Theorizing the Urban: Putting Comparison to Work for Global Urban Studies. In: S. Parnell and S. Oldfield, eds., *The Routledge Handbook on Cities of the Global South*. London: Routledge, pp.57–70.

Rodrigue, J.P. (2010). Containerization. In: J. Zumerchik and S.L. Danver, eds., *Seas and Waterways of the World: An Encyclopedia of History, Uses, and Issues*. California: ABC-CLIO, LLC.

Rodrigue, J.P. (2012). *The Containerization of Commodities: Integrating Inland Ports with Gateways and Corridors in Western Canada*. Calgary, Ab: Van Horne Institute.

Rodrigue, J.-P., Comtois, C. and Slack, B. (2009). *The Geography of Transport Systems*. 2nd ed. London: Routledge.

Rodrigue, J.-P. and Notteboom, T. (2009). The Geography of Containerization: Half a Century of Revolution, Adaptation and Diffusion. *GeoJournal*, [online] 74(1), pp.1–5. Available at: https://people.hofstra.edu/Jeanpaul_Rodrigue/downloads/Future_Containerization_TN_JPR_pre-introduction.pdf.

Rosen, C.M. (1986). *The Limits of Power: Great Fires and the Process of City Growth in America*. Cambridge: Cambridge University Press.

Roy, A. (2009). The 21st-Century Metropolis: New Geographies of Theory. *Regional Studies*, [online] 43(6), pp.819–830.

Roy, A. and Ong, A. (2011). *Worlding Cities: Asian Experiments and the Art of being Global*. Oxford: Wiley-Blackwell.

Roy, A. (2005). Urban Informality: Toward an Epistemology of Planning. *Journal of the American Planning Association*, 71(2), pp.147–158.

Roy, A. (2011). Postcolonial Urbanism: Speed, Hysteria, Mass Dreams. In: A. Roy and A. Ong, eds., *Worlding Cities: Asian Experiments and the Art of Being Global*. Malden: Wiley-Blackwell, pp.307–335.

Sanjek, R. (1982). The Organization of Households in Adabraka: Toward a Wider Comparative Perspective. *Comparative Studies in Society and History*, 24(1), pp.57–103.

Sauer, C. (1925). The Morphology of Landscape. *University of California Publications in Geography*, 2, pp.19–54.

Saviano, R. (2008). *Gomorrah: A Personal Journey into the Violent International Empire of Naples' Organized Crime System*. New York: Picador.

Saxon, S. and Stone, M. (2017). *Container Shipping: The Next 50 Years*. Mckinsey&Company.

Saunders, P. (1981). *Social Theory and the Urban Question*. London: Routledge.

Sepe, M. (2013). Urban Containers. In: M. Sepe, ed., *Planning and Place in the City: Mapping Place Identity*. London: Routledge, pp.31–37.

Schindler, S. (2017). Towards a Paradigm of Southern Urbanism. *City*, 21(1), pp.47–64.

Schmid, C. (2008). Henri Lefebvre's Theory of the Production of Space: Towards a Three-dimensional Dialectic. In: K. Goonewardena, S. Kipfer, R. Milgrom and C. Schmid, eds., *Space, Difference, Everyday Life: Reading Henri Lefebvre*. New York: Routledge, pp.27–45.

Schrank, A. (2009). Case-Based Study. In: E. Perecman and S.R. Curran, eds., *A Handbook for Social Science Field Research: Essays & Bibliographic Sources on Research Design and Methods*. London: Sage Publications.

Schumpeter, J. (2003). *Capitalism, Socialism, And Democracy.* London: Taylor and Francis.

Schwarzer, M. (2013). The Emergence of Container Urbanism. *Places Journal*, February 2013. https://doi.org/10.22269/130212

Schwab, P. (2002). *Africa: A Continent Self-destructs*. New York, N.Y.: Palgrave Macmillan.

Schwarz, B. (2014). Architecture and Meaning. In: A.C. Michalos, ed., *Encyclopedia of Quality of Life and Well-Being Research*. Dordrecht: Springer.

SG Blocks (2017). [online] Available at: https://www.sgblocks.com/.

Shaffir, W. and Stebbins, R.A. (1991). *Experiencing Fieldwork: An Inside View of Qualitative Research*. Newbury Park: Sage Publications.

Shaffir, W., Stebbins, R.A. and Turowetz, A. (1980). *Fieldwork Experience: Qualitative Approaches to Social Research*. New York: St. Martin's Press.

Shen, J., Copertaro, B., Zhang, X., Koke, J., Kaufmann, P., and Krause, S. (2020). Exploring the Potential of Climate-Adaptive Container Building Design under Future Climates Scenarios in Three Different Climate Zones. *Sustainability*, [online] 12(1), p.108. Available at: https://www.mdpi.com/2071-1050/12/1/108/htm [Accessed 11 Mar. 2020].

Shen, L., Guo, X. (2014). Spatial Quantification and Pattern Analysis of Urban Sustainability Based on a Subjectively Weighted Indicator Model: A Case Study in the City of Saskatoon, SK, Canada. *Applied Geography*, 53, pp.117-127.

Simon, D. (1992). *Cities, Capital, and Development: African Cities in the World Economy*. London: Belhaven Press.

Simon, D. (1996). Rethinking Cities: Sustainability and Development in Africa. In: *Paper prepared for the Panel on "The Morphology of Urban Spaces", Spring Symposium. Space. Culture and Society in Africa, Centre for African Studies, University of Illinois at Urbana-Champaign. 28-30 March 1996."*

Simone, A.M. (2004). *For the City Yet to Come: Changing African Life in Four Cities*. Durham: Duke University Press.

Sinclair, S.W. (1976). Informal Economic Activity in African Cities: Proposals for Research. *The Journal of Modern African Studies*, 14(4), pp.696–699.

Smith, N. (2008). *Uneven Development: Nature, Capital, and the Production of Space*. London: The University of Georgia Press.

Snape, D. and Spencer, L. (2003). The Foundations of Qualitative Research. In: J. Ritchie and J. Lewis, eds., *Qualitative Research Practice: A Guide for Social Science Students and Researchers*. London: Sage Publications, pp.2–23.

Spencer, G. (1991). Methodological Issues in the Study of Bureaucratic Elites: A Case Study of West Point. In: R.G. Burgess, ed., *Field Research: A Sourcebook and Field Manual*. New York: Routledge.

Spire, A. and Choplin, A. (2018). Street Vendors Facing Urban Beautification in Accra (Ghana): Eviction, Relocation and Formalization. *Articulo – revue de sciences humaines*, (17–18).

Seelow, A.M. (2018). The Construction Kit and the Assembly Line—Walter Gropius' Concepts for Rationalizing Architecture. *Arts*, 7(4), p.95.

Scoates, C., LOT/EK Architecture., & Walker Art Center. (2003). *LOT-EK: Mobile Dwelling Unit*. New York, NY: Distributed Art Publishers.

Sheller, M. and Urry, J. (2006). The New Mobilities Paradigm. *Environment and Planning A: Economy and Space*, [online] 38(2), pp.207–226. Available at: https://journals.sagepub.com/doi/10.1068/a37268.

Simon, R. and Timmons, H. (2006). A Ship Already Sailed. *New York Times*. 24 Feb.

Smith, R.E. (2010). *Prefab Architecture: A Guide for Architects and Construction Professionals*. [online] Hoboken, N.J.: John Wiley & Sons. Available at: https://www.wiley.com/en-us/Prefab+Architecture%3A+A+Guide+to+Modular+Design+and+Construction-p-9780470275610 [Accessed 4 Dec. 2019].

Sofia, Z. (2000). Container Technologies. *Hypatia*, [online] 15(2), pp.181–201. Available at: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1527-2001.2000.tb00322.x [Accessed 26 Sep. 2019].

Sørensen, M.P. and Christiansen, A. (2012). *Ulrich Beck: An Introduction to the Theory of Second Modernity and the Risk Society*. 1st ed. London: Routledge.

Soja, E.W., Dufaux, F., Gervais-Lambony, P., Buire, C. and Desbois, H. (2011). Spatial Justice and the Right to the City: An Interview with Edward Soja. *Justice spatiale - Spatial justice, Université Paris Ouest Nanterre La Défense, UMR LAVUE 7218, Laboratoire Mosaïques*.

Soja, E.W. (1980). The Socio-Spatial Dialectic. *Annals of the Association of American Geographers*, 70(2), pp.207–225.

Songsore, J. (2009). *The Urban Transition in Ghana: Urbanization, National Development and Poverty Reduction*. London: IIED.

Sorkin, M. (2001). *Some Assembly Required*. Minneapolis: University of Minnesota Press.

Stanek, Ł. (2008). Space as Concrete Abstraction: Hegel, Marx and Modern Urbanism in Henri Lefebvre. In: K. Goonewardena, S. Kipfer, R. Milgrom and C. Schmid, eds., *Space, Difference, Everyday Life: Reading Henri Lefebvre*. New York: Routledge, pp.62–79.

Steel, W., Ujorany, T. and Owusu, G. (2014). Why Evictions do not deter Steet Traders: Case Study in Accra, Ghana. *Ghana Social Science Journal*, 11(2), pp.52–76.

Stopford, M. (2009). *Maritime Economics*. 3rd ed. London: Routledge.

Stock, R. (1995). *Africa, South of the Sahara*. New York; London: The Guilford Press.

Sullivan, E. and Olmedo, C. (2014). Informality on the Urban Periphery: Housing Conditions and Self-help Strategies in Texas Informal Subdivisions. *Urban Studies*, 52(6), pp.1037–1053.

Sutherland, A. (1958). Planning Law and Practice in Ghana. *Town Planning Institute Journal [TPIJ]*, 44, p.137.

Talley, W.K. (2002). Dockworker Earnings, Containerisation, and Shipping Deregulation. *Journal of Transport Economics and Policy*, 36(3), pp.447–467.

Talley, W.K. and Schwarz-Miller, A.V. (1998). Railroad Deregulation and Union Labor Earnings. In: *Regulatory Reform Railroad Deregulation and Union Labor Markets*. Boston: Kluwer Academic Publishers, pp.125–53.

Talen, E. (2015). Do-it-Yourself Urbanism: A History. *Journal of Planning History*, 14(2), pp.135–148.

Teubner, G. (1991). The Two Faces of Janus: Rethinking Legal Pluralism. *Cardozo Law Rev*, 13, pp.1443–1462.

Thibault, M., Brooks, M.R. and Button, K.J. (2006). The Response of the U.S. Maritime Industry to the New Container Security Initiatives. *Transportation Journal*, 45(1), pp.5–15.

Thorns, D.C. (2002). *The Transformation of Cities: Urban Theory and Urban Life*. New York: Palgrave Macmillan.

The Council of Economic Advisers (2019). *The State of Homelessness in America*. The Executive Office of the President of the United States of America.

The Economist (2014). High-Tech Shipping Containers: Boxing Clever. *The Economist. Retrieved from https://www.economist.com/science-and-technology/2014/03/01/boxing-clever*

Town and Country Planning Division (1958). *Accra. A Plan for the Town*. The Report for the Minister of Housing. Town and Country Planning Division of the Ministry of Housing.

Tighe, C. (2018). Shipping Container Developments Offer Lifeline to Small Businesses. *Financial Times. Retrieved from https://www.ft.com/content/d2d10652-a08c-11e8-85da-eeb7a9ce36e4*.

Timmermans, H. (2004). Retail Location and Consumer Spatial Choice Behavior. In: A. Bailly and L.J. Gibson, eds., *Applied Geography*. Dordrecht: Springer.

Trace, K. (2001). For "Tyranny of Distance" Read "Tyranny of Scale": Australia and the Global Container Market. *The Great Circle*, 23, pp.21–46.

Turner, J.F.C. (1972). Housing as a Verb. In J.F.C. Turner & R. Fichter, eds., *Freedom to Build: Dweller Control of the Housing Process*. Basingstoke: Macmillan, pp.148-175

Ulrich Beck (2000). *World Risk Society*. Cambridge: Polity Press.

UK Government (2017). Tenth Anniversary of the MSC Napoli Shipwreck Disaster. *https://www.gov.uk/government/news/tenth-anniversary-of-the-msc-napoli-shipwreck-disaster*

UN-HABITAT (2006). *State of the World's Cities 2006/2007*. Nairobi: United Nations Human Settlements Programme (UN-Habitat).

UN-HABITAT (2007). *Enhancing Urban Safety and Security: Global Report on Human Settlements*. New York: UN-Habitat.

UNDP (2007). *Ghana Human Development Report 2007*. Accra: UNDP.

UN-HABITAT (2008). *State of the World's Cities 2010/2011: Bridging the Urban Divide*. Nairobi: UN-HABITAT.

UN-Habitat (2011). *Ghana Housing Profile*. Nairobi: UN-HABITAT.

UN-HABITAT (2009). *Ghana: Accra Urban Profile*. New York: UN-HABITAT.

UN-HABITAT (2009). *Planning Sustainable Cities, Global Report on Human Settlements 2009*. UN-HABITAT: Earthscan Publications

UN-HABITAT (2016). *Urbanization and Development: Emerging Futures. World Cities Report 2016*. Nairobi: United Nations Human Settlements Programme (UN-Habitat).

UN-HABITAT (2020). *Access to Basic Services by Population between 1990 & 2018 4th Feb 2020*. Accessed at: https://urban-data-guo-un-habitat.hub.arcgis.com/datasets/access-to-basic-services-by-population-between-1990-2018-4th-feb-2020/data?orderBy=County&page=21&selectedAttribute=Access_to_sufficient_living_are&where=Sub_Region%20%3D%20%27Western%20Africa%27.

United Nations Centre For Human Settlements (1996). *An Urbanizing World: Global Report on Human Settlements, 1996*. Oxford; New York: Oxford University Press for The United Nations Centre For Human Settlements Habitat.

United Nations Human Settlements Programme (2003). *The Challenge of Slums: Global Report on Human Settlements, 2003*. London; Sterling, Va: Earthscan Publications.

United Nations, Department of Economic and Social Affairs, Population Division (2015). *World Population Prospects: The 2015 Revision, Key Findings and Advance Tables*. Working Paper No. ESA/P/WP.241.

United Nations (2017). *The Ocean Conference*. New York, 5-9 June 2017: United Nations.

Van der Vleuten, E. (2004). Infrastructures and Societal Change. A View from the Large Technical Systems Field. *Technology Analysis & Strategic Management*, 16(3), pp.395–414.

Valente, J., Roldán, J., Garzón, M. and Barrientos, A. (2019). Towards Airborne Thermography via Low-Cost Thermopile Infrared Sensors. *Drones*, 3(1), p.30.

Valente, T.W. (1996). Social Network Thresholds in the Diffusion of Innovations. *Social Networks*, 18(1), pp.69–89.

Valente, T.W. and Davis, R.L. (1999). Accelerating the Diffusion of Innovations using Opinion Leaders. *The Annals of the American Academy of Political and Social Science*, 566(1), pp.55–67.

Valente, T.W., Watkins, S.C., Jato, M.N., Van Der Straten, A. and Tsitsol, L.-P.M. (1996). Social Network Associations with Contraceptive Use Among Cameroonian Women in Voluntary Associations. *Social Science & Medicine*, 45(5), pp.677–687.

Vecchiato, R. (2016). Disruptive Innovation, Managerial Cognition, and Technology Competition Outcomes. *Technological Forecasting and Social Change*, [online] 116(2017), pp.116–128. Available at: https://www.sciencedirect.com/science/article/pii/S004016251630587X.

VICE NEWS (2017). Decolonising Technology: Does It Use Us or the Other Way Around? *Vice.com*.

Vogt, W.P., Gardner, D.C. and Haeffele, L.M. (2012). *When to Use What Research Design*. New York: Guilford Press.

Volont, L. (2019). DIY Urbanism and the Lens of the Commons: Observations from Spain. *City & Community*, 18(1), pp.257–279.

Waldrop, M.M. (2007). Data Center in a Box. *Scientific American*, 297(2), pp.90–93.

Ward, P.M. (2004). Informality of Housing Production at the Urban-Rural Interface: The 'not so strange case' of the Texas Colonias. In: N. AlSayyad and A. Roy, eds., *Urban Informality: Transnational Perspectives from the Middle East, Latin America, and South Asia*. Lanham, MD: Lexington Books, pp.243–270.

Ward, P.M. and Peters, P.A. (2007). Self-help Housing and Informal Homesteading in Peri-urban America: Settlement Identification Using Digital Imagery and GIS. *Habitat International*, 31(2), pp.205–218.

Ward, P.M. (1999). *Colonias and Public Policy in Texas and Mexico: Urbanization by Stealth*. Austin: University of Texas Press.

Ward, C. (1976). *Housing: An Anarchist Approach*. London: Freedom Press.

Watson, V. (2003). Conflicting Rationalities: Implications for Planning Theory and Ethics. *Planning Theory & Practice*, 4(4), pp.395–407.

Way, H.K. (2010). Informal Homeownership in the United States and the Law. *St. Louis University Public Law Review*, 29(1), pp.113–92.

Weeks, J.R., Hill, A., Stow, D., Getis, A. and Fugate, D. (2009). Can We Spot a Neighborhood from the Air? Defining Neighborhood Structure in Accra, Ghana. *GeoJournal*, 69(1–2), pp.9–22.

Wexler, M.N. (1996). A Sociological Framing of the NIMBY (Not-In-My-Backyard) Syndrome. *International Review of Modern Sociology*, 26(1), pp.91–110.

Weinthal, B. (2013). Syrian Refugees Face an Increasingly Horrific Situation in Turkey. *The Atlantic*.

Wildavsky, A. (1973). If Planning is Everything, Maybe it's Nothing. *Policy Sciences*, 4(2), pp.127–153.

Williams, R.J. (2019). The Sinister Brutality of Shipping Container Architecture. *The New York Times,* August 2019. https://www.nytimes.com/2019/08/14/opinion/shipping-container-homes.html

Wood, S. (1970). Some Problems of Town and Country Planning in Africa. *The Journal of Legal Pluralism and Unofficial Law*, 2(3), pp.77–95.

Woetzel, J., Mischke, J. and Ram, S. (2014). The World's Housing Crisis Doesn't Need a Revolutionary Solution. *Harvard Business Review*. *Retrieved from https://hbr.org/2014/12/the-worlds-housing-crisis-doesnt-need-a-revolutionary-solution*

World Bank (2017). *2014 Land Cover Classification of Accra, Ghana*. https://datacatalog.worldbank.org/dataset/c-2014-land-cover-classification-accra-ghana.

World Bank (2015). *Rising through Cities in Ghana: Ghana Urbanization Review Overview Report*. Washington DC: World Bank.

World Bank (2016). *World Development Indicators*. http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators#.

World Bank (2018). *Overcoming Poverty and Inequality in South Africa: An Assessment of Drivers, Constraints, and Opportunities*. Washington DC: World Bank.

WHO (2016). *Ambient (outdoor) Air Quality and Health*. Fact sheet No 313, updated March 2014, World Health Organization (http://www.who.int/mediacentre/factsheets/fs313/en/)

World Shipping Council (2004). *Liner Shipping Facts and Figures*. Washington, D.C: World Shipping Council.

World Shipping Council (2017). Various Statistics. Available at: www.worldshipping.org.

Yamada, I. (2017). Thiessen Polygons. In: D. Richardson, N. Castree and M.F. D. Richardson, N. Castree, M. F. Goodchild, et al, eds., *The International Encyclopedia of Geography: People, the Earth, Environment, and Technology*. Wiley & Sons, Ltd, pp.1–6.

Yankson, P.W.K. (2000). Accommodating Informal Economic Units in the Urban Built Environment: Petty Commodity Enterprises in the Accra Metropolitan Area, Ghana. *Third World Planning Review*, 22(3), p.313.

Yankson, P.W.K. and Bertrand, M. (2012). Challenges of Urbanization in Ghana. In: E. Ardayfio-Schandorf, P.W.K. Yankson and M. Bertrand, eds., *The Mobile City of Accra. Urban Families, Housing and Residential Practices*. Council for the Development of Social Science Research in Africa.

Yankson, P.W.K. and Gough, K.V. (2014). Urban Low-income Housing in Ghana. In: J. Bredenoord, P. Van Lindert and P. Smets, eds., *Affordable Housing in the Urban Global South: Seeking Sustainable Solutions*. Abingdon: Earthscan, pp.381–394.

Yin, R.K. (2003). *Case Study Research: Design and Methods*. 3rd ed. Los Angeles: Sage Publications.

Zarocostas, J. (1996). Port Industry Jobs Worldwide Continue to Decline, Study Says. *Journal of Commerce*. 12 May.

Zhang, G., Setunge, S. and van Elmpt, S. (2014). Using Shipping Containers to Provide Temporary Housing in Post-disaster Recovery: Social Case Studies. *Procedia Economics and Finance*, 18, pp.618–625.

Zieleniec, A. (2018). Lefebvre's Politics of Space: Planning the Urban as Oeuvre. *Urban Planning*, 3(3), p.5.

Appendix One

Interview questions for Container Prefabricators and Distributors

1. What is the mission/goal behind your firm?

2. What services does your firm provide?

3. Why focus on shipping containers/modular homes?

4. Please briefly describe the state of the housing and property market in your city/country?

5. What impact do companies like yours have on the urban built environment?

6. What are your marketing strategies and the value proposition?

7. Who are your typical customers?

8. How many modules have your firm produced so far?

9. What is the average cost of a container module, and how do you maintain the price at affordable rates?

10. Do you consider your firm a market disrupter in the real estate market and why?

11. What challenges do you face as a market disrupter?

12. Who are your major competitors, and what does your firm do differently from others?

13. What are the biggest threats to the sustainability of your business model?

14. What do you think about the future of container homes and mass-produced factory housing in cities? Is this form of urbanism environmentally and socioeconomically sustainable?

Appendix Two

Interview Guide for urban authorities in Ghana

1. Please describe how your work affects spatial planning and urban sustainability strategies in Accra?

2. What do you think about container urbanism in Accra?

3. Why do you think people use these containers as an alternative urban process? What are the underlining factors?

4. What is the impact of the containerization of urban space on the urban built environment?

5. Do you think the current legislative instruments are sufficient for regulating the containerization of urban space in Accra?

6. Are urban institutions doing enough to enforce these legislative instruments?

7. How do you establish authority to deal with the proliferation of informal urban processes?

8. To what extend are policymakers complicit in the proliferation of alternative urban processes such as the containerization of urban space?

9. What challenges do urban planning institutions face in implementing planning and sustainability policies to address the normalization of the containerization of urban space?

10. What is your relationship with other state agencies and departments regarding the management of alternative urban processes?

11. What is your relationship with NGOs and housing advocacy groups?

12. What are your thoughts on the future of container urbanism?

Appendix Three

Questionnaire Survey for Container Users

1. Location (GPS)

2. Sex (Male, Female)

3. Age of respondent (16-24, 25-34, 35-44, 45-54, 55-64, 65+)

4. Education background (None, Primary, Secondary, Vocational training, Tertiary)

5. Marital Status (single, married, divorced, in a relationship)

6. Number of Children (0, 1-3, 4-6, 7+)

7. What is your occupation? (civil servant, artisan, entrepreneurs, petty trader, food vendor, other)

8. Region of origin (Greater Accra, Ashanti, Volta, Western, Central, Northern, Upper East, Upper West, Brong Ahafo, Eastern)

9. Length of residence in Accra (This is my hometown, less than 6 months, 6 to 12 months,1 to 2 years, 2 to 4 years, more than 4 years)

10. Are you the breadwinner of the household? (Yes, No)

11. Average Monthly income in Ghana Cedis (Below 100, 100-400, 500-700, 800-1000, 1000+)

12. How would you classify yourself (very rich, rich, high-income earner, middle-income earner, low-income earner, poor, very poor)?

13. Does the container belong to you? (Yes, No) If no, tenancy arrangement (rented, supplied by relative or friend, supplied by employer)

14. How much did the container cost you in Ghana Cedis? (less than 1000, 1000-2000, 2000-4000, 5000+)

15. If the container is rented, what is the average cost of rent in a month in Ghana Cedis? (Below 100, 100-200, 200-400, 500-700, 800+)

16. Type of container (locally prefabricated, standard shipping container)

17. What is the size of your container in dimension (10ft, 20ft, 30ft, 40ft)

18. What is the purpose of your container? (Retail only, dwelling only, multipurpose)

19. Who designed the container? (architect, Welder/Vulcanizer)

20. Who in your opinion should design/build Containers?

21. Were you involved in the design specification of the container? (Yes, No)

22. How many people use the container at a given time?

23. Container opens at

24. Container closes at

25. How long have you been using the container? (Less than 6 months, 6 to 12 months,1 to 2 years, 2 years to 4 years, more than 4 years)

26. What were you using before the container? (nothing, wooden structure, tables, brick and mortar structure, others)

27. Are you a member of any association or union? (Yes, No). If yes, please provide the name of the association or union.

28. Ownership of land on which the container is located (own land, rented from the landowner, government land, public right of ways-open space (no man's land), family land, open space attached to a residence, don't know landowner, other)

29. How easy was it for you to find and secure land to locate your container (very easy, easy, neither easy nor difficult, very difficult, don't know)

30. Is space on which the container located temporary or permanent? (temporary, permanent)

31. Did you experience any challenges setting up your container here? (Yes, No) if yes, please explain, if no continue

32. Why did you choose this place to assemble your container?

33. Is the container easy to assemble and disassemble? (Yes, No)

34. Is your container modifiable or transformable? (Yes, No)

35. Aesthetically, do you think containers are good for the city? (Yes, No). Please explain your answer

36. Has your health deteriorated since moving into the container? (Yes, No) If yes, since when and what type of health issues?

37. Do you have electricity in your container? (Yes, No)

38. Have you ever received a complaint from neighbors for setting up your container? (Yes, No) If yes, please specify

39. Did you register your container with city authorities? (Yes, No)

40. Have you ever received notification for the removal of your container from city authorities? (Yes, No). If Yes, have you complied with the notification? If No, why not

41. Do you pay money to the city authorities? (Yes, No), If yes, how frequency (daily, weekly, monthly, annually). If No, Why not?

42. Do you have a fire extinguisher in the container? (Yes, No)

43. How many hours of the day do you stay in the container on average?

44. What is the average distance of the container from your home? Note, If not used as a place of dwelling. (Close to house, very far from home?)

45. Do you think the container harm the urban environment? (Yes, No). Please provide reasons for your answer.

46. Do you face any challenges accessing your container during the perennial flooding in Accra? (Yes, No)

47. Have you ever moved your container from one location to another? (Yes, No) If yes, why?

48. How long do you plan to use the container? (Less than 1 year, 1-2yrs, 2-4yrs, 4-6yrs,6-10yrs, 10+, Don't know)

49. Do you perform regular maintenance (welding, rust maintenance) on your container? (Yes, No). If yes, the number of times in a year.

50. Have you ever been a victim of crime? (Yes, No)

51. Has your container ever been burglarized or vandalized? (Yes, No), If yes, how frequently?

52. How worried are you of been burglarized? (Very worried, A Little Worried, Not Very Worried, not at all worried, do not know)

53. Do you think using the container exposes you to a high risk of victimization? (Yes, No)

54. Environmental conditions in and around the container

	Good		Regular		Poor	
	Inside container	Immediate environment	Inside container	Immediate environment	Inside container	Immediate environment
Air						
Cleanliness						
Dust						
Light						
Odor						
Temperature						
Space						
Noise						
Sanitation						

With regards to the location of the container, to what extent do you agree with the following statements

55. My container is affordable (strongly agree, agree, neither agree nor disagree, strongly disagree).

56. Using the container reduced the risk of poverty (strongly agree, agree, neither agree nor disagree, strongly disagree).

57. I chose the container as a temporary solution (strongly agree, agree, neither agree nor disagree, strongly disagree).

58. I chose the container because I have no choice (strongly agree, agree, neither agree nor disagree, strongly disagree).

59. I have a good relationship with other container users (strongly agree, agree, neither agree nor disagree, strongly disagree).

60. I have a good relationship with neighbors/non-container users (strongly agree, agree, neither agree nor disagree, strongly disagree)

61. It is important that the container must be close to my friends/family place (strongly agree, agree, neither agree nor disagree, strongly disagree)

62. It is important that the container must be located in my neighborhood (strongly agree, agree, neither agree nor disagree, strongly disagree)

63. It is important for me that the container is close to the roadside (strongly agree, agree, neither agree nor disagree, strongly disagree)

64. It is important for me that the container is close to a market (strongly agree, agree, neither agree nor disagree, strongly disagree)

65. It is important to me that my container is close to other containers (strongly agree, agree, neither agree nor disagree, strongly disagree)

66. The landowner/local authorities can force to leave this place (strongly agree, agree, neither agree nor disagree, strongly disagree)

67. I feel discriminated against for using the container (strongly agree, agree, neither agree nor disagree, strongly disagree)

68. Are you a member of a political party? (Yes, No)

69. If yes, Which party (NPP, NDC, CPP, PNC, PPP, DPP, NDP, Unaffiliated)

70. Do you have a close relationship with the Assemblymember of this community? (Yes, No)

71. Do you have a close relationship with the DCE/MCE of this Community? (Yes, No)

72. Do you have a close relationship with someone in the municipal or district assembly of your area? (Yes, No)

73. Do you have a close relationship with the Member of Parliament of this Community (Yes, No)?

74. Do you have a close relationship with the chief/queen mother of this community? (Yes, No)

75. Do you have a close relationship with opinion leaders and community elders in this area? (Yes, No)

76. How confident are you that your container will not be demolished (not at all confident, less confident, confident, more confident, very confident)?

77. Are you a member of a community association? (Yes, No)

78. Do you participate in community activities? (Yes, No)

79. Under normal circumstances, what would dissuade you from using the container?

80. Photo of the container.

Appendix Four

Questionnaire Survey for Household Heads (Non-Container Users)

1. Location (GPS)

2. Sex (Male, Female)

3. Age of respondent (16-24, 25-34, 35-44, 45-54, 55-64, 65+)

4. What is the size of your household including yourself? (1-3, 4-6, 7-10, 10+)

5. Education level (No education, Primary, Secondary, Vocational training, Tertiary, others)

6. Are you employed? (Yes, No). If yes, are you engaged in the formal or informal sector?

7. How long have you been living in this neighborhood? (Less than 6 months, 6-12 months, 1-2 years, 2-4 years, more than 4 years)

8. Region of origin (Greater Accra, Ashanti, Volta, Western, Central, Northern, Upper East, Upper West, Brong Ahafo, Eastern)

9. How would you classify yourself? (very rich, rich, high-income earner, middle-income earner, low-income earner, poor, very poor)

10. Do you know someone who owns a container in your neighborhood? (Yes, No)

11. If yes, what is your relationship with that person (Close relatives, close friend, neighbor, other (Specify))

12. Do you know someone outside your neighborhood who owns a container? (Yes, No), If yes, Relationship with that person (kin, Close friend, neighbor, other)

13. Are the majority of the container owners' members of your neighborhood? (Yes, No)

14. To what extent do you agree with the following statement. There are too many containers in the neighborhood. (strongly agree, agree, neither agree nor disagree, strongly disagree).

15. To what extent do you agree with the following statement. Containers are good for the city and the environment (strongly agree, agree, neither agree nor disagree, strongly disagree).

16. To what extent do you agree with the following statement. City authorities should regulate the use of containers (strongly agree, agree, neither agree nor disagree, strongly disagree).

17. To what extent do you agree with the following statement. People use containers because it is affordable (strongly agree, agree, neither agree nor disagree, strongly disagree).

18. To what extent do you agree with the following statement. People use containers because they had no choice (strongly agree, agree, neither agree nor disagree, strongly disagree).

19. To what extent do you agree with the following statement. People use containers as a temporary solution (strongly agree, agree, neither agree nor disagree, strongly disagree).

20. Did you or any member of your household have any dispute with a container user? (Yes, No)

21. Have you registered any complaint with city authorities about the localization of a container in your neighborhood? (Yes, No)

22. Do you know someone who has been ordered to remove their container? (Yes, No). If yes, what is your relationship with that person (friend, close relative, neighbor, acquaintance, other)

23. How did that make you feel (very sad, sad, worried, indifferent, not sad, happy)?

24. Are you a member of a political party? (Yes, No)

25. If yes, Which party (NPP, NDC, CPP, PNC, PPP, DPP, NDP, Unaffiliated)

26. Do you have a close relationship with the Assembly member of this community? (Yes, No)

27. Do you have a close relationship with the DCE/MCE of this Community? (Yes, No)

28. Do you have a close relationship with someone in the municipal or district assembly of your area (Yes, No)?

29. Do you have a close relationship with the Member of Parliament of this Community (Yes, No)?

30. Do you have a close relationship with the chief/queen mother of this community? (Yes, No)

31. Do you have a close relationship with opinion leaders and community elders in this area? (Yes, No)

32. Are you a member of a community association? (Yes, No)

33. Did you participate in any community activities in the past month? (Yes, No)

34. What type of community activities (eg. Wedding, political meeting, market, funeral, bar, dance, or concert)

Appendix Five

Interview Questions for NGOs in Ghana

1. Please introduce yourself and your current position with the organization?

2. What are the core mission and objectives of the organization?

3. Could you please describe the services your organization provides to the urban population?

4. What challenges does your organization face in achieving key goals and objectives?

5. Could you please describe in detail the projects and assistance your organization offered to people living in informal settlements?

6. Who are your typical members?

7. How many members does your organization have?

8. What is your organization's view on the containerization of urban space in Ghana?

9. What assistance is available to your members who improvise containers for various purposes?

10. Have there been problems with eviction among your members?

11. What have your organization done to prevent evictions of squatters in general and container users in particular?

12. What is your organization's relationship with community-based organizations, local authorities, and international organizations?

13. How do partnerships with these stakeholders help advance inclusivity and the right to the city?

Appendix Six

Demographic Profile in Study Areas, 2010 Population and Housing Census

Key Attributes	Korle Gono	Adabraka	Kotobabi	New Fadama	East Legon
Gender					
Male	14,203	17,582	16,134	8,592	4,626
Female	16,352	18,928	17,494	9,293	4,235
Age					
0-4	3,340	3,300	3,636	2,109	882
5-9	3,021	2,904	3,039	1,778	665
10-14	2,965	2,943	3,099	1,720	660
15-19	2,931	3,524	3,126	1,752	788
20-24	3,179	4,976	4,066	2,067	1,184
25-29	3,024	4,204	3,821	1,943	1,182
30-34	2,474	3,056	3,014	1,666	847
35-39	2,129	2,409	2,420	1,369	643
40-44	1,725	1,958	1,944	993	479
45-49	1,454	1,700	1,406	703	384
50-54	1,282	1,512	1,276	570	310
55-59	932	1,157	924	372	253
60-64	681	936	661	284	189
65-69	479	638	380	188	153

70-74	353	503	335	151	99
75-79	233	358	199	95	66
80-84	162	222	152	70	40
85-89	108	138	75	32	28
90-94	60	46	37	11	5
95+	23	26	18	12	4
Level of Education					
Nursery	866	719	876	430	140
Kindergarten	1,072	1,101	1,101	743	264
Primary	5,972	6,489	5,945	3,484	1,445
JSS/JHS	5,478	7,046	6,249	3,543	1,688
Middle	4,169	4,831	4,131	1,926	658
SSS/SHS	3,495	4,198	4,656	2,257	1,006
Secondary	1,314	1,572	1,288	746	342
Vocational/Technical/Commercial	1,391	1,622	1,501	624	312
Post middle/secondary certificate	430	490	473	230	133
Post-secondary diploma	998	1,669	1,592	510	468
Bachelor degree	766	1,079	1,041	464	745
Postgraduate (Cert., Diploma, Masters, PHD, etc)	106	131	174	45	517
Marital Status					
Never married	17410	22092	20494	10902	5162

Informal/Consensual union/Living together	2852	1442	1031	455	375
Married	7224	9306	9815	5382	2801
Separated	1118	1124	600	224	109
Divorced	673	974	683	452	243
Widowed	1278	1572	1005	470	171

Source: Ghana Statistical Service

Household Profile in Study Areas, 2010 Population and Housing Census

Key Attributes	Korle Gono	Adabraka	Kotobabi	New Fadama	East Legon
Type of Dwelling					
Separate house	424	422	546	218	1351
Semi-detached house	702	594	294	185	65
Flat/Apartment	392	463	576	206	59
Compound house (rooms)	6784	7899	7215	3931	370
Huts/Buildings (same compound)	52	45	27	32	4
Huts/Buildings (different compound)	23	16	5	10	4

Tent	15	20	22	10	12
Improvised home (kiosk/container,etc)	189	1182	656	162	623
Living quarters attached to office/shop	62	235	61	32	47
Uncompleted building	4	29	32	11	285
Other	8	36	19	17	11
Rooms Occupied by Households					
One room	4798	6654	4189	2037	1170
Two rooms	2876	2885	3739	2046	340
Three rooms	551	665	647	275	160
Four rooms	214	239	282	129	147
Five rooms	57	127	133	60	156
Six-Nine rooms	73	138	271	101	496
Ten and more rooms	30	28	48	7	116
Ownership of Dwellings					
Owned by household member	4,023	2,985	3,069	1,216	1,088
Being purchased (e.g. mortgage)	16	9	68	10	3

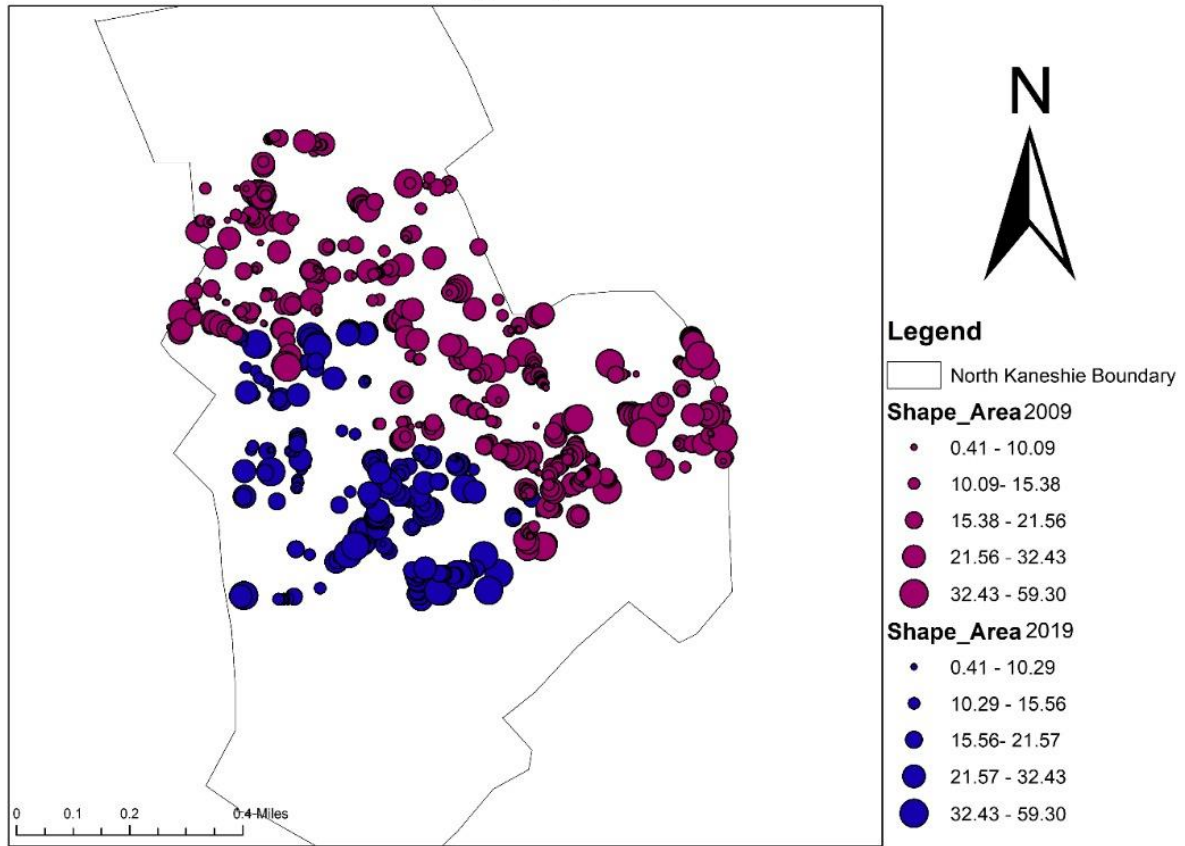| Relative, not a household member	1,405	2,524	1,034	481	237
Other private individual	2,729	4,255	4,714	2,795	986
Private employer	72	423	170	42	210
Other private agency	33	36	167	5	23
Public/Government ownership	270	187	61	40	33
Other	51	317	26	66	5

Source: Ghana Statistical Service

Appendix Seven
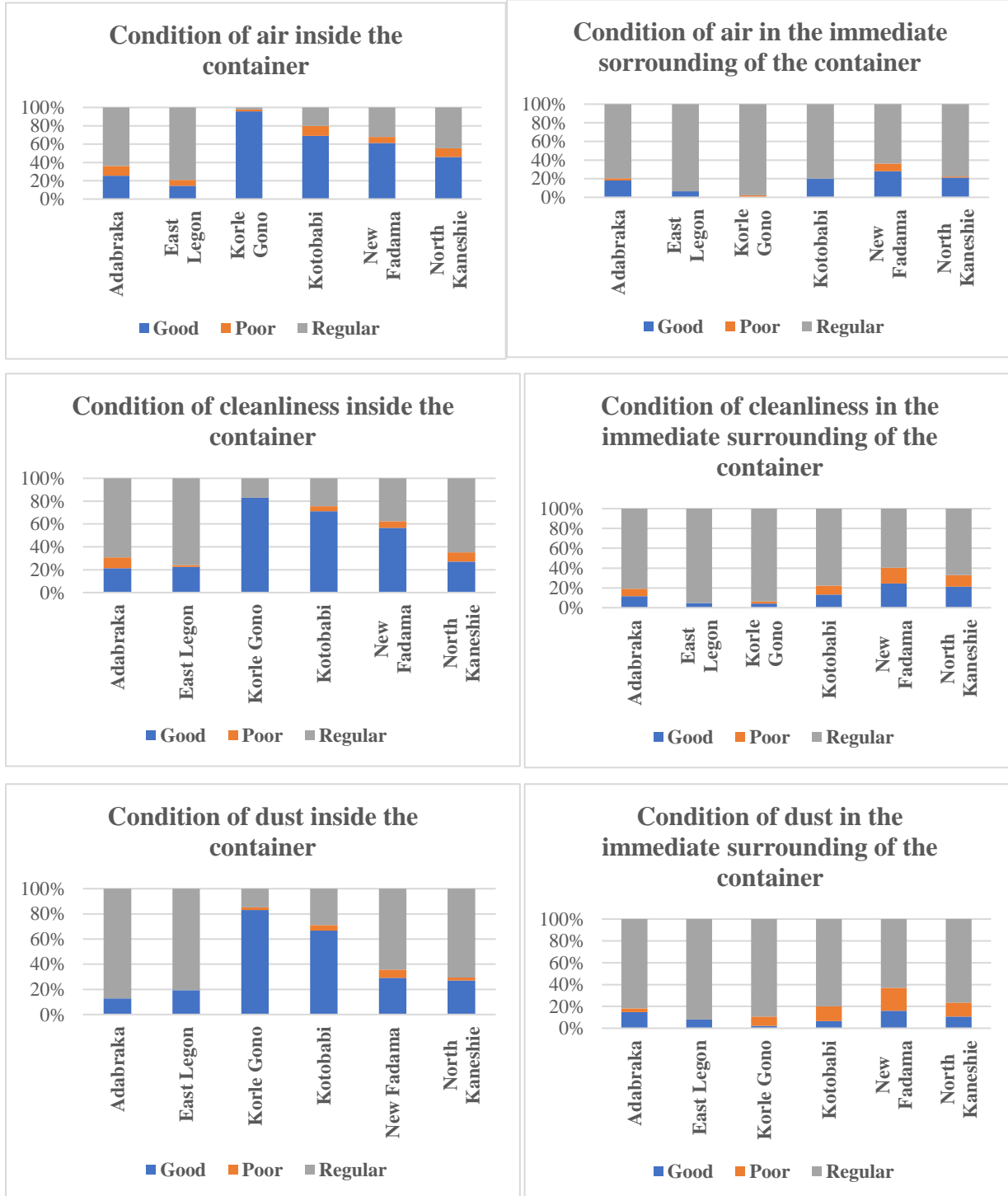
Spatial Distribution of Containers in North Kaneshie
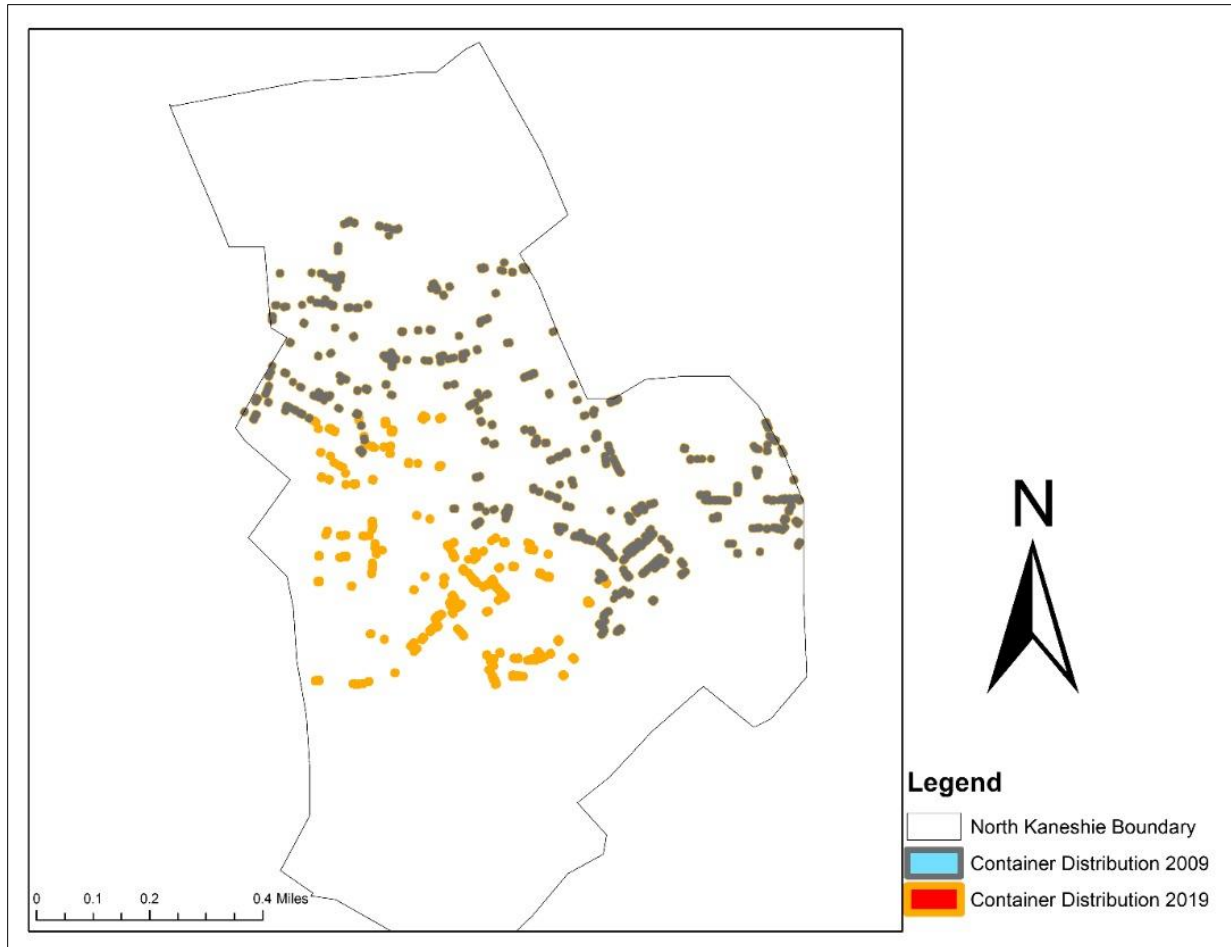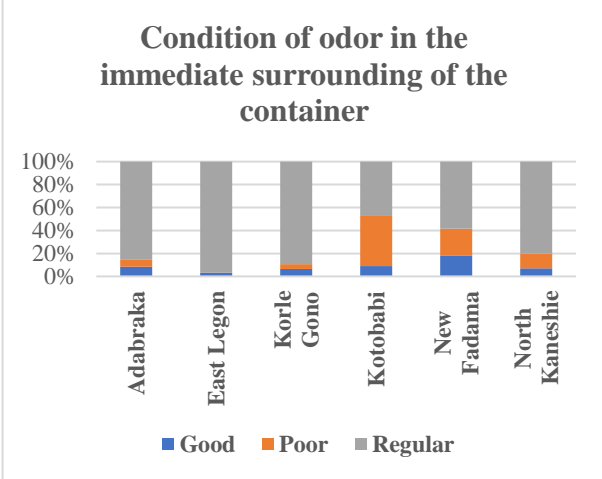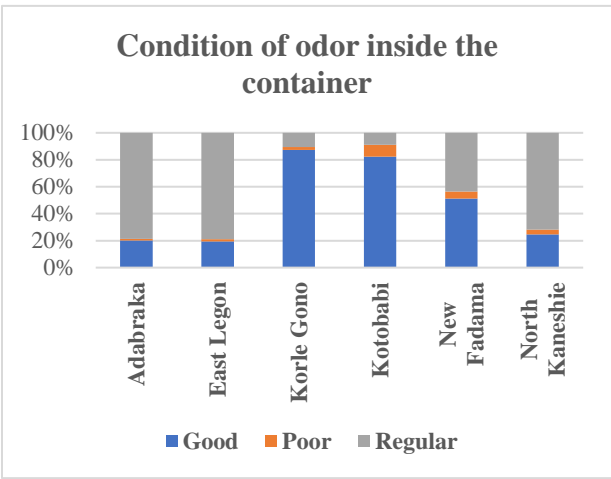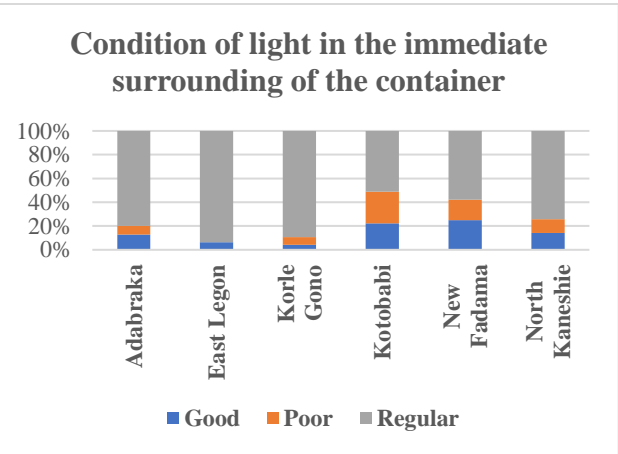
Container Distribution by Square Area in North Kaneshie

Legend

North Kaneshie Boundary

Shape_Area 2009
- 0.41 - 10.09
- 10.09- 15.38
- 15.38 - 21.56
- 21.56 - 32.43
- 32.43 - 59.30

Shape_Area 2019
- 0.41 - 10.29
- 10.29 - 15.56
- 15.56- 21.57
- 21.57 - 32.43
- 32.43 - 59.30

Appendix Eight

Environmental conditions inside and in the immediate surrounding of the container

Condition of air inside the container

Good ■ Poor ■ Regular

Condition of air in the immediate sorrounding of the container

Good ■ Poor ■ Regular

Condition of cleanliness inside the container

Good ■ Poor ■ Regular

Condition of cleanliness in the immediate surrounding of the container

Good ■ Poor ■ Regular

Condition of dust inside the container

Good ■ Poor ■ Regular

Condition of dust in the immediate surrounding of the container

Good ■ Poor ■ Regular

Condition of light inside the container

Condition of light in the immediate surrounding of the container

Condition of odor inside the container

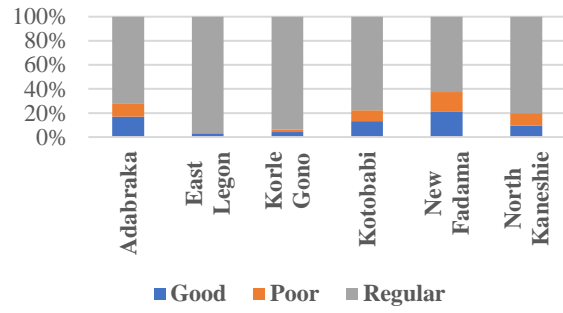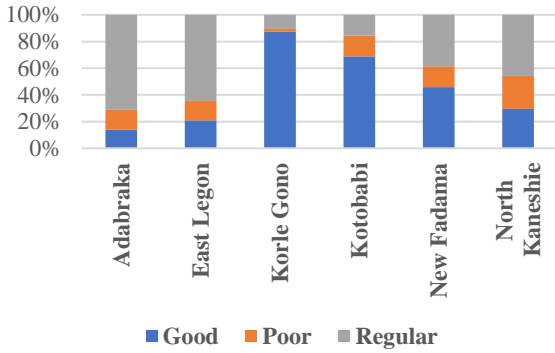Condition of odor in the immediate surrounding of the container

Condition of temperature inside the container
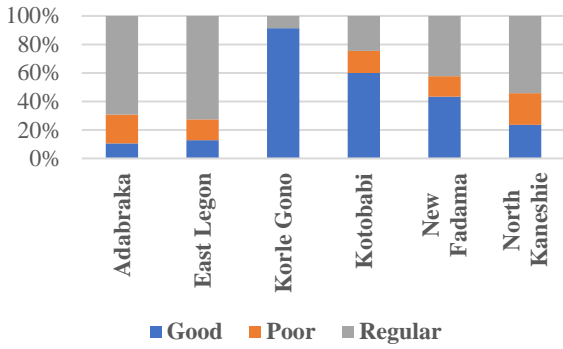
Condition of temperature in the immediate surrounding of the container

Condition of space inside the container

Condition of space in the immediate surrounding of the container

Condition of noise inside the container

Condition of noise in the immediate surrounding of the container

Sanitation condition inside the container

Sanitation condition in the immediate surrounding of the container