

NOURISHING SPACES PROJECT

WORKING PAPER

FOOD SYSTEMS AND DIET-RELATED
NON-COMMUNICABLE DISEASES IN
KISUMU, KENYA

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This is the third in the project's working paper series. For more information about the project and its publications, see <https://www.africancentreforcities.net/programme/nourishing-spaces/>. We welcome comments and suggestions. Please direct them to Paul Opiyo at popiyo2002@yahoo.com

The project (Urban Food Systems Governance for NCD Prevention in South Africa, Kenya and Namibia. IDRC Project # 108458) argues that there is a rising burden of non-communicable diseases across Africa that is being driven in part by increasing consumption of unhealthy diets (ultra-processed and fast foods). Unhealthy diets are becoming more available because food systems, especially in urban parts of Africa, are changing rapidly as a result of urbanization and globalization. This project proposes 'urban-scale research' for addressing diet-related non-communicable diseases in six urban sites – two cities each in South Africa, Kenya and Namibia. Ultimately, the project aims to support local governments and community stakeholders in each study site to utilize the knowledge generated from this research to develop local action plans and interventions that will help to reduce the burden of food-related non-communicable diseases.

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Introduction

The world is increasingly faced with diet-related non-communicable diseases (NCDs). These include cardiovascular diseases, diabetes, cancers and chronic respiratory diseases. They are mainly caused by excessive energy intake associated with purchased meals and processed foods, and decreasing levels of physical activity, particularly in urban settings. These NCDs are closely related to obesity and represent a significant development challenge in low- and middle-income countries (LMICs), including sub-Saharan Africa (SSA). According to World Health Organization (WHO) statistics, NCDs kill 41 million people annually, which is equivalent to 71% of all deaths globally. Of this total, 15 million are between the ages of 30 and 69, and over 85% of these 'premature' deaths occur in LMICs. Cardiovascular diseases, cancers, respiratory diseases and diabetes account for over 80% of all premature NCD deaths. Tobacco use, physical inactivity, the harmful use of alcohol and unhealthy diets all increase the risk of dying from a NCD (WHO, 2018).

The burden of NCDs is increasing in LMICs. In Kenya, NCDs represent a significant and increasing burden of ill-health and death. NCDs represent an estimated 50–70% of all hospital admissions and up to half of all inpatient mortality, with the leading causes being cardiovascular diseases and cancer (WHO, 2012). There is a possibility of underestimation due to uncertain or unavailable mortality and morbidity data on NCDs in Kenya.

Kenya's Ministry of Health has adopted the global vision of halting and reversing the NCD threat. To this end it launched the 'Kenya National Strategy for the Prevention and Control of Non-Communicable Diseases 2015–2020' to guide the implementation of specific measures in addressing the burden (Republic of Kenya, 2015). The 'Kenya Health Sector Strategic and Investment Plan 2013–2017' also outlined a key objective on halting and reversing the rising burden of non-communicable conditions (Republic of Kenya, 2013). The plan set out implementation strategies to address all the NCDs identified in the country. The plan further recognised that some of these NCDs are diet-related, and that there was a need to provide guidance on prevention and control measures to reduce morbidity and mortality.

The 'Kenya National Nutrition Action Plan' (2018) recognises that government needs to empower communities to claim their rights to good nutrition and guide them in realising these rights. However, government policy focuses on the national scale and little attention has been given to the urban or neighbourhood scale. Since the current investments in NCD control are unlikely to bear fruit in the short term, there is a need to set realistic goals for national programmes and pay attention to regional-, city- and community-level interventions.

The Nourishing Spaces project seeks to understand the relationship between people's diets and NCDs. The project focuses on six urban sites in three SSA countries: Cape Town and Kimberley in South Africa; Nairobi and Kisumu in Kenya; and Windhoek and Oshakati in Namibia. This paper presents research done in Kisumu as part of the project's Work Package 2, which seeks to understand the relationship between the local food system, people's consumption practices and NCDs.

Methodology

The research involved analysing the local food system to understand its interactions with other components of the urban environment. It focused on formal and informal food retail as an entry point to engage the wider food system, and examined how retailers' stocking and pricing practices are shaped by trends in national and global food systems, the local urban environment and consumer demands. Data was collected through the following research activities: site observation; citywide mapping of supermarkets; mapping the local food system; and semi-structured interviews.

Site observation

The study site was in Kogony sub-location, a settlement on the western fringes of Kisumu City. The population of Kogony is concentrated in Bandani informal settlement. The rest of Kogony sub-location is formerly a rural area undergoing rapid transition typical of informal settlements on the fringes of secondary cities in SSA. Site observation took place from March 2018 to November 2019, taking note of physical infrastructure, residential houses, business premises, energy types and sources, water sources, the quality of sanitation facilities, security and safety, lighting, people's daily activities, and the general environment. Site observation was conducted to better understand the environment and how it affects the food system, people's dietary patterns and health.

Mapping supermarkets

The historical growth of supermarkets was analysed as a proxy indicator of change in food systems. This involved citywide mapping of the expansion of supermarkets in Kisumu since 2000. The data was collected in July and August 2018 and included the names of supermarkets, dates of opening, location and type of trading space, ownership type, operating hours, and the nature of food products sold. Information on when each supermarket opened was obtained from the store manager. However, in cases of defunct supermarkets or where the managers did not have the information, data was obtained from officials at the local Chamber of Commerce and Industry.

The geo-coordinates/location of all supermarkets were collected using hand-held tablets. The data was recorded on Microsoft Excel spreadsheets and converted to a Microsoft Excel comma-separated values (CSV) document. The data was uploaded to an online mapping platform (ArcGIS) which allowed for map creation, compiling geographic data and analysing mapped information. Details about the city food system and the relationship between supermarket locations, the city's transport system and socio-economic status were also noted. Maps were produced indicating the location of supermarkets in Kisumu in 2000, 2010 and 2018.

Mapping the local food system

This component involved mapping the neighbourhood-scale food system in order to understand its interaction with the urban infrastructure. The mapping was done in Bandani informal settlement and extended to Riat Market, which forms part of the wider Kogony sub-location food system. The primary focus was on mapping food retail. A survey was conducted (16–20 September 2019) of the various types of food retailers, which were classified as: mini supermarket, shop (*duka*), roadside vendor, mobile vendor, roadside kiosk, food kiosk, butcher, market stall, restaurant, or petrol station café. A hand-held tablet was used to record the geo-coordinates of food retailers who were found in the area during the day. The type of outlet, trading structure (permanent/temporary), retailer gender, and the nature of products sold were also noted. The data was recorded on Microsoft Excel spreadsheets and converted to a Microsoft Excel CSV document before being uploaded to ArcGIS.

Semi-structured interviews

The final component of the study involved semi-structured interviews with food retailers in Kogony. The purpose of the interviews was to understand the food environment in the community. Having differentiated the different types of food retailers and considered the geographical spread of the traders, purposive sampling was done to ensure a spatial spread of interviewees in the neighbourhood and among the different categories. Twenty interviews were conducted in June 2019. The traders were interviewed at their place of business operation and all interviews were recorded. The interviews included enquiries about stocking and pricing practices, relationships with consumers, and structural drivers of business practice and location.

The study also involved asking questions about and observation of the type of business, the gender of the trader, the physical nature of the business, the way customers engage the trader, the dominant gender of customers, the main times of business operation, the infrastructure of the business and immediate environs, and linkages to other urban systems such as transport or foot traffic (to and from work).

The description of respondents is presented in Table 1.

Table 1: Description of respondents (R)

No.	Gender	Location	Typology	Business description
1.	Female	Bandani, next to the railway line	Roadside vendor	Small-scale cereals trader
2.	Female	Kombedu Market	Market stall	Small-scale greengrocer in a temporary market stall
3.	Female	Kombedu Market	Food kiosk	Roadside food kiosk, cooked foods
4.	Female	Bandani, home-based operator	Shop (<i>duka</i>) – retail	Permanent structure, general groceries
5.	Female	Bandani	Roadside vendor	Greengrocer, selling on a table in front of a shop
6.	Female	Bandani	Shop (<i>duka</i>)	Greengrocer in a permanent structure
7.	Male	Bandani, next to Kombedu Market	Mini supermarket	General groceries
8.	Female	Riat Market	Shop (<i>duka</i>) – wholesale and retail	General groceries
9.	Female	Riat Market	Roadside kiosk	Fruit retailer
10.	Male	Kogony	Butcher	Sells meat from a temporary structure on the roadside
11.	Male	Bandani, next to the railway	Kiosk	General groceries
12.	Female	Bandani	Mobile vendor	Cereals, greens and chips
13.	Male	Bandani, next to the railway	Shop (<i>duka</i>)	Temporary structure, general groceries
14.	Male	Bandani, next to railway	Butcher	Sells meat from a temporary structure
15.	Female	Bandani	Roadside kiosk	General groceries
16.	Male	Riat Market	Mini supermarket	General groceries
17.	Male	Riat Market	Shop (<i>duka</i>) – retail	General groceries
18.	Male	Bandani	Roadside kiosk	Greengrocer
19.	Female	Bandani, next to the railway	Roadside vendor	Greengrocer
20.	Female	Bandani	Food kiosk	Cooked food in a temporary structure

Language

The interviews were conducted in three languages: English, Kiswahili and Dholuo. The majority of Kisumu's residents speak these three languages. The interviews were professionally transcribed and translated, and checked for accuracy.

Data analysis

The data was analysed using mixed methods. A thematic analysis was conducted by creating a codebook in ATLAS.Ti. The starting point for coding was the research questions and themes that emerged during interviews. Each code was annotated with a description of the code so that other researchers could use the codebook and identify similar themes. All interview transcripts were coded using ATLAS.Ti. The notes from the field observations were also analysed for emerging themes.

Ethics

This study was approved by Kenya's National Commission for Science, Technology and Innovation (NACOSTI). It was anticipated that traders would be concerned about revealing their identities to city or other government authorities. Written informed consent assured participants of confidentiality, outlined the purpose of the research and the risks and benefits, and gave them the opportunity to opt out before or during the interview. Transcripts were blinded and the audio recordings and written transcripts were kept in password-protected electronic format to eliminate the risk of access by unauthorised persons.

Overview of Kisumu City's food system

This section presents an overview of Kisumu City's food system. Since urban residents purchase most of their food, the food retail environment and the growth of supermarkets were used as a lens for understanding the city's food system.

Food retail environment

Historically, the origin of Kisumu is linked to barter trade. The name 'Kisumu' is derived from the Luo word '*kisuma*', meaning 'a place to find food'. Kisumu is located at the confluence of a major trading route and was an important trading point for the Luo, Maragoli and Nandi peoples long before the site was selected as a colonial administrative centre in 1898 (Nodalise Conseil, 2013; UN-Habitat, 2005).

Kisumu, like many other cities, currently has a hybrid food system that combines different forms of food provisioning and consumption (Opiyo and Ogindo, 2019). Kisumu is deficient in food production and food-processing industries and is thus a net importer of food from other counties within Kenya and beyond the country's borders. The city's rapid population growth has increased demand well beyond the production capacity of its peri-urban areas (Hayombe, et al., 2018). An insignificant proportion of the food consumed in the city is produced in the immediate neighbourhood (Opiyo and Ogindo, 2019). However, the city has maintained its position as a leading centre for food trade in Western Kenya.

The current study confirmed earlier findings that food retail in Kisumu is largely informal (Opiyo and Ogindo, 2019). Apart from established

municipal markets, food retail often takes place in temporary structures and unapproved markets on the roadsides. Two main markets – Kibuye and Jubilee – are significant in the local food system as they are the main source of supplies for smaller markets, informal traders in the city and sub-urban markets (Opiyo and Ogindo, 2019). This was confirmed in the current study as most of the traders interviewed indicated that they get their supplies from Kibuye Market.

Food retailers in Kisumu have adopted different strategies in response to customer needs. These include selling ready-to-eat packaged snacks, bulk-breaking, offering credit, selling cooked foods, and roadside catering. Small-scale traders buy food in bulk from wholesalers to sell in smaller units in informal markets. Bulk-breaking into smaller units that would ordinarily not be found in formal shops allows households with low daily incomes to purchase food in what is locally called the 'kadogo economy'. The current study confirmed that the prevalence of food vendors on the streets is a direct response to the needs of customers, who were observed buying food along the roads and at public transport termini on their way home from work.

Lack of or inadequate infrastructure is the most significant challenge to food retail in Kisumu. The cost of food is pushed up by the inefficient transport system. Inadequate food preservation and storage facilities lead to spoilage. Traders have inadequate access to electricity, refrigeration, water and sanitation. Traders thus restock fresh produce on a daily basis to cut down on losses due to spoilage. However, this incurs additional transport costs (Opiyo, et al., 2018). This was confirmed in the current study as most fresh food retailers indicated that they restock on a daily basis.

Growth of supermarkets

The last two decades have witnessed the growth of supermarkets in Kisumu's central business district and, more recently, in residential neighbourhoods. In 2000 there were only three main supermarkets in Kisumu, all of which were in the city centre. By 2010 the number had grown to seven supermarkets (five in the city centre and two strategically located along the main transport routes leading to the north and east of the city). By 2018 there were 18 supermarkets in Kisumu. The supermarkets are clustered around three areas: the central business district, near the main bus station, and the Kondele interchange (Figure 1). There are a few supermarkets located in residential areas, situated on the main transport routes linking Nyalenda, Nyamasaria and Kondele to the city centre. The mapped supermarkets included local brands and international franchises. It was also observed that whenever a supermarket ceased trading at a particular place, another company emerged and occupied the same space.

An earlier study noted that the formal retail sector is growing rapidly, but that supermarkets have not become a significant contributor to household food provisioning, particularly for the poor (Opiyo and Ogindo, 2019). Traditional markets and informal traders were the main source of the fresh fruit and vegetables, whereas supermarkets and convenience stores primarily provide customers with processed and ultra-processed foods. The growth of supermarkets promotes increased consumption of processed foods associated with NCDs.

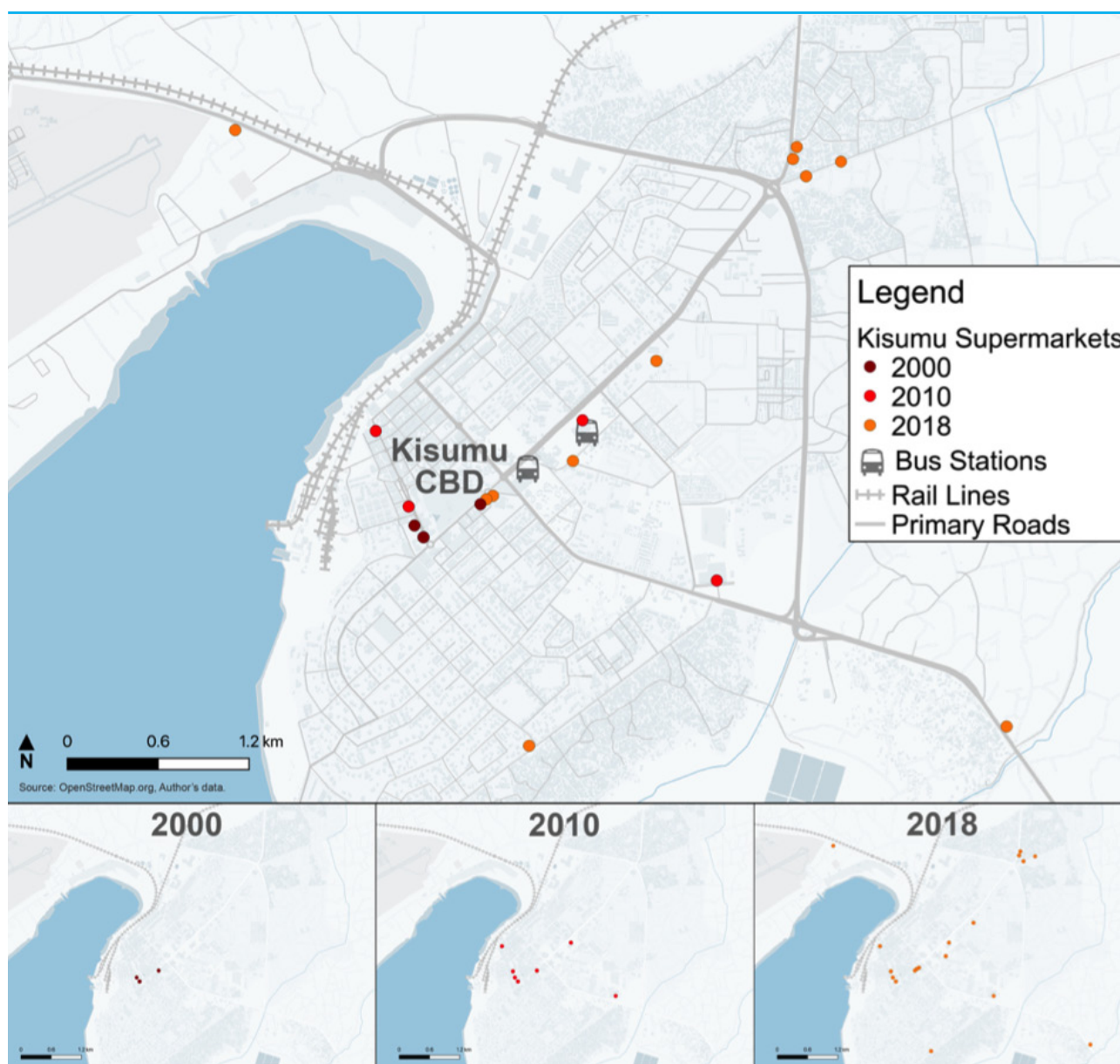


Figure 1: Kisumu supermarket locations in 2000, 2010 and 2018. (Map produced by Christian Alexander for Nourishing Spaces)

Overview of the study site's food retail environment

Having looked at the food retail environment across the city, we now turn our attention to that of the study site.

Description of the study site

The study focused on Kogony sub-location, which, together with Korando A and Korando B, make up Central Kisumu Ward of Kisumu West Constituency in Kisumu County. According to the '2019 Kenya Population and Housing Census' (KNBS, 2019), the population of Kogony sub-location was 31,140 persons in a land area of 12.1 square kilometres. Although the population density of the sub-location was 2,573 persons per square kilometre, the land area includes a large non-habited area of Kisumu International Airport. Bandani informal settlement, which is close to the airport, is one of the most densely populated settlements in Kisumu City (Figure 2).

Other settled areas of Kogony (outside Bandani) were formerly rural but in rapid transition. Rural-urban immigrants have bought land in the area to build homes and rental flats. The number of non-locals (including homeowners and tenants) is increasing and may soon outnumber Kogony clan members, who are the original inhabitants of the sub-location.

Bandani is poorly drained and forms a bowl through which stormwater from Riat Hills and the upper parts of Kogony drains before joining River Kisat into Lake Victoria. The drainage problems are compounded by densely built housing structures that impede natural drainage. Housing in Bandani is mainly single-roomed row-houses with mud walls and corrugated iron roofs, known locally as *landies*. Some of the original inhabitants still live in their traditional homesteads, but have added *landies* within their compounds to earn income. There has been a gradual fragmentation of land in Bandani with changes in use from agriculture to housing and commercial. Farming is now minimal, although some households still plant maize, kale and indigenous vegetables for subsistence and others keep a few cattle, sheep and goats (mainly as a form of investment to be sold when a need arises).

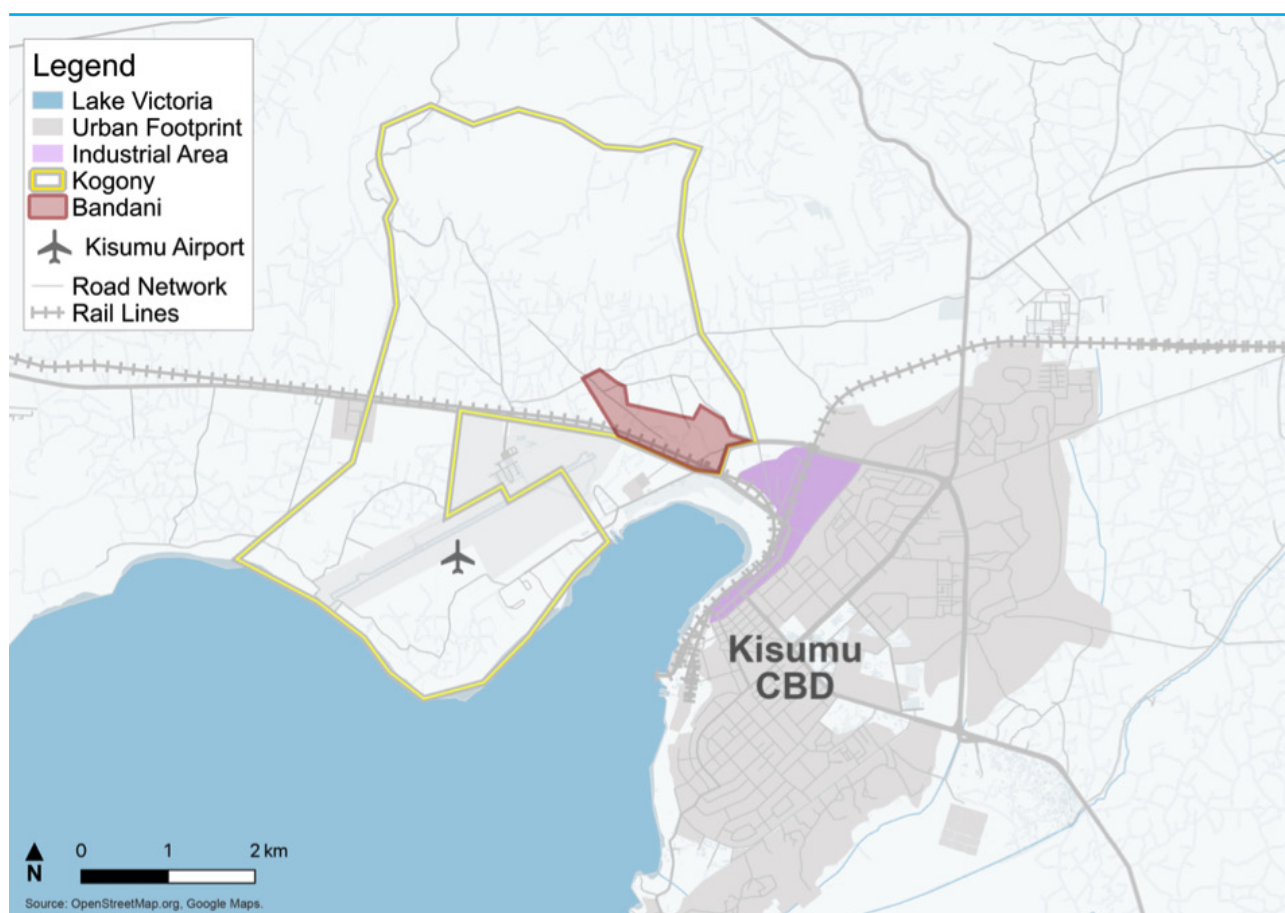


Figure 2: The location of Kogony sub-location and Bandani informal settlement in relation to Kisumu City.



Figure 3: Residential houses in Bandani (left) and the upper part of Kogony (right). (Images: Paul Opiyo)

Piped water is available in the area from the public water company, Kisumu Water and Sanitation Company (KIWASCO). However, most households in Bandani do not have piped water connections into their homes. The majority of residents purchase water from standpipes at communal water points, from shallow wells in the settlement, from water vendors, or from boreholes. The main means of faecal disposal in Bandani is pit latrines within the plots. However, many plots do not have pit latrines and use communal pay toilets within the community. In the wealthier upper part of Kogony, most residents have piped water into their homes and tanks for harvesting rain water. The wealthier areas have septic tanks and some are connected to a sewer line that runs through Bandani to the Kisat sewage treatment plant.

Electricity is available in the area and some households have been connected to the national grid through the Last Mile Connectivity Program, spearheaded by the national government. However, it was observed that most households and informal business premises still do not have electricity. Traders were observed using solar lanterns in the evenings. Many charcoal dealers were also encountered on the roadsides, indicating the common use of charcoal as a source of energy. Informal traders dealing in cooked food were seen using charcoal and firewood for cooking. The county government recently installed high mast floodlights at Kombedu Market and in the centre of Bandani. Traders reported that lighting has improved security and enabled them to extend their working hours.

Although there is inadequate data at the neighbourhood scale, recent comparative data indicate that physical infrastructure and basic social services in this area are comparatively worse than in other informal settlements, and that Bandani is more densely populated than other settlements in Kisumu's slum belt (UN-Habitat, 2005). The old Kisumu–Butere railway line and the Kisumu–Busia highway that runs parallel to it separates Bandani from Kisumu International Airport. The wider Kogony area is served by earth roads, which become impassable during the rainy seasons due to poor drainage, particularly in Bandani.

Kisumu industrial area used to be the main source of livelihood for Bandani residents, before the collapse of the major industries in the 1990s. The majority of Bandani's residents are blue-collar workers, mostly in the informal sector. They either work as informal traders or are employed in informal business. Others are domestic workers, motorcycle taxi operators, tuk-tuk operators, and security guards. Although done in secrecy, some traders intimated that the sale of illicit alcohol is common and that government officials occasionally raid such premises.

Kogony's food retail environment

Results of the mapping exercise in Kogony indicate that food retail activities are concentrated in and around three informal market areas (Kombedu, Bandani and Riat markets) and at the intersection of the two roads separating Bandani from the wealthier upper part of Kogony (Figure 4). The informal markets are located along the roads leading into the settlement from the public-transport stopping stages on the main Kisumu–Busia highway. There were informal traders selling foodstuffs along the roads in Bandani, including home-based operators selling food outside their houses. These informal traders sold vegetables, fruit, mandazi, fish, chips, cereals, and various sugared drinks. There were a few house shops and kiosks selling general groceries. Most traders sourced their products from Kibuye Market and wholesale shops in the city. Residents occasionally purchase food from supermarkets, Kibuye Market and Jubilee Market when they travel to the city centre (Opiyo, et al., 2018; Opiyo and Agong, 2020). However, the majority of the residents buy their day-to-day food from informal traders on the roadsides within Bandani.



Figure 4: Location of food retail outlets in Bandani.

Out of the 71 food retailers that were mapped, 33 (46.5%) traded in shanties/temporary structures; 29.6% were trading in the open, without any structure at all; and 23.9% traded in permanent structures. Those trading in the informal markets erected temporary market-stall structures (the markets are open spaces). Traders on the railway and road reserves also operated out of shanties, which are often dismantled by government authorities. The shanties are demolished every time the government does some road or drainage works, but the traders rebuild them soon afterwards. Some operate from moveable tables, which they remove from the roadsides and return after the road or drainage repair works are completed (Figure 5).



Figure 5: Roadside food retailers near Riat Market, Kogony. (Image: Paul Opiyo)

Mapping food retailers by type revealed that roadside vendors made up the largest share (27), followed by market stalls (9), shops (*dukas*) (9), food kiosks (8), roadside kiosks (5), butchers (3), mobile vendors (3), liquor outlets (2), mini supermarkets (2), petrol station café (1), and restaurant (1). The food products were mainly vegetables (mostly kale and cabbage), general groceries (sugar, cooking oil, bread, maize meal, beverages, confectionaries, snacks), cooked foods (chips, boiled maize and beans, *ugali*, kales, chapati, *mandazi*, tea), cereals, dried silver cyprinid (*omena*), and fried fish.

The location of food retail outlets in Bandani is linked to mobility. Food retail is mostly informal and develops organically along roads and next to public-transport stopping stages. The concentration of food retailers around informal markets indicates that, apart from residents, food retailers target other traders and informal-sector workers in the markets. Women dominate the food retail business. The majority of operators of the food retail outlets that were mapped were women (81.7%), confirming the traditional role of women in food provisioning in Kenya. The prevalence of roadside food vendors and food kiosks implies that residents buy food from these sources, despite poor infrastructure and sanitation facilities. It was, however, observed that cooked-food kiosks were more concentrated in the poorer areas than the wealthier areas of Kogony.

Overview of retailer activity

Having described the food retail environment, this section focuses on the profile of food retailers, the kinds of food products sold, pricing, and reasons behind their physical location.

The majority of food retailers interviewed were women, ranging from young adults to elderly. They had been in business for varying durations – some as long as 20 years, while others had started as recently as the previous month. New businesses were starting up more frequently as more people tried to make a living from food retail due to easy entry and exit. The most common reason given by the traders for starting their businesses was to earn a living. Other traders started in food retail following changed life circumstances or financial instability.

I started business because my husband died in 2004. So I stayed at my rural home for some time. I had no source of livelihood or income to educate my children, so my sister invited me to town to come and try to make a living. (R5)

Others saw an opportunity near home and decided to take it up.

I started the business here, because at first, in this area, there was none selling fruits. I was still new in the area and I said,

because there are no fruits here, let me try if I can sell fruits here. (R9)

Another said:

Being that this is my home area, once you got a place – there are those who own spaces here – you just build and move on. You only needed to get space and look for a licence and then you work in peace. (R11).

Minimal barriers make food retail an easy entry point.

The foods and other products available for sale varied, depending on the preference of individual traders or customer demand. The foods most prevalent were cereals. Maize, rice, pulses and beans were sold by informal traders on the roadsides, while bread, processed milk, cooking oil, processed maize flour, wheat flour, sugar, salt, noodles, sweets and sugared drinks were mostly sold by shops (*dukas*) and roadside kiosks. Cooked-food kiosks mainly sold maize and beans boiled whole (*githeri*), silver cyprinid (*omena*), tilapia, Nile perch, tea, bread, *mandazi*, kale, traditional vegetables, *ugali*, and chapatis. There were also roadside retailers selling kale, fruit, dried silver cyprinid (*omena*), smoked sausages, *bhajias*, and chips.

The mini supermarkets emerging in residential areas sell mostly processed foods. None were found to sell fresh produce, which was sold mostly by informal traders. Respondent 7 listed food products sold in his mini supermarket as maize meal, juices, cooking oil, bread, eggs, milk, soda, cakes, wheat flour, biscuits, sweets, salt, sugar, and margarine. The same respondent cited space as a limitation:

You can see the space is small. So I do not sell fruits and vegetables. (R7)

In limited space, mini supermarkets choose to focus on processed foods. The top-selling items varied from trader to trader, depending on their speciality. For general grocers, the best-selling items were those that people used on a daily basis:

Top-selling foods are bread, wheat flour, cooking oil, sugar and maize flour. (R8)

What people use most are milk, sugar, cooking oil and maize flour. (R18)

Most food retailers set their pricing according to stock costs, affordability, and the prices at which other traders sell particular items. Many traders were of the opinion that customers generally know the retail prices of most food items and they would try to maintain prices within those limits. Traders were sensitive to customers' demands and set prices that were affordable to them. Competition among traders also ensured lower prices for consumers. Some of the responses to questions about pricing were as follows:

The prices are set depending on the cost of stock and the prevailing prices in the neighbourhood. (R11)

We consider the cost of stock and affordability. And customers know the prices, so we set a margin to stay within the prices customers know. (R17)

Sometimes I go to other shops just to investigate and know at what prices they sell. (R4)

We set affordable prices so that stock moves, and I go get others. Otherwise if you set higher prices, stock will not move. (R11)

Food retailers gave various reasons for their choice of location, the most prominent of which were: proximity to customers, where opportunity exists, where space is available, and closeness to home. Most of the food retailers were located along roads and main pathways into the settlements, enabling them to target foot traffic. Others were located at informal markets due to the concentration of people in those places, which also happened to be located next to public-service transport termini, where traders could attract customers on their way home. In some instances, traders in food items and services that complement one another were located next to each other – for example, traders in dry maize sold in front of maize mills. Some of the responses noted on why traders chose their current trading spaces were:

People alight here when they come from work, so they buy things on their way home, because it is next to the road. (R1)

I saw the market was better here. (R2)

This is the centre close to home. Home is near here. (R11)

The advantage of this place is that the population of people is high. (R12)

I have so many customers in this area. Secondly, the road is near here. If I come with goods, I find some youth who carry for me to the door. (R13)

It has a high population of people coming from inside the settlement. The other places are far so they just come here. (R14)

It is nearer to where I stay. And in the evenings, it is a busy road. During the day it is not very busy, but there are many people passing by here in the evenings after 5 p.m. (R9)

The traders were not very busy during the day, but had more customers in the evenings when people came home from work. Explanations for this are that people prefer to buy food from traders known to them in their residential neighbourhoods, and that residents avoiding carrying food on public transport from the city centre.

Relationship with customers and response to consumer needs

Traders' business practices are driven by their customers' needs. Neighbourhood food retailers usually offer for sale what is affordable and demanded by their customers.

Bulk-breaking is a popular business strategy in low-income settlements that makes food affordable. Food vendors buy in bulk and sell in smaller quantities to consumers, making it convenient for daily wage earners who have to divide their incomes across food and other expenses. It was noted that traders in Bandani bulk-break items into very small measures. The food items commonly sold in smaller measures included silver cyprinid (*omena*), cereals, vegetables, sugar, cooking oil, salt, and maize flour. A 2016 survey of selected food products sold by informal traders in Kisumu found that 85% of traders would bulk-break grains, 78% dry pulses, and 75% smoked and salted fish (Opiyo, et al., 2018). Bulk-breaking was extended to some unusual items in Bandani. Traders were observed selling live chickens in the wealthier areas of Riat Market, while in the poorer areas of Bandani, no live chickens were seen offered for sale, but traders were seen selling deep-fried pieces of chicken late in the evening. Residents would buy a piece of chicken and either eat it by the road or take it home. One respondent confirmed that live chickens do not sell in the poorer areas of Bandani:

Sometimes only one person – one asks for a live chicken. You can only find those in Riat. If I bring here, it will not sell. (R19)

Other than price, another reason for this trend could be that people living in poorer areas do not have preservation facilities. Buying a whole chicken would mean that it would have to be consumed within one day, even if a person lived alone or there were few people in the household.

The prevalence of cooked foods available on the roadsides in the poorer areas is a response to customer need. During the day, cooked foods were mainly sold around the trading centres – Kombedu, Bandani and Riat markets – targeting informal-sector workers and other traders who do not have time to go home for meals. In the evenings, the number of cooked-food retailers increased along the roads, targeting people returning from work. The majority of customers who purchased cooked food along the roads in the evenings were noted to be men. An operator of a cooked-food kiosk next to the public-transport stage in Bandani said:

This place is close to the stage [bus stop] and those who live here who do not cook, like single men, who when they alight here, eat before going to their houses. (R20)

Household interviews done as part of Work Package 1 revealed that people who stayed alone were less likely to cook at home than those who stayed with their families. Those who stayed alone felt that buying ready-to-eat food was cheaper than cooking at home.

Interviews with retailers and customers suggested that perceived healthiness does not necessarily shape what customers want or what food retailers stock (Opiyo and Agong, 2020). Due to widespread poverty, cheap ready-to-eat foods were in high demand in the poorer areas. However, sugared drinks were in demand in wealthier and poorer areas. The only difference was that, in poorer areas, traders sold ready-to-drink juices in smaller bottles. A shopkeeper at Riat Market confirmed stocking larger containers of juices due to customer demand:

Juices – the two-litre or three-litre containers – I never used to stock them, but people were asking, so I started stocking them. (R17)

Traders stock what customers demand, regardless of its healthiness. For example, a shopkeeper in Bandani who was asked whether he stocks wholemeal bread said:

Only specific few people ask for brown bread. And if they miss it they do not take another, because that brown is their preference. But there are others, if you give brown bread they cannot take. So for us as business people, we bring all types, depending on what customers like. (R13)

A Consuming Urban Poverty (CUP) study established that informal food retailers in poor neighbourhoods of Nyalenda in Kisumu contribute to food security by offering food on credit to customers (Opiyo, et al., 2018). This was also found to be true for food retailers in Bandani. Several of the interviewed traders located in the neighbourhood (rather than by the roadside) confirmed that they offer credit. However, formal retailers like the two mini-supermarket operators, and some shops, indicated that they do not offer credit to their customers. Those who were offered credit were regular customers and other traders in the same neighbourhood.

I offer credit to those we live with around here or those who do business around here. (R1)

Some traders offer stock on credit to other traders. For example, operators of eateries obtained meat or vegetables from butchers and vegetable vendors in the morning and paid for it in the evening after sales. This

symbiotic relationship ensured fresh-food retailers sold more stock than they would otherwise be able to preserve if it was not sold within the day, and received their money in the evening, while the eatery operators also earned from cooking and serving the food to other traders and informal-sector workers in the neighbourhood. One butcher said:

Those who operate eateries, we give them on credit in the morning, to go cook and sell, and after sales in the evening they bring the money. (R10)

Another butcher said that they offer food to eatery operators at discounted prices:

Here we set different prices for domestic consumers and eatery operators, because those operating eateries also need a margin. They are given a discount. (R14)

Some food retailers said they used to offer food on credit to their customers, but had stopped due to many cases of default.

I used to give credit, but not anymore. Some people used to promise they will pay then they get lost, and I do not see them again, and I lose capital. But there are some who are good, when you give credit, they ensure it is paid. (R12)

Bad debt is one of the challenges faced by food retailers who offer credit in informal settlements.

Food retailer relationship with the wider city food system

Food retailers in Kogony are part of Kisumu's wider food system. They are related through the supply chain, which is intricately linked to national and international markets. The CUP 2016 reverse value chain analysis (RVCA) of five key food commodities established that maize was brought into the city from Trans-Nzoia, Uasin Gishu, Narok and Bomet counties (Kenya) and Busia (Uganda). Fish was brought into the city from Siaya and Busia, and some tilapia was imported from China, while dried fish was brought from as far as Lake Turkana in northern Kenya and Uganda. Cabbages and kale were brought from Bomet, Kisii and Nakuru counties. Sorghum and cassava for making porridge were obtained from Busia, Kisii and Migori counties. Most eggs were brought from Nakuru and Uganda (Opiyo and Ogindo, 2019). The foods from other counties in Kenya, other countries in the region, and even internationally, find their way into informal food retail outlets in Bandani. Kibuye and Jubilee markets in Kisumu are the most significant wholesale and retail markets respectively for fresh produce and cereals. Most small-scale traders dealing in fresh produce purchase stock from Kibuye Market every morning.

I go to buy my stock from Kibuye Market every day. (R2)

I go to the market every day in the morning for stock. (R6)

A few retailers occasionally bring cereals from markets outside Kisumu directly to Bandani due to lower prices in those markets.

When I have good money, I go to Busia for the cereals. But when I have less money, I get stock from some of my friends in Kibuye. (R12)

Wholesalers in Kibuye Market who know the retailers offer them stock on credit. Some retailers also bring vegetables from Sondu Market in Kisumu County.

The kales I sometimes get from Sondu. (R19)

Butchers also stock up every day due to a lack of refrigeration facilities. They get meat from either Mamboleo Slaughter House in Kisumu or from Ahero or Rabuor abattoirs some 30 km away. It was noted that most butchers operated in temporary structures by the roadsides. Any unsold meat is carted away in the evening, either for storage or for delivery to other categories of clients.

A fresh meat box is brought here every morning. If there is any left over in the evening, there are those who come to pick it and go to sell to those who can use meat that has stayed overnight. (R10)

Leftover meat may be sold to restaurants and some will refrigerate it for the roadside butchers for a fee.

It was observed that retailers dealing in processed foods do not have to go for stock daily and benefit from deliveries by distributors. Some distributors with branded delivery vans deliver products including sugared drinks, juices, bread, cooking oil, and noodles.

There are some items we go to bring from wholesalers in town while others are delivered here like maize flour, cooking oil, juices, bread and sodas. For Coke products, we have a depot near here. I just send a message and they deliver. (R17)

There were also deliveries of small items by bicycle:

There is one who brings tea leaves, drinking chocolate, and sweets. He passes here on a bicycle and so I do not have to go for these things elsewhere. (R4)

This makes processed foods more easily available and they are easier to store. The branded delivery vans are a form of advertising that contributes to the consumption of more processed foods, which are associated with NCDs.

There are wholesalers in the city centre and around Kibuye Market that stock various processed foods. Those mentioned more frequently as sources of stock for food retailers were Kibuye Mart, Nyanza Wholesalers, and Pramukh. Traders preferred to go to these wholesalers to select different brands according to the needs of their customers.

When I go, I am able to select the products that I need. People here prefer different brands, so I have to bring a brand that sells. (R15)

Most food retailers lack their own transport. The most common modes of transport used to buy fresh produce and cereals from Kibuye Market are three-wheeler taxis (*tuk-tuks*) and motorcycle taxis (*boda-bodas*). *Boda-bodas* are preferred for smaller stock items.

When I buy less stock I use motorcycles, and when stock is a little bigger stock, I use tuk-tuk. (R15)

Tuk-tuks are sometimes unable to cross the railway line and the earth road linking the main Kisumu–Busia highway and Bandani informal market, in which case traders have to pay to get their stock carried to their premises.

When I bring potatoes, I use tuk-tuk to carry stock. But sometimes they leave me on the road over there and I have to pay someone to carry it up to here. But the motorcycle riders get up to here. But because I do not like boarding motorcycles I come in a tuk-tuk and the load is carried on a motorcycle and brought to me here. (R12)

The difficulty in transporting fresh food from the wholesale market to residential neighbourhoods adds to the cost to the final consumer. It was noted that most large companies that deal in processed foods deliver food to retailers in residential neighbourhoods.

Kibuye Market is generally wholesale, whereas Jubilee Market is a central retail market. Kibuye Market is considered an important source of stock by food retailers because of the variety of foods available.

I like Kibuye because when I go there I get all of these items. I do not miss an item so that I go to another place. (R5)

Items at Kibuye Market are also cheaper than at other markets.

I get stock from Kibuye because it is cheaper. One can also get some of these items from Jubilee Market, but I know of some women who used to get stock from Jubilee Market but now they are back to Kibuye because it is cheaper. (R6)

Availability, variety and the cost of stock are thus key determinants in retailers' decisions about where to source stock.

Some informal food retailers have developed relationships with suppliers in the market who give them stock on credit. The system is further linked to suppliers upstream who deliver food to the wholesalers at Kibuye Market.

I have suppliers in Kibuye who give me stock on credit. I sell then I pay later, and they too have suppliers who deliver food from farms to them in lorries. (R12)

Neighbourhood-based food retailers have also developed relationships among themselves for the survival of their businesses and customer convenience. This was demonstrated by some specialised outlets allowing traders in complementary items to sell close by. For example, butchers welcomed vegetable vendors to sell next to them, so that when customers come to buy meat, they also find onions, kale and tomatoes.

I may think of stocking things like tomatoes, but the women here are selling the same, so if I stock such it will be seen as if I am rivalling them. So I leave that to them so that one buys vegetables and tomatoes from the other side and then comes here for meat. (R14)

These relationships were also seen among butchers and vegetable sellers who offered eatery operators credit on stock that they could cook and sell, and pay for in the evening.

Food retailer practices shaped by local conditions

Local conditions were noted to influence food retail practices in Kogony. These included urban infrastructure and services; security; and relationships with local custodians, city authorities, national government agencies, and other contextual operators.

Infrastructure and urban services

As noted earlier, the lack of or inadequate infrastructure are important challenges to food retail in Kisumu. At the neighbourhood scale, Kogony is more deficient in infrastructure than other informal settlements in Kisumu. The formerly rural area is currently undergoing rapid transition, with a fast-growing population. The whole of Kogony has no formal market. Riat, Bandani and Kombedu markets are all informal markets, which are characterised by shanties that are prone to fire outbreaks, resulting in losses to traders. Several of the traders who were interviewed felt that

they could not improve their trading structures due to the threats of eviction. Bandani Market, which is located on a road and railway reserve, has been demolished twice since 2017.

There was a project here to construct a sewer line, so our structures were demolished. It is just recently that I built this structure again. It is not even two months old. (R1)

Several traders felt unwanted by the government because of their shanties.

In this area, most of the time we are threatened with eviction. If it is these structures that they do not want, they should tell us how they want us to construct. (R11)

There are no paved roads in Kogony, apart from the Kisumu–Busia highway that separates Bandani and the upper parts of Kogony from Kisumu International Airport. The earth road network that serves the settlement area is in very poor state. Recent efforts by the county government to gravel the roads did not result in much improvement due to poor drainage, particularly in Bandani.

The road is bad. Most of our customers come from within the settlement. When it rains, it gets muddy and waterlogged, and they find difficulty reaching here. Even for me, getting from here to the house where I live is a problem. (R11)

Food retailers incur extra transport costs as *boda-bodas* and *tuk-tuks* cannot reach some parts of Bandani. Instead, they have to hire porters to carry their stock from the highway.

Especially like this rainy season, the road it is bad. It is impassable, and sometimes when we come with goods, the motorcycles do not accept to reach here. They leave us on the main tarmac road and one has to carry the luggage to this place. (R6)

Although piped water is available in the area from KIWASCO, most informal business premises do not have piped water connections. Most informal food retailers get water from standpipes at communal water points, or from shallow wells, or from water vendors. Toilet facilities and waste collection services are also inadequate. Purchasing water from standpipes is more costly for traders and residents, but it is safer than getting free water from shallow wells in an area where pit latrines are commonly used for faecal matter disposal. Most informal traders did not have pit latrines at their premises and used private pay-toilets, which adds to the cost of sanitation and increases the risk of communicable diseases. Solid waste management is also inadequate. Of the three informal markets, only Riat has a public waste-disposal bin, which is occasionally emptied by city authorities, further increasing the risk of communicable diseases in the area. Respondents had the following to say about the water and sanitation environment in the area:

We do not have water here, so we buy from two water selling points. (R11)

Dirt here is a problem. I do not know whether the public health people stopped working. That public toilet is not useable, so we go and pay for a toilet where it is available over there. (R1)

There are private individuals with toilets. There are three of them, and we have to pay. (R19)

The city authorities do not provide waste collection services here. We have a pit where we dispose of the waste and then burn. (R5)

The lack of or inadequacy of water and sanitation facilities in Bandani has a negative effect on food and nutrition security in the area and business viability. In terms of business viability, several participants identified the high price of toilets and water as problematic. This reflects findings by Women in Informal Employment: Globalizing and Organizing (WIEGO), based on case studies in Nakuru (Kenya) and Durban (South Africa), and an Institute of Development Studies (IDS) case study in Dar es Salaam (Tanzania). It was found, particularly for female traders, that the high cost of using toilet facilities and the time this involved undermined their businesses (Carr, 2019; Siebert and Mbise, 2018).

In terms of food and nutrition security and food safety, food retailers and their customers were observed casually handling food. This puts them at high risk of contracting communicable diseases. The poor sanitary environment in which food retail takes place discourages some people who are conscious about communicable diseases from purchasing fresh and cooked foods from roadsides vendors. This means they are likely to consume more processed and packaged foods, which increases the risk of NCDs. As in other cities, street vendors play an important role in securing access to food for residents of low-income settlements in Kisumu, but they are often seen as providing unsafe food and contributing to environmental degradation. However, it has been argued elsewhere that the root cause of these safety challenges is inadequate infrastructure and that solutions are to be found in addressing these deficiencies (IIED, 2014).

Energy is important for lighting and for processing, preserving and cooking food. It was observed that the majority of cooked-food retailers use charcoal or wood fuel for cooking rather than gas cookers. Gas cookers have a higher initial cost, but are more cost-effective over time. Small-scale traders lack resources to invest in gas cookers, opting instead to buy wood fuel or charcoal on a day-to-day basis. Most traders who operated in both formal and informal structures had access to electricity from the national grid, courtesy of the national government's Last Mile Connectivity Program. However, due to its high cost, electricity was mainly used for lighting and not for cooking or refrigeration. Some respondents indicated that they had electricity, but had to use alternatives due to frequent power outages.

There is electricity but most of the time there are blackouts, so I use a solar lamp. (R19)

One respondent also brought to fore the risk of installing electricity in poorly built temporary structures:

I did install electricity, but there was a heavy rainfall and a storm blew away the roof plus the electricity cables. So I have not installed again. (R3)

This points to the centrality of quality infrastructure for an efficient and sustainable urban food system.

A lack of resources to invest in refrigeration facilities forces informal traders to restock perishable products on a daily basis. This implies an additional cost for transport to and from the market. Although informal traders dealing in perishable products had challenges with refrigeration, it was observed that both formal and informal traders who sold Coca-Cola Company products had branded refrigerators that were restricted to Coke products. This form of merchandising, accompanied by poster advertising, promotes the consumption of sodas, which are linked to NCDs.

The nature of the food products being sold also depended on food-preservation facilities. It was noted that many formal and informal traders dealing in processed foods and dry goods like cereals were not concerned about spoilage. Highly perishable products like fish were preserved either by deep frying or sun-drying. Many informal fresh-produce traders stocked sun-dried silver cyprinid (omona), which is an important source

of protein for the poor because it is cheaper and has a longer shelf life than other fish.

Security and safety

Security and safety are key to a healthy urban life and important for food retail to flourish. Food retailers in Kogony had mixed feelings about security in the area. Some felt that the situation had improved in recent years, while others still considered the area generally insecure. Incidences of insecurity were attributed to politics (post-election violence), unemployed youth, and social reasons, including hostility towards non-locals (i.e. Kenyans from other parts of the country). One respondent described how post-election violence affected her business:

During the post-election violence, I went to the rural home as I could not withstand the teargas. It was too much and sometimes we ran and left behind our merchandise. So I went to my rural home and, when I came back, I found my trading space was already taken up. (R12)

Post-election violence was also blamed for changes in customers' needs and dietary patterns. Due to insecurity, some men relocated their families to their rural homes and remained alone, which had a negative effect on food retail businesses in Bandani.

There were many non-locals here, tenants from other communities, who were our main customers. So during the post-election violence, most men took their families to their rural homes. So it is the men who were left, staying alone, and most of them would come after having eaten elsewhere and would just go to sleep. That has made business go down so much. (R15)

Some respondents blamed unemployed youth for insecurity at Bandani and Kombedu markets.

The youth in Kombedu are bad. They just watch you sell and you will not reach home with the money – they will rob you. Our youth here in Bandani are also bad, but the ones in Kombedu are worse. (R12)

There was also a feeling of hostility towards non-local traders. One respondent blamed the frequent fire outbreaks at Bandani Market on arson due to jealousy:

I do not live around here. I come from Kanyamedha, and the other ladies there are also not locals. One is from Alego, another is from Kendu Bay. But the locals here are just seated. And when we invest here, a fire breaks out. There is jealousy here. This place would have been developed. There were many shops here, some owned by Somalis. (R19)

However, some non-local traders indicated that they have been able to bond well with the locals and do not experience any hostility.

You know this is not my original home. I am a settler here. If I have a problem, they [local neighbours] are the first to reach me. And if they have a problem, I am with them. So I have many friends here than in my native home. My relationship with the people here is not bad. If it were bad, then I would not be able to do business here. You have to relate well with people to do business and have security. (R13)

Despite the security challenges, some traders felt that the situation had improved with a police presence at the Chief's Camp, and the installation of floodlights at Kombedu Market and in Bandani. Local elders have also been instrumental in maintaining peace and security in Bandani.

The local leaders know we are here. If we have a problem with locals we report to our leaders whom engage them. Bandani used to be very insecure in the past. We would carry our stock back home at the end of the day. (R19)

Other respondents appreciated the improved security situation:

Security is fine. In the past it was bad. But currently it is good. (R3)

Of late security has improved, but previously it was insecure. (R7)

Relationship with city authorities

Local government holds the mandate for trade, food security and safety, and the provision of urban infrastructure and services. These are devolved functions of the county government under the Constitution of Kenya. Kisumu City operates under the County Government of Kisumu (CGK). Most of the traders interviewed felt that city officials were more interested in revenue collection than offering services. Traders at Bandani informal market reported incidences of resisting attempts by city authorities to impose market levies on them because the space they occupied was not designated as a market.

They were told there is no market here, and traders also insisted that for them to collect levies, they should provide toilet facilities and waste collection bins here. But they said this space is not designated as a market. So they build toilets and took the waste collection bins to Kombedu and Riat markets. (R14)

Some thought that the city should build a market before they paid levies.

We told them that if they want us to pay levies, they should build for us a market and toilets. (R19)

Traders operating in permanent structures are required to pay KES10,000 (about USD90) for an annual single business permit to the city authorities, while those operating in temporary structures are required to a KES30 (about USD0.27) daily vending fee. Some traders who built informal structures next to Kombedu Market indicated tensions with the city authorities over revenue collection. They felt that the annual single business permit fee was expensive for their type of business and preferred to pay daily market levies. An operator of a cooked-food kiosk said:

They only come to arrest people and we ask ourselves: Can one pay KES10,000 for licence for this kind of kiosk structure? So we asked them to send revenue collectors to collect daily vending fees. Let them build the market to a good standard first. Then they employ caretakers of the market so that one can even leave goods overnight. Then even if we are told to pay annual licence fee, then we just pay. (R3)

The Public Health Department of Kisumu City Council is mandated to inspect food retail outlets to ensure the safety of food offered for sale. Some traders (mostly those with formal shops or food kiosks, and butchers) indicated that their premises were inspected, while others (mainly informal market traders and roadside vendors) said they had never been visited. This is likely due to inadequate departmental capacity, as noted in an earlier study conducted in 2016 (Opiyo and Ogindo, 2019). The relationship between city health officials and traders who had the required licences was noted to be cordial. However, there were also reports of con artists impersonating city officials.

There are no tensions, so long as you have the required licences. But there are also conmen who impersonate city authorities to extort money from traders. (R17)

Inadequate inspection of food retail outlets exposes consumers to health risks.

Relationship with national government agencies

National government agencies with influence over Kogony's food system include the Kenya National Highways Authority (KeNHA), Kenya Railways Corporation (KRC), and the offices of the Assistant Chief and Kenya Police, who are agents of the national government at local level. There were no reports of interactions with other government agencies such as the Kenya Revenue Authority (KRA) and Kenya Bureau of Standards (KEBS), which would ordinarily interact with traders, perhaps due to the informal nature most business enterprises in Kogony.

However, the relationship between KeNHA and KRC and informal traders at Bandani Market is often adversarial. KeNHA and KRC are keen on protecting the road and railway reserves from encroachment in the interest of potential future infrastructure development, while the traders consider the open space, where many have traded for years, as their source of livelihood and are not keen to relocate. This often leads to confrontation between the government and traders when evictions are executed, resulting in massive losses for the traders. As noted earlier, Bandani Market has been demolished twice since 2017. The constant threat of eviction has discouraged traders from investing in improvements to their trading premises. Some of the traders voiced their frustrations:

The land which we occupy is no man's land, from the other side is a road reserve and from this side is railway reserve. So those people in charge of the road reserve, whenever there are demolishing structures, demolish including those on the railway reserve. The railways people also demolish structures. And every time they demolish structures, our goods are damaged inside. (R13)

We cannot even build better structures. We are forced to put up these iron-sheet shanties as every other time we are threatened with demolitions. The market used to extend up to over there, but those were demolished when the road was being built. Now we are squeezed here. (R14)

Here, we are in a very precarious position. Every time we are threatened with eviction. The governor promised that we will be relocated to Kombedu Market once it is constructed. But it has not been done to date. (R18)

The Assistant Chief and Kenya Police are agents of the national government. Both are based at the Chief's Camp in Kogony. They are mainly concerned with security in the sub-location and rarely interact with traders, unless there is a security issue or they are called upon by other government agencies to help with enforcement (e.g. evictions). However, there were complaints about police harassment from butchers who claimed that police officers demand bribes from them, despite the police having no mandate to inspect butchers. One respondent said:

We asked the city officials to clarify to us, between them and the police, who should inspect butchers? If there is a health issue, there is the public health officers, and the city also has those who check licences. So what do the police come to look for in butcheries? (R14)

Other traders appreciated the roles of the Assistant Chief and the police in maintaining security. They indicated that, provided they are doing legitimate business, the security officers do not bother them and that they occasionally come into Bandani to arrest those dealing in illicit brew:

There is no harassment by the police. They just come to arrest those dealing in illicit brew. (R18)

Traders also mentioned that police officers sometimes leave their motorcycles with the business people on the roadside as they move into Bandani to raid those who sell illicit brew.

The relationship with the police is cordial. They come around and leave motorcycles here when they go to raid those who sell illicit brew. (R6)

This relationship with security agencies has improved security in Bandani and facilitated food retail businesses.

Relationship with local custodians

Local custodians include village elders and leaders of traders' associations in the area. Village elders are included in the formal government structure and work with the Assistant Chief. Traders appreciated the role of the village elders and the leaders of traders' associations in security and conflict resolution.

There was no differentiation here between locals and non-locals. Good relations between traders and village elders was also attributed to religion:

The village elders do not have issues with anybody, and majority of them here are Muslims, you know Muslims are gentle people. (R4)

That the majority of village elders are Muslim can be attributed to historical reasons. Apart from the original inhabitants who were evicted from the current airport land, Muslim immigrants were some of the early settlers in the area.

Relationship with other contextual actors

The intricacies of relationships among informal food retailers extend to other operators in the informal sector. Food retailers provide food to other informal-sector workers in the markets, including carpenters, fabricators, textile dealers, and *tuk-tuk* and *boda-boda* operators. These were the main clients, particularly for cooked foods and processed, ready-to-eat foods and drinks. Some are offered food on credit.

I offer credit to those live around here and those who do business around here. (R1)

Tuk-tuk and *boda-boda* operators provide transport to food retailers. Some traders said they did not have to close their businesses to go for stock, but sent *tuk-tuk* and *boda-boda* operators to purchase stock from wholesale shops in town and bring it to them.

The future of food retail businesses

Some of the retailers interviewed had big hopes for the growth of their businesses by expanding and stocking more products. Those who were operating retail outlets on behalf of their employers planned to start their own businesses.

I just see if it can grow big, because this is where I get my livelihood, and get money to take my children to school. (R1)

An employed butcher said:

I hope that I will open my own butchery. (R10)

Despite the ambitions for expansion, some traders felt limited by the environment in which they operated due to land tenure issues.

My hope is to make my shop a wholesale, but this place is insecure because of the temporary structures. That is a challenge for all the shops here in Bandani Market. (R18)

Other formal traders felt limited by space. A shopkeeper next to Riat Market said he wished to grow his business, but was limited by the space available in the rented premises:

In terms of growth, it cannot grow beyond this room because this is rented premises and we are limited by space. (R17)

Others saw their businesses as temporary endeavours to earn money to meet their current needs and invest in their rural homes. This confirmed the transient nature of some urban business people, who see the city as a place where they can make money to invest in their rural homes.

My hope is that the business should assist me to make my things at the rural home, to finish educating my children, and build a house at my rural home. (R5)

To realise these dreams, traders felt they needed a clean environment, investment in infrastructure and services, security, capital, and regularisation of city levies.

Conclusion

Kisumu County does not produce sufficient food to feed its fast-growing urban population. Population growth is highest in the informal settlements at the fringes of the city. These settlements are unplanned and have unique challenges as they are transitioning from rural into urban areas. Kisumu's informal settlements, like other cities in developing countries, are characterised by high levels of poverty, poor housing, high population density, and inadequate infrastructure and services (roads, water, sanitation, energy, lighting) – all of which have a negative impact on residents' food choices.

With land-use changing from farming to housing and commercial, farming has all but disappeared in Kogony sub-location. A few households still practice small-scale subsistence farming, but this is insignificant in the area's food system. Kogony sub-location's food system is linked to the wider city, regional and international food systems through a complex supply chain. Food retailers in the neighbourhood mainly get fresh produce from Kibuye Market, and processed foods from three main wholesalers in the city: Kibuye Mart, Nyanza Wholesalers, and Pramukh. There are also a few retailers who bring foods directly to Kogony from other counties in Kenya.

Although Kogony sub-location does not have a major supermarket, there are two mini supermarkets, which indicate nutrition transition in the neighbourhood. The mini supermarkets and formal retail shops mainly sell processed and ready-to-eat foods that increase the risk of NCDs. They do not sell fresh produce. Informal retail in fresh and cooked foods flourishes, despite unsanitary conditions that promote communicable diseases, putting customers' lives at risk. It can be argued that some consumers may be trying to reduce their risk of contracting communicable diseases by consuming more processed and packaged foods, thereby increasing their risk for NCDs. Processed foods and sugared drinks are also promoted by large companies through advertising, deliveries to retailers, and merchandising support services like refrigeration.

Food retail activities are linked to transport routes and foot traffic. Informal markets were found next to main public-service transport termini and roadside cooked-food kiosks were concentrated along the main pathways in the poorer areas of the settlement. The wealthier residential areas

had minimal roadside food retail activities, perhaps because residents purchased their food from the main markets in town and cooked it at home. However, food retail outlets in the wealthier and the poorer areas sold processed foods, implying that nutrition transition is taking place among all residents.

Kogony sub-location is deficient in urban infrastructure and services. The area is served by earth roads that become impassable during rainy seasons. Piped water is available in the area, but most residents and business premises do not have piped water connections due to the high initial cost of connection. Sanitation facilities are lacking or inadequate and there are no formal markets. Informal food retail is thriving and city authorities have insufficient capacity to regulate and control the sector. Traders in Bandani are often in conflict with government agencies when they attempt to evict them from the railway and road reserves. Constant threats of eviction discourage traders from investing in improvements to their business premises. There have been efforts by the local government to improve infrastructure by repairing the earth roads, installing lighting, and building sanitation facilities. Though these are still inadequate, they have contributed to improving trade in the area. Food retailers' stocking practices were not driven by health considerations, but by customer demand. Similarly, customers' choices were also not driven by health considerations, but by affordability and convenience.

Recommendations

Based on the analysis of the neighbourhood food system of Kogony, an informal settlement in Kisumu with similar characteristics to other informal settlements in the area, it is recommended that the following measures be taken at the neighbourhood and city scales to improve food and nutrition security and reduce the risk of NCDs:

- City authorities should invest in modern markets that support traders in informal settlements to sell healthy foods. There are plans in Kisumu to expand and modernise Kibuye wholesale market and Jubilee retail market, and to build a new market at Otonglo. However, smaller neighbourhood markets like Riat and Kombedu should also be built to standards and provided with facilities that can support more traders to provide food to residents in sanitary conditions. This needs to be done through a participatory process that includes trader experiences and perspectives.
- Kisumu City is in the process of developing a detailed spatial plan for the extended areas of the city. Mixed land use is recommended for informal settlements in transition like Kogony. This should include commercial and residential premises, and support for informal food retailers to develop food retail outlets that comply with hygiene and safety standards within residential areas and along transport routes.
- Local government policy should focus on giving incentives to producers, supermarkets and other retailers dealing in healthy foods. Since agriculture and trade are devolved functions within the mandate of the county government, local government can promote healthy foods through subsidies for producers and the reduction of trade licence fees and market levies for traders dealing in healthy foods. The traders can be assisted to safely sell food by providing piped water and toilets near markets and other trading premises. Security can also be enhanced through the provision of lighting and involving traders in self-policing through their associations.

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