



Institute for Poverty, Land and Agrarian Studies (PLAAS)

# WORKING Paper 38

## Deflating the fallacy of food deserts

Local food geographies in Orange Farm  
and Inner City Johannesburg

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## PLAAS Working Paper 38: Deflating the fallacy of food deserts: Local food geographies in Orange Farm and Inner City Johannesburg

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## ABSTRACT

The availability and accessibility of food is constrained by the environments where people live, work and purchase goods, and the pathways which they use to traverse these. This recognition has given rise to innovative conceptual frameworks including “food environments” and “food deserts”. These concepts add a spatial dimension to food security research that could inform food systems governance. Although the concepts have expanded the understanding of food security in the global North, their application to the South African context, and to value chains analysis, is still in its infancy. This paper introduces these frameworks and considers their utility in South African cities. The paper presents recent data emerging from case studies of local food geographies conducted by the African Food Security Urban Network (AFSUN). This research proceeded from recognising the importance of informal retail in South African urban food systems. The case studies mapped formal sector food retail outlets in urban Johannesburg, correlating these with socio-economic data. Informal food processing and trade were also mapped in smaller research areas to explore food prevalence and diversity in the local geography and map the spatial patterns of informal food outlets. These studies reveal that the distribution of supermarkets entrenches spatial inequalities and constrains access to food distributed through formal value chains. The studies also reveal spatial and temporal patterns of informal food retail, which provides diverse food retail outlets clustered around public transport access points, along high traffic pedestrian routes, and distributed throughout residential spaces. Although healthy foods are available, unhealthy foods and risky food environments are pervasive. These findings confirm that the concept of food deserts fails to reflect the diversity of food available and accessible through informal livelihoods and suggests that scalar network models of food geographies offer better conceptual frameworks.

**Key words:** food environments; food deserts; informal trade; supermarkets; South Africa

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## ACRONYMS

AFSUN	African Food Security Urban Network
FLOW	fostering local well-being
GIS	geographic information system
GPS	Global Positioning System
IC	Inner City
ICT	information and communication technology
IDP	Integrated Development Plan
NCD	non-communicable disease
NGO	Integrated Development Plans
OF	Orange Farm
OGC	Open Geospatial Consortium
RDP	reconstruction and development programme
SDF	Spatial Development Framework
UN DESA	United Nations Department of Economic and Social Affairs

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## 1. INTRODUCTION

Food security – universal and consistent access to enough good food to sustain a healthy, productive and meaningful life – is often evaluated across four dimensions – availability, accessibility, utilisation and stability or resilience. At household level, each of these dimensions are affected by the options available in the household's environment – the sources and types of food available in the physical settings through which people move in the course of their daily lives. These settings include homes, schools, stores, restaurants, community gardens, soup kitchens, food banks and other places.

Recognising the importance of environmental factors that enable, constrain and shape food choices has led to several emerging research approaches in the US and UK. Key among such research approaches are the notions of food deserts – areas characterised by a comparative absence of outlets with healthy food options – and the wider concept of food environments, which encompasses social and cultural influences as well as the policy and regulatory environment. This approach presents opportunities to better understand and engage with drivers of food security that transcend the divide between macro-level political, economic and environmental dimensions and determinants of food security, and the household scale dynamics of poverty, unemployment and the various assets and capabilities thought to shape household food security. Bridging this divide is particularly important in the South African context, where 54% of the population appears to be food insecure or hungry (Shisana et al. 2013), dietary diversity is generally low, and the poor and food insecure increasingly live in urban contexts (Crush et al. 2011).

However, the urban, post-industrial settings in which the US and UK approaches were developed are arguably different from the environments in which the households of South Africa's urban poor are embedded. Hence, this paper begins by exploring the conceptual framework of food environments developed in the global North. We then consider the limits of Northern frameworks based on commentary by leading researchers of food security in South Africa. This paper is strongly influenced by a key finding emerging from a survey conducted by the African Food Security Urban Network (AFSUN) in 2008, which established that in addition to sourcing food from supermarkets, the urban poor in South Africa frequently access food from informal food retailers (Battersby 2012; Rudolph et al. 2012; Crush&Caesar 2014). The paper presents the AFSUN findings and discusses the implications for the food environments concept. The AFSUN study implies that, in mapping South African food environments, the limits of the formal food retail sector should be transcended, and informal food environments should also be considered.

We therefore present and discuss recent research which explores both formal and informal aspects of food environments. In 2013, AFSUN conducted a detailed spatial survey of informal food traders in poor areas of Cape Town and Johannesburg, which recorded a number of variables including the types of food traded, infrastructure assets used, operating times, and environmental factors affecting trade (Battersby, forthcoming; Kroll et al. forthcoming). The AFSUN research also mapped the location of various supermarket retail outlets at a city-wide scale and correlated these with socio-economic data. The mapping confirms that formal food retail outlets indeed favour locations in wealthier areas and along major road transport corridors and nodes, thus spatially constraining access for the urban poor to the foods available through the formal retail sector. However, the findings also show that this gap is filled by a wide variety of informal food retail outlets selling diverse foods. We consider the geographical patterning of these food retail outlets, the main types of food available, as well as the diurnal and weekly rhythms and some risks which informal food environments present.

The AFSUN findings have other important implications – for the conceptual utility of “food deserts” and “food environments”, for future research in South African settings, and for food security policy. These implications are considered in the final section of the paper, which identifies research and knowledge gaps, makes recommendations on policy, outlines promising participatory research approaches, and sketches a more illuminating theoretical framework for understanding food environments.

## 2. CONCEPTUAL REVIEW OF FOOD ENVIRONMENTS AND FOOD DESERTS

A growing recognition has emerged in Anglo-American public health and health promotion literature that physical and social settings have a powerful impact on health, simultaneously constraining and enabling behaviour, and exposing people to or protecting them from risks. Strategies based on the links between public health and environmental factors therefore offer powerful leverage to promote health (e.g. Hancock 1993; Dooris 2009; Bentley 2014). The obvious insight that healthy settings can bring about improvements in eating, physical activity, and weight across populations has influenced the development of the food environments discourse and related research.

The nutrition transition – a term used to describe a pervasive shift in dietary consumption and energy expenditure which corresponds to economic, demographic, and epidemiological changes associated with urbanisation and industrial food systems – is a key concept in understanding links between changing food environments and public health. Countries in the developing world are undergoing a rapid transition towards increased nutrition – related non-communicable diseases (NCDs) such as obesity, hypertension and diabetes which are shifting the burden of NCDs to the poor. The transition seems to be associated with changes in industrial urban diets towards high energy density through increased intakes of dietary fats and sugar and a parallel shift towards reduced physical activity. In particular, stunting in infancy seems to be linked to increased incidence of obesity and other NCDs (Popkin 2003; Popkin 2004; Popkin&Larsen 2004; Drewnowski 2004; Drewnowski&Popkin 1997).

Urbanisation and poverty seem to be linked to particular forms of nutrition transition in southern Africa, including (1) the simultaneous existence of macro-nutrient over-nutrition and micronutrient malnutrition, (2) persistently high levels of early childhood stunting, especially in impoverished urban areas, (3) high and rapidly growing prevalence of obesity, particularly in urban areas and among women, (4) a vicious cycle between food insecurity, malnutrition and HIV/AIDS, and (5) important impacts on mental health and physiological outcomes (Crush et al. 2011). Specific aspects of urban environments appear to promote nutrition-related illnesses in South African cities.

Food environments can be seen as concrete manifestations of the wider food system – the complex network of agents, processes, institutions and cross-system dependencies involved in the various value chains along which food commodities flow from production, through processing, storage, distribution and retail to final consumption and waste (Ingram 2011; Ericksen 2008). A better understanding of these environmental drivers of food insecurity and malnutrition could help to identify important points of leverage to develop policy to promote food security and health in poor urban settings. Recognising the importance of environmental drivers of food security implies that spatial planning and management present important points of leverage for urban food system governance – here defined as the interactions between multiple stakeholders contesting the formation and realisation of collective goals related to the features and impacts of food systems. This is distinct from government, which implies a legalistic, state-centric approach to regulating food systems (Candel 2014).



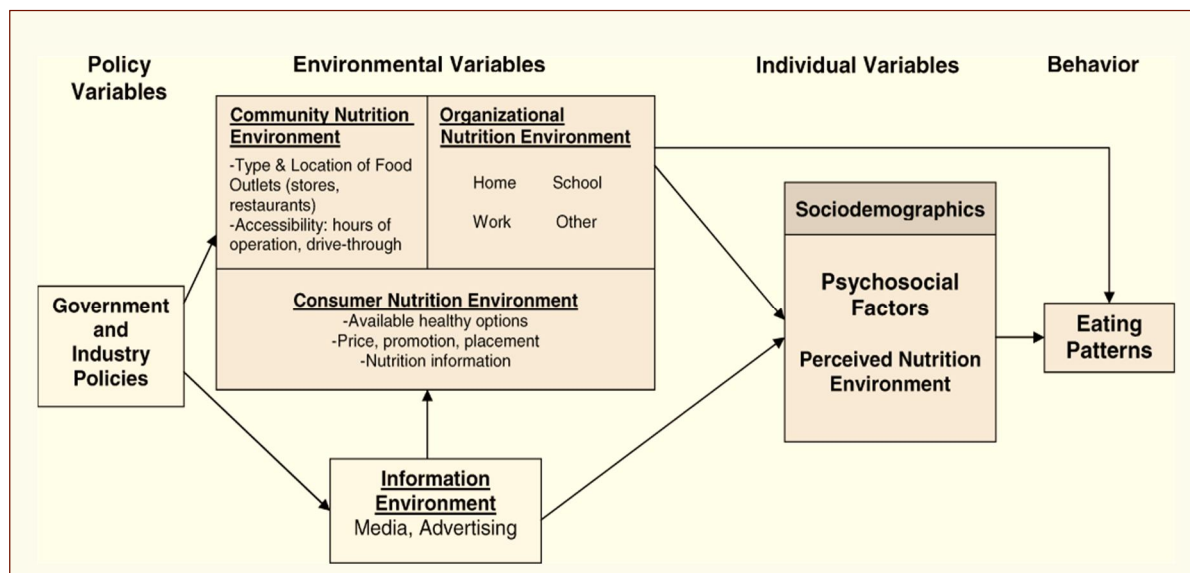
Several groups of researchers have explored the link between environments and food in the US and UK. A review of these researchers' methodologies and conceptual frameworks can provide a useful entry point for exploring food environments in South Africa. In this review, we focus on research by Glanz et al. (2005), Gittelsohn and Sharma (2009), and Alkon et al. (2013).

Initial research emphasised not only the evaluation of schools as important sources of children's food, but also noted that fast food environments were more present in poor neighbourhoods while supermarkets tended to locate in wealthier neighbourhoods. In much of this research, availability and cost of foods in consumer food environments are recognised as barriers to accessing healthy foods and researchers also saw how spatial aspects of food environments contribute to the barriers to healthy food access (Horowitz et al. 2004; Sloane et al. 2003; Drewnowski 2004; Jetter&Cassady 2006; Cheadle et al. 1991).

The term "food deserts" has entered the popular food security discourse and describes impoverished food environments where it is difficult to access nutritious food due to the lack of outlets offering healthy foods. The prominent idea of "food deserts" in the food systems literature has been widely applied to the study of food environments, particularly in the US (Bodor et al. 2008; Larsen&Gilliland 2008; Block& Kouba 2006; Moore&Diez Roux 2006; Zenk et al. 2005) and UK (Whelan et al. 2002; Wrigley 2002; Wrigley et al. 2002; Wrigley et al. 2004).

Although various measures applied in these studies offer valuable insights, poor comparability of these studies prompted Glanz et al. (2005: 330) to call for conceptual clarity and valid, reliable measures of nutrition environments in order to 'make significant progress in this area of inquiry, and to inform public health policy'. Glanz et al. (2005: 332) note that 'given the public health imperative to improve eating behaviours in the population, greater priority needs to be given to understanding the role of food environments on individual's eating patterns'.

Figure 1: Model of food environments approach



Source: Glanz et al. 2005: 331.

By way of conceptual framing, Glanz et al. (2005) present a model of food environments which recognises four classes of variables affecting eating patterns: policy, environmental, individual and behavioural variables. Community and consumer nutrition environments - considered key to understanding local food geographies and the ability to access food in these geographies - correspond to different scales: the community nutrition environment looks at the neighbourhood scale, while consumer food environments look more narrowly at in-store features.

To analyse the community nutrition environment, Glanz et al. (2005) evaluate the distribution of food sources: the number, type, location, and accessibility of food outlets. They distinguished between grocery stores and convenience stores in high- and low-income areas, and propose several different data sources for evaluating community food environments: geographic information system (GIS) analysis of land-use data, census data, food license lists from health and agriculture departments, website searches, and online yellow pages.

Although the study acknowledges the importance of correlating race, ethnicity, socio-economic and health patterns, and individual purchasing behaviour at community scale, they also caution that too much focus on these issues could detract from root causes embedded in local geographies such as the distribution of food sources, urban planning and transportation routes.

*Because of the large number of potential variables that could be measured, we have identified the “community nutrition environment” and the “consumer nutrition environment” as highest priority because they have been less studied and could have broad effects.*

*Glanz et al.:331.*

Glanz et al.'s (2005) approach evaluates not only where people access food, but also what consumers encounter in and around a retail outlet with regards to nutritional qualities, price, promotions, placement, the range of choices, freshness, and nutritional information. In addition, their evaluations of the consumer nutrition environment explore the cost and availability of healthy options, shelf space allocated, product placement and promotion relative to children (e.g. lower shelf positioning of sweet foods). They also developed a standardised methodology to evaluate consumer environments in stores, using a composite indicator based on cost, availability, and quality of 10 commonly consumed indicator food categories.

Recognising other aspects of the food environment, Glanz et al. (2005) include the information environment (media, reports, advertising) operating at broad scales, as well as organisational consumer environments (e.g. a workplace or clinic) which apply to specific institutions or organisations which influence availability for a specific group of people.

Though an important entry-point, this approach reveals several limitations, both generally and in the South African context. Firstly, the criteria for healthy foods are based on guidelines developed in a contested and uneven research funding environment and may be vulnerable to industry influence (grain, dairy and meat lobby) (Love et al. 2001; Vorster et al. 2013; Steyn et al. 2002). Secondly, assumptions are based on the principle of least effort, suggesting that the relative proximity of healthy as opposed to unhealthy foods determines purchasing and consumption behaviour. Third, and perhaps most crucially, while vaguely mentioning socio-cultural correlations, the model does not adequately discuss agency and neglects the interiorities of consumers – the cultural realm of symbol, language, narrative and identity. Instead, it locates the root causes for food choice firmly in the material realm. While the model hints at the cultural dimension – as the information environments and perceived food environments – it is very narrowly conceived in terms of media and advertising. This apparent environmental determinism has been criticised, and Alkon et al. (2013) emphasise the importance of consumer knowledge, choices, preferences and agency.

A paper by Gittelsohn and Sharma (2009) does address – and draws valuable conclusions from – minority and vulnerable communities in diverse settings. They propose new ways to understand accessibility in shops and draw attention to a new way to understand geographical limits when defining the boundaries of a local community. For example, store configurations which prevent customers from entering and seeing options available are likely to affect purchasing behaviour. With regards to defining geographic limits, the authors point out that

research boundaries need to be based on understanding the specific context considered in order to accommodate long-distance travel to remote outlets, especially in rural settings. The adequacy of local approaches is also questionable when long transport distances and refrigeration are involved.

Gittelsohn and Sharma (2009) highlight several methodological challenges, including how to accurately document the availability of fresh produce when many different varieties are available. Another challenge relates to the temporal dimension of food environments which could include periodic shortages of, especially, perishables. Taking into account this temporal dimension raises the question of how to document fluctuating food availability in a food environment and whether research conducted over a short timespan can adequately reflect such diurnal and seasonal patterns. Similarly, recording costs can pose another challenge: should a cost analysis include all items in a store when some stores are likely to stock huge varieties of goods, or should a specific sub-sample be chosen? If a sub-sample is chosen how is this choice made?

In order to calibrate surveys with contextual variables, Gittelsohn and Sharma (2009) recommend preliminary research to inform systematic food environment surveys, including a review of specific details such as internal store accessibility, seasonal variability, and social aspects. For example, research needs to be sensitive to locally grown, gathered or hunted foods in the area surveyed.

It should also consider the dynamics involved in inter-household food sharing, especially with regards to locally hunted foods in rural areas. Gittelsohn and Sharma (2009) also draw attention to language and cultural context and the way that ethnic differences between shop owners or operators and consumers could lead to antagonism and poor commitment. Compared to most current Anglo-American research, both Glanz et al. (2005) and Gittelsohn and Sharma (2009) raise important questions about understanding and documenting minority and vulnerable communities in diverse settings in order to formulate setting-specific models.

A brief review of some key Anglophone literature on food environments revealed some important aspects relevant to studying food systems and food security in South Africa, including:

- Community food environments, consumer food environments and organisational food environments present entry points to explore how different settings influence food choice and consumption;
- Community food environments can be analysed by recording and correlating location, number, and type of food outlets;
- Consumer food environments can be evaluated by recording range, placement, quality, accessibility, visibility and promotions;
- Surveys should include preliminary contextual research taking into account local specificities relating to food varieties, seasonal fluctuations of availability, local harvesting or foraging, boundaries in the context of remoteness and mobility patterns, and local socio-cultural dynamics of food sharing;
- Research should be sensitive to the specific contexts of minorities and vulnerable groups, and should take into account the foodways – culturally inscribed ways in which people seek, choose, access, prepare, share and consume food – in the studied areas.

Although these general principles are useful and can be applied to the South African context, it is important to consider contextual factors which may present challenges not encountered by research in the US and UK.

### 3. URBAN FOOD ENVIRONMENTS IN SOUTH AFRICA

A fundamental issue is that the food geographies model developed in the US and UK is based on a highly formalised context where data sources are comprehensive, well-managed and accessible. The South African context is profoundly different – posing challenges for adopting wholesale the food environments frameworks of the global North. Challenges include the spatial and infrastructural legacies of apartheid planning and subsequent urban development policy, high levels of mobility and migration, and the key role played by informal economies closely enmeshed with highly consolidated formal food value chains. The next section considers each challenge.

#### Spatial and infrastructural context

*The low – density, fragmented form of South African cities has harmful social, economic and environmental consequences. It creates poverty traps on the periphery and favours road – based transport – private cars and minibus taxis.*

Source: Turok 2012: 1.

Urban environments in South Africa differ in several significant ways from the food deserts discussed in US and UK studies. Unique spatial settlement patterns in South Africa's urban environments reflect a history of industrialisation, jobless de-agrarianisation, migrancy, and legally enshrined racial regimes of land ownership. These settlement patterns emerged from an unevenly enforced geographic separation of different racial and ethnic groupings, often intentionally engineered in line with apartheid ideologies (Turok 2011; Crush et al. 2011). While the apartheid legal regime has ended, its legacy remains hardwired into the spatial patterns of South African cities and continues to entrench race, income and class divisions, cementing adverse incorporation in the urban economy through the physical barriers of distance, infrastructure, and services. In post-apartheid South Africa this legacy of segregation and fragmentation persists and is often aggravated by developers' preference to locate poor suburbs on the far urban periphery where land is cheaper.

The legacy of segregation has contributed to widespread peri-urbanisation in what Allen (2014) calls a lumpy rural–urban continuum in which poverty and wealth co-exist side-by-side as groups with heterogeneous and changing socio-economic profiles contest the urban fringe, dominated by developers and speculators. The fundamental need for land and space to accommodate the growing numbers of poor migrating to cities and towns is fuelling the rapid growth of informal settlements which typically lack access to network infrastructure such as electricity, water, sewage or waste disposal (Harris 2014). Informal settings are often characterised by poor infrastructure, service delivery challenges, stagnant economies and high unemployment rates. Informal livelihoods are therefore widespread and varied in informal settings (Atkinson 2014).

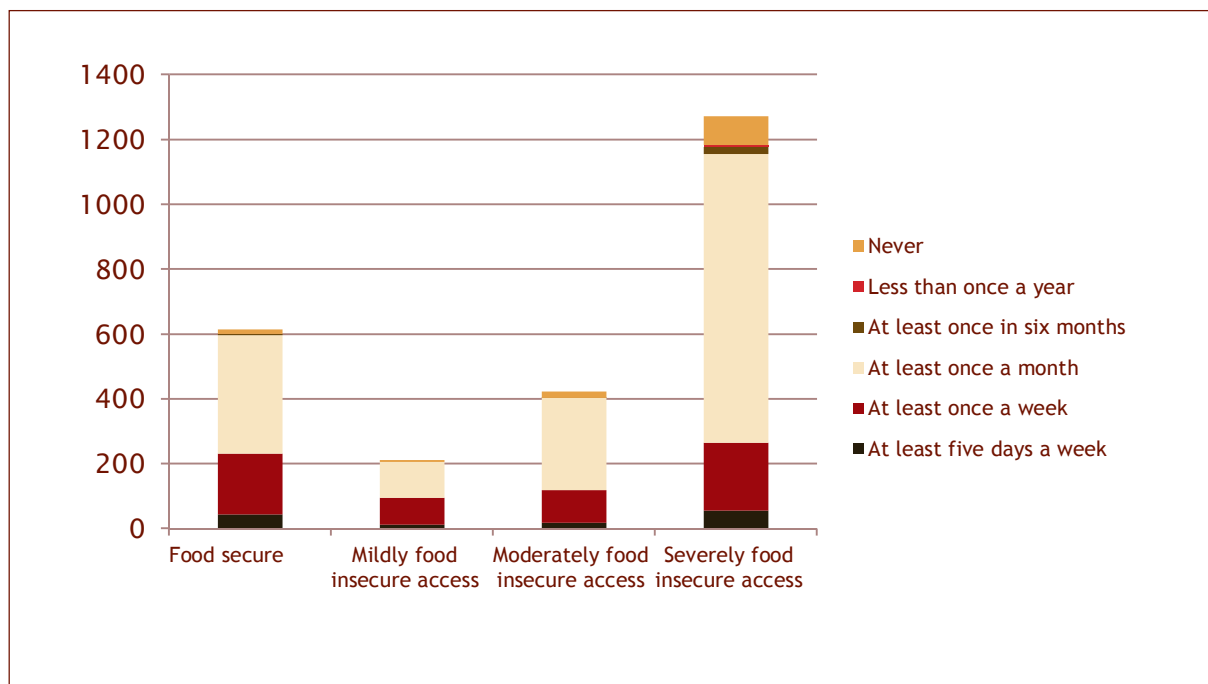
The spatial legacies have also led to splintered and expansive spatial patterns where large distances separate peri-urban dormitory townships, workplaces, and markets. The urban working poor daily traverse vast distances to get to work, often spending as much as three hours a day in transit. To do so they depend on a vibrant but poorly-integrated public transport system dominated by the minibus taxi industry. Long hours in transit in turn reduce the time available for shopping and preparing food, so street foods and restaurants are often clustered around transport hubs. However, the challenges of physically transporting bulk food items in taxis and accessing nutritious affordable street foods remain. Moreover, while high income areas consistently have well established and functional infrastructure such as roads, retail and marketing systems, in the residential areas where groups with the highest risk of food insecurity often live, shops tend to be sparse and public transport generally poor (Swift&Hamilton 2001).

## Supermarket expansion and resilient informalities

South African food systems are dominated by a cluster of capital intensive, highly consolidated food value chains which supply consumers through a rapidly growing supermarket and fast food retail sector (Greenberg 2010). However, this core food economy is closely enmeshed with a range of informal livelihoods involved in preparing and selling food.

AFSUN 2008 data shows that most city dwellers (>90%) purchase food from supermarkets at least once a month. More than two thirds got food from small shops, takeaways or restaurants indicating that these formal channels are indeed an important food source. But most people bought from multiple sources, getting different foods from different outlets.

Figure 2: Market based food sources of food secure and insecure urban households in Johannesburg, Cape Town and Manzini

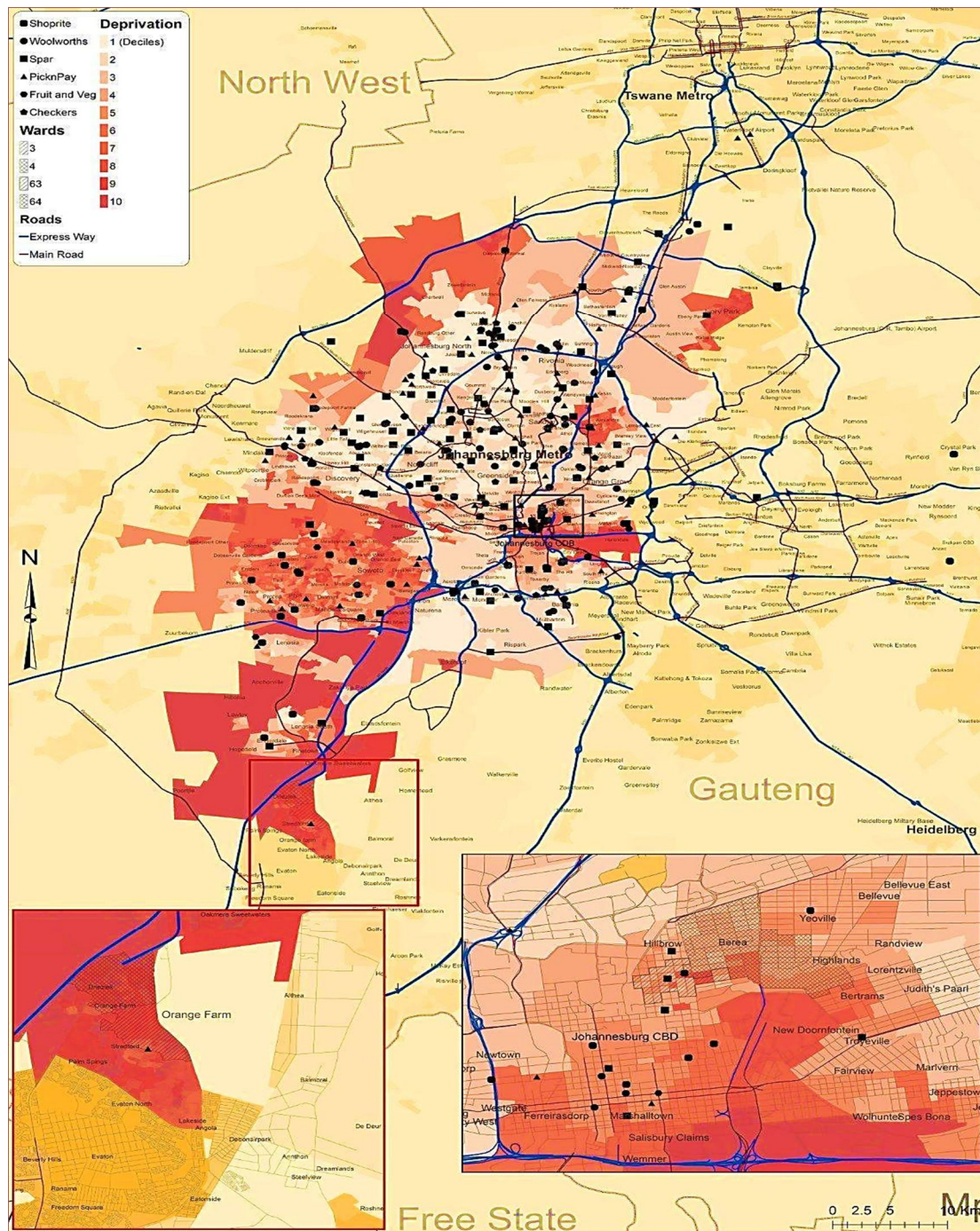


Data source: AFSUN 2008.

Much of the Anglo-American research emphasises the apparent benefits of supermarkets due to a higher variety of available food and lower cost, and notes the comparative absence of supermarkets in poorer areas (Laraia et al. 2004; Morland et al. 2006; Morland et al. 2002a; Morland et al. 2002b; Zenk et al. 2005a; Zenk et al. 2005b). However, supermarkets in lower income areas often stock less healthy foods than those in wealthier areas and so do not necessarily increase access to healthy foods. Moreover, wealth disparities, irregular incomes and greater purchasing costs could prevent poorer households from taking advantage of the larger volumes and greater variety offered by supermarkets, and their presence therefore does not necessarily imply improved food security (Crush 2014; Hawkes 2008).

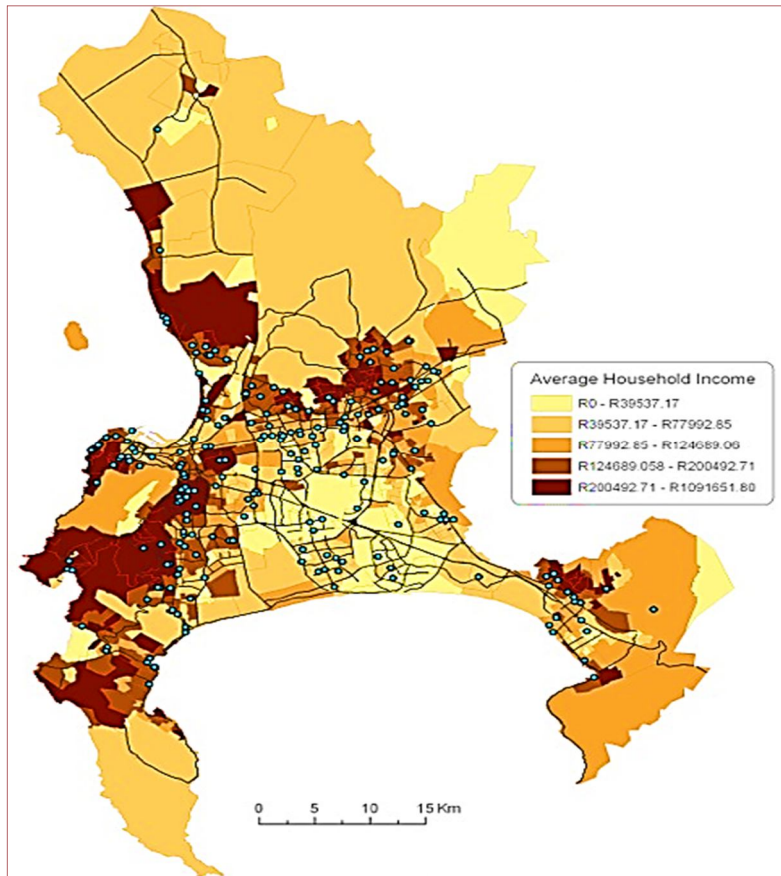
Mapping the spatial distribution of supermarkets, income and transport corridors in Cape Town, Peyton et al. (2015) show that supermarket distribution is highly unequal and the distance between low- and high-income areas often hinders supermarket access for the urban poor. Unequal supermarket distribution is similar in Johannesburg, when compared with spatial deprivation indices (see Figure 3; Kroll et al. forthcoming).

Figure 3: Supermarket locations in Johannesburg superimposed over the 2001 Spatial Deprivation Index reveal the clustering of supermarkets in wealthier areas



Contrary to the standard food deserts arguments, while supermarkets are clustered in wealthy areas, supermarkets are moving closer to and becoming more accessible to poor urban consumers (see Figure 4; Battersby, forthcoming). Supermarket locations are however mostly close to busy transport routes and in areas where profit margins are higher, making them difficult to access without private motorised transport. Although this uneven location makes economic sense to retailers who focus on relative purchasing power, it can translate into unequal food access as supermarkets stocking broader ranges including healthier food options are clustered in wealthier areas, and where supermarkets enter poorer areas, the foods stocked are likely to include a smaller range and fewer healthy options.

Figure 4: Supermarket distribution in Cape Town overlaid with average household income data



Source: Peyton et al. (2015)

For example, many consumers in residential areas who do not have close geographical access to supermarkets or reliable public transport often have to walk long distances to access supermarkets or other food outlets. Therefore, they are unable to economise by buying in bulk as it is physically challenging to carry heavy, bulky packages; they also cannot participate in the social and symbolic aspects of food purchasing and consumption discussed in Kroll (2016). Furthermore, consumers using pedestrian routes are often at risk from those with criminal intent who target people carrying large amounts of cash for shopping trips. The gap left by the inaccessible formal sector retailers and poor access to public transport is bridged by various informal local economies, which have become cultural institutions in urban geographies throughout South Africa.

The food deserts concept developed in the global North is therefore misleading and inappropriate to South African realities in urban food environments, where food insecurity and poor dietary diversity persist despite relative accessibility of supermarkets (Battersby 2012). Battersby and Crush (2014: 143), therefore present a revised definition of African food deserts as:

*... Poor, often informal, urban neighbourhoods characterised by high food insecurity and low dietary diversity, with multiple market and non-market food sources but variable household access to food.*

Because supermarkets do not cater for consumption strategies and capabilities of the poorest households, “hybridised” food landscapes emerge in which formal and informal food outlets coexist, catering more comprehensively to the urban poor. Supermarkets and informal trade thus seem to have developed a symbiotic and complementary relationship (Peyton et al. 2015). It is therefore important to consider the informal food environment more closely.

Supermarket expansion is widely thought to be detrimental to small outlets and street traders (Reardon&Gulati 2008; Kennedy et al. 2002). However, evidence about the impact of supermarket penetration into areas previously dominated by informality is contradictory, and informal retail seems resilient, despite supermarket entry (Crush 2014).

Informal food sources play a significant role in urban household food provisioning strategies, bolstered by sharing and borrowing, especially among the food insecure (Battersby 2011; Rudolph et al. 2012; Crush&Caesar 2014). Informal food retailers have several characteristics which distinguish them from formal food retail, including that they: (1) are not registered for tax or employee benefits, (2) have few employees (often within the same household), (3) have minimal infrastructure and equipment, (4) have comparatively narrow margins, (5) have strong backward linkages into the formal economy, and (6) are located in public spaces with high pedestrian traffic or in small shops attached to people's homes – *spazas*<sup>1</sup> (Neves et al. 2011; Chen 2007; Devey et al. 2006; Horn 2011; Lehola 2014).

While *spazas* may stock a limited diversity of products compared with supermarkets, they also stock small product volumes and provide most products at cheaper prices<sup>2</sup> than supermarkets (Peyton et al. 2015). Moreover, their location makes them a convenient source of food, which responds to the spatial and mobility challenges outlined above, by clustering around the nodes in urban mobility routes. However, informal food trade may also have some disadvantages, including more expensive foodstuffs and unstable prices, a poor variety of products, and the occasional distribution of stale products (Chebelyon-Dalizu et al. 2010).

As *spazas* cater to needs of poor households and capitalise on the limits of formal supermarkets, the argument that supermarkets displace *spazas* through low prices and economies of scale is over-simplified (Battersby 2012; Crush 2014; Peyton et al. 2015). Battersby (2012) further argues that too much emphasis on supermarket sources, while neglecting non-market food sources and household decision making processes, can lead to research gaps. Some of these gaps include: (1) poorly considering the informal food economy with its irregular or inconsistent operating times, (2) daily mobility patterns of consumers who need to travel long distances, and (3) 'out-shopping' with people travelling long distances to access specific retail outlets (only about half of household expenditure actually occurs in local neighbourhoods). Different household-level mobility patterns can therefore lead to variable geographical access and food security levels, even if households are located in the same urban space. Attention must also be paid to the way different income patterns lead to different food sourcing patterns, gender related income and mobility disparities, and migrant statuses. Lastly, the incidence of informal food sourcing varies between different areas in the same city and between cities (e.g. informal trade in Manzini plays a very small role).

The simultaneous articulation and tension between formal and informal economies thus continues to shape South African local food geographies. In evaluating food environments in South African cities, research approaches need to reflect the complex features of a wide variety of community food environments. Consumer food environments encompass outlets spanning the spectrum of formal and informal food economies at the community or neighbourhood scale. Research must, therefore, recognise the high degree of mobility of the South African poor across urban landscapes, which means that they regularly traverse several different community food environments. Each community food environment contains a variable profile and spatial distribution of different formal and informal food retail outlets operating in rhythms dictated by the pulse of commuters traversing cities fractured by income disparities, contested space, uneven infrastructure, and overlapping urban cultures.

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<sup>1</sup> "hidden" shops.

<sup>2</sup> Comparison between prices in local *spazas* and Philippi Shoprite showed that average prices of informal food traders seem slightly cheaper than those offered by formal retailers.



## Mapping food environments in specific settings

This review of the key features of South African urban food environments suggests that various discrete food environments exist in specific settings, each with specific characteristics and subject to various governance regimes, which exposes consumers and retailers to different risks, and poses different challenges to research. Like the US and UK food environments frameworks, a range of formal sector consumer food environments exist, which belong to the formal food system, including shopping malls and supermarkets, fast food outlets, and service station forecourts. Such formal food systems are dominated by highly concentrated and vertically integrated food value chains operating (mostly) within the frameworks of relevant government codes and regulations.

Various organisational food environments also exist in South Africa's private sector, like workplaces in offices, retail, or industry, and in public institutions like schools, universities, hospitals and clinics, prisons, and various departmental buildings across all spheres of government. Again, despite possible similarities with settings in the global North, closer scrutiny is likely to reveal specific features reflecting apartheid and more recent urban histories. However, a wide variety of informal retail outlets occupy community food environments which are often unregulated, precarious, and poorly-resourced consumer food environments. Informal retail outlets include street traders (typically located along busy pedestrian transit routes and clustered around transit nodes) and "hidden" food economies of spazas and shebeens.

A review of foodways of the South African poor reveals the ongoing importance of social food environments created by ritual feasting accompanying events like weddings, funerals, graduations, and initiations, which are essential in the ascription of value and the circulation of social capital. Homes and households can also be considered as part of this social food environment, especially in the context of the extensive food sharing networks which are key coping strategies of the food insecure. These social food environments are likely the most complex, diverse and dynamic settings, with highly variable capacity to purchase, transport, store, and prepare food. Such capacities are influenced by factors including employment, income, gender, age, culture, location, migration, social organisation, knowledge, education, and power relations between household members.

Finally, in recognising high mobility rates and the centrality of urban transport networks that stitch together the fractured South African urban terrains, research should consider transit-based food environments. These include environments characterised by roads and highways, service station forecourt shops, bus and train stations – which include vibrant informal dimensions centred on bustling minibus taxi ranks and ubiquitous minibus taxis weaving through traffic, along clearly defined circulation routes with well-established stop-off points.

Systematic, comprehensive evaluation of these different food environments and how they link to the mobility routes of the urban poor present many research opportunities in a field which is still in its infancy in South Africa. However, the next section presents key insights emerging from two recent AFSUN case studies exploring local food geographies in Johannesburg's poor neighbourhoods, with a specific focus on informal food geographies.

## 4. INFORMAL FOOD GEOGRAPHIES IN JOHANNESBURG

A 2013 survey of Johannesburg's informal food retailers (Kroll et al. forthcoming) followed up on a 2008 survey in:

- Orange Farm (OF) on the far urban periphery of Johannesburg
- Hillbrow and Berea in the Johannesburg inner city (IC).

An initial mapping survey consisting of basic questions was followed by telephonic interviews with a consenting sub-sample of respondents from each location.

The information gathered in the survey responds closely to the US and UK approaches to food environment research, while taking into account many of the specificities of the South African urban context. The survey used Global Positioning System (GPS) technology to geo-reference key aspects of informal food outlets including primary and secondary products traded, trading infrastructure, permanence of trading location, and trading times. Subsequent detailed interviews revealed more details about safety, hygiene, and other environmental concerns. The findings give insight into important dimensions of these community food environments, including the number of outlets, types of food available, spatial patterning in relation to other aspects of the urban environment, and operating times. More detailed elements of the specific consumer food environments such as price, product placement, quality, and variety were not considered. The next sections discuss findings from the case studies, with a focus on the Johannesburg findings, with which the author is more familiar.

The chosen area boundaries (administrative wards) do not denote actual economic, social, or cultural boundaries; neither do residents traverse all these boundaries. In each category, the locations revealed similarities and differences which shed light on the factors influencing informal food trade.

## Number and type of food outlets

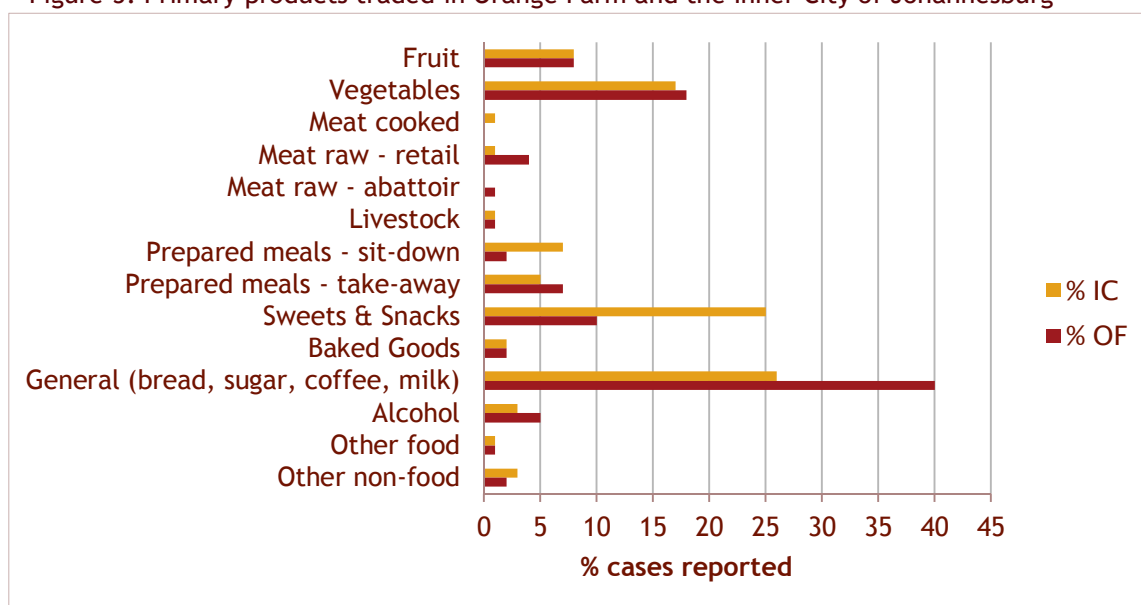
A total of 883 food traders participated in the spatial survey conducted in the two study areas in Johannesburg: 548 IC and 335 OF traders. Based on Census 2011 data, this translates into a density of 112 people per food trader in the Inner City and 124 people per trader in Orange Farm. The IC is thus more densely served by food traders than OF despite the proximity of several supermarkets and other formal retail outlets, and despite the apparently greater need in the relatively under-served and geographically larger area of Orange Farm.

The Inner City prevalence may reflect that it is able to sustain relatively more food traders due to passing trade, and also that higher levels of unemployment and lower incomes mean that the OF economy can sustain fewer food traders. As there are 10% more people per OF food trader than per IC trader, and few OF formal food retail outlets, OF residents' access to food is more restricted than in the IC. This finding correlates well with AFSUN's 2008 survey findings, which showed that Orange Farm households were more likely to be food insecure than Inner City counterparts (Battersby 2011; Rudolph et al. 2012).

Three types of food dominated primary products traded in both Johannesburg research areas (see *Figure 5*): general manufactured or packaged foods (26% IC and 39% OF), vegetables (17% IC and 18% OF), and sweets & snacks (25% IC and 10% OF). Fruit was also equally important in both areas (8%). Prepared meals were also significantly represented, but whereas sit-down meals were more important in the inner city (7% IC vs. 2% OF), in Orange Farm, takeaways were slightly more common (7%). General foods were of far greater significance in Orange Farm (39% of traders vs. IC 26%), possibly reflecting the inaccessibility of supermarkets with these goods, the greater geographical extent of the Orange Farm survey area, and the associated challenges of mobility to food access. The informal trade of general food items may therefore reflect a response to a failure of the formal food system to serve as a channel for this population.

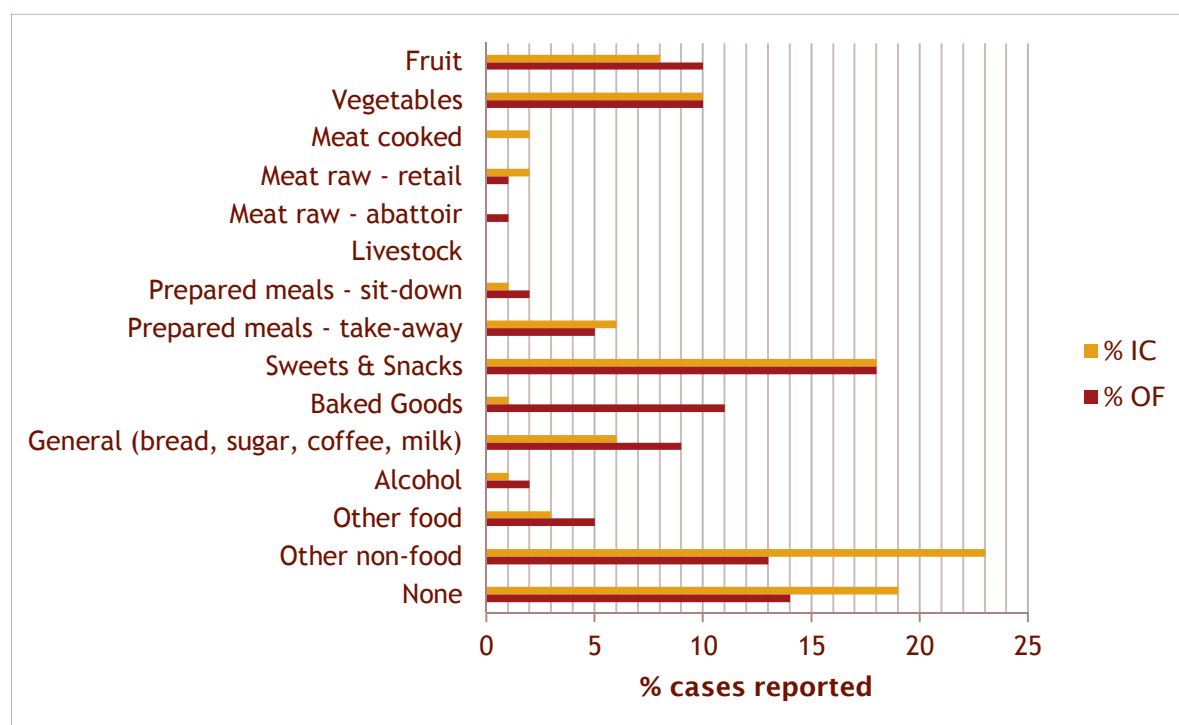
In the two Johannesburg areas sweets and snacks were more readily available in the Inner City (25% vs. OF 10%) (see *Figure 6*). This discrepancy may reflect the Inner City's greater reliance on passing trade and the greater importance of food that responds to a high rate of pedestrian mobility for consumers in transit. However, sweets and snacks were also the most widely reported secondary food product in both areas (18%), followed by vegetables (10% in IC and OF), and fruit (8% IC and 10% OF). Traders sometimes reported no secondary products (IC 19% and OF 14%). However, 23% of Inner City traders and 13% of Orange Farm traders reported also trading non-food products.

Figure 5: Primary products traded in Orange Farm and the Inner City of Johannesburg



Source: Kroll et al, forthcoming. Data from AFSUN 2013.

Figure 6: Secondary foods traded in Orange Farm and the Johannesburg Inner City



Source: Kroll et al, forthcoming. Data from AFSUN 2013.

Again, clear differences between the two Johannesburg study areas, included the prevalence of general foods (OF 9% and IC 6%) and baked goods (OF 11% and IC 1%). Such differences may again reflect the formal food system's failure to provide general food in the more geographically remote area of Orange Farm, an opportunity to which local traders respond. The relatively high prevalence of baked goods in Orange Farm reflects the popularity of *vetkoek*, a deep fried dumpling which is a common street food in this area and again reflects a home industry providing food to local consumers. Traders in the Inner City were also far more likely to trade non-food items than traders in Orange Farm (23% vs. 13%).

## Geography of informal urban food environments

### Orange Farm

Orange Farm lies at the remote periphery of Johannesburg, and is a well-established settlement that emerged from the reconstruction and development programme (RDP), with significant informal housing in backyard shacks. Traders concentrate on Orange Farm's main taxi routes, with particularly dense clusters of trade in a few key locations. The cluster located in the far south-western corner of the study area is particularly dense (see *Figure 7*), with a high concentration of fruit and vegetable traders. Residential areas set back from the main circulation routes show very few traders. In the next sections, we consider a map of the different food products to explore the urban geography of different food categories.

Sweet and snack traders were to some extent clustered along key circulation routes and also near the main clusters where fruit and vegetable traders congregated. Several snack traders had also set up along a new pedestrian walkway built across the ridge separating the north-eastern section of the study area from the central area. These snack traders seemed to cluster near schools and access routes to schools and also near bus stations.

Baked goods traders were located along main routes but also in some more isolated areas. They did not cluster as much as fruit and vegetable traders, and only eight traders reported baked goods as a primary product, while 20 traders reported baked goods as a secondary product. Only two baked goods traders operated in the Drieziek area, west of the Golden Highway. Of the eight traders who reported baked goods as their primary product, several were close to taxi stops and schools, suggesting that these urban landmarks attracted customers.

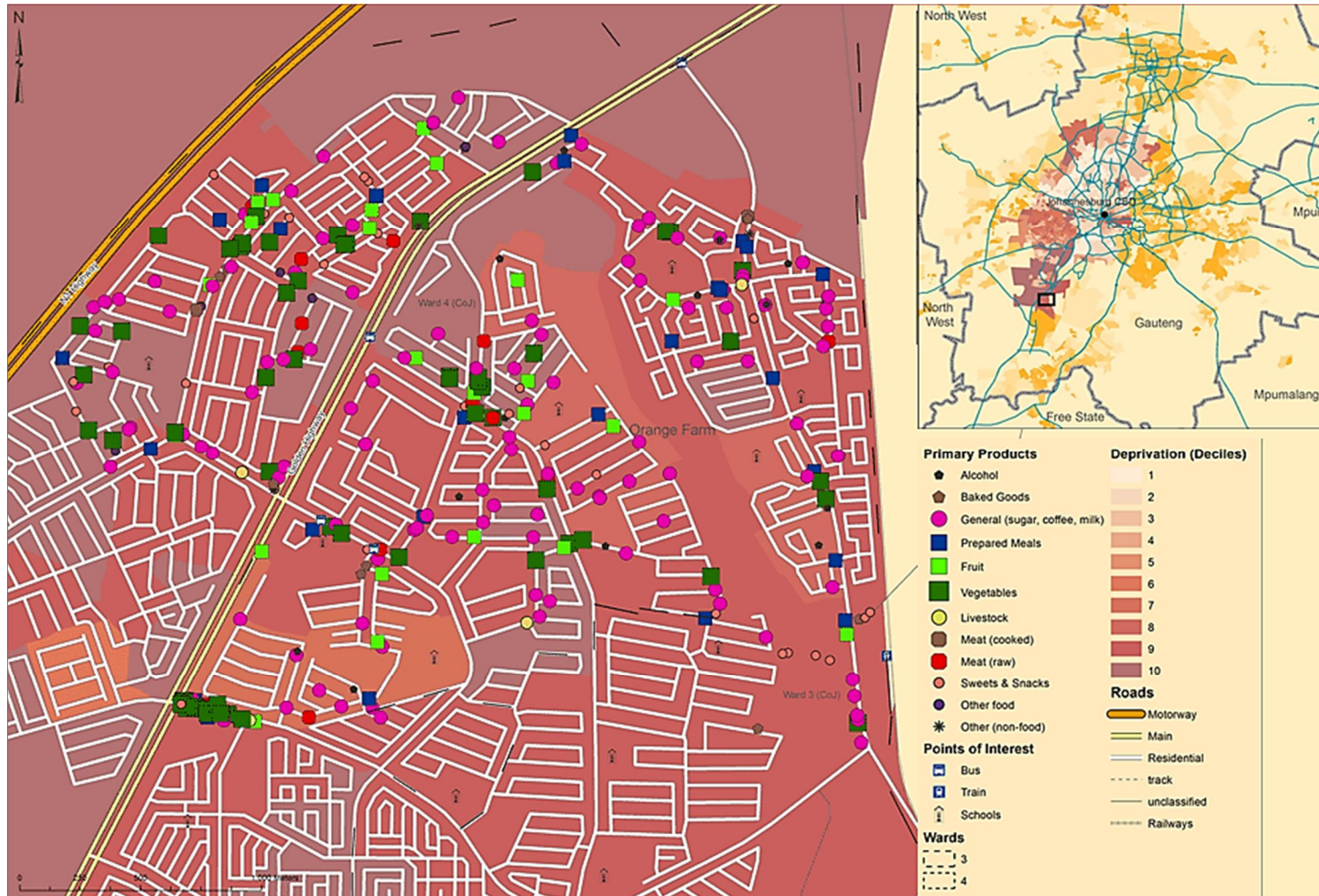
General food traders in the Orange Farm area showed a different spatial pattern to that of fruit and vegetable traders. Although many general food traders were also located along key routes, they also operated spazas in the isolated parts of the study area. The higher density and more even distribution of general food traders indicate that these traders responded to a great need for general food. Also, the population density, relative durability of produce, and ubiquitous demand for general food can support far more general food traders than other types of trade. General traders seem to play a vital role in bridging the access barriers presented by the presence of few supermarkets in the vicinity of this study area – the nearest Pick 'n Pay at the time of research was about 5km away, and beyond this, the nearest clusters were in Lenasia (~15km) and Evaton (10km).

Fruit and vegetable traders also tended to operate along primary circulation routes, and also cluster around central places; in the Orange Farm study area, one major cluster was on the corner of the Golden Highway and an unnamed road into Drieziek, and two secondary clusters exist. Many fruit traders also traded vegetables as a secondary product and vice versa, suggesting that fresh produce traders depend on passing trade, from pedestrians *en route* to and from public transport routes, and from passengers embarking and disembarking from public transport. As with fruit traders, distribution patterns confirm the importance of mobility patterns and local transport routes for fresh produce traders.

### Johannesburg Inner City

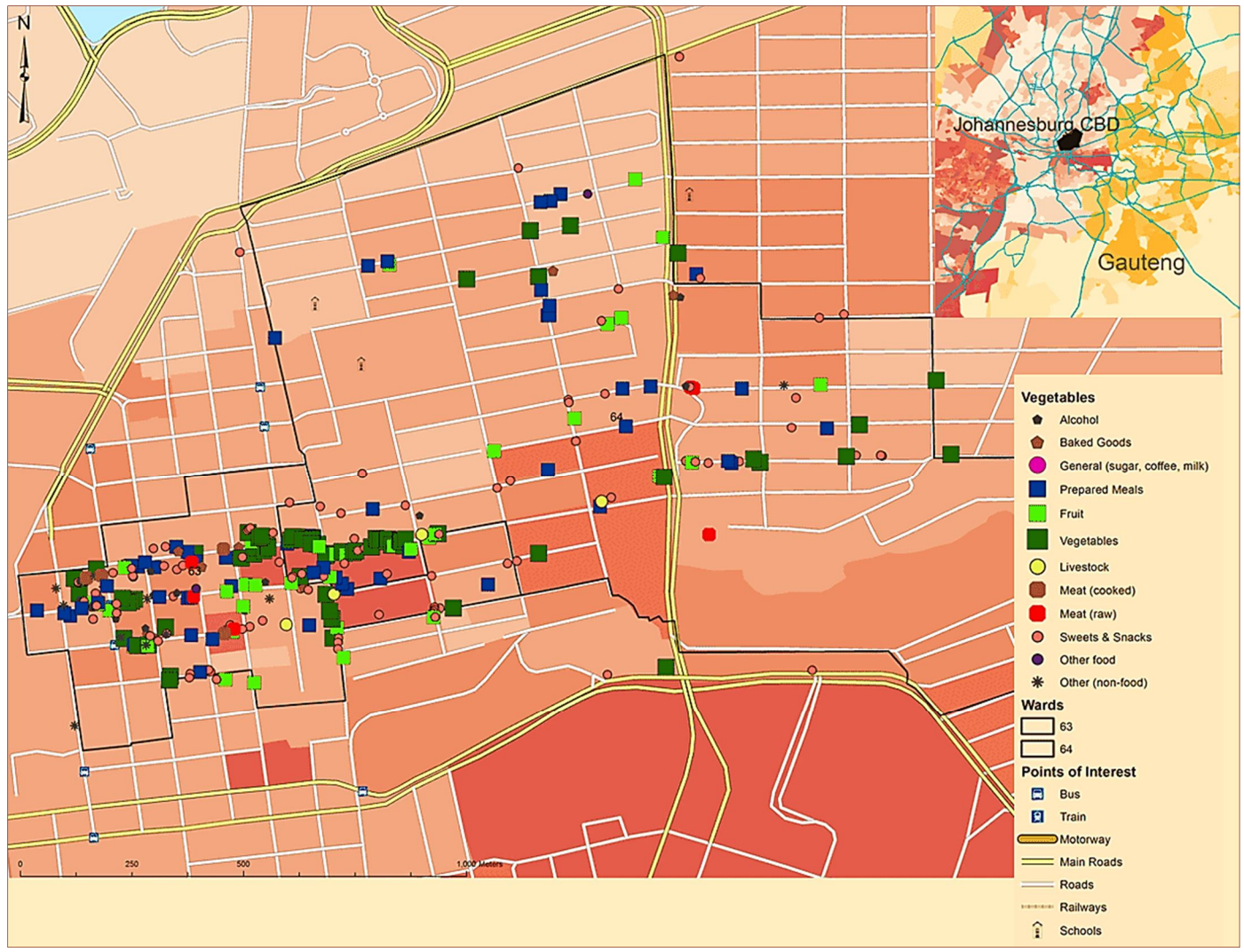
Johannesburg Inner City is highly formalised, with high rises along main thoroughfares, lower density residential complexes, and free standing houses set back from primary circulation routes (see *Figure 8*). The distribution pattern for informal food outlets in the Inner City study area shows a dense clustering of informal traders in the high rise area along Pretoria, Kotze and, to a lesser extent, Esselen Street to the far West of the study area. Secondary clusters exist near the Northeast of the study area, and an east-west linear pattern crossing Joe Slovo Drive near Alexandra Street and Joel Road.

Figure 7: Spatial patterning of food sold by Orange Farm's informal traders



Source: Kroll et al., forthcoming. Data from AFSUN 2013.

Figure 8: Spatial distribution of informal food outlets in Johannesburg Inner City



Source: Kroll et al. forthcoming. Data from AFSUN 2013.

Sweet and snack traders were numerous, and dealers clustered along Pretoria and Kotze streets, near the intersection between Kotze, Nugget and Abel streets and on Harley Street, but did not seem to cluster around the schools in the area. Traders who dealt in sweets and snacks as a secondary product occupied less central areas, and coincided with clusters of traders dealing in general foods. Some sweet and snack traders seemed to be using the sweet and snack sales as a front to sell illicit goods such as cannabis and other drugs.

Meat traders, mostly dealing in raw meat, were clustered in the western part of the study area. Only two traders reported slaughtering operations, and only one reported slaughtering as a primary trade. Only three traders sold cooked meat – two in the western section of the study area (Ward 63). Traders selling sit-down prepared meals mainly clustered along the western end of Kotze Street and along Pretoria Street. Takeaway prepared meals were far more broadly distributed throughout the study area.

General food traders – by far the most common in the study area – clustered to the west along Pretoria, Kotze and Esselen streets, along Nugget Street, near the intersection of Lily and Hillbrow streets, and along Harley, Minors and Saunders Streets to the west of Joe Slovo drive. However, many general food traders were scattered in peripheral areas – mostly in spazas. Fruit vendors clustered along Pretoria and Kotze streets, most densely where these streets cross Nugget Street. Several other traders dealing primarily with fruit scattered further towards the north-eastern and central parts of the study area. Traders stocking fruit as a secondary product were scattered more widely in the northern and central parts of the study area, occupying more marginal spaces, but also clustered most densely along Pretoria Street, where it crosses Nugget Street. Secondary clusters occur on the eastern boundary of the study area, to the east of Joe Slovo Drive and in the northern parts of Berea. As with fruit traders, those who deal in vegetables as a secondary product are spread out less densely on the periphery of the study area.

## Food trading infrastructure

The 2013 AFSUN informal food trade surveys recorded trading infrastructure, providing insight not only into the value and permanence of assets on which informal livelihoods are built, but also environmental conditions under which food is prepared and traded. The environmental conditions are especially important from a public health perspective – both in terms of food contamination risks and occupational health hazards for food traders. The 2013 AFSUN study devised a typology of food trading infrastructure, with specific infrastructure indicating a discrete type of consumer food environment – reflecting varying degrees of formality, permanence, and enclosure.

In terms of infrastructure and location, the least formalised are pedestrian traders who sell foods on busy intersections. Boxes sometimes covered by a board represent a very minimalist trading infrastructure that is easily moved and quickly set up, but highly exposed. By contrast, informal trading stalls have a more enduring setup, involving tables and display trays or shelves. These stalls allow traders to trade larger volumes, but are also more time consuming to transport and set up. Some are covered by tarpaulins or gazebos, affording rudimentary and semi-permanent protection from sun, rain and wind.

Municipal trading stalls are permanent trading facilities, sometimes including basic storage, and usually having display shelves and roofing. Mobile trading stands – typically trailers – are a large infrastructure investment and imply easy access to private motorised transport. Mobile stands are often used to prepare and trade street foods. Lockable shipping containers are also in use, offering security, a high degree of permanence, and a sizeable storage space.

Spazas are far more permanent, being walk-in shops and usually part of a private residence. Traders can stock more products for longer periods, and tend also to trade in less perishable goods like sugar, milk, and maize meal. Some spaza traders (“house shop”) restrict customer access by trading through a window which can be securely locked at night, with obvious impacts on the visibility and range of products available to customers. It also reflects a context in which traders are exposed to theft, violence and vandalism, perhaps creating mistrust and exclusion. Towards the formal and permanent end of the spectrum, mini-markets offer a far greater range and volume of goods than more informal consumer food environments. Formal food outlets recorded include wholesalers, service station forecourt shops, franchises and restaurants.

The two Johannesburg study areas had very different informal consumer food environment profiles (see *Figure 9*). Spazas were far more common in Orange Farm (26% vs. 10% IC). Similarly, 19% of traders in Orange Farm reported house shops, but only 7% of Inner City traders did so, reflecting the predominantly residential character of the Orange Farm study area. Conversely, the Inner City had a far greater degree of formal sector food trade than Orange Farm, with wholesalers (4%), service station shops (1%) and franchises (2%).

Few traders operated from municipal trading stalls (4% IC, 3% OF), but 16% of Inner City traders and 19% of Orange Farm traders were using informal trading stalls. In Orange Farm, most informal stalls were semi-permanent post and tarp setups. Conversely, private mini-markets were reported by 10% of Inner City traders and only 5% of Orange Farm traders. Mobile stall use was chosen by 7% of Inner City traders and 4% of Orange Farm traders.

The importance of mobility as an Inner City trading strategy is shown by the extremely high prevalence of boxes (28% IC vs. 8% OF). Box trading requires little capital and therefore limits risk if produce or infrastructure are vandalised or impounded by officials. In fact, informal conversations between traders and field researchers suggest that box trading may be a response to alleged exploitation and persecution by Metro Police, who were observed raiding and extorting traders at least once during fieldwork.<sup>3</sup> Some traders indicated that they would trade more goods and invest in more durable infrastructure if officials did not consistently harass them. Currently, many are limited to trading as much product as they can easily carry and hide in nearby stores when raids occur.

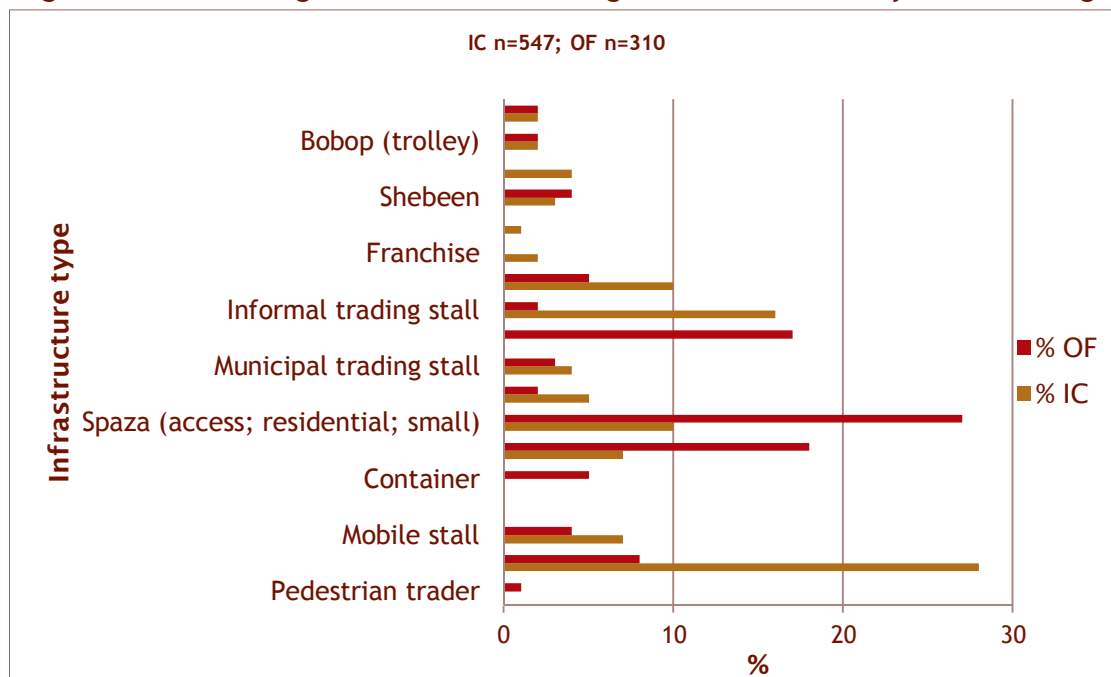
The trading infrastructure reflected in the aggregate statistics conceal a more complex reality: traders specialising in different product types, in different areas tend to prefer different trading setups. General food vendors in Orange Farm operated largely from spaza shops and house shops, selling through a secured window. Private mini-markets and containers were also observed in a few cases. In the Inner City, spazas were also of prime importance for general food traders, but many private minimarkets also existed, as did house shops – the third largest category. Informal trading stalls and wholesalers were only observed in a few cases. In both locations, general food traders operated mainly from permanent structures, usually on residential premises.

Baked goods traders were poorly represented in Orange Farm, but they mostly operated from boxes, informal trading stalls or spazas. In the Inner City, these were similarly poorly represented and where observed, sold from boxes or other setups. Sweet and snack traders in Orange Farm operated mainly from informal post and tarp trading stalls, and from boxes. In the Inner City, boxes were the most widely represented setup, with informal trading stalls far fewer but still the second most numerous.

<sup>3</sup> The researcher’s conversations and observations coincided with Operation Clean Sweep, when the City of Johannesburg evicted hundreds of traders from the inner city, apparently because the messy appearance of informal trade contradicts the glitzy image of the world class African city to which Johannesburg officials aspire to attract global investor finance.



Figure 9: Food trading infrastructure in Orange Farm and Inner City Johannesburg



Source: Kroll et al. forthcoming. Data from AFSUN 2013.

Fruit traders in Orange Farm operated mainly from informal post and tarp stalls, followed by boxes, house shops, and municipal trading stalls. In the Inner City, boxes were by far the most common setup, followed by informal trading stalls. Trolleys, mobile stalls, spazas, minimarkets and house shops were also observed in a few cases. A similar pattern applies to vegetable traders, most of who in Orange Farm traded from informal post and tarp stalls, followed by a far fewer traders operating from boxes, municipal trading stalls, and trolleys. Spazas, containers, pedestrian traders and private minimarkets were also observed in a few cases. Inner City traders, dealing mainly with vegetables, usually operated from informal stalls, boxes, or mobile stalls. Municipal trading stalls were also reported, and a few spazas, house shops and minimarkets were observed.

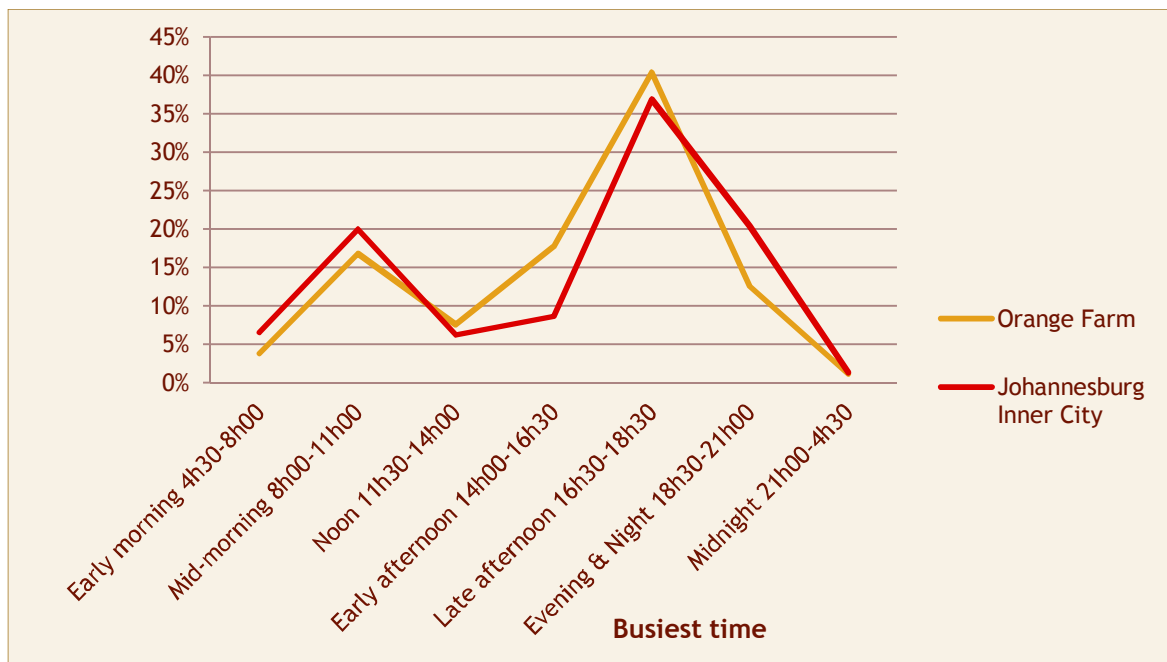
### Time signatures of informal food trade

As emerged from the conceptual review, food environments research should be sensitive to changes in the food environment over time. The 2013 AFSUN survey also gathered information on the intensity of trading activity over various timeframes. This information provides a more dynamic perspective of informal food trade pulsing in response to the daily movements of commuters, weekly work, recreation and provisioning cycles, and longer – term rhythms of holidays and cyclical migration to rural areas.

In both Johannesburg locations, the late afternoon (16h30–18h30) was reported as the busiest time (see *Figure 10*). Mid-morning was the second busiest time for both Johannesburg locations (37% OF vs. 32% IC). Inner City traders were more likely to report evening as their busiest trading time. These patterns reflect that the informal food trade responds to commuter peaks, especially the mornings and late afternoons when people leave for and return from work.

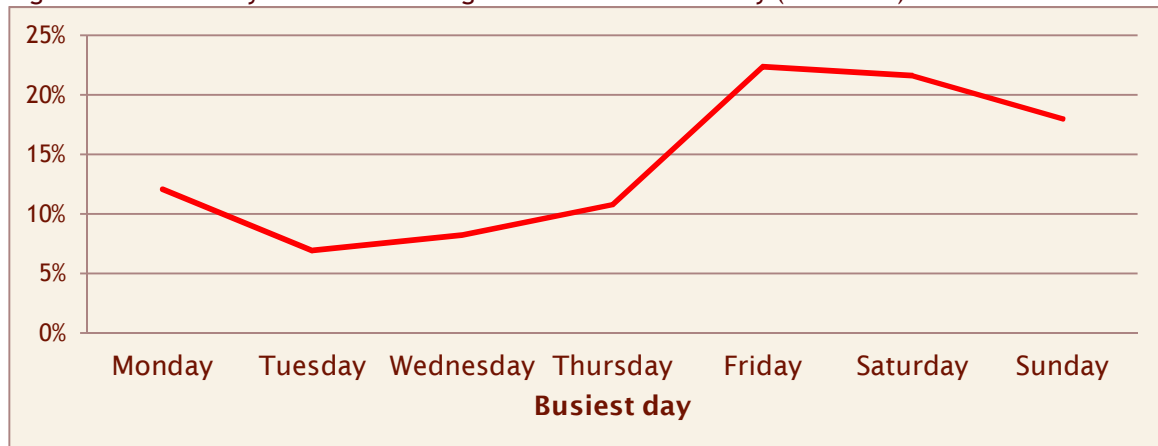
Interviews with traders revealed that in both cases trading is most vibrant over weekends, while there seems to be a notable mid-week lull (see *Figure 11*). Traders in both areas seem vibrant throughout the year, except for a dip from May to July (see *Figure 12*).

Figure 10: Busiest times for informal trade in Orange Farm and Johannesburg Inner City



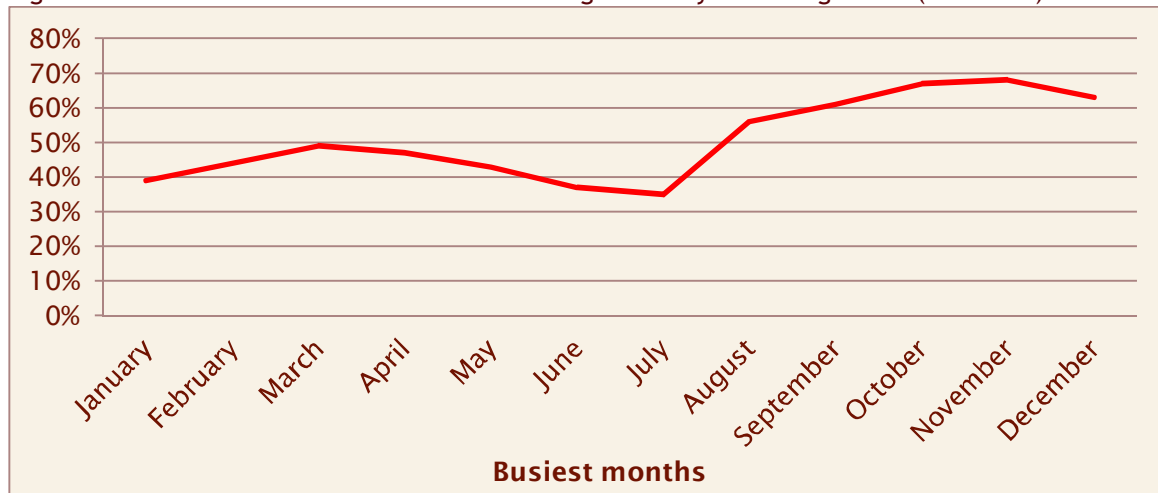
Source: AFSUN 2013

Figure 11: Busiest days of trade in Orange Farm and the Inner City (combined)



Source: AFSUN 2013

Figure 12: Busiest months for trade in Johannesburg Inner City and Orange Farm (combined)



Source: AFSUN 2013

## Key features and implications of urban informal food geographies

The preceding sections presented key findings of the AFSUN case studies regarding important dimensions of urban informal food environments including: type of food available, number of outlets, trading infrastructure (reflecting aspects of the consumer food environment), local food geographies, and time signatures. Each dimension reveals key features with potential impacts on food security, public health, and livelihoods summarised below.

General foods and staples are widely available throughout the study areas, which implies basic staple foods are readily available and accessible even in remote, impoverished peri-urban settlements. Therefore abject hunger is unlikely to be a result of poor availability. Fruit and vegetable traders were highly prevalent, albeit mostly clustered around high traffic areas such as taxi stops, service stations, and along approaches to supermarkets. Therefore, although fruit and vegetables are available in impoverished community food environments, they are more accessible to people who are employed and commuting to or from work.

From a public health perspective the high prevalence and easy accessibility of sweets and snacks (especially in the Inner City urban environment) is a concern, as is the widespread availability of meat along pedestrian pathways. Regular consumption of sweets and snacks can contribute to increased sugar intake, which is implicated in the increasing prevalence of NCDs like obesity, diabetes and hypertension (Puoane et al. 2013); informal meat trade poses risks of food borne diseases (Roesel et al. 2015; Heeb et al. 2015) and high meat consumption may contribute to some NCDs.

The trading infrastructure reveals that informal consumer food environments are diverse, but that the minimal enclosure, location in high traffic areas, and restricted access to sanitation, cold storage and waste expose customers and traders to environmental and social risks such as food spoilage, bad air, waste, theft and vandalism (Battersby forthcoming; Kroll et al. forthcoming). Time signatures in informal food trade reflect a dynamic, shifting terrain responding to the daily, weekly and annual cycles of employment, commuting and migration. It is unclear to what extent this impacts on food availability or accessibility in informal urban food environments or what the public health impacts may be. However, this patterning suggests that informal food trade as a livelihood strategy is exposed to large fluctuations over time, so incomes and asset accumulation may be constrained when trade is slow. The time patterns also suggest that studies over a short time may not reflect the full diversity of informal food livelihoods in a given area, especially when the study coincides with periods of low activity.

From a value chains perspective, many of the features of informal trade result from the way informal food traders respond to the limits of formal value chains, including: (1) spatial clustering in inaccessible high income areas, (2) the preference for larger unit volumes, (3) shorter operating hours, (4) reluctance to offer credit, and (5) the inability of formal value chains to accumulate social capital embedded in the social relations of poor communities. Due to structural linkages to the formal sector, many of the risks and hazards of informal food environments previously discussed can be seen as externalised costs – while formal value chains are thus able to extract and accumulate value from the urban poor through informal livelihoods, they are not directly exposed to the risks, which traders and their customers carry. Key aspects of informal food environments can therefore be understood as the spatial manifestation of adverse incorporation of the urban poor into formal food value chains. It would therefore seem justified to suggest that formal value chain governance should address not only the spatial location, design, impacts and accessibility of formal sector outlets, especially supermarkets and shopping malls, but should also explicitly consider how the needs and capabilities of informal food trade can be more equitably addressed through standards, incentives, infrastructure investments, and up-skilling, which could allow more healthy and secure consumer food environments to emerge.

## 5. RESEARCH GAPS AND OPPORTUNITIES

Geographical approaches allow different classes of geo-referenced data to be visually and spatially correlated, presenting opportunities to: (1) discern spatial patterns, (2) correlate food geographies with specific risks and vulnerabilities such as hygiene hazards (e.g. dumps, sewage spills, informal abattoirs), and (3) infrastructural parameters such as public transport routes or pedestrian pathways. While this review and the AFSUN case studies discussed have presented novel insights into the food geographies of South African cities, various knowledge gaps and research opportunities have also emerged.

Informal food trade reflects the resilience and agency of the urban poor in pursuing livelihoods in adverse and, at times, conflicting spatial, political and economic regimes to meet vital food needs, which are currently inadequately and inequitably met by formal value chains. However, the food environments approach outlined in this paper generally adopts a top-down, extractive approach to mapping food geographies which is at odds with the spirit of agency from which informal food geographies emerge. The top-down approach also risks imposing structural determinism, which is contradicted by the existence and nature of informal food trade.

Top-down methods also do not adequately take into account the foodways of the poor – the densely layered systems of knowledge, meaning and practice which influence food choice (Alkon et al. 2013). Foodways are particularly relevant to exploring ‘social food environments’ such as ritual feasting at events like funerals, weddings, initiations, and graduations. Such rituals play a key role in the accumulation of social capital and the ascription of prestige and relative status in poor communities (du Toit&Neves 2007). Social capital underlies the food sharing and borrowing networks, which are an important coping strategy in food insecure households (Cooke 2012). Social food environments thus provide fertile ground for exploration. Another important socio – cultural dimension of food environments lies in the spatial economy and governance regimes that shape informal food trade. Emic<sup>4</sup> approaches which explore the agency of the poor and their subjective perceptions of food environments are crucial to understanding how the spatial economy and governance regimes are negotiated and contested.

Furthermore, as has emerged from the review of mobility and out-shopping in South African cities, it would be misleading to overstate the importance of any one food environment except for small, highly vulnerable groups who are firmly bound to a single area. Instead, research approaches should recognise that (1) mobility pathways link multiple food environments across different scales (household to neighbourhood to city), (2) food environments respond to mobility patterns, and (3) food environments and mobility pathways reflect household knowledge, capabilities and resources. Similarly, it would be interesting to explore food pathways before food reaches informal outlets by mapping food sources upstream to mostly formal food value chains.

The dynamism and adaptability of informal food trade implies that longer term studies are needed to discover changing spatial patterns, diurnal and annual cycles, and long-term trends in food environments, especially to understand the relationship with and response to increasing supermarket penetration (Crush 2014).

The need and opportunity exist to adopt more protracted, emic research approaches in studying food geographies, taking foodways into account and making visible the complex network of food environments seen and navigated by poor consumers and food traders. Information and communication technology (ICT) advances present novel opportunities to conduct research to facilitate the emergence of emic food geographies, and transcend the limitations of top-down approaches because they permit mobile collection, geo-referencing, and aggregation of audio-

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<sup>4</sup> Studying or describing a particular language or culture in terms of its internal elements and their functioning rather than in terms of any existing external scheme.

visual and survey data through crowd-sourcing (Boulos et al. 2011). Such ICT approaches could permit more detailed, fine-grained exploration and representation of consumer food environments as they present themselves to the poor (e.g. product variety, quality, and price) and blur traditional boundaries between researchers and their “subjects”.

Such a revolutionary approach, currently pioneered by the fostering local well-being (FLOW) project<sup>5</sup>, can engage interested households in participatory research to enable household members to document and comment on different food environments traversed in their daily commutes, thus permitting the emic mapping of food environments through elements of photo-voice (Harper 2002; Wang&Burris 1997; 1994), adapted to take advantage of smartphone technology.

While this review has focused on urban areas, the notable internal differences suggest that even within the studied cities, there is scope for detailed geographies of spatially, socially and culturally distinct areas. Moreover, food environments in secondary cities, small towns and rural areas are still virtually unstudied, and it would be arrogant and misleading to assume that the patterns observed in the case studies apply universally to other South African contexts. Ample scope exists for further research that explores largely unstudied and invisible food environments, and that adopts innovative methodologies that challenge the power dynamics inherent in social research.

## 6. POLICY IMPLICATIONS

As emerged from this review, the opportunities and constraints presented by South African urban food environments shape consumption and therefore impact on public health, including the rising tide of NCDs. Moreover, food environments are in turn powerfully shaped by the dynamic interplay between formal food and informal food retail.

Although the body of knowledge is still sparse, and specific policy recommendations should be informed by a broader body of knowledge, it is already possible to identify key policy implications, as follows:

1. Food systems governance should incorporate an explicit spatial planning and governance mandate that goes beyond identifying marginal spaces for urban agriculture – food systems governance initiatives must transcend a managerialist, problem-solving approach, and recognise the complex and contested nature of food systems governance (Candel 2014).
2. A spatial food system governance mandate should be based on recognising the important role of informal economies, both in terms of livelihoods and providing food access that caters to the needs of the poor. Policy should therefore be sensitive to the particular and diverse needs, capabilities and vulnerabilities of both formal and informal food economies.
3. Governance of food environments at city or neighbourhood scale should be rooted in sustained participatory processes, which ensure that governance is transparent, legitimate, and responsive.
4. Moving towards democratic governance of food environments should also be designed to engage with the multiple and often fragmented regimes of power, authority and influence which govern informal food livelihoods.
5. Due to the central spatial and economic role of mobility pathways and transit nodes, participatory governance of food environments at places like taxi ranks, train stations, bus stations, and transit routes represents a powerful leverage point to improve urban food environments.

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<sup>5</sup> <http://flowafrica.org/>

## 7. CONCLUSION

From the preceding discussions, one clear insight emerges: in South African cities, food deserts are a mirage created by catchy concepts, developed in the highly regulated global North, which are poorly reflect the messy complexities of South Africa's urban food environments. As the mirage disappears under closer scrutiny, it also reveals the limits of the wider food environments model.

The linear food environments model suggests that organisational, community, consumer, and informational environments determine psychosocial environments, which in turn shape purchasing behaviour. This linear, one way model does not take into account the multiple feedback loops that move from psychosocial environments back to organisational, community, consumer, and informational environments. The model neglects key social and cultural dimensions of food environments, and by proposing tightly bounded food environments, the model ignores high mobility rates and the interconnectedness of diverse settings at multiple scales.

An alternative perspective sees the urban poor pursuing their particular foodways by negotiating far flung mobility networks, linking household provision to a nested scalar hierarchy of food environments. Each level is composed of myriad discrete settings, with each setting shaped by cross-scale dynamics, inter-system dependencies and multiple overlapping governance regimes including regulations, standards, spatial economies, and moral codes. Though at present it is only possible to discern the roughest features of the food environment networks, the perspectives sketched in this study aim to encourage further exploration to map out its details and make visible the fragmented terrain.

Given the creative agency and dynamism with which informal food economies shape local food geographies, urban and regional policymakers should find ways to support and channel the energy to enhance local food environments. Local and provincial governments need to reorient in favour of informal trade, away from attempts to control or repress informal trade, and towards recognising informal trade as a legitimate and powerful role player in shaping local food environments. Local and provincial governments, therefore, should review relevant bylaws and ordinances to establish how these could better accommodate the needs, capabilities, and customary governance arrangements of informal food traders, and build internal capacity.

Apart from reviewing bylaws and ordinances, government also specifically needs to find ways to engage informal traders in urban planning, design and provincial, metropolitan and local management. The engagement should explore how the needs, interests and potentials of informal food producers, processors, transporters and traders inform key planning processes such as Spatial Development Frameworks (SDFs), Integrated Development Plans (IDPs), urban master plans, and environmental impact assessments involved in spatial planning and development.

Interventions could include participatory designing and developing local market and trading facilities, which respond to the unique dynamics of each space to ensure safe, hygienic and securely lockable facilities are available to informal traders. Due to the importance of public transport in facilitating mobility across the spatial divides of South African cities, improved facilities should be aimed especially at key transit nodes. However, other key focus areas would include spaces around government institutions such as schools and clinics. As part of the food environment is visual and symbolic, policymakers also need to explore how food is marketed and promoted in public spaces and ensure that messaging take public health concerns into account.

In terms of the formal food value chain (e.g. locating and designing malls and supermarkets), it would be valuable to consider how to provide for the complementary role of informal trade and enhance access for poor consumers who do not have motorised transport, once again, through participation, engaging traders, poor shoppers, and public transport agencies in where to locate and how to design of such facilities.

Finally, due to the powerful energy that informal food processing and trade have in shaping local food environments, direct forms of government and non-governmental (NGO) support could include training, and financing mechanisms specifically aimed at enhancing food environments. Training could include aspects of enterprise development, hygiene, nutrition, and regulatory compliance.

In acting on these recommendations, government must recognise that engagement and participation require long term commitments to relationship building. Such processes must incorporate elements of conflict management to resolve tensions between various interest groups in the diverse informal trade sector. Aspects of organisational development are needed to ensure that traders and consumers patronising their stalls are able to develop and articulate strong, clear voices to contend with more powerful stakeholders such as property developers and formal retailers.

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