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The Geography of Supermarkets in Cape Town: Supermarket Expansion and Food Access

Jane Battersby · Stephen Peyton

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Abstract Although the rapid expansion in the number of supermarkets in South and Southern Africa in recent years is well-documented, the potential impact of this process is not well understood. The existing literature does not engage adequately with the spatial distribution of supermarkets within cities and is therefore unable to address the impact of these stores on household food security. The paper presents a mapping of the location of supermarkets in Cape Town with reference to income characteristics of neighbourhoods and transport routes. The distribution of supermarkets is shown to be highly unequal and the distance of low-income from high-income areas hinders access to supermarkets for the urban poor. The paper further argues that the supermarkets in low-income areas typically stock less healthy foods than those in wealthier areas and, as a result, the supermarkets do not increase access to healthy foods and may, in fact, accelerate the nutrition transition.

Keywords Supermarket expansion · Urban food security · South Africa · Food access · Nutrition

Introduction

The food system in South and Southern Africa is undergoing a rapid transformation as large supermarket companies increasingly dominate from production to point of sale (Abrahams 2010, Crush and Frayne 2011). The impact of this transformation on food security and nutrition has been widely debated elsewhere, with some deeply concerned about the impact of supermarketization on food security and sovereignty

J. Battersby (✉)
African Centre for Cities and Department of Environmental and Geographical Science, University of Cape Town, P/B Rondebosch, Cape Town, South Africa
e-mail: Jane.battersby.lennard@gmail.com

S. Peyton
Department of Geography, Macalester College, St. Paul, MN, USA
e-mail: stephendpeyton@gmail.com

(Holt-Giménez and Shattuck 2011) and others arguing that supermarkets may prove an "urban food security boon" because of their capacity to lower food prices (Reardon and Minten 2011). The argument about the impact of supermarkets on the food security of the urban poor has been made primarily on the basis of price as the main determinant of access. This paper argues that access needs to be understood as physically, as well as economically, determined. This point has been powerfully argued in the Global North in the context of 'food deserts', but the spatiality of supermarket expansion has been all but ignored in the African context (Battersby 2012).

This paper first discusses the existing literature on supermarket expansion, with a particular focus on South Africa. It provides an overview of the international and local literatures on the extent and drivers of supermarket expansion. The paper argues that the lack of spatial analysis within the existing literature prevents conclusions being drawn about the actual impact of supermarket expansion on the food and nutrition security of urban residents. Following the mapping approach adopted by food desert researchers in Anglo-American countries, the paper presents an analysis of the spatial distribution of supermarkets in Cape Town with particular focus on income, transport routes and store type. Through this analysis, the paper seeks to address the question of whether supermarket expansion does improve access to food for residents of low-income areas of Cape Town.

Expansion of Supermarkets in Developing Countries

Developing countries are widely acknowledged to be undergoing a nutrition transition characterised by a shift towards a diet high in saturated fats, sugar and low-fibre-refined foods. These shifts have been evident since the 1990s, mostly in urban areas (Popkin 2003). There is significant evidence of the nutrition transition in South Africa. Bourne et al. (2002, p. 158) compared dietary data of urban black South African adults from 1940 with similar data generated in 1990 and found an 11 % reduction in carbohydrate consumption as a proportion of all energy consumed and a 59 % increase in fat intake. In recent years, there has been a dramatic shift in the South African diet. Sales of snack bars, ready meals and noodles rose by over 40 % between 2005 and 2010, and the average number of Coca Cola products consumed in South Africa increased from a high 130 per person per year in 1992 to 254 per person per year in 2010 (Igumbor et al. 2012, p. 1).

The nutrition transition has been linked to a number of factors, most noticeably the higher-income profiles of urbanites, but changing diets cannot only be attributed to higher urban average incomes. Altman et al. (2009, p. 15), for example, note that "the differences between urban and rural food expenditure patterns can also be traced to particular food types. It is surprising that rural households spend a larger share of their food budget on grain products, fruit and vegetables and a lower share on meat, than urban households in the same decile". The difference in the urban diet, irrespective of dietary type, has been attributed elsewhere to the time constraints of urban life, particularly women's employment away from the home, which have encouraged a shift towards the consumption of more processed foods.

These factors are clearly important, but it must be acknowledged that the shifts in diet analysed by Popkin have occurred within the same period as the rapid expansion of

the supermarket sector within developing countries. Reardon et al. have identified three, or perhaps four, waves of supermarket expansion in developing countries (Reardon et al. 2001, 2004; Reardon and Minten 2011; Timmer 2008; Weatherspoon and Reardon 2003). Broadly speaking, these waves are as follows: the first wave in the early- to mid-1990s included much of South America and East Asia outside of China and South Africa. The second wave took place in the early 2000s and included much of Southeast Asia and Central America. The third wave is currently underway in East Central Europe, China and Africa outside of South Africa.

By 2003, the supermarket sector in South Africa accounted for 50–60 % of all food retail, although supermarkets accounted for just 2 % of all food retail outlets (Weatherspoon and Reardon 2003, p. 337). Reardon et al. (2003, p. 1142) note that these 1,700 supermarkets were equivalent to 350,000 spaza stores in terms of sales. The supermarket sector continues to grow, with a share of the food retail market increasing to 68 % in 2010 (Planting 2010, p. 34). Four major companies account for 97 % of sales within the South African formal food retail sector. Shoprite Checkers currently controls around 38 % of the formal food retail market, followed by Pick n Pay at 31 %, Spar with 20 % and Woolworths with 8 % (GAIN Report 2012).

The supermarket sector in South Africa continues to expand both within the country and in the wider African continent. Shoprite opened its first non-South African store in 1995 and by the end of 2012, had 131 non-South African supermarkets in 16 African countries. Within South Africa, the major supermarkets are expanding into rural areas and lower-income urban areas previously without supermarkets. The expansion can be attributed both to the growing disposable income among African consumers, which has effectively opened new markets to the supermarkets and their subsidiaries (such as Boxer, owned by Pick n Pay and Sentra, owned by Shoprite). Pick n Pay announced plans to open 225 stores in the 18 months from October 2012. Of these new stores, 119 would be Pick n Pay supermarkets and the rest would be Boxer Superstores, small format and express stores (Magwaza 2013).

In addition to entering new markets, the supermarkets are expanding through the opening of new store formats. Pick n Pay, for example, recently announced a partnership with BP to build 120 new convenience stores on petrol station forecourts. Woolworths currently have 45 such stores in partnership with Engen (Mantshantsha 2013).

Reasons for the Expansion of the Supermarket Sector

Reardon et al. (2004) view supermarket expansion as being driven both by demand by customers and a series of supply side determinants. On the demand side, factors such as the rapid urbanisation of developing countries, the increased presence of women in the labour force and improved household storage capacity have been identified as drivers of supermarket expansion (Reardon et al. 2001). On the supply side, structural changes such as increased retail foreign direct investment, institutional and regulatory reforms and the modernization of supermarket procurement systems have all enabled the expansion of the supermarket sector (Reardon et al. 2007).

Within South Africa, the rapid growth of the black post-apartheid middle class has opened up new markets for supermarkets within townships (Ligthelm 2008). In

addition, improvements in infrastructure in many townships have made the presence of large retail businesses more feasible (Tustin and Strydom 2006, p. 56). In the post-apartheid era, there have also been considerable changes in the agricultural sector, which have allowed supermarkets to expand their procurement systems and gain market dominance (Van der Heijden and Vink 2013).

The impact of supermarket expansion has been widely debated with authors such as Lang and Barling (2012) drawing attention to the confluence of 'Big Food', supermarkets and the nutrition transition. Within Africa, much of the focus to date has been on the impact of the supermarket sector on food producers (Louw et al. 2008; Neven et al. 2009; Van der Heijden and Vink 2013). In South Africa, there has been a small body of work on the impact of mall developments (which generally include supermarkets as anchor tenants) on local economic development in township areas. The African Cooperative for Hawkers and Informal Businesses has stated that about 150 informal retail stores in Soweto alone have been forced out of business, partly because of the entry of large retail chains into the township (Bisseker 2006). Initial findings from a DEMACON survey on the impact of Jabulani Mall in Soweto are less conclusive, with 76 % of informal traders and retailers reporting no change, although the weighted percentage spent at local traders dropped from 25 to 14 % (McGaffin 2010, p. 4). Ligthelm (2008) found that small traders were generally negatively impacted by the presence of a mall development and that those who were able to survive did so by changing their business models. Battersby (2011) has argued that the loss of these small businesses is potentially damaging to the food security of residents in these areas as these traders sell amounts that are affordable for the poor and provide food on credit.

In her work on supermarketization in Zambia, Abrahams (2010, p. 116) cautions against "supermarket revolution myopia" and presents a discussion on the types of transformation occurring in other sectors of the food system that challenge the assumption of the inevitable dominance of the supermarket sector. As Humphrey (2007, p. 438) has argued, "the depth and implications of retail transformation in developing countries is still unclear. A transformation is taking place. The literature on the supermarket revolution captures this and highlights its potential implications. However, when a significant new trend is first located, it is quite common for the pioneering analyses to over-generalise both its react and its impact".

This paper seeks to address the potential impact of supermarket expansion on the food security of the urban poor in Cape Town through a spatial analysis of supermarket location. While the expansion of the supermarket sector has been well-documented in terms of market share and general location of stores, the actual geography of supermarkets has not been interrogated. This reflects a tendency to equate access to food with affordability of food and to neglect the role of geography in shaping food access (Battersby 2012). Reardon and Minten (2011, p. 5) suggest that, "there is emerging evidence that modern retail charges lower prices than traditional retail, which may prove an urban food security boon from retail transformation". This assumes that the cost of food is the only transaction cost, and ignores the transport and time costs associated with obtaining cheaper food. It also assumes that the product range available in supermarkets in low-income urban areas is the same as that in higher-income areas. However, Reardon and Timmer (2012) note that the spread of supermarkets into lower-income areas has been accomplished through the adoption of different market strategies and retail formats.

Methodology

For this study, the spatial distribution of stores of the four largest food retail companies in Cape Town (namely Shoprite, Pick n Pay, Woolworths and Spar) were first mapped. These chains dominate the food retail sector in the city and operate a variety of store types to accommodate different consumers. In addition to their standard supermarkets, the companies have a convenience store format. Furthermore, Shoprite has three different supermarket formats for low, medium and high-quality retail outlets, namely USave, Shoprite and Checkers, respectively. A total of 269 supermarket retail outlets were found in the Cape Town metropolitan area, consisting of 99 Shoprite stores, 67 Pick n Pay stores, 56 Woolworths stores and 47 Spars. This includes their convenience stores, supermarkets and hypermarket formats.

Supermarket locations were gathered from online store locators from company websites. This information was cross-referenced using Google Maps and then manually standardised. The data were geocoded and converted into a readable shapefile using BatchGeo's online website (http://batchgeo.com). This approach did not work for 3 of the 269 stores identified, and their addresses were inputted manually using Google Maps' street view tool to confirm their location. Once properly geocoded and formatted for use in geospatial software, the data were inputted into ArcGIS 9.3 for further analysis. The store locations were then overlaid on a series of maps of socio-economic and infrastructure information. In order to engage with questions of spatial inequity in the distribution of supermarkets in Cape Town, household income and informal dwelling frequency data were collected from Census 2001 datasets. These data sets, disaggregated down to the finest spatial scale available (the sub-place level), were then joined to a spatial enumeration unit shapefile. In addition, a street file was used to determine main road transportation routes.

At the time of the research, the data for Census 2011 were not yet available at the sub-place level. It is acknowledged that Census 2001 is now out of date. The total population of Cape Town increased from 2,893,249 in 2001 to 3,740,026 in 2011. The number of individuals self-identifying as black African increased from 916,584 to 1,444,939, and the number self-identifying as Coloured increased from 1,392,594 to 1,584,286. Given the historical racial inequalities in the country, it is likely that the vast majority of these new residents reside in lower-income areas of the city. This therefore means that present levels of spatial inequality within supermarket distribution are likely to be higher than those reflected using Census 2001 data.

All sub-places were divided into five ranked quintiles using an ARCGIS software algorithm. According to these generated quintiles, category 1 areas had average household incomes of R0-R39,537 per annum; category 2: R39,537-R77,993 per annum; category 3: R77,993-R124 689 per annum; category 4: R124,689-R200,493 per annum, and category 5: R200,493+ per annum. This exercise provided a map of equal numbers of sub-places within each quintile. However, it is important to note that this does not reflect equal numbers of households. For example, the sub-places located within the lowest-income quintile (category 1), contained 295,526 households, while the total number of households in all category 5 sub-places was 71,757 (Fig. 1). Over 60 % of all of Cape Town's households lived in sub-places that fell into the lowest two income quintiles. Since lower-income sub-places have far greater numbers of households than higher-income sub-places, analysis of census data using enumeration units

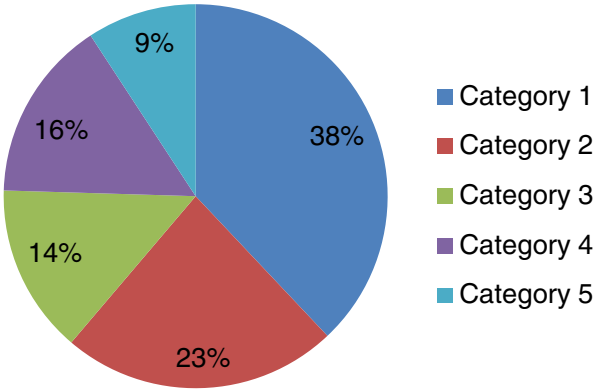

Fig. 1 Proportion of households in sub-places by income quintile

tends to mask the full extent of inequality within the city. This needs to be considered when interpreting the maps presented in this paper.

The major road transport infrastructure was also mapped in order to provide a sense of physical accessibility of stores to residents and to understand the spatial logic of store location. Roads labelled as "expressway", "freeway", "primary arterial" and "secondary arterial" were selected, while those labelled "minor road", "private road" and unlabelled were discarded. This choice was made in order to include only those routes that were likely to be significant enough to be used by public transportation systems such as buses or minibus taxis.

Supermarket Location

The distribution of supermarkets in Cape Town is highly unequal. Residents in the highest-income quintile sub-places had almost eight times as many supermarkets per household as those in the lowest-income quintile sub-places (Fig. 2). These findings reflect the general trend noted by Reardon et al. (2004, p. 19) where supermarkets initially occupy "a small niche in capital cities serving only the rich and middle class" and then spread well beyond the middle class "in order to penetrate deeply into the food markets of the poor". The spatial logic of supermarkets is profit-seeking behaviour, the desire to seek new markets at minimal risk, and gaining an advantage over competitors

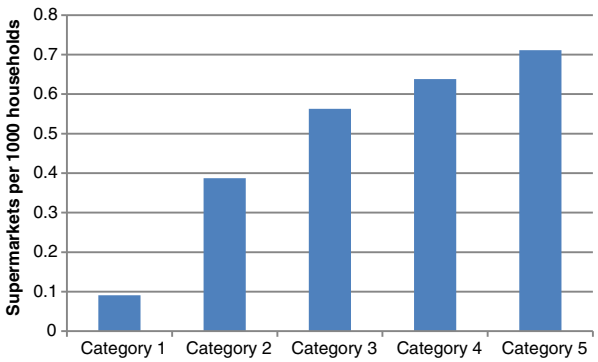

Fig. 2 Number of supermarkets according to average income of sub-places

(Tustin and Strydom 2006, p. 51). For these reasons, supermarkets continue to concentrate in wealthier areas of the city.

Location of Supermarkets Relative to Transport Routes

Cape Town's supermarkets are clustered around major roads, in particular, roads that form arterial routes for taxis and buses (Fig. 3). Of the 269 stores mapped, 195 were located within 200 m of a main road. This locational strategy expands the spatial reach of individual stores, enabling them to tap residents from other parts of the city. Supermarkets clustered around busy transport hubs noticeably cater to lower-income workers commuting via these hubs. These stores stock cheaper brands and more limited fresh produce than other nearby stores that cater to residents of the wealthy areas in which they are located. The Shoprite store in Mowbray and the Pick n Pay on Wynberg's Main Road are particularly popular for workers commuting from the lower-income Cape Flats.

Supermarkets in Cape Town are unequally distributed by income. However, it would be incorrect to assume that households necessarily purchase their food within their residential area. The location of supermarkets along major transport routes increases the accessibility of supermarkets to residents of lower-income areas. The practice of 'outshopping' (shopping outside of residential location) is well recognised in South Africa and was traditionally associated with a lack of formal retail in township areas (Strydom 2011). Although the retail environment has shifted and supermarkets have begun to spread into lower-income areas, outshopping still occurs, but not in a uniform manner. Research conducted in Soweto (2004), for example, found that almost half of the expenditure of the poorest households (49 %) occurred within the area. By contrast, 91 % of the retail expenditure of the most affluent households occurred outside Soweto (Ligthelm 2008, p. 38).

Despite the widespread practice of outshopping, it would be incorrect to conclude that the spatial location of supermarkets therefore does not matter. As the Soweto study indicated, purchasing habits are, in part, determined by financial resources. The supermarkets in the wealthier parts of Cape Town are only accessible if households have sufficient resources to get to them. For working household members, the transport cost is a part of the cost of their daily commute. For households without a working member, the cost makes regular supermarket purchases unfeasible.

A distinguishing feature of the South African city is the spatial legacy of apartheid, which systematically located the poorest households furthest from the wealthiest (Fig. 3). Such spatial inequality has meant that low-income households are not only located far from places of potential employment, but also from opportunities to access food from supermarkets. The 2008–9 AFSUN food security baseline survey in Cape Town found that food-secure households purchased food more frequently at supermarkets than food-insecure households (Battersby 2011). This is attributable to the higher incomes of the latter, which makes shopping in bulk at supermarkets possible, and also to the greater physical accessibility of supermarkets to working households.

Location of USave Supermarkets

The expansion of supermarkets into lower-income areas of Cape Town is exemplified by the distribution of Shoprite's USave stores (Fig. 4). Shoprite claims that "the USave

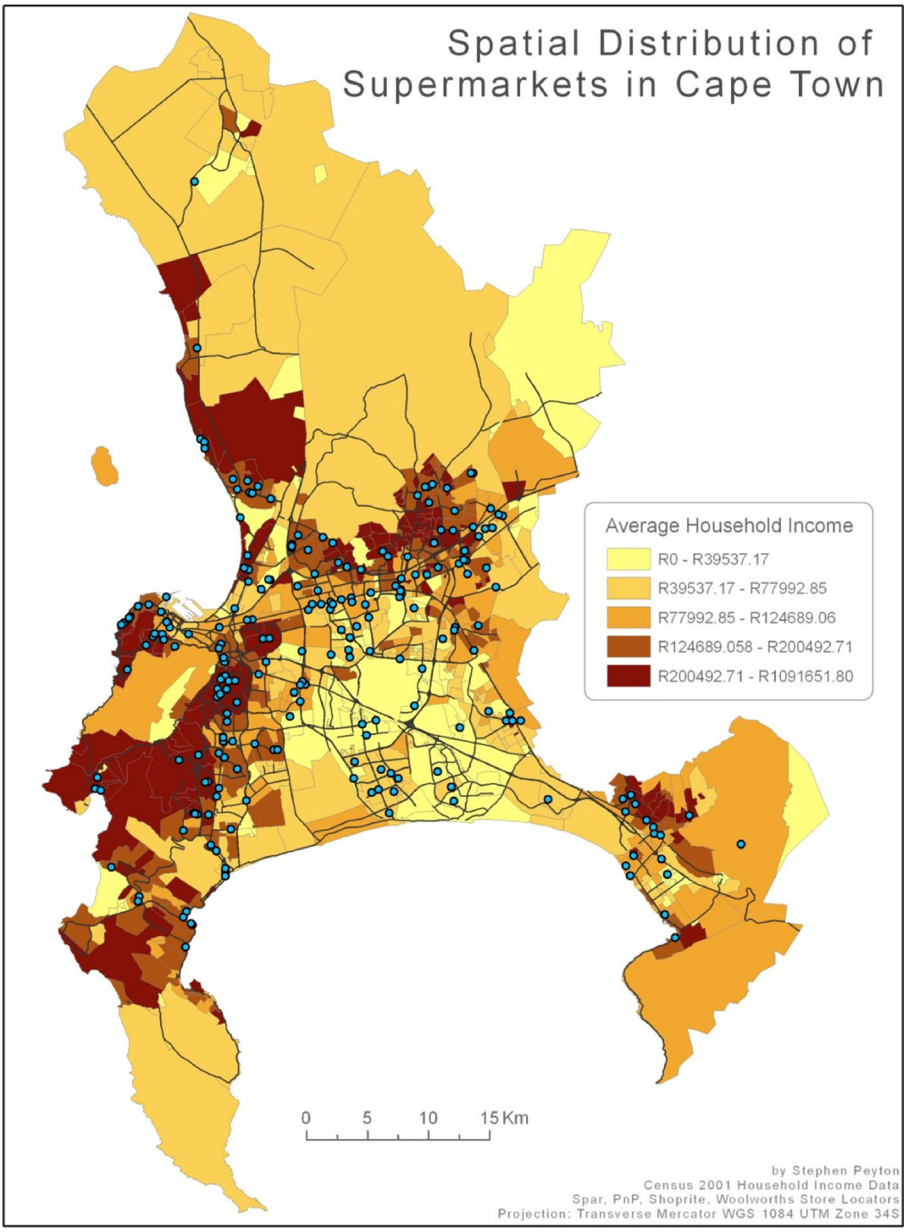

Fig. 3 Spatial distribution of supermarkets in Cape Town

chain's focus is on the lower-income groups. Customers who are serious about saving and do not need the expensive frills and spills of regular shopping centres, are invited to put USave to the test" (www.shopriteholdings.co.za). While these stores are indeed in lower-income areas, they are not in the lowest-income areas of the city (Fig. 5). There are almost 2.5 times as many USave stores per household in the second lowest income quintile sub-places as in the lowest-income quintile sub-places. Even when entering

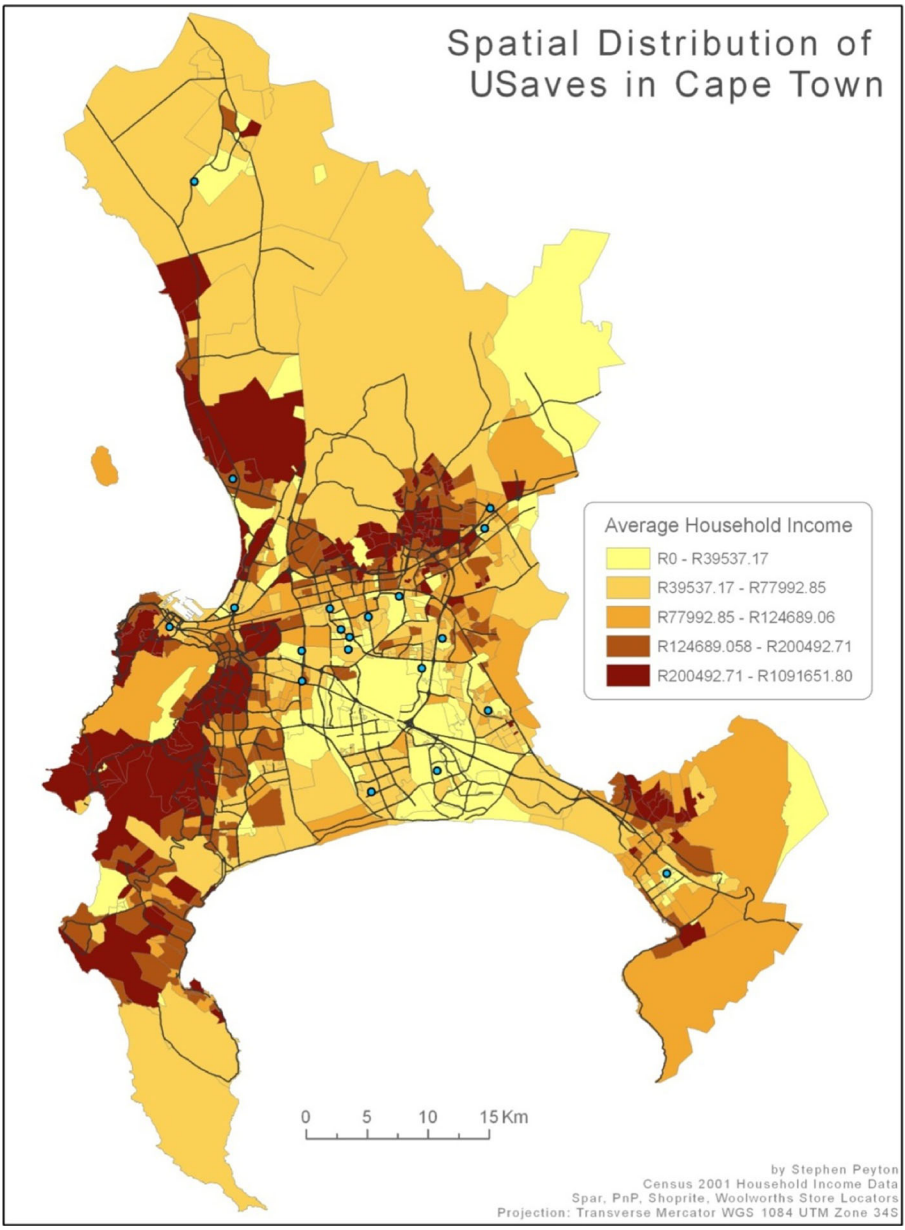

Fig. 4 Spatial distribution of USaves in Cape Town

low-income areas, the supermarkets' locational strategy is, by necessity, based on market efficiency, not social efficiency. The diffusion of supermarkets in its current phase cannot therefore be argued to be bringing low-cost food to the poorest households.

There is also a need to interrogate what foods are being sold in these supermarkets. The alternative format stores, such as USave and Boxer, tend to stock a more limited range of products. In particular, they carry less fresh produce than the full supermarkets

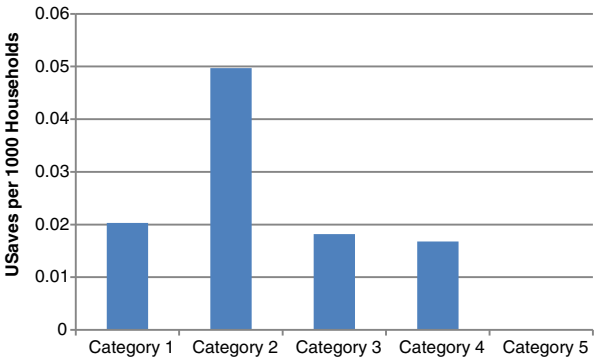

Fig. 5 Number of USave supermarkets by average income of sub-places

in wealthier areas. This distribution and stocking profile reflects the international trend identified by Reardon et al. (2007, p. 407) in which the diffusion of supermarkets is characterised by format diversification and "consumer segment differentiation". Not only are there different spatial waves of diffusion, there are also waves of diffusion by product type. The first wave of product penetration is characterised by processed foods like rice, noodles, edible oils, canned and dried foods. Following this come the semi-processed foods, such as dairy products and meats. The final, and slowest, wave to penetrate the local supermarket sector is fresh produce (Reardon et al. 2007, p. 408). The limited penetration of fresh produce into supermarkets in lower-income areas is in part due to consumers' perceptions of the low relative freshness and quality of the produce compared to traditional vendors (Humphrey 2007, p. 439). It is also the result of a general lack of refrigeration, which means that low-income consumers prefer to buy fresh produce in smaller, more frequent purchases from informal traders (Reardon et al. 2007; Strydom 2011).

The primary outcome of this process is that residents of low-income areas with supermarkets are receiving better access to calorie-dense, nutritionally poor foods rather than fresh produce (Temple and Steyn 2009). Temple et al. (2011, p. 57) compare the prices of six commonly consumed foods with healthier versions of those foods. The healthier foods cost between 10 and 60 % more than the regular foods, based on weight and between 30 and 110 % more based on the cost of food energy. The economies of scale conferred by supermarket supply chains, coupled with their relationships with large food producers, allow supermarkets entering low-income areas to reduce their prices artificially and undercut local retailers. Given the dependence of the urban poor on buying food on credit from local businesses, this process may actually reduce accessibility to affordable, nutritious food for the urban poor.

Conclusion

The food system in South Africa is undergoing a rapid transition. The implications of this for food security, particularly in urban areas, are not well understood. Food policy in South Africa has tended to neglect the impact of the market on food security (Kirsten 2012; Van der Heijden and Vink 2013). Failure to understand the changing structure of the food system and to develop policies and strategies to address its impacts will hinder

the country's ability to realise the constitutional right to food. The data presented in this paper suggest the need for more fine-grained research into the process and outcomes of supermarket expansion in low-income areas, particularly with reference to the locational and stocking strategies of supermarkets, and the pricing mechanisms of supermarkets in relation to products available through other forms of retail.

The distribution of supermarkets in Cape Town reflects the model of supermarket diffusion identified in the international literature. Supermarkets are still overwhelmingly located in wealthier areas of the city but are moving into lower-income areas. Within the international literature, there are speculative statements about what impact supermarket expansion may have on the food security of the poor. However, this literature only speaks in general terms about the location of supermarkets. This paper has mapped the actual spatial location of stores in Cape Town with reference to income characteristics of the areas they are located within and transport routes. The analysis demonstrates that supermarket location is highly stratified according to income. Some residents of lower-income areas are able to access these supermarkets due to their location along public transport commuting routes, but this increased accessibility is not available to all residents of areas lacking supermarkets.

Although Reardon and Minten (2011) suggest that the lower prices offered by supermarkets may improve urban food security, the discussion of the characteristics of the supermarket formats operating in lower-income areas of Cape Town found that this phase of diffusion may only provide better access to less-nutritious processed foods. This will accelerate the nutrition transition in these areas, but not necessarily address food and nutrition insecurity. The increased presence of these stores may actually reduce food security by putting out of business local retailers that had allowed customers to buy food on credit.

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