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Consumer research in Papua New Guinea: Exploring preferences and purchasing behaviours for staple foods in an urban market

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The supermarket expansion throughout emerging economies has caused dramatic shifts in fresh produce markets, impacting consumers and smallholders. As supermarkets begin to compete with open markets in the sale of fresh produce, new market opportunities emerge for smallholders, and new purchasing behaviours emerge for consumers. This research explores how the expansion of large-scale supermarkets is impacting the sale of local fresh produce staples in the largest urban market of an emerging economy. Using an intercept survey (n=353) at open market and supermarket locations throughout Port Moresby, this research found that consumers are motivated by convenience and price and use both supermarkets and open markets depending on what staples they are buying. As the first published data on supermarket consumers in Port Moresby, the results provide a baseline of urban purchasing behaviours in a country where consumer insight is scarce and offer insights to those marketing fresh produce within the context of emerging modern retail.

Key words: Consumer research, open market, Papua New Guinea, supermarket, wet market.

INTRODUCTION

Value chain projects throughout low- and middle-income countries have focused on increasing the commercial production and trade of fresh produce to improve livelihoods (Hainzer et al., 2019). However, expanding the trade of fresh produce requires equivalent increases in consumer demand and market opportunities to accommodate production increases and realise livelihood improvements. A crucial part of increasing consumer demand is a deeper understanding of consumers' behaviours and product preferences to better align preferences with product offering (Badar et al., 2015). However, a deeper understanding of consumers' behaviour is complicated in low- and middle-income countries where staples are sold both in open markets and in a growing number of supermarkets (Iton, 2017). In a collectivist culture such as Papua New Guinea (PNG), where cultural reciprocities can further influence consumers' behaviour in open market shopping, the

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range of influences on consumers' behaviour becomes incredibly diverse.

Shopping is a phenomenon shaped by cultural factors and represents much more than a simple process of utility (Cleveland and Chang, 2009). In urban and rural areas throughout PNG, purchasing locally grown staples such as sweet potato or cooking bananas has traditionally happened exclusively in open markets from one of many small-scale vendors. These marketplaces, often referred to as subsistence marketplaces (Viswanathan and Sreekumar, 2017), provide spaces where consumers and vendors can meet and interact (Hukula, 2019). Over time these spaces have become important places not only for commerce, but also play a key role in social interactions (Busse and Sharp, 2019) and cultural identity. In contrast, a growing supermarket expansion is combining with a long-established network of smaller, cornerstone-style supermarkets (Abe et al., 2009) and growing their market share of products formerly sold at open markets. This is particularly evident in the urban centre of the PNG capital, Port Moresby. As supermarkets increase their presence, research into the impact on fresh produce markets in other low and middle-income countries find consumers facing a convergence of cultural and convenience factors as they balance shopping between open markets and supermarkets (Johns et al., 2017). Research has shown that consumers in Fiji, Thailand, and Brazil use supermarkets but continue to use open markets to purchase fresh produce; while in Hong Kong, Malaysia and Vietnam, widespread adoption of supermarkets saw their share of the fresh produce market grow rapidly (Johns et al., 2017). Large scale supermarkets have been increasing their presence throughout Port Moresby since the early 2000s, and smaller scale stores have been established for decades (Barbara et al., 2015; Hukula, 2019). There is a lack of research, however, into the consumers' behaviours of using small and large supermarkets and how consumers purchase fresh produce within this rapidly changing retail landscape.

The increasing presence of supermarkets also increases the availability of imported and refined staple foods such as rice and noodles. In other Pacific Islands, an increase in the availability of convenience foods has transformed consumers' preferences from traditional whole food staples to largely imported refined staples (Hughes, 2003). These changes have contributed to the increasing burden of diet-related non-communicable diseases in Fiji (Thow et al., 2011) and Samoa (Seiden et al., 2012). Consumer research conducted in the open markets of the PNG capital Port Moresby found that rice was the preferred staple among open market consumers, predominantly due to convenience; sweet potato was second preferred due predominantly to taste (Chang et al., 2017). While there is a dearth of published data on supermarket consumers in PNG, it is hypothesised that larger style supermarkets have become a dominant presence in the market for non-perishable staples like rice. It is further hypothesised that periodic devaluations of the national currency Kina combined with the price related shocks from Covid-19 have maintained an affordability and therefore preference for locally grown staples like sweet potato, taro or cassava. In addition to changes in diets and the retail landscape for staple foods, there is a growing middle-class consumer segment in Port Moresby who are predicted to have different consumption habits when compared with previous generations (Barbara et al., 2015).

The emergence of retail centres with large hypermarkets, combined with rising incomes in Port Moresby, is creating new spaces where a growing middle class can participate in shopping as a leisure activity (Barbara et al., 2015). This expanding consumer class is driven by non-price factors such as shopping experience and indicates a dynamic shift in consumers' behaviour and continued growth in the supermarket segment (Tandon et al., 2011). Research in PNG has shown that this middle class will have a more global outlook in consumers' tastes than that of previous generations (Barbara et al., 2015). This research potentially signals a shift in preferences away from traditional whole foods staples like sweet potato or cassava, which would have impact on those producing and marketing local fresh produce. Although Covid-19 related shocks have reduced urban incomes by up to 16% in Port Moresby, potentially delaying further middle-class growth (Diao et al., 2021), the increasing availability of supermarkets continues to create new potential market channels for fresh produce staples in Port Moresby. However, knowledge gaps exist in the purchasing behaviours of urban consumers using supermarkets to buy staples. Furthermore, it is not understood how consumers are changing their preferences for staple foods in this context. These knowledge gaps make it difficult to assess how the expansion of supermarkets will change the retail landscape of fresh produce and how this will impact smallholder producers who market their fresh produce in the urban markets of Port Moresby.

With the retail options for staples undergoing a dynamic shift in Port Moresby, thereby providing urban consumers with greater availability and convenience, research is required to provide new insights to those marketing fresh produce within the context of emerging modern retail. Therefore, the purpose of this research is to determine how the expansion of supermarkets is impacting the purchasing preferences and consumption behaviours for staple foods using the following research questions:

RQ1: What are the preferred staple foods of urban consumers?
RQ2: What are the purchasing behaviours of urban consumers for preferred staples?
RQ3: What factors influence purchasing behaviours?

This research forms part of a larger multi-faceted, five-year project supporting commercial sweet potato production in PNG. Integral to this project is exploring potential market opportunities and market channels for sweet potato. Guided by the goals of the larger project and the knowledge gaps on supermarket consumers in PNG, this research used a rapid consumer intercept survey at open market and supermarket locations throughout the capital of Port Moresby to better understand the purchasing behaviours for preferred staple foods, and provide insights to inform fresh produce marketing in the largest urban market of PNG.

URBAN DIETS AND URBAN RETAILING IN PORT PORT MORESBY

Although reliable national statistics are lacking in PNG, seminal studies provide a characterisation of diets and consumption of staples in urban and rural areas of PNG. The following is a history of urban diets and the urban retail landscape in the capital of Port Moresby, where this research was conducted.

Urban diets in Port Moresby

Research into supermarket expansion and dietary change in Pacific Nations typically reveals a widespread dietary transition from locally grown whole foods to largely imported refined grains (Thow et al., 2011; Hughes, 2003). The reality, however, is much more nuanced with considerable differences in dietary behaviours between urban and rural populations (Hughes, 2003). As a largely agrarian nation, locally grown roots and tubers such as sweet potato, taro and cassava provide the major energy source for rural populations in PNG (Gibson, 2001b). In contrast, as early as the 1960s, the urban diets of residents in Port Moresby contained a much greater proportion of rice and flour than local roots and tubers (Joughin and Kalit, 1988; Hughes, 2003) with obesity far more prevalent amongst urban populations in PNG (Hughes, 2003).

By 1975, urban diets in Port Moresby were dominated by imported refined grains. Households were receiving three times as much energy from rice as they did from domestic staples, and rice consumption per capita was on the rise (Joughin and Kalit, 1988). By 1996, urban rice consumption averaged 66 kg of rice per person annually (Gibson, 2001a). A devaluation of the Kina in 1994 and again in 1998 saw the cost of the predominately imported rice increase significantly, making local fresh produce relatively more affordable (Mellor, 2010; Sharp, 2021). Consequently, research from 2009/2010 found urban households were consuming 59.2 kg per person annually, down from its peak in 1996 (Schmidt et al., 2021). Covid-19 related shocks in 2020/2021 have seen the price of rice increased by 30%, and urban incomes reduced by 15%; thus household rice consumption has reduced by almost 20% (Schmidt et al., 2021). Prior to Covid-19 related shocks, authors had proposed that the growth in rice consumption in Port Moresby had plateaued (Bourke and Harwood, 2009; Gibson, 2019). Irrespective of consumption rates, rice remains a largely imported staple and is an ongoing contentious issue within PNG agricultural (Gibson, 2019) and dietary (Vengiau, 2020) discourses.

In terms of the consumption of local fresh produce, it was calculated that urban consumers prior to 1996 received 50% of total food energy from locally grown food (Gibson, 2001b). After 1996, with the growth in rice consumption reaching a plateau and the cost of rice increasing with the devaluation of the Kina (Bourke and Harwood, 2009), an increase in local root crop consumption was observed throughout PNG. This trend continued until 2006 (although disaggregated data between urban and rural populations were not calculated in the study). Covid-19 related shocks have also impacted fresh produce trade in urban markets. Data from 2020 show a reduction in the volume of fresh produce shipments into Port Moresby from 1,220 tonnes per week in January to 150 tonnes per week in May (Davila et al., 2021). This has increased the cost of some fresh produce staples and has reduced the incomes of those selling at urban markets or small stores (Davila et al., 2021). Modelling of impacts from Covid-19 indicates decreasing urban incomes from reduced economic activity and a related decrease in urban calorie consumption of up to 20% (Diao et al., 2021). This modelling suggests a decrease in the consumption of fresh produce.

Urban retailing for staple foods in Port Moresby

The landscape of urban retailing for staples in Port Moresby is incredibly diverse. Historically, a division of offering has meant local fresh produce staples like sweet potato, cassava, taro and yams are sold in open-air markets of various sizes located throughout the city. These markets are often unregulated, lacking security or toilets, which results in many marketplaces being unsafe for women who depend on these markets for a livelihood (Hukula, 2019). Predominately female vendors sell fresh produce in small piles for a fixed Kina price.

In comparison, the sale of rice and other perishable staples like instant noodles or wheat flour happens almost exclusively at small cornerstone-style supermarkets and in Western-styled supermarkets. The smaller "supermarkets" occupy a huge diversity of sizes and structures (Hukula, 2019) and are often located near fresh produce markets or on the fringes of migrant settlements throughout the capital. Large, Western-style supermarkets are expanding in number and increasingly provide a place of leisure or recreation, whereas smaller, local supermarkets provide a more utility-focused shopping experience (Barbara et al., 2015).

Although the division of offering meant fresh produce marketplaces focused initially on the sale of fresh local produce, urban markets now offer a growing range of "store goods", which includes items like rice, confectionery, cigarettes and mobile phone credit (Sharp, 2021). Rice is now sold in small 1 to 2 kg bags, but as a relatively new option, most consumers still buy fresh produce from open markets and perishable staples from either small or large supermarkets.

The urban retail markets for staples play a dominant role in the economic activity of Port Moresby and are currently undergoing a rapid transformation. Smallholders focus on Port Moresby as this city is three times larger than Lae (the next largest city). Port Moresby is also serviced through a relatively functional transportation network that connects the production regions in the highlands (and some lowlands provinces) to the capital (Bourke and Harwood, 2009). This research explores the preferred staples and the purchasing behaviours of consumers for locally grown fresh produce staples and a perishable staple rice to better understand purchasing behaviours within a context of rapidly emerging larger Western-style supermarkets. Findings will give more detailed market strategies for sweet potato smallholders from the highlands and to explore what opportunities may exist within expanding modern retail.

RESEARCH METHODOLOGY

This research used an intercept survey to explore the preferred staples of urban consumers and the purchasing behaviours of consumers for staple foods. Consumer intercept is a marketing research survey that targets users or purchasers of a product at the location of purchase (Green, 1988). The survey started with a verbal confirmation that the interviewee consented to the survey and consented to the answers being used anonymously for research. Ethical approval was granted through Central Queensland University's Human Research Ethics Committee (#0000022666) before the commencement of research.

Survey questions were split into two sections and were designed with input from the PNG and Australian team, guided by the only published study on consumer behaviours in PNG (Chang et al., 2017). A screening question preceding the survey was used to confirm that the respondent was responsible for buying staples. Our rapid consumer survey aimed to provide an updated understanding of urban purchasing behaviours in both open markets and supermarkets. Therefore, our survey used the same approach as Chang et al. (2017) from their open market research conducted in 2013, but expanded sampling beyond open markets to include supermarket consumers. Our survey began with a socio-demographic component where consumers were asked their gender, age, weekly income and education level.

Section two explored how consumers purchase their preferred staples. Preferences for staples used the same eight categories from Chang et al. (2017) and included sweet potato, potato, taro, yam, banana, cassava, rice and sago. Consumers were asked to choose which staple was most preferred in their household. Section two also explored the purchasing behaviours of preferred stapes. A question on where staples are purchased included four categories (small and large open markets and small and large supermarkets). Small supermarkets included small corner style supermarkets and included the small house front stores which are increasing in number in Port Moresby (Hukula, 2019). A final question explored the main reason behind choosing a shopping location. The options available explored pragmatic reasons such as convenience, quality, cheap prices, large range, safety, and habit, but also introduced socio-cultural reasons which included “my friends or Wantok shop here” and “my Wantok is a seller here”. The Wantok system is a deeply embedded social system whose basis can be ethnicity, linguistic, geographic or tribal and directs much of the social interactions in PNG society (Nanau, 2011). Although most respondents understood the word convenience due to the widespread use of English in schools and workplaces, there is no direct translation into Tok Pisin. When not understood, enumerators explained convenience as meaning a location that is nearest, easy to access and accessible using a car or bus.

The survey was conducted by the in-country project leader from the National Agricultural Research Institute (NARI) and a team of four enumerators. Pretesting occurred during the 11-12th of February 2021, and the wording of two questions was simplified for clarity. Data collection occurred between the 16 and 25th of February 2021, and a total of 353 consumers were surveyed with 192 consumers surveyed in open markets and 161 surveyed in supermarkets. The selection of survey locations was guided by the expertise of project partners of the Fresh Produce Development Agency (FPDA) and NARI, who have been engaging with local markets and producers throughout PNG for decades. The team travelled to different open market and supermarket locations in Port Moresby to conduct intercept surveys one on one with consumers. Surveying at open markets happened at Gordon's and Koki. Supermarket locations (RH Gordon's and RH Vision City) were contacted prior to sampling to obtain permission to conduct research in their supermarkets. Surveying occurred between 9 am and 2 pm each day. Convenient sampling at each location was used to recruit participants who volunteered their time without incentive. A digital survey instrument (Commcare v2.0) was used to collect data. Commcare is a mobile, web-based survey instrument where completed surveys are sent from the mobile collection device to a central online repository, which ensures the security of data.

The data set was analyzed using univariate descriptive statistics and Chi-square tests for association using information processing software (SPSS v26.0, IBM 2020). Univariate descriptive statistics were used to explore frequencies and to provide an overview of the data set. Bivariate associations were used to explore whether demographic variables were associated with where consumers shop and their purchasing behaviours when buying staples. Chi-square tests of independence were used to determine associations between variables and to answer the research questions. Associations satisfied expected cell counts except for analyses on preferred staples where the expected cells count for many preferred staples were less than five, and as the total number of cells below five was greater than 20% of the total data set (Yates et al., 1999), fresh produce staples were collapsed into three groups (sweet potato, banana and other roots) to conduct associations.

RESULTS

A demographic overview of open market and

Table 1. A summary of socio-demographic data for respondents in open markets (n=192) and supermarkets (n=161).

Variable	Open market	Supermarket	Significance*
Age (years ±std)	26±2.1	27±2.2	No Assoc (*p* = 0.329)
Education level (%)			
College or above	20	54	Assoc (*p* = 0.000)
Secondary	37	37	
Primary or below	43	9	
Monthly Income (%)			
401 kina or more	23	37	Assoc (*p* = 0.008)
201-400 kina	24	27	
200 or less	53	36	
Gender (%)			
Female	62	53	No Assoc (*p* = 0.082)
Male	38	47	

*Chi-squared level of significance p<0.05.

supermarket respondents is shown here. It then explores the preferred staples and the purchasing behaviours of consumers for staple foods.

Demographic overview of open market and supermarket consumers

A typical open market respondent was 26 years old, likely to be female and have received a secondary education or below, making less than 200 kina (USD $57) a month. A survey of open market consumers in 2013 also found consumers are typically female, have an average age around 28, and likely completed a secondary education or less (Chang et al., 2017). Education is free in PNG, but the gross primary enrolment rate is about 72%, and those from lower socio-demographic backgrounds and particularly females, are less likely to attend school or complete more than a primary education (Packer et al., 2009).

In comparison, supermarket consumers are likely to be about the same age (27 years old), are no more likely to be male or female but have higher incomes (above 200 kina (USD $57) per month) and are educated at least to a secondary level or have likely attended college. Although income inequality is rising in PNG, rising incomes are also giving way to expanding middle class who are using supermarkets as a leisure activity (Barbara et al., 2015). A summary of the socio-demographic characteristics of the consumers in each location is shown in Table 1.

Chi-square tests for association were conducted between where the survey was conducted (open market or supermarkets) and age, education level, monthly income and gender. There was a moderate level ($\varphi c = 0.3449$, $p = 0.000$) of statistically significant association between shopping location (open market or supermarket) and education level, $\chi^2(1) = 71.212$, $p = 0.000$. There was also a moderate to weak level ($\varphi c = 0.198$, $p = 0.008$) of statistically significant association between where the survey took place and income level, $\chi^2(1) = 13.660$, $p = 0.008$. There were no statistically significant associations between survey location and age ($\chi^2(1) = 10.268$, $p = 0.329$) or gender ($\chi^2(1) = 3.028$, $p = 0.082$).

What are the preferred staples?

Preferred staples are presented in Figure 1 and indicate a similar preference between consumers in open markets (n=192) and supermarkets (n=161). Sweet potato is the preferred staple for open market consumers (42%), followed by rice (34%), banana (17%) and other roots and tubers (7%). The only previous study of open market consumers in Port Moresby in 2013 found that rice (55%) was the preferred staple, followed by sweet potato (40%), banana (3%) and other root and tuber crops (2%) (Chang et al., 2017). This indicates an increased preference for sweet potato over the previous eight years, and further increases in the preference for cooking bananas and other roots and tubers. An increased preference for whole foods and fresh produce is contrary to other studies in Pacific nations that have seen a decrease in the consumption of traditional whole food staples (Johns et al., 2017). One possible explanation is the impact of

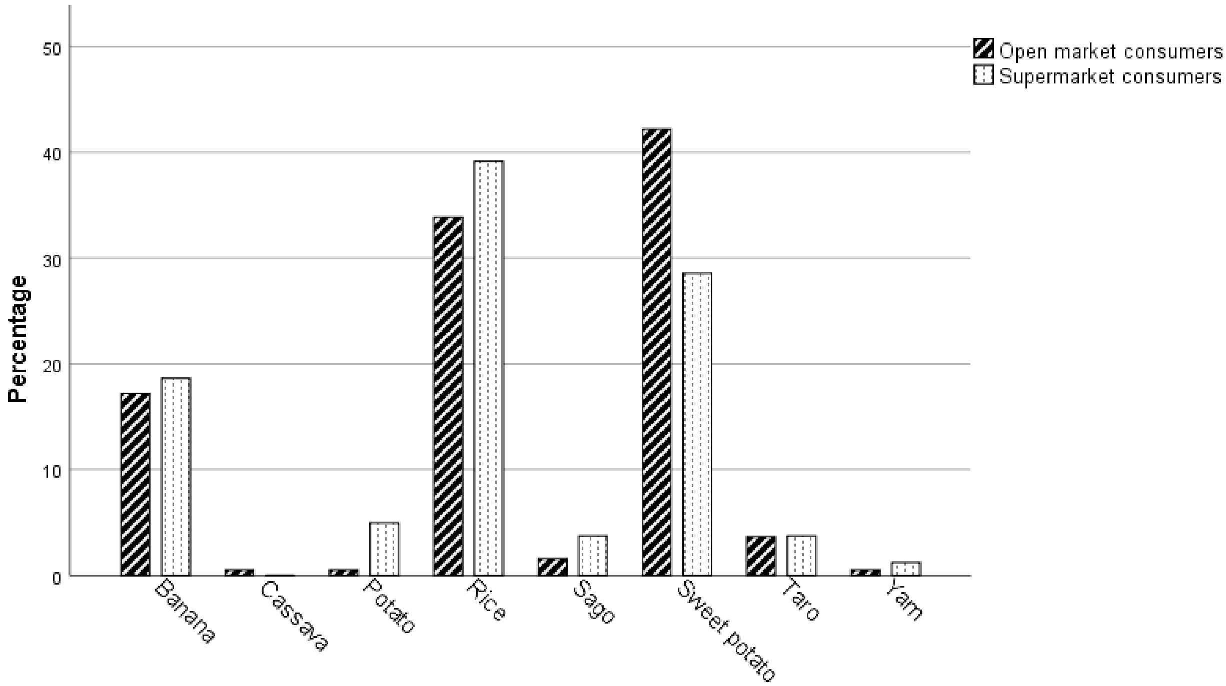

Figure 1. The preferred staples of open market (n=192) and supermarket (n=161) consumers.

Covid-19 on urban livelihoods as modelled research projects urban incomes to decline by 10% due to lower economic activity and the cost of imported rice to increase by 30% (Diao et al., 2021). Lower urban incomes and higher rice prices could indicate a renewed preference for the often cheaper, locally grown fresh produce staples.

The preferred staple for supermarket consumers was rice (39%), followed by sweet potato (29%) and bananas (19%). Although there are no data available on the product preferences of supermarket consumers in PNG, a preference for rice is in line with the history of urban diets in Port Moresby (Gibson, 2001b) and aligns with dietary composition found in other Pacific nations that are also experiencing an increased presence of supermarkets (Johns et al., 2017). No associations were found between preferences for staples (rice and fresh produce) among open market and supermarket consumers. Both groups of consumers had similar preferences and were not significantly different (p = 0.304).

Purchasing behaviours for staple foods

Purchasing behaviours explored where consumers bought preferred staples and the reasons why consumers purchase staples at different outlets. Our research found an association (p = 0.000) between the choice of outlet and whether a consumer was buying rice or buying fresh produce. Consumers bought rice predominately in supermarkets and fresh produce predominately in open markets, with over 90% of all surveyed consumers continuing to use both supermarkets and open markets. When exploring why consumers choose an outlet, over 80% of consumers are driven by the same factors (convenience, followed by price), with no significant associations found when choosing an outlet for purchasing staples for supermarket or open market consumers.

Where do consumers purchase staples?

There was a clear distinction between where rice and fresh produce is purchased. Figure 2 demonstrates that rice is purchased almost exclusively at large supermarkets (40%) or small local supermarkets (56%). Small local supermarkets in the PNG are akin to a medium or large-sized corner store and will have three or more aisles of groceries and a small fresh produce section, but also include the very small outlets of trade stores or house-front stores. Large supermarkets are modelled on the western-style supermarkets and feature many grocery aisles and a large fresh produce section. In contrast to rice, fresh produce is purchased almost

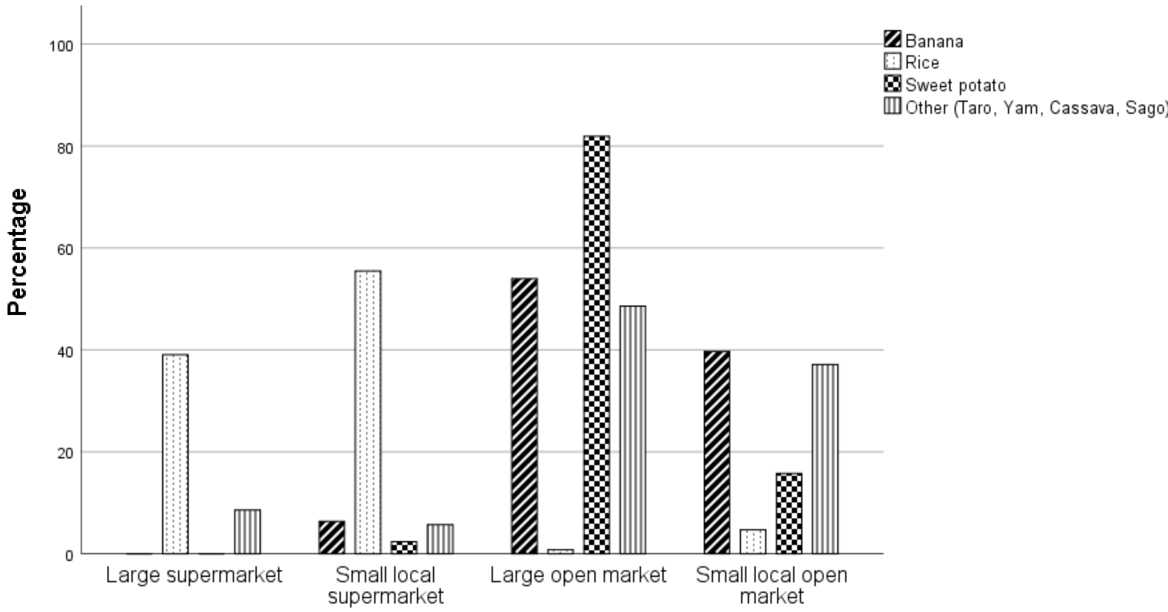

Figure 2. Where consumers purchase staples (*n*=353).

exclusively in either small (26%) or large (70%) open markets. Both small and large open markets have fresh produce sellers who sell produce in small piles. As in many emerging economies, these markets are outdoors, poorly maintained and controlled, and are often dirty and unhygienic (Chang et al., 2017). This continuum of retail markets in low- and middle-income countries is well established in the literature (Reardon et al., 2009). There was a moderate level ($\varphi c = 0.349$, $p = 0.000$) of statistically significant association between where a consumer bought rice or fresh produce, $\chi^2(1) = 42.998$, $p = 0.000$.

Consumers in Port Moresby continue to use both open markets and supermarkets, depending on what they are buying. This "cross-platform" consumer has been found in other countries where shopping in open markets is a cultural norm (Si et al., 2019), and research has shown that open markets can compete concurrently with supermarkets in these markets, at least in the initial stages of supermarket expansion. Figure 3 shows that over 90% of consumers use both locations, with only 4% of supermarket consumers just using supermarkets.

Why a consumer chooses to purchase in either a supermarket or open market?

The reasons for choosing where to purchase staples were the same amongst consumers, irrespective of what was being purchased. Convenience and cheap prices are the primary reasons for buying rice and fresh produce for over 80% of all consumers. When buying fresh produce, convenience (56%), price (25%), and then quality (9%) were the main reasons for choosing where to buy. Socio-cultural factors, like shopping "where my Wantok sells" (1%) or "where my Wantok or friends do" (0.4%) have little influence on where customers choose to buy fresh produce. Rice follows a similar pattern and is bought in small and large supermarkets predominately because of convenience (56%), cheap prices (24%) and safety (7%). For context, rice in supermarkets costs between 4 and 6 kina (USD $1.10 – $1.50) for a 1 kg bag and about the same price for a 1 kg bag when it is available in open markets. The price of fresh produce varies, but a pile of five medium-sized sweet potatoes costs 5 kina (USD $1.40) and weighs about 1 kilo. In the supermarkets, a kilogram of sweet potato costs up to 5 kina (USD $1.40). There was no statistically significant association between why a consumer chooses to buy staples in a particular location, $\chi^2(1) = 5.848$, $p = 0.119$, with both groups of consumers driven by similar motivations (Figure 4).

In 2013, open market consumers chose availability (30%) and price (20%) when buying rice, and taste (40%) and availability (20%) for choosing fresh produce (Chang et al., 2017). The lack of influence from cultural norms and a continued increase in convenience-driven consumers will likely impact the growth of supermarkets, as the prioritisation of non-price factors such as convenience and safety have been linked to rapid supermarket growth (Tandon et al., 2011).

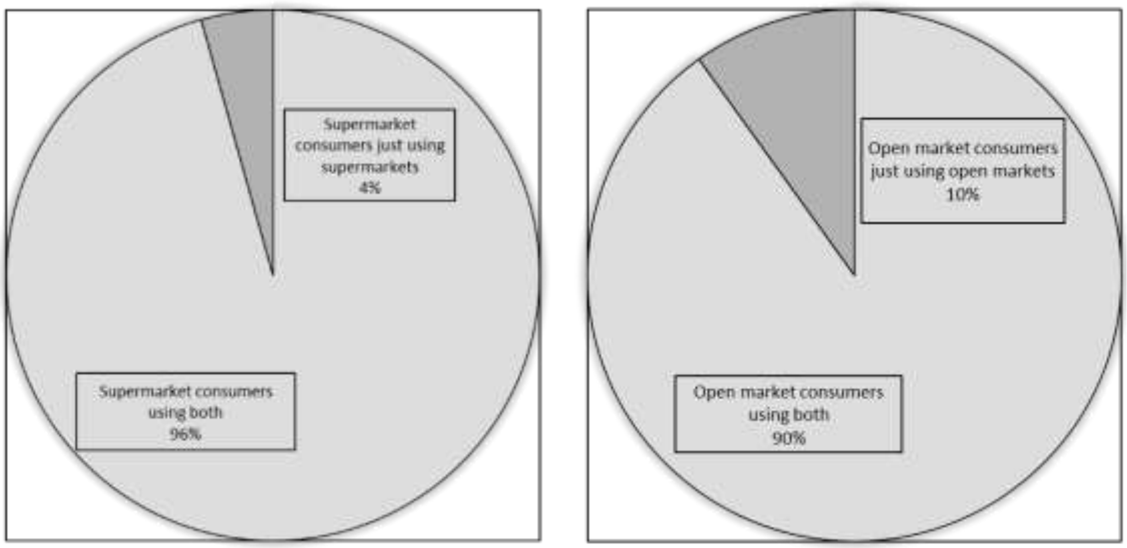

Figure 3. The proportion of open market (n=192) and supermarket (n=161) consumers who just use one outlet compared to those who use both.

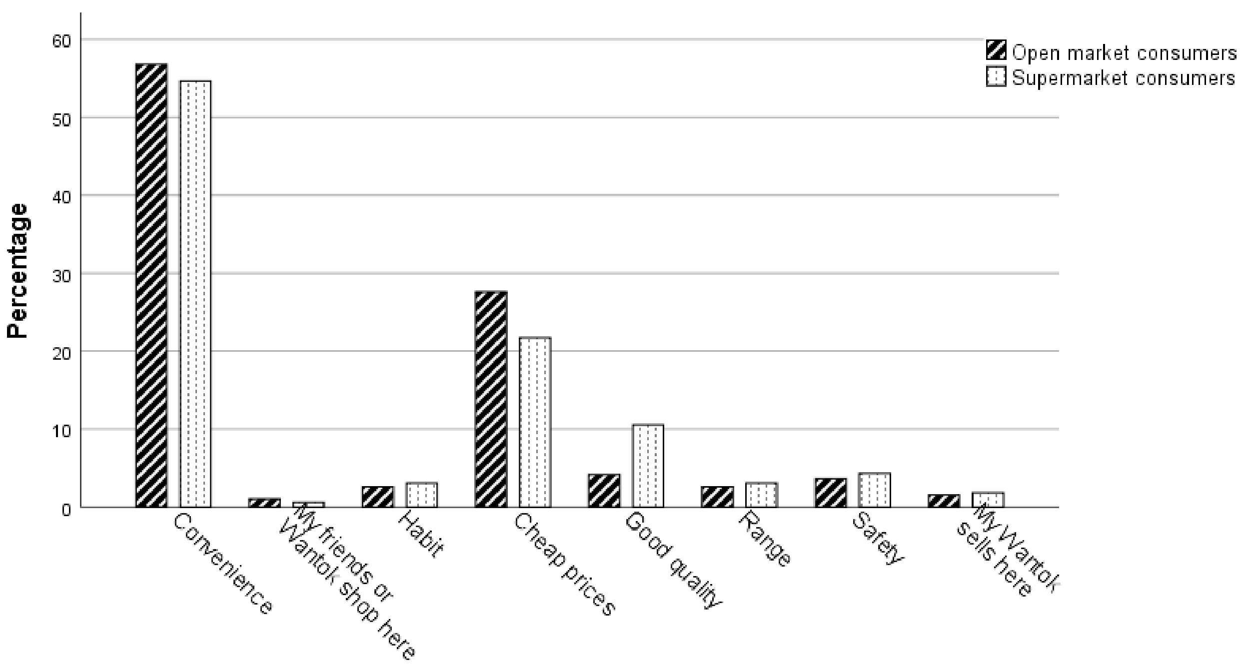

Figure 4. Reasons why open market (n=192) and supermarket (n=161) consumers choose to buy staples at a location.

DISCUSSION

This research aimed to provide an updated understanding of urban purchasing behaviours of preferred staple foods in Port Moresby. Traditionally, retailing in Port Moresby saw fresh produce being sold in open markets and largely imported perishable staples like rice being sold in smaller supermarkets akin to small corner stores. However, Port Moresby is experiencing a similar trajectory to many other low- and middle-income countries where a growing availability of larger Western-style supermarkets is rapidly changing the retail landscape for locally produced fresh produce staples and imported staples such as rice and noodles. We discuss how consumer preferences captured in Port Moresby indicate a rapidly developing supermarket sector. We also explore how an improving fresh produce offering from supermarkets is combining with a greater desire for convenience by consumers, and how these factors impact the market for fresh produce.

Consumers are cross-platform and choose a store depending on what they are buying, for now

This research found that few consumers exclusively shop at either open markets or supermarkets. In Port Moresby, 92% of all surveyed consumers use supermarkets, and 94% also use open markets and decide on an outlet, or retail platform, based on whether they are buying rice or fresh produce. Consumers continue to use both locations, and this cross-platform consumer has been found throughout lower- and middle-income countries as the emergence of supermarkets coincides with a continuing legacy of purchasing fresh produce in open markets (Si et al., 2019). This cross-platform consumer has also been found in Taiwan (Li and Houston, 2001) and Mexico (Anand, 2009), where open markets are still the preferred choice for buying fresh produce even as supermarkets continue to increase their market share of other grocery categories. In Fiji, where supermarkets have had a presence since the early 2000s, 97% of consumers still use open markets (Johns et al., 2017), suggesting that the open markets of Port Moresby can compete with supermarkets in the fresh produce category.

However, longer-term studies into the expansion of supermarkets have shown that while open markets can initially hold on to their market share of fresh produce categories (Minten and Reardon, 2008), they start to lose market share once supermarkets better align product offering and become more efficient (Reardon and Timmer, 2007). Thus, although consumers in Port Moresby may now continue to be cross-platform, subsequently, we discuss how an increase in convenience-driven consumers and an improved offering by supermarkets will likely erode the market share of fresh produce sold in open markets. This phenomenon has also been observed in other low- and middle-income countries (Tandon et al., 2011).

Consumers are convenience-driven, and supermarkets are improving their offering, a worrying combination for fresh produce sales in open markets

This research found no association between why people use supermarkets or open markets, and instead, it found that consumers at both locations have the same preferences for choosing where they buy, which is predominantly convenience, followed by price. Furthermore, social factors in the collectivist culture of PNG influence less than 10% of consumers when choosing where to shop. This absence of cultural or social factors and a dominance of convenience and price is contrary to ideas of collectivist marketplaces (Chikweche and Fletcher, 2010) but does align with an observed trajectory of supermarket expansion into other low- and middle-income countries. After multiple waves of supermarket expansion into low- and middle-income countries, the literature identifies a three-stage trajectory, which concludes with open markets losing significant market share of fresh produce sales (Reardon et al., 2009). In this trajectory, supermarkets first emerge serving wealthier consumers and focus on high-end products before competing with smaller local stores for processed staples, like rice. The final stage is a move into the fresh produce category, where the product offers better aligns with consumer demand and preferences for convenience diminishes cross-platform shopping.

Although larger Western-style supermarkets are still a relatively new option in PNG, our research showed that 40% of consumers already purchase rice in large supermarkets, indicating supermarkets are already into the second phase of the expansion trajectory. However, the current product offering in the few hypermarkets of Port Moresby indicates retailers are already making a play for fresh produce markets, potentially signalling that supermarket expansion is reaching its final stage. As was found in Hong Kong and Thailand (Reardon et al., 2009), where supermarkets mimicked the offering of open markets and expanded it further by offering premium fresh produce (which included hydroponic, organic and pesticide-free options), hypermarkets in Port Moresby are increasing their offering of imported premium fresh produce from neighbouring countries such as Australia. There is also an increased offering of pre-packaged hydroponic produce grown in Port Moresby by international private investors (Vari, 2018).

This research found that consumers in Port Moresby continue to be cross-platform and are required to shop more frequently at open markets for fresh produce due to the perishability of fresh produce and often inferior quality of fresh produce available at supermarkets. However, as supermarkets rapidly improve their fresh produce section in Port Moresby, and more consumers are motivated by convenience, it could mark a worrying trend for the market share of fresh produce sold in open markets and signal market opportunities in supermarkets. Although further research is needed to understand better the ongoing demand for higher quality and greater convenience fresh produce, research in other low- and middle-income countries found that high growth in supermarkets also saw higher growth in the sale of pre-packaged fresh produce, suggesting that supermarket expansion is the fastest where the demand for increased convenience is growing most rapidly (Tandon et al., 2011).

Supermarkets are not just for the rich, open markets are not just for the poor, but non-price factors are rising

This research found that higher levels of education and a higher income are associated with choosing to shop in a supermarket. Income has also been shown to influence the choice to use supermarkets in Thailand (Gorton et al., 2011) and Taiwan (Li and Houston, 2001), where a majority of consumers in both countries still use open markets for fresh produce. As with consumers in Thailand and Taiwan, urban consumers in Port Moresby are cross-platform, and supermarkets are not just used by those with higher incomes but are used by almost all respondents irrespective of income level.

Income may indicate a preference for a location, but open markets are still a preferred location for fresh produce as they have the advantage of selling fresher produce at the same or lower price as supermarkets. In most low-and middle-income countries, the lack of supply systems means supermarkets compete with open market vendors in the same wholesale markets for fresh produce but incur greater costs as supermarkets are required to sort and grade it for sale (Tandon et al., 2011). The lack of supply systems in PNG results in supermarkets selling the same produce as open markets vendors for a higher price and at a lower quality due to multiple handlings, which likely creates incentives for some consumers to continue using open markets.

Although price-based elements may continue to influence poorer consumers, research has shown that as middle-class segments and incomes grow, non-price elements will start to influence consumers' preferences (Tandon et al., 2011). Our research found that safety was the third reason behind price and convenience for choosing to shop in a supermarket, and the emergence of non-price elements like safety could indicate a shift away from open markets. Although open markets are cheap, they are often unhygienic and chaotic places to shop despite repeated and ongoing efforts to improve security and facilities at these important places of commerce and social interactions (Craig and Porter, 2017). As incomes rise, research in low- and middle-income markets shows that consumers start to be motivated by non-price factors such as shopping experience, including safety (Tandon et al., 2011). With supermarkets in Port Moresby continuing to improve their fresh produce offering and consumers starting to place a greater influence on non-price factors like convenience and safety, this will likely impact the share of fresh produce sold in open markets, which struggle to compete with supermarkets on non-price factors.

Preferences for staples continue to favour traditional whole food staples and rice, but Covid-19 will impact incomes and total calorie consumption

With the increasing availability of supermarkets modifying the mix of staples in many emerging markets, we found that consumers in Port Moresby prefer a similar mix of staples which was not significantly different based on survey location and aligned with the history of urban consumption in the capital (Chang et al., 2017; Mellor, 2010). Rice and sweet potato are the preferred staples for over 65% of both open market and supermarket consumers. Although income associates with shopping location, with higher incomes preferring to shop at supermarkets, income does not associate with a preferred staple.

Although preferences have remained similar for urban consumers, research into the food shocks resulting from the Covid-19 pandemic has shown a likely decrease in the consumption of fresh produce and refined staples. With urban incomes projected to decrease by about 10%, and with the cost of rice increasing in producing countries like Thailand and Vietnam, rice consumption is expected to decline in Port Moresby (Diao et al., 2021; Schmidt et al., 2021). The availability of fresh produce has reduced in Port Moresby due to decreased shipments of fresh produce from the Highlands. The fresh produce that is available remains affordable because it is locally produced, yet estimates predict a decrease of up to 20% in total calorie consumption of urban consumers due to income losses which will decrease the quantity of fresh produce consumed (Diao et al., 2021; Schmidt et al., 2021) impacting those marketing fresh produce into Port Moresby.

Conclusion

This research used the preferences for staple foods and their associated purchasing behaviours to explore how the expansion of large-scale supermarkets is impacting the sale of local fresh produce staples that have traditionally been purchased from open markets. This research aimed to provide an updated understanding of urban purchasing behaviours of preferred staples to inform more detailed market strategies for smallholders from the highlands that produce and market sweet potato.

This research found that consumers in the PNG capital of Port Moresby continue cross-platform shopping and choose a retail location depending on what they are buying. Fresh produce sales continue to be dominated by open markets; however, rice sales are now split between larger Western-style supermarkets, which are the preferred location for 40% of consumers, and smaller supermarkets which continue to be the preferred location for the remaining 60% of consumers. A similar continuation of cross-platform shopping has been found in other low- and middle-income countries in the initial stages of supermarket expansion. However, there are some indications that the supermarket expansion in Port Moresby has progressed beyond the initial stages. Further research is needed to better understand this ongoing expansion and its impact on cross-platform shopping.

This research also found that consumers at open markets and supermarkets are driven by price and convenience, and non-price factors such as safety are starting to influence store choice. Furthermore, social factors that align with the collectivist identity in PNG were not found to be influential in the decision of store choice. These findings of a growing group of consumers driven by non-price factors such as convenience and safety, combined with the larger Western-style supermarkets improving their fresh produce category, indicate the continued growth of fresh produce sales in supermarkets, likely at the expense of the market share of fresh produce sold in open markets. A limitation of this research is that its purpose was to provide a rapid assessment of purchasing behaviours and consumer preferences. Although captured responses indicate that cultural factors don’t play a major role in choosing a shopping outlet, these often-subconscious motivations need to be further explored through qualitative methods.

Preferences for staples are similar amongst consumers throughout Port Moresby, with locally grown fresh produce staples remaining a part of diets and rice continuing to be a major part of urban diets. Although this research has identified a continued preference for fresh produce staples, further research is needed to better explore the proportion of different staples consumed in urban diets and how increasing urbanisation and changes in the socio-economic status of consumers will continue to influence the consumption of available staples. Furthermore with research into food shocks from Covid-19 projecting a decrease in the consumption of rice and fresh produce, further research is needed to explore what impact Covid-19 continues to have on urban consumption.

This research provides a baseline of the purchasing behaviours and preferences for staple foods for urban consumers in Port Moresby. Its practical implications for those marketing fresh produce are that the ongoing expansion of supermarkets presents new market opportunities, which are likely to come at the expense of sales made in open markets. This research also provides further important insight into how the emergence of supermarkets and modern retailing impacts open markets and the sale of fresh produce in Pacific Nations, a region where changes in consumption are having widespread societal impacts and have been largely neglected by consumer research.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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