HUNGRY CITIES PARTNERSHIP

The State of Household Food Security in Kingston, Jamaica

HUNGRY CITIES REPORT NO. 15

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Robert Kinlocke, Elizabeth Thomas-Hope, Adonna Jardine-Comrie, Beth Timmers, Therese Ferguson and Cameron McCordic

Series Editors: Prof Jonathan Crush and Dr Liam Riley

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Executive Summary

This report presents the findings of a household food security survey conducted by the University of the West Indies, Mona, and the Hungry Cities Partnership. The questionnaire survey was administered to 702 households distributed across seven communities in the Kingston Metropolitan Area, Jamaica. The following analysis is based on emergent patterns related to various food security measures, spatial and temporal dimensions of food access, perceptions of supermarkets, practices of urban agriculture, and access to social grants. Some of the data is explored relative to intersections with differential experiences of poverty, income quintiles, and household structure. The results indicate that:

- Expenditure on food consumes a relatively significant proportion of total household income, accounting for almost 10% of overall expenditure. Education, housing, insurance, and transportation also had a significant impact on expenditure and, collectively, consumed the most significant proportion of household income.
- In general, a slightly greater proportion of respondents had never had the negative experiences generally associated with food insecurity.
- Experiences with food security partly varied depending on the temporal scale. The MAHFP, which uses months of the year as the reference period, produced more homogenous results but indicated that January, February, and July were the most common periods of inadequate food. However, most households did not experience many sustained periods of food insecurity.
- The HFIAS results, which tapped into micro-scale variations by using the previous four weeks as a reference period, revealed that approximately 30% of the sample displayed high levels of food insecurity. HFIAP measures indicated that 37% could be classified as severely food insecure.
- In just under half of the households surveyed, the restriction in food quantity meant that they were at least occasionally deprived of one or more meals because of a lack of resources.
- Worry about food and restrictions on consumption constituted a significant consequence of diminished access to food. Such limitations, particularly related to preferred consumption, may have an impact on dietary diversity and, by extension, nutrition.
- Relatively low levels of dietary diversity were observed. Nuclear families and extended family structures displayed higher levels of dietary diversity relative to female-centred and male-centred households.
- Carbohydrates was the food group most frequently consumed by most households. This included bread, rice, noodles, biscuits, and other foods made from grains. These items were consumed far more frequently than fruits and vegetables and such patterns may have negative health implications.

- Low incomes and other dimensions of the lived poverty experience are compounded by rising food prices that restrict access to food. In the six months prior to the survey, food prices had restricted access to certain types of food at least once per month in two-thirds of the households surveyed.
- While various factors affected food access, a household member's reduced income or loss of employment were the two most important factors that threatened food security in the households surveyed.
- Rice, sugar, and cooking oil are the most commonly purchased foods in Kingston. All had been purchased by over 80% of the surveyed households within the month prior to the survey.
- Choice of food source has a distinctive spatial expression. Areas within the neighbourhood or within walking distance were the most commonly cited access point for most food items. Over 40% of the sample accessed nearly all food types from these areas.
- In general, most food items were purchased at least once per week. Canned products, tea and coffee, and cooking oil were purchased less frequently than other products.
- At least two-thirds of the households obtained some of their food from supermarkets. The high level of supermarket patronage was linked to perceptions of greater product diversity relative to other food sources.
- Approximately 10% of the sample received social grants and the average amount per month was JMD24,438, which is relatively low. Two-thirds of the grant recipients used the funds for food purchase.

The report concludes with a discussion of how observed patterns may be used to inform policy and provides recommendations for future research on food-related themes in the city. It offers suggestions on ways in which analytical insight may be extended to uncover latent patterns in the data set and enhance micro-scale understandings of food security in the city.

1. Introduction

This report provides an analysis of results from a household food security survey conducted in Kingston, Jamaica, by the Hungry Cities Partnership (HCP). It documents the state of food insecurity in households across selected communities in the Kingston Metropolitan Area. It should be read in conjunction with HCP Report No. 4: The Urban Food System of Kingston, Jamaica (Thomas-Hope et al 2017), which provides more detailed background and context for the results discussed here.

2. Methodology

The city-wide HCP survey of Kingston was conducted between July and September 2015 by a team of 14 data collectors. The survey instrument represents an adaptation of a household food security survey developed by the African Food Security Urban Network (AFSUN) and HCP and includes questions related to demographic and socioeconomic circumstances as well as experiences with food (in)security. Food sources as well as attitudes towards various components of the food system were also explored. A total of 702 respondents were selected from households in Kingston using a two-tiered sampling approach. The first stage involved the selection of communities from a sampling frame that comprised a list of communities in the Kingston Metropolitan Area. These communities are represented by the Statistical Institute of Jamaica (STATIN) as primary settlement divisions in Kingston (Figure 1). Based on poverty prevalence data, seven communities were selected to represent the range of socioeconomic conditions across the city. The communities were divided into three income groups based on poverty levels. The Jenk's Natural Breaks optimization was used as an objective method of grouping communities based on poverty levels. This method is an iterative process that uses an algorithm to sort values based on the population variance existing within and between randomly defined subgroups. It attempts to cluster similar values together and is a less arbitrary method of assigning breakpoints between groups (McMaster and McMaster 2002).

The second stage involved the use of systematic random sampling to select households in each of the communities. Every third household was selected in relation to a predetermined starting point established by the data collection supervisor. Figure 2 indicates the distribution of the sample by community. This method was chosen for its lack of bias and logistical appropriateness based on the layout of housing in the community. Questionnaires were orally administered to adult

household members who were deemed to have knowledge of household expenditure, income, and various food security indicators.

Despite the attempt to reduce bias in the sampling, the process was potentially affected by low response rates in some communities. Also, access challenges limited the expansion of the survey to more communities. These challenges were more prevalent in low-income communities, which often required permission from informal community leaders. While a greater number of communities would have yielded more generalizable results, the risks involved inhibited spatial extension of the research beyond the communities identified. Nevertheless, the statistical procedures deployed in community selection may serve to partially offset the inherent shortfalls associated with access challenges.

FIGURE 1: Communities in the Kingston Metropolitan Area

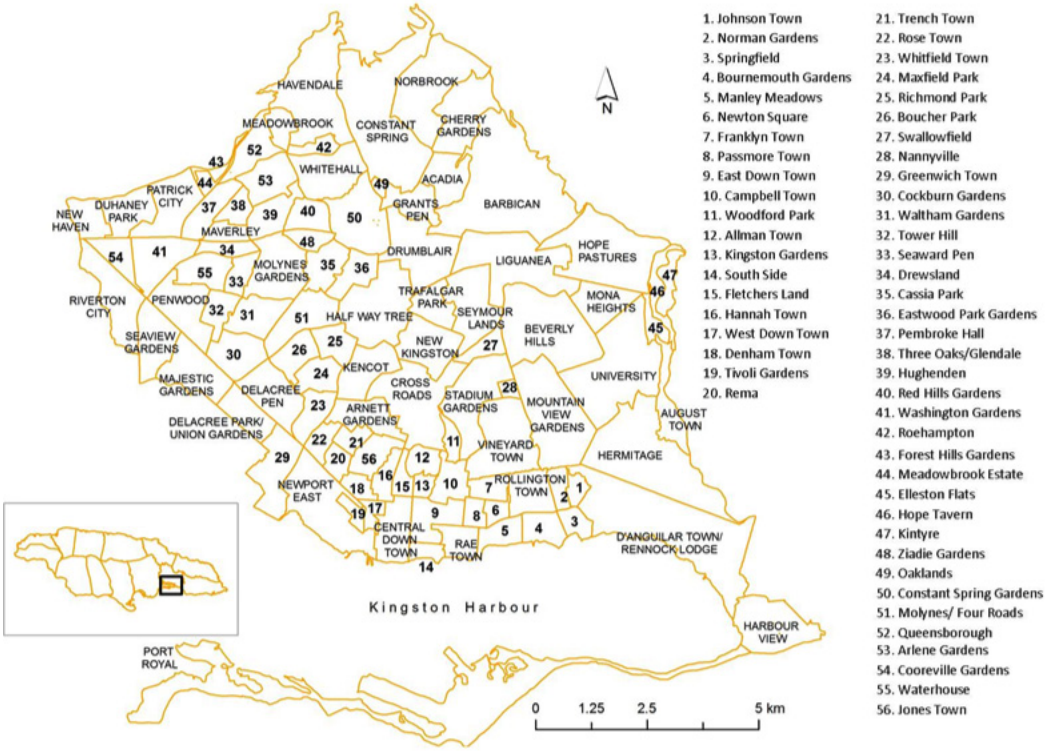
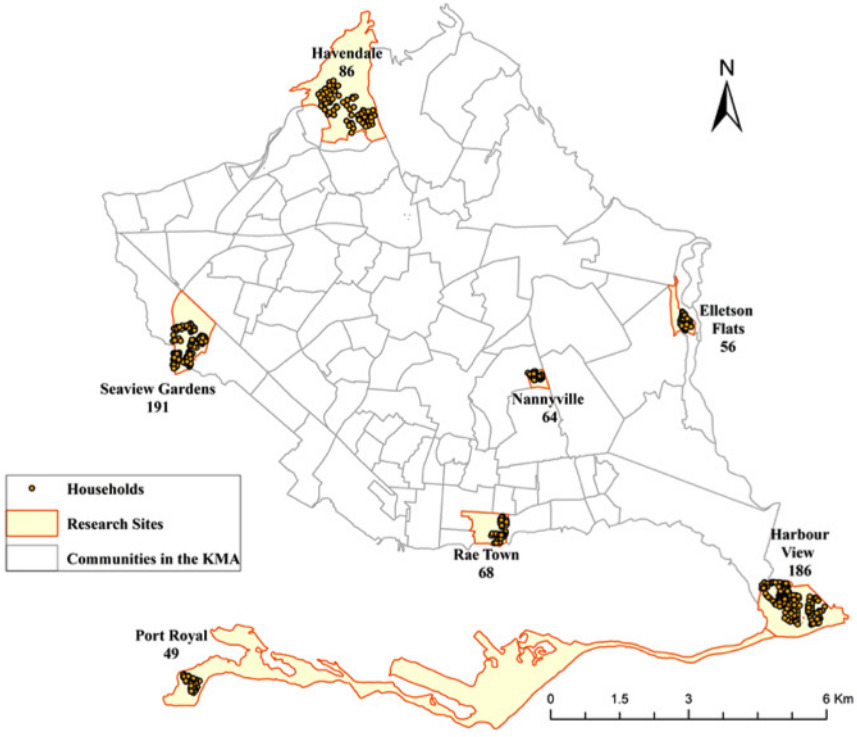


FIGURE 2: Spatial Distribution of Surveyed Households in Kingston



3. Household Member Profile

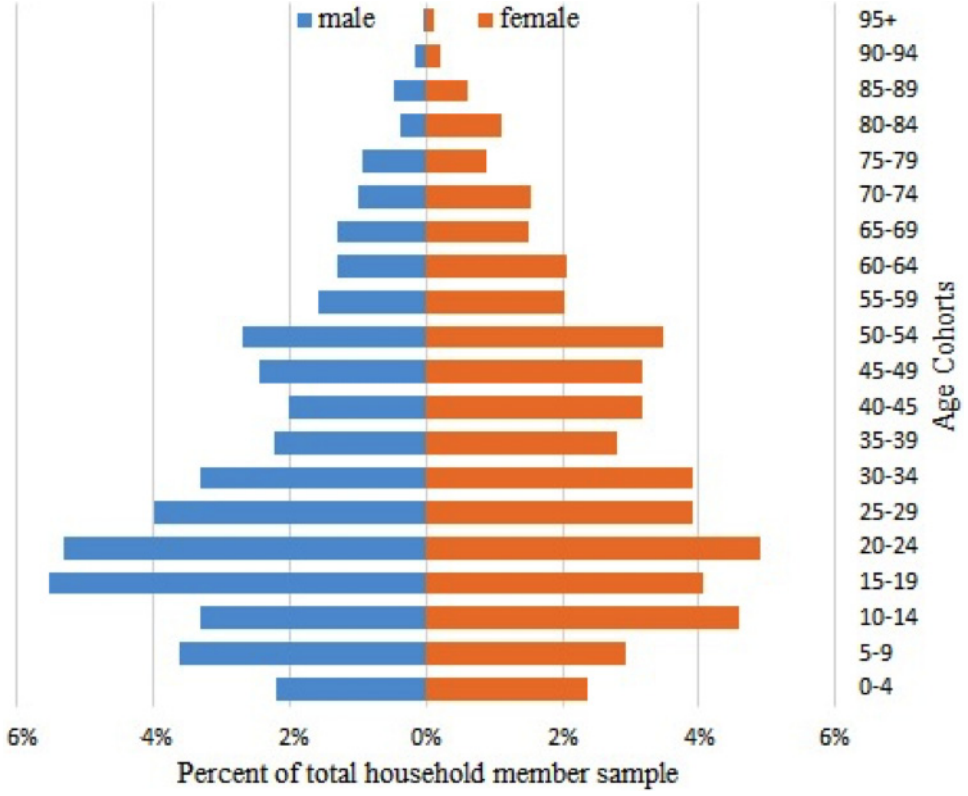
3.1 Age Structure

The sampled households had a slightly more female (53%) than male (47%) members; proportions that are not significantly different from the 2011 census data, which reported a 52%:48% female-male split (STATIN 2011). The age structure reflected a relatively youthful population with 44% being younger than 25 years (Figure 3). About 20% of the sample was in the 15-24 age group. The population younger than 10 years accounted for 11% of the sample, while those between 10 and 14 represented 8% of the sample. The contraction of cohorts below age 15 (relative to the 15-24 cohort) may reflect declining birthrates and possible population growth associated with young adult rural-urban migrants settling in Kingston in pursuit of employment and study opportunities. Such patterns have typified a long history of migration to the city and continue to influence its demographic structure (Clarke 2006, Thomas-Hope et al 2017).

About 10% of the sampled household members were over the age of 65. Combining them with those up to 15 years of age gives a dependency ratio of 46%,

which aligns relatively closely with patterns observed in national data sets. The 2011 census indicated a dependency ratio for the Kingston Metropolitan Area of 42%. The slightly higher value for the sample, relative to the city, may be explained by the lower response rates in some higher-income communities that ultimately affected sample size.

FIGURE 3: Age/Sex Structure of Sampled Households



3.2 Level of Education

A significant portion of working-age household members (i.e. over 18 years old) had either completed high school or had some high school education (Table 1). By comparison, about 23% said their highest level of attainment was either full or partial completion of primary school (15%) and about 1% had no formal education. Vocational training had been completed by 11% and a similar proportion had also completed university (11%). Only 2% were educated at post-graduate level. In total, about 13% had tertiary education and another 6% had some university education, which aligns closely with national figures. National data sets indicate that 15% of the Jamaican population have been educated at tertiary level (Cross 2018).

TABLE 1: Highest Level of Education of Household Members over 18

Level of education	No.	%	Cumulative %
No formal schooling	16	1.1	1.1
Some primary school	39	2.6	3.7
Primary completed	189	12.8	16.5
Some high school	108	7.3	23.8
High school completed	686	46.4	70.2
Post-secondary qualifications not university	164	11.1	81.3
Some university	90	6.1	87.4
University completed	159	10.8	98.2
Post-graduate	28	1.9	100.00
Total	1,479	100.00	

3.3 Employment Status

About 44% of the adult household members (over 18) were in paid employment. Full-time workers (30%) and self-employed individuals (19%) accounted for a significant proportion of the overall sample, while part-time, casual, contract, or seasonal workers accounted for only 9% (Table 2). Levels of unemployment reported by respondents were higher than national levels, which hover around 14% annually for those aged 15-64 who are actively seeking work (PIOJ 2014). About 24% of the working-age sample were unemployed with 14% classified as "looking for work" and 10% as "not looking for work". Many individuals were engaged in multiple activities, which partially explains the high proportion of students in the sample (28%).

TABLE 2: Work Status of Household Members over 18

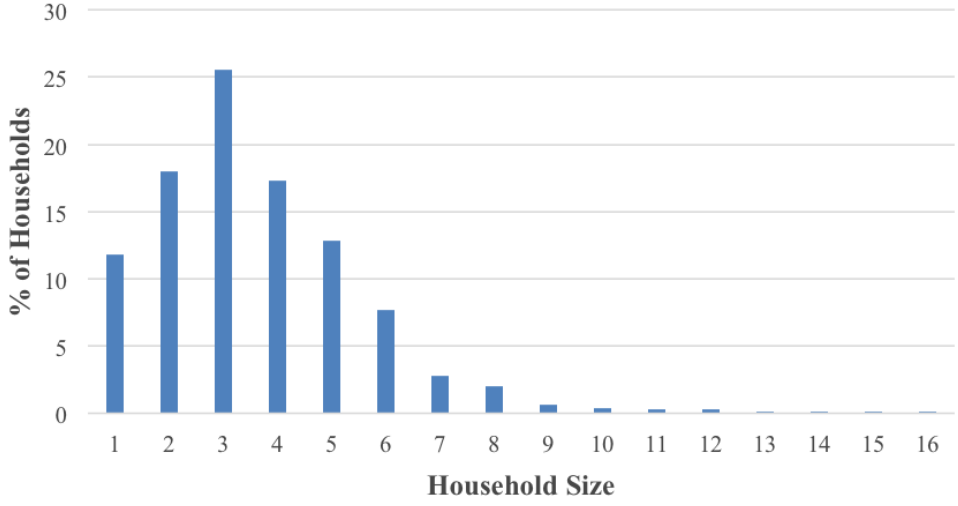
		No.	%
Employed	Working full-time	474	29.8
	Self-employed	296	18.6
	Working part-time/casual/contract/seasonal	144	9.1
Unemployed	Looking for work	219	13.8
	Not looking for work	155	9.7
Other	Pensioner	120	7.5
	Student	97	6.1
	Medically unfit/disabled	66	4.2
	Home maker	19	1.2

4. Household Profile

4.1 Household Size

The average size of the households surveyed in Kingston was 3.64 (Figure 4). About one-quarter had three members while households with more than five members accounted for less than 15% of the sample. National census data indicates that the average household size in the city of Kingston was 3.0 in 2011 (STATIN 2011). The higher values reported in this survey are possibly related to the geographical and socioeconomic distribution of the sample in which response rates were higher in several lower-income communities. These communities tend to have larger families and this may ultimately yield higher mean values.

FIGURE 4: Distribution of Household Size



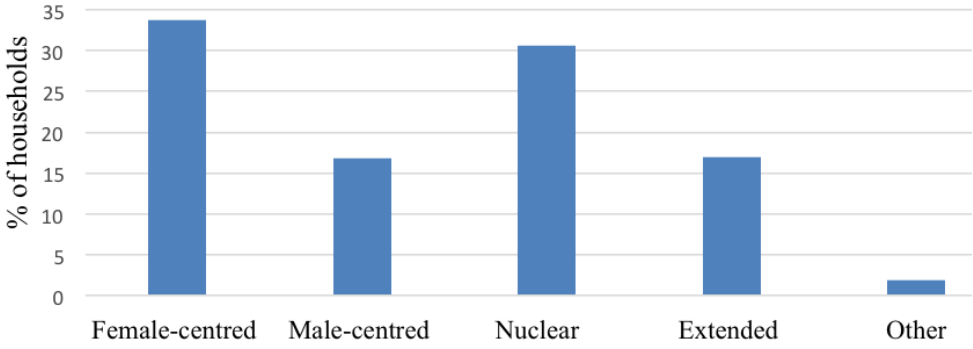
4.2 Household Dwelling and Structure

A range of dwelling types was found in the sample but houses were the predominant type (87%). The 2011 census indicated that 83% of Kingston residents live in detached housing structures, which closely approximates the estimates derived in the sample. Dwelling types such as townhouses and flats accounted for only 7% and 2%, respectively. All other dwelling types were observed among less than 2% of the total sample.

Female-centred and male-centred households have a female or male head respectively without a spouse or partner plus any combination of children, relatives, and other members. Nuclear and extended households include a head with a spouse or partner. The distinguishing feature between these two types is that the nuclear household has children as its only additional members, whereas extended

households include others, e.g. parents or siblings of the household head, other relatives, or non-relatives. The largest proportion of surveyed Kingston households were female-centred (34%) and nuclear (31%) (Figure 5). Male-centred and extended households each accounted for 17% of the sample.

FIGURE 5: Structure of Surveyed Households



4.3 Household Income

Income has been found to have both a direct and indirect association with food security (Frayne and McCordic 2015). In a city where unemployment rates are high, food security is likely to be compromised by low wages and diminutive income streams from other sources. This survey found that three-quarters of the sampled households derived income from formal, informal, or casual wage work. About 70% of these households derived their income from formal wage work, representing just over half (53%) of the total sample. Twelve percent of the sample derived some income from informal activities, including the sale of fresh produce grown in and outside the household, property rental, and the sale of goods other than produce. Not surprisingly, remittances from the Jamaican diaspora was the second most important income source (received by 23% of households). Jamaica has a long history of remittance-based revenue streams, which annually contribute more than 15% to its GDP (World Bank 2018).

Collectively, these income sources translate to an average income of JMD74,422 per month (for the 294 households who answered the question). Those that answered reported on the previous month of income, excluding loans. When loans were included in the calculation of means, only marginal differences were observed as the average income increased to JMD74,756. Only 1% of the households said they had accessed loans from either formal or informal sources in the previous month. Both calculations of mean income had high standard deviations ($\sigma_{\bar{X}}$ = 109,839.00 and 109,927.03), indicating significant variability, with most incomes falling at the lower end of the range. This is symptomatic of fairly high levels of income inequality in the city and partially reflects estimates of income inequality at the national level. In 2015, estimates of income inequality indicated that Jamaica is one of the most unequal societies in the Caribbean,

with a Gini coefficient of 38 (CIA 2018). While estimates were not available for Kingston, the figure is likely to be even higher given the concentrations of wealth amid immense poverty in several sections of the city. Disaggregation of the data into income quintiles revealed that 41% of the sample had earned less than JMD25,000 in the previous month while 19% had incomes of over JMD100,000 per month (Table 4).

TABLE 3: Household Income Sources in Previous Month

Household income sources	No.	% of households
Formal wage work	361	52.7
Cash remittances	155	22.6
Informal wage work	99	14.5
Government social grants	83	12.1
Casual wage work (formal and informal)	54	7.9
Net income from informal business (sale of goods)	40	5.8
Net income from formal business	32	4.7
Gifts	25	3.6
Net income from renting property	21	3.1
Interest earned on personal investments	14	2.0
Net income from informal business (sale of fresh produce not produced by household)	8	1.2
Net income from other informal business	7	1.0
Formal loans	7	1.0
Non-government formal grants or aid	5	0.7
Net income from informal business (production and sale of fresh produce by household)	3	0.4
Informal loans	3	0.4
Other income sources	22	3.2
Note: Multiple-response question		

TABLE 4: Household Income Quintiles (excluding loans)

Income quintile	No.	%	Cumulative %
1 JMD <=10,000	71	24.1	24.1
2 JMD10,001-25,000	49	16.7	40.8
3 JMD25,001-50,000	65	22.1	62.9
4 JMD50,001-100,000	53	18.0	80.9
5 JMD100,001+	56	19.0	100.0
Total	294	100.0	

4.4 Household Expenditure

Households were asked what items had contributed to their expenditure in the previous month. Most paid for food and groceries (95%), publicly provided utilities (81%), telecommunications (64%), transportation (59%), and fuel (45%)

(Table 5). Only a few households incurred expenditures on household furniture, tools, and appliances (3%), sending cash remittances to rural areas (4%), donations (5%), informally purchased utilities (5%), and debt repayments (7%).

TABLE 5: Household Expenditure in Previous Month

Household expenditure	No.	% of households	Mean JMD
Food and groceries	653	94.9	20,104
Public utilities	559	81.3	15,031
Telecommunications (cellphone, telephone, internet)	439	63.8	5,074
Transportation	407	59.2	10,502
Fuel	311	45.2	3,760
Housing	235	34.2	23,221
Savings	187	27.2	23,401
Medical care	178	25.9	13,816
Insurance	123	17.9	19,474
Clothing	111	16.1	12,274
Education	80	11.6	35,753
Entertainment	77	11.2	8,405
Debt repayments	49	7.1	26,103
Informally purchased utilities	37	5.4	12,296
Donations, gifts, family support	36	5.2	3,748
Cash remittances to rural areas	27	3.9	9,367
Household furniture, tools, and appliances	22	3.2	8,818
Note: Multiple-response question			

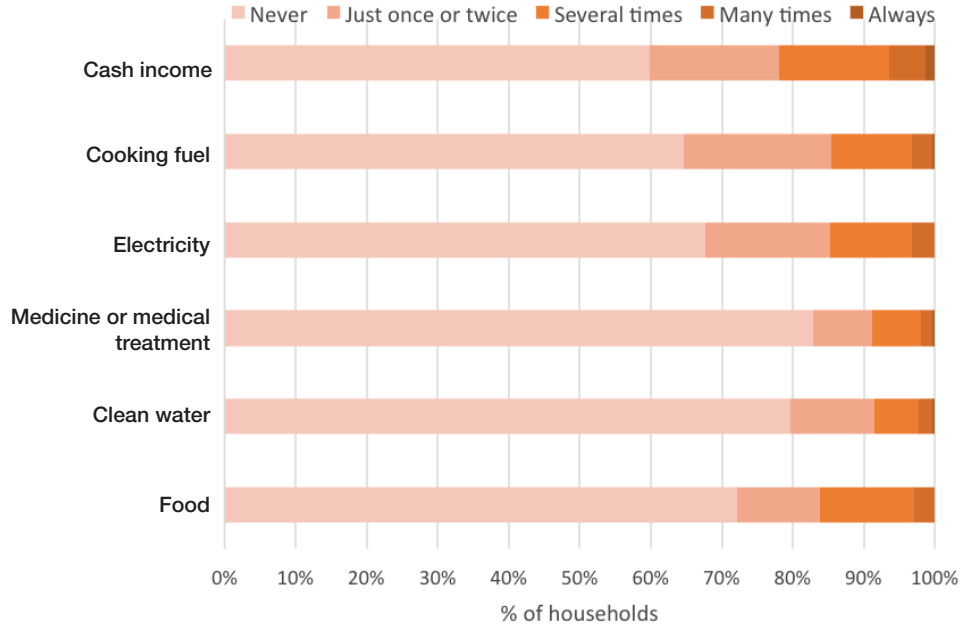
Although the proportion of households incurring these expenses was relatively low (at 12%) the highest mean household expenditure was on education (tuition, books, and uniforms) at JMD35,753. Debt repayments were next at JMD26,103, although the proportion of households spending on debt repayment was also relatively low (at7%). Of the more common expenses (incurred by at least one-third of households), housing had the highest mean expenditure (JMD23,155), followed by food and groceries (JMD20,104), public utilities (JMD15,031), and transportation (JMD10,502). Households spent JMD9,367 on cash remittances to rural areas. Less was spent on fuel (JMD3,760) and donations, gifts, and family support to other households (JMD3,748).

4.5 Lived Poverty

The Lived Poverty Index (LPI) is a well-tested compound subjective measure of the experience of poverty, which does not rely on self-reporting of income. Using a composite score comprising several variables, the LPI attempts to capture different dimensions of the experience of poverty based on access to various basic needs (Afrobarometer 2016). An LPI score is calculated for each household

as the mean score on a 5-point Likert scale, with 0 indicating total access and 4 indicating no access or significant lived poverty. With an overall mean of 0.46, Kingston appears to have relatively low levels of lived poverty. Figure 6 compares the mean LPI scores for all households across the selected parameters and indicates minor variation in the extent to which basic needs are met. Access to cash income appears to be the most frequent problem with 23% of respondents indicating that they had experienced inconsistent cash income at least several times over the past year. Approximately 15% of households cited inconsistent access to food, cooking fuel, and electricity as difficulties.

FIGURE 6: Distribution of LPI Scores



5. Household Food Insecurity

5.1 Measures of Food Security

Household food security has many dimensions and is related to the context in which it occurs (Coates et al 2007, Haysom and Tawodzera 2018). The survey conducted for the Hungry Cities Partnership project uses information on household experiences of food deprivation, constrained access, and dietary choices to develop a picture of the food security situation across the cities in the project. The indicators and scales utilized for the assessment of food security were developed by the Food and Nutrition Technical Assistance (FANTA) project (Coates et al 2007). The four main metrics of household food security developed by FANTA that were combined for an analysis of household food security in the

HCP project are discussed below.

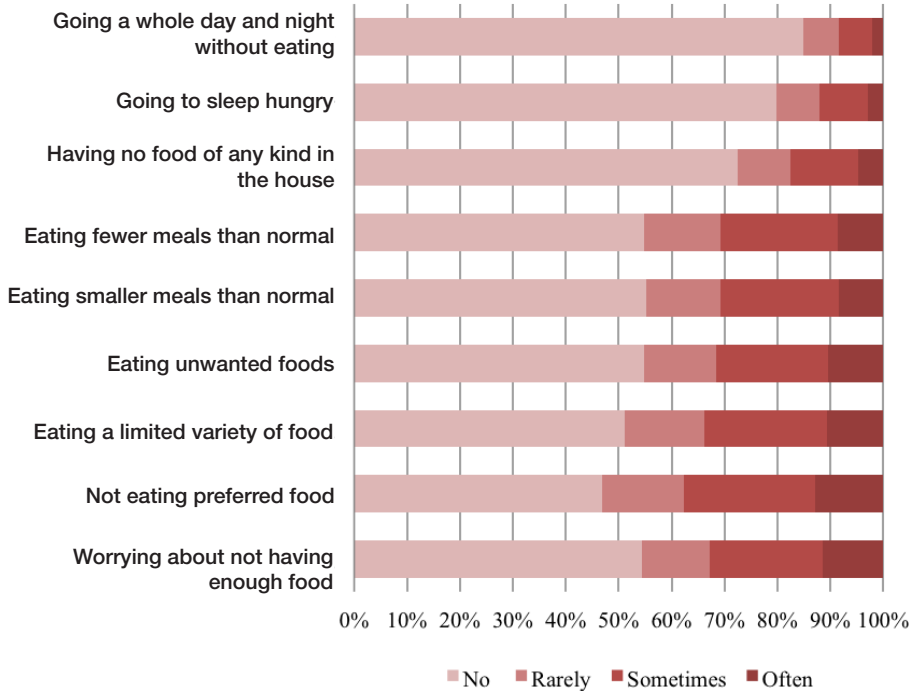
- **Household Food Insecurity Access Scale (HFIAS):** The HFIAS score is a continuous measure of the degree of food insecurity in the household (Coates et al 2007). It highlights the consistency of a household's access to food and the kinds of challenges faced. The answers to nine questions – which assess the frequency with which specific experiences of food insecurity occur in the four weeks prior to the survey – are used to calculate the HFIAS score. The maximum score is 27 and the minimum is 0. A higher score indicates greater levels of food insecurity, while a lower score indicates fewer food insecurity experiences.
- **Household Food Insecurity Access Prevalence (HFIAP):** The HFIAP indicator is derived from the HFIAS and uses a scoring algorithm to categorize households into four levels of household food insecurity: food secure, mildly food insecure, moderately food insecure, and severely food insecure (Coates et al 2007).
- **Household Dietary Diversity Score (HDDS):** Dietary diversity refers to how many food groups were consumed in the 24 hours prior to the survey (Swindale and Bilinsky 2006b). The scale ranges from 0 to 12, with 0 indicating no consumption of food and 12 indicating that food from all 12 food groups was consumed in the previous 24 hours. An increase in the average number of different food groups consumed provides a quantifiable measure of household dietary diversity, which is indicative of better household nutrition.
- **Months of Adequate Household Food Provisioning (MAHFP):** The MAHFP indicator is a measure of the household's ability to ensure that food is available above a minimum level throughout the year (Bilinsky and Swindale 2007). Households are asked to identify in which months (during the past 12) they did not have access to sufficient food to meet their household needs. A score is calculated by subtracting the number of months of inadequate food from 12. Accordingly, a score of 12 means that the household had adequate food provisions every month over the previous year.

5.2 Levels of Food Insecurity

Figure 7 presents the frequency of occurrence of household food insecurity experiences based on the nine HFIAS questions. In general, more than half of the households had had none of the negative experiences associated with food insecurity in the month prior to the survey. However, over half (58%) had experienced some level of deprivation in that they were not able to eat preferred food within the previous four weeks. A little less than half (49%) were restricted to a limited variety of food, had worried (46%) that they would not have enough food, or had been forced to eat types of food that they did not want to eat because of a lack of resources (45%), and were not always able to eat the quantity of food

they felt they needed (45%). In just under half the households, food quantity restrictions meant that they were at least occasionally deprived of one or more meals because of a lack of resources. Of great concern is the fact that 15% of the respondents indicated that their household experienced hunger for a whole day and night at least once in the four-week period because there was not enough food. This occurred between three and 10 times for 6% of the respondents and more than 10 times for a small percentage of the respondents (2%).

FIGURE 7: Responses to Food Access Questions in the HFIAS Scale



An HFIAS score was derived for each household from these frequency-of-occurrence questions (Figure 8). The mean HFIAS score was 6.6. Approximately 45% of the households had very low HFIAS scores ranging from 0 to 3, indicating that they had never or very rarely encountered experiences indicative of food insecurity. Just over one-quarter of the households (26%) had scores between 3.1 and 9.0, indicating that they had not experienced the most severe food insecurity experiences or that the frequency of these experiences was low. However, almost one-quarter (23%) had scores between 9.1 and 18, and 7% had scores between 18.1 and 27. In total, almost 30% of the households had scores greater than 9, which is indicative of high levels of food insecurity.

When the HFIAP algorithm is applied to the HFIAS scores, food insecurity is an issue for nearly three-quarters (74%) of the sample (Figure 9). As many as 37% of the households were suffering from severe food insecurity, with 28% experiencing moderate food insecurity and 9% mild food insecurity. Only 26%

were completely food secure. Table 6 compares the findings for Kingston with a diverse range of cities in the Hungry Cities Partnership globally. Kingston's food security profile is most similar to the African cities of Maputo (Mozambique) and Nairobi (Kenya) and least similar to Bangalore in India and Nanjing in China. Bangalore and Nanjing have high levels of food security. Kingston's levels of severe food insecurity are similar to those found in the South African city of Cape Town, which has one of the world's highest levels of income inequality.

FIGURE 8: Household HFIAS Scores

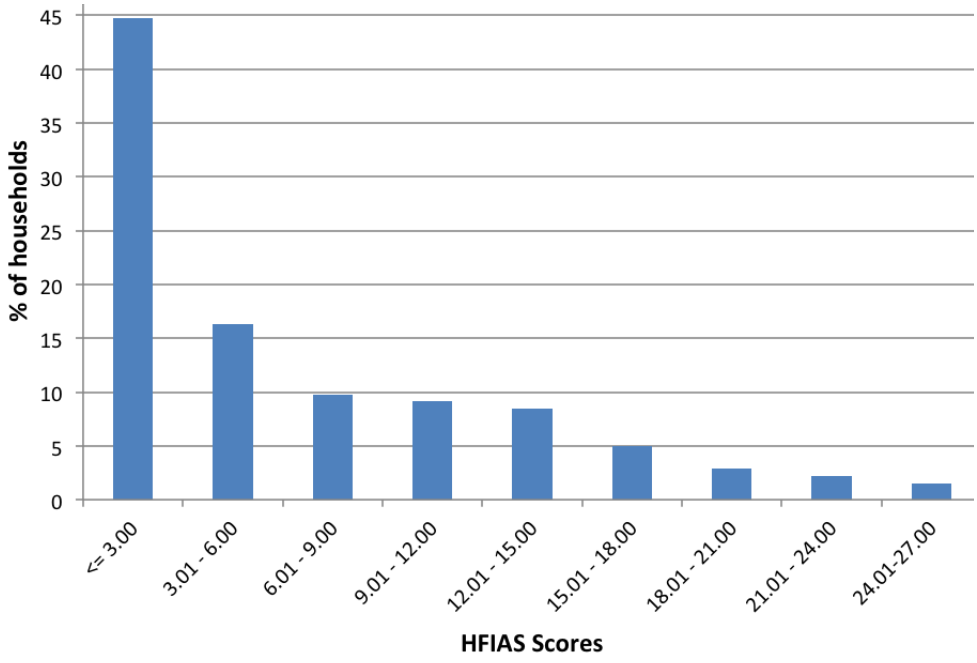


FIGURE 9: Distribution of HFIAP Categories

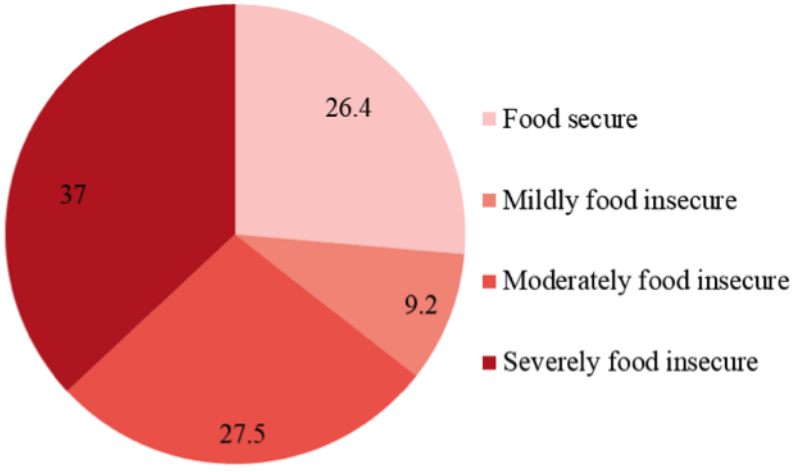


TABLE 6: Levels of Household Food Security in HCP Cities

	Kingston (%)	Mexico City (%)	Maputo (%)	Nairobi (%)	Cape Town (%)	Nanjing (%)	Banga-lore (%)
Food secure	26	50	29	29	46	79	83
Mildly food insecure	9	12	11	13	6	14	13
Moderately food insecure	28	12	22	33	13	5	2
Severely food insecure	37	27	38	25	36	2	2

5.3 Dietary Diversity

In the 24 hours before the administration of the questionnaire, the average number of food groups consumed was 4.5. Figure 10 shows a distribution curve positively skewed towards lower levels of dietary diversity, indicating that foodstuffs from very few food groups were consumed in most households. In fact, the largest number of households consumed food from only three groups, while less than 15% consumed food from seven or more groups. Comparing Kingston with the other HCP cities, only Maputo had a lower mean HDDS. Overall, Kingston's dietary diversity profile was most similar to Maputo's (Table 7).

Carbohydrates was the food group most frequently consumed by households (90%). This includes bread, rice, noodles, biscuits, or other foods made from grains. Of note is the fact that complex carbohydrates, such as foods from roots and tubers, were less likely to be eaten (30%). The second most popular food group was meat, such as chicken and beef. This was the protein source for 68% of the population. Fewer households got their protein from peas, beans, lentils, or nuts (27%), or from seafoods (20%). Of concern is the fact that less than half of the households consumed vegetables (40%) or fruits (32%). They were more likely to consume sugar or honey (36%) or condiments such as tea or coffee (33%) than fruits. The number of households consuming fats and oils was the same as that for fruits (32%). Eggs (22%) and dairy products (22%) were also rarely consumed.

The lack of dietary variety is not necessarily detrimental to health if the diet consists of foods that provide the essential macro and micro nutrients needed for good health. However, the low consumption of fruits and vegetables, and the reliance on simple carbohydrates and meat, indicates that this may not be the case in most households in Kingston. The data presented in Figure 11 is consistent with anecdotal knowledge of the diet of many poor households in Kingston: rice or boiled white flour dumplings and a protein source, which could be beef or chicken. Kingston thus not only has a narrow range of foods but the typical diet does not include vegetables or fruits, which could have negative health implications for its residents.

FIGURE 10: Household Dietary Diversity Score

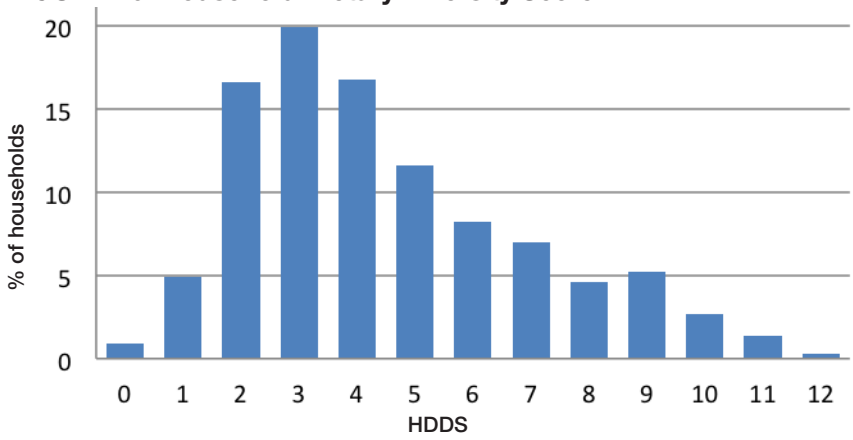
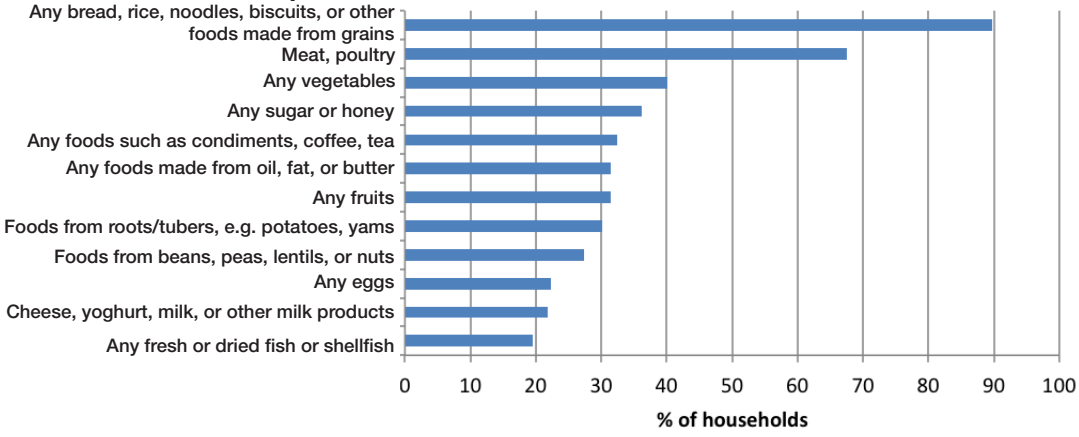


TABLE 7: Dietary Diversity in HCP Cities

HDDS	Kingston (cum %)	Mexico City (cum %)	Maputo (cum %)	Nairobi (cum %)	Cape Town (cum %)	Nanjing (cum %)	Bangalore (cum%)
0	1	1	1	1	1	0	0
1	6	1	4	1	3	1	2
2	22	8	27	5	8	1	5
3	42	20	42	12	14	5	13
4	59	33	60	24	21	10	34
5	71	50	76	41	29	17	55
6	79	62	87	59	42	27	68
7	86	74	94	74	57	39	73
8	90	83	97	86	73	57	78
9	96	90	99	95	86	75	85
10	98	96	100	99	93	88	92
11	100	99		100	98	97	99
12		100			100	100	100
Mean HDDS	4.5	5.9	4.1	6.1	6.8	7.8	6.0

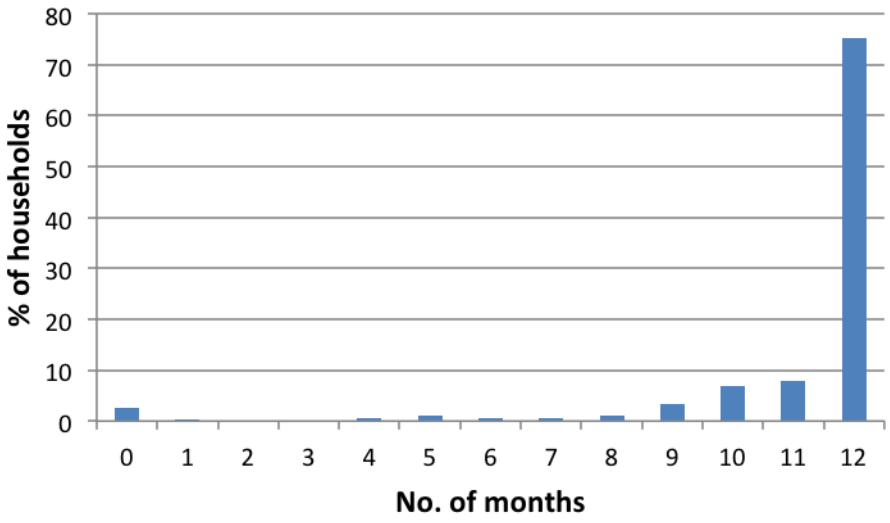
FIGURE 11: Food Groups Consumed in the Previous 24 Hours



5.4 Stability of Food Access

When participants were asked to identify the months of adequate food provisioning during the previous year, 75% indicated that they had 12 months of adequate food provisions for the household, while only 5% had one month or less of adequate food (Figure 12). The others had experienced between four and 11 months of adequate food provisions.

FIGURE 12: No. of Months of Adequate Household Food Provisioning

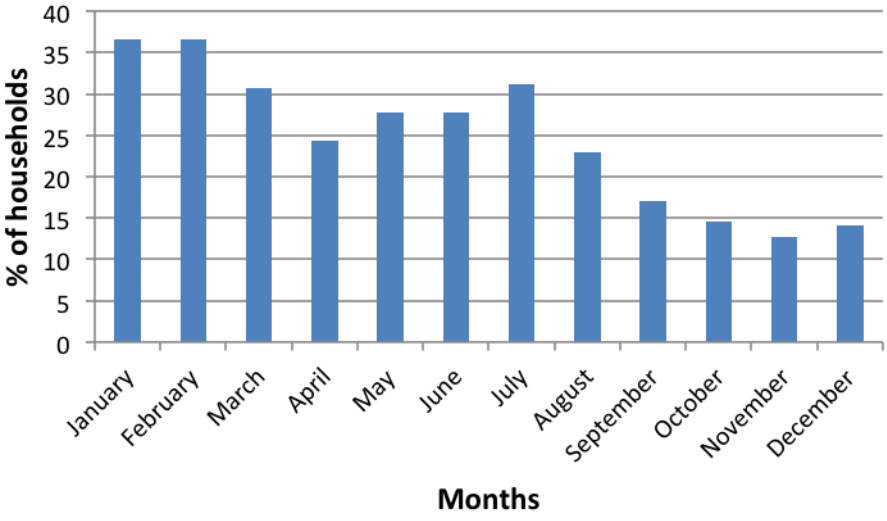


In general, January and February, followed by July, were the months most frequently identified as having inadequate food provisions. November and December were the months when households were most likely to have adequate supplies of food. A combination of socio-cultural and climatological factors possibly explain observed patterns. Low levels of inadequacy during November and December are predictable given the often excessive spending on food generally associated with the festive Christmas season. Food and cash remittances from relatives overseas also tend to be higher during this period, contributing to greater levels of food access. Comparatively high spending during the festive season is likely to place households in financially precarious positions afterwards, resulting in the higher levels of inadequacy in January and February. Reported levels of inadequacy during July may be related to the increased food demands created by the summer holidays. During this period, children spend more time at home and are therefore likely to consume more food. In other months, this burden is possibly offset for some by school feeding programs or other options for food access outside the household.

These socio-cultural factors are possibly compounded by climatological conditions that influence food production levels. December to March and July to

August generally have the lowest precipitation (Gamble et al 2010). Water scarcity and recent droughts are likely to contribute to lower production levels and the associated scarcity inevitably leads to higher food prices. A compromised financial capacity, combined with higher food prices, potentially explains why these months were the most commonly cited periods of inadequate food provisioning.

FIGURE 13: Months with Inadequate Household Food Provisioning



5.5 Household Income and Food Security Status

Food security status was cross-tabulated with household income to show how the financial status of households correlates with food insecurity. Table 8 shows the relationship between the mean food insecurity scores (HDDS, HFIAS, and MAHFP) and household income quintiles. Unsurprisingly, the data shows that the lower the income quintile in which a household falls (the poorer it is), the lower the mean HDDS score, indicating that the diet is less diverse in poorer households. As it relates to the HFIAS, the poorer the household, the higher the HFIAS and the greater the degree of food insecurity. The HFIAS score for households in the lowest quintile was 10.6 compared to only 3.8 for those in the highest income quintile. In general, households in the lower-income quintiles had a correspondingly lower MAHFP.

TABLE 8: Food Security Scores and Household Income

Income quintiles	Mean HDDS	Mean HFIAS	Mean MAHFP
1	3.87	10.57	10.42
2	4.12	9.08	10.88
3	4.78	6.06	11.21
4	4.67	5.40	11.58
5	4.71	3.75	11.47

5.6 Food Insecurity and Household Structure

Household structure is likely to influence food security given the possible relationship with overall income. It also has potential implications for dependency ratios, which may compound economic and social issues in the household and, in turn, affect how food is accessed and distributed. In this section, the HDDS, HFIAS, and MAHFP are described in relation to the range of household structures included in the survey – female-centred, male-centred, nuclear, and extended. Nuclear households had the highest average HDDS score (4.84), extended households the second highest (4.75) and single-parent households reporting lower scores. For the 226 female-centred households, the mean HDDS score was 4.21, while for the 113 male-centred households, it was 4.07 (Table 9).

In terms of food security and the HFIAS, the mean for extended-family structures was 7.56. Male-centred and female-centred households recorded scores of 7.19 and 7.06, respectively; while nuclear families averaged 5.39. This indicates that there is minor incongruence between the patterns observed in the relationship between household structure and the HFIAS and HDDS scores respectively. Extended households exhibited the highest levels of food insecurity and this is possibly explained by the comparatively higher levels of dependence that may characterize these households. With an average household size of 5.5 members, extended-family structures were found to be considerably larger than all other household structures. Nuclear families represented the second largest household structure with 3.8 members. With only minor variations, the MAHFP patterns were consistent with results of the HFIAS and the HDDS. Nuclear households displayed the highest MAHFP scores compared to single-parent households where the lowest scores were reported.

TABLE 9: Food Security Scores by Household Structure

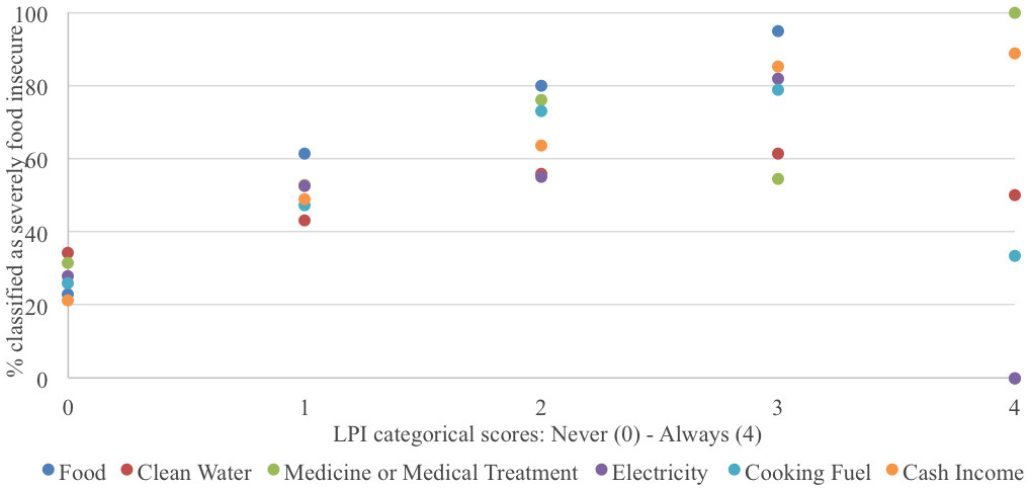
Household structure	HDDS	HFIAS	MAHFP
Female-centred	4.21	7.06	10.92
Male-centred	4.07	7.19	11.13
Nuclear	4.84	5.39	11.34
Extended	4.75	7.56	11.25
Total	4.54	6.61	11.12

5.7 Lived Poverty and Household Food Insecurity

The LPI subscales were compared to identify which variables could potentially moderate the relationship between food security and lived poverty. The HFIAP was used as the measure of food security. Households with no/minimal levels of lived poverty displayed comparatively minimal variation in severe food inse-

curity (Figure 14). Inconsistent access to cash income reflected the relationship between food insecurity and LPI scores most directly and suggests that income is the most important mediator in the relationship between poverty and food access.

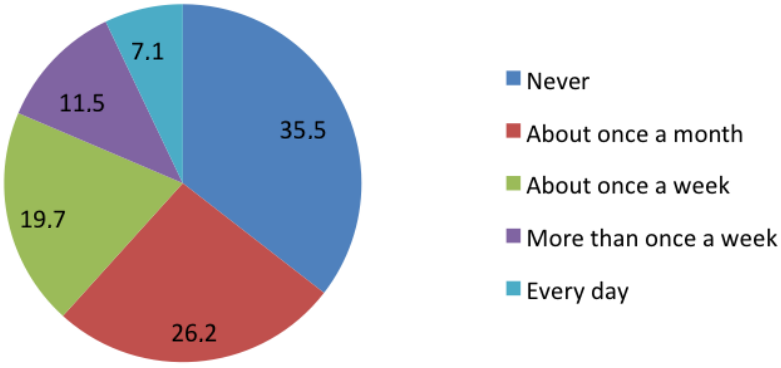
FIGURE 14: Distribution of LPI Subscales by Severe Food Insecurity



5.8 Impact of Food Price Increases

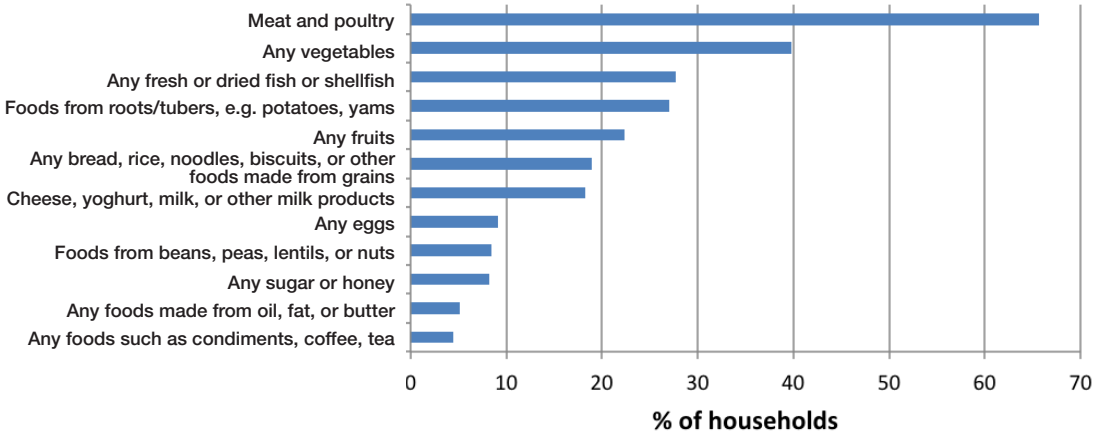
In the six months prior to the survey, food prices restricted access to certain types of food in two-thirds of the households surveyed (Figure 15). This was an occasional experience (once per month) for 26% but a weekly occurrence for 31%. This included 12% who were unable to afford certain types of food multiple times per week. The inability to afford certain types of foods was a daily experience for 7% of the households surveyed.

FIGURE 15: Frequency of Food Deprivation Because of Food Prices



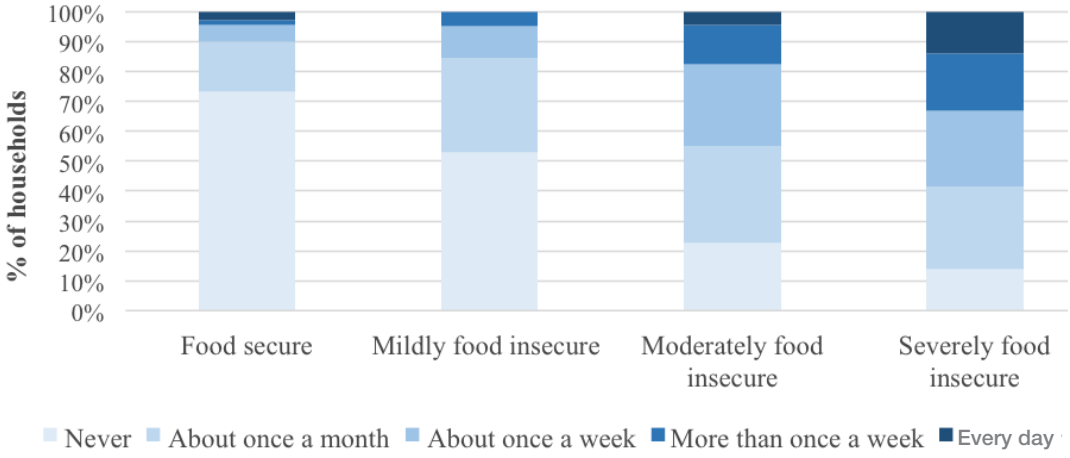
Most households found meats to be the most unaffordable food (Figure 16). Two-thirds were unable to eat meat or poultry because of its price. In addition, almost 40% of the households indicated that they could hardly afford vegetables. Fresh or dried fish was also referred to as unaffordable (by 28%) followed closely by ground provisions (27%) and fruits (22%). Of the households that did not consume vegetables in the period before the survey, only 40% said it was because they were unaffordable. The lack of consumption for the others was perhaps a result of personal preference or a physical lack of the products. Similarly, the non-consumption of ground provisions and fruits was also not necessarily driven by affordability, since 70% of the respondents indicated that they had not consumed this type of food but only 27% classified it as unaffordable. Likewise, 69% of the respondents had not eaten any fruits in the 24 hours before the survey, but only 22% classified it as an unaffordable type of food. Less than 20% found that dairy products or carbohydrates from grains were unaffordable.

FIGURE 16: Food Types Identified as Unaffordable



Despite variations in levels of food security, all groups appear sensitive to vagaries in food prices. However, the impact was directly proportional to the level of food security, with the most food insecure households being the most affected by changes in food prices. More than one-quarter of food secure households had been deprived of food because of its price at least once per month (Figure 17). Predictably, moderately and severely food insecure households were most seriously affected by food price changes, with 77% of moderately food insecure households being deprived of food because of price increases at least once month, and 45% once per week. This was the experience of 86% of severely food insecure households once per month and a weekly experience for 60% of these households.

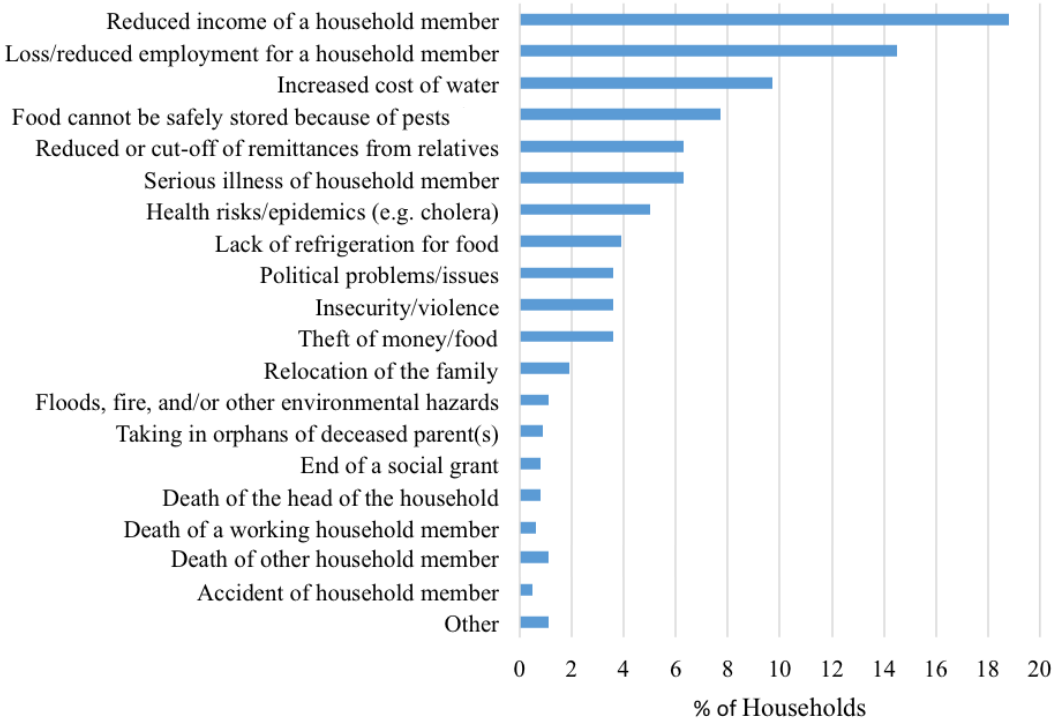
FIGURE 17: Food Insecurity and Frequency of Food Price Related Deprivation



5.9 Food Access Hazards

Food access hazards generally denote relatively rapid or slow onset threats that may not be under the control of the household yet may compromise its ability to access food. Households with diminutive incomes, high expenditures, and high dependency ratios are particularly vulnerable to the impact of food access hazards. Reduced income of a household member and loss of employment of a household member were the two most important factors that had threatened the food security of the surveyed households in the previous six months (19% and 15%, respectively) (Figure 18). The cost of basic commodities, such as water, and pest infestation, which affected food storage, were also found to be significant (10% and 8%, respectively). Loss of remittances or reduction in amounts received and serious illnesses were next in line, each affecting 6% of the households. Health epidemics negatively affected 5% of the households, while a lack of facilities for food storage, such as a refrigerator, impacted 4% of the households. Crime and violence as well as political problems affected equal numbers of households (4%).

FIGURE 18: Food Access Hazards in Previous Six Months



6. Food Sourcing and Consumption

6.1 Household Food Sources

Households were asked to list which retail outlets they had patronized in the previous year and how frequently they had done so. As Table 10 shows, the city's food markets had been patronized by three-quarters of the households, followed by small wholesalers (72%), and corner shops (66%). Supermarkets were also well-patronized by nearly two-thirds of households. Use of fast food outlets and restaurants was relatively high; a reflection of shifting food consumption patterns. As the Jamaican Food and Nutrition Security Policy notes, "the diet of a majority of the population has shifted away from locally grown produce, with limited foods of animal origin, to diets consisting of more processed and energy-dense foods, more of animal origin, and more added salt, sugars and fats. Unfortunately, these new food consumption patterns have meant a shift in consumer preferences towards nutritionally poor diets that have led to the increasing prevalence of obesity, and nutritional related non-communicable chronic diseases (NCDs) such as diabetes, hypertension, stroke, heart diseases and some forms of cancers"

(GOJ 2013: 3). Finally, close to one-third of households (29%) had purchased food from street vendors/hawkers; an indicator of the significance of the informal food sector in the city. With the exception of corner shops, which were patronized almost daily by 54% of households and at least weekly by 86%, all other outlets tended to be patronized with the same level of frequency. There was no significant difference, for example, in the frequency of patronage of supermarkets and other, less formalized, outlets.

TABLE 10: Retail Food Sources by Frequency of Access

Food sources	% of households patronizing source	At least five days per week	At least once per week	At least once per month	At least once in six months	At least once per year
Market	75.8	2.8	58.3	35.0	3.6	0.4
Wholesale (grocer, café, butchery, small shop)	72.8	5.9	46.8	44.0	2.9	0.4
Corner shop/community shop	65.8	54.3	32.0	10.4	1.9	1.3
Supermarket	64.8	7.0	47.5	40.7	4.2	0.7
Fast food, takeaway	43.7	9.1	39.4	38.8	10.4	2.3
Restaurant	34.0	10.9	36.0	39.7	10.0	3.3
Street vendor/hawker	28.6	16.4	42.8	29.4	10.0	1.5

Table 11 shows that non-market food sources are also of importance for a minority of households. Food sharing within communities is important to almost one-third of households, as are rural-urban transfers for one-quarter. Another source of food for 21% of households is food remittances from outside the country, although these transfers take place only once or twice per year. Relatively unimportant sources of food for the surveyed households include urban agriculture (8% of households), growing their own food in rural areas (6%), food at work (4%), and school feeding (2%).

TABLE 11: Non-Market Food Sources by Frequency of Access

Food sources	% of households patronizing source	At least five days per week	At least once per week	At least once per month	At least once in six months	At least once per year
Shared meal with neighbours and/or other households in the community	30.3	14.1	29.1	33.3	17.4	6.1
Food sent by relatives in rural areas in Jamaica	24.6	0.6	7.5	45.7	31.2	15.0
Food sent by relatives in urban areas of other countries	21.1	0.0	0.7	7.4	32.4	59.5
Food provided by neighbours and/or other households in the community	15.2	10.3	24.3	40.2	20.6	4.75

Household grows food in urban areas	7.5	1.9	11.3	26.4	52.8	7.6
Household grows food in rural areas	5.7	5.0	10.0	62.5	15.0	7.5
Food sent by relatives in rural areas of other countries	4.7	0.0	0.0	36.4	39.4	24.2
Food provided at work	4.0	75.0	10.7	7.1	7.1	0.0
Food sent by relatives in other cities or towns in Jamaica	3.7	0.0	0.0	46.2	42.3	11.5
Livestock owned by household	3.3	8.7	4.4	39.1	43.5	4.3
Food sent by relatives in another suburb/community of Kingston	3.0	4.8	14.3	23.8	47.6	9.5
Community food kitchen	2.8	0.0	75.0	15.0	10.0	0.0
Begging	2.7	10.5	26.3	47.4	10.5	5.3
Borrow food from others	2.6	0.0	27.8	33.3	22.2	16.7
Food provided to children at school	2.4	70.6	23.5	5.9	0.0	0.0

6.2 Food Purchases Matrix

The Hungry Cities Food Purchases Matrix (HCFPM) allows for a more fine-grained analysis of aggregate household consumption through an item-by-item examination of volume of purchase, location of purchase (in terms of type of retail location and spatial positioning), and frequency of purchase (Crush and McCordic, 2017). Table 12 shows the proportion of surveyed households that purchased each item in the previous month and the type(s) of outlet where the item was purchased. The shaded cells represent items purchased by over 40% of households at the given retail source.

The most commonly purchased foods in Kingston are rice, sugar, and cooking oil, all of which had been purchased by over 80% of surveyed households in the month prior to the survey. Other grain products, such as brown (63%) and white (48%) bread and cereals (45%), are purchased by many households. Chicken is definitely the preferred meat – as compared to organ meat, fish, and other meat – but is most commonly purchased in frozen (67%) rather than fresh (24%) form. Canned meat is also relatively popular (54%). Fresh and cooked vegetables, roots and tubers, and green bananas and breadfruit are important parts of household diets, purchased by around two-thirds of households. Fruits were purchased by just over half of the households. Powdered milk is more commonly purchased than fresh milk, while over half of households buy eggs. The most commonly purchased snacks are crisps and Niknaks, as compared to buns, cakes, sweets, and french fries.

TABLE 12: Household Food Purchases by Food Source

	% of households buying item	Supermarket	Wholesaler	Butchery/ bakery	Takeaway	Restaurant	Formal market	Informal market	Corner shop	Street vendor
Rice	87.0	44.4	44.2	0.2			0.8	0.3	28.2	0.3
Sugar	84.0	44.1	43.6	0.2			0.2	0.2	28.8	0.3
Cooking oil	81.8	44.8	43.2	0.7			0.4		26.5	0.5
Frozen chicken	66.5	31.5	32.1	23.3			1.7	1.1	27.2	1.3
Vegetables	65.5	26.3	3.7				69.6	7.6	6.5	2.8
Roots and tubers	64.5	10.2	1.3				74.2	10.8	8.8	7.5
Brown bread	63.1	51.0	22.1	9.7			0.2	0.2	28.2	2.5
Green bananas, breadfruit	59.8	7.4	1.9		0.1		41.6	7.3	6.3	5.3
Eggs	59.3	39.2	26.9	6.0			3.1	2.6	23.8	10.1
Snacks	54.3	52.5	32.8	2.4				0.3	27.8	1.3
Fruits	54.3	27.3	2.9	0.3			66.1	7.4	3.4	10.0
Canned meat	53.8	44.7	43.1				0.5	0.3	31.2	0.5
Powdered milk	52.6	49.6	41.7						24.4	0.3
Tea/coffee	50.9	58.3	35.0				0.8	0.3	16.8	0.6
White bread	48.0	40.7	23.7	9.2			0.9		40.7	2.4
Cereals	44.9	61.3	39.1					0.3	10.5	0.3
Buns, sugar buns, cakes	38.7	53.7	18.8	6.6		0.4		0.4	29.4	4.0
Kidney, liver, tripe	36.3	20.4	28.2	34.9	0.4	0.0	1.6	0.0	27.8	0.0
Patty, sow bow, pies	33.3	0.9	0.9	17.5	59.4	25.6		0.4	7.7	0.9
Fresh fish	31.9	14.7	11.2	17.4		0.9	12.5	12.5	11.2	33.0
Pasta	30.8	63.4	35.2		0.5	0.9		0.5	13.9	0.0
Frozen fish	30.1	37.9	27.0	24.2			2.8	3.8	10.0	8.1
Corn meal	29.2	49.9	43.1				0.2	0.2	24.1	0.2
Fresh milk	27.2	59.7	23.0				0.1	0.1	22.5	3.1
Canned vegetables	25.1	71.0	30.7				2.2	1.1	12.5	
Fresh chicken	24.1	31.4	24.2	27.8			4.1	1.8	18.3	7.1
French fries	21.5	30.5	12.6	3.3	23.8	31.8			17.2	2.0
Dumplings, festivals, bammy	20.8	38.4	21.2	1.4	2.7	15.1	3.4	0.7	18.5	9.6
Sweets, chocolate	19.2	57.0	10.4						45.9	2.2
Frozen meat	19.1	41.0	37.3	23.9			3.7	1.5	16.4	
Fresh meat	13.0	30.8	24.2	35.2			5.5	1.1	17.6	2.2
Cooked chicken	13.5	12.6	2.1		22.1	54.7		1.1	22.1	5.3
Canned fruit	6.6	71.7	23.9				2.2	2.2	10.9	2.2
Cooked fish	6.1	16.3	2.3		14.0	60.5	2.3	7.0	7.0	2.3

Note: Multiple-response question

Table 12 also shows where households purchased each item in the previous month. Supermarkets were the most important source for 22 of the 34 different food items, including all cereal products, canned foods, and processed food. However, in the case of many products - including rice, sugar, cooking oil, canned meat, powdered milk and corn meal – the proportion of households purchasing from wholesalers was very similar. And, in fact, there are no products purchased at supermarkets that are not also purchased from wholesalers. Similarly, some households purchase all of the products on the list from corner shops. In the case of two items – white bread and sweets/chocolates – corner shops command an equal or greater proportion of custom. Overall, this suggests that supermarkets enjoy a dominant position in the city's food system but that there is significant competition for customers between supermarkets, wholesalers and corner stores.

The main exceptions to these purchasing patterns concern cooked food (which is primarily purchased at restaurants and takeaways), fresh produce, and fish. Formal markets are the important source for roots and tubers (patronized by 74% of surveyed households), fresh vegetables (70%), fresh fruit (66%), and green banana and breadfruit (42%). However, some households do obtain their fresh produce from other outlets. For example, around a quarter of households also shopped for fresh vegetables and fruit at supermarkets. Of these, the majority were from upper income quintiles. Although quintiles 4 and 5 accounted for only 7% each, these quintiles represent a considerable proportion of the persons who shopped for vegetables and fruits at the supermarket. Quintiles 4 and 5 collectively accounted for 67% who obtained vegetables from the supermarket and 62% of those who obtained fruits from the supermarket. The preference among higher income households for these locations may be related to the comparatively lower consideration for differences in the cost of these commodities between supermarkets and other sources such as formal markets and vendors. Convenience may therefore be a greater consideration than cost as many other items are sourced at supermarkets.

With the exception of frozen meat and canned vegetables, at least some households buy every product from street vendors. However, the proportion doing so is generally small (10% or less). The only product in which street vendors appear to command a significant market share is fresh fish (patronized by exactly a third of households). It was also clear that choice of food source had a distinctive spatial expression. Areas within the neighbourhood or within walking distance represented the most commonly cited access point for most food items. Over 40% of the sample accessed nearly all food types from these areas. The exceptions to this pattern were fruits, vegetables, green bananas, breadfruit, roots and tubers, which residents tended to purchase Downtown, Kingston. Downtown, Kingston, houses the largest produce market in the county and acquisition of these commodities at this site may be explained by the pervasive perception that items such as fruits, vegetables and other forms of produce are more affordable relative

to other locations such as supermarkets, community/corner shops or other locations within or outside the city.

The high level of purchase from nearby locations may also suggest high levels of geographical access to food in the city. Many of the communities sampled have facilities such as corner shops or wholesalers or are in close proximity to outlying business districts established to serve the needs of nearby communities. Such locations contain a diversity of food purchasing outlets including supermarkets, restaurants and wholesalers, which several respondents cited as important purchase locations.

FIGURE 19: Typical corner shop located in many lower-income neighbourhoods in Kingston

Source: Elizabeth Thomas-Hope

FIGURE 20: Typical supermarket located on the outskirts of several neighbourhoods in Kingston

Source: Robert Kinlocke

FIGURE 21: Coronation Market, Kingston

Source: https://www.pinterest.com/pin/263390278179386801/

FIGURE 22: Street Food Vendors in Kingston CBD

Source: https://goodnewsjamaica.com/culture/kingston-vibes/

FIGURE 23: Jerk Chicken Street Vendor in Kingston

Source: https://www.pinterest.com/pin/482729653783846597/

FIGURE 24: Wholesale Store in Kingston

Source: http://www.traveladventures.org/continents/americas/kingston-market04.html

Areas outside the city were the least commonly cited places of obtaining food. This directly relates to the fact that urban locations provide extensive food purchasing options, which effectively diminishes the magnetism of areas further away. It also suggests that levels of food-based remittances from rural to urban households may be relatively low. Interestingly, the acquisition of cooked fish slightly differed from other patterns. Compared to other food items, cooked fish reflected a greater level of access from areas outside Kingston (12%) and other shopping areas within Kingston (42%). This may be explained by the popularity of fishing communities such as Helshire Beach, located outside of Kingston, and Port Royal, located within Kingston. The consumption of fish in these communities represents a very popular mode of engagement. The areas are renowned for selling tasty fish meals and are often preferred sites for dining out.

TABLE 13: Spatial Location of Household Food Sources

	Within neighbourhood (walking distance)	On way to and from work	Historical centre / Downtown	Other shopping area	Outside Kingston
Rice	62.4	3.3	26.4	21.3	2.5
Sugar	61.5	2.0	25.8	21.0	2.0
Cooking oil	60.1	2.6	23.7	22.8	3.0
Frozen chicken	63.6	3.2	24.2	22.5	2.6
Vegetables	31.5	1.3	68.0	13.7	1.5
Roots and tubers	27.6	0.7	68.4	8.6	3.1
Brown bread	69.5	2.9	13.8	22.6	2.9
Green bananas and breadfruit	32.6	1.0	66.0	9.3	3.8
Eggs	65.6	2.9	20.9	15.9	4.6
Snacks	63.8	2.6	21.3	22.6	2.9
Fruit	32.3	4.5	59.3	16.0	3.4
Canned meat	63.8	4.0	25.1	22.2	2.1
Powdered milk	61.0	1.9	22.5	23.6	1.9
Tea/coffee	58.3	3.4	22.7	25.5	4.2
White bread	70.9	3.3	16.0	22.0	2.1
Cereals	49.8	3.2	23.8	31.4	2.5
Buns, sugar buns, cakes	61.2	1.6	10.5	24.0	1.6
Kidney, liver, tripe	61.2	2.4	29.8	20.8	3.1
Patty/sow bow/pies	45.7	10.3	32.1	36.3	4.7
Fresh fish	54.9	2.7	29.0	13.4	8.9
Pasta	56.5	2.8	21.8	29.2	2.8
Frozen fish	50.2	3.8	25.1	27.5	2.4
Corn meal	55.5	4.1	19.2	25.3	7.5
Fresh milk	62.8	2.6	17.3	24.6	3.7
Fresh chicken	62.7	2.4	23.7	14.2	10.7
Canned vegetables	55.1	2.3	21.0	33.0	4.0
Dumplings, festivals, bammy	55.5	4.1	19.2	25.3	7.5
French fries	63.6	6.6	17.2	33.1	7.3
Sweets, chocolate	78.5	2.2	8.9	24.4	3.0
Frozen meat	49.3	2.2	38.1	22.4	2.2
Cooked chicken	61.1	12.6	8.4	30.5	3.2
Fresh meat	64.8	2.2	29.7	12.1	2.2
Canned fruit	43.5	2.2	23.9	32.6	6.5
Cooked fish	48.8	11.6	7.0	41.9	11.6

Note: Multiple-response question

In general, food items were most commonly purchased at least once per week. Canned products, tea/coffee, and cooking oil were purchased less frequently than other products; probably because these items have a longer shelf life than most other commodities. At least 60% of the surveyed households purchased fresh vegetables and white bread at least once per week, which may be explained by the comparatively short shelf-life along with the high demand for these foods that form part of many meals. It must also be noted that although no food item was commonly purchased five days per week, cooked chicken, snacks, sweets and chocolates were more frequently represented in this category relative to other foods. This observation may be explained by the ease of access, low cost and convenience of obtaining these items, which are particularly popular as daytime snacks or lunches.

The data on food purchase frequency also suggests that many items were also purchased less often than twice per month. This was the second most commonly cited purchase frequency and potentially suggests the practice of monthly bulk purchase for many commodities. This appears to be a common practice among households, which may have been catalyzed by the emergence of large wholesale/retail membership clubs that offer lower prices for bulk purchases. The most prominent of these entities is Pricesmart, which offers competitively priced bulk commodities to members who pay an annual fee. This company has reported significant growth in sales since it opened in 2003 and recent reports indicate that annual sales have doubled projections (Bennett 2017).

TABLE 14: Frequency of Purchase of Food Items

	At least 5 days per week	At least once per week	At least twice per month	At least once per month
Rice	11.1	43.9	20.0	25.0
Sugar	3.1	44.1	24.4	28.5
Cooking oil	4.2	36.2	25.6	34.0
Vegetables	3.0	60.0	22.0	15.0
Frozen chicken	4.9	54.6	22.7	17.8
Roots and tubers	2.9	56.3	22.5	18.3
Brown bread	4.1	63.4	21.7	10.8
Green bananas and breadfruit	3.3	56.9	20.5	19.3
Eggs	5.5	46.9	21.9	25.7
Snacks	16.8	47.5	15.7	19.9
Fruits	6.8	58.0	18.6	16.5
Canned meat	6.6	39.9	22.5	31.0
Powdered milk	8.4	45.8	22.2	23.6
Tea/coffee	6.4	26.1	17.9	49.6
White bread	4.7	62.9	22.3	10.1
Corn meal	1.9	29.0	29.0	40.1
Cereals	1.3	30.2	28.6	40.0

Buns, sugar buns, cakes	6.3	43.8	19.5	30.5
Kidney, liver, tripe	2.0	32.5	27.1	38.4
Patty/sow bow/pies	9.0	40.2	24.8	26.1
Fresh fish	5.4	36.6	27.2	30.8
Pasta	3.7	25.0	23.1	48.1
Frozen fish	1.4	34.1	26.1	38.4
Fresh milk	4.2	46.1	27.7	22.0
Fresh chicken	5.3	47.9	20.7	26.0
Canned vegetables	1.1	28.4	24.4	46.0
Dumplings, festivals and bammy	2.7	37.7	19.2	40.4
French fries	1.3	51.0	17.2	30.5
Sweets, chocolate	20.0	31.9	15.6	32.6
Frozen meat	4.5	47.8	19.4	28.4
Cooked chicken	12.6	48.4	18.9	20.0
Fresh meat	6.6	45.1	34.1	14.3
Canned fruit	0.0	34.8	23.9	41.3
Cooked fish	4.7	23.3	30.2	41.9

6.3 Attitudes to Supermarkets

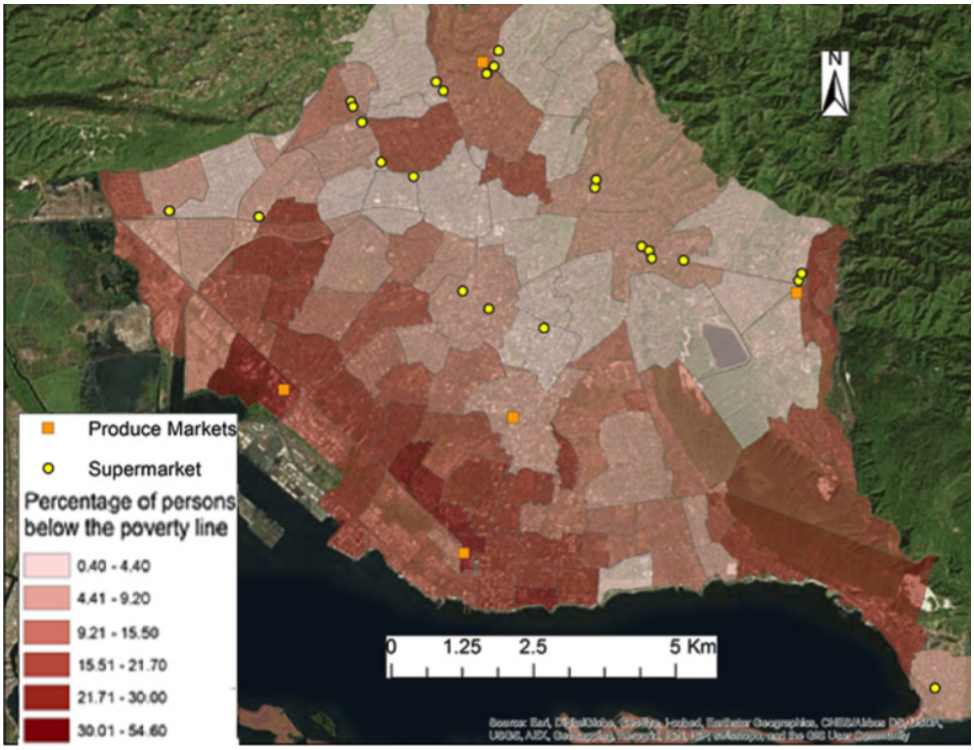
As Table 15 shows, two-thirds of surveyed households obtain some of their food from supermarkets. In light of debates about the nature of the supermarket revolution in the Global South, it is important to establish why consumers patronize these outlets in Kingston. The main reasons given by those who patronize supermarkets were that supermarkets offer greater variety (with 93% in agreement), that food can be bought in bulk at supermarkets (71%) and that the food is better quality (65%). Only one-quarter said that food was cheaper at supermarkets, which suggests that cost is not a significant factor in explaining patronage.

The primary reasons for not shopping at supermarkets include that they do not provide goods on credit (mentioned by 79%), are too expensive (70%) and too far away (56%). Over 40% also agreed with the proposition that supermarkets are only for the wealthy. In terms of the distance factor, many of the city's largest supermarkets are indeed located in areas far from poor neighbourhoods (Figure 25). Poorer areas tend to be more commonly served by produce markets and corner shops.

TABLE 15: Attitudes to Shopping at Supermarkets

	Agree	Disagree	Neither
Supermarkets have a greater variety of foods	93.4	3.3	3.3
We can buy in bulk at supermarkets	71.0	21.2	7.8
Food is better quality at supermarkets	64.8	15.6	19.6
Food is cheaper at supermarkets	27.6	55.5	16.9
Non-shoppers			
Supermarkets do not provide credit	79.4	15.9	4.7
Supermarkets are too expensive	70.3	18.4	11.3
Supermarkets are too far away	55.5	38.7	5.8
Supermarkets are only for the wealthy	44.3	49.8	5.9
Supermarkets do not sell the food that we need	13.0	81.7	5.3

FIGURE 25: Location of Supermarkets in Kingston



6.4 Attitudes to Urban Agriculture

As noted above, only 10% of the surveyed households in Kingston are involved in urban agriculture. The main reasons for the non-participation by most households were that they would be victims of theft (70% in agreement), that it was easier to buy food than grow it (60%), that they did not have land on which to grow food (59%), that they did not have the time or labour (47%), and that they

did not have access to relevant inputs (45%) (Table 16). Only one-third said they had no interest in urban agriculture and even fewer believed that farming was only for rural people.

TABLE 16: Attitudes to Urban Agriculture

	Agree (%)	Disagree (%)	Neither (%)
People would steal whatever we grow	70.2	21.5	8.3
It is easier to buy our food than grow it	60.3	31.0	8.7
We have no land on which to grow food	59.4	37.5	3.2
We do not have the time or labour	47.1	45.3	7.6
We do not have access to inputs (seeds, water, fertilizer)	44.8	48.4	6.8
We have no interest in growing food	32.8	61.9	5.3
We lack the skills to grow food	32.2	62.3	5.5
Farming is for rural people only	13.3	84.4	2.3

Of the 123 households that did participate in urban agriculture, 92% did so on their own housing plots. External spaces such as roadsides, river beds, urban forests, and industrial sites were not used by any households in the sample. The most common crops were vegetables (grown by 46% of participants) and fruits (36%). These patterns align well with anecdotal observations of the city where fruit trees and small vegetable gardens are common sights. Keeping livestock in the city is rare. Of the 29 households that do so, 62% keep chickens.

6.5 Social Grants

Jamaica's food stamp programme supports nutrition for children, replacing the food subsidy programme of the early 1990s (Thomas-Hope et al 2017). In 2002, the food stamp program was amalgamated with the broader Programme of Advancement through Health and Education (PATH). PATH provides small cash transfers to low-income citizens, focusing on improving school attendance and the nutrition of children in the poorest families and increased use of preventative health care. In 2014, the Government of Jamaica initiated a social protection strategy intended to address issues of poverty and social exclusion, including food insecurity, through support mechanisms for small farmers and school gardens (PIOJ 2007). This mainly rural programme is of less significance in the Kingston urban context. The most important social security safety net for older Jamaicans is the old-age pension. However, government pension payments are contingent on individuals and their employers having paid into the National Insurance Scheme during their working life. Given that many in Kingston's poor communities do not work consistently and therefore never pay into the scheme, in old age they are faced with destitution or total dependence on their families.

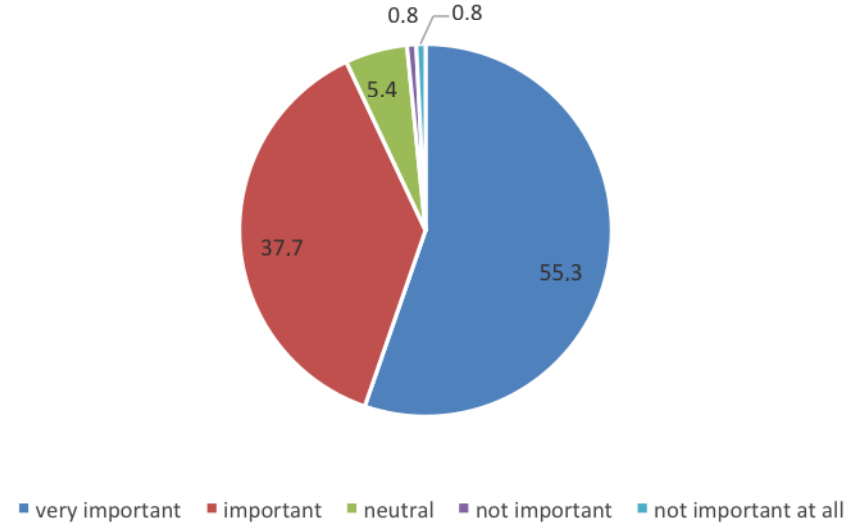
The Kingston survey found that around three-quarters of surveyed households do not receive any social grants. A mere 3% received social grants for children, while 16% received old-age pensions.

The amount of social grant support received was, on average, JMD24,438 per month and ranged from JMD1,500 to a maximum of JMD165,000. Two-thirds of the grant recipients used the funds to purchase food for the household (Table 17). The next highest usage was utility costs (39% of grant recipients) and medical expenses (31%). More than half (55%) of recipients indicated that the funds were "very important", and more than one-third (38%) that they were "important" in supporting the food security of their households. Only a small minority stated that they were of little or no importance to household food security (Figure 26).

TABLE 17: Uses of Social Grants

	% of recipients
Purchase food/groceries for household	64.6
Pay utilities	38.9
Pay medical expenses	31.3
Pay education expenses	15.3
Buy household items	13.9
Buy clothing	6.9
Savings	6.9
Pay debts	4.2
Gifts	2.8
Note: Multiple-response question	

FIGURE 26: Importance of Social Grants for Food Security



7. Conclusion

The sampled Kingston households represent a spatially and socially diverse group. Although their experience with poverty varies, these differences align fairly closely with patterns of food security. Overall, the city of Kingston appears to have relatively low levels of food insecurity, but such a general observation obscures micro-scale variations that potentially present severe challenges at the neighbourhood level. Experiences with food insecurity also vary depending on the temporal scale utilized in the metric. The MAHFP, which uses months of the year as the reference period, produced more homogenous results, indicating that most households do not experience sustained periods of food insecurity. By contrast, the HFIAS, which is more sensitive to micro-temporal variations by using a four-week reference period, reveals a higher prevalence of food insecurity in the city.

Several variables may be at play in determining levels and types of food security. In just under half of the households surveyed, for example, restrictions in food quantity means that they are at least occasionally deprived of one or more meals because of a lack of resources. This may be related to the diffusion of income across various obligatory expenses, family structures with high dependency ratios, and the sudden onset of diminished income due to job loss or death of an income earner. Income seems directly associated with lower levels of food insecurity, but it is also important to understand the potential role of intervening variables that may moderate the relationship between income and food security. Households with diminutive incomes, high expenditures, and high dependency ratios are particularly vulnerable to the impact of food access hazards. The fact that the greatest levels of dietary diversity were found in nuclear households and extended-family structures possibly reflects the benefits of combined incomes and even the role that social capital may play in enhancing food security.

Food purchasing practices are generally characterized by a high level of frequency from a variety of sources, including supermarkets, corner shops, and produce markets. Produce markets tend to be more popular among lower-income earners but are extensively used by the general population. Respondents in higher-income brackets are more dependent on supermarkets, which are generally distributed across middle-class neighbourhoods, yielding distinctive spatial patterns. Within Kingston, the practice of informal food access appears to be very common, given the high level of dependency on food from street vendors and corner shops, many of which operate within the informal sector. The informal economy therefore contributes significantly to food security in the city. The process of supermarketization appears to be spatially countered by the presence of these informal sources that cater extensively, but not exclusively, to low-income households in the city.

An alternative, but relatively underrepresented, pathway for food access was engagement in urban agriculture. This was not commonly practiced even though attitudes towards the activity were generally positive. These attitudes may provide opportunity for the promotion of more sustainable urban living through the use of foods grown in urban gardens to supplement existing food sources. However, land shortages remain a major constraint on expanding urban agriculture.

While this report provides some comprehensive analyses regarding household food security and social vulnerability, its findings also provoke more questions. It would be interesting to probe deeper, possibly through a disaggregation of the data at the community level. This approach may allow for more insight into the experiences of the city's most vulnerable residents. More work is also needed on the extent to which food hazards exacerbate existing vulnerabilities and compound the lived poverty experience. A conceptual frame and rigorous methodological tool that could be used to identify existing vulnerabilities and specifically target households at greatest risk should be developed. Currently, national grant schemes tend to compensate based on an evaluation of long-term or pervasive conditions and there are limited provisions for circumstances in which households experience sudden shocks that impact incomes and livelihoods.

References

1. Bennett, K. (2017). Pricesmart seeks second location in Jamaica. At: http://www.jamaicaobserver.com/business/Pricesmart-seeks-second-location-in-Ja_94328 (Kingston: *The Jamaica Observer*).

2. Bilinsky, P. and Swindale, A. (2007). *Months of Adequate Household Food Provisioning (MAHFP) for Measurement of Household Food Access: Indicator Guide* (Washington DC: FANTA).

3. Central Intelligence Agency (2018). *The World Fact Book.* At: https://www.cia.gov/library/publications/the-world-factbook/geos/jm.html

4. Clarke, C. (2006). *Kingston, Jamaica: Urban Development and Social Change, 1692-2002* (Kingston: Ian Randle Publishers).

5. Coates, J., Swindale, A. and Bilinsky, P. (2007). *Household Food Insecurity Access Scale (HFIAS) for Measurement of Food Access: Indicator Guide* (Version 3) (Washington, DC: FANTA).

6. Frayne, B. and McCordic, C. (2015). "Planning for Food Secure Cities: Measuring the Influence of Infrastructure and Income on Household Food Security in Southern African Cities" *Geoforum* 65: 1-11.

7. Gamble, D., Campbell, D., Allen, T., Barker, D., Curtis, S., McGregor, D. and Popke, J. (2010). "Climate Change, Drought and Jamaican Agriculture: Local Knowledge and the Climate Record" *Annals of the Association of American Geographers* 100: 880-893.

8. Grosh, M. (1992). "The Jamaican Food Stamps Programme: A Case Study in Targeting" *Food Policy* 17: 23-40.

9. Haysom, G. and Tawodzera, G. (2018). "Measurement Drives Diagnosis and Response: Gaps in Transferring Food Security Assessment to the Urban Scale" *Food Policy* 74: 117-125.

10. McMaster, R. and McMaster, S. (2002). "A History of Twentieth-Century American Academic Cartography" *Cartography and Geographic Information Science* 29: 305-321.

11. McDonald, S. (2002). "The Jamaica Food Stamp Programme: The Beneficiaries' Viewpoint" *Social and Economic Studies* 51: 211-241.

12. Levy, D. and Ohls. J. (2007). *Evaluation of Jamaica's PATH Program: Final Report* (Washington, DC: Mathematica Policy Research Inc).

13. Pemberton, C., Patterson-Andrews, H., De Sormeaux, A. (2016). "The Effects of Trade Liberalization on Dairy Trade and Domestic Milk Production in CARICOM" *International Food and Agribusiness Management Review* 19(B): 125-146.

14. PIOJ (2014). *Economic and Social Survey Jamaica 2014 Overview.* At: http://www.pioj.gov.jm/Portals/0/Social_Sector/ESSJ%202014%20

15. STATIN (Statistical Institute of Jamaica) (2011). *Census of Population and Housing*. At: http://statinja.gov.jm/Census/PopCensus/Popcensus2011Index.aspx

16. Swindale, A. and Bilinsky, P. (2006). "Development of a Universally Applicable Household Food Insecurity Measurement Tool: Process, Current Status, and Outstanding Issues" *Journal of Nutrition* 136: 1449S-1452S.

17. Thomas-Hope, E., Kinlocke, R., Ferguson, T., Heslop-Thomas, C. and Timmers, B. (2017). *The Urban Food System of Kingston, Jamaica* HCP Report No. 4, Cape Town and Waterloo.

18. World Bank (2018). "Personal remittances received (% of GDP)". At: https://data.worldbank.org/indicator/BX.TRF.PWKR.DT.GD.ZS?locations=JM

This report presents the findings of a household food security survey in Kingston, Jamaica, and bases its analysis on emergent patterns related to various food security measures, spatial and temporal dimensions of food access, perceptions of supermarkets, practices of urban agriculture, and access to social grants. The sampled Kingston households represent a spatially and socially diverse group. Although their experience with poverty varies, these differences align fairly closely with patterns of food security. The city of Kingston appears to have relatively low levels of food insecurity, but such a general observation obscures micro-scale variations that potentially present severe challenges at the neighbourhood level. Households with diminutive incomes, high expenditures, and high dependency ratios are particularly vulnerable to the impact of food access hazards. In the six months prior to the survey, food prices had restricted access to certain types of food at least once per month in two-thirds of the households surveyed. A conceptual frame and rigorous methodological tool that could be used to identify vulnerabilities and specifically target households at greatest risk should be developed. Currently, national grant schemes tend to compensate based on an evaluation of long-term or pervasive conditions and there are limited provisions for circumstances in which households experience sudden shocks that impact incomes and livelihoods.

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