Food Insecurity, Food Sourcing and Food Coping Strategies in the OOO Urban Corridor, Namibia

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INTRODUCTION

The world is rapidly urbanizing, with half the global population estimated to be living in cities and towns by 2050 (UN-DESA, 2018). Namibia was already 50% urbanized in 2018, a figure projected to rise to 62% by 2030.

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While the African continent has witnessed a rise in megacities such as Lagos and Kinshasa, with populations in excess of 10 million, much of the growth is taking place further down the urban hierarchy. The challenges that follow rapid urbanization in large cities, including rising poverty and food insecurity, and the mushrooming of marginalized people on the urban fringes, are also being replicated in smaller towns and cities (Irham, 2012; Knorr et al., 2018). Lack of access to food presents a particular challenge for sustainability in secondary cities. Hunger and poverty are intrinsically linked, with the urban poor spending a large proportion of their income on food (Chung & Myers, 1999; UNCTAD, 2008). Food insecurity is also closely tied to health and nutrition (Hassan, 2017; Sassi, 2018), quality of life (Casey et al., 2005; Moafi et al., 2018; Sharkey et al., 2011) and general well-being (Frongillo et al., 2017; Jaron & Galal, 2009). Various coping strategies are commonly used as fallback mechanisms for dealing with insufficient food supplies (Farzana et al., 2017; Maxwell et al., 1999; Shariff & Khor, 2008). Long-term coping strategies include selling assets to meet food demands, which may leave the household even more vulnerable to future shocks (Heltberg et al., 2012; Miller et al., 2010).

Common measures of food insecurity include the Household Food Insecurity Access Scale (HFIAS), the Household Food Insecurity Access Prevalence (HFIAP), the Household Dietary Diversity Score (HDDS) and the Months of Adequate Household Food Provisioning indicator (Sassi, 2018; Swindale & Bilinsky, 2006). While the HFIAS and HFIAP are the most widely used indicators in the literature, dietary diversity is critically important because of its linkages to nutrition insecurity (Hassan, 2017). The association between food insecurity, dietary diversity and food sources has been increasingly examined. Various studies have focused on the impact of formal food sources, especially the effect of supermarket expansion on food insecurity (Crush & Frayne, 2011; Heltberg et al., 2012; Peyton et al., 2015; Shariff & Khor, 2008). However, much less attention has been paid to the relationship between food and nutrition security, dietary diversity and food sources, especially in secondary cities. Similarly, the role of informal community social support systems is not highlighted in the mainstream literature on food security (Nyikahadzoi et al., 2013). These support systems include begging, food

sharing, borrowing from neighbours and food provisioning at schools or communal kitchens. Another emerging food security strategy is reliance on rural-to-urban food remittances, sent by either family or friends (Crush & Caesar, 2018; Frayne, 2010).

In this chapter, we unpack the food sources and coping strategies adopted by marginalized and low-income groups in three interlinked secondary cities in Namibia. The goal of the study was to assess the relationship between food insecurity, household characteristics and food sources in the northern urban corridor of Oshakati-Ongwediva-Ondangwa (OOO). This chapter also considers the use of household coping strategies in response to food insecurity in OOO. The first section of this chapter provides geographical context, information about the household survey methodology, and the descriptive and statistical modeling techniques used. The section also identifies and explains the food security, food sourcing and socio-economic variables and measures selected for analysis. The following section of this chapter presents the results of the statistical analysis, identifying which independent food sourcing and household variables are most closely associated with the odds of being food insecure, having low dietary diversity and needing to employ various coping strategies. This chapter concludes with reflections on the significance of the analysis for understanding why, despite considerable food system transformation, these levels remain extremely high.

Methodology

Study Context

The corridor towns of OOO are located in the northern part of Namibia (see Nickanor et al. [2019b] for further details). The combined population in 2020 was 114,472, increasing from 35,705 at independence in 1991. At the time of the 2011 Population and Housing Census, 21% of the houses were informal or semi-permanent. Rural-to-urban migration is the main contributing factor to growth, with 60% of the population born in rural areas (Nickanor et al., 2019a, b). The proportion of the population that is severely poor increased from 4.4% in 2009–2010 to 4.8% in 2015–2016 (Nickanor et al., 2019a, b). Administratively, all three towns

are located within Namibia's Oshana Region, with a total 2011 population of 176,674, of whom 45% were urban-based (NSA, 2014). Oshana Region is divided into 11 constituencies and includes the four corridor constituencies of Ondangwa, Ongwediva, Oshakati East and Oshakati West. Much of the surrounding countryside is communal land, where the population lives in scattered villages and primarily engages in the communal cultivation of staple crops such as pearl millet (*mahangu*), livestock-rearing and the harvesting of wild foods.

Selection of Participants

The research on which this chapter is based involved a representative household food security survey in the OOO Corridor in May 2017, using a two-stage stratified sampling design. At the first stage, 35 primary sampling units covering the entire corridor were selected. At the second stage, a fixed number of 26 households was selected in each of the sampling units. A total of 910 households were targeted for interview, and 853 household heads were actually interviewed, giving a response rate of 94%. The wide-ranging questionnaire from the African Food Security Urban Network—Food, Urbanization, Environment and Livelihoods project (AFSUN-FUEL)—was used and collected comprehensive data on household membership and characteristics, food security, food sources, dietary diversity and coping strategies. (For further details of the sampling strategy, see Nickanor et al. [2019b].)

Variables

A number of dependent variables of interest were chosen from the data set for further analysis. The first is food insecurity (defined as the prevalence of food inaccessibility in the four weeks prior to the survey). Three measures of food insecurity were calculated. First, for each household, the HFIAS and HFIAP were derived from a set of 9 questions that capture different aspects and the increasing severity of food insecurity. Here, we use a binary indicator (0 = food secure; 1 = food insecure) derived from the scores generated by the 9 questions. Second, dietary diversity was measured using the HDDS, which is based on the number of food groups consumed within the household in the previous 24h (Swindale & Bilinsky, 2006). The HDDS scale runs from 0 to 12, and a score is calculated for each household. An increase in the average number of different food

groups consumed provides a quantifiable measure of improved household dietary diversity. The HDDS scores were binned into two categories: more food diverse (6–12 on the HDDS) and less food diverse (1–5 on the HDDS). The third measure used was the reduced coping strategies index (CSI), which deploys 12 questions related to food unavailability. Respondents were asked the number of days per week that they applied each coping strategy and a mean score was obtained for each strategy. An overall average toward a value of 7 suggests the family was more food insecure, while a mean toward 0 indicates less food insecurity. A coping index was computed using the principal component technique and split into three categories: 1 = food secure; 2 = moderately food insecure; 3 = severely food insecure.

The primary explanatory variables used in the analysis include sources of food and the socio-economic characteristics of the respondent households, including sources of income, income level (as a categorical variable), informality (household in informal or formal housing), subjective and objective poverty measures (defined using the lived poverty index (LPI) and the income-based marginal poverty line, respectively), household size, type of household (female-centered, male-centered, nuclear, extended) and education level of the head of household. The LPI measures the frequency with which people experience shortages of basic necessities, including lack of water, cooking fuel, electricity and medical care (Mattes et al., 2016). LPI scores range from 0 to 4, with values close to 0 indicating availability of basic items, while high values suggest lack of one or more basic necessities. Types of household were binned into two categories: female-headed (all female-centred households) and male-headed (the other three types). Food sources were grouped into food categories: (a) rural-to-urban food transfers (from relatives or friends); (b) communal food sources, including shared meals with neighbours and/or other households in community, food provided by neighbours and/or other households in the community, community food kitchens (e.g., soup kitchen), borrowing food from others, food provided at work, food provided to children at school/creche (educare) and begging; (c) informal food sources (tuck shops and street vendors) and (d) formal food sources (supermarkets, small shops such as grocers, cafés and butcheries, fast food takeaways, restaurants and open markets). We generated a score for each household based on the number of sources used to access food in the previous month.

Analysis

Descriptive summaries using cross-tabulation of the three food insecurity outcomes and the four types of explanatory variables were first generated, and a chi-square test of association carried out. Second, since both food insecurity prevalence and household dietary diversity were binned into two categories, a binary logistic regression was fitted. Third, for the coping strategy outcome, the generated variable had more than two categories so multinomial logistic regression was used. In all three outcome models, we adjusted for socio-economic and food source variables. Significant associations between the response variables and the explanatory variables were assessed at $p < 0.005$.

RESULTS

Background Characteristics of the Sample

Of the sample of 853 households, two-fifths (40%) were female-centred (headed by a woman without a partner or spouse), while 19% were male-centred (headed by a man without a partner or spouse). Extended families comprising a couple with dependents, including children and other relatives, constituted 21% of the sample, and nuclear households of parents and their offspring accounted for only 16%. The average household size was 4.4 (standard deviation of 3.1). Half the surveyed households had members below the age of 25 years, and two-thirds of all household members were of working age (16 to 60 years).

Food Insecurity Prevalence and Household Dietary Diversity

Overall food insecurity prevalence was at 77% of households, while 65% reported a low dietary diversity score of five or fewer food groups consumed. Table 9.1 cross-tabulates the two food security indicators of food insecurity prevalence and greater dietary diversity with the four sets of independent variables. The table shows a positive relationship between food insecurity prevalence, food sources and socio-economic factors. More than 80% of households receiving rural-to-urban food transfers and sourcing food both communally and informally were in the food insecure prevalence category. Similarly, more female-headed households, informal housing households, marginally poor and low lived poverty households

Table 9.1 Cross-tabulation of food insecurity prevalence and household dietary diversity

Variable	Categories	Food insecurity prevalence % (n)	Household dietary diversity % (n)
Food sources			
Rural–urban transfer	1=Yes	80.7 (377)	38.8 (178)
	0=No	72.6 (277)	30.4 (112)
	χ^2_{df} (p-value)	**7.78 (p = 0.003)**	**6.25 (p = 0.012)**
Communal food sources	Yes	85.9 (73)	34.1 (28)
	No	76.2 (582)	34.9 (262)
	χ^2_{df} (p-value)	**4.09 (p = 0.043)**	**0.18 (p = 0.89)**
Informal food sources	Yes	84.8 (196)	39.2 (89)
	No	74.3 (459)	33.2 (201)
	χ^2_{df} (p-value)	**10.7 (p = 0.001)**	**2.65 (p = 0.061)**
Formal food sources	Yes	76.9 (644)	35.2 (290)
	No	91.7 (11)	0 (0)
	χ^2_{df} (p-value)	**1.46 (p = 0.023)**	**5.95 (p = 0.015)**
Socio-economic Factors			
Female-headed household	Female	81.4 (276)	32.2 (107)
	Male	75.2 (233)	40.7 (124)
	χ^2_{df} (p-value)	**3.74 (p = 0.033)**	**4.88 (p = 0.017)**
Housing type	Formal	73.4 (398)	42.3 (225)
	Informal	84.0 (252)	21.8 (64)
	χ^2_{df} (p-value)	**12.25 (p < 0.001)**	**35.1 (p < 0.001)**
Marginal poverty*	Poor	85.9 (55)	11.3 (7)
	Otherwise	78.6 (485)	36.0 (219)
	χ^2_{df} (p-value)	**1.89 (p < 0.001)**	**15.33 (p < 0.001)**

(continued)

Table 9.1 (continued)

Variable	Categories	Food insecurity prevalence % (n)	Household dietary diversity % (n)
Lived poverty index	< 1.00	64.8 (273)	45.9 (188)
	1.01–2.00	93.4 (155)	34.8 (57)
	2.01–3.00	100 (60)	21.7 (13)
	3.01–4.00	100 (16)	0 (0)
	χ^2_{df}(*p*-value)	**80.3 (*p* < 0.001)**	**26.9 (*p* < 0.001)**
Net income	< = N$1100.00	89.2 (141)	17.4 (77)
	1101.00–2100.00	84.7 (100)	19.7 (23)
	2101.00–4200.00	85.0 (113)	23.4 (31)
	4201.00–12,000.00	76.5 (114)	42.9 (63)
	N$ 12,001.00 +	58.5 (72)	67.2 (82)
	χ^2_{df}(*p*-value)	**47.24 (*p* < 0.001)**	**101.23 (*p* < 0.001)**

*Below the national lower-bound or severe poverty line (N$520.80 = US$40.1)

were food insecure than their male-headed, formal and less poor counterparts. As lived poverty increased in severity, so did food insecurity prevalence. There was a very clear relationship with income quintiles as food insecurity prevalence declined from 89% for households in the lowest quintile to 59% for households in the highest.

With regard to greater dietary diversity, there were again significant relationships, but this time between dietary diversity and food transfers from the rural areas and formal food sources. The reverse would also be true, with households that do not receive food transfers and that source food from communal and informal sources having low levels of dietary diversity. In addition, male-headed households, residents of formal housing and those households with better marginal poverty and lived poverty scores had more dietary diversity. Conversely, female-headed households, marginally poor households and those in informal settlements had low dietary diversity. As Table 9.1 shows, dietary diversity improved with income, with 17% of the lowest income quintile households in the more diverse category, compared with 67% of households in the highest income quintile.

Table 9.2 presents the results from the multiple binary regression on food insecurity prevalence as odds ratios (OR). An OR > 1 suggests increased odds of food insecurity, while an OR < 1 indicates a decreased likelihood of food insecurity. The odds of being food insecure are three times as high for households receiving rural-to-urban food transfers (OR = 3.16, 95% confidence interval (CI): 1.69–5.90) and sourcing food from informal sources (OR = 3.15, 95% CI: 1.25–7.98). They were also slightly higher for households relying on communal food sources (OR = 1.29, 95% CI: 0.24–6.94). Income level and poverty (severe and lived) were significantly associated with food insecurity. Households living in severe poverty were four times as likely to be food insecure than other households (OR = 4.02, 95% CI: 0.70–23.07), as were households in the lowest income quintile compared with households in the upper quintile (OR = 3.81, 95% CI: 3.81, CI: 0.89–16.27). In general, the odds of being food insecure declined with income. Informal housing residents also had increased odds of being food insecure. Female-headed households had marginally reduced risk of being food insecure compared to male-headed households. An important additional finding was that households receiving social grants were less likely to be food insecure (OR = 0.52, 95% CI: 0.28–0.88).

Table 9.2 Results from multiple logistic regression on food insecurity prevalence

Variable	Categories	Odds Ratio (OR)	95% CI for OR		p-value
Food Sources					
Rural–urban transfer	1=Yes	3.16	1.69	5.90	$p < 0.001$
	0=No	1.00			
Communal food sources	Yes	1.29	0.24	6.94	0.767
	No	1.00			
Informal food sources	Yes	3.15	1.25	7.98	0.015
	No	1.00			
Formal food sources	Yes	0.85	0.57	1.33	0.274
	No	1.00			
Socio-economic factors					
Female-headed household	Female	1.38	0.86	2.22	0.18
	Male	1.00			
Housing type	Formal	1.00			
	Informal	1.61	0.63	4.09	0.32
Marginal poverty	Poor	4.02	0.70	23.07	0.12
	Otherwise	1.00			
Social grants	Yes	0.52	0.28	0.88	0.041
	No	1.00			
Net income	< N$1,100	3.81	0.89	16.27	0.071
	1,101–2,100	2.09	0.70	6.18	0.182
	2,101–4,200	2.94	1.14	7.56	0.026
	4,201–12,000	2.44	1.09	5.43	0.029
	N$12,001+	1.00			
Lived poverty index		5.89	3.07	11.89	$p < 0.001$
Household size		1.18	1.04	1.27	0.203

Table 9.3 shows the results of the same multiple logistic regression with reference to dietary diversity and confirms some of the findings observed using chi-square tests in Table 9.1. For example, patronage of formal food sources was associated with increased odds of greater dietary diversity (OR = 1.66, 95% CI: 1.18–2.59, p = 0.015). Similarly, access to informal food sources was associated with a threefold increase in dietary

Table 9.3 Results for multiple logistic regression on high household dietary diversity

Variable	Categories	Odds Ratio (OR)	95% CI for OR		p-value
Food sources					
Rural–urban transfer	1 =Yes	1.14	0.58	1.47	0.45
	0=No	1.00			
Communal food sources	Yes	1.15	0.25	5.73	0.66
	No	1.00			
Informal food sources	Yes	3.14	1.29	7.36	0.015
	No	1.00			
Formal food sources	Yes	1.66	1.18	2.59	0.021
	No	1.00			
Socio-economic factors					
Female-headed household	Female	1.29	0.48	1.47	0.26
	Male	1.00			
Housing type	Formal	1.00			
	Informal	1.19	0.46	2.32	0.411
Marginal poverty	Poor	1.31	0.54	3.17	0.55
	Otherwise	1.00			
Social grants	Yes	1.36	0.49	3.73	0.54
	No	1.00			
Net income	<=N$1,100	0.25	0.11	0.54	0.031
	1,101–2,100	0.22	0.10	0.45	0.021
	2,101–4,200	0.23	0.12	0.48	0.075
	4,201–12,000	0.64	0.29	1.07	0.12
	N$12,001+	1.00			
Lived poverty index		0.78	0.44	0.98	0.05
Household size		0.79	0.67	0.94	0.024

diversity (OR = 3.14, 95% CI: 1.29–7.36, p = 0.021). However, use of communal food sources and rural-to-urban transfers did not significantly increase or decrease the odds of greater dietary diversity. Of the socio-economic variables, the most important factor increasing the chances of greater dietary diversity was net income; however, there was no significant

association with whether the household was female-headed (OR = 1.29, 95% CI: 0.48–1.47), nor whether it received social grants (OR = 1.36, 95% CI: 0.49–3.73), although there were increased odds of higher dietary diversity. The odds of more dietary diversity were reduced with increased lived poverty (OR = 0.78, 95% CI: 0.44–0.94) and increased household size (OR = 0.79, 95% CI: 0.67–0.94). While social grants were associated with less risk of food insecurity, they were not positively associated with more dietary diversity, which suggests that they may increase the quantity of basic staples consumed but do not lead to a more diverse diet.

Coping Strategies

The next set of tables examines the relationship between food-related coping strategies and the food source and socio-economic variables. We first calculated how many of the strategies each household had used in the previous seven days and a mean value for all households using each strategy. The closer the mean to 0, the lower the use of that strategy. An increase in the mean value indicates more frequent use of that strategy. Table 9.4 shows that the most important coping strategies overall were relying on less preferred and less expensive foods (2.67), reducing the number of meals eaten in a day (1.34) and limiting portion size at meal-times (0.98). Although these mean values seem quite low, the standard deviation suggests that significant numbers of households were using these strategies. For example, 70% of households relied on the coping strategy of reduced portions for five days in the week. Or again, about 70% of the households coped for close to four days in the week by reducing the number of meals eaten. Figure 9.1 identifies three levels of coping strategy use—low, moderate and intensive—and the variation in use of these strategies by food source. The highest level of use of coping strategies was observed among households obtaining food from community and informal food sources.

Table 9.5 explores the association between coping strategies and the food source and socio-economic variables, based on chi-square tests. As many as 70% of poor households fall into the intensive use category. In addition, 61% of households in the lowest income quintile fall into this category (compared to only nine percent in the upper quintile). Households in informal housing were also more likely to be using more coping strategies (52% versus 24% in formal housing). Roughly equal proportions of female- and male-headed households were in the intensive category, although fewer female-headed than male-headed households were using

Table 9.4 Coping strategy and mean/median number of days household applied them

Coping Strategy	Mean	Median	Standard Deviation	N
Relied on less preferred and less expensive foods	2.67	2	2.65	816
Had to borrow food, or rely on help from a friend or relative	0.52	0	1.43	770
Had to purchase food on credit	0.23	0	0.87	730
Had to gather wild food, hunt or harvest immature crops	0.11	0	0.63	684
Had to consume seed stock held for next season	0.12	0	0.75	674
Had to send household members to eat elsewhere	0.30	0	1.09	710
Had to send household members to beg	0.16	0	0.77	711
Had to limit portion size at mealtimes	0.98	0	1.97	778
Had to restrict consumption by adults in order for small children to eat	0.45	0	1.26	614
Had to feed working members of HH at the expense of non-working members	0.04	0	0.34	689
Had to reduce number of meals eaten in a day	1.34	0	2.35	785
Had to skip entire days without eating	0.55	0	1.32	776

the lowest level of coping strategy (25% versus 31%). In terms of food sources, 58% of households purchasing food from the informal sector were using coping strategies most intensely, followed by communal food sources (47%) and formal food sources (33 percent). Coping strategies were less strongly associated with rural-to-urban transfers, although 37% of households not receiving transfers fell into the intensive use category, compared to 30% of those receiving transfers, suggesting some benefit.

Table 9.6 shows the results from the multiple logistic regression analysis for the intensity of use of coping strategies. The greatest use of coping strategies is associated with informal food sources (OR = 4.61, 95% CI: 2.64–7.48), living in informal housing (OR = 2.82, 95% CI: 1.75–4.54), increased household size (OR = 1.56, 95% CI: 1.07–2.22) and lived poverty (OR = 2.74, 95% CI: 1.88–3.99). Those with monthly incomes
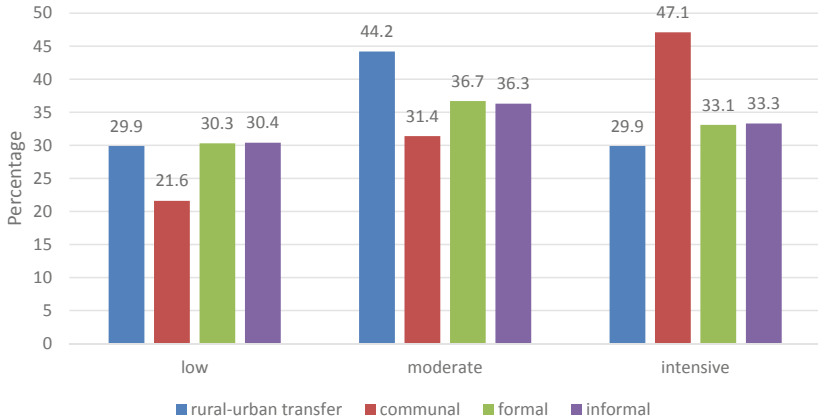
Fig. 9.1 Variation in coping strategies across food sources

of less than N\$1,100 were seven times more likely to use some coping strategy (OR = 7.12, 95% CI: 2.65–20.32). Those receiving an average income of N\$1,101–2,100 were five times more likely to use coping strategies (OR = 5.24, 95% CI: 1.84–14.57) than those with incomes higher than N\$12,000.00. The risk of having to use coping strategies decreases consistently with increasing income. Further, households that were deemed to be marginally poor were nearly four times more likely to use coping mechanisms than those deemed otherwise (OR = 3.94, 95% CI: 1.64–9.15). In addition, households that received rural-to-urban transfers proved to be less reliant on coping strategies than those that did not (OR = 0.78, 95% CI: 0.50–1.22). Those receiving social grants were more likely to deploy coping strategies than those that were not (OR = 1.13, 95% CI: 0.62–2.41), which is consistent with Namibia's social grant policy targeting the most vulnerable households.

CONCLUSION

The arrival of supermarket chains in the OOO Corridor over the last decade, as part of Namibia's supermarket revolution (Nickanor et al., 2019a), has fundamentally altered the food system of these secondary cities, lengthening food supply chains well beyond the local area and improving the diversity (although not necessarily the affordability) of food

Table 9.5 Coping severity by food sources and socio-economic factors

Variable	Categories	Coping strategy			Total
		Less	Moderate	Intensive	(n)
Food sources					
Rural–urban transfer	1 =Yes	25.9	44.2	29.9	294
	0=No	35.8	26.7	37.4	243
	χ^2_{df}(p-value)	17.78 ($p < 0.001$)			
Communal food sources	Yes	21.6	31.4	47.1	51
	No	31.3	36.8	31.9	486
	χ^2_{df}(p-value)	14.99 ($p = 0.034$)			
Informal food sources	Yes	15.0	27.2	57.8	147
	No	36.3	39.7	24.1	390
	χ^2_{df}(p-value)	58.83 ($p < 0.001$)			
Formal food sources	Yes	30.3	36.7	33.1	532
	No	10.0	0	60.0	5
	χ^2_{df}(p-value)	3.06 ($p = 0.232$)			
Socio-economic factors					
Female-headed household	Yes	24.6	40.8	34.6	228
	No	30.9	32.3	36.9	217
	χ^2_{df}(p-value)	3.97 ($p = 0.137$)			
Housing type	Formal	35.0	41.2	23.7	354
	Informal	20.9	26.9	52.2	182
	χ^2_{df}(p-value)	43.91 ($p < 0.001$)			
Marginal poverty	Poor	13.3	16.7	70.0	30
	Otherwise	29.2	39.2	31.7	401
	χ^2_{df}(p-value)	18.19 ($p < 0.001$)			
Lived poverty index	<1.00	43.3	40.9	15.8	291
	1.01–2.00	87.0	46.6	44.7	103
	2.01–3.00	0	26.1	73.9	46
	3.01–4.00	0	67.0	93.3	15
	χ^2_{df}(p-value)	133.7 ($p < 0.001$)			
Net income	<=N$1,100	15.2	23.9	60.9	92
	1,101–2,100	14.6	37.8	47.6	82
	2,101–4,200	32.5	41.3	26.3	80
	4,201–12,000	36.3	39.2	25.5	102
	N$12,001+	42.7	48.0	9.3	75
	χ^2_{df}(p-value)	67.57 ($p < 0.001$)			

Table 9.6 Results for multiple logistic regression on coping intensity

Variable	Categories	Odds Ratio (OR)	95% CI for OR		p-value
Food Sources					
Rural–urban transfer	1=Yes	0.78	0.50	1.22	0.278
	0=No	1.00			
Communal food sources	Yes	1.17	0.49	2.65	0.719
	No	1.00			
Informal food sources	Yes	4.61	2.64	7.48	0.001
	No	1.00			
Formal food sources	Yes	0.32	0.02	3.95	0.64
	No	1.00			
Socio-economic Factors					
Female-headed household	Female	1.66	0.49	2.12	0.43
	Male	1.00			
Housing type	Formal	1.00			
	Informal	2.82	1.75	4.54	<0.001
Marginal poverty	Poor	3.94	1.64	9.15	<0.001
	Otherwise	1.00			
Social grants	Yes	1.13	0.62	2.41	0.52
	No	1.00			
Net income	<=N$1,100	7.12	2.65	20.32	<.001
	1,101–2,100	5.24	1.84	14.57	<0.001
	2,101–4,200	3.65	1.05	11.45	0.045
	4,201–12,000	1.78	0.78	4.67	0.34
	N$12,001+	1.00			
Lived poverty index		2.48	1.34	3.12	$p < 0.001$
Household size		1.56	1.07	2.22	0.011

available in the corridor. In addition, town councils have replaced earlier informal markets with modern facilities where food vendors can rent space and take advantage of the municipal services available on site. Despite these recent changes in the food system, the informal food vending sector remains strong and vibrant and is expanding as the population grows. These informal sources include street vendors, mobile sellers, home-based enterprises and tuck shops (small shops in informal settlements). Foods

from both the formal and the informal food system are further supplemented by the transfer of locally grown cereals, vegetables and wild foods from neighboring communal farming districts. Despite the abundance of food wrought by these transformations, levels of food insecurity are extremely high, dietary diversity is low and many households rely on coping strategies, such as eating fewer meals or foregoing food altogether. This conundrum—of dearth in the midst of plenty—is not confined to OOO, but it is particularly acute given the year-round availability of all varieties of food and the multiplicity of outlets. This chapter addresses the conundrum, using data from a recent AFSUN-FUEL city-wide survey of nearly 1,000 households.

Despite the proliferation of food sources and food types, the overall prevalence of food insecurity in the OOO Corridor is very high at 77% of households, with two-thirds also reporting low dietary diversity. These households are also more likely to deploy a variety of coping strategies. Over 80% of households receiving rural-to-urban food transfers and sourcing food communally and informally were food insecure. In other words, these food sources may make food more available and affordable, but they do not guarantee food security. In addition, female-headed households, those in informal housing and those living in poverty were more food insecure. The strongest relationship is between food insecurity and income: as household income decreases, food insecurity prevalence consistently increases. Greater dietary diversity is positively associated with food transfers from the rural areas and patronage of formal food sources. In addition, male-headed households, residents of formal housing and households with better poverty scores all had more dietary diversity. As with food security, dietary diversity improves with household income.

In order to further test these findings, a multiple logistic regression was applied to the data. First, the odds of being food insecure were three times higher for households receiving rural-to-urban food transfers and sourcing food informally than those that were not, confirming that access to transfers and informal vendors may mitigate, but not eliminate, food insecurity. Second, income level and poverty were significantly associated with food insecurity. Households living in severe poverty were four times as likely to be food insecure than other households, as were households in the lowest income quintile when compared with households in the upper quintile. Third, the odds of being food secure increased with household income. Fourth, patronage of formal food sources was associated with increased odds of greater dietary diversity, while the use of informal food

sources and rural-to-urban transfers did not significantly affect the odds of greater dietary diversity. The likelihood of improved dietary diversity also declined with increased lived poverty, larger household size and reduced household income. Finally, while social grants were associated with lower risk of food insecurity, they were not positively associated with more dietary diversity.

The most important coping strategies relied on by food insecure and low-income households were reliance on less preferred and expensive foods, reducing the number of meals eaten in a day and limiting portion size at mealtimes. The most intensive use of coping strategies was observed among food insecure households, those sourcing from communal and informal food outlets, poor households, those in informal housing and those in the lowest income quintile. This picture is broadly consistent with the emerging scenario in the Global South more generally (Crush & Frayne, 2010). In smaller urban places, most food sources are physically accessible and even within walking distance for most residents. The central question, therefore, is why so many households are unable to take advantage of physical proximity and remain food insecure.

Although there is a growing presence of informal food sources in the OOO Corridor, these sources do not provide the necessary cushion against food insecurity and lack of dietary diversity (Nickanor et al. 2019b). The association of improved dietary diversity with formal sources of food presents an important policy message,particularly as the majority of households source some of their food from the formal market, such as supermarkets. All varieties of food—staples, cooked, fresh produce and processed foods—are obtained from supermarkets (Nickanor et al. 2019b). Access to such sources is key to maintaining nutrition security and curbing the emerging non-communicable disease epidemic (Nickanor et al., 2021).

An important characteristic of secondary urbanization in Namibia is the perpetuation of strong rural–urban linkages, including informal rural-to-urban food remittances. Over 60% of the population in the corridor's urban centres were born in the rural areas. Nickanor et al. (2019b) show that 80% of the households in the corridor own land in the rural areas, 42% were growing food in the rural areas and 55% received food from relatives in rural areas. Thus, proximity to the rural areas as well as closer rural–urban linkages than in the capital, Windhoek, are highly relevant as coping strategies related to food and nutrition insecurity. While informal food sources can play a greater role in protecting urban residents against

food insecurity (Tawodzera & Crush, 2018) and formalization of urban informal food sources is desirable through greater provision of trading spaces (Bénit-Gbaffou, 2016; Kazembe et al., 2019; Morange, 2015; Skinner, 2008), the policy focus needs to be on both rural and urban areas simultaneously for secondary cities. Achieving greater food security in secondary cities in Namibia requires policies that facilitate the journey of rural produce to markets, investments in education (including building awareness among street vendors of opportunities to source food from rural areas) and infrastructure for increased production of food in the rural areas.

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