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Urban food system and nutrition assessment in Pokhara, Nepal

Project report



PUBLIC
HEALTH
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of INDIA

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This report is an outcome of the Urban Food System Assessments for Nutrition (UFSAN) project of the Food and Agriculture Organization of the United Nations (FAO). The objectives of the UFSAN project were to: (i) develop and pilot a holistic tool to assess nutrition and food systems in urban areas, with the aim to guide policies, programmes and investments towards a range of potential food system actions that promote better nutrition and healthy diets; (ii) pilot the tool in four cities: Ahmedabad and Pune, in India, and Pokhara and Kathmandu, in Nepal; and (iii) disseminate the findings of the UFSAN tool among nutrition and food systems stakeholders in these cities. For detailed information about the rationale of the project, the methodology underpinning the tool and a step-wise guide to its implementation, readers are referred to the Technical Guidance Note on Urban food system assessments for nutrition and healthy diets.

This report presents the key findings of the application of the UFSAN tool in Pokhara, Nepal. It was written by Ahmed Raza (FAO), Himanshi Pandey (Public Health Foundation of India [PHFI], New Delhi), Aameeka Shereen Lobo (PHFI, New Delhi) and Anjali Ganpule Rao (PHFI, New Delhi), with helpful feedback from Isabela Sattamini (FAO).

The local research partners in Pokhara were Nira Joshi, Ramesh Dangi and Sanish Shrestha. Overall guidance on the implementation of the tool in Pokhara was provided by Ahmed Raza (FAO), Anjali Ganpule Rao (PHFI) and Lindsay Jaacks (University of Edinburgh), with support from Manu Raj Mathur (PHFI, New Delhi) and Prabhakaran Dorairaj (PHFI, New Delhi).

The document was edited by Sarah Pasetto, and Davide Cascella was responsible for the layout and the development of the illustrations. Bianca Carlesi and Chiara Deligia provided communication support.

ABBREVIATIONS AND ACRONYMS

COVID-19	coronavirus disease 2019
IDDS	individual dietary diversity score
MDD-W	minimum dietary diversity - women
UFSAN	Urban Food System Assessment for Nutrition
NPR	Nepali Rupee*

* NPR 1 = USD 0.0084 (average 2020 rate)

1. BACKGROUND

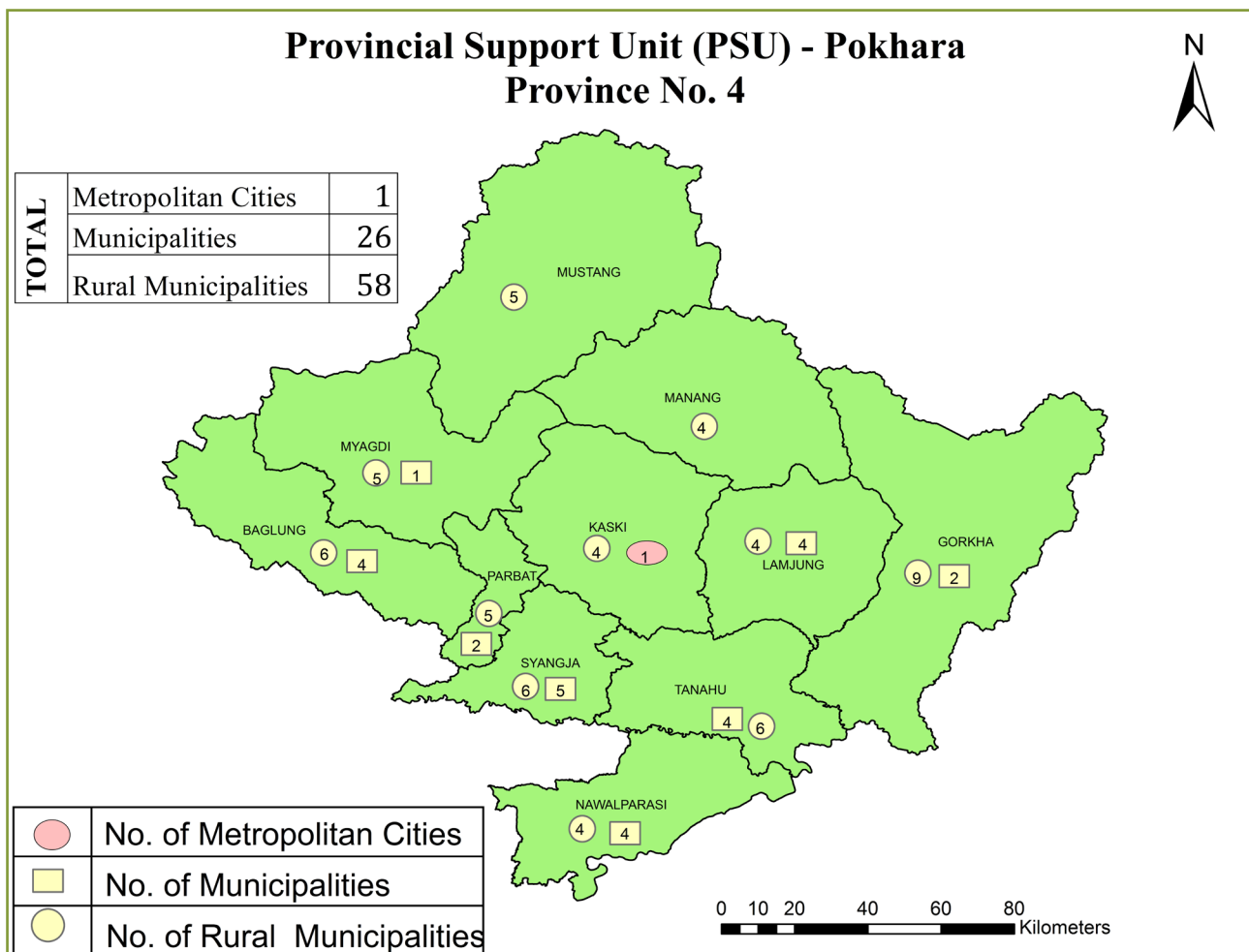
Pokhara Lekhnath Metropolitan City (Pokhara) is the largest metropolitan city of Nepal, in terms of administrative boundaries, and is situated in western Nepal. It is the capital of Gandaki Pradesh province and is headquartered in Kaski district. Pokhara has an area of 464.94 km² and is divided into 33 wards (Figure 1 and 2) (Ministry of Federal Affairs and General Administration, 2017).

Currently, Gandaki province is composed of 85 local government subdivisions. In particular, it consists of 11 districts, which are further divided into:

- 1 metropolitan city (Pokhara);
- 26 municipalities;
- 58 rural municipalities;
- 759 wards; (see Ministry of Federal Affairs and General Administration, 2017 and 2020; Government of Nepal, 2020).

FIGURE 1.

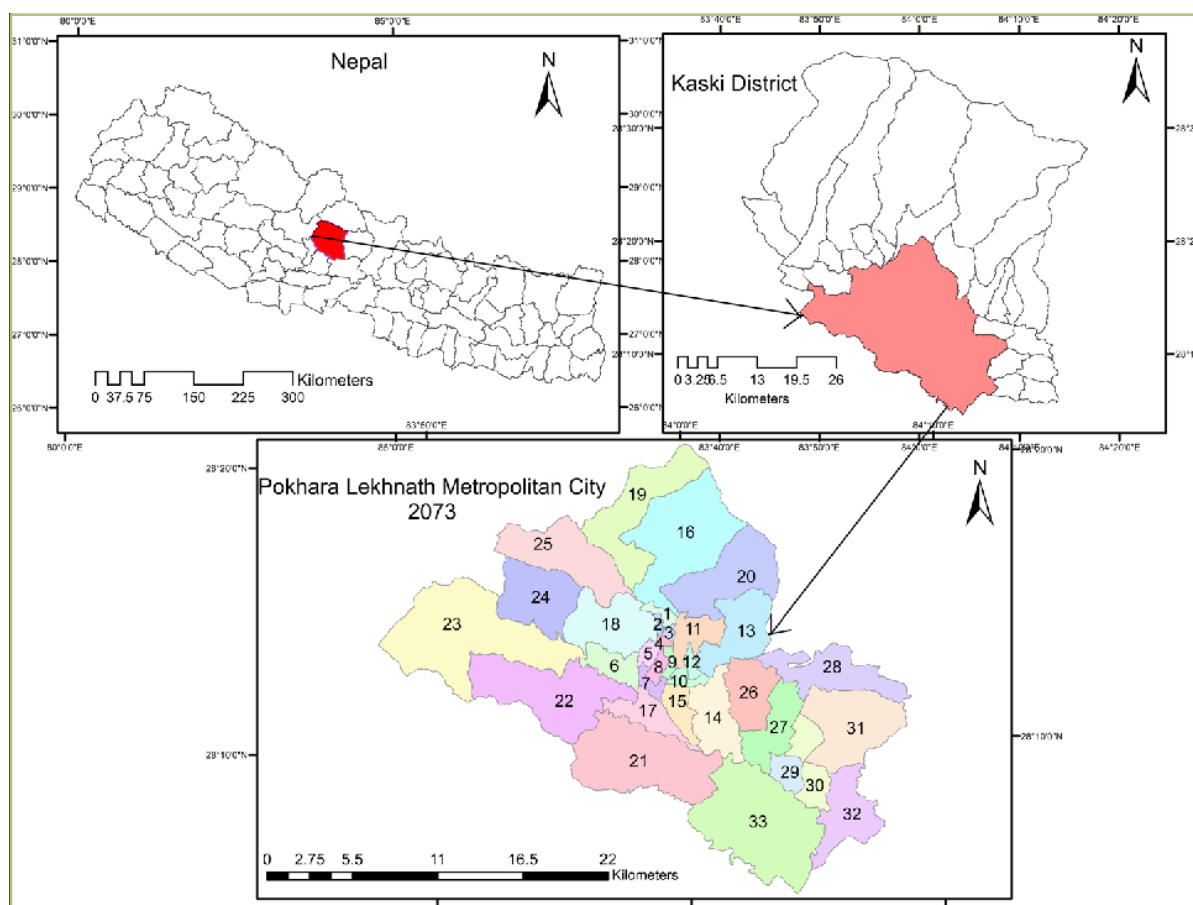
Provincial support unit for Pokhara, Nepal



Source: Local Governance and Community Development Programme, 2020.

FIGURE 2.

Location map of Pokhara Lekhnath Metropolitan City



Source: Ministry of Federal Affairs and General Administration, 2017.

1.1. Municipal governance structures

The Provincial Support Unit for Pokhara was established in 2009, and acts as a coordinating and supporting organization. It mainly links local government bodies and the programme coordination unit of the Ministry of Federal Affairs and General Administration/Local Governance and Community Development Programme. It also coordinates and provides technical support to local government authorities in establishing institutional set-ups, capacity building and the implementation of annual programme and projects for better governance. The Provincial Support Unit also collects information from local-level bodies and prepares a progress report, which is submitted to the Ministry of Federal Affairs and General Administration (Ministry of Federal Affairs and General Administration, 2020).

1.2. Socio-economic profile

1.2.1. Population trends

The population of Pokhara’s metropolitan area has increased by 4.73 percent since 2019. The 2020 population stands at 421 000, against the figure of 402 000 inhabitants in 2019. This, in turn, constituted a 4.69 percent increase from 2018, when the population was 384 000; in 2017, the inhabitants of the Pokhara metropolitan area were 364 000 (Central Bureau of Statistics, 2012). Table 1 provides a list of households, population, area, sex ratio and population density in Pokhara is given in Table 1.

TABLE 1.

List of households, population, area, sex ratio and population density in Pokhara, Nepal

Municipality	HHouseholds	Population			Area	Sex ratio	Population density
		Total	Male	Female			
Lekhnath municipality	14 958	59 498	27 394	32 104	77.45	85.33	768.21
Pokhara sub-metropolitan area	68 398	264 991	133 318	131 673	55.22	101.25	4 798.82

Source: Central Bureau of Statistics, 2012

1.2.2. Identification of socio-economic zones in the city

Approximately 22 percent of the population in Gandaki Pradesh is in the lowest income quintile, while about 16 percent is in the middle quintile (see Table 2).

TABLE 2.

Wealth quintile for Gandaki Pradesh, Nepal

Wealth quintile	Gandaki Pradesh (%) (n=4 320)
Lowest	22.0
Second	21.1
Middle	16.2
Fourth	20.3
Highest	20.4

Source: Ministry of Health, Nepal, New ERA and ICF, 2017

1.3. The malnutrition situation in Gandaki Pradesh

TABLE 3.

Prevalence of malnutrition

Indicator	Prevalence
Stunting (children < 5 years of age)	28.9%
Wasting (children < 5 years of age)	5.8%
Underweight children (< 5 years of age)	14.9%
Anaemia among children (< 5 years of age)	46.2%
Anaemia among women (15–49 years of age)	28.0%

Source: Ministry of Health, Nepal, New ERA and ICF, 2017

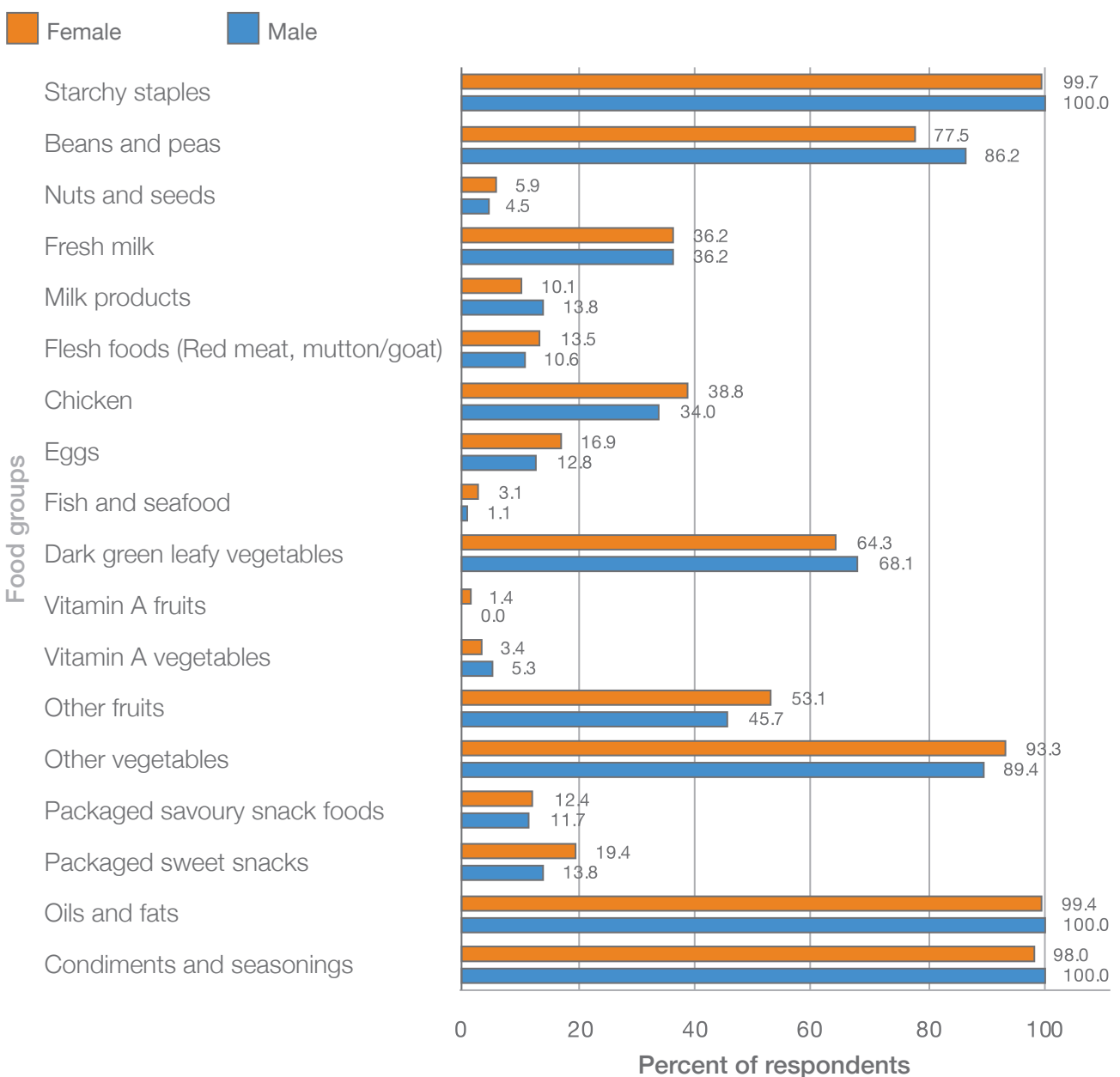


OVERVIEW OF DIETS IN POKHARA

- In Pokhara, most of the participants consumed starchy staples daily.
- More than 65 percent consumed dark green leafy vegetables and other fruits and vegetables daily.
- Approximately one quarter consumed milk and milk products, and 42.5 percent consumed legumes, nuts and seeds, daily. Less than 20 percent consumed flesh foods, eggs and packaged foods daily.
- Only 3 percent consumed vitamin A-rich fruits and vegetables daily.
- The mean individual dietary diversity score (IDDS) was 5.05, and there was a significant increase in the IDDS as household income levels increased.
- The mean minimum dietary diversity score for women of reproductive age (15–49 years) (MDD-W) was 5.15. Approximately 90 percent of this population group recorded a dietary diversity score of 4 and above
- Higher-income individuals reported a higher IDDS and MDD-W.

FIGURE 3.

Distribution of food consumption on daily basis by gender (N=450)



Source: Authors' own elaboration.



2. DIETS

A total of 450 consumers were interviewed across two wards – Wards 10 and 27 – in Pokhara. The interviews were conducted face-to-face.¹

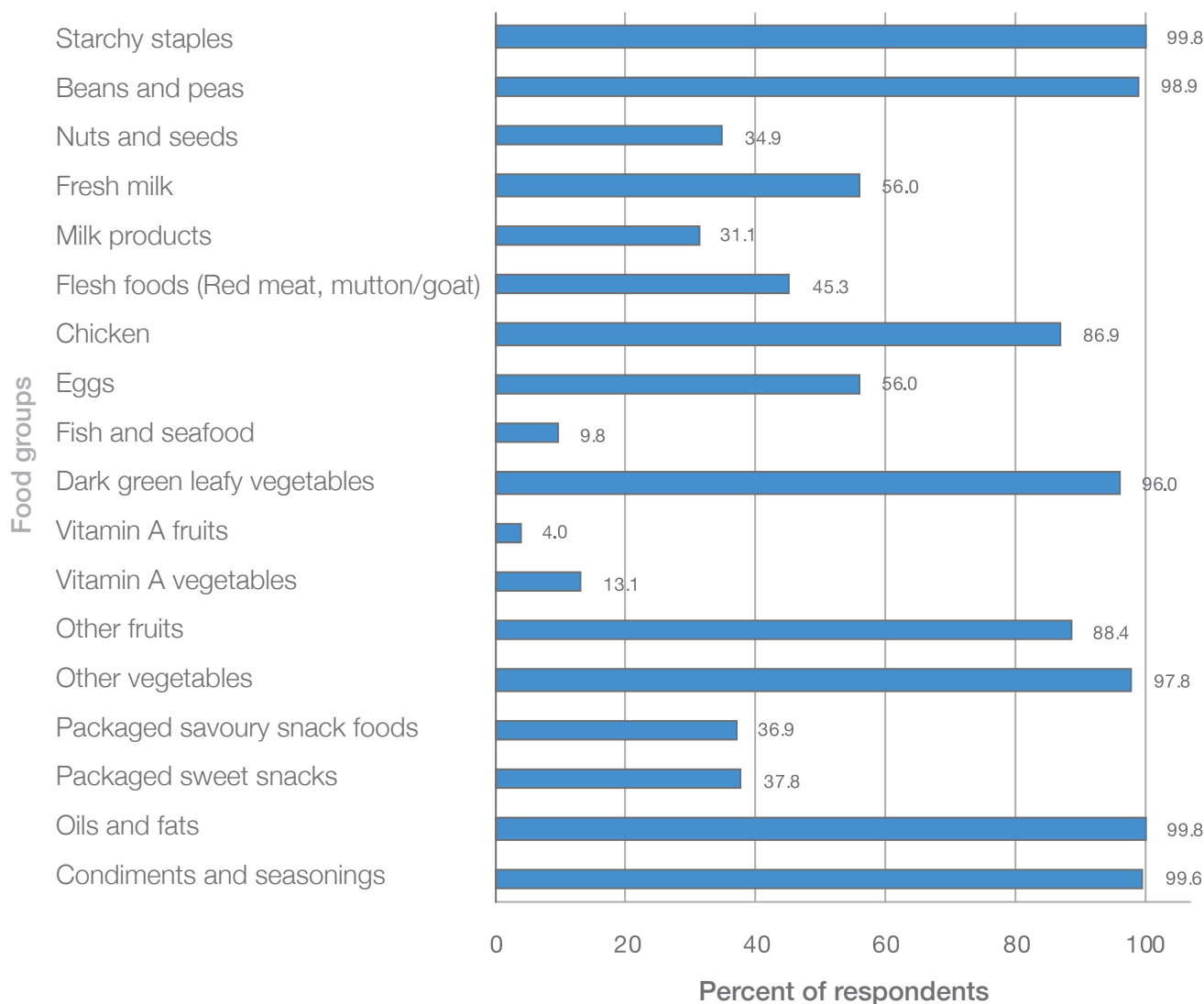
A high proportion of respondents reported consuming starchy staples (100 percent), beans and peas (79 percent), dark green leafy vegetables (65 percent), condiments and seasonings (98 percent), and other vegetables (92 percent) on a daily basis, in comparison to fruits (51 percent), vegetables rich in vitamin A (4 percent), fruits rich in vitamin A (1 percent), and nuts and seeds (6 percent), which were consumed by a lower proportion. Moderate proportions of respondents reported consuming poultry (38 percent), flesh foods (red meat, mutton and goat) (13 percent), eggs (16 percent) and fresh milk (36 percent) on a daily basis. Almost 100 percent of respondents reported consuming oils and fats on daily basis. Packaged savoury snacks and sweets were reported to be consumed by 12 percent and 18 percent respondents on a daily basis, respectively.

The participants' weekly food consumption also revealed a higher consumption of staples, beans and peas, chicken, fruits and vegetables (Table 6). Concernedly, the consumption of packaged savoury snack foods and packaged sweet snacks was high – 37 percent and 38 percent, respectively. The consumption of oils and fats was reported to be 100 percent.

¹ The consumer interviews were conducted from 20 to 25 November 2020.

FIGURE 4.

Distribution of food consumption on a weekly basis (N=450)



Source: Authors' own elaboration.

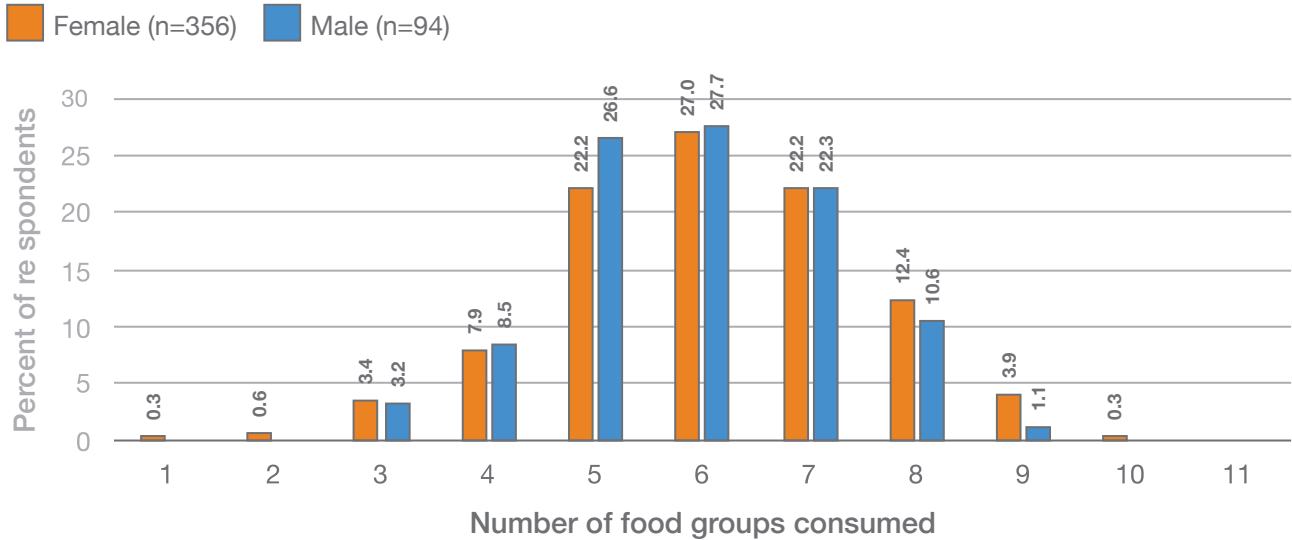
The mean individual dietary diversity score² (IDDS) was 5.05. Female respondents (n=356) reported a mean IDDS of 5.08 and male

respondents reported a score of 4.93 (n=94). Approximately 81 percent of the respondents recorded an IDDS of 5 and above.

² The IDDS was calculated considering ten food groups: starchy staples, legumes, nuts and seeds, milk and milk products, flesh foods, eggs, dark green leafy vegetables, vitamin-A rich fruits and vegetables, other vegetables and other fruits.

FIGURE 5.

Percent of consumption of food groups by female and male respondents during the previous 24 hours (N=450)

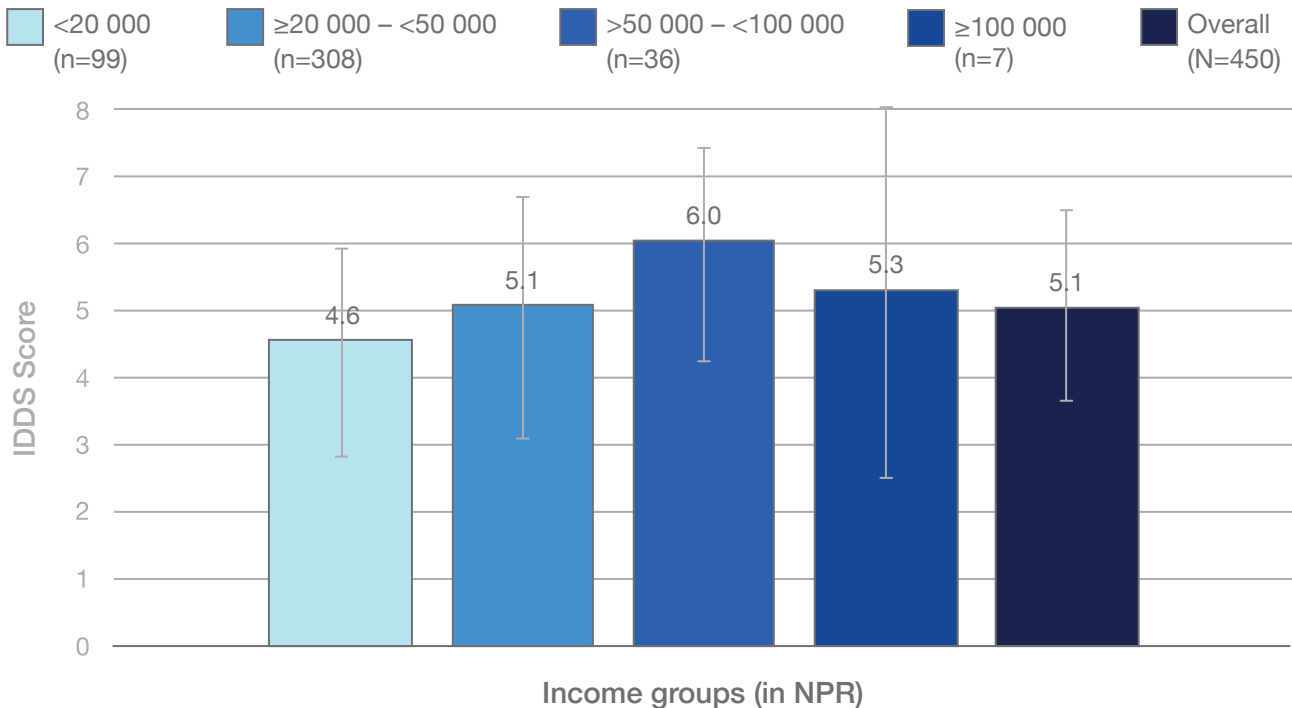


Source: Authors' own elaboration.

There was a significant increase in the IDDS as income levels increased (as seen from Figure 6).

FIGURE 6.

Distribution of IDDS by income group (N=450)



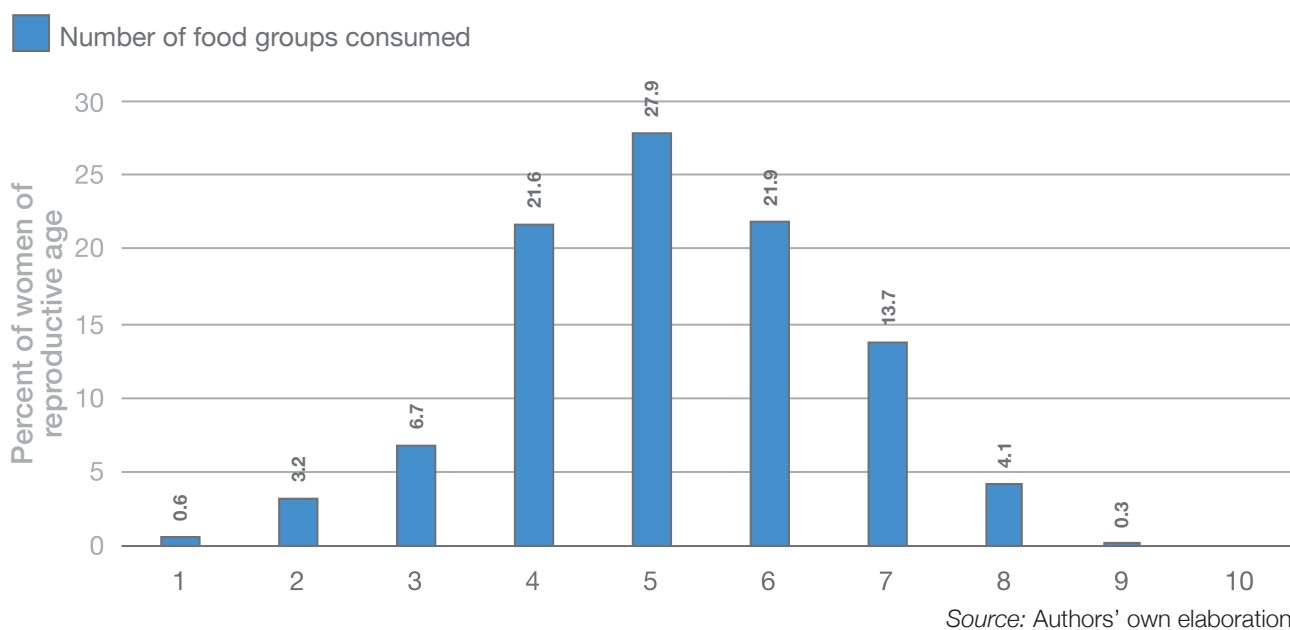
Source: Authors' own elaboration.

The mean minimum dietary diversity score for women of reproductive age (15–49 years) (MDD-W) was 5.15. Approximately 90 percent of this population group recorded a dietary

diversity score of 4 and above. Figure 7. Percent of consumption of food groups by women of reproductive age during the previous 24 hours (N=315).

FIGURE 7.

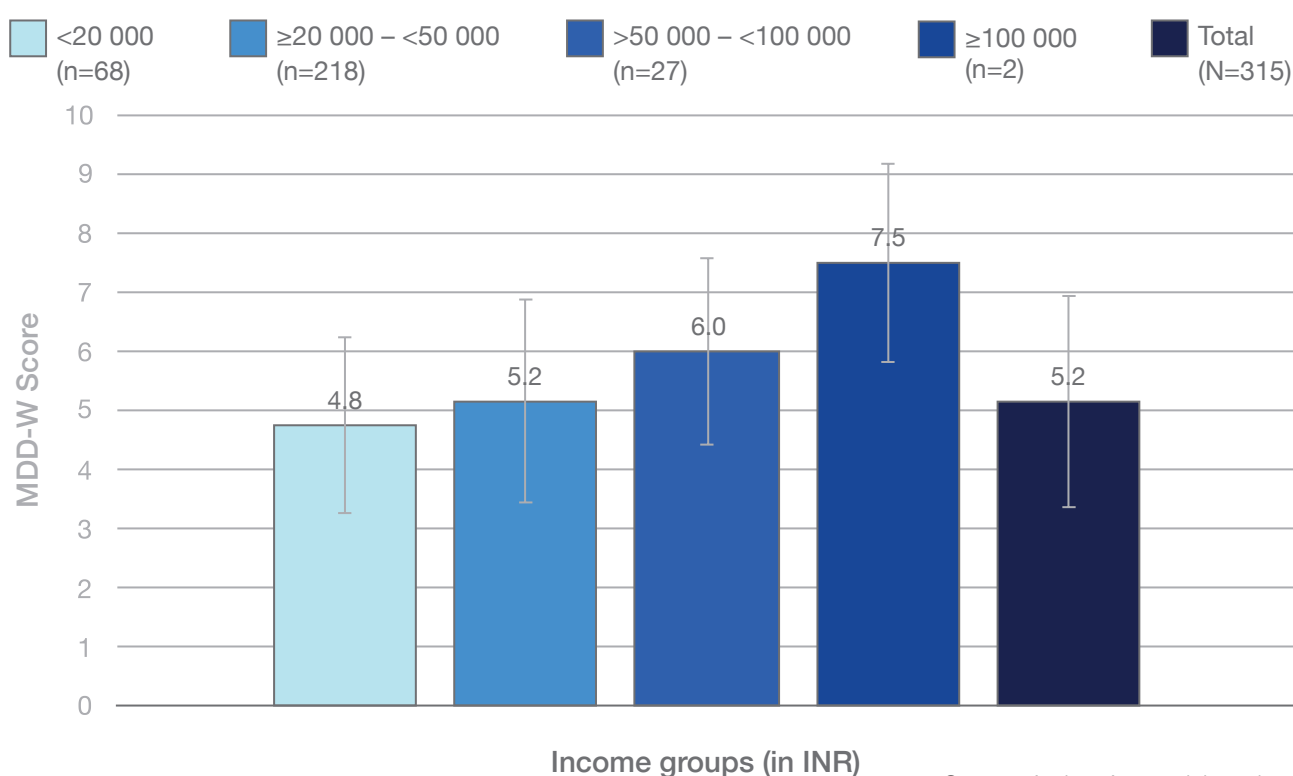
Percent of consumption of food groups by women of reproductive age during the previous 24 hours (N=315)



There was a significant increase in MDD-W as income levels increased (as seen from Figure 8).

FIGURE 8.

Distribution of MDD-W by income group among women of reproductive age (15–49 years), (N=315)







OVERVIEW OF CONSUMER BEHAVIOUR IN POKHARA

TABLE 4.

Overview of consumer behaviour in Pokhara

Socio-economic characteristics	Accessibility of food	Desirability and acceptability of food	Food preparation	Eating patterns
<ul style="list-style-type: none"> The majority of the participants were female, married, literate and in the age group ranging from 18 to 78 years. Most of the participants owned a refrigerator. A small number owned a freezer, a microwave and had paid help for cooking. Water piped into the dwelling was a major source of cooking water, while bottled water was a major source of drinking water. The maximum amount of money on each occasion was spent on the purchase of grains (NPR 1 850). 	<ul style="list-style-type: none"> All participants purchased most of their food predominantly from retail outlets. Small local shops are the key place of purchase for most consumers, followed by mobile door-to-door vendors and specialty stores. Small local shops were the preferred point of purchase for participants from all socio-economic groups. On each occasion, consumers' maximum expenditure was made on staples, followed by pulses and nuts, fruits and vegetables. 	<ul style="list-style-type: none"> Most consumers preferred to buy: <ul style="list-style-type: none"> buy in small quantities; from retailers who offered competitive prices; from retail stores that are close to their homes; from retailers open at convenient times; and from retailers who offer friendly service and have a variety of quality products. 	<ul style="list-style-type: none"> Both food shopping and food preparation were dominated by women. Few households mentioned receiving information on nutrition and healthy diets in the last twelve months. Respondents reported receiving messages from social media, non-governmental organizations and government authorities. Most respondents noted high adherence to food safety practices. 	<ul style="list-style-type: none"> The majority of the participants reported consuming all the food and did not waste or throw away any food items. Participants reported the following reasons for not consuming food: <ul style="list-style-type: none"> no storage facilities; poor food quality; food spoilage before consumption; and preparing too much.

Source: Authors' own elaboration.

3. CONSUMER BEHAVIOUR

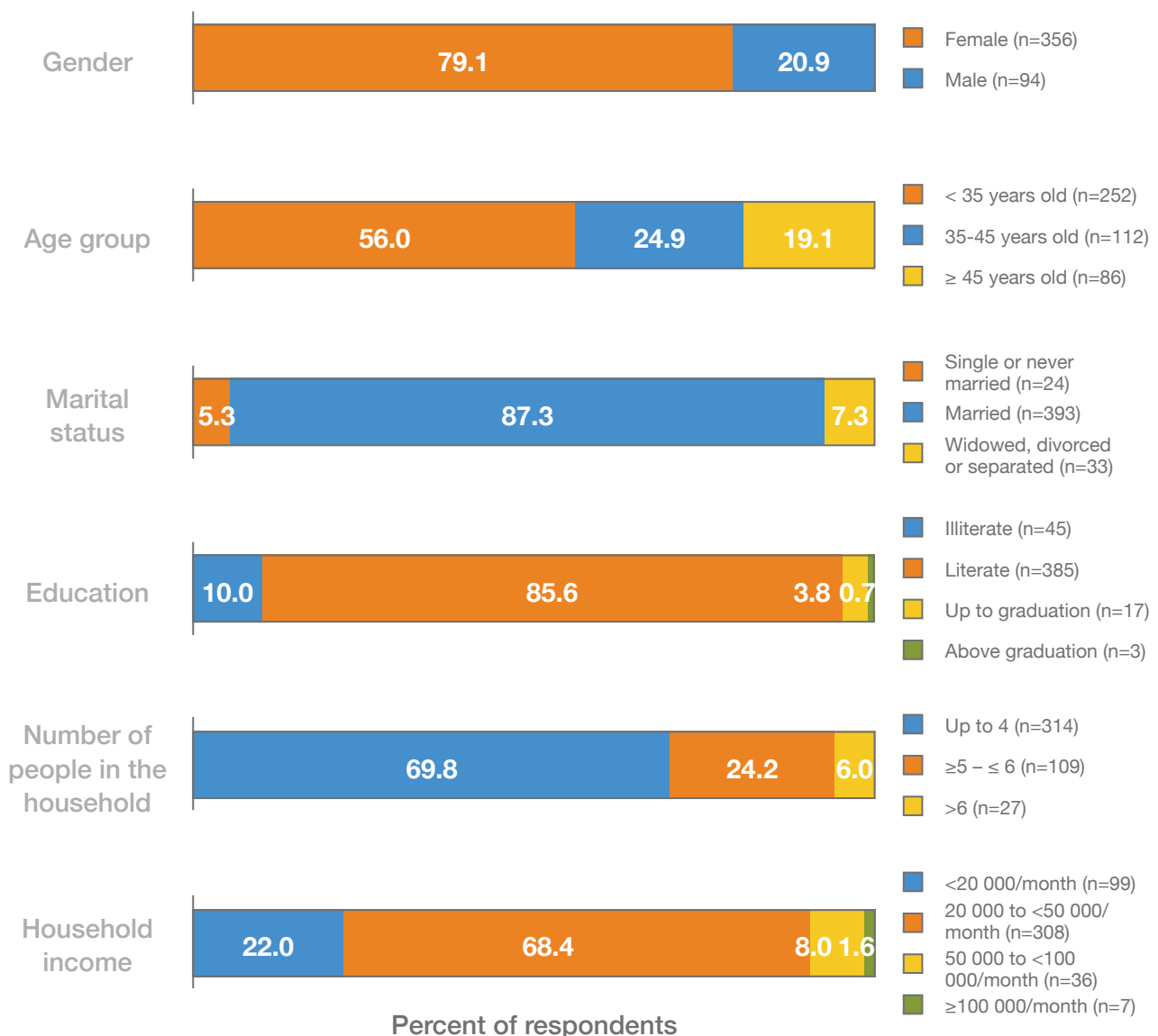
3.1. Socio-economic characteristics

The majority of the participants were females (79.1 percent), married (87 percent) and literate (86 percent). Fifty-six percent of the participants were between 25 and 35 years of age and the mean age was 36.4 years (12.2 percent).

Approximately three quarters of the households followed a nuclear family pattern with four family members, and 68 percent of the participants earned NPR 20 000 to 50 000 per month (see Figure 9).

FIGURE 9.

Distribution of socio-demographic profiles (N=450)



Source: Authors' own elaboration.

Note: Graduates are persons who have received a degree or diploma upon completing a course of study in a university or college.

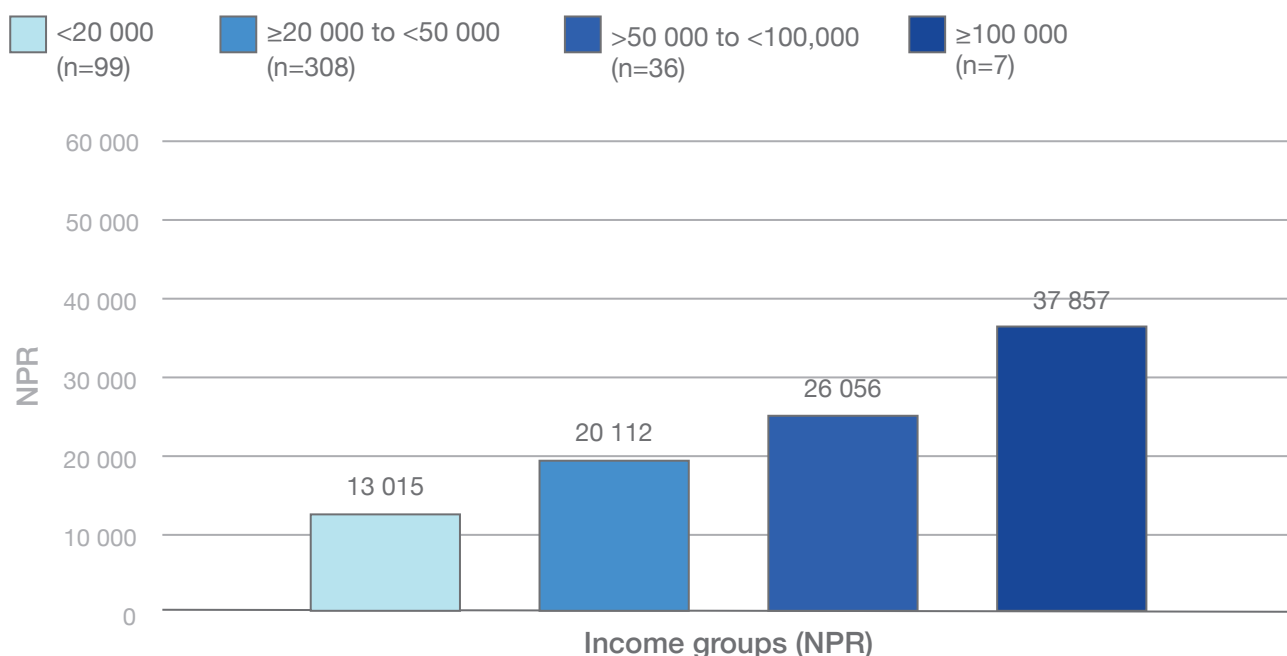
Approximately 48 percent of the participants owned a refrigerator, while less than 2 percent owned a freezer, microwave, or had paid help for cooking. The majority of the participants used piped water within their dwelling as the source of cooking water (89 percent). As a source of drinking water, the majority of the participants (46 percent) used bottled water, followed by public taps (34 percent). Fifty-six percent of the participants treated water before use, with the

most common method of treatment being boiling (43 percent).

The consumers who participated in the assessment had a reported median household food expenditure of NPR 18 000 per month. Most of the food expenditure was made at the retailer level. As the income levels increased, the expenditure also increased significantly (see Figure 10).

FIGURE 10.

Distribution of household expenditure, by income group (N=450, p<0.01)



Source: Authors' own elaboration.

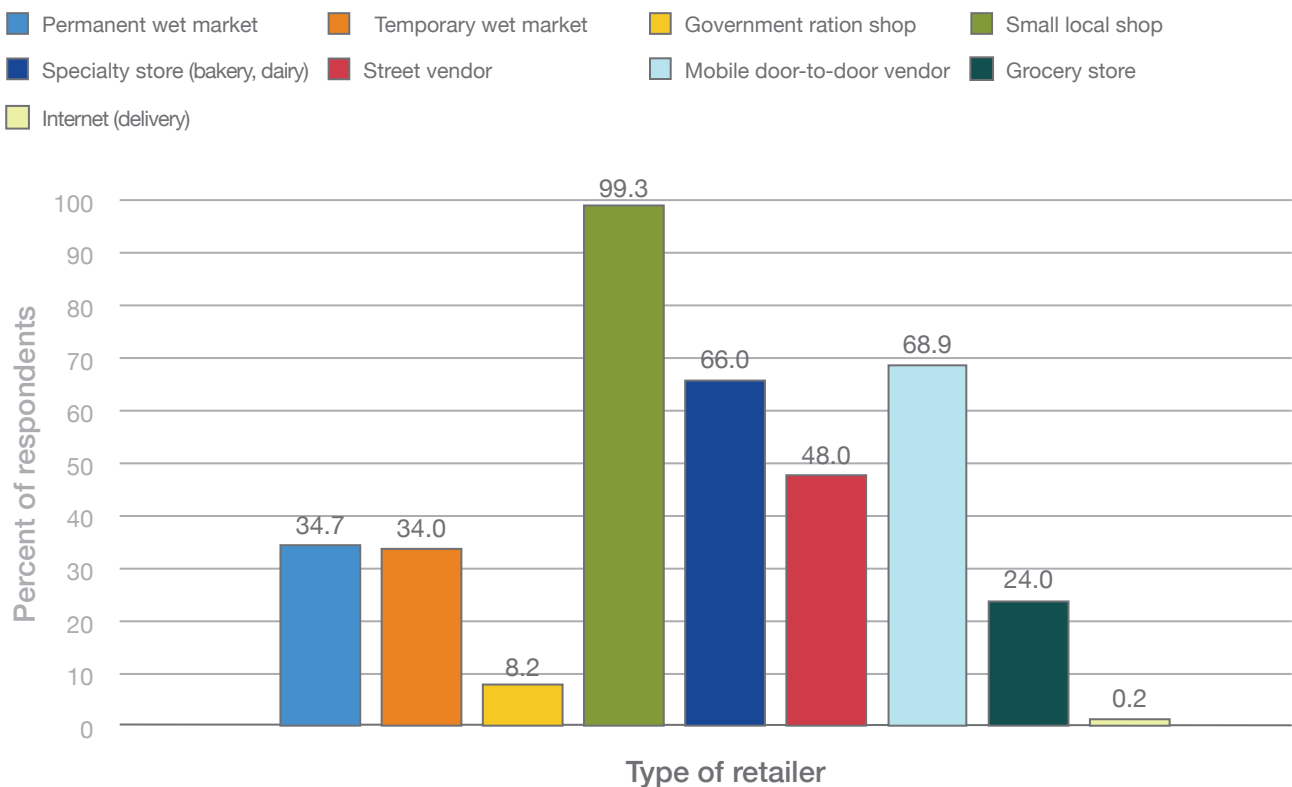
3.2. Accessibility of food

For consumers in Pokhara, small local shops (99.3 percent) remain the key place of purchase for most consumers, followed by mobile door-to-door vendors (68.9 percent) and speciality stores

(66 percent) (Figure 11). The type of retailers that were least popular included e-commerce (Internet delivery-based) food retailers and government ration shops.

FIGURE 11.

Distribution of consumers' preferred retail outlets (N=450)



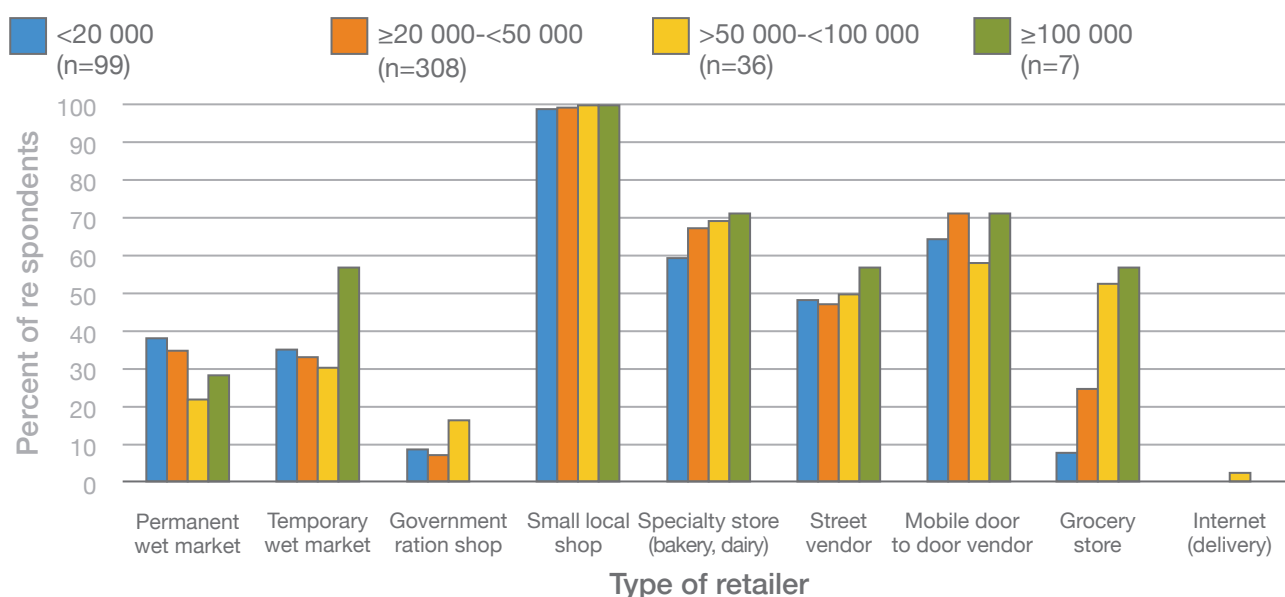
Source: Authors' own elaboration.

For low-income households (monthly income less than NPR 20 000 per month), small local shops (99 percent), mobile door-to-door vendors (65 percent), speciality stores (bakeries, dairies, etc.) (60 percent) and street vendors (49 percent) were the preferred retailers (Figure 12). Similar preferences were noted by

respondents belonging to households within the income group of NPR 20 000 to 50 000 per month. For households in the high-income groups (NPR 50 000 to 100 000 per month and above NPR 100 000 per month), small local shops, speciality stores and mobile door-to-door vendors were the preferred retailers.

FIGURE 12.

Consumers' preferred retail outlets of choice, according to income group (N=450)



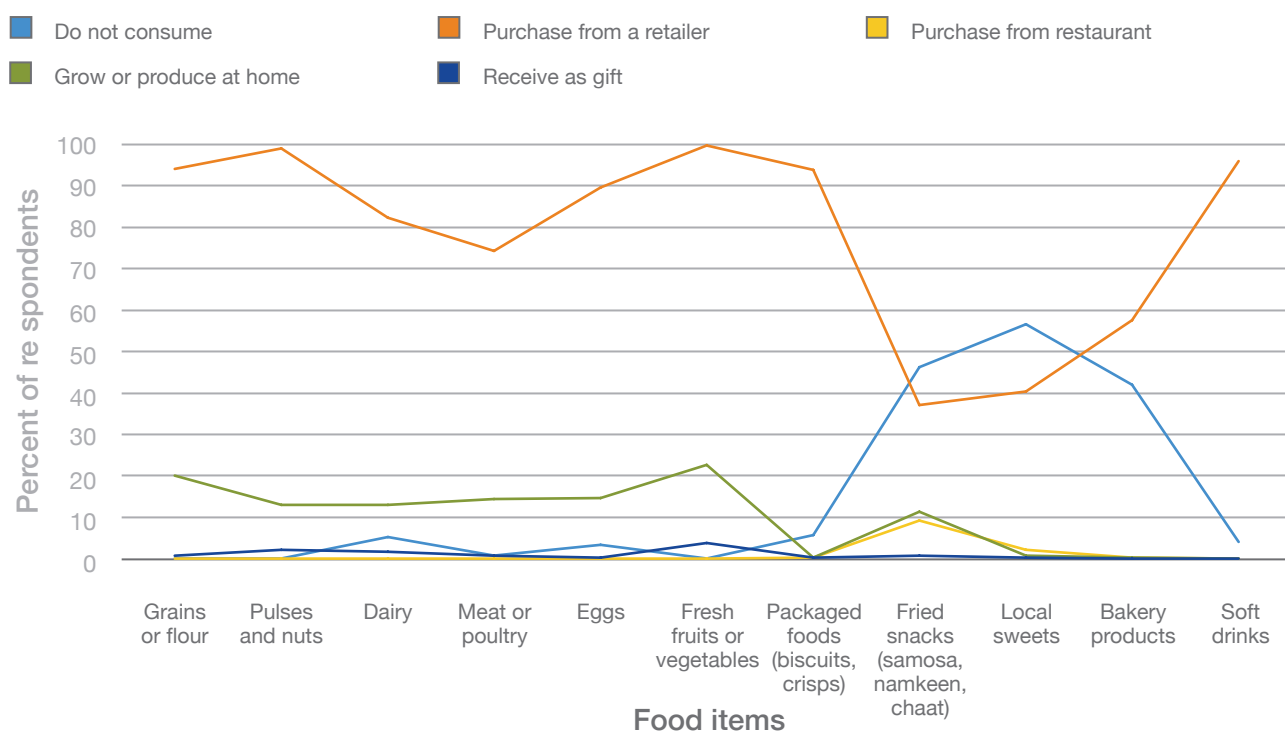
Source: Authors' own elaboration.

All of the participants purchased most of their food predominantly from retail outlets (Figure 13). For instance, a high proportion bought the following from retailers: fruits and vegetables (100 percent), pulses and nuts (99 percent), soft drinks (96 percent), grains,

including flour (94 percent), fresh purchased foods such as biscuits and crisps (94 percent), dairy (82 percent), bakery products (58 percent), local sweets (40 percent) and fried snacks (37 percent).

FIGURE 13.

Distribution of food purchases by location (N=450)



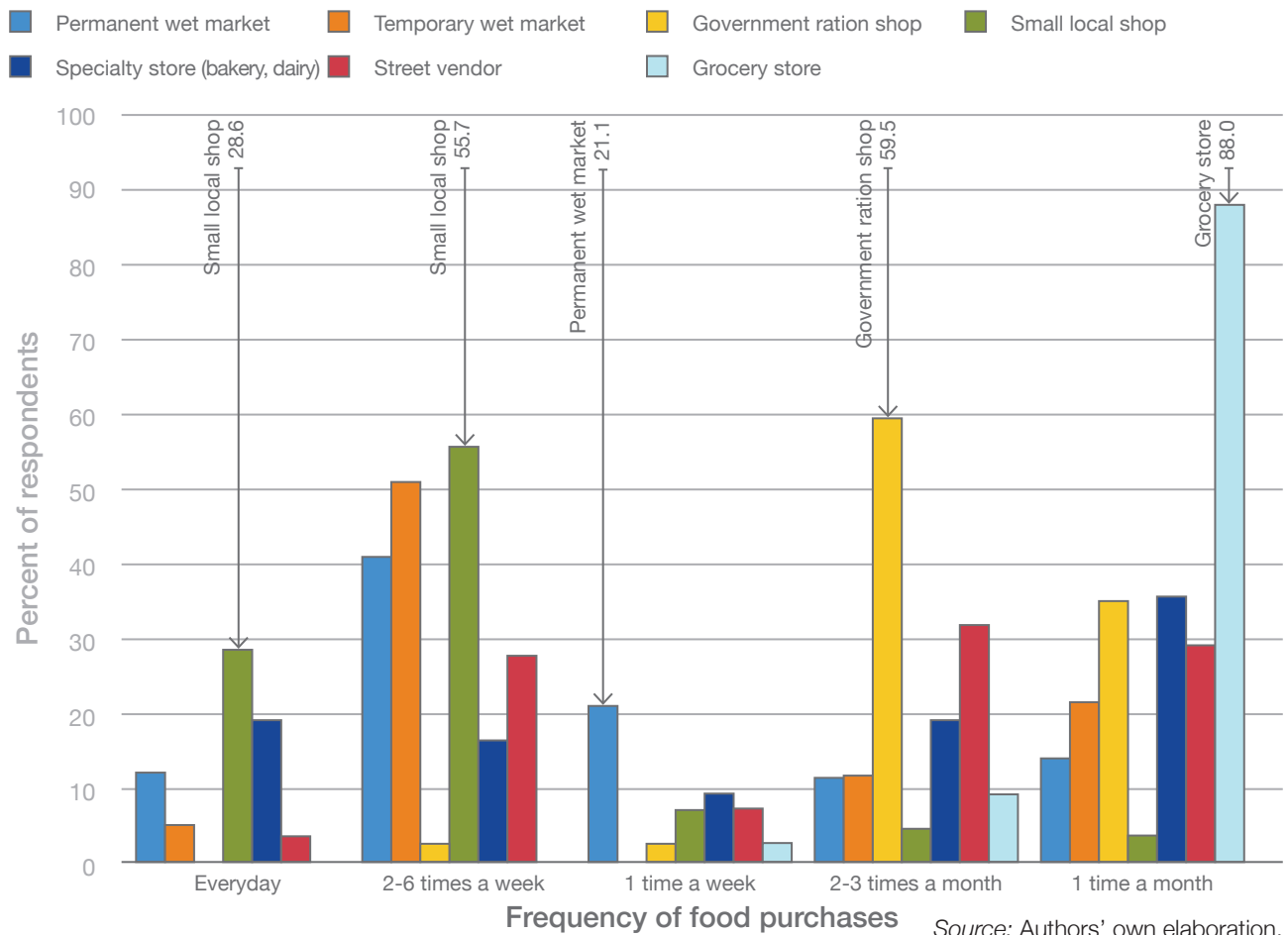
Source: Authors' own elaboration.

The majority of the participants frequented small local shops, permanent and temporary wet markets at least two to six times in a week

(Figure 14). Monthly shopping was done at speciality stores, grocery stores and street food vendors.

FIGURE 14.

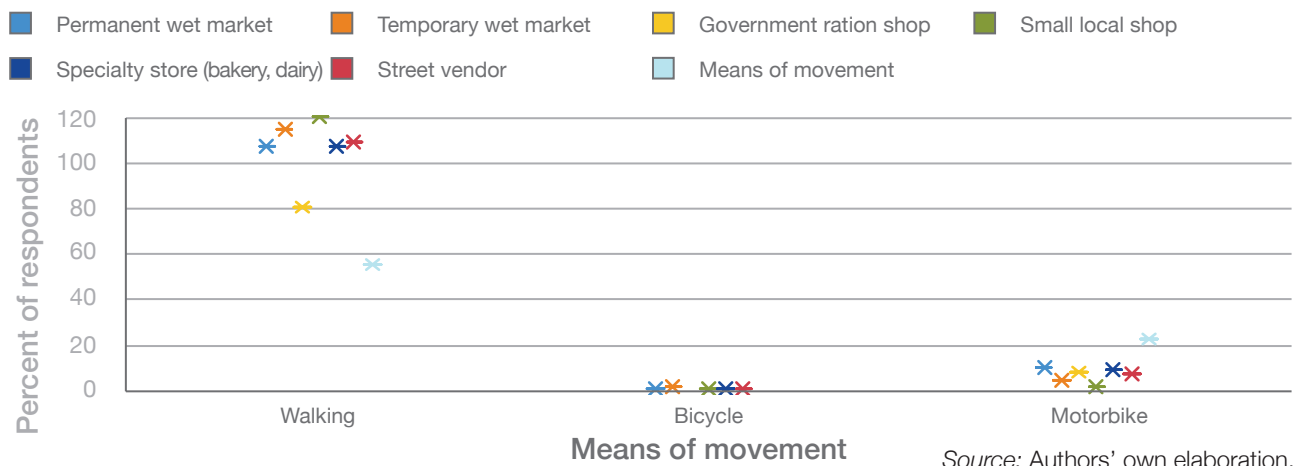
Distribution of frequency of food purchases from the retailer (N=450)



The majority of the respondents preferred walking or using a motorbike as a means of transportation to purchase food from retailers (Figure 15).

FIGURE 15.

Preferred means of transportation to access retail outlets (N=450)

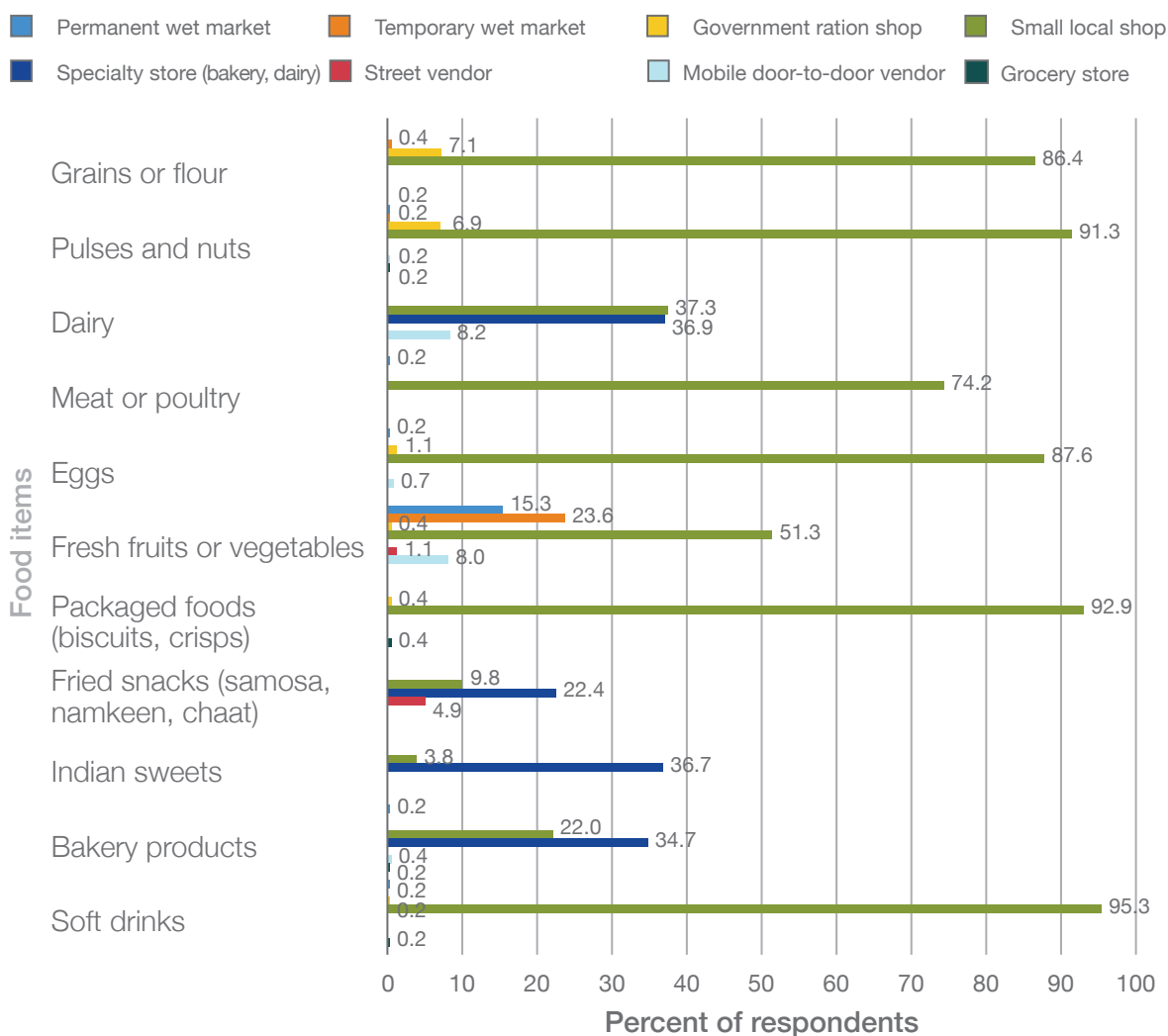


Various types of retailers were preferred for different food items (Figure 16). Grains, including flour, were mostly purchased in small local shops (86 percent). Similarly, pulses and nuts were bought at small local shops (91 percent). Dairy was also bought at small local shops (37 percent) and speciality stores (37 percent). Small local shops were the preferred retailers for the purchase of meat and

poultry (74 percent), eggs (88 percent), packaged foods (93 percent) and soft drinks (95 percent). Fresh fruits and vegetables were purchased at small local shops (51 percent) and wet markets, both temporary (24 percent) and permanent (15 percent). Speciality stores were the preferred outlets for fried snacks (22 percent), local sweets (37 percent) and bakery products (35 percent).

FIGURE 16.

Distribution of food purchases, by type of retailer (N=450)



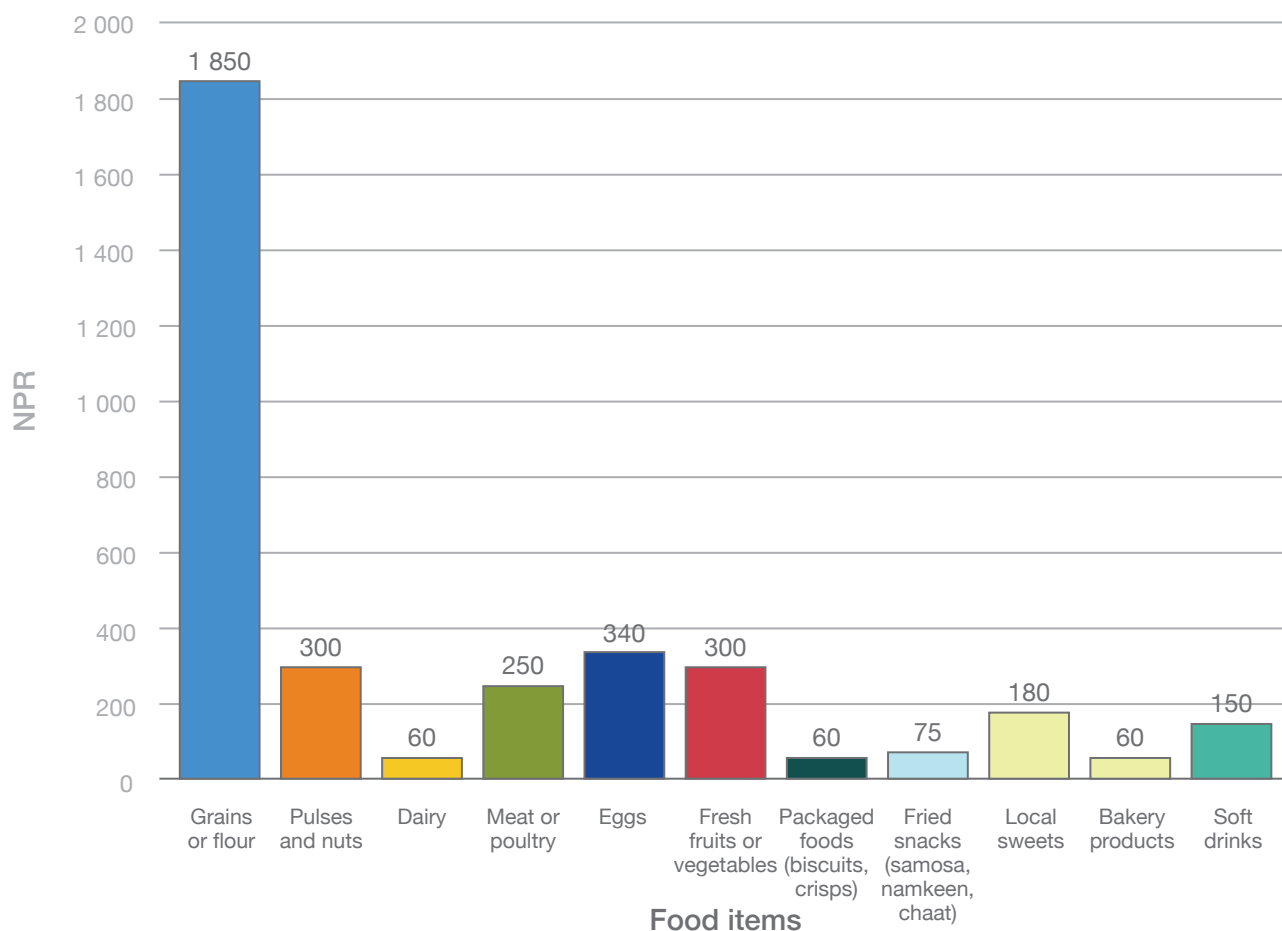
Source: Authors' own elaboration.

On each occasion, consumers' maximum expenditure was made on staples, followed by pulses and nuts, fruits and vegetables (Figure 17). The maximum median amount

spent on major food items is as follows: grains, including flour – NPR 1 850; eggs – NPR 340; pulses – NPR 300; and fruits and vegetables – NPR 300.

FIGURE 17.

Median money spent by consumers on each occasion, by food item (N=450)



Source: Authors' own elaboration.

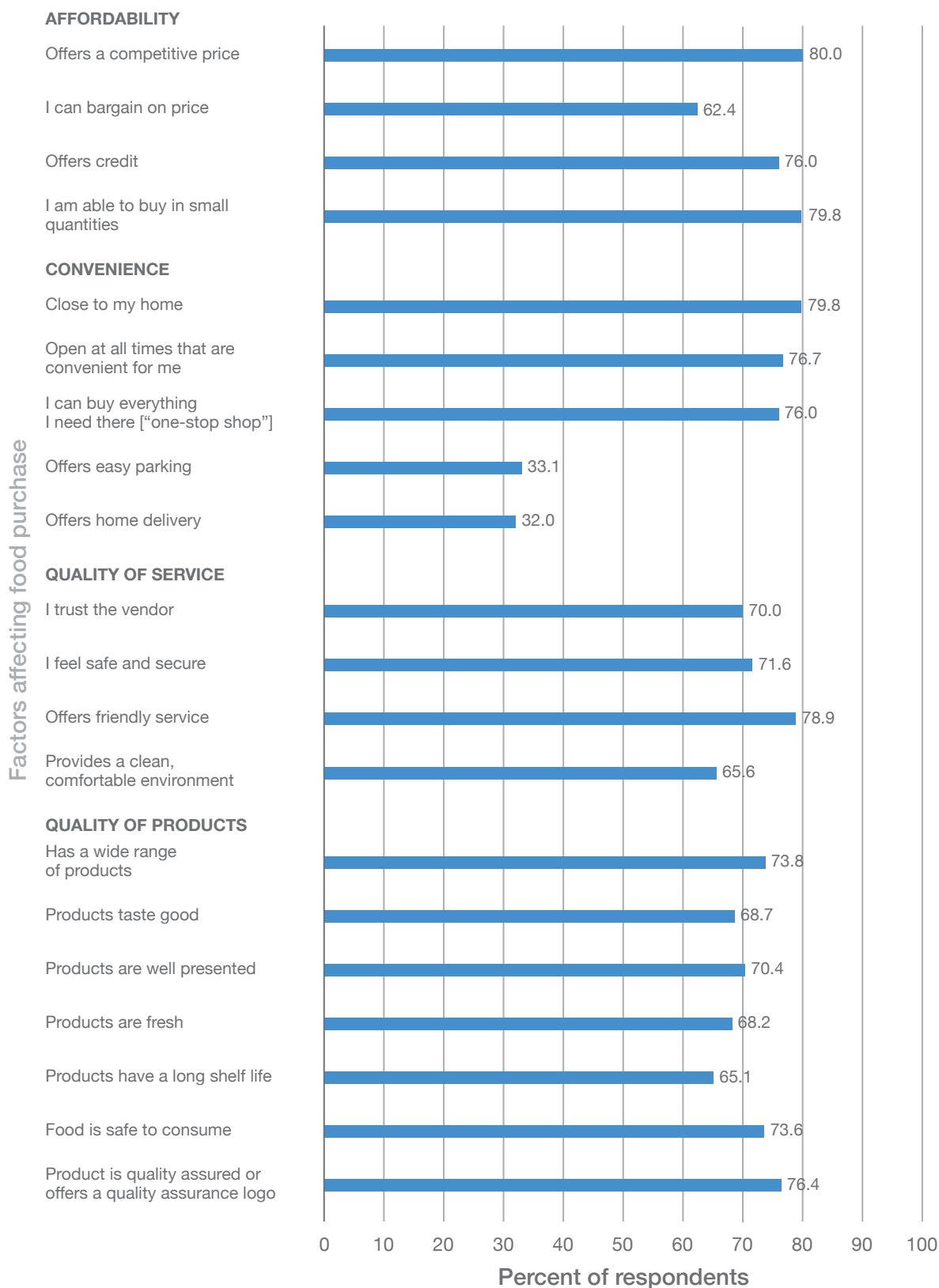
3.3. Desirability and acceptability of food

Respondents were asked to identify their preferences when making food purchases across the following four factors: affordability, convenience, quality of service and quality of products. Under food affordability, most consumers preferred the possibility to buy in small quantities (80 percent), retailers who offered a competitive price (80 percent), retailers who offered the possibility of credit (76 percent) and the possibility to bargain on the price (62 percent) (Figure 18).

In terms of convenience, consumers preferred to buy from outlets that were close to their homes (80 percent), open at suitable timings (77 percent), and were “one-stop shops” for all food items (76 percent). Most consumers considered quality of service as an important factor when making purchases, valuing friendly service (79 percent), the feeling of safety and security (72 percent) and trustworthiness of the vendor (70 percent). In terms of the quality of products, consumers valued retailers that sold products marked with a quality assurance logo (76 percent) and were safe to consume (74 percent), and that had a wide range of products (74 percent).

FIGURE 18.

Distribution of factors affecting consumers’ food purchase patterns (N=450)



Source: Authors’ own elaboration.



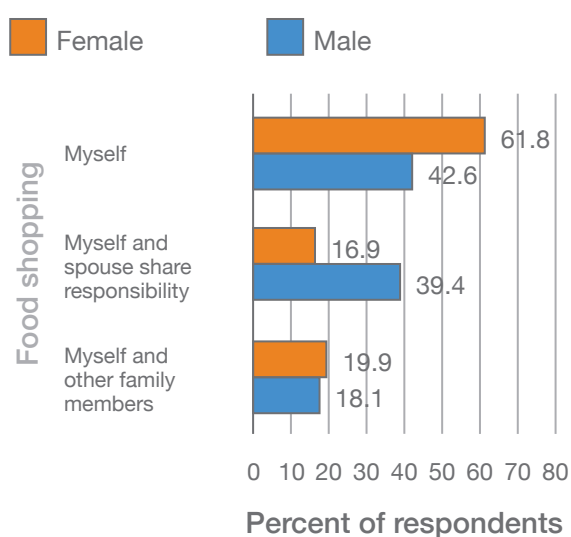
3.4. Food preparation

Approximately 58 percent of the participants did food shopping on their own, with 22 percent reporting sharing responsibility with their spouse and 20 percent reporting sharing responsibilities with other family members (including children) (Figure 19). Among female respondents, approximately 62 percent noted doing shopping on their own, followed by 20 percent sharing responsibility with another family member and 17 percent with their spouse. Among male respondents, 43 percent mentioned that they shopped themselves, followed by 39 percent sharing responsibility with their spouse and 18 percent with another family member.

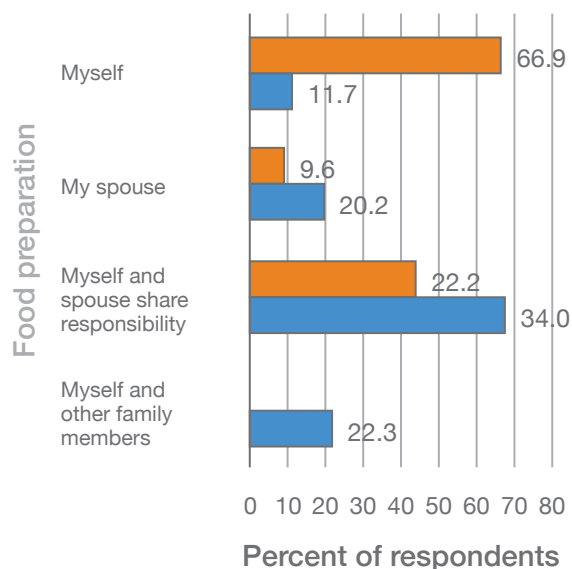
Similarly, 55 percent of the respondents did food preparation on their own, with 22 percent sharing the responsibility with other members of their family (including children) and 15 percent sharing with their spouse (Figure 19). Among female respondents, approximately 67 percent mentioned that they prepared food themselves, followed by 22 percent sharing the responsibility with another family member and 10 percent with their spouse. Among male respondents, only 12 percent noted that they prepared food themselves, followed by 34 percent stating that they shared the responsibility with their spouse and 22 percent with other family members. Twenty percent of the male respondents noted that their spouse alone did food preparation.

FIGURE 19.

Distribution of food shopping and preparation patterns in the household by gender (N=450)



Source: Authors' own elaboration.



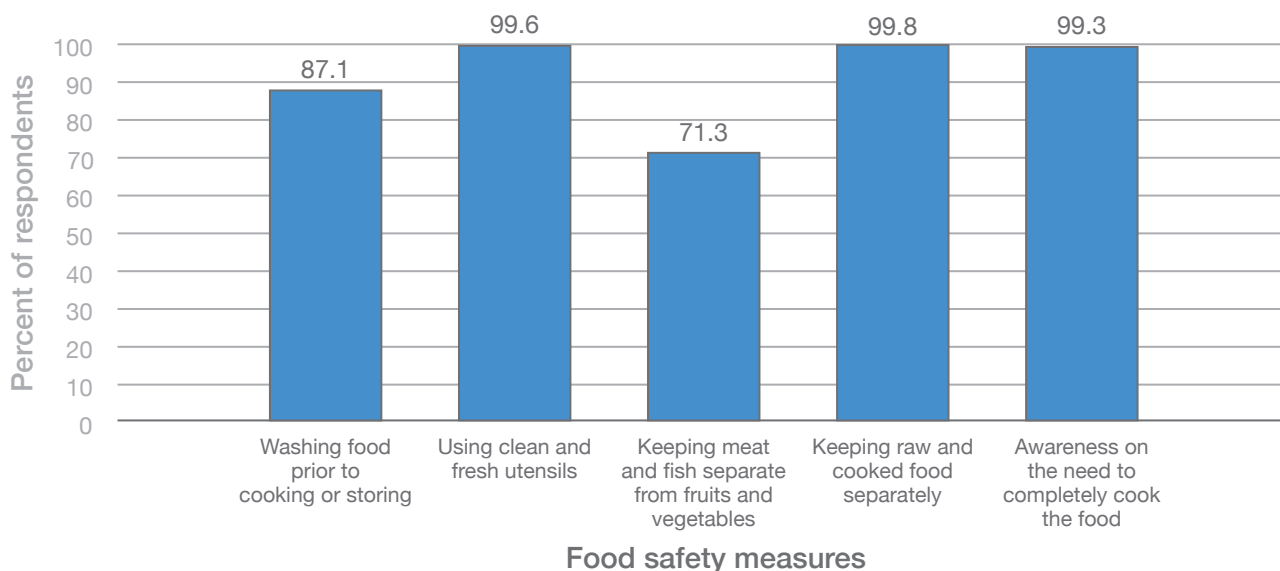
Source: Authors' own elaboration.

Most respondents noted high adherence (above 87 percent) to the food safety practices of: washing food prior to cooking or storing, using clean and fresh utensils, keeping raw and cooked foods separately, and awareness of the

need to completely cook the food (Figure 20). Seventy-one percent of consumers mentioned adherence to keeping meat and fish separate from fruits and vegetables.

FIGURE 20.

Food safety practices at the household level (N=450)



Source: Authors' own elaboration.

Very few households (8 percent) mentioned that they received information on nutrition and healthy diets in the previous twelve months. Respondents reported receiving messages from social media (23 percent), from non-governmental organizations (5 percent) and government authorities (1.6 percent).

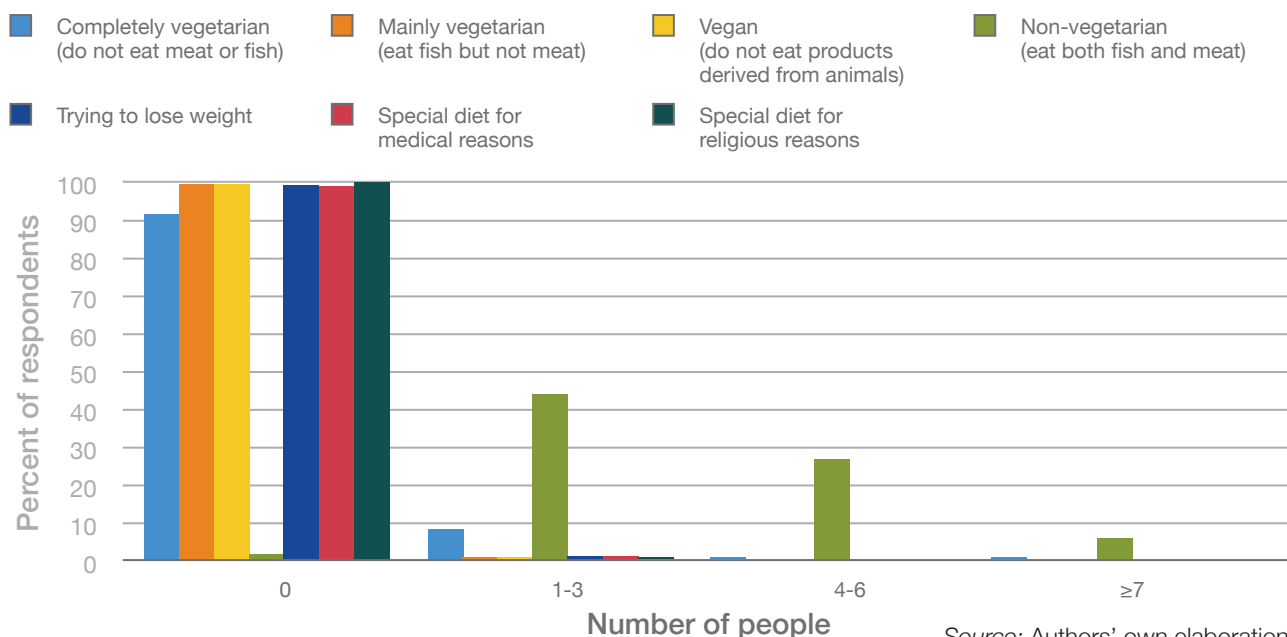
3.5. Consumption patterns

When asked about the dietary patterns of the family members, 91 percent of the respondents reported zero completely vegetarian (do not eat meat or fish) household members; 99 percent

stated having mainly vegetarian (eat fish but not meat) household members; and 99 percent reported having vegan (do not eat products derived from animals) members in the household (Figure 21). As for non-vegetarians (eat both fish and meat), 43.8 percent of the participants had up to three such members in the household; 27 percent had four to six household members who were non-vegetarian. In terms of consuming special diets, the majority of the households (above 99 percent) reported having zero individuals consuming special diets for weight loss, medical or religious reasons.

FIGURE 21.

Dietary patterns of households (N=450)

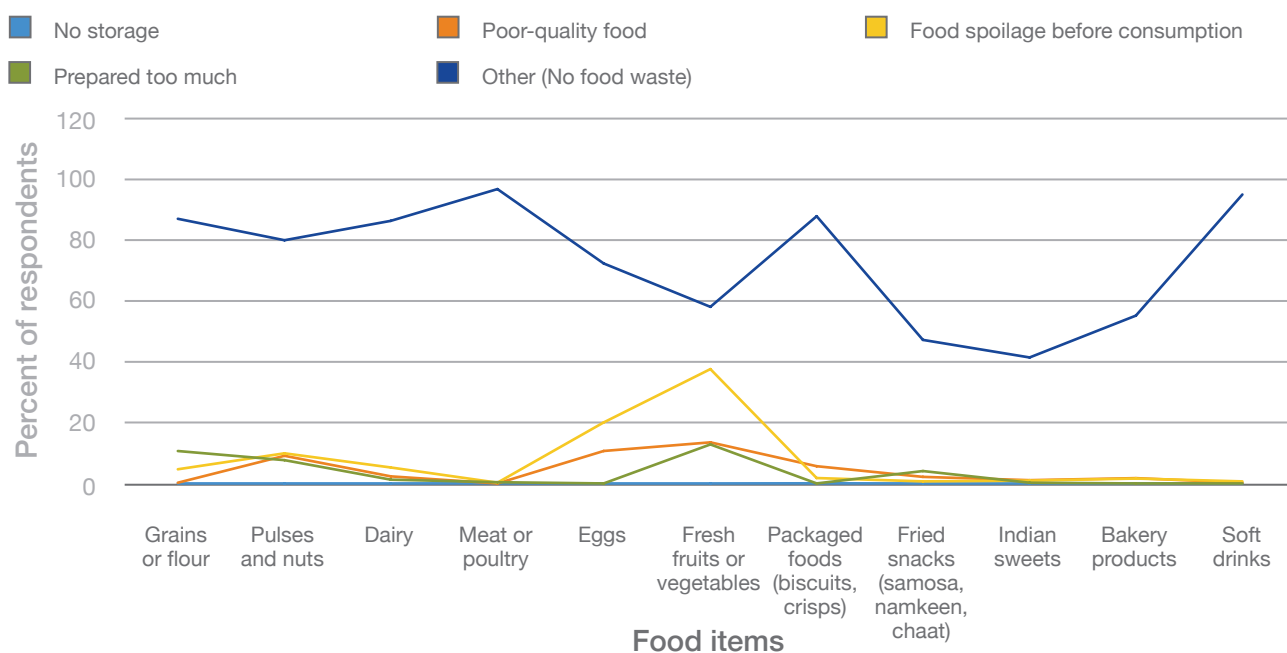


The majority of the participants reported consuming all the food and did not waste or throw away any food items (Figure 22). Participants were asked to specify the reasons for not consuming food purchased for the household, around the following five factors: no storage facilities, poor food quality, food spoilage before consumption, prepared too much, and other relevant factors.

For grains and fried snacks, preparing too much was noted as the major reason for not consuming the food. For pulses, dairy, eggs, soft drinks, fresh fruits and vegetables, spoilage before eating was identified as the main reason for non-consumption. Poor quality was reported as the reason for not consuming packaged food, bakery products and local sweets.

FIGURE 22.

Distribution of consumers' reasons for not consuming food (N=450)





MARKET

S **A** **L** **E**

SPECIAL
Price

GROCERY STORE

DAIRY

50%
OFF

SALE

DRINKS

FRUITS & VEGETABLES



OVERVIEW OF FOOD ENVIRONMENTS IN POKHARA

TABLE 5.

Overview of food environments in Pokhara

Availability and accessibility of food
<ul style="list-style-type: none">• All in all, the assessment revealed that 307 food items were sold by retailers.• Rice was the main staple sold, while <i>tur</i> and <i>mung dals</i> were the main pulses available for consumers.• Several retailers sold packaged foods (biscuits and crisps), fried snacks (<i>samosas</i>, <i>namkeen</i>, <i>chaat</i>, etc.) and soft drinks.• For staples, the main source of purchase for retailers were wholesalers (83 percent) and traders (25 percent).• Milk was mostly procured from traders (47 percent) and distributors (41 percent). Retailers procured from wholesalers.• Wholesalers were also the main source of purchase for fresh fruits and vegetables, eggs, packaged foods and beverages (soft drinks).• Closed and open vehicles, two-wheelers, bicycles and headload were used to transport food products to the retailers.• As expected, the greatest proportion of food products (99 percent) across all food groups were sold primarily to consumers by the retailers.
Marketing and regulation
<ul style="list-style-type: none">• Formal retailers advertised most of their food products outside the retail outlets (e.g. on doors, windows, walls, fences and parking lots) or at the entrance.• Few informal retailers (27 percent) advertised foods and beverages, and most of them advertised outside.• Informal retailers advertised the following food items outside their outlets: soft drinks, crisps, biscuits and ice cream.• Among formal retailers, the most common food item advertised were soft drinks, ice cream and confectionery.• Nutritional information on menus and menu boards was observed in 11 percent of the food service outlets.• The same proportion of food service outlets (11 percent) offered healthier sides (such as salads, fruits and steamed and boiled vegetables).• A moderate proportion (33 percent) of food service outlets offered consumers diet beverages and water.
Food quality and safety
<ul style="list-style-type: none">• A very high proportion of retailers (80 percent and above) highlighted food safety and quality, service, convenience and affordability as important factors when choosing potential suppliers.• Most retailers did not report any problems with their suppliers for 55 percent of the food products.• Retailers noted that there was no food loss or wastage for 39 percent of the food products.• The most sought-after strategies by retailers to reduce food loss were reducing the damage caused by rodents, pests and insects, and sourcing good-quality products.

Source: Authors' own elaboration.

4. FOOD ENVIRONMENTS

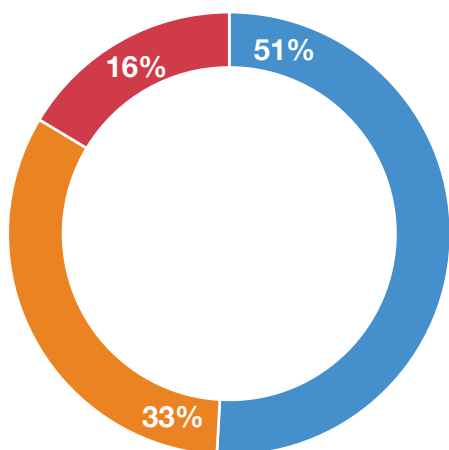
In this study, retailers are mainly divided into three types: formal retailers, informal retailers and food service outlets. Formal retailers are those having permanent establishments with a license to sell their goods in local markets or malls. Informal retailers are those who do not have a license or a fixed place to sell their products. Food service outlets are those which provide ready-to-eat food and meals to customers.

A total of 55 retailers and food service outlets were surveyed in Pokhara. Twenty-eight (51 percent) comprised of formal retailers, 18 (33 percent) comprised of informal retailers and 9 (16 percent) were food service outlets³ (Figure 23).

FIGURE 23.

Distribution of type of retailers interviewed for the assessment (n=55)

■ Formal retailers (n=28) ■ Informal retailers (n=18)
■ Food service outlets (n=9)



Source: Authors' own elaboration.

The survey was conducted in two wards: Ward 10 and Ward 27. Retailers were evenly distributed across these two wards – 27 (49 percent) were surveyed in Ward 10 and 28 (51 percent) in Ward 27.

³ The interviews with retailers and food service outlets were conducted from 19 to 25 November 2020.

All of the formal retailers (28) interviewed as part of the assessment had permanent structures. In this study, permanent structures are defined as those shops which operate under a license and have been established in a fixed place. Temporary structures, instead, are those that are not situated in an allocated place. Twelve (out of 18) informal retailers had permanent structures and seven (out of nine) food service outlets had permanent structures.

Out of 55 retailers, only 3 (5 percent) – all of which formal retailers – were members of a trade association. These trade associations were reported to provide the following services: extension and technical production advice, market information, sourcing of inputs, mechanization services, publicity and advocacy, assistance with licenses and compliance with regulations, and negotiation with authorities.

4.1. Availability and accessibility of food

Table 6 presents an overview of food groups and food items sold by retailers in Pokhara. All in all, the assessment revealed that 307 food items were sold by retailers. Rice was the main staple sold, while *tur* and *mung dals* were the main pulses available for consumers. Several retailers sold packaged foods, such as biscuits and crisps, fried snacks (*samosas*, *namkeen*, *chaat*, etc.) and soft drinks.

TABLE 6.

Distribution of food items and food groups, overall (n=307 food products)

Food group	Food items	Frequency (%)
Staples and pulses	Wheat	5 (9.1)
	Rice	23 (41.8)
	Other staples	26 (47.3)
	Tur dal	18 (32.7)
	Mung dal	15 (27.3)

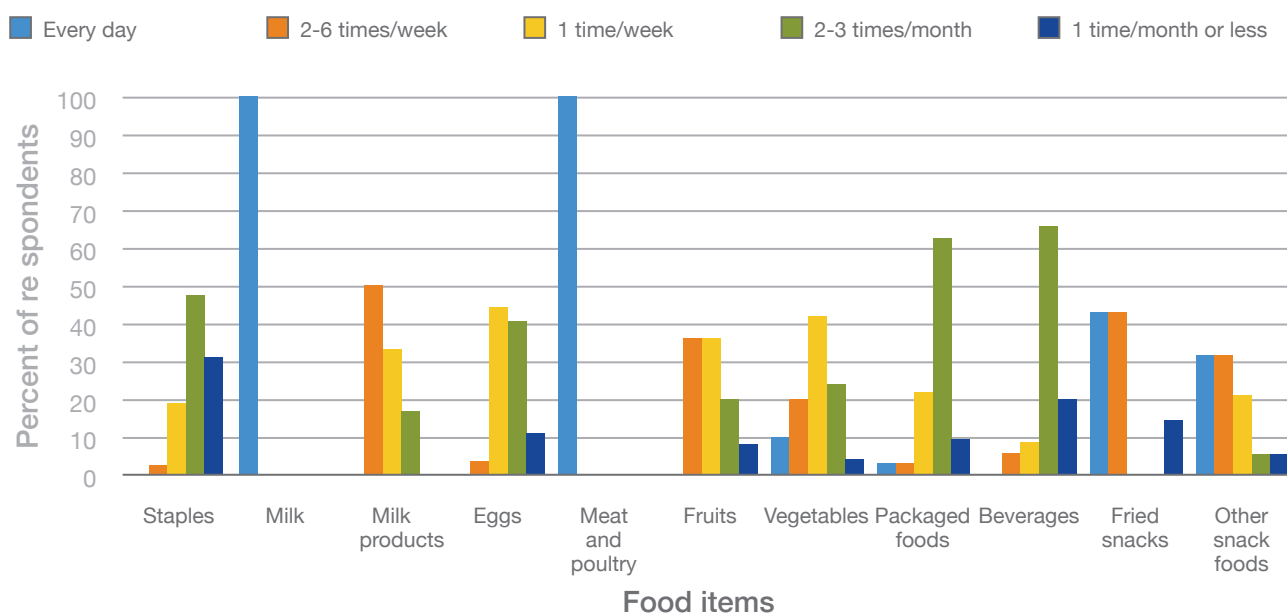
Food group	Food items	Frequency (%)
Vegetables	Onion	17 (30.9)
	Potato	18 (32.7)
	Tomato	8 (14.5)
	Other vegetables	7 (12.7)
Fruits	Banana	9 (16.4)
	Papaya	3 (5.5)
	Pomegranate	4 (7.3)
	Other fruits	9 (16.4)
Milk	Milk	17 (30.9)
Milk products	Paneer	6 (10.9)
Meat and poultry	Meat and poultry	5 (9.1)
Eggs	Eggs	27 (49.1)
Packaged foods	Packaged foods (biscuits, crisps)	32 (58.2)
Fried snacks	Fried snacks (samosas, namkeen, chaat)	6 (10.9)
Other snack foods	Local sweets	4 (7.3)
	Bakery products	13 (23.6)
Beverages	Soft drinks	35 (63.6)

The majority of retailers selling milk, meat and poultry reported repurchasing these food items on a daily basis (Figure 24). Beverages (66 percent), packaged foods (63 percent), staples (48 percent) and eggs (41 percent) were repurchased two to three times per month. Milk products (50 percent) were repurchased two to six times per week, while vegetables were repurchased once a week. Fruits were either repurchased two to six times per week or once a week (36 percent). Fried snacks (43 percent) and other snack foods (32 percent) were either repurchased daily or two to six times per week.

Source: Authors' own elaboration.

FIGURE 24.

Distribution of food items and repurchasing frequency by retailers (N=307 food products)



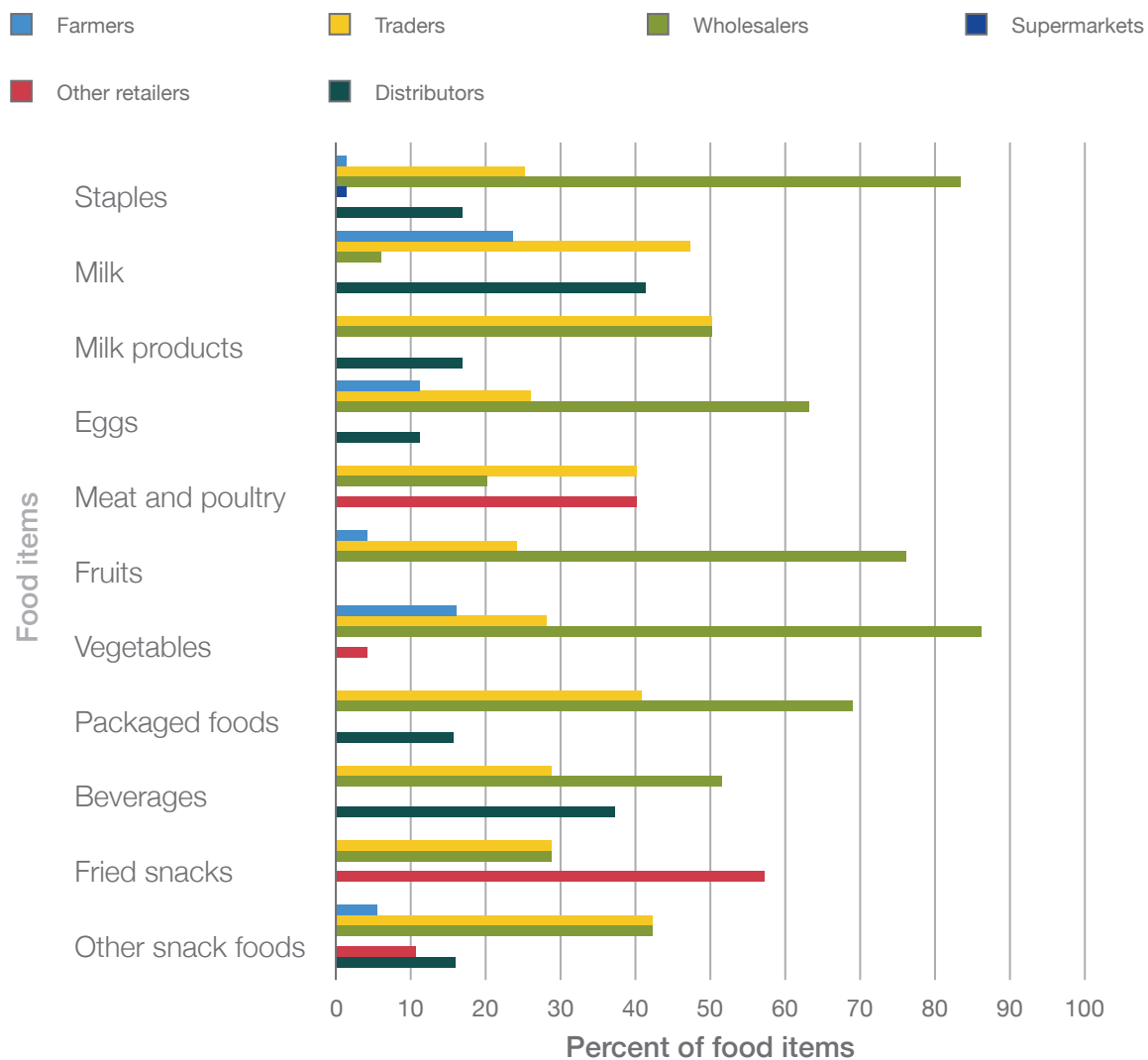
Source: Authors' own elaboration.

For staples, the main source of purchase for retailers were wholesalers (83 percent) and traders (25 percent). Milk was mostly procured from traders (47 percent) and distributors (41 percent) and distributors (41 percent) (Figure 25). Retailers

procured from wholesalers. Wholesalers were also the main source of purchase for fresh fruits and vegetables, eggs, packaged foods and beverages (soft drinks).

FIGURE 25.

Distribution of retailers' main sources of food purchase, by food system actor (N=307 food products)



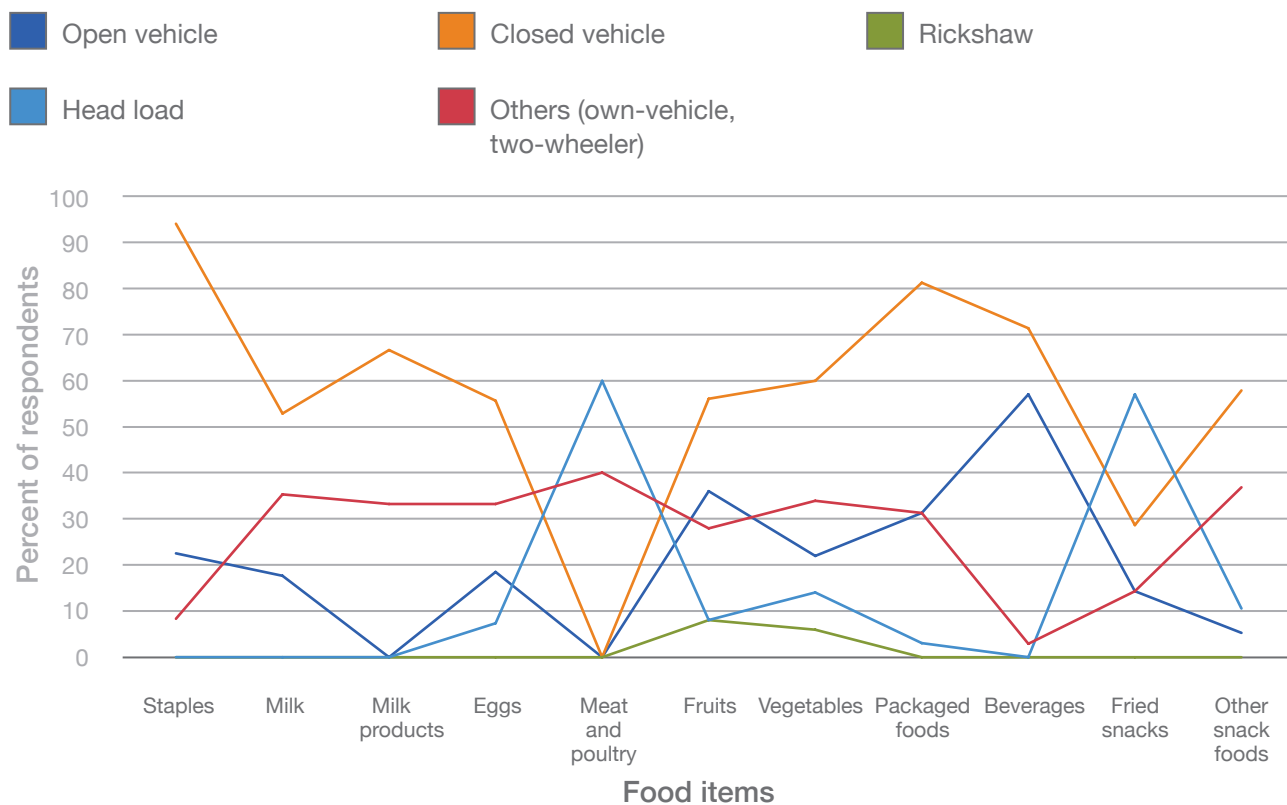
Source: Authors' own elaboration.

Closed and open vehicles, two-wheelers, bicycles and headload were used to transport food products to the retailers (Figure 26). Staples and pulses were mostly transported via closed and open vehicles. Milk, milk products and eggs were transported through closed vehicles.

Meat and poultry were transported via headload, two-wheelers and bicycles. Fruits and vegetables, packaged foods and snack foods were mostly transported via closed vehicles. Beverages (soft drinks) were transported by both closed and open vehicles.

FIGURE 26.

Mode of transportation of food items from suppliers to retailers (N=307 food products)



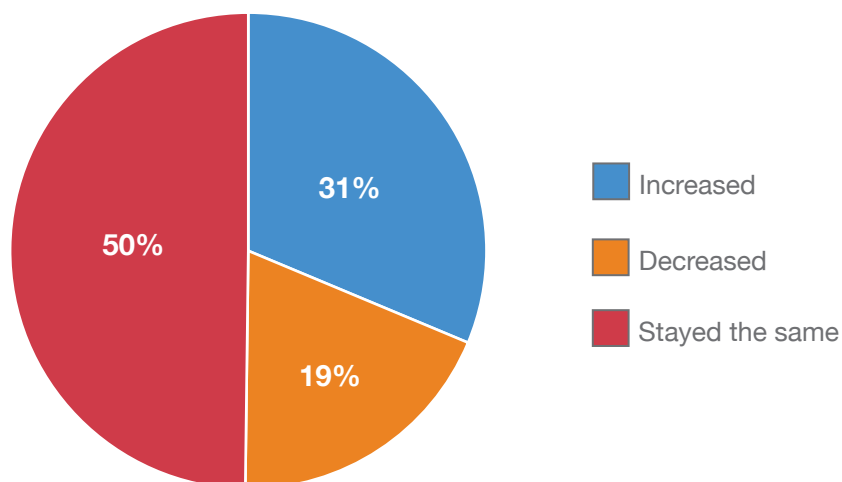
Source: Authors' own elaboration.

As expected, the greatest proportion of food products (99 percent) across all food groups were sold primarily to consumers by the retailers. Sales of half of the food products were expected

to be consistent during the same time in 2021 (Figure 27). The most common reasons for this were linked to the COVID-19 pandemic and previous sale experiences.

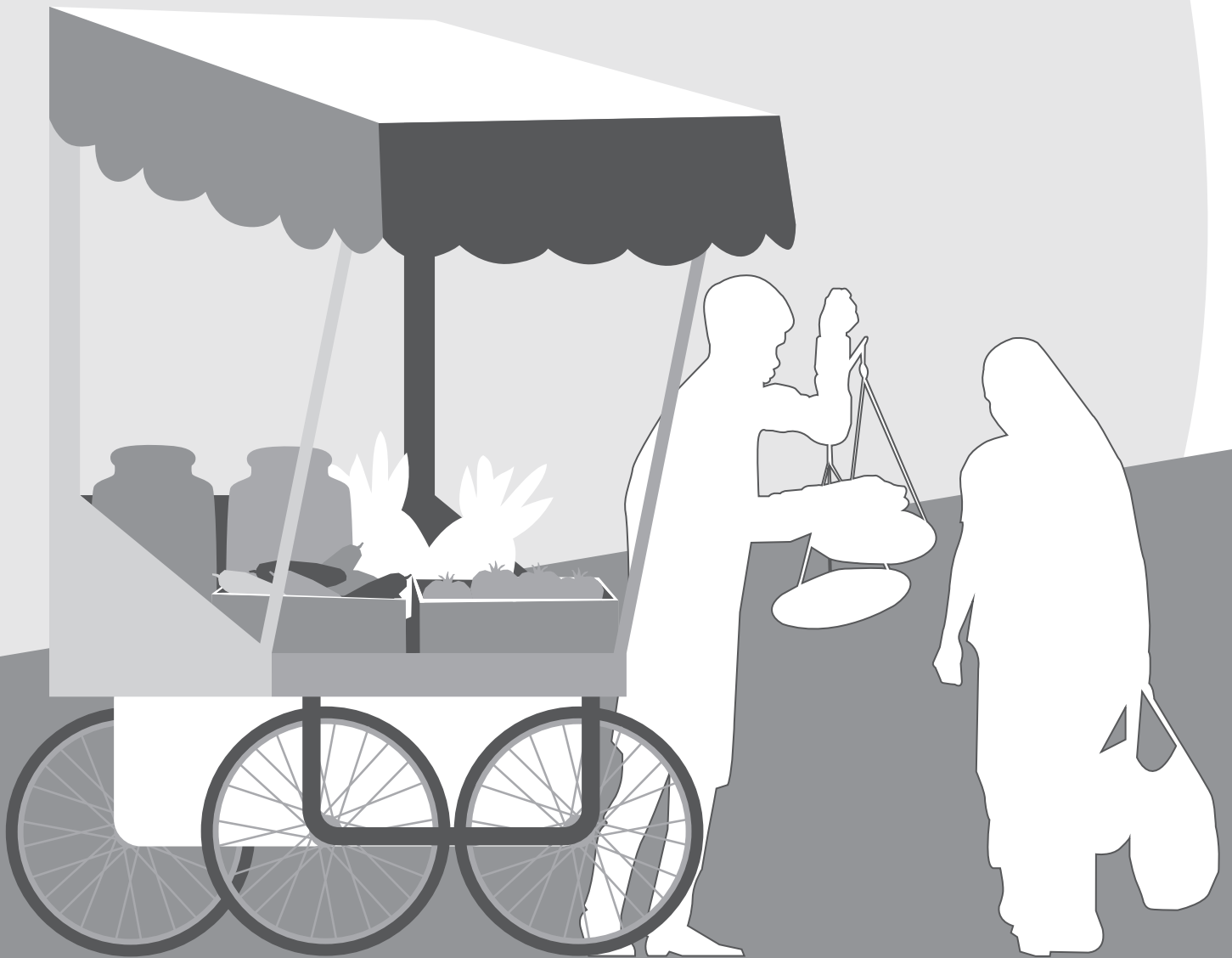
FIGURE 27.

Distribution of retailers' sales expectations for the same time the following year (2021) (N=307 food products)



Source: Authors' own elaboration.





4.2. Marketing and regulation

Among the 55 retailers, only 3 stated that fresh fruit or vegetable produce bins were available outside the premises.

Formal retailers advertised most of their food products outside the retail outlets (for example on doors, windows, walls, fences and parking

lots) or at the entrance. Few informal retailers (27 percent) advertised foods and beverages, and most of them advertised outside (See Table 7). The informal retailers advertised the following food items outside their outlets: soft drinks, crisps, biscuits and ice cream.

TABLE 7.

Distribution of food and beverages advertisements (n=55)

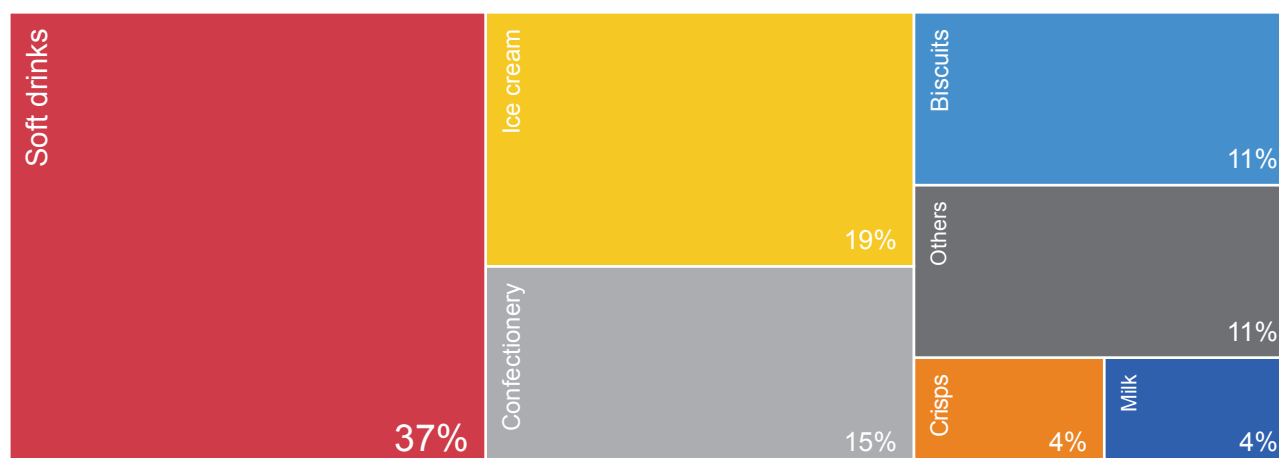
Advertisement area	Frequency (%)			Total (%) n=55
	Formal retailers (N=28)	Informal retailers (N=18)	Food service (N=9)	
Outside (doors, windows, walls, fences and parking lots, etc.)	10 (35.7)	5 (27.8)	-	15 (27.2)
Entrance	3 (10.7)	-	-	3 (5.4)
Checkouts	1 (3.6)	-	-	1 (1.8)
Ends of aisles	2 (7.1)	-	-	2 (3.6)
Floor	-	-	-	-
Ceiling	1 (3.6)	-	-	1 (1.8)

Source: Authors' own elaboration.

Among formal retailers, the most common food items advertised were soft drinks (37 percent), ice cream (19 percent) and confectionery (15 percent) – see Figure 28.

FIGURE 28.

Percent distribution of common food items advertised by formal retailers (N=27 food products)

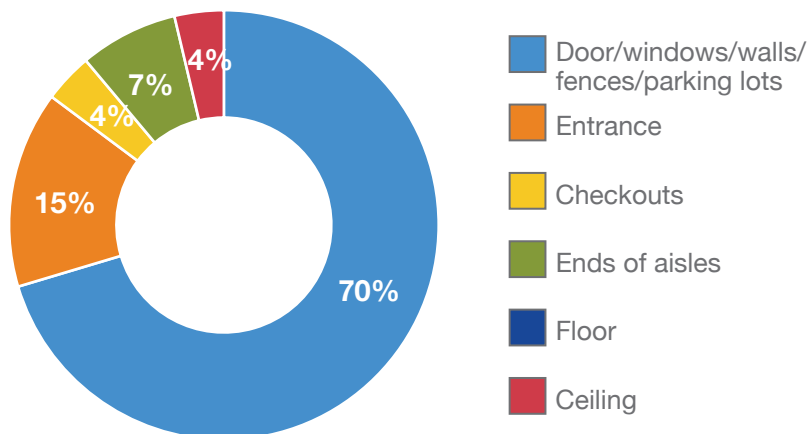


Source: Authors' own elaboration.

The most desired areas to advertise were outside the retail outlet (doors, windows, walls, fences and parking lots: 70 percent) and the entrance (15 percent) – see Figures 29 and 30.

FIGURE 29.

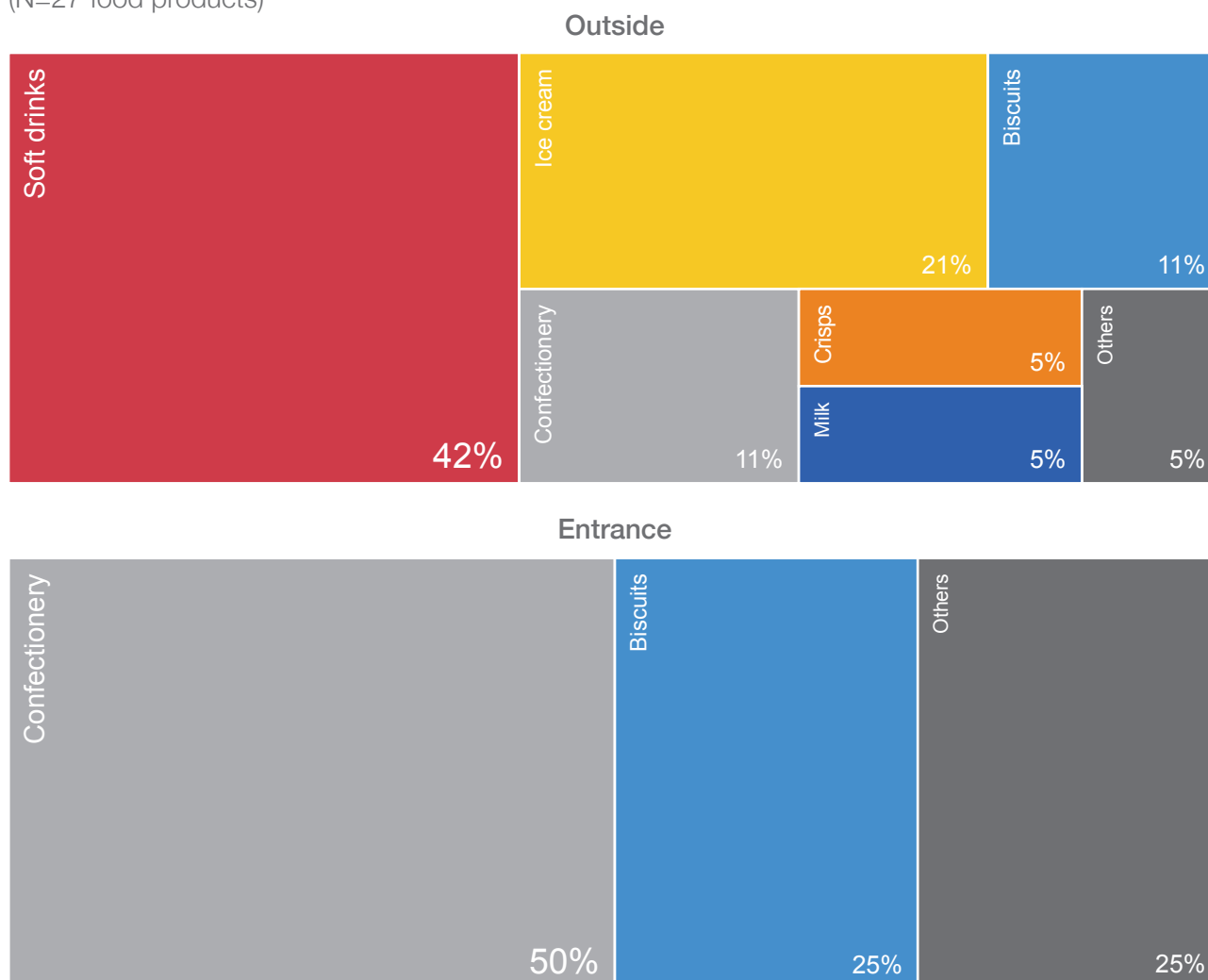
Distribution of total food and beverage products advertised by formal retailers (N=27 food products)



Source: Authors' own elaboration.

FIGURE 30.

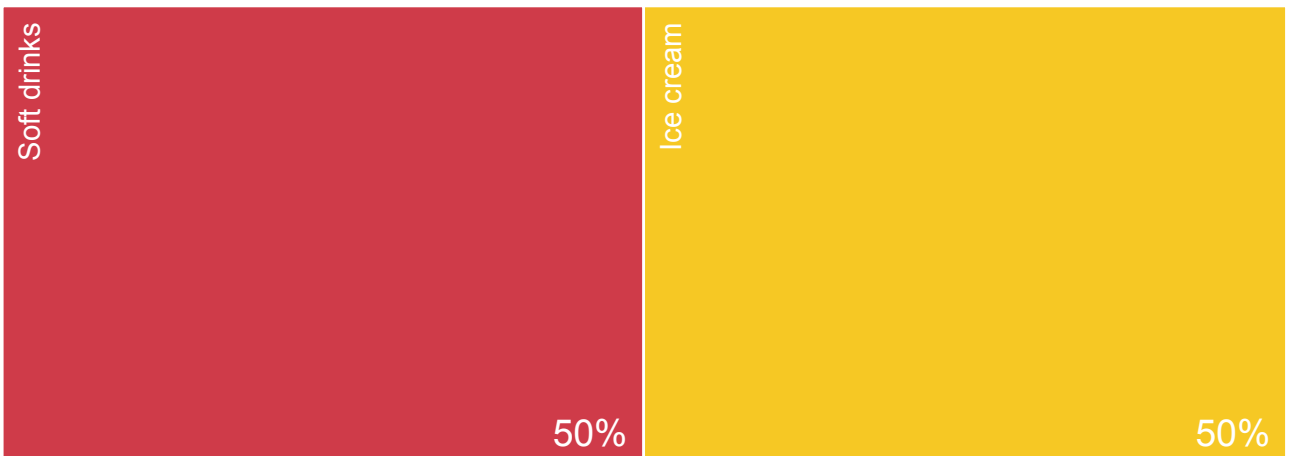
Distribution of food and beverage products advertised by formal retailers, by place of advertisement (N=27 food products)



Checkouts



Ends of aisles



Ceiling



Source: Authors' own elaboration.

Information on nutrition was captured for food service retailers (see Table 8). Nutritional information on menus and menu boards was observed in 11 percent of the food service outlets. The same proportion of food service outlets offered healthier sides (such as salads, fruits, steamed and boiled vegetables). A moderate proportion (33 percent) of food service outlets offered diet beverages and water to consumers.

TABLE 8.

Distribution of food service outlets (N=9 food service outlets)

Food services	Frequency (%)
	Food service outlets (N=9)
Is any nutritional information posted on the menu or menu board?	1 (11.1)
Is a choice of healthy sides available (e.g. salad, fruits, steamed/boiled vegetables)?	1 (11.1)
Are healthy cooking options available (e.g. baking, boiling, steaming)?	1 (11.1)
Are diet beverages or water available?	3 (33.3)

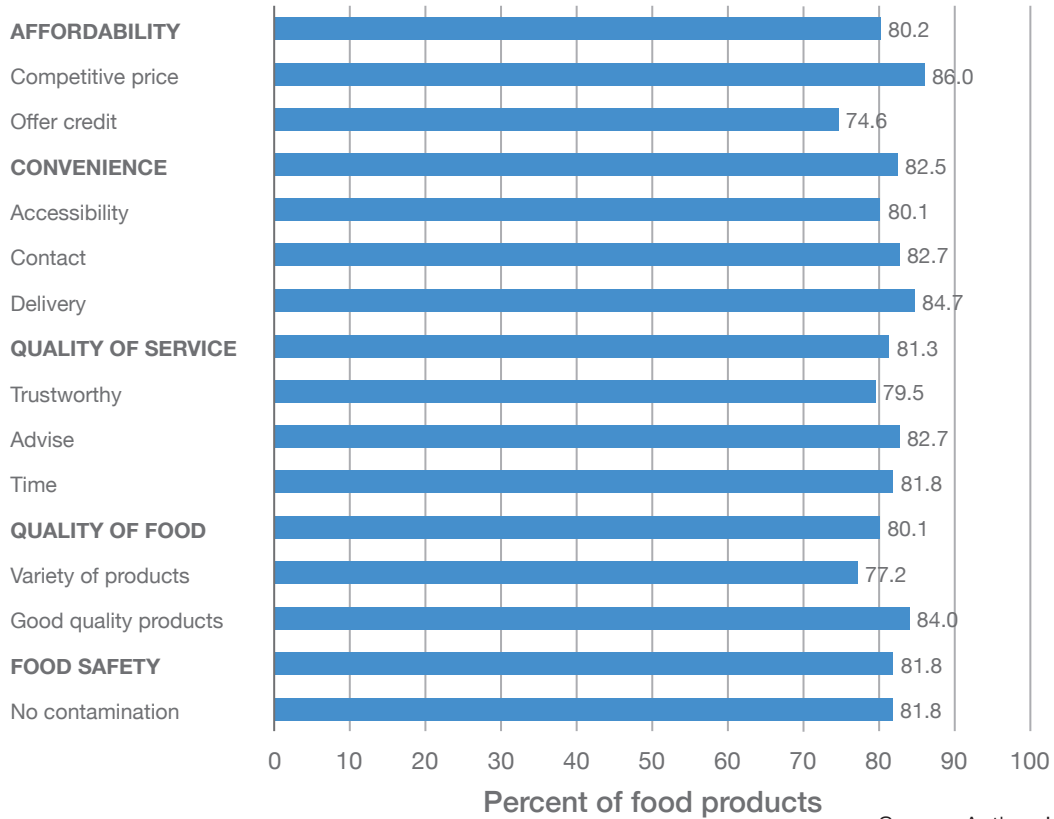
Source: Authors' own elaboration.

4.3. Food quality and safety

Given that retailers mostly sell to consumers, their preferences related to food quality and safety are critical in understanding the food environments. For this reason, retailers were asked to identify their preferences when selecting food items to sell. A very high proportion of retailers (80 percent and above) highlighted food safety and quality, service, convenience and affordability as important factors when choosing potential suppliers (Figure 31). Under food safety and quality, retailers valued suppliers who could provide a wide range of products, of consistently good quality and without contamination. As for convenience, ease of access and proximity to the supplier, the ability to contact them at any time and the possibility of delivery were noted as important considerations. Under food affordability, retailers valued the possibility of being able to obtain a competitive price and credit from the supplier. Under quality of service, retailers deemed it important for the supplier to be trustworthy, proactive in communicating any supply problems and time-sensitive.

FIGURE 31.

Percent distribution of food quality and safety concerns reported by retailers (N=307 food products)



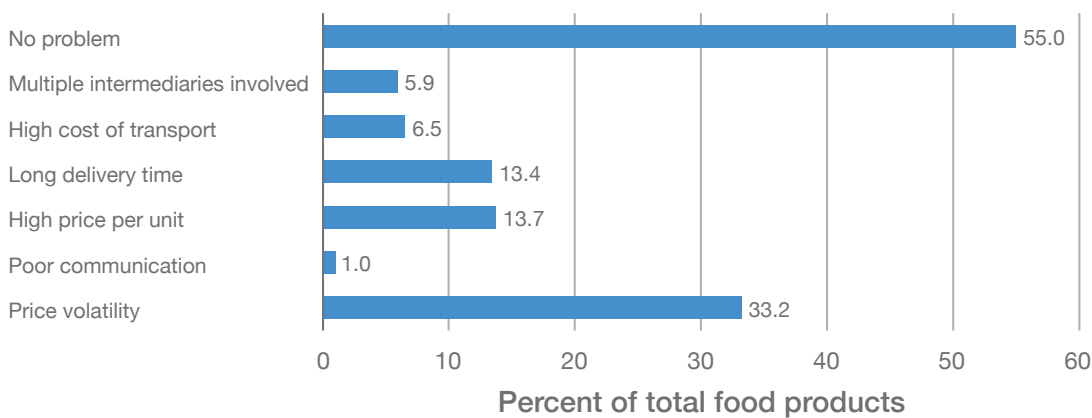
Source: Authors' own elaboration.

Most retailers did not report any problems with their suppliers for 55 percent of the food products (Figure 32). However, retailers

considered price volatility to be a major problem for 33 percent of the food products.

FIGURE 32.

Distribution of major problems retailers faced with suppliers (N=307 food products)



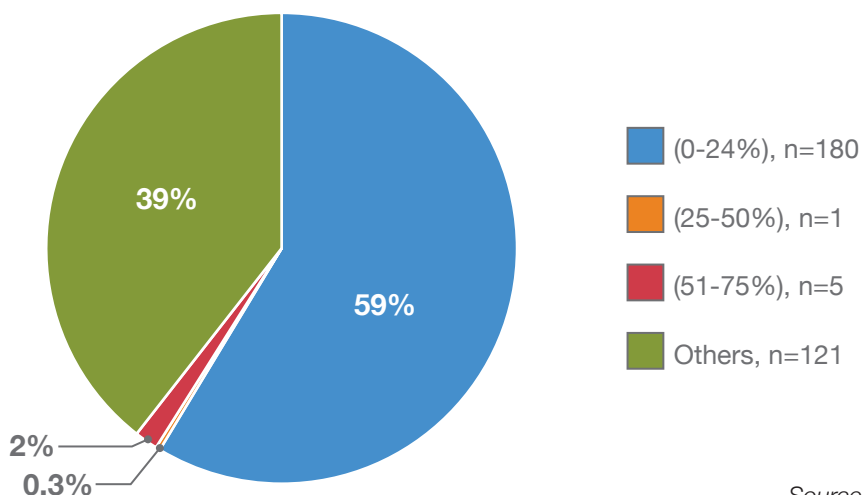
Source: Authors' own elaboration.

Retailers noted that there was no food loss or wastage for 39 percent of the food products (Figure 33). Fifty-nine percent of the food

products experienced food loss within the range of 0 to 24 percent.

FIGURE 33.

Self-reported food losses at the retail level (N=307)



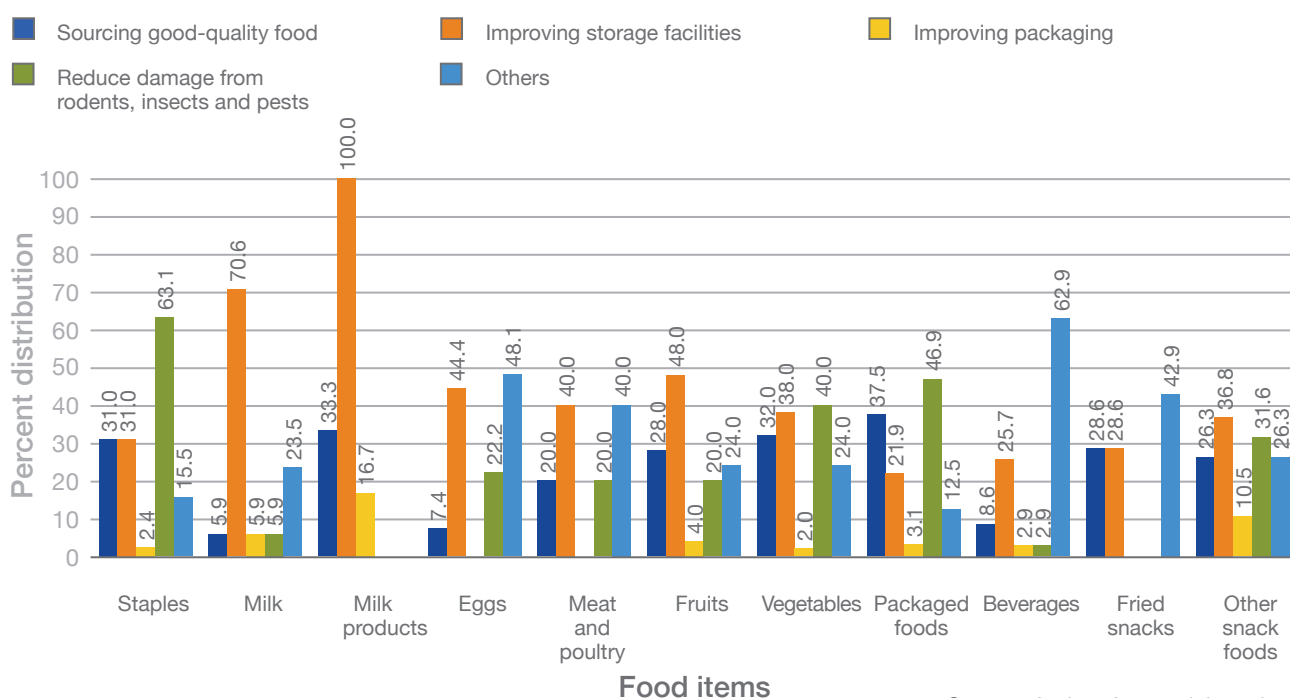
Source: Authors' own elaboration.

In order to reduce the loss of food products across food groups, retailers noted that the strategies they employed most often were sourcing good-quality food (77 percent), improving storage facilities (37 percent) and reducing damage caused by rodents, insects and other pests (35 percent) (Figure 34). For staple food products, retailers' most

sought-after strategy to reduce food loss was to reduce damage from rodents, insects and pests (63 percent). For fruits, the most common strategy included improving storage facilities (48 percent). For vegetables, common strategies included: reducing damage caused by rodents, insects and other pests; improvements in storage facilities; and sourcing good-quality foods.

FIGURE 34.

Percent distribution of strategies implemented to reduce losses (N=307)

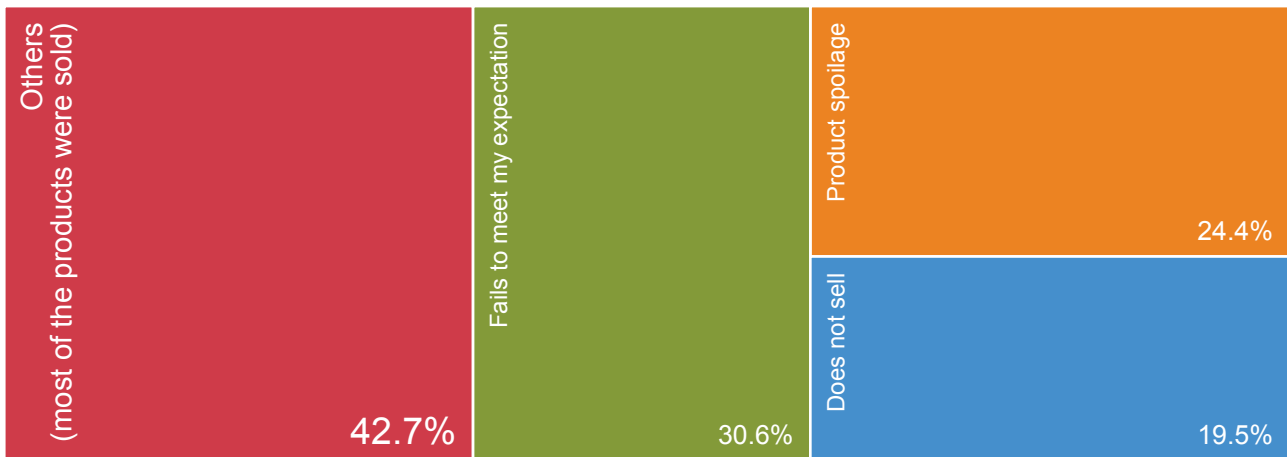


Source: Authors' own elaboration.

Retailers noted main reasons for not selling food to be not meeting expectations and product spoilage (Figure 35).

FIGURE 35.

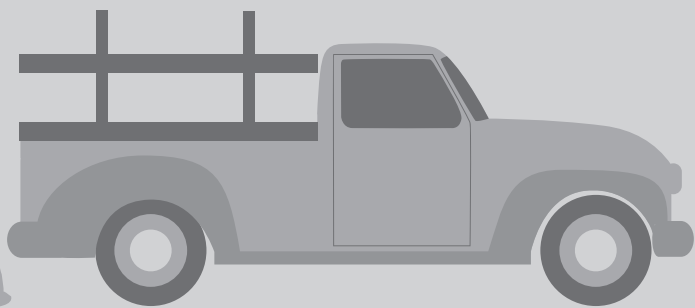
Percent distribution of reasons for food groups not being sold by retailers (food products=307 food products)



Source: Authors' own elaboration.

Out of 55 retailers, only 2 (4 percent) reported receiving formal training in food safety management practices provided by government officers and private franchises. In addition, only two (4 percent) operated under a food safety or quality assurance programme. The major barrier perceived by food actors in operating formal food safety programmes was the lack of awareness of such programmes among the population.

Retailers were asked about the services and infrastructure offered by municipal authorities. Formal retailers adjudicated the quality of following services as “poor”: provision of clean and potable water, food safety education and training, hygiene and food safety inspection, support for establishing new businesses and availability of transport infrastructure. Informal retailers considered services related to the availability of clean and potable water and support for establishing new businesses to be “poor”.



OVERVIEW OF FOOD SUPPLY CHAINS IN POKHARA

- Traders, wholesalers and processors mainly sold their products to other food retailers (94 percent), followed by consumers (90 percent), across all food groups.
- Out of 55 traders, wholesalers and processors, 40 (73 percent) were members of a trade association.
- Out of 55 traders, wholesalers and processors, only 3 had received formal training in food safety management.
- Processing, storage, packaging, transport and marketing were the main post-harvest activities undertaken by traders, wholesalers and processors.
- Only five farmers (11 percent) were members of a farmer producer organization.
- Most farmers (76 percent) reported that buyers collected the crops using either truck, van or headload. Only three farmers reported that a vehicle with cold storage was used to transport crops.
- Eighty-two percent of the farmers reported having no problems with the buyer. However, 16 percent reported delay in payment and 9 percent reported reduced shares of profits due to multiple intermediaries.

TABLE 9.

Indicative distribution of food products according to yearly supply and demand, as reported by traders, intermediaries and wholesalers

Food groups	Supply		Demand	
	Low	High	Low	High
Staples	April	August	September	January February
Milk	December	April May	June	September October
Milk products	September October	March April	March April December	June July
Eggs	January April December	August September October	January April December	August September October
Meat and poultry	October November	March	April	October November
Fruits	October	July	September	June July
Vegetables	March	September	April	June July August

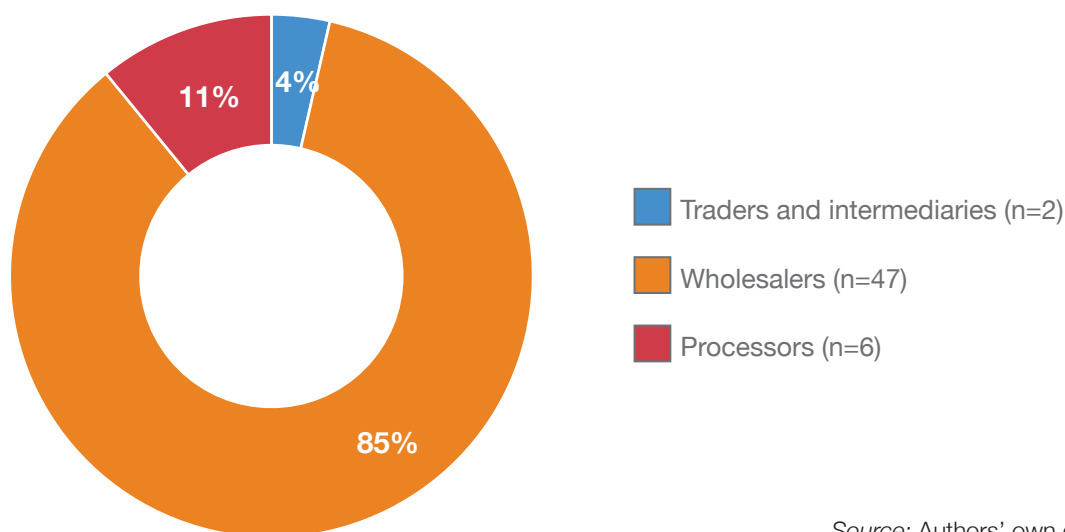
Source: Authors' own elaboration.

5. FOOD SUPPLY CHAINS

To understand food supply chains in Pokhara, 55 traders, wholesalers and processors, were interviewed. Two traders (and intermediaries), 47 wholesalers and 6 processors were identified in 19 wards in the city^{4,5} (Figure 36).

FIGURE 36.

Distribution of traders, wholesalers and processors interviewed for the assessment (n=55)



Source: Authors' own elaboration.

About 13 (24 percent) and 12 (22 percent) food actors were located in the Ram Ghat and Pokhara wards, respectively. These food supply chain actors managed a total of 94 food products from the following food groups: staples and pulses (wheat, rice, dals, etc.), fruits (banana, papaya, etc.) and vegetables (potatoes, tomatoes, etc), milk and milk products (milk and paneer), meat and poultry, and eggs. Most of the actors sold staples, pulses, fruits and vegetables – 30 (55 percent) sold staples and pulses and 16 (29 percent) sold fruits and vegetables.

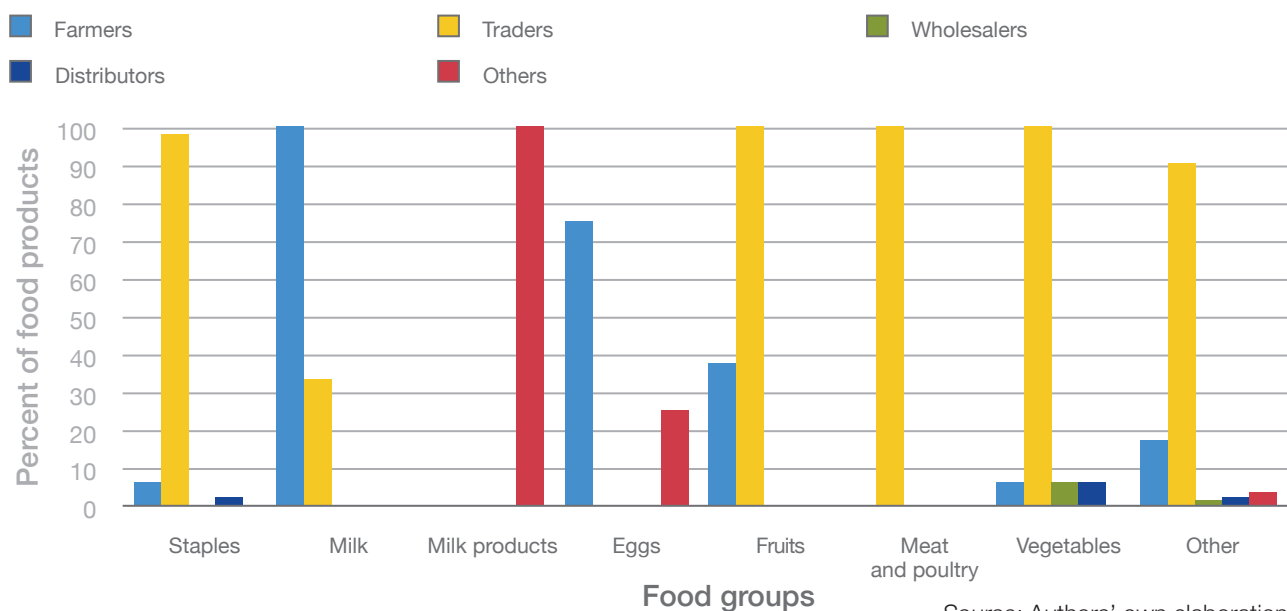
Farmers and traders were the main sources of purchase for food products (Figure 37). For staples, most of the food products (98 percent) were purchased from traders. For fruits, vegetables, meat and poultry, traders were also the main source of purchase, whereas milk and eggs were procured from farmers.

⁴ The interviews with traders, wholesalers and processors were conducted from 20 to 24 November 2020.

⁵ Baglung Rajmarg, Chiple Dhunga Rd, Gairapatan Road, Ganeshman Sinha, Maarga, Gyan Marg, Hemja, Indra Marg, Indrapuri Sreet, Janpriya Marga, Nagdhunga, Nayabazar Road, Pokhara, Puraano Bazaar Road, Tarkari Bazaar, Ram Ghat, Rastra Bank Road, Shivalay Marg, Simalchour and Siddhartha Maarga.

FIGURE 37.

Percent distribution of food groups and sources of purchase of traders, wholesalers and processors (N=94)

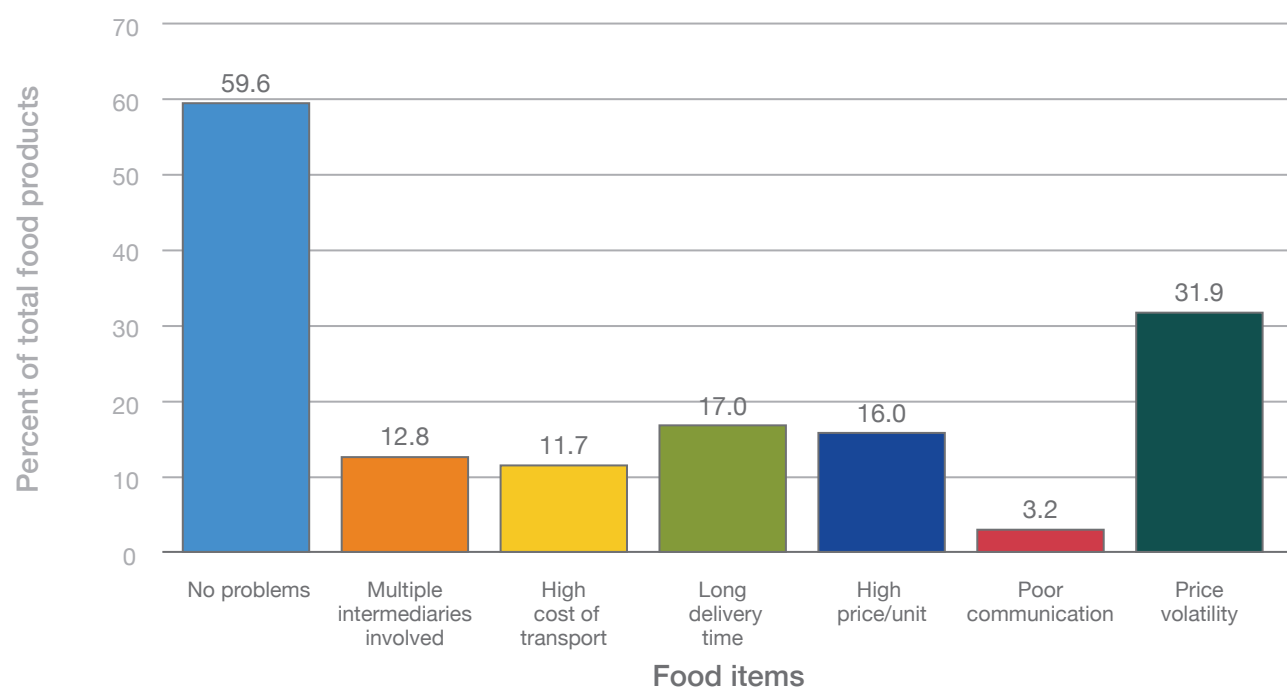


Retailers noted that for approximately 60 percent of the food products, there were no problems with the supplier (Figure 38). However, price

volatility was considered to be an issue for actors managing staples, pulses, fruits, vegetables and eggs.

FIGURE 38.

Percent distribution of major problems with suppliers faced by traders, wholesalers and processors (N=94)

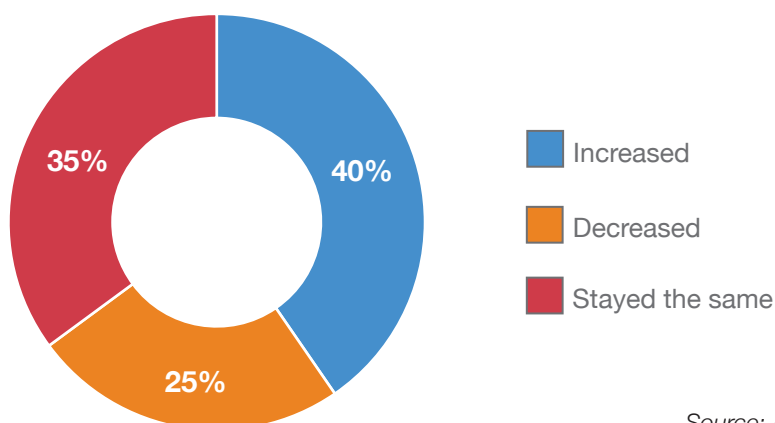


Traders, wholesalers and processors mainly sold their products to other food retailers (94 percent), followed by consumers (90 percent), across all food groups. Approximately 40 percent of the food products sales were expected to decrease

during the same time in 2021 (Figure 39). The most common reasons for changes in sales expectations were the COVID-19 pandemic and product demand.

FIGURE 39.

Distribution of traders', wholesalers' and processors' sales expectations for the same time the following year (2021) (N=94)



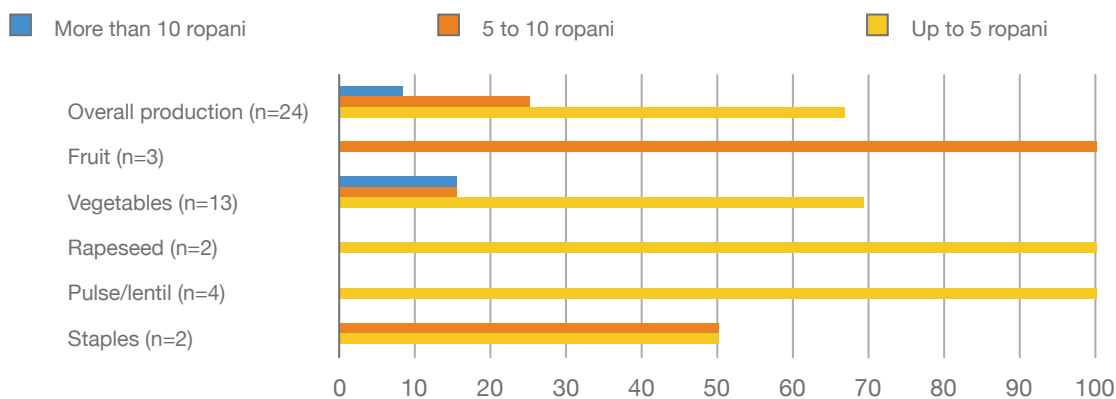
Source: Authors' own elaboration.

A total of 45 farmers were interviewed⁶ from the peripheral areas of Pokhara with respect to the type of crop production. During the *rabi* season⁷, 26 (58 percent) farmers grew at least one crop and two (4 percent) grew two crops, which were mostly vegetables (grown by 13 farmers), pulses and lentils (grown by four farmers), fruits (grown

by three farmers), staples (grown by two farmers) and rapeseed (grown by two farmers). Sixty-seven percent of the farmers cultivated up to 5 *ropani*⁸ of land, and 25 percent cultivated 5 to 10 *ropani* land for crops during the *rabi* season (Figure 40). Around 92 percent of the farmers reported selling three quarters of their crops.

FIGURE 40.

Crops cultivated during the *rabi*, season according to farm size (N=45)



Source: Authors' own elaboration.

⁶ The farmer interviews were conducted from 21 to 23 November 2020.

⁷ The winter season, from November to April.

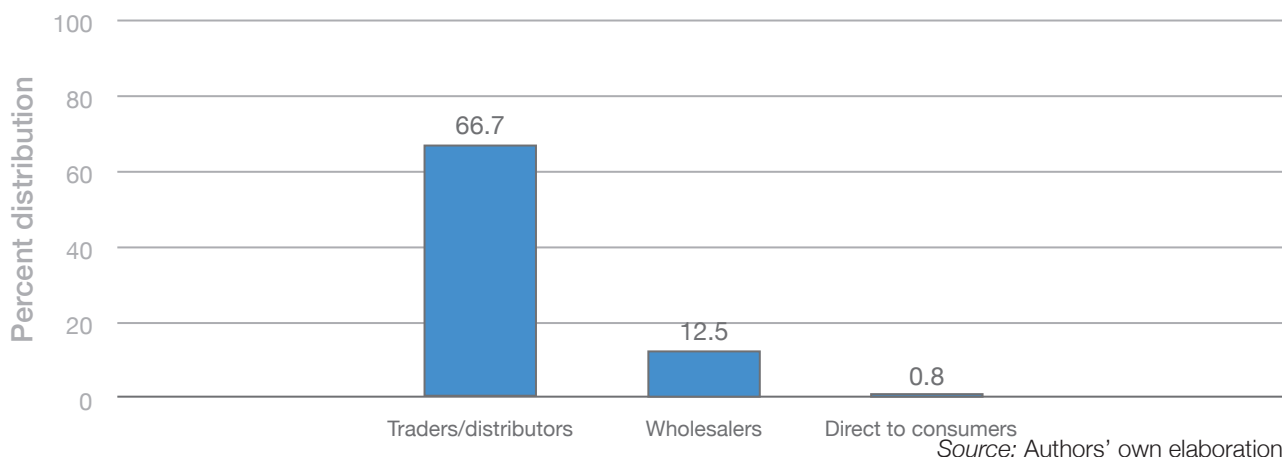
⁸ 1 *ropani* = approximately 0.05 ha.

The unsold crops during the *rabi* season were mostly used for home consumption by all farmers, followed by donating them to others.

Most farmers sold most of their produce to traders and distributors (67 percent), followed by directly to consumers (21 percent) (Figure 41).

FIGURE 41.

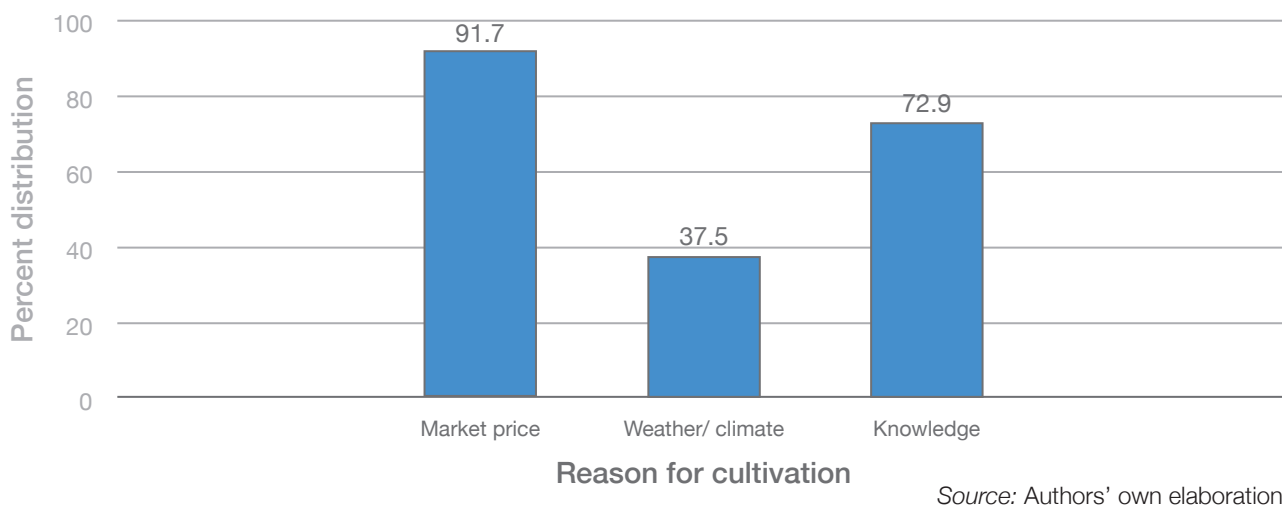
Distribution of farmers' primary place for selling crops in the *rabi* season (N=45)



Ninety-two percent of the farmers cultivated the crops because of the market price, followed by 73 percent who cultivated based on their knowledge (Figure 42).

FIGURE 42.

Percent distribution of reasons for cultivation during the *rabi* season (N=45)



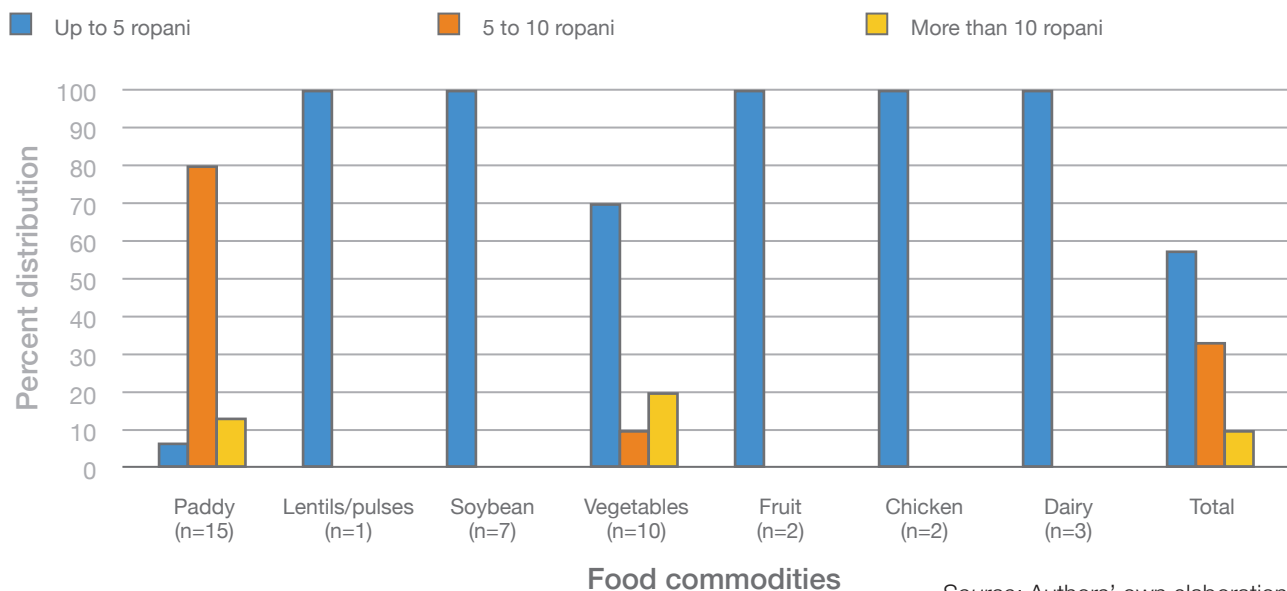
During the *kharif* season⁹, the majority of the farmers (38 percent) grew rice (paddy), 25 percent cultivated vegetables, and 18 percent produced soybean. Paddy farmers mostly cultivated over 5 to 10 *ropani* of land, whereas

vegetables and soybean were grown within 5 *ropani* of land (Figure 43). Twenty-five percent of the farmers sold half of the crops grown, and 68 percent sold three quarters of their crops.

⁹ The rainy season, from May/June to October.

FIGURE 43.

Crops cultivated during the *kharif* season, according to farm size (N=45)



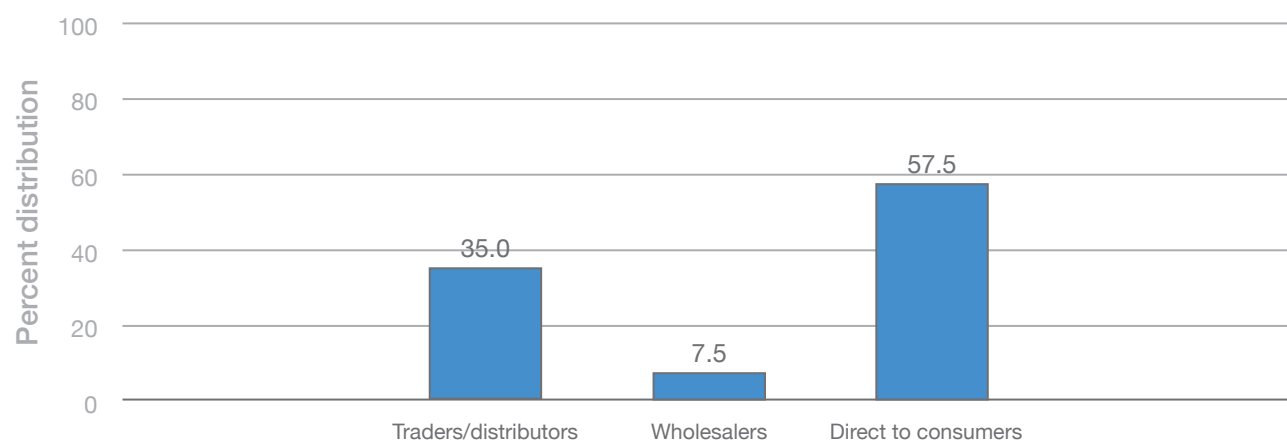
Source: Authors' own elaboration.

The unsold crops during the *kharif* season were mostly used for home consumption by all farmers. Most farmers (58 percent) sold their

crops directly to consumers, while 35 percent sold to traders and distributors (Figure 44).

FIGURE 44.

Distribution of farmers' primary place for selling crops in the *kharif* season (N=45)



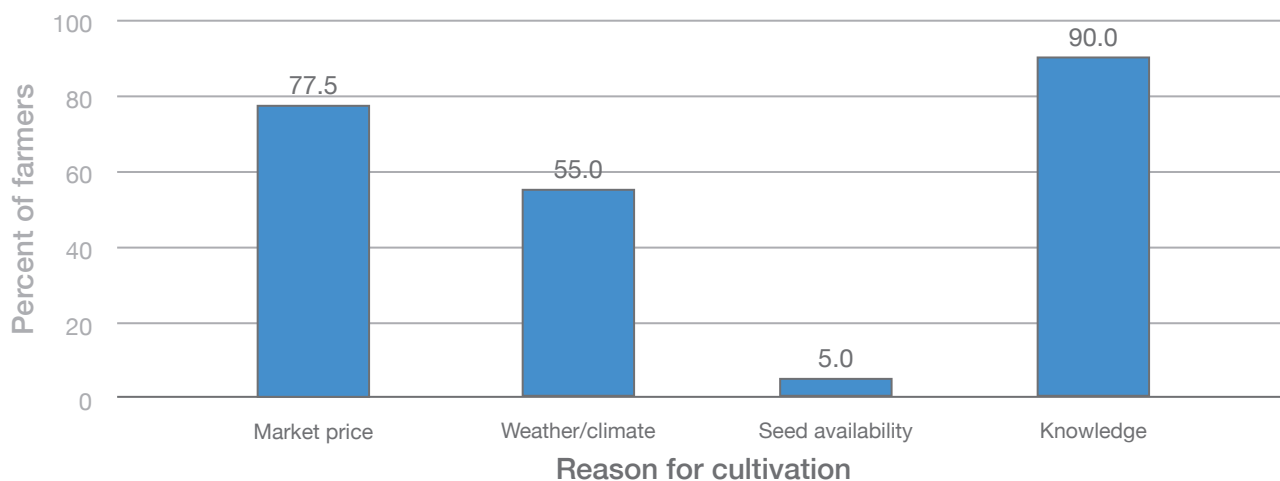
Source: Authors' own elaboration.

Ninety percent of the farmers cultivated the crops because of their knowledge, followed by 78 percent who cultivated because of the

market price and 55 percent who planted due to climatic and weather-related factors during *kharif* (Figure 45).

FIGURE 45.

Reasons for cultivation during the *kharif* season (N=45)



Source: Authors' own elaboration.

5.1. Access to services

Out of 55 traders, wholesalers and processors, 40 (73 percent) were members of a trade association – 1 of these was a trader (and intermediary), 37 were wholesalers and 2 processors. These trade associations mostly offered the following services to traders and wholesalers: extension and technical production advice, market information, sourcing of inputs, mechanization services, publicity and advocacy, assistance with licenses and compliance with regulations, and negotiation with authorities.

Out of the 55 traders, wholesalers and processors interviewed, only three had received formal training in food safety management. The actors reported receiving formal trainings in food safety management from the government authorities, non-governmental organizations and business associations, while 44 (80 percent) operated under a food safety or quality assurance programme. The programmes based on food safety or quality assurance programs were offered by the Nepal authorities for food technology and quality control, which included the Department of Commerce and Supply Management, the Department of Food Technology and Quality Control, and the Nepal Bureau of Standards & Metrology.

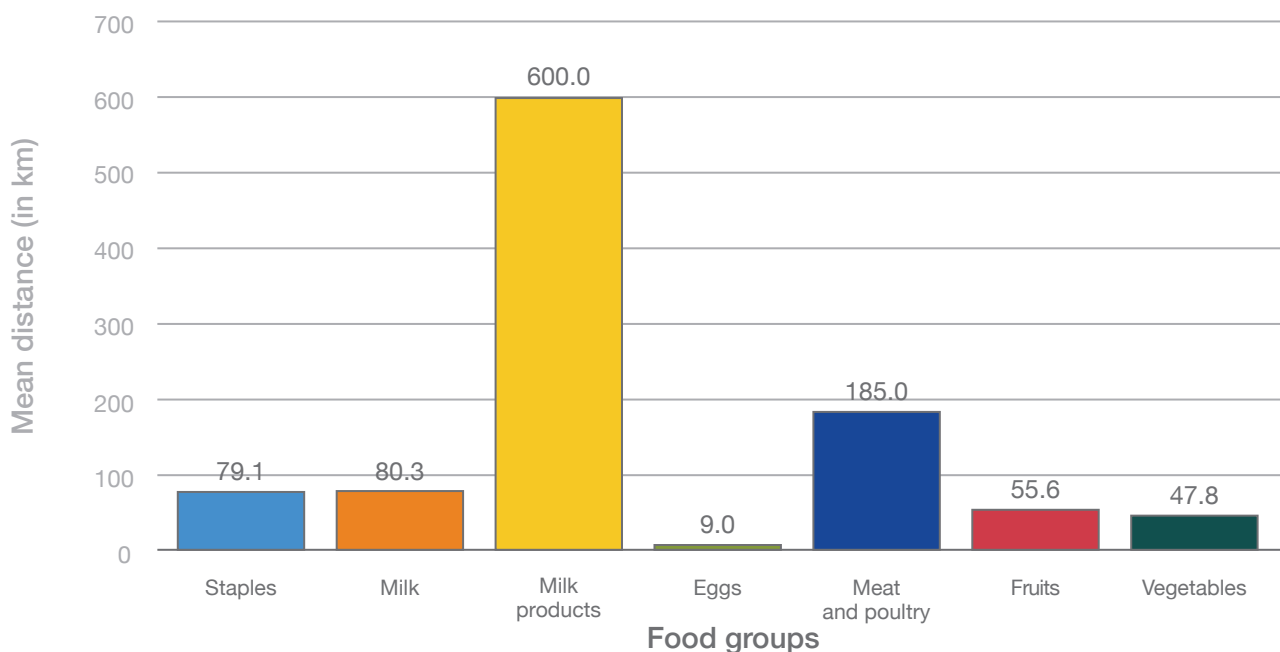
Out of the 45 farmers interviewed, only five (11 percent) were members of a farmer producer organization. These organizations provide services to farmers related to: market information; aggregation, grading, packaging; publicity and advocacy; and assistance with licenses and compliance with regulations.

5.2. Post-harvest, processing and distribution

The majority of the food products (87 percent) across the food groups were transported to the traders, wholesalers and processors using a closed vehicle. Food items belonging to the staples and pulses category were mostly delivered through closed vehicles. The mean distance between the supplier of staples and pulses items and the trader, wholesaler or processor was 164 km (Figure 46). To transport fruits from the supplier, open vehicles were mostly used, and the mean distance was noted to be 190 km. As for vegetables, mostly open vehicles were used for transportation, and the mean distance from the source was 132 km. The analysis revealed that only one product (fruit) was transported and distributed through cold storage.

FIGURE 46.

Mean distance (in km) between suppliers and traders, wholesalers and processors, by food product



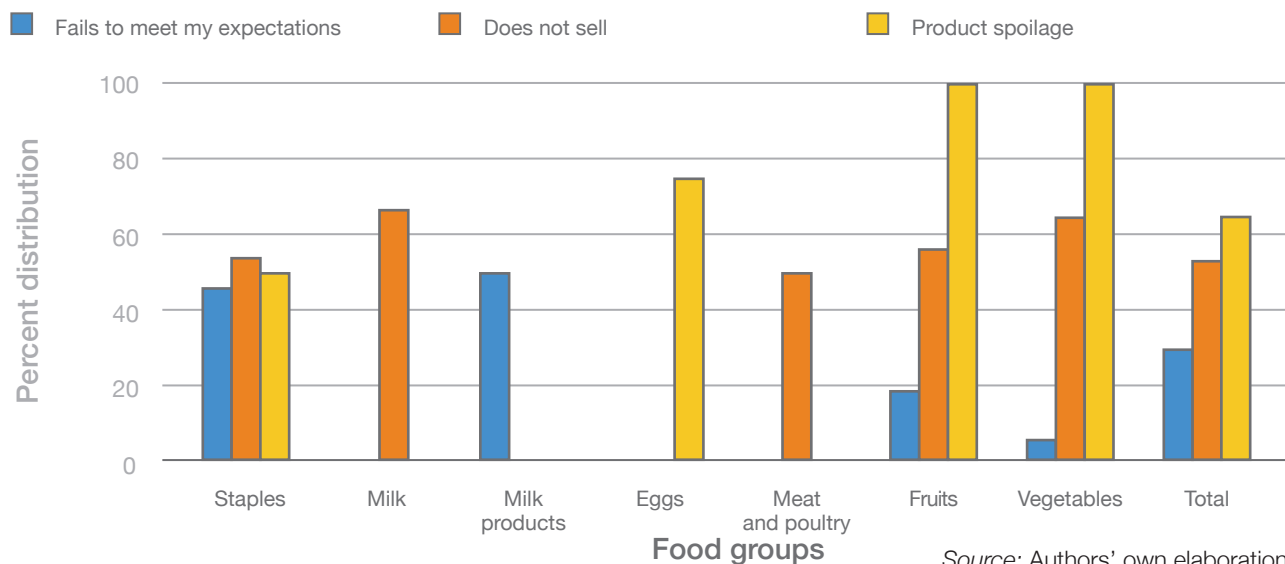
Source: Authors' own elaboration.

Processing, storage, packaging, transport and marketing were the main post-harvest activities undertaken by traders, wholesalers and processors. These supply chain actors mentioned that only 5 percent of the food products were unsold, implying that food loss and wastage were negligible. Product spoilage was the most common reason for not selling

food products, across food groups, affecting 61 percent of the products (Figure 47). Within food groups, the reason for most staple commodities not being sold was failure to sell the products, product spoilage and products failing to meet expectations. Product spoilage was the main concern for fruits and vegetables.

FIGURE 47.

Percent distribution of reasons for food groups not being sold (food products=94)



Source: Authors' own elaboration.

Most of the food products (47 percent) across the three food groups that were not sold were discarded as waste by the traders, wholesalers and processors. In the case of staples, the products were used as fodder (58 percent). Unsold fruits and vegetables were mainly discarded as waste. The most desired strategy to reduce losses across food groups was sourcing good-quality food (47 percent), improving storage facilities (47 percent) and reducing damage caused by rodents, insects and pests (34 percent).

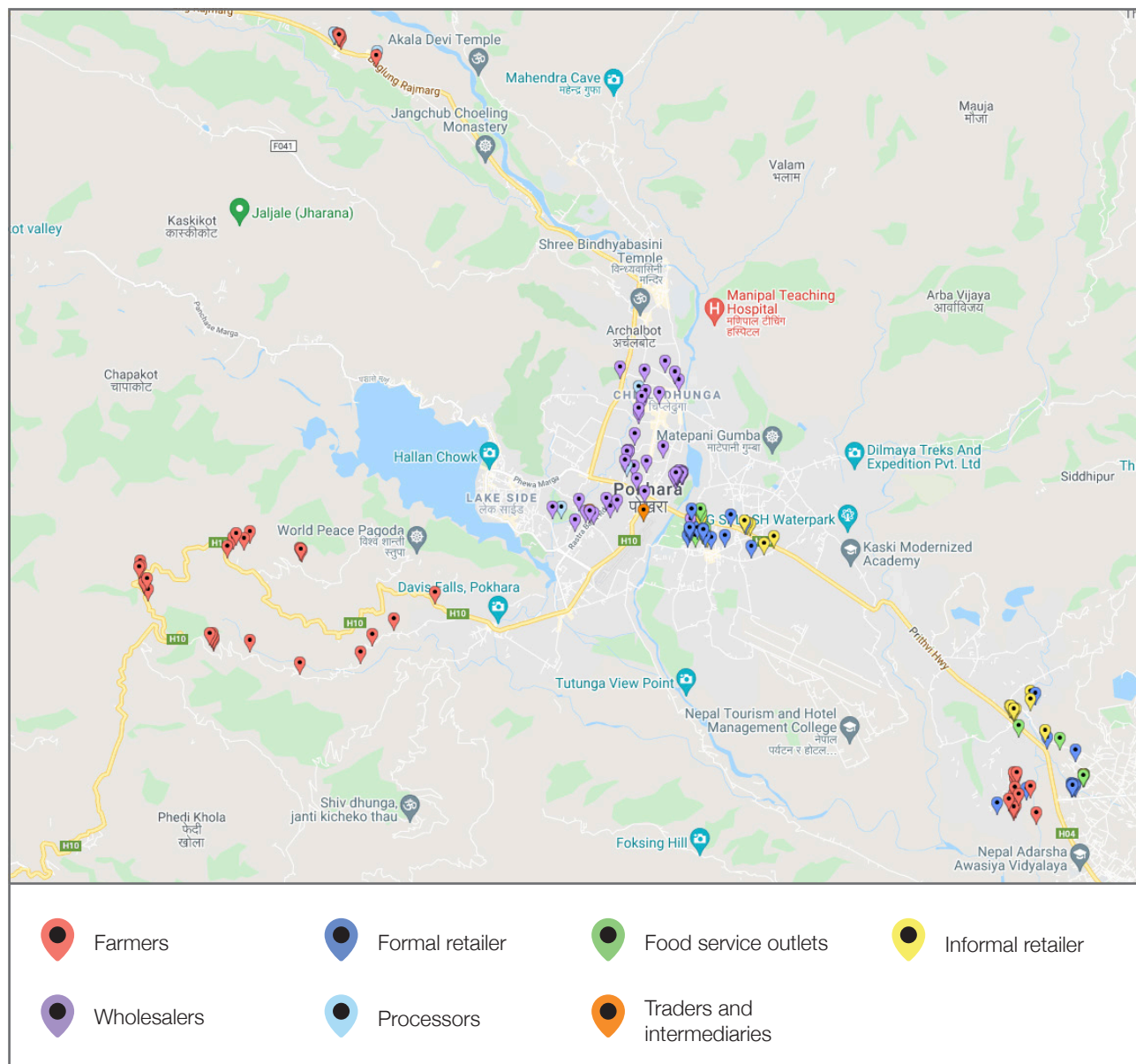
When farmers were asked about their strategies to reduce crop losses, the majority of the farmers (80 percent) reported making efforts to reduce damage caused by rodents, insects and pests. When asked about their strategies to improve crop safety, 69 percent of the farmers reported using fewer chemical inputs (organic, non-pesticide management, zero budget natural farming, etc.); 40 percent reported adherence to Good Hygiene Practices and 24 percent reported adherence to Good Agricultural Practices.

Most farmers (76 percent) reported that buyers collected the crops using either truck, van or headload. Only three farmers reported that a vehicle with cold storage was used to transport crops. Eighty-two percent of the farmers reported having no problems with the buyer. However, 16 percent reported delay in payment and 9 percent reported reduced shares of profits due to multiple intermediaries. On asking about the key factors considered important when choosing a potential buyer, prompt payment, offer of a competitive price, and easy access (close location) were reported. Additionally, farmers gave preference to buyers who collect products from their farms.

6. GEO-MAPPING OF KEY FOOD SYSTEM ACTORS AND AVAILABILITY OF KEY FOOD GROUPS IN POKHARA

FIGURE 48.

Distribution of farmers, traders, wholesalers and retailers by survey type in Pokhara

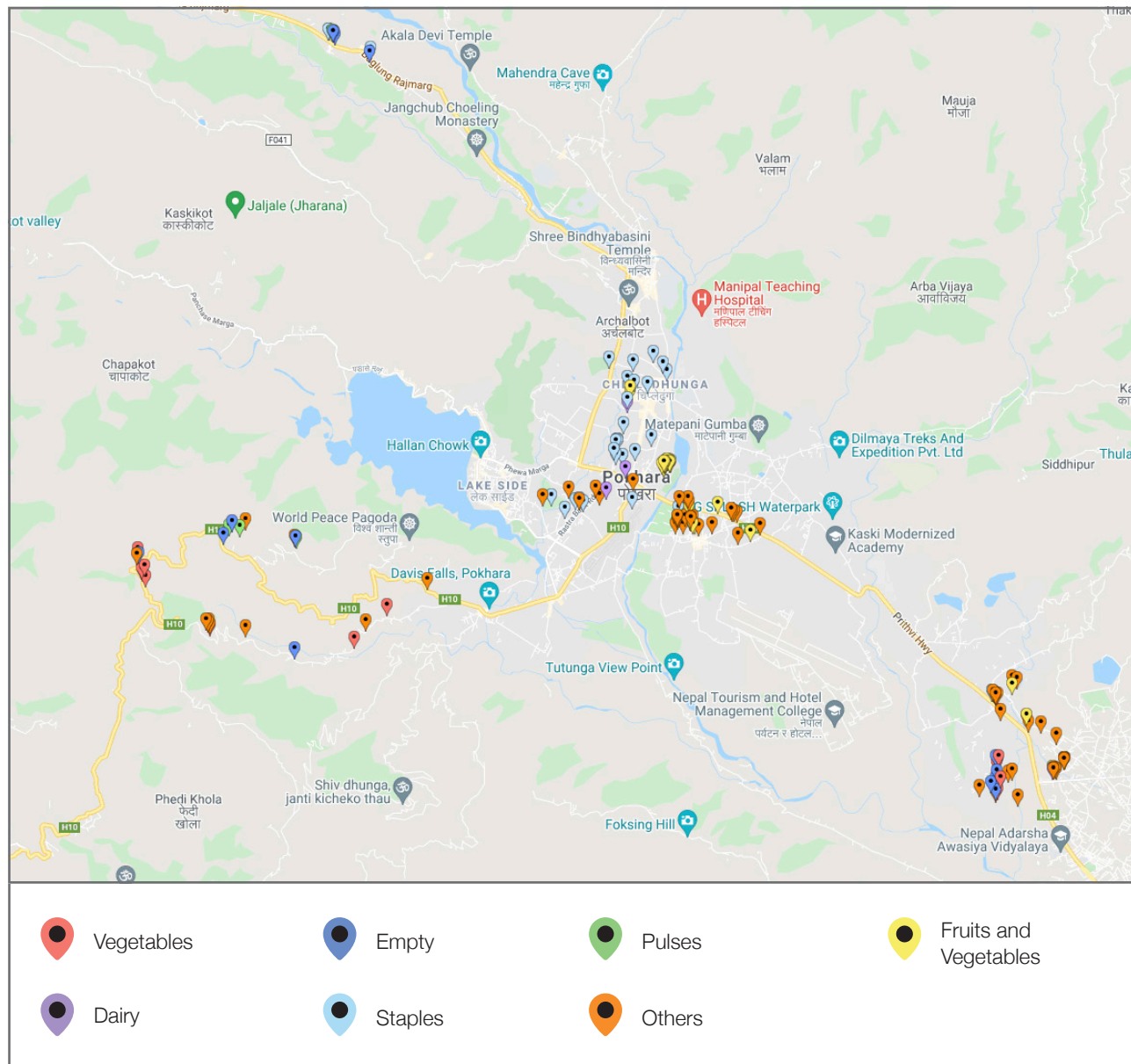


Source: SurveyCTO & Batchgeo, 2020.

Note: The geo-mapping was captured through the SurveyCTO Android Application & Batchgeo. SurveyCTO collects GPS coordinates using the device's built-in GPS function.

FIGURE 49.

Distribution of farmers, traders, wholesalers and retailers by food group in Pokhara

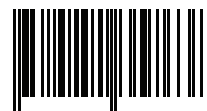


Source: SurveyCTO & Batchgeo, 2020.

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