



## 3.1 Food Flows

Truck passing a tollbooth in Ouagadougou, Burkina Faso.

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### Recording food flows

#### 1. Road survey

In- and outgoing food flows were recorded on major access roads day and night during one week during the end of rainy (peak) season and end of dry (lean) season. In Tamale, flows were recorded at police check points. In Ouagadougou, data were recorded at the tollbooths.



#### 2. Market survey

In all urban markets, traders were interviewed about the origin and the collection point of the traded commodity. The survey was carried out during the road survey period as well as on a monthly basis.



#### 3. Secondary data

Secondary data were acquired from customs, airport and railway agents to account for alternative transport channels, as well as for flows that did not occur during the main survey period.



For the transportation of food, roads were the only entry point to Tamale. In Ouagadougou, selected crops, rice in particular, was also imported via railway from Côte d'Ivoire (Figure 3.1). While, generally, some types of fresh food, such as mango and green beans, are exported from Ouagadougou by air (mainly to Europe), almost all high-value processed food is imported by plane. Tamale, *via* the ports in Tema and Takoradi, has direct access to overseas imports, whereas Ouagadougou mainly relies on its francophone neighboring countries for imports from overseas.



Train station in Ouagadougou, Burkina Faso.

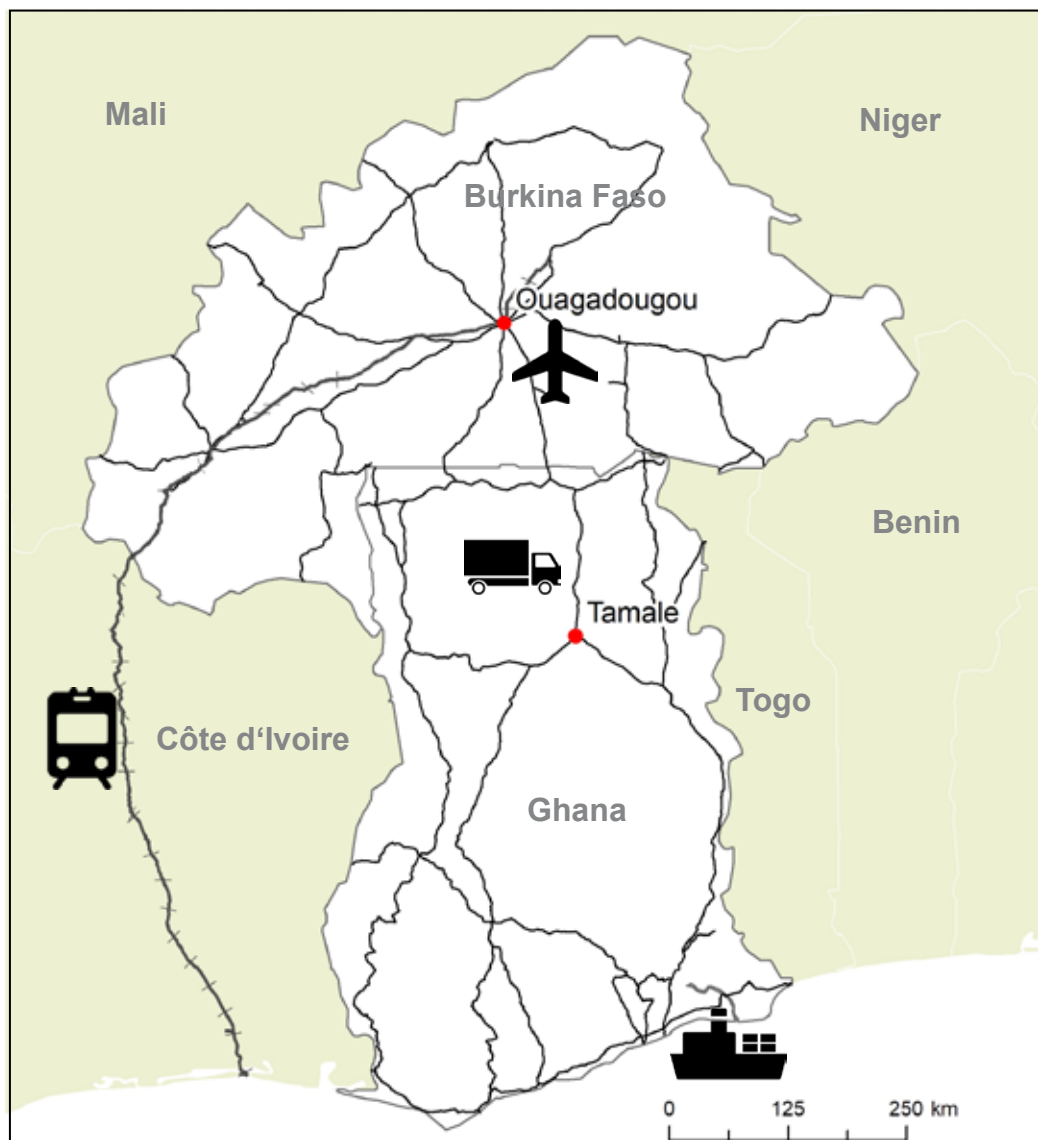


Figure 3.1. Transport channels leading to Tamale (Ghana) and Ouagadougou (Burkina Faso).

## Food composition

Incoming per capita quantities of food commodities reflect consumption patterns in both cities, despite outgoing flows not having been considered (Figure 3.2). Both countries heavily rely on cereals as the main source of calories. In terms of weight, maize and rice are the most important cereals entering the cities, followed by millet and sorghum. In Tamale, cereals, apart from wheat and imported rice, are produced in close proximity to the city (see page 47) where warehouses ensure stable supply across seasons. From Tamale, cereals are also exported to the central and southern parts of the country in both seasons. Apart from imported rice and wheat, cereals supplying Ouagadougou are largely produced within Burkina Faso (Figure 3.3). Root crops such as yam are more prominent in Tamale than in Ouagadougou, with more than five times the incoming product per capita (Figure 3.2). Due to higher rainfall, Ghana is better suited to the production of roots and tubers. Yam mostly originates

While the supply of staple crops is rather stable across seasons, seasonal differences primarily concern perishable goods such as vegetables and fruits

from areas around Yendi, east of Tamale, close to the Togolese border.

While the supply of staple crops such as cereals, roots and tubers is rather stable across seasons, seasonal differences primarily concern perishable goods such as vegetables and fruits (e.g., avocado, orange, mango and watermelon; Figure 3.4). For Tamale, the central part of Ghana is a main supplier of fruits such as orange, papaya and banana, and vegetables such as cabbage and avocado. In Ouagadougou, apart

from onion, urban vegetable supply is largely met by domestic production, albeit with large seasonal differences concerning the source locations. In the peak season, vegetables entering the city come

from surrounding areas, taking advantage of the proximity to urban markets, whereas in the lean season, vegetables are produced in various locations throughout the country with available irrigation water. Leafy vegetables, both traditional and exotic, are supplied exclusively by urban and peri-urban farming with no other sources outside the urban and peri-urban zones.

The livestock sector is a major pillar of Burkina Faso's economy. Accordingly, more than half of the cattle is exported. Northern Ghana is also suitable for livestock keeping, and animals are exported to the central and southern parts of the country. In Burkina Faso, domestic production of chickens accounted for almost 100% of total consumption, reflected by the large inflow of live chickens into Ouagadougou.



Transportation of chicken in Ouagadougou, Burkina Faso.

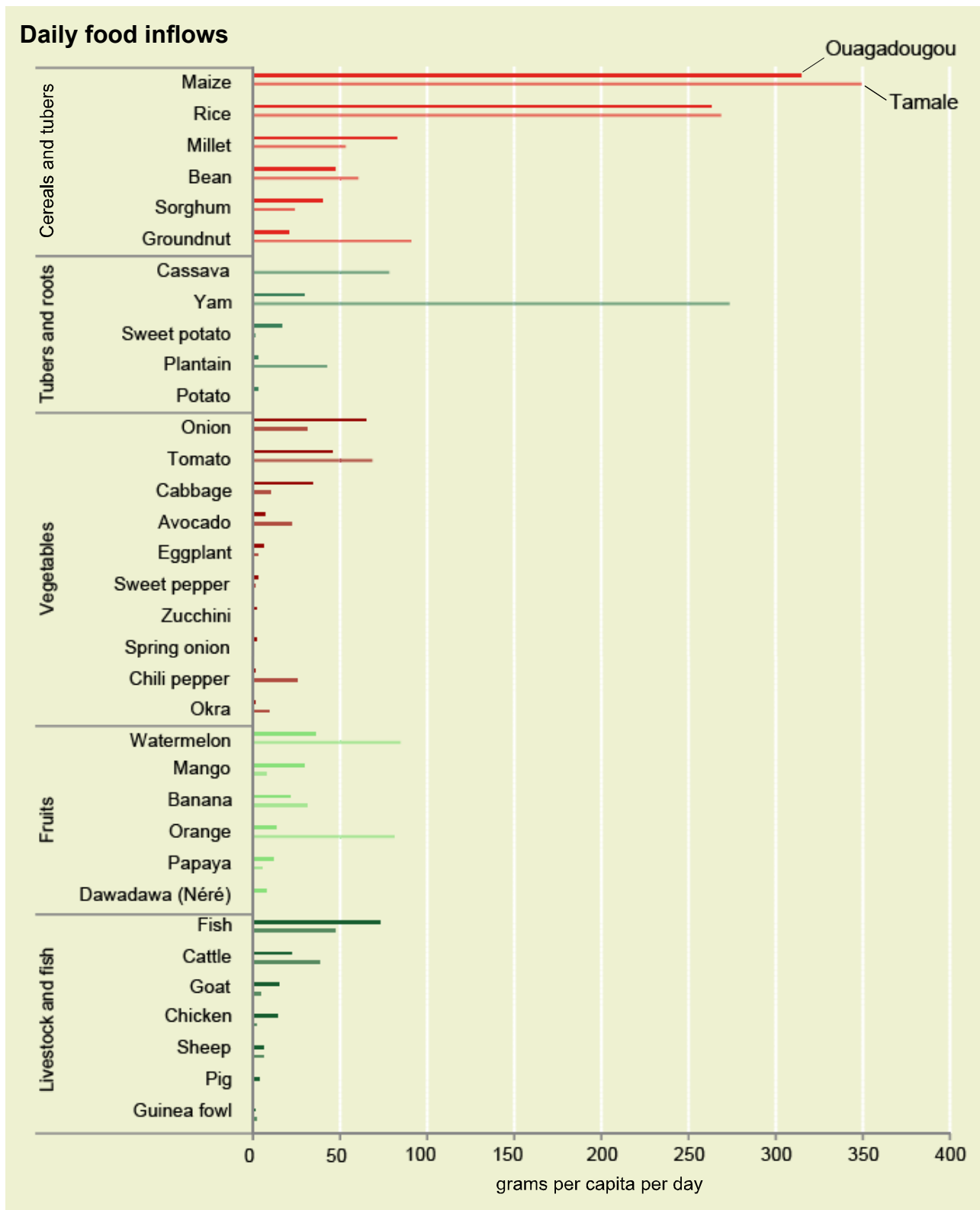


Figure 3.2. Daily food inflows in grams per capita per day to Ouagadougou (Burkina Faso) and Tamale (Ghana), whereby outflows are not considered.

# Foodsheds

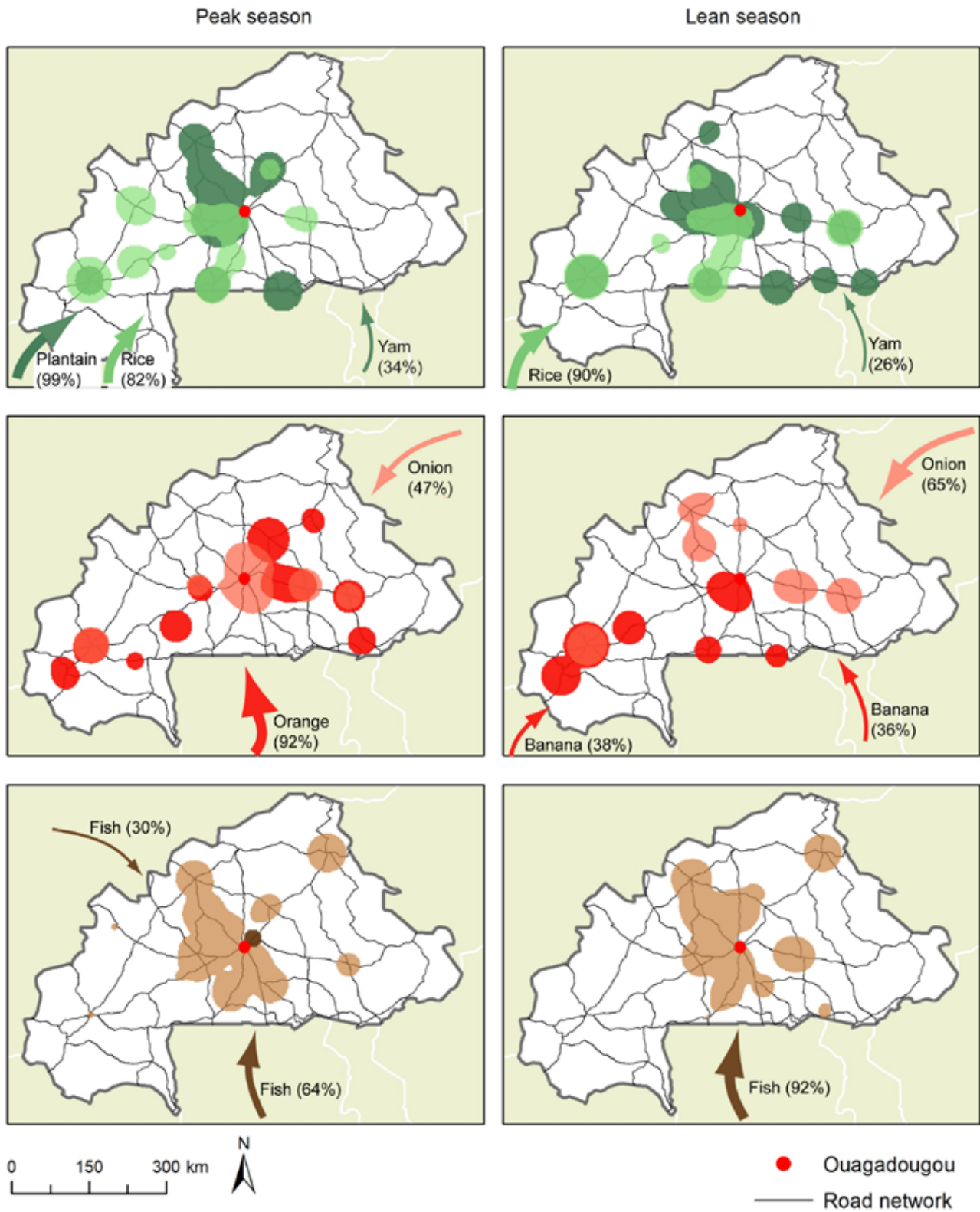


Figure 3.3. Season-specific sources of various food groups for Ouagadougou, Burkina Faso ('foodsheds').<sup>v</sup>

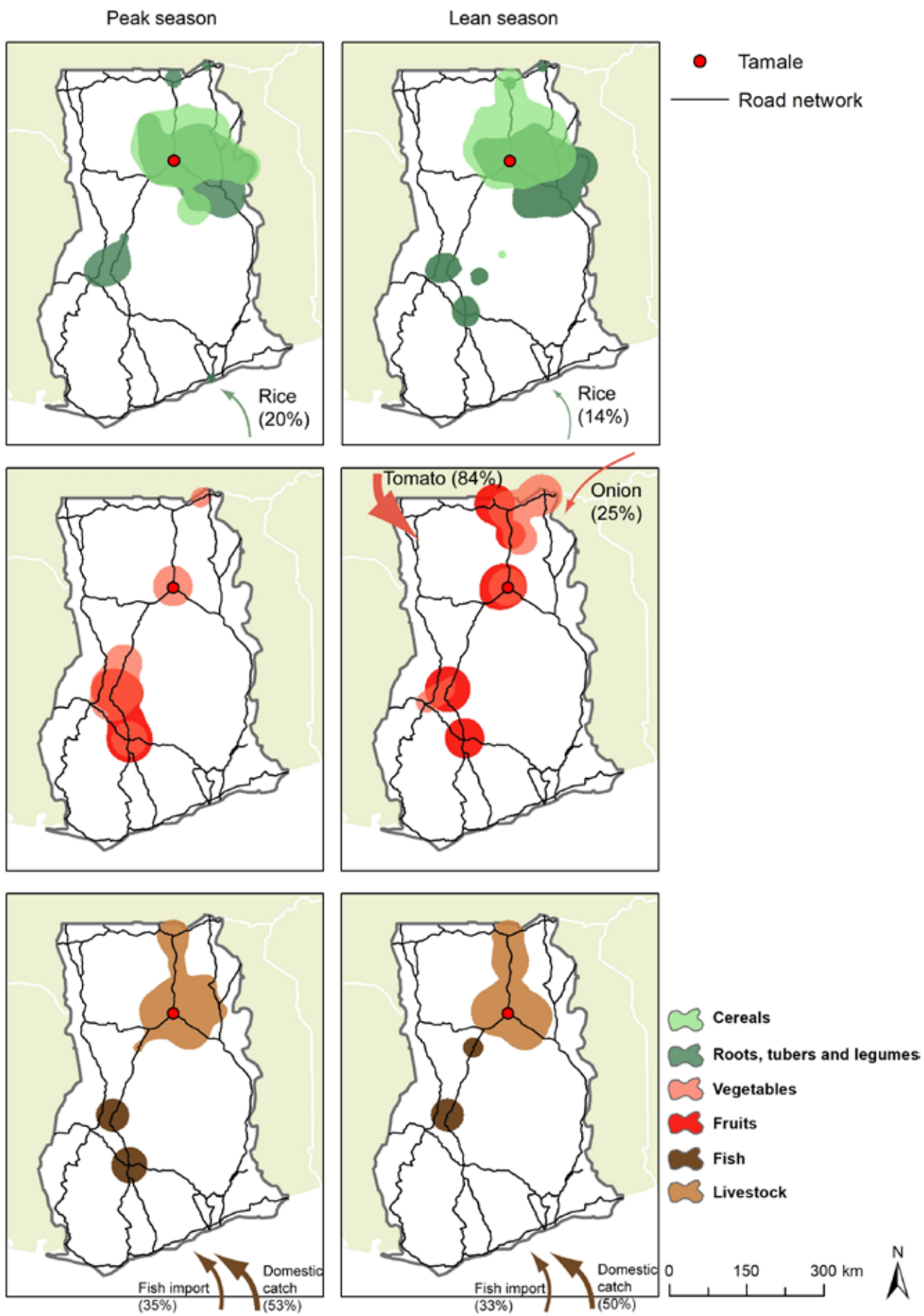


Figure 3.4. Season-specific sources of various food groups for Tamale, Ghana ('foodsheds').<sup>v</sup>

## Food miles

The status of Ouagadougou as capital city is reflected in the larger diversity of food products, vegetables in particular, as well as the higher share of imported food as compared to Tamale. Besides, agro-ecological conditions in Burkina Faso are less favorable than in Ghana, a country with a wider range of agro-ecological zones. Accordingly, Burkina Faso is importing selected products, such as oranges, avocado, yams and plantains, from its coastal neighboring countries. Tamale,

on the other hand, relies more on local and regional sources, apart from certain vegetables and fruits, and imported cereals (wheat and rice). Therefore, the majority of food products originate from within a distance of 100 km from the city (Figure 3.5). Rice and fish cover the largest distances before they reach their destination. The average distance rice travels to Ouagadougou is 9,176 km, with the majority of rice originating from South and Southeast Asia.

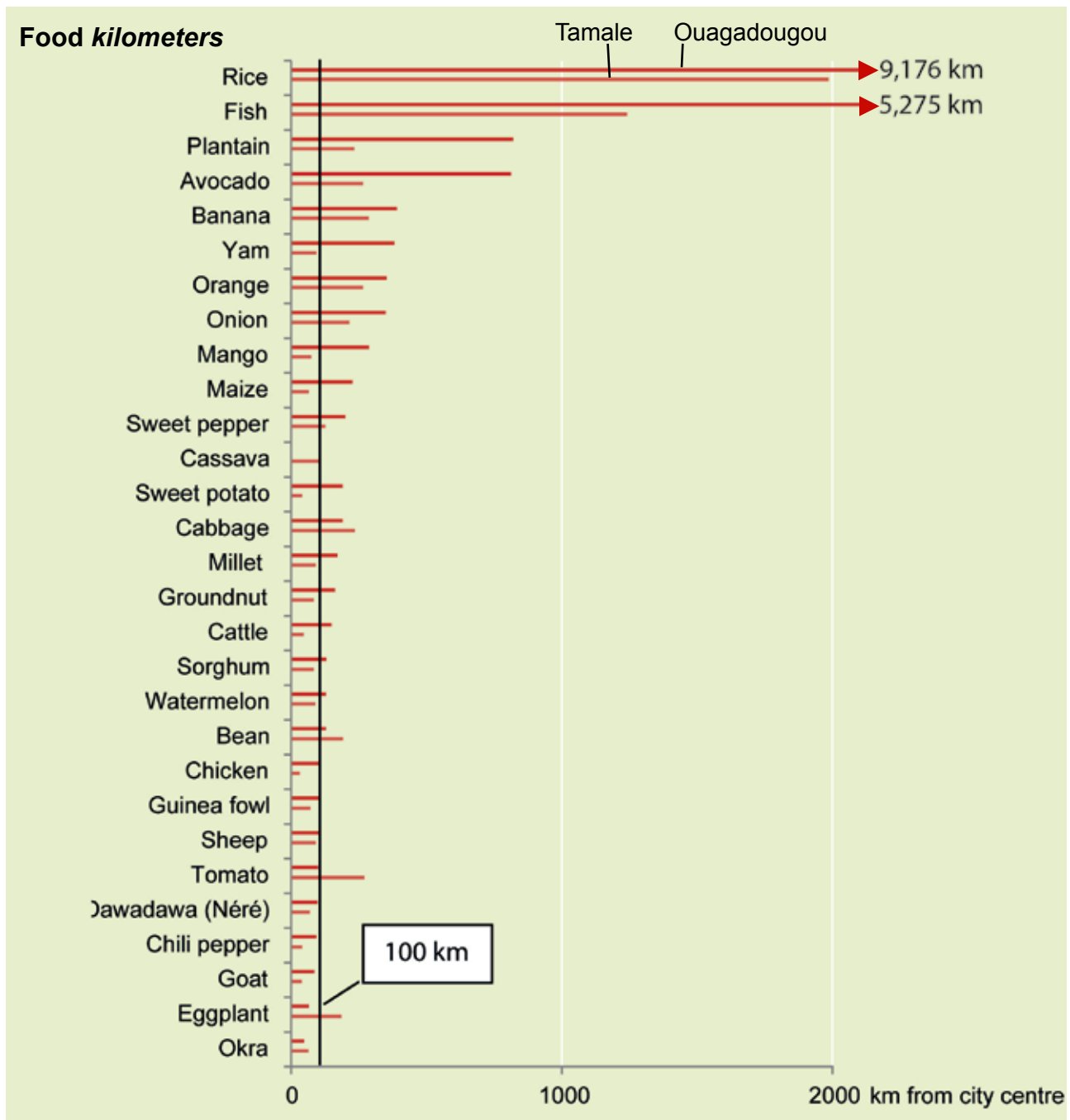


Figure 3.5. Average distance in km that food travels to Ouagadougou (Burkina Faso) and Tamale (Ghana), respectively.<sup>vi</sup>

The average distance rice travels to Tamale is only 1,987 km since the share of imported rice within the total incoming rice is significantly lower than in Ouagadougou, namely 14-20% as compared with 75-90% in Ouagadougou.<sup>3,4</sup>

Fish is the major animal product in both cities in terms of incoming weight per capita (re-export not considered). The reason why higher quantities of fish enter Ouagadougou than Tamale is likely that fish is redistributed within the country after arriving in the city's main fish market. National data show that Ghana produces and imports far more fish than Burkina Faso (Figure 3.6). Ghana is one of the few countries in the world where fish accounts for more than 50% of the population's animal protein intake, compared with the world average of 17%.<sup>3,5</sup> In Ouagadougou, the majority of fish is imported from Senegal and

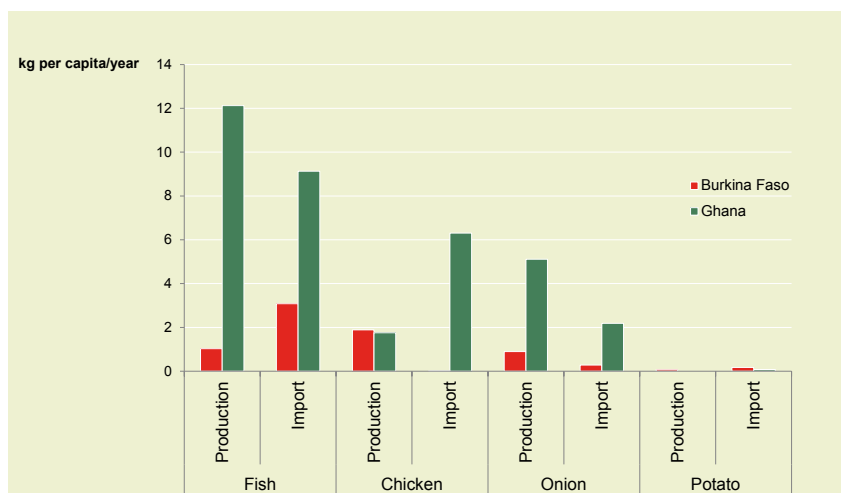


Figure 3.6. Levels of imports vs. domestic production for selected commodities in 2013.<sup>3,6, 3,8, 3,9</sup>

Mali (dry fish) as well as coastal neighboring countries (fresh fish). According to UN Comtrade data, the Republic of Korea was the main supplier of fish in Ghana in 2013.<sup>3,6</sup>

Apart from these two major commodities, Ghana and Burkina Faso each have an individual import portfolio. While in Burkina Faso, chicken supply

is met by domestic production, Ghana imports more than three times more than it produces despite its poultry industry flourishing already in the late 1980s and despite having import regulations and tariffs similar to those in Burkina Faso.<sup>3,7</sup> More than 80% of the chicken imports come from the United States, Brazil and Belgium.<sup>3,6</sup> Despite domestic production of onion, both countries import onion. The main suppliers for imported onion in Burkina Faso are Niger (32%), the Netherlands (24%) and Morocco (21%), while 90% of Ghana's onion imports originate from Niger and Burkina Faso. Even though the demand for potato is still relatively low in Burkina Faso, compared to the demand for onions (in Ghana, potato play an even smaller role), Burkina Faso imported 1,560 tonnes of potato from the Netherlands in 2013. This corresponds to 39 trucks (40 tonnes each) per year and to 45% of the total potato import.



Imported onions from the Netherlands in a market of Ouagadougou, Burkina Faso (above). Articulated truck transporting onions from Niger in Tamale, Ghana (below).



# Transport

Diversity of food products decreases with the distance food travels.

Apart from selected commodities, both cities rely heavily on their hinterland for the provision of food (see page 47). This is reflected in the number and type of vehicles from the area. In Tamale, 350 vehicles coming from within a radius of 100 km, an area referred to as the 'city region' hereafter, were recorded every day. This translates into 87% of all vehicles entering the city. In Ouagadougou, which relies less on its city region than Tamale, about 400 vehicles from the city region enter the city on a daily basis, corresponding to 75% of all vehicles. The city region

and other domestic sources provide the full diversity of the recorded commodities, whereas neighboring countries provided only 57% (Ouagadougou) and 30% (Tamale) of the commodities entering the cities. The range of products imported from global sources is the least diverse where unprocessed products are concerned. Modes of transport differ greatly according to the origin and nature of the product as well as between the cities (Figure 3.7). Small vehicles, such as motorbikes and bicycles in Ouagadougou and motorized tricycles in Tamale, are particularly relevant for the transportation of food originating from the city region.

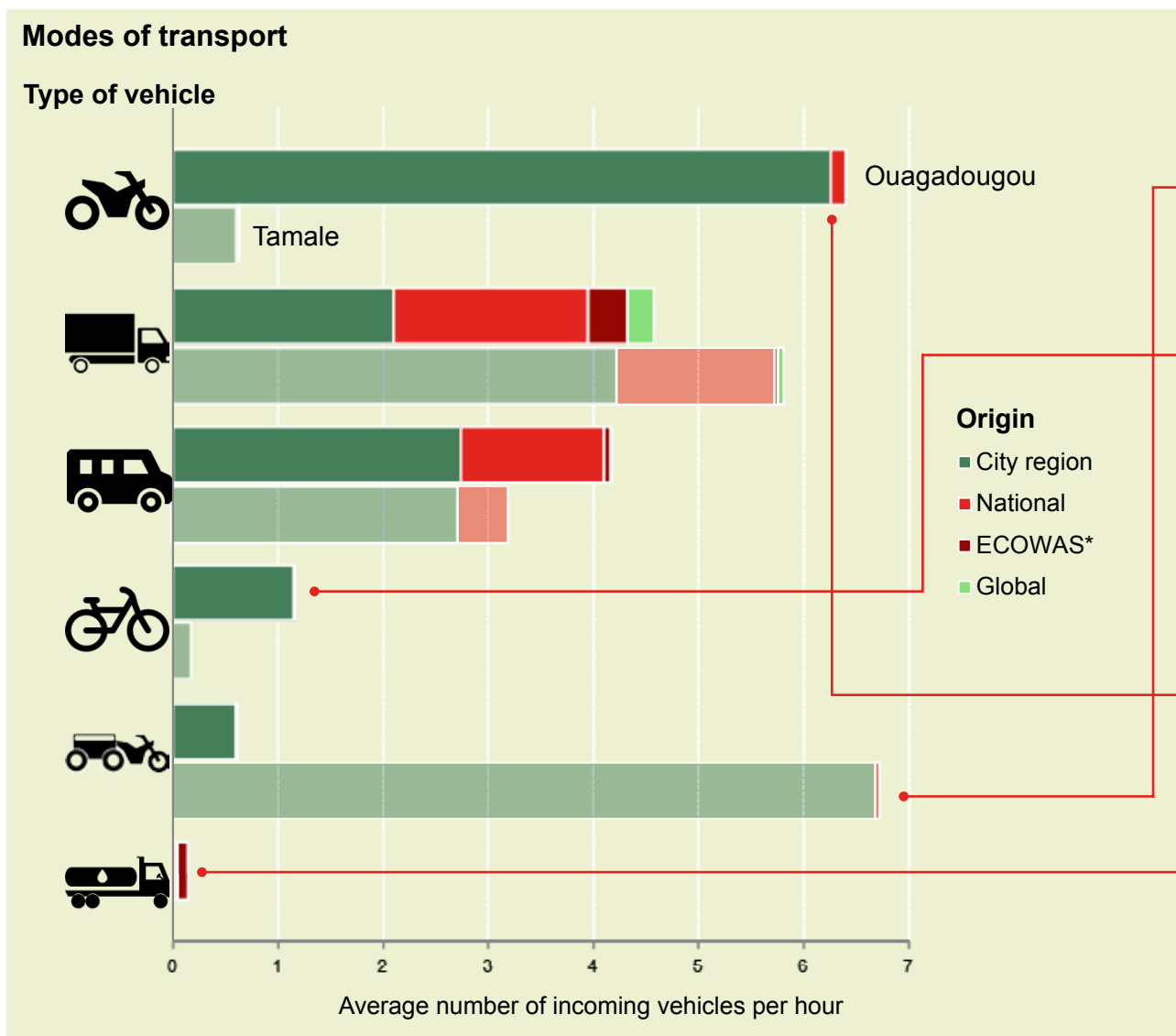


Figure 3.7. Type, number and origin of food-transporting vehicles entering Ouagadougou (Burkina Faso) and Tamale (Ghana) per hour.

\* Economic Community of West African States, a regional economic union of fifteen countries in West Africa (Figure 3.9).

## Rural-urban linkages and the periodic market system in Tamale

Hanna Karg

Tamale's cereal supply is largely met by its rural hinterland (Figure 3.8). Cereals are sold either directly to the Tamale market, or channelled to the city through a traditional hierarchical system of periodic small-town and village markets. There, markets take place every three or six days and rotate in such a way that market days in villages located close to each other will be separated by a relatively long period. This system also links farmers to the large urban centers in central and southern Ghana

as well as to international markets.

The existence of food markets strengthens the development of related infrastructure, such as roads and public transport, and *vice versa*. Thus, village and small-town markets are critical in linking urban and rural people through flows of goods and capital, and simultaneously they experience infrastructural and economic change. Tamale's rapid growth suggests that the market towns examined in this study may experience further development in the near future.

For more information:

Karg, H.; Bellwood-Howard, I.; Akoto-Danso, E.K.; Schlesinger, J.; Chagomoka, T.; Drescher, A. 2018. Small town agricultural markets in northern Ghana

and their connection to rural and urban transformation. *European Journal of Development Research*.

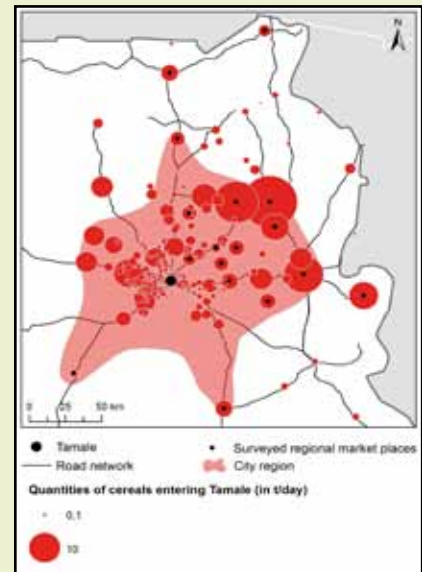


Figure 3.8. Surveyed markets in the regional hinterland and sources of cereals entering Tamale.



In Tamale (Ghana), motorized tricycles are very common and oftentimes used for transporting food items. They are getting increasingly popular in Ouagadougou (Burkina Faso), too.



In contrast with Tamale (Ghana), people in Ouagadougou (Burkina Faso) sometimes cover large distances by bicycle to transport food from villages to the city. Motorbikes are most commonly used for the transportation of food.



Pineapples from neighboring Togo and Benin are transported on top of fuel trucks to Ouagadougou, Burkina Faso.

## Nutritional and monetary indicators

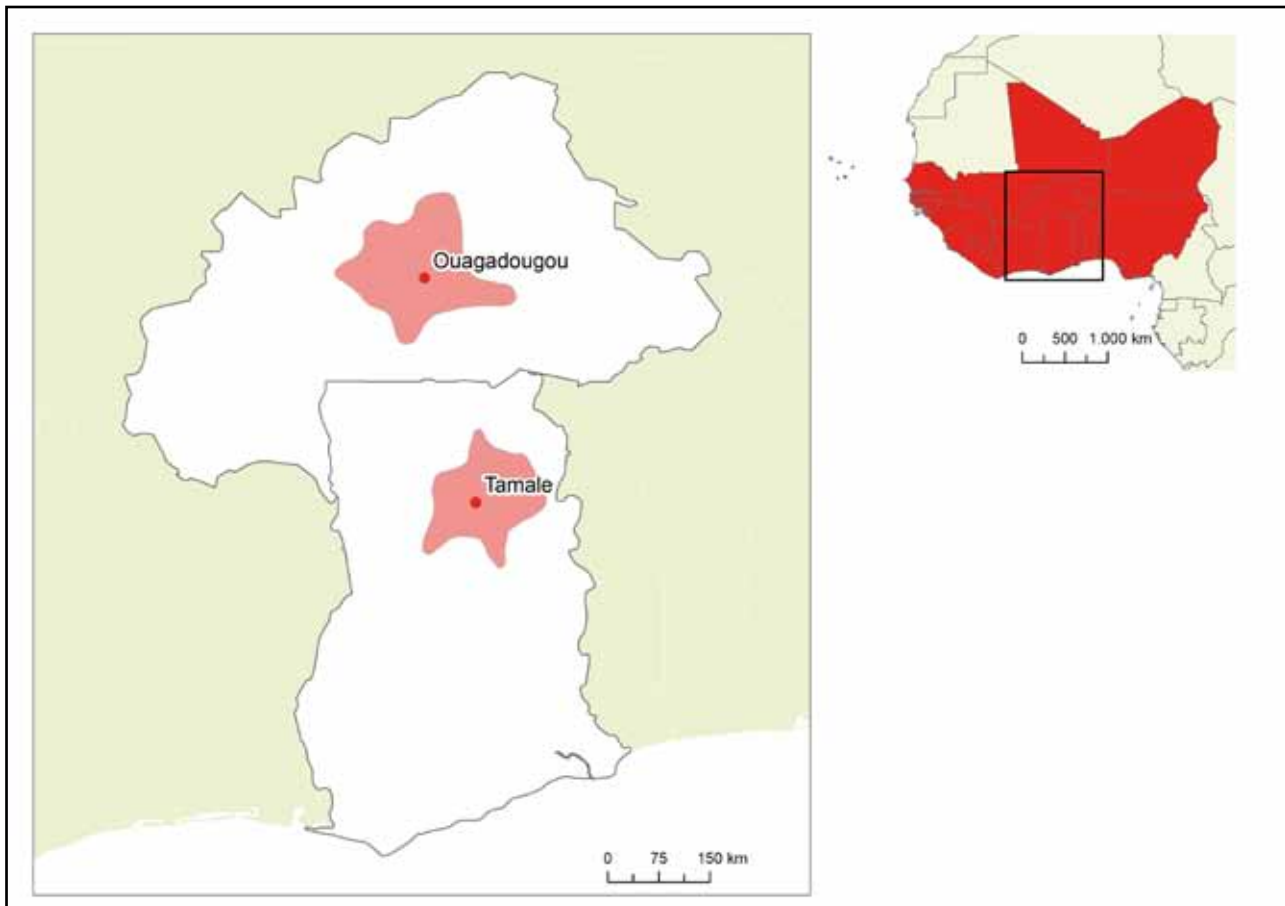


Figure 3.9. City regions of Tamale (Ghana) and Ouagadougou (Burkina Faso), and the location of the two countries within the ECOWAS zone.<sup>3,4</sup>

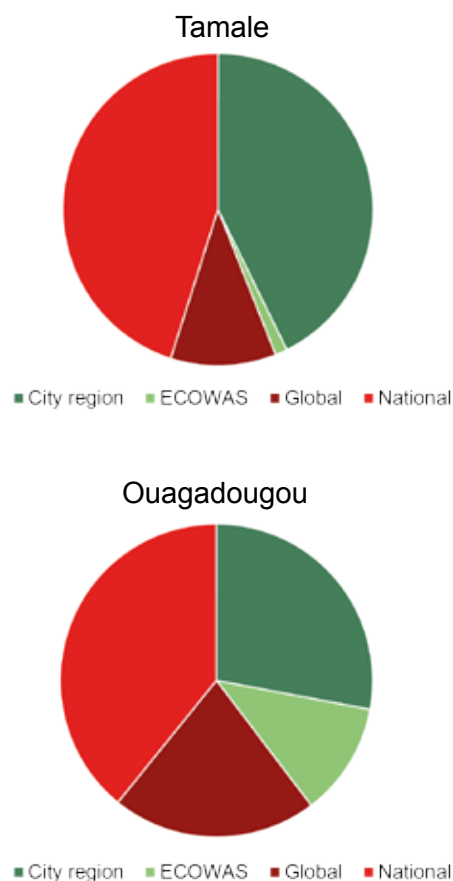
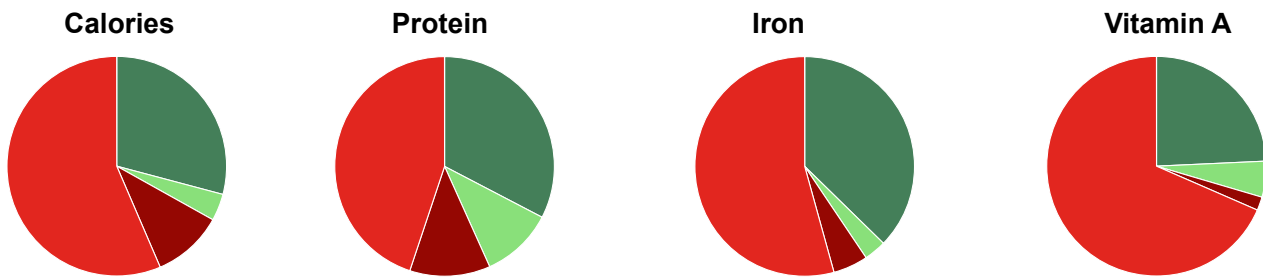


Figure 3.10. Return flow of money spent on non-processed food items.<sup>vii</sup>

Households in Ghana and Burkina Faso spend about half their income on food.<sup>3.10, 3.11</sup> Based on expenditure data<sup>3.12</sup> and food inflows, we calculated which countries and regions benefit from the expenditure of thousands of households on food. In Tamale, 88% of the money spent on non-processed food stays in the country, while 11% are spent on global products and only 1% on products from other ECOWAS countries. This is different in Ouagadougou, where one-third is spent on food coming from ECOWAS or other foreign countries (Figure 3.10). The share returning to global sources, however, is relatively high when comparing food expenditure with the nutritional values from globally sourced food, reflecting the relatively high monetary value of imported commodities such as rice and fish.

## Ouagadougou



## Tamale

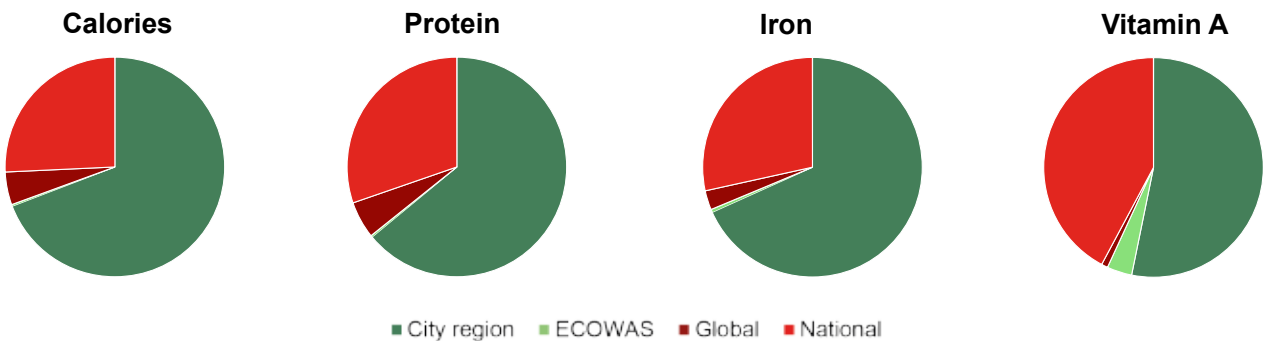


Figure 3.11. Contribution of city region, other national sources, ECOWAS countries and global food sources to the supply of nutrients.<sup>3,13</sup>

The origins of the cities' nutrient supply reflect the relationship between domestic supply *vs.* imports (Figure 3.11). Ouagadougou sources a higher share of its key commodities such as rice, fish and selected fruits and vegetables from foreign countries, including ECOWAS countries and other global sources, as compared to Tamale. Not only is the quantitative proportion relevant, but also the type of product. For instance, in Ouagadougou, the relatively

higher share of imported protein, as compared to other nutritional indicators, can be attributed to the high proportion of imported protein-rich fish (making up 17% of protein inflows). In Tamale, on the other hand, domestically produced groundnut contributes 18% to the protein inflows. Green leafy vegetables produced in urban agriculture are an important source of vitamins and minerals such as iron, but are not included in the analysis, like offals, eggs and dairy products.

### Nutritional indicators

**Calories:** Expresses dietary energy supply of food intake (also kilocalorie = kcal).

**Protein:** Provides dietary energy besides carbohydrates and fats. Animal source protein is considered of particularly high value given its composition of amino acids; however, in low income countries, protein is mainly derived from cereal-based staple foods.

**Iron:** Low dietary intakes of iron are a major cause of anaemia among children and women. In addition, African diets are usually poor in vitamin C, which further hampers iron absorption.

**Vitamin A:** Inadequate or excessive intake of vitamins A or E can lead to various disorders. For example, vitamin A deficiencies are considered to be the main cause of childhood blindness in low-income countries.