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**Food Markets and Nutrition in the  
Democratic Republic of the Congo (2004–2005)**

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## ABSTRACT

Inspired by the ongoing process of decentralization and in an effort to inform local and national policy makers concerned with food security, this paper provides a descriptive but detailed geographical overview of Congo's food markets as well as the nutritional status of its population. To do so, this paper will mainly rely on the 1-2-3 budget survey data, conducted in 2004–2005. Along both dimensions, access to food and nutrition, a good deal of spatial variation exists. First, overall efficiency of domestic food markets seems extremely poor. The capital city of Kinshasa is a good example of this; it is food deficient and poorly connected to its own hinterland and therefore highly dependent on foreign food imports. Markets in the former provinces of Kasai, in the center of the country, and the conflict-prone northeastern part of the country are two minor exceptions, as food prices are slightly more equal. Furthermore, the most competitive food producers are found in Équateur and North Kivu. Notwithstanding these differences in food access, about five diet types can be identified. The most energy-rich diet is based on cassava and palm oil, typically consumed in Maniema, Orientale, Équateur, and rural Bas-Congo. As a result, these provinces on average display higher calorie intakes. Apart from diet composition, income levels and prevailing nonfood needs also determine energy sufficiency. For these reasons households in Katanga and North Kivu are relatively well nourished too, while urban dwellers in Bas-Congo and Orientale (contrary to their corresponding rural sector), and especially households in South Kivu and Kinshasa, suffer from large calorie deficiencies.

**Keywords:** decentralization, food markets, diets, 1-2-3 Survey, Democratic Republic of the Congo

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# 1. INTRODUCTION

In line with the latest aid paradigm, which rewards good governance and effective policies, territorial decentralization has become a popular instrument used by recipient countries to comply with these new rules of donor engagement (Bardhan 2002). Certainly, in specific circumstances and under certain conditions, decentralization should encourage more grassroots political/social participation and commitment, more locally adapted policies, and by consequence, more effective development outcomes. Presently, the Democratic Republic of the Congo (DRC) is engaged in such a process of decentralization.<sup>1</sup> Defined by the new constitution of 2006 (République démocratique du Congo 2006), this process not only entails the transfer of a substantial number of functions from the central to lower tiers of public administration but also stipulates the reshuffling of provinces. By 2015, and despite the absence of a significant number of important constitutional provisions for this decentralization to take effect fully (Englebert 2012), the DRC has officially moved from 11 to 26 provinces. It is difficult to predict how these future provincial governments will fare in their efforts to generate well-being, fight poverty, and ensure food security. The same holds for the central government, which remains responsible for the crucial functions of ensuring stability and redistributing wealth among provinces.

Therefore, the main objective of this paper is to meet, in part, the information needs of local, national, and international decision makers in charge of defining socioeconomic and food policies for the DRC. As a matter of fact, little is known about the functioning of Congolese food markets and its direct implications on the diets and nutritional adequacy of its population. To illustrate this information deficit, the Food and Agriculture Organization of the United Nations since 2011 has no longer published country-level estimates for a common indicator like undernutrition—for reasons of data insufficiency (von Grebmer et al. 2015). Unfortunately, given the sampling design of the latest available household and expenditure survey (2004–2005), this paper is not able to perform a geographical analysis beyond the sector level in each of the 11 former provinces without violating standard statistical practice. Therefore, in anticipation of spatially more refined data, this paper aims to map up current food markets and people's nutrition along these more crude geographical delimitations.<sup>2</sup> In Section 2, the so-called “Sub-Saharan Africa's proximity gap” will be used to illustrate the appropriateness for the DRC to decentralize its public administration. On the basis of the 1-2-3 Survey (2004–2005), the following sections will then analyze the consequences of this proximity gap on households in terms of access to food (Section 3) and its effect on diets and nutritional levels (Section 4). Finally, Section 5 will conclude.

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<sup>1</sup> For the law on decentralization as well as a discussion of associated challenges linked to such administrative reform, the author would like to refer, respectively, to République démocratique du Congo (2006) and the several preliminary “Lois Organiques” dealing with the three layers of decentralization (that is, state, provinces, and decentralized territorial entities) and to Marysse (2005).

<sup>2</sup> As a result and throughout this paper, the author will make use of the former provinces' names as they occur in the 2004–2005 1-2-3 Survey (INS 2005), unless otherwise stated.

## 2. DRC'S PROXIMITY GAP

The economic geography of the DRC provides an ideal example of what has become known as “Sub-Saharan Africa’s proximity gap” (Naudé 2009). In this context, proximity should be understood as “proximity to markets, customers, suppliers, competitors, supporting industries, and governments. It is the ease with which economic agents can coordinate decisions, and ... is influenced by amongst others physical distance and accessibility” (Naudé 2009, 1). Referring to Table 2.1, which lists a number of proximity indicators by type, one can immediately discern the disadvantageous position of the DRC: for all indicators except four, the DRC clearly performs (much) worse than its own regional average. For the first set of indicators, this underperformance finds its origin in the adverse geography of the country with its tiny coastline in the west, the asymmetric location of its capital city, and its poorly accessible tropical rain forest in the belly of the country, which in demographical terms represents an empty hole around which a number of cities are scattered (Pourtier 2008). On the contrary, and in line with the latter observation, the share of the Congolese population living at less than 75 kilometers from an international border is equal to the average share observed in other African countries south of the Sahara. And in terms of urbanization, the DRC is even doing slightly better than its regional average.

**Table 2.1 Proximity gap in the DRC**

Type	Proximity indicator	Year	SSA	DRC
Geography and demography	Coastline (km)	2007	622	37
	National average distance to capital city (km)	2000	376	1006
	Population density (per km <sup>2</sup> )	2006	33	26
	Urban population (% of total population)	2005	33	38
	Population living < 75 km from an international border (%)	2000	47	47
	Population living < 75 km from a coastline (%)	2000	34	2
Transport and communication	Road density (road km per 100 km <sup>2</sup> )	2000–2006	24	7
	Rail density (rail km per 100 km <sup>2</sup> )	2000–2006	2	0
	Ports and terminals (nbr)	2007	2	11
	Airports with paved runways (nbr)	2007	12	25
	International voice traffic (in-/outgoing minutes per person)	2000–2006	24	5
	International Internet bandwidth (bits per person)	2000–2006	23	0
Trade and institutions	Countries that need a visa to visit this country (nbr)	2004	131	190
	Countries for which country's residents need a visa (nbr)	2004	148	162
	Cost of obtaining a passport relative to GDP per capita (%)	2005	17	125
	Index of shipping difficulties (index)	2008	131	154
	Average tariffs and custom duties (% of import value)	2005	23	27
	Total trade as share of GDP (%)	2005	66	44

Source: Based on World Development Report (2009) and World Bank (2016).

Note: DRC = Democratic Republic of the Congo; GDP = gross domestic product; km = kilometers; km<sup>2</sup> = square kilometers; nbr = number; SSA = Africa South of the Sahara.

With respect to transport and communication, one can easily link the proximity problem of the DRC to the continental dimensions of the country, the total neglect of the transport system’s maintenance since independence,<sup>3</sup> and the widely branched waterways composing the Congo River basin. Indeed, the omnipresence of rivers and bodies of water in the center of the country may be another factor impeding

<sup>3</sup> Only after the signing of a Chinese contract in 2007 did the Congolese government start to invest in infrastructure on a large scale.

the development of transport infrastructure over land. On the other hand, this same geographical reality has contributed to the development of ports and terminals, many more in number than what on average is observed in Africa South of the Sahara. In a similar vein, the DRC has twice as many airports with paved runways compared to its regional average to connect the many widely separated cities.

In terms of trade and its facilitating institutions, all six proximity indicators point to the fact that it is more difficult for people and goods to enter or exit the DRC, in terms of both cost and red tape, than is the case in many other African countries south of the Sahara. Indeed, almost all nationalities willing to visit the DRC need to obtain an expensive visa, whereas some facilitation exists (either in terms of overall cost or nationalities being exempted) to enter most other African countries south of the Sahara. In a similar vein, Congolese, more often than other Africans, need a visa to travel abroad. Also in terms of traded commodities, the DRC compared to its regional average seems to impose more financial and bureaucratic constraints. As a result, total trade as share of gross domestic product is only two-thirds the level of what on average is observed in Africa South of the Sahara.

Although many of the indicators presented in Table 2.1 capture only the physical dimension of market access, other data for the DRC provide additional evidence for the country's proximity gap. For example, Ulimwengu et al. (2009) have estimated, using geographic information system modeling and based on conservative travel time assumptions, that no more than 15 percent of the Congolese population lives within a five-hours' drive from a town of more than 50,000 dwellers—a percentage that is among the lowest in Africa.

Considering all this information, one can reasonably assume that real market access for an average Congolese will be extremely low. At the same time, the discussion of these country-level statistics revealed that quite some variation in proximity can be expected within the country. Indeed, whether a Congolese lives close to an international harbor in the west or in the more densely populated eastern part of the country, or whether he or she lives near a big city, near a mining site, or along one of the many tributaries of the Congo River network, each may matter a great deal in terms of economic opportunities.

Furthermore, the complex cultural and social heterogeneity of the country adds another layer of diversity to the spatial variation in economic opportunities. Indeed, in the DRC four national languages are spoken, and more than 400 different tribal groups exist. This variation is well captured in the ethnolinguistic fragmentation index, whose estimations indicate that in only 3 of the 26 current provinces do a majority of the people belong to the same ethnic group. For all other provinces, the probability of encountering someone from the same ethnic background is on average only 29 percent (Marivoet 2009).

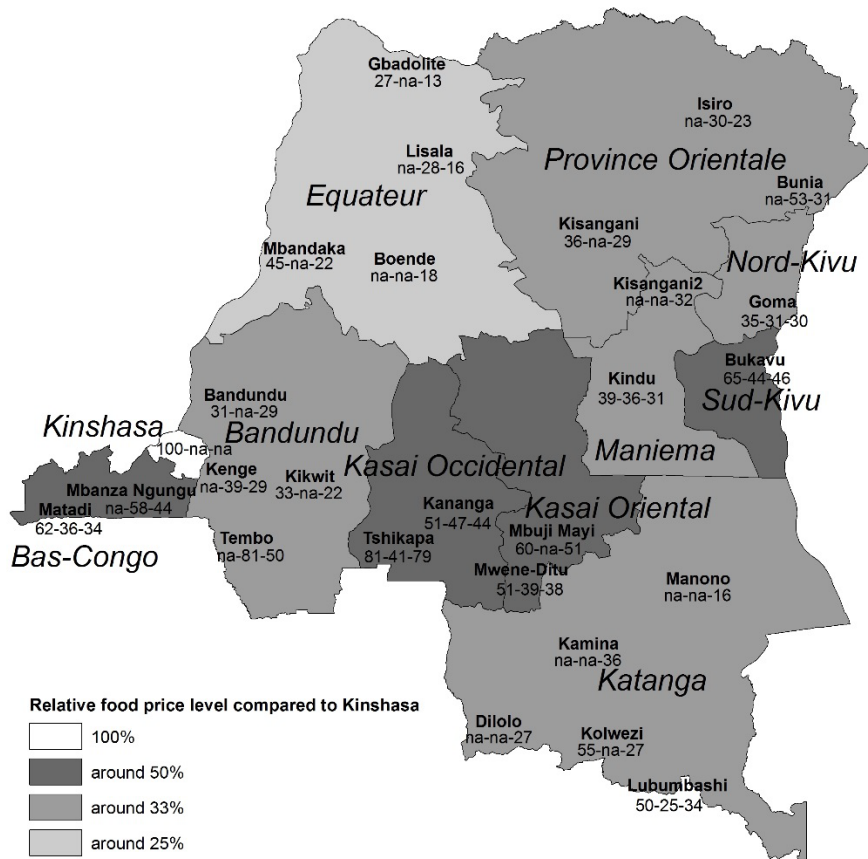
This fragmented economic geography is further complicated by the recent violent history of the country and its lingering impact in terms of persistent insecurity or reduced state capacity in general. As a matter of fact, the peace treaties that formally ended the Congo Wars (1997–2003) did not coincide with any full suppression of violence, as several armed factions continue to pose important security threats to many civilians in the east of the country. More generally, the retreat of the state from a number of public domains during the war years created a vacuum for other actors to enter the stage, each on its own terms and with its proper logics (De Herdt 2015; Titeca and De Herdt 2011; Kambale Mirembe 2012). As a result, small island states emerged and reshaped local economic structures, which did not necessarily follow national, ideological, ethnic, or cultural lines and which further intensified the degree of economic fragmentation (Reyntjens 2005).

Now, given this pronounced spatial diversity, decentralization might be a satisfactory approach to develop and implement more locally rooted policies. Indeed, by formally transferring power and functions to more decentralized tiers of public administration, community ownership of local programs might increase, and accountability loops for those responsible for program execution might become shortened. Moreover, due to greater knowledge of prevailing realities, these programs can be much better adapted and prioritized to meet local needs and preferences (Herderschee, Kaiser, and Mukoko Samba 2012).

### 3. ACCESS TO FOOD

The adverse economic geography discussed in the previous section becomes tangible if one compares the level of food prices across the country. Based on budget data coming from the 2004–2005 1-2-3 Survey (INS 2005), Figure 3.1 presents the Eltetö-Köves-Szulc<sup>4</sup> Fisher food index for 56 localities<sup>5</sup> and must be read as follows: if the general cost of food equals 100 Congolese Francs (CF)<sup>6</sup> in the city of Kinshasa, then the same cross-weighted basket will cost CF 62 in Matadi, and, respectively, CF 36 and CF 34 in the smaller towns and villages around the country’s main harbor. This example of food prices being 1.6 times more expensive in Kinshasa than in Matadi is already telling, classifying this intercity connection as one of the most economically integrated areas of the country.

**Figure 3.1 Eltetö-Köves-Szulc Fisher food price index per pool and sector**



Source: Based on the 1-2-3 Survey (2004–2005). The map itself was created using Quantum GIS and geographic data coming from Africover.

Note: The three numbers of each pool consecutively refer to the EKS Fisher food price index of big cities, towns, and villages within that pool (reference: Kinshasa = 100). na = not available.

<sup>4</sup> A particular methodology is named after Eltetö-Köves-Szulc; it renders bilateral price indexes multilateral (or transitive). Within the framework of international comparisons, this method or one of its derivatives is used by Eurostat–Organization for Economic Co-operation and Development and the World Bank (Deaton and Heston 2008).

<sup>5</sup> In line with the methodology developed by Marivoet and De Herdt (2015), these localities are determined by combining the variables “pool” and “place of residence.” Whereas the 26 pools were used to logistically organize the implementation of the survey and therefore already offer a first indication of relative market fragmentation, the place of residence allows us to go a bit further by also considering the connection between the urban sector and its respective rural hinterland.

<sup>6</sup> At that time, 100 Congolese Francs (CF) equaled approximately US\$0.25.

Before embarking on an analysis of food prices, it is important to underline that the available survey data, strictly speaking, do not allow to qualify markets as being “integrated” or “efficient.” Indeed, whereas the former requires data on trade flows or price levels over time to observe co-movement, the latter entails knowledge about the full range of transfer costs to move goods from one location to another. Yet although both qualifications are often used interchangeably, markets will be roughly considered here to be more inefficient than others the more prices for comparable goods over comparable distances differ—pointing to unexploited opportunities for mutually beneficial trade at current transfer costs (exchange inefficiency), to unexploited opportunities to reduce transfer costs below the current level (operational inefficiency), or to both (Rashid and Minot 2010).

Backed with this knowledge, one can easily conclude from Figure 3.1 that the functioning of Congo’s food markets seems to be far from efficient. Indeed, food prices in Kinshasa are on average twice as high as those in the provinces of Bas-Congo, South Kivu, and Kasai and more than three times as high as food prices in the rest of the country—with Équateur clearly being the cheapest food province of all. In the villages around Gbadolite, for example, food prices can be as low as 13 percent of Kinshasa’s prices. These observations of course stem from the uneven location of the country’s capital within its own domestic market as well as from the adverse topographical nature of the country overall (see *supra*). Yet on top of these evident reasons induced by the country’s physical geography, many other transfer costs in terms of taxation (legal and illegal), red tape, risk, or imperfect information explain the huge price differentials between Kinshasa and its hinterland provinces (Goossens, Minten, and Tollens 1994). At the same time, this divergence in prices may reflect relative food shortages and surpluses. As such, the higher food prices observed in Kinshasa may point to a structural deficit of local suppliers in the capital’s periphery to feed a population estimated at 6 million people. As a result of this structural deficit combined with Congo’s inefficient internal market, one can assume that food imports from abroad are quite substantial.

That Kinshasa indeed depends a lot on global food markets can be seen from Table 3.1, which presents the 10 most consumed food items in Kinshasa together with their corresponding prices paid in the capital city and in each of the five cheapest pools of the country. Clearly, aside from maize and cassava (two of the basic components to prepare the national dish *fufu na pondu*), all food items within the *Kinois*<sup>7</sup> diet are either imported or locally produced based on imported ingredients. An example of the latter is the baguettes (200 grams) that are produced by one of the four industrial bakeries in town using imported wheat. These small breads are sold on the streets for less than CF 100 per piece and therefore have become a popular and cheap outdoor snack. Another source of calories is imported rice coming mainly from Asia (Tollens and Biloso 2006) and consumed at CF 307 per kilogram. Given its intermediate price in between the two ingredients for *fufu*, rice with its 7.7 percent share nowadays takes up an important proportion of the total food outlays of the *Kinois*.

Further, as a source of protein, the inhabitants of Kinshasa also rely on cheap imported *mpiodi* (8.7 percent), which is a sort of mackerel captured along the Atlantic coastline, and to a lesser extent chicken (2.9 percent), imported from Brazil and Europe. Both of these food items are generally of inferior quality and come in frozen form and then are stored in cool chambers across the country. In particular, the very low price of *mpiodi* (CF 629 per kilogram) guarantees at least a minimal protein intake for many households, but at the same time it also complicates the prospects of artisanal fishers to enter the market in Kinshasa. And finally, whereas the country at independence was producing enough sugar and palm oil for its own domestic needs, it is now importing large quantities from Brazil, Malaysia, and the European Union (Tollens and Biloso 2006). Given the fact that all of these imported food items are shipped through the country’s main harbor, price levels from Matadi to Kinshasa are also (in general) gradually increasing. As a result, the inhabitants of Mbanza-Ngungu (a town halfway between Matadi and the capital city) are able to profit well from their advantageous geographical position between both city markets: prices for *mpiodi*, imported rice, and bread each time fall within the price range of the five cheapest pools.

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<sup>7</sup> Inhabitants of Kinshasa.

**Table 3.1 Prices of top 10 food items consumed in Kinshasa**

Food item	Food share (%)	Mean standardized food prices (Congolese Francs per kilogram) for Kinshasa and the 5 cheapest pools						
		Kinshasa	1st	2nd	3rd	4th	5th	
1 Cassava flour	9.4	439	36 Lisala	44 Lubum'shi	64 Kikwit	67 Dilolo	85 Kenge	
2 Frozen fish ( <i>mpiodi</i> ) <sup>a</sup>	8.7	629	468 Matadi	629 Kinshasa	636 Bandundu	657 Kananga	701 Mbanza-N.	
3 Import rice	7.7	307	97 Goma <sup>b</sup>	261 Matadi	286 Mbanza-N.	307 Kinshasa	318 Lubum'shi	
4 Bread ("baguette")	7.0	452	402 Mbanza-N.	410 Matadi	452 Kinshasa	474 Lubum'shi	552 Mbandaka	
5 Maize flour	5.6	281	50 Gbadolite	65 Lisala	65 Manono	75 Kolwezi	88 Lubum'shi	
6 Palm oil	4.2	255	57 Manono	62 Gbadolite	65 Isiro	70 Boende	75 Kikwit	
7 Sugar (crystallized)	3.3	388	289 Lubum'shi	369 Bandundu	369 Kolwezi	388 Kinshasa	399 Matadi	
8 Dry corn (husked)	3.1	143	46 Kolwezi	50 Kikwit	76 Lubum'shi	83 Bunia	89 Mwene-D.	
9 Chicken (frozen)	2.9	1,346	1,018 Matadi	1,346 Kinshasa	na	na	na	
10 Cassava leaves	2.6	384	12 Mbandaka	13 Gbadolite	20 Lisala	24 Isiro	25 Kisangani	
	54.5							

Source: Based on the 2004–2005 1-2-3 Survey (INS 2005).

Note: <sup>a</sup> There were two other pools, Lubumbashi (village) and Kikwit (city), where *mpiodi* could be purchased at significantly lower prices. Given the geographical location of both pools and the fact that *mpiodi* is an imported mackerel captured in the territorial waters off the coast of Mauritania and Namibia, these price observations were labeled as unreliable and discarded from Table 3.1. <sup>b</sup> This low price for imported rice in the pool of Goma probably reflects the effect of humanitarian aid assistance. Lubum'shi = Lubumbashi; Mbanza-N. = Mbanza-Ngungu; Mwene-D. = Mwene-Ditu; na = not available.

Based on road rehabilitation impact studies, Tollens and Biloso (2006) were able to track the origins of other (domestically produced) food items consumed in Kinshasa. As such, the capital of the DRC seems to be supplied mainly by its neighboring provinces (see Figure 3.1 to locate each of the cities mentioned): with cassava from Kikwit, Mbandaka, and the Bas-Fleuve district and with maize from Kikwit and Lisala (Tollens and Biloso 2006). Looking at corresponding price levels for both food products in Table 3.1, the poor market efficiency of the country seems to make cassava flour seven times more expensive in Kinshasa than in Kikwit. This ratio is somewhat lower for maize flour shipped from Lisala (281/65) and for husked dry corn from Kikwit (143/50), but it reaches an extreme level for cassava leaves from Mbandaka (384/12). Probably the latter difference in prices is due to the highly perishable nature of this particular product, which also explains the recent popularity of city gardening (or horticulture) in the peri-urban areas around Kinshasa. Be it in terms of increased food security or livelihoods, these price differentials reflect the huge potential of improved market efficiency both for the inhabitants of Kinshasa and for the many farmers in the country.

So far this discussion has focused mainly on Kinshasa's connection to domestic and foreign food markets, but what about the functioning of local food markets in other regions and across their respective urban and rural sectors? Here, although overall market efficiency still remains rather poor throughout the country, the picture is somewhat more variable.

First, given similar price levels and their more homogeneous ethnic and linguistic background, together with the relatively small intercity distances (see Figure 3.1), one can assume that regional markets are more efficient within the provinces of Kasai-Occidental and Kasai-Oriental. Moreover, except for the diamond-rich pool of Tshikapa (where food prices seem to be markedly higher), all cities in both Kasai provinces seem to be fairly well connected to their respective rural hinterlands as the small price range between sectors may indicate. Yet food prices in general are also relatively higher in these particular provinces compared to the rest of the country, which again may point to a local production shortage. This observation is confirmed by the same study above and primarily relates to the production of maize, this being the single most important food item for households in Kasai. As a result, maize typically would be imported to a minor extent from Bandundu and in much larger quantities from neighboring southern states (Tollens and Biloso 2006).

In Table 3.2, these claims are illustrated by considering the prices of the 10 most consumed food items in the urban sector of both Kasai provinces and corresponding data for the urban sector at large. A remarkable difference with the *Kinois* diet (and that of the average Congolese; see below) concerns the consumption of maize flour: not less than a quarter of total food outlay in the Kasai region is spent on this particular food item. As a result, prices for maize flour on average are 7.7 percent higher in Kasai (CF 211) compared to the rest of the urban sector (CF 196). However, given the huge difference in demand, this price gap is rather low, which may indeed point to important and cheap imports of maize flour to suppress local prices in Kasai. On the other hand, price inequalities for this product between the cheapest and most expensive pool in Kasai are considerably lower (3.1) than for the urban sector at large (7.2). The latter observation then supports the idea of a more efficient local market.

**Table 3.2 Prices of top 10 food items consumed in the urban sector of Kasai-Occidental and Kasai-Oriental**

Food item	Food share (%)	Prices Kasai (urban)				Prices DRC (urban)				Diff (%)
		Min	Max	Mean	Max/min	Min	Max	Mean	Max/min	
1 Maize flour	25.6	109	340	211	3.1	77	555	196	7.2	7.7
2 Cassava flour	10.9	102	310	185	3.0	44	439	183	9.9	0.8
3 Palm oil	8.6	187	786	544	4.2	65	816	382	12.6	42.6
4 Fried sardines ( <i>Ndak</i> )	5.7	808	1,996	1,310	2.5	363	2,396	1,032	6.6	27.0
5 Salted fish ( <i>Bitoyo</i> )	3.8	738	2,701	1,513	3.7	345	5,944	1,438	17.2	5.2
6 Dry corn (husked)	3.5	103	313	176	3.1	103	313	153	3.1	14.7
7 Cassava leaves	3.2	57	248	113	4.3	29	443	114	15.3	-1.2
8 Frozen fish ( <i>Mpiodi</i> )	3.0	657	1,098	859	1.7	331	1,992	833	6.0	3.1
9 Multicolored beans	2.5	272	800	466	2.9	175	800	405	4.6	15.0
10 Sugar (crystallized)	2.2	440	1,246	697	2.8	289	1,420	610	4.9	14.3
	69.0				3.1				8.7	12.9

Source: Based on the 2004–2005 1-2-3 Survey (INS 2005).

Note: Diff = difference; DRC = Democratic Republic of the Congo; Max = maximum; Min = minimum. For each food item, the minimum and maximum price estimates, respectively, refer to the cheapest and most expensive average price level observed in all pools concerned.

For most other food items, the same overall tendency seems to occur: prices on average are higher but more equal within the urban sector of Kasai compared to price levels recorded in all Congolese cities. Indeed, the 10 most important food items are on average almost 13 percent more expensive in urban Kasai than in the whole urban sector. Except for cassava flour and cassava leaves, where mean prices are similar, this price difference ranges from 3.1 percent for *mpiodi* to almost 42.6 percent for palm oil, each time with the Kasai cities recording the higher price. At the same time, average price inequalities for these 10 food items level around factor 3 for cities in the Kasai region and around almost factor 9 for the overall urban sector. To be clear, prices being three times higher in one Kasai pool compared to another is far from exemplary of an internally efficient economic region. Yet given that this price variation is clearly lower compared to the urban sector at large, one can infer that this local market is relatively more efficient. In short, combining price levels and ranges, the Kasai economy seems to be at the same time internally more efficient than, and externally more isolated from, the rest of the country. The latter aspect of isolation is also reflected in the poor variety of the Kasai diet. Indeed, whereas the top 10 food items in Kinshasa represent 54.5 percent of the overall food budget (see Table 3.1), this share amounts to 69.0 percent for the urban sector in Kasai.

A second region of relative market efficiency, likely for other reasons, is the area shaped by the provinces of Maniema, North Kivu, and Orientale. Again, food prices seem to be fairly similar across different pools of these three provinces (see Figure 3.1), but this time the driving force behind it may be linked to the armed conflicts they all faced. Indeed, since 1996 this part of the DRC has been the site of continuous hostilities between several well-armed native and foreign rebel factions (Reyntjens 2009), whose presence might have been initiated for legitimate reasons but later on came to be driven by economic interests and steered by the abundance of mineral resources. Given this blending of warfare and economic interests (Vlassenroot and Raeymaekers 2004), many movements and commercial activities of either legal or illegal nature were, and still are, taking place, which may in turn explain why markets are more efficient in this part of the country. Here again, food produced in the rural sector of these three provinces seems to find its way relatively easily to the local city markets, as prices in the latter are only marginally higher than in the villages around. To be sure, this observation should not be read as an argument in favor of a further lingering of the conflict but merely as a highly uncertain—though positive—spillover effect. Furthermore, apart from increased economic exchange within this area, the protracted instability may also greatly reduce commercial traffic with other areas outside the conflict zone. This was actually the case during the second Congo War (1998–2003), which resulted in a partitioning of the country into several chunks and a disruption of nearly all economic activity in between (Tollens 2003).

In Table 3.3, the previous exercise is reapplied for the 10 most consumed food items in the urban sector of North Kivu, Maniema, and Orientale. Apart from the greater variety in sources of protein, the diet in this northeastern region again strongly resembles the one in Kinshasa. In terms of food prices, the urban sector of North Kivu, Maniema, and Orientale seems to be on average 14.8 percent cheaper than the overall urban sector. Except for local rice, fresh fish, and cassava leaves, this northeastern region has a comparative advantage over the total urban sector in terms of all other food items within this top 10 list, especially for salted fish, palm oil, and multicolored beans. These lower prices may point to a more autarkic food economy, to a better connection with production centers outside the region or even across the border with Rwanda or Uganda, or to both.

**Table 3.3 Prices of top 10 food items consumed in the urban sector of North Kivu, Orientale, and Maniema**

Food item	Food share (%)	Prices region (urban)				Prices DRC (urban)				Diff (%)
		Min	Max	Mean	Max/min	Min	Max	Mean	Max/min	
1 Cassava flour	9.5	128	206	167	1.6	44	439	183	9.9	-8.9
2 Local rice	8.1	226	417	327	1.8	144	491	313	3.4	4.6
3 Palm oil	6.9	65	621	233	9.6	65	816	382	12.6	-38.9
4 Multicolored beans	6.1	175	513	294	2.9	175	800	405	4.6	-27.4
5 Beef with bone	4.1	922	1,030	962	1.1	838	2,417	1,228	2.9	-21.7
6 Dried/smoked fish	3.9	469	1,842	851	3.9	285	2,185	1,009	7.7	-15.7
7 Fresh fish	3.4	642	1,161	810	1.8	145	2,784	759	19.2	6.7
8 Salted fish ( <i>Bitoyo</i> )	3.3	448	1,261	832	2.8	345	5,944	1,438	17.2	-42.1
9 Cassava leaves	3.1	34	443	131	13.1	29	443	114	15.3	15.0
10 Sugar (crystallized)	2.7	430	611	489	1.4	289	1,420	610	4.9	-19.9
	51.1				4.0				9.8	-14.8

Source: Based on the 2004–2005 1-2-3 Survey (INS 2005).

Note: Diff = difference; DRC = Democratic Republic of the Congo; Max = maximum; Min = minimum. For each food item, the minimum and maximum price estimates, respectively, refer to the cheapest and most expensive average price level observed in all pools concerned.

Further, and similar to the observation for the urban sector in the Kasai region, the city markets of North Kivu, Maniema, and Orientale seem to be relatively more efficient, given the rather limited spread in maximum and minimum average prices observed in all pools in this region. To be sure, average price inequalities still level around factor 4 but would have been much lower without the high price differentials on cassava leaves and palm oil, two food items difficult to transport due to their perishable or liquid nature. In any case, compared to price data for all Congolese cities, this average price range of 4.0 is still more than half the one observed in the urban sector of the DRC (9.8). As such, the urban sector of North Kivu, Maniema, and Orientale resembles the Kasai region with respect to its degree of internal market efficiency but differs in terms of self-sufficiency or connection with markets outside. Again, the latter observation is underscored by the greater food diversity characterizing the diet of urban dwellers in North Kivu, Maniema, and Orientale: the 10 most important food items here represent only half of the total food budget.

The above observations about the relative efficiency of food markets in the DRC can be reassessed from Table 3.4, which provides an overview of price levels observed in the three most competitive provinces for each of the 20 most consumed food items in the DRC. At the same time, this table allows the identification of those areas where opportunities for mutually beneficial trade are most promising.

**Table 3.4 Lowest mean prices and origin of top 20 food items consumed in the Democratic Republic of the Congo**

Food item	Food share (%)	Top 1		Top 2		Top 3	
		Province	Price	Province	Price	Province	Price
1 Cassava flour	11.6	Katanga	98	Équateur	127	Bandundu	136
2 Maize flour	7.1	Équateur	91	Katanga	109	Orientale	174
3 Palm oil	6.5	Équateur	116	Maniema	176	North Kivu	219
4 Multicolored beans	3.9	North Kivu	166	Katanga	221	South Kivu	271
5 Cassava leaves	3.2	Équateur	32	North Kivu	46	Bandundu	56
6 Frozen fish ( <i>Mpiodi</i> )	2.9	Katanga	494	Bas-Congo	597	Kinshasa	629
7 Dry corn (husked)	2.7	Orientale	83	Katanga	89	Bandundu	96
8 Local rice	2.6	Katanga	168	Bandundu	236	Équateur	245
9 Cassava chips	2.5	Katanga	34	Kasaï-Ori.	63	North Kivu	63
10 Import rice	2.4	North Kivu	261	Bas-Congo	304	Kinshasa	307
11 Dried/smoked fish (other)	2.2	Équateur	565	Maniema	607	Kinshasa	630
12 Fresh fish (other)	2.1	Katanga	450	Équateur	512	Orientale	542
13 Salt	2.1	North Kivu	212	Bas-Congo	282	Équateur	333
14 Sugar (crystallized)	2.1	Kinshasa	388	North Kivu	452	Katanga	473
15 Fried sardines ( <i>Ndakala</i> )	2.0	North Kivu	353	Maniema	770	Équateur	770
16 Salted fish ( <i>Bitoyo</i> )	1.9	South Kivu	651	North Kivu	697	Orientale	984
17 Plantain bananas	1.8	Bas-Congo	46	North Kivu	68	Équateur	77
18 Meat (other)	1.7	Équateur	343	North Kivu	420	Kasaï-Ori.	431
19 Cassava tuber	1.4	Équateur	22	Bas-Congo	46	Orientale	47
20 Bread ("baguette")	1.3	Bas-Congo	435	Kinshasa	452	Katanga	474

Source: Based on the 2004–2005 1-2-3 Survey (INS 2005).

Note: Kasaï-Ori. = Kasaï-Oriental.

First, the isolated and deficient nature of the Kasaï economy is indicated by its limited occurrence in Table 3.4. Indeed, only for cassava chips and nonspecified meat, respectively, is Kasaï-Oriental the second and third cheapest producer. Given the region's preference for maize over cassava, this first observation is remarkable; the second, which identifies the region east of Mbuji-Mayi as an important producer of beef, is in line with the study by Tollens and Biloso (2006).

Second, Kinshasa's particular linkage to global food markets as a compensation for its inefficient domestic food economy appears again in Table 3.4. The five products for which Kinshasa figures among the three cheapest "producers" mainly concern imported food items, like *mpiodi*, imported rice, sugar, and bread.

Finally, the relatively low prices observed in the northeastern region of the country seem to be driven mainly by North Kivu, being the cheapest province for multicolored beans, imported rice, salt, and fried sardines and among the three cheapest for not less than 11 food products in total. As one could already note from Table 3.1, the cheap price for imported rice may be due to humanitarian assistance (in the form of food aid) offered through Goma, the provincial capital of North Kivu. The province of Orientale, another province within the relatively efficient northeastern market, is among the three cheapest for 5 food items. For fish and cassava tubers, this is no coincidence given its climatic and topographical conditions along the river Congo. For maize flour, it may relate to cheap imports from Lisala (Tollens and Biloso 2006), and for dry corn it is actually Bunia at the eastern border with Uganda

that is responsible for the favorable price of corn observed in Orientale. In this respect, Maniema, with only three occurrences in Table 3.4, is doing much worse than the other two provinces.

Yet the most competitive overall producer within this list of 20 food items is not North Kivu but Équateur: for not less than 12 food products, Équateur figures among the three cheapest provinces. Moreover, to prepare the national dish, one would best live in Équateur as cassava flour, maize flour, palm oil, and cassava leaves are sold in this province at very cheap prices. But also for dried and smoked fish and meat, one should be in Équateur. Remarkably enough, Katanga is the cheapest province in which to buy cassava flour, despite the fact that its inhabitants have a diet similar to those in the Kasai region (thus based more on maize than on cassava). Actually, Katanga's food markets are performing relatively well given its 10 occurrences in Table 3.4. Indeed, not only for cassava flour but also for maize flour, multicolored beans, *mpiodi*, and dry corn is Katanga a potential competitive supplier.

In general and depending on the local conditions to increase supply, one should first focus on ways to open up the food economy of Équateur and North Kivu, being the most competitive producers of the 20 food items listed in Table 3.4. One solution to unlock the province of Équateur is to improve access to fluvial ports, dredge the Congo River, and increase its navigability to reduce the economic cost of transporting merchandise along this river to its main city clients in the east (Kisangani) and the west (Kinshasa). This recommendation is supported by Ulimwengu et al. (2009), who apart from identifying Équateur as one of the high-production areas, underscored the importance of river transport investments next to road rehabilitation. Other possibilities are to increase competition among the few shipping companies that currently control most of this inland maritime trade or to promote agroprocessing in river ports to provide a solution for the highly perishable nature of some food items (Ulimwengu et al. 2009).

For North Kivu and from the perspective of the 2005 data, ending the conflict at first sight seems to be the most logical proposition. On the contrary, it was assumed that the conflict itself is responsible for the fairly equal prices observed in the northeastern part of the country. In any case, with Katanga and Orientale, respectively, occupying third and fourth place in the ranking of cheap-food-producing provinces, the idea of a dependency of eastern provinces on surpluses generated by western provinces, as stated by Tollens and Biloso (2006), does not seem to be supported by the 1-2-3 price data. To be sure, Bas-Congo and Bandundu may well produce a considerable surplus for many food items; their proximity to Kinshasa with its insatiable demand may explain the relatively higher prices recorded in these two neighboring provinces.

## 4. DIETS AND NUTRITION

Given the high spatial variation in prices observed above and largely in line with Ulimwengu, Roberts, and Randriamamonjy (2012), it should not be a surprise that food acquisition and nutritional levels are quite heterogeneous throughout the country as well. In this section, the various diets of the Congolese will be mapped together with their corresponding levels of nutrition. To be clear, diet diversity here will be approached exclusively by looking at intakes from different food groups. This approach has consistently proven to be positively associated with the nutrient quality of diets and child anthropometrics (Jones et al. 2013). However, it should be stated that such diet diversity proxies cannot substitute for a more detailed analysis of food outlays, whereby the nutritional content of each specific food item is aggregated and evaluated against a list of recommended nutrient intakes.<sup>8</sup> Yet this latter type of analysis, which allows the identification of macro- and micronutrient deficiencies, falls outside the scope of this paper.

The following two figures give an overview of the five types of diet that can be roughly identified in the DRC. Whereas Figure 4.1 attempts to localize each of them, Figure 4.2 gives an account of their average composition. The first diet can be labeled simply as “cassava based” given its huge reliance on this particular food item: almost half of all calories in diet 1 are obtained through cassava. The other components in this diet include maize and palm oil, having shares, respectively, around 20 percent and 10 percent. This food basket seems to be most typical for the province of Bandundu but also can be found in the rural sector of Kasai-Occidental and Katanga. The latter observation may go slightly against general expectations as both Kasai’s and Katanga’s diets are mainly considered to be maize based. However, the vital imports of maize from southern states as discussed above may be insufficient and primarily focused on the city centers.<sup>9</sup> As a result of this, rural households (especially in the more isolated Kasai-Occidental) may have shifted to cassava for their daily calorie intake. Indeed, cassava is an ideal crop to ensure food security since it conserves well in the ground and can be harvested at any time (Tollens 2003).

Even if the rural inhabitants in Kasai (-Occidental) and Katanga may encounter some difficulties in pursuing their preferred diet, this does not seem to be the case for most of their urban counterparts. The diet observed in these cities (and the villages in Kasai-Oriental) is clearly maize based as more than 40 percent of all calories are provided by this cereal. Further, cassava and palm oil are the second and third most important food items, with shares of, respectively, 20 percent and 10 percent. As such and clearly visible from Figure 4.2, this second diet is the perfect mirror of the previous, although the consumption of rice in diet 2 is twice the share of that in diet 1.

A third diet type can be observed in the urban sector of Bas-Congo and Kinshasa and concerns the importance of bread and rice. Both of these food items seem to account for about 25 percent of all calories consumed—rice being responsible for two-thirds. Most likely, this observation connects to the discussion above and relates to the cheap imports of wheat and rice shipped through the harbor in Matadi. Apart from these two cereals, this third diet also entails important (and rather equal) shares of maize, palm oil, and cassava.

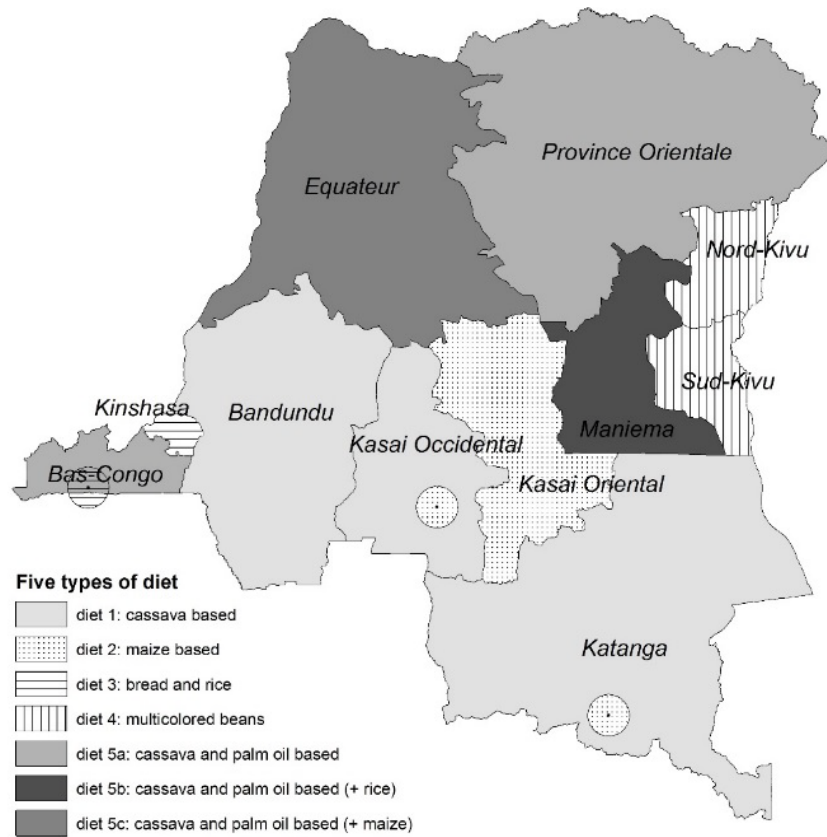
Another diet type can be found in North and South Kivu and is characterized by its reliance on multicolored beans. Although this food item does not dominate the food bowl (as was the case with previously discussed diets), multicolored beans represent an important share in total calories consumed; a characteristic absent in all other diets. This share levels at around 18 percent and is somewhat higher in the rural sector, where this crop is cultivated (Tollens and Biloso 2006), than in the cities of both Kivu provinces. The most important food crop in these two provinces is clearly cassava with a share a bit higher than 30 percent. On the other hand, maize and palm oil are far less important food items in this particular diet compared to others, each of them responsible for only around 10 percent of all calories consumed.

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<sup>8</sup> For such a more full-fledged analysis, see Ulimwengu, Roberts, and Randriamamonjy (2012).

<sup>9</sup> This actually seems to be the case when comparing the average prices for cassava and maize flour in the rural sector of Kasai-Occidental: 270 CF/kilogram for maize and 206 CF/kilogram for cassava flour. For the villages in Katanga, however, prices for both food items are very similar at around 92 CF/kilogram.

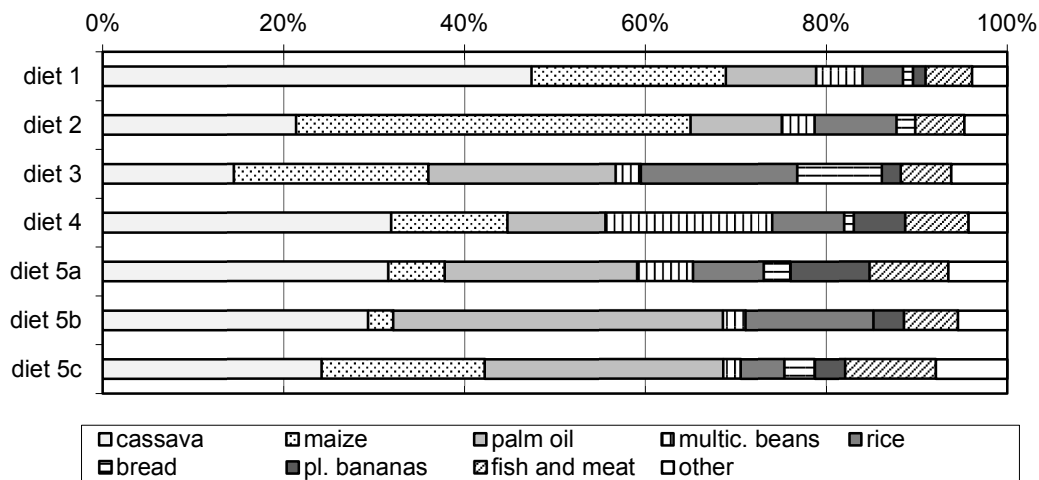
**Figure 4.1 Spatial variation in diets across the country**



Source: Based on the 2004–2005 1-2-3 Survey (INS 2005). The map itself was created using Quantum GIS and geographic data coming from Africover.

Note: The small spheres in Figure 4.1 point to a difference in diet type between the urban and rural sectors.

**Figure 4.2 Five diets and their underlying components**



Source: Based on the 2004–2005 1-2-3 Survey (INS 2005).

Note: The composition of each diet is based on the relative calorie contribution of each of the displayed categories within the 20 most consumed food items. The choice for calories as a common unit to differentiate diet types is arbitrary and solely induced by the fact that each food item at least has some energy content (compared to some other nutrients). multic. = multicolored; pl. = plantain.

The last diet comes in three versions, but all share the characteristic of being dependent on cassava with large intakes of palm oil as a complement. Indeed, both of these food items make up not less than 50–65 percent of all calories consumed. Except for the province of Bandundu and the urban centers in Bas-Congo and Kinshasa, this diet can be found all along the Congo River basin. In Orientale and the villages of Bas-Congo, this diet also contains substantial, and almost equal, shares of plantain bananas, fish, and meat. In the province of Maniema, the dominance of cassava and palm oil within the food bowl is further supplemented with rice, this being responsible for another 15 percent of all calories consumed. The latter observation stems from the production of local rice in Maniema. Yet although similar production sites exist in Équateur (district of Mongala) (Tollens 2003), it is rather the consumption of maize that further characterizes and adds another important slice of calories to this province's diet. Moreover, this diet also contains a fair amount of fish and meat (around 10 percent).

Now, given the spatial variation in prices and diets discussed above, one might be interested in their combined effect on people's nutrition. Indeed, food prices will influence what households eat and what they do not, which in turn will determine their nutritional status. Before proceeding, three other aspects need to be highlighted.<sup>10</sup> First, the real food budget will depend on not only food prices but also prices for nonfood items. If prices for the latter are relatively cheaper than prices for the former, households will allocate their budget more in favor of nonfood goods. Second, prevailing social norms or individual desires to make life less boring may also govern this specific choice between food and nonfood. In this respect, one can observe poor households being compelled, willing, or both to spend considerable amounts on funerals, weddings, dowries, TV sets, or mobile phones (Banerjee and Duflo 2011) or, which may sound less reprehensible, on educating their children when the state is only partially financing this sector (Titeca and De Herdt 2011). This same social pressure or the pursuit of a more pleasant life may be at play in the next stage as well, when allocating the food budget over a series of food items. Often the poor will choose their diet not only as a function of prevailing food prices but also because certain items are socially preferred over others or simply tastier. To be sure, if one had no food preferences at all but a minimal daily intake of 2,400 calories (with 10 percent of calories coming from protein and 15 percent from fats), then only US\$0.12 per day would do for most Congolese to survive. Unfortunately, this diet would consist of only palm oil and peanuts,<sup>11</sup> way too far from a realistic meal. And third, the nutritional status of the Congolese across the country will of course also depend on their respective income levels—the higher a person's real income, the better on average his or her nutritional status will be, *all things equal*. The latter three italicized words are important because the income level itself will influence (1) the budget share spent on nonfood goods (such as Engel's law) and (2) its exact allocation for different food items. This of course does not nullify the previous two factors (nonfood prices and social/individual preferences), whose influence on nutrition is context driven and thus further complements the income effect.

These latter remarks are illustrated in Table 4.1, which presents, per sector and province, the translation of daily real expenditure levels into calorie intakes, both per adult equivalent. For instance, when comparing Kinshasa and the rural sector of Bandundu, mean purchasing power for food seems to be almost equal among households: CF 561 in Kinshasa compared to CF 575 in rural Bandundu. Yet when looking at their corresponding calorie intakes, the *Kinois* seem to attain on average only 1,818 kilocalories compared to 2,585 kilocalories for their rural counterparts in Bandundu. The reasons for such a difference may be observed in the columns in between, which provide evidence of the average share of total budget spent on nonfood items and the average diet diversity. Not only do the *Kinois* spend a much larger fraction of their income on nonfood items (45 percent), but their diet also seems to be much more diverse (5.81) compared to rural dwellers in Bandundu. The higher nonfood share may be due to relatively lower prices for nonfood in Kinshasa compared to the countryside of Bandundu (which is a

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<sup>10</sup> These aspects are typically taken into account when specifying a demand model, which is an exercise beyond the scope of this paper.

<sup>11</sup> In the Philippines, the cheapest diet possible would cost US\$0.21 but would contain only bananas and eggs (Banerjee and Duflo 2011).

typical observation between any urban and rural sector) but also because social norms in terms of food and nonfood might be more demanding/expensive in the capital. By contrast, households in rural Bandundu may have access to only a limited range of food and nonfood goods, which may explain their poorly diversified diet (4.30) as well as their low nonfood share (29 percent). Simply stated, households in the rural sector of Bandundu seem to spend the lion's share of their budget on a few food items only; most probably cassava, maize, and palm oil—all three very rich in calories.

**Table 4.1 From real expenditure levels to calorie intakes per sector and province**

Province	Daily mean expenditures <sup>a</sup> (EKS, adult equivalent)		Mean nonfood share (%)		Mean diet diversity <sup>b</sup> (score on 7)		Daily mean calorie intake <sup>c</sup> (adult equivalent)	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Kinshasa	561	na	45	na	5.81	na	1,818	na
Bas-Congo	817	711	38	31	5.47	5.35	2,212	3,331
Bandundu	752	575	34	29	5.38	4.30	2,511	2,585
Équateur	876	898	33	31	5.52	5.08	3,027	3,593
Orientale	746	882	36	26	4.90	4.50	2,156	3,825
North Kivu	1,359	782	45	28	4.89	3.98	2,708	3,408
Maniema	1,202	992	29	30	4.83	4.45	3,805	3,472
South Kivu	583	429	40	21	5.27	4.41	1,722	1,427
Katanga	969	827	38	26	5.40	4.81	3,256	3,939
Kasaï-Oriental	912	679	36	30	5.32	4.61	3,077	2,732
Kasaï-Occidental	768	601	35	30	4.97	4.46	2,690	2,847
Total	784	737	40	28	5.44	4.60	2,454	3,186

Source: Based on the 2004–2005 1-2-3 Survey (INS 2005).

Note: <sup>a</sup> These daily expenditure levels are expressed per adult equivalent and controlled for regional price differences using the EKS Fisher food index as displayed in Figure 3.1. As a result, they reflect each region's purchasing power for food. <sup>b</sup> Inspired by Arimond and Ruel (2004), this diet diversity has been obtained by applying a seven-point score card to each household's food basket during a three-day reference period. <sup>c</sup> For Kinshasa and Kikwit, the calorie intakes expressed per person are well in line with observations from other small-budget surveys executed by PNUD-SOCOMEG (2000) and Food and Agriculture Organization of the United Nations (2002). On the contrary, for Lubumbashi and Kindu this similarity does not seem to hold (Tollens 2003). EKS = Elteto-Köves-Szulc; na = not available.

The latter comparison between Kinshasa and rural Bandundu is actually a good illustration of the general difference between the urban and rural sectors. First, the Elteto-Köves-Szulc food index used here to deflate nominal expenditure levels is, without doubt, an imperfect price index as it entails only food prices. As a result, and assuming nonfood goods are relatively cheaper in cities, real expenditure levels based on such an index will underestimate (overestimate) true purchasing power in the urban (rural) sector. For this reason, one might consider the difference between CF 784 (urban) and CF 737 (rural) too low. In a similar vein and due to the low food prices observed, the rural sectors of Équateur and Orientale on average reveal a higher purchasing power than their corresponding urban sector. Unfortunately, the 1-2-3 budget data do not include standardized nonfood prices to verify the claim of over- and underestimation, not to mention correcting for it. Yet the average nonfood share of the urban sector is markedly higher than for the rural sector: respectively, 40 percent compared to 28 percent. For most provinces, except for Maniema, this marked difference seems compelling and may indeed point to nonfood goods being generally less expensive in cities compared to villages. On the contrary, these higher nonfood shares generally observed in the urban sector may also indicate that social nonfood norms are much more demanding than in the rural sector. Accordingly, Kinshasa and the urban sector in both Kivu provinces may be among those locations exercising the most social pressure on their inhabitants. At the other extreme, the rural sectors of South Kivu, Orientale, and Katanga may be among the least

demanding, with nonfood budget shares between 21 percent and 26 percent. Again, it is unclear to what extent these differences in mean budget shares are due to variation in nonfood prices or social norms.

Looking at diet diversity may be another way to determine what is going on. By assuming that prevailing social norms are uniformly applicable to both food and nonfood items, variation in diet diversity may reveal differences in social pressure irrespective of nonfood prices. Indeed, why else would the diet of the average *Kinois* be the most diversified of all Congolese, while his or her calorie intake figures among the lowest of all? If social norms were completely irrelevant, the *Kinois* diet would probably be much more dependent on palm oil and peanuts. Under the same assumption, one could consider the high nonfood share observed in the cities of North Kivu rather as a manifestation of relatively cheaper nonfood prices. Indeed, mean diet diversity here is the second lowest of all urban sectors, signaling lower social expectations with respect to what households eat.<sup>12</sup> Of course, this association between social norms governing to a similar degree food and nonfood consumption is merely an assumption. It could well be possible that households in North Kivu spend a lot on securing their house (being the norm as the prevailing situation of insecurity demands this) but that social norms are far less stringent with respect to food consumption.

In any case, households in the urban sector on average have a more diversified food basket than their rural counterparts: respectively, 5.44 compared to 4.60 on a scale from 1 to 7. On the contrary, calorie intakes are on average 30 percent higher in the rural (3,186 kilocalories) compared to the urban (2,454 kilocalories) sector. In the majority of cases, there seems to be an inverse relation between diet diversity and calorie intake across different provinces and sectors, but this of course ultimately depends on the exact underlying diet composition and corresponding calorie content of each food item. Within the urban sector, Maniema stands out as the province with both the highest calorie intake (3,805 kilocalories) and the lowest diet diversity (4.83), while Kinshasa is a good example of the opposite. In the rural sector, this inverse relation is rather nonexistent as rural households in Katanga have the highest energy intake (3,939 kilocalories) but also the third most diversified diet (4.81), and those in Bandundu are ranked second lowest with respect to both these indicators (2,585 kilocalories; 4.30). Remarkably, the inhabitants of South Kivu in both sectors have a distinctively lower calorie intake (1,722 kilocalories and 1,427 kilocalories in the urban and rural sectors, respectively), combined with a relatively moderate diet diversity. In any case, this variable relation between energy levels and diet diversity is not exceptional. In a study on food insecurity covering 12 countries in Africa south of the Sahara, Smith, Alderman, and Aduayom (2006) concluded that no strong association existed between food energy levels and diet diversity, with possible discrepancies between food quantity and quality stemming from cultural traditions, climatic conditions, and functioning of local markets.

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<sup>12</sup> To be sure, further research indicated that this low diet diversity in the urban sector of North Kivu is not due to a more restricted availability of food, compared to (for example) the urban sector in South Kivu—where mean diet diversity levels around 5.27.

## 5. CONCLUSIONS

This paper examined the geographical variation in access to food and nutrition across the DRC based on the 1-2-3 Survey data (2004–2005). The importance of such a spatial perspective stems not only from the fragmented economic geography of the country but also from the ongoing decentralization of its national administration. Ideally, this administrative reform will be instrumental to better discern the exact location of food production, trade, and consumption in the country and will contribute to fostering local solutions for encountered problems. Meanwhile, and to guide future policy design, the descriptive findings of this paper already allow for a first crude delimitation of themes and areas of intervention.

Overall, given the observed high variation in food prices across the country, this paper pointed to the weakly efficient food markets in the DRC. In this respect, the situation of the capital city of Kinshasa is informative: overall food prices in Kinshasa are twice to four times higher than in its hinterland, making the capital city highly dependent on, and vulnerable to, food imports from abroad. However, there are two exceptions to this general finding: on the one hand, one can observe more equal, but relatively high, food prices in the culturally more homogeneous provinces of Kasai, which points to some degree to regional market efficiency combined with external isolation from the rest of the country. On the other hand, the northeastern part of the country, apart from misery and hardship, also experiences more equal, but relatively lower, food prices. Further, since Équateur and North Kivu are among the most competitive food producers in the country, economically unlocking these provinces should be among the most promising strategies to address food insecurity.

Differential access to food as described in this paper further distinguishes between five diet types, of which the one based on cassava with large complements of palm oil is clearly the most energy rich. As a result, households that rely on this diet in general have a higher calorie intake and mainly live in the provinces of Maniema, Orientale, Équateur, and (rural) Bas-Congo. Yet apart from diet composition, income levels and prevailing nonfood needs will determine the calorie adequacy of households. In this respect, those who dwell in Katanga and North Kivu have enough to eat as well, thanks to their higher income levels, while urban households in Bas-Congo and Orientale (contrary to their rural counterparts) generally eat too little as a result of their relatively higher nonfood expenditures. In any case, the lowest calorie levels of all can be found in South Kivu and Kinshasa, the former because of the low purchasing power of its inhabitants and the latter due to high food prices combined with the more expensive social norms governing this particular society.

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