



# Regional Food Security to Cope with Agricultural Policy Changes in North-Western Zambia

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# Regional Food Security to Cope with Agricultural Policy Changes in North-Western Zambia

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## **Abstract**

This paper examines the strategies of small-scale farmers that enable them cope with fluctuations in food production according to changes in national agricultural policy in north-western Zambia. Maize is the most important staple food in Zambia. The maize cultivation started when the colonial government set up food supply systems for urban workers. In Zambia, small-scale farmers earn a cash income through selling maize and its cultivation relies on subsidised fertiliser provided by the government. Changes in the national agricultural policy are affected by the political situation. Maize yields are fluctuated by delivery delays of the fertilisers. In north-western Zambia, the indigenous Kaonde concentrate on growing maize and sorghum, whereas the Lunda, Luvala, Chokwe, and Luchazi immigrants from other areas mostly grow cassava. The indigenous Kaonde experience hunger during the off-crop season for grains and sustain their self-sufficient lifestyle by obtaining cassava grown by the immigrants. Small-scale farmers do not depend on maize cultivation. The Kaonde are able to obtain cassava from the immigrants during the hunger period, therefore they have realised regional food security in the local community.

**Key words:** maize, cassava, subsidy program, the Kaonde, immigrants, Zambia

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## I Introduction

Food security still remains a challenge in sub-Saharan Africa. There are many factors of food insecurity, such as inadequate policies, conflicts, poor infrastructure, rapid population growth, food price volatility (Ozor et al., 2014). Plantation-based investments create direct risks of land grabbing and can have major repercussion for local food security in much of rural sub-Saharan Africa (Vermeulen and Cotula, 2010). Although the majority of the population in rural is farmer, food availability is declining in sub-Saharan Africa (Khalif and Nur, 2013).

Maize is the most common staple crop in sub-Saharan Africa. It became central to the food system in eastern and southern Africa during the second half of the 20th century (McCann, 2010: 49). In Zambia, which is located in southern Africa, maize is the most important grain crop and is cooked daily as part of the staple diet. Small-scale farmers also cultivate maize as a valuable cash crop. During the colonial period, maize became the staple diet for urban workers after the government at that time established a food supply system for urban workers (Lukanty and Wood, 1990). Before the structural adjustment program (SAP) started in earnest in the 1990s, the Zambian government began to support maize production as an important national staple food. The core role of the government was to maintain the low price of maize for urban consumers while maintaining remunerative prices for maize producers through subsidies (Mason et al., 2013).

Following the change of government in 1991, the new government oversaw the rapid progression of SAP. All government subsidies were abolished and national enterprises were privatised. The input subsidies were also drastically cut. Thus, it became difficult for small-scale farmers in remote areas to obtain any type of agricultural subsidies, such as hybrid maize seeds and chemical fertilisers (Oyama and Kondo, 2007). The Zambian government reinstated the agricultural input subsidy programs for small-scale farmers in 1997 (Mason et al., 2013), and these were still ongoing in 2015. However, a shortage of agricultural input and a delay in the supply of subsidised fertilisers had a large effect on the livelihoods of small-scale farmers in Zambia (Xu et al., 2009; Mason et al., 2013). The agricultural programs set up by the government were not able to provide effective and efficient support for small-scale farmers in sub-Saharan Africa (Dorward et al., 2004).

The adoption of cassava, as a potential cash crop and staple food source to replace maize, has long been discussed in Zambia (Marter, 1978). Because maize is reliant on rainfall and this increases its vulnerability to climate change (Cairns et al., 2013). Cassava was introduced in the 1930s when the colonial administration promoted its cultivation as a relief food (Marter, 1978). The calorie yield per acre of cassava is high; it is a drought-resistant crop that grows well on poor soil and is productive throughout the year (Jones, 1959). Cassava makes up for the calorie shortfall of maize, offering an affordable means to mitigate lean-season hunger and providing a low cost, in-kind insurance against drought for rural households (Barratt et al., 2006). Simulations of the impact of droughts in Zambia have shown that the price of maize would increase by over 160% and people would roughly consume an additional 43,000 tons of cassava (Dorosh et al., 2009). Indeed, when the government restored the input subsidy program between 1990 and 2002, the proportion of maize in the total smallholder crop output declined, while that of cassava increased, largely replacing maize in northern Zambia (Jayne et al., 2007). Cassava has since contributed to food self-sufficiency, as it can counteract the vulnerability and calorie shortfall of maize yields.

In African rural society, villagers still sustain self-sufficient life and food is shared in a community based on kinship. Food shortages in one household are bridged by other households in the community. This social custom, which acts as a levelling mechanism with respect to the distribution and consumption of food, material goods, prevents individuals from becoming too prominent or distinct within the community (Kakeya and Sugiyama, 1987). People have experienced large-scale food shortages that cannot be covered by others in their community. Small-scale farmers have also faced larger problems, such as changes in national policies and the climate.

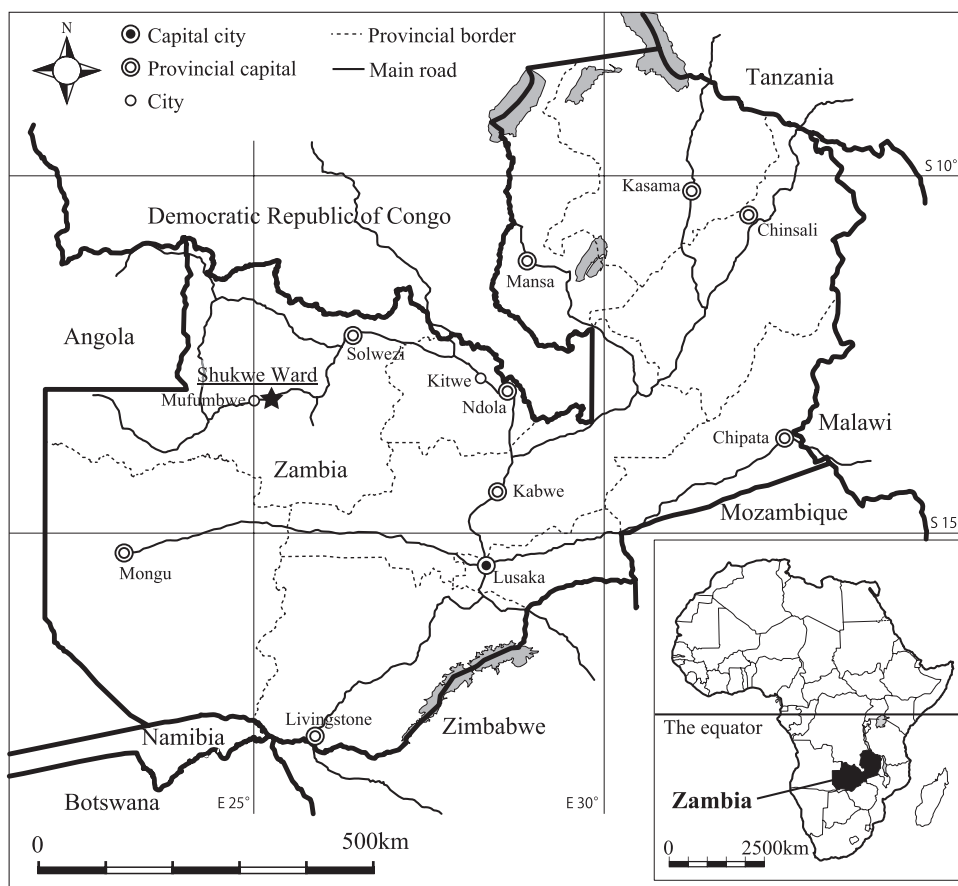
Small-scale farmers cultivate maize to generate a cash income and for personal consumption; i.e. to maintain their livelihoods. The lives of small-scale farmers who cultivate maize are vulnerable to changes in agricultural policy, which are in turn influenced by the political situation. This paper discusses a community in a remote area of north-western Zambia that clearly demonstrates the effects of changes in national policies. I outline the daily activities undertaken by residents to ensure food security. The community is comprised of several ethnic groups because the indigenous people have accepted immigrants from other areas. Therefore, the agricultural systems of the indigenous people and the immigrants coexist. This paper focuses on the influences of agricultural input subsidy programs on small-scale farmers, the crop choices of households in the community, and cassava spread by the immigrants, and examines regional food security in the local community. This paper clarifies the strategies of small-scale farmers that enable them cope with fluctuations in food production according to changes in national agricultural policy in north-western Zambia.

## II Study Area

The study area was Shukwe Ward in the Mufumbwe District of North-Western Province, Republic of Zambia (Figure 1). Shukwe lies within a territory of the Kaonde traditional chief. It is located approximately 15 km from Mufumbwe town, which is the district capital. A population census in 2010 of Mufumbwe District showed a population density of 2.8 people per square km, which was the lowest density in Zambia (CSO, 2012). The area lies approximately 1,200 m above sea level and the annual rainfall is approximately 1,300 mm. There are distinct dry and rainy seasons; the dry season is from April to October, and the rainy season is from November to March. There is no rain at all during the dry season. This paper is based on intermittent fieldwork carried out during a 21-month period, from September 2011 to March 2016.

In 2012, the population of Shukwe Ward comprised 1,320 people, living in 243 households spread among 23 villages. An ethnicity survey was carried out by means of interviews with householders and their spouses (a total of 418 people). The indigenous Kaonde comprised 57% of the total (238 people), followed by the Lunda (23%; 94 people), Luvala (8%; 34 people), Chokwe (8%; 32 people), Luchazi (4%; 18 people), and the others (2 people). The societies of all of the ethnic groups were matrilineal, although the husband and wife settled in the husband's village. The people carried out slash-and-burn cultivation in the Miombo woodlands. The Lunda, Luvala, Chokwe, and Luchazi, referred to as immigrants in this paper, moved to Shukwe from other villages and towns.

The Lunda, Luvala, Chokwe and Luchazi originated from the Lunda Empire in the southern Congo Basin



**Figure 1.** Map showing the location of the research village (★).

Source: by author

during the 17th century (McCulloch, 1951; Vansina, 1966). They practice male circumcision (von Oppen, n.d.), and their languages are similar (Kashoki, 1978). Several Kaonde totems immigrated into what is currently north-western Zambia from the Luba Empire, which was located on the south side of the Lunda Empire between the 16th and 19th centuries (Jaeger, 1981: 54–56).

The Kaonde build small villages consisting of fewer than seven kinship households, and move their villages every few years (Oyama and Kondo, 2007). People in the area lived along a main road, which was built after a rural development project instigated by the Zambian government in 1964. They built a simple hut to live in while they worked in their fields, as the woodland was distant from the villages. A senior headman of the ward oversees between 10 and 30 villages (Jaeger, 1981: 35). A chief rules over approximately 10 wards. The senior headman can make decisions regarding the immigration of newcomers and cultivation of new woodland areas. In Kaonde society, the chief does not have sole authority; the senior headman is also recognised as having autonomy over his ward. Villagers can move within their ward and build a new village; Kaonde society is fluid.

Immigrants started to arrive in Shukwe during the 1960s. Most were born in other districts in North-Western Province and the reasons for their immigration also differed. Some immigrants came due to retirement or loss

of their jobs. They relied on their friends and colleagues in the town, such that Shukwe became a multi-ethnic community.

### III Agricultural Systems of the Kaonde and the Immigrant Population

#### 1 Staple crops cultivated by each household

In Shukwe, the three main staple crops that are cultivated are maize, sorghum and cassava. Maize is cultivated both as a staple and cash crop. In north-western Zambia, sorghum and cassava are the indigenous crops. Sorghum is the most important staple food for the Kaonde (Jaeger, 1981; Crehan, 1997; Oyama and Kondo, 2007). On the other hand, the Lunda, Luvala, Chokwe and Luchazi consume cassava as their main staple food (Trapnell and Clothier, 1957; Pesa, 2012; von Oppen, n.d.). Today, cassava remains the food of choice for the Lunda; they proudly proclaim that “Cassava is our staple food, cassava is our chief” (Pesa, 2012). The Kaonde cultivate sorghum and the immigrants cultivate cassava as their staple crops in Shukwe.

Interviews conducted with 121 households showed that they all cultivated maize during the 2012/2013 growing season (Table 1). The Kaonde only cultivated sorghum, and 40 immigrant households (91% of the total immigrant households) cultivated cassava. Although half of the Kaonde households also cultivated cassava, most made only a few mounds and planted few cassava. Therefore, it was observed that the Kaonde and the immigrants cultivated their respective indigenous staple crops even though they lived together.

#### 2 Maize cultivation: “*faamu*”

Small-scale farmers in Zambia began to cultivate maize as a cash crop after the 1970s. The purchase of maize seeds and chemical fertilisers became possible in remote areas after the government developed a network of roads. Many farmers sold maize through the national marketing board in the 1980s (Kakeya and Sugiyama, 1987; Crehan, 1997). Maize has long been an important subsidiary crop for the Kaonde, since it ripens earlier than sorghum and thus shortens the hunger period experienced by almost all households when the previous season’s sorghum has been consumed and the new sorghum is not yet ripe (Crehan, 1997: 163–164). The

**Table 1.** Choice of staple crops in Shukwe Ward

Ethnicity of household	Sorghum		Cassava		Maize	
	Number of households	%	Number of households	%	Number of households	%
The Kaonde (61 households)	18	30	31	51	61	100
Inter-marriage* (16 households)	1	6	11	69	16	100
Immigrants (44 households)	0	0	40	91	44	100
Total (121 households)	19	16	82	68	121	100

Note: \* Husband or wife is the Kaonde.

Source: by author

Zambian government and the Integrated Rural Development Program (IRDP) began distributing hybrid maize seed and chemical fertiliser to villages in Mufumbwe District in 1978 (Oyama and Kondo, 2007). Thereafter, the Kaonde adapted their agricultural systems to cultivate maize.

Most households in Shukwe cultivate maize as a cash crop using chemical fertilisers. This type of maize farming is known as *faamu*. Under this system, they make furrows in the fields in November, which is the start of the rainy season (Figure 2-2). They then sow the maize harvested during the previous year, as well as the hybrid seeds provided by the government. Sowing is finished by the beginning of January.

The *faamu* fields of maize are then dressed with the base fertiliser D-compound, when the plants reach knee height (usually between the end of November and beginning of December). Farmers then top-dress the fields with urea, when the maize plants reach waist height (between January and February). They have to judge the timing carefully so as to fertilise the crops for optimal maize growth, as late application of fertiliser is not effective. Green maize can be harvested from the end of February. The period between December and March is the off-crop season for maize and sorghum. Kaonde households with insufficient grains are not able make *nshima* during this time, which is a main staple food in Zambia. Thus, the green maize is not only boiled and roasted for snacks, but is also cooked as *nshima* by drying and then pounding the grains. Farmers harvest the mature maize between May and July. After harvesting, they pack the maize grains into nylon bags and these are kept in their houses. The maize bags are also sold to the parastatal Food Reserve Agency.

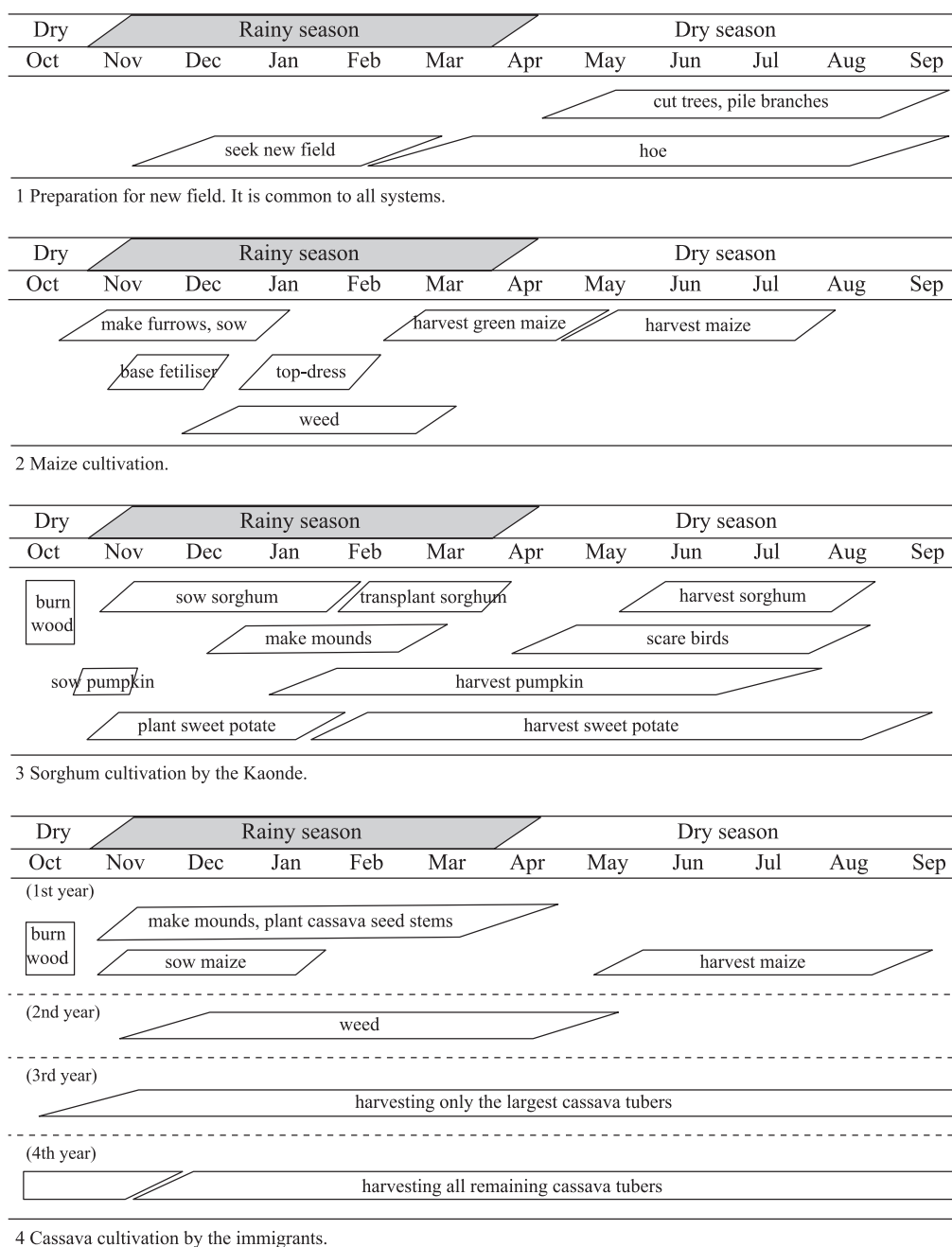
### 3 Sorghum cultivation by the Kaonde

The Kaonde carry out slash-and-burn cultivation, known as “*bujimi*” in the Kaonde language. The men seek out the forest to create new fields at the end of February (Figure 2-1). They cultivate sorghum, maize, finger millet, sesame, sweet potato, pumpkin and common beans in the new field (Oyama and Kondo, 2007).

Under *bujimi*, the Kaonde hoe the surface soil to a depth of 15 cm and mix in grass to improve it before cutting down the trees. In this way, the soil becomes more fertile and better drained. The men cut the trees and the women hoe. The tree branches are piled to dry after cutting until the end of October, when they are burned; this marks the end of the dry season (i.e. the hottest month of the year). As there is often too much wood to burn at once, half-burned branches are piled up again for burning.

The Kaonde sow sorghum, pumpkin, sesame, and finger millet first, in the ash patches left after the burning; this is known as “*monde*” (Figure 2-3). They create fields that are hoed in the dry season, called “*munkulutu*”; the fields are then ploughed in the rainy season. Sorghum is sown in all the field types. *Munkulutu* fields are created before the beginning of the rainy season and maize is sown in November. Sorghum and sesame are sown in the space between the maize stems when the plants reach waist height. “*Milala*” refers to mound cultivation, which is done in December. After making the mounds, the Kaonde farmers transplant sorghum from *munkulutu* to *milala* fields. They cut the leaves of the transplanted sorghum by hand, 15 cm from the top of leaves, because the sorghum becomes dry soon after transplanting if the leaves are not cut.

Sorghum produces ears in April and is harvested from June to July. The sorghum is vulnerable to being eaten by birds and it is the women’s and children’s job to scare the birds away from the ripening sorghum by banging on saucepans or cooking pots and shouting, all day long, every day. The culms are then cut with knives. The



**Figure 2.** Agricultural calendar in Shukwe Ward.

Source: by author

harvested ears are kept in a granary and threshed by beating the culms. Most of the Kaonde farmers live in the field huts built near their fields during the busy seasons (December to February and April to July). After harvesting, they return to their villages along the main road. Some Kaonde have stopped cultivating sorghum due to the work involved in scaring birds off the crop, as well as the large distances from the field hut to schools



and hospitals.

#### 4 Cassava cultivation by immigrants

The Lunda, Luvale, Chokwe, and Luchazi immigrants mainly cultivate cassava. Here, the agricultural systems of the Lunda are described because they are representative of the systems of all four ethnic groups. The Lunda men seek out new uncultivated woodland to farm (Figure 2-1). They begin to hoe the ground during the latter half of the rainy season. At the beginning of the dry season, they cut the trees and pile up the branches, which are then burned at the end of October (Figure 2-4).

After burning the branches, they make mounds approximately 40 cm high in the soil and plant cassava seed stems in the mounds. The stems are intermittently planted from November to April. Maize, common bean and sweet potato are sown alongside the cassava in the mounds. All the members of the household help to make the mounds and plant the seed stems because this is very time-consuming. Some households even employ friends and relatives due to shortages of labour.

The cassava tubers are generally harvested in the third and fourth years after planting, and harvesting is performed by the women. They harvest only the largest cassava tubers in the third year, and then harvest all remaining tubers in the fourth year. They judge the tuber size from the surface cracks in the mounds to ensure that undersized third-year cassava tubers are not harvested. In this way, they maximise the yield per stem.

Soaking and cooking of the cassava are also performed by the women. The cassava tubers are soaked in drums of water because they contain prussic acid (Jones, 1959; von Oppen, 1991; Chiwona-Karlton et al., 2015). In the rainy season, the tubers are soaked in seasonal pools. The soaked tubers are then dried in the sun or on stoves in a kitchen during the rainy season. Drying of the tubers takes several days and is a laborious task for the women. After pounding the dry tubers, the women can finally cook *nshima*.

The Lunda have a saying: “Cassava is our bank.” They further explain that “We can ‘deposit’ cassava tubers under the ground for many years, continuously ‘withdraw’ them from the fields, and ‘increase’ the number of tubers by planting seed stems.” Cassava has the ability to ensure a continuous food supply and acts analogously to savings in “a bank”.

### IV Coping with the Uncertain Distribution of Subsidised Fertilisers

Maize is a major source of cash income for all households in Shukwe. Here, I describe the agricultural input subsidy programs for maize cultivation introduced by the government of Zambia, and examine the influences of the national policy on the food security of households.

The government supported maize cultivation through agricultural credits, and reduced costs for agricultural input, maize purchases, and distribution, after independence was achieved in 1964 (Chabatama, 2007; Kodamaya, 2011; Mason et al., 2013). In 2002, the government initiated the Fertiliser Support Programme (FSP) (Kodamaya, 2011; Mason et al., 2013). The FSP provided subsidised chemical fertilisers and hybrid maize seed for small-scale farmers. The FSP was renamed the Farmer Input Support Programme (FISP) in 2008 and continues to support farmers today (current at 2015). Farmers cultivating under 0.5 ha of land can

obtain a subsidised input pack to cultivate maize. This pack contains two bags (100 kg) of D-compound, two bags (100 kg) of urea, and 10 kg of hybrid maize seed. The fertiliser subsidy rate was 50% of the market price in 2002, which increased to 75% in 2010 (Mason et al., 2013). After the change in government of 2011, subsidies were reduced to 50% of the market price. In 2015, farmers paid 400 kwacha<sup>1)</sup> per pack.

FISP inputs could be accessed only through approved farming cooperatives and other farming groups (Kodamaya, 2011). The cooperatives were set up to promote autonomous activities of the farmers. However, at present, cooperatives are only set up to distribute the subsidies. In 2015, there were 157 cooperatives in Mufumbwe District and 3 cooperatives that were active in Shukwe. Cooperative B, established in 2010, is the oldest cooperative in Shukwe. Cooperative T was established in 2011 and cooperative K was set up in 2012. All of these cooperatives were set up relatively recently, with the main goal being to distribute the subsidies. Cooperative members pay 30 kwacha for membership fees and 50 kwacha to share the capital generated each year.

After the cooperative has submitted an application form to apply for a subsidy to the district office of the Ministry of Agriculture, it has to transfer the fee for the input packs to the bank. In most cooperatives, the secretary completes the FISP requirements. After the money is transferred, the government delivers the D-compound, urea and hybrid maize seed to a cooperative storehouse. However, delivery delays and fertiliser shortages are serious issues in Zambia (Oyama and Takamura, 2001; Xu et al., 2009; Mason et al., 2013). The supply varies on an annual basis, but the media has suggested that production delays and problems with delivery were due to poor governmental management. Farmers also felt that the delays and shortages increased after the change of government in 2011. Here, I describe the conditions in a cooperative during the 2015/2016 season.

By February 2016, cooperative T had 43 members. All of the members hoped to purchase subsidised fertilisers. Mrs. C, the secretary, collected the application forms and fees for the subsidised input packs from all members in November 2015. She then completed the procedure to purchase the packs. However, an officer from the Ministry of Agriculture informed her that cooperative T could not have the 43 packs due to countrywide fertiliser shortages. The D-compound and hybrid maize seed were delivered in December 2015. The urea was delivered in January 2016. The additional fertilisers arrived in February 2016, which was later than in the previous year. Ultimately, cooperative T only received a total of 33 packs, meaning that it was only able to distribute a single 50 kg bag of D-compound, and one 50 kg bag of urea, to the cooperative's members. The members also received some additional fertiliser—either D-compound or urea—and these were then mixed and used together to fertilise the maize.

If the subsidised inputs were delivered after January, the farmers would have to postpone sowing and fertilising their crops, which would in turn result in reduced growth. Some cooperatives received the fertilisers and hybrid seeds separately, which meant that the farmers had to delay sowing the maize because they did not know when the fertiliser would be delivered.

More recently, some farmers have started to cultivate maize without using any chemical fertilisers. Interviews held in 2012 and 2015 showed that 64% (77 of 120 people) used the fertilisers in 2012, but only 47% (69 of 147 people) used them in 2015. This represented a drop of approximately 17%, with the farmers not being

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1) 1 USD=5.55 kwacha (February 1, 2014).

able to purchase the subsidised fertilisers largely because the subsidies had been cut. Others said that problems with the supply were to blame, as they were not able to plan for how much—or when—the fertiliser would be available each year. Most farmers complained to the government about the fertiliser supply and this resulted in some farmers not using any fertilisers to grow their maize crops.

If farmers continue to cultivate maize without using fertilisers in the same field over a long period of time, the yield decreases due to nutrient depletion in the soil. Farmers often prefer to clear new forested areas for maize cultivation, but some are not able to open large fields due to labour shortages. The immigrants, however, can consume cassava as their staple food in any case. Meanwhile, the Kaonde prefer to cultivate grains because they grow maize both to sell and consume. This has meant that the Kaonde face difficulties, such as food and cash shortages, due to not being able to obtain the subsidised fertilisers.

## V Daily Activities Undertaken to Ensure Food Security

Grain yields, for example of maize and sorghum, are vulnerable to changes in rainfall. Furthermore, the unstable subsidy policy and supply of chemical fertiliser significantly affect maize yields. Meanwhile, the immigrants are able to harvest cassava tubers throughout the year because they are stored under the ground and cassava is a stable crop. In Zambia, people eat chicken, dried river fish, beans, and the leaves of sweet potato and pumpkin with *nshima* at every meal. A meal without *nshima* translates into hunger and poverty for the people of Zambia. The Kaonde cook *nshima* from maize and sorghum, while the immigrants use cassava flour to cook their *nshima*. This means that Kaonde households often face food shortages in the rainy season. Next, I describe the alternative relief foods used by the Kaonde, as well as food bartering between the Kaonde and the immigrants.

### 1 Cultivation and use of “*kisaka*” as a relief food

Food consumed during the grain off-crop season for the Kaonde is known as relief food, or *kisaka* in the Kaonde language. *Kisaka* is not *nshima*; rather, it is a meal consisting of boiled cassava, boiled pumpkin, boiled maize, or baked sweet potato. Boiled groundnuts and fresh fruit can also be *kisaka*. All households start to eat *kisaka* as their main meal in the off-crop season. In the rainy season, they can harvest sweet potato, immature pumpkin, and green maize. They also pick fruits, such as mango and guava, from trees. Farmers survive by eating *kisaka* during the rainy season.

The interviews revealed that 118 of 146 households (81%) cultivated sweet potato during January, 2016 while 45 households (31%) cultivated pumpkin. Sweet potato and pumpkin are usually planted along with the staple crops. Some of the Kaonde open new fields for sweet potato and pumpkin to prevent hunger. However, people only eating *kisaka* every day during the rainy season are viewed as being in a state of hunger and poverty; such households are mocked by their neighbours.

Therefore, if people want to eat *nshima* every day during the off-crop season, cultivating cassava would be a better option. In fact, half of the Kaonde households in Shukwe plant cassava in several mounds. Some of the Kaonde have attempted to cultivate more cassava as their secure staple food during the off-crop season.

As an example Mr. F of the Kaonde, who is a dedicated farmer, cultivates 3 ha of maize every year. Alongside the maize, he also grows cassava, common beans, sweet potato, and pumpkin. In 2015, he cultivated 60 a of cassava. He has only ever planted cassava twice before, in 1993 and 2005, and does not plant it every year. He created a new field and planted cassava seed stems donated by his relatives after harvesting all his remaining cassava tubers in the previous field. He cultivates cassava as a subsidiary crop alongside maize.

Another example is Mr. D of the Kaonde, who cultivates sorghum in a new field and maize using subsidised fertilisers each year. On March 2016, he also had 50 a of cassava. He planted three varieties of cassava seed stems that his friend, Mr. Z of the Lunda, gave him free of charge in November 2013. Mr. D said that he did not really know much about the names and characteristics of the cassava varieties that he had planted, but he did emphasise his reasons for planting them.

“Cassava can grow during years of low rainfall. Sorghum and maize can’t grow well when there is little rain. But we will experience hunger if we only cultivate sorghum and maize. In this case, we have to buy maize at the market. If we don’t have enough money, we have to barter fish and shirts for maize. If we have nothing, we will go hungry. But if we cultivate cassava, we don’t go hungry”.

Neither man planted cassava every year because they had many tubers left in their fields. They did not know much about the cassava varieties that they grew. Cassava represents a substitute crop for maize to cover periods of food shortage for the Kaonde.

## 2 Bartering with cassava

Although some of the Kaonde avoid food shortages by planting cassava, most of the Kaonde do not grow the cassava tubers on an annual basis. Therefore, they have to obtain food from their neighbours during periods of food shortage. Next, I describe the bartering for cassava of household L from January 16, 2014 to February 28, 2014 (44 days). Household L comprised Mr. L of the Lunda, Mrs. L of the Chokwe, and their six children. Each year, they create a new field to plant cassava. They have not cultivated *faamu* since 2013 due to governmental cuts to input subsidies. They also sow local maize in the cassava mounds. Household L has four fields, covering a total 2 ha of cassava. They opened new fields and cultivated cassava annually from 2011 to 2014. Mrs. L began to harvest the cassava tubers planted on November 2011 in a 60 a field in February 2014.

Households that cultivate cassava in Shukwe sell dried cassava tubers at their home. The price of the dried cassava does not fluctuate throughout the year, because that crop can be harvested anytime. On the other hand, the price of maize fluctuates greatly. Maize commands the highest price during the rainy season. For example, two shops in Shukwe sold maize for 10 kwacha<sup>2)</sup> per bucket (5 litres) on February 11, 2016. Meanwhile, two households sold dried cassava tubers for 7 kwacha per bucket on the same day. During times of food shortage, the Kaonde often buy the cheaper cassava during the rainy season.

Household L sold, bartered and gave away cassava to 20 people during the 44-day period (Table 2, 3). Household L sold cassava to 6 people who they knew and 5 strangers (Table 2). The total number of selling days was 10. Mrs. L usually sold a bucket of dried cassava tubers to each person; however, a teacher at a secondary school

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2) People sell maize for 5 kwacha per bucket after harvesting between July and October.

**Table 2.** Records of cassava sales by household L

	Date	Sold goods	Price	Customer	Situation
1	Jan. 20	A bucket* of dried cassava	6	Stranger 1 (Kaonde)	Mr. L's daughter sold at market.
2	Jan. 21	A bucket of dried cassava	5	Neighbour H (Luvale)	
3	Jan. 25	A bucket of dried cassava	6	Neighbour C (Lunda)	
4	Jan. 25	A bucket of dried cassava	6	Neighbour S (Lunda)	
5	Jan. 27	Four buckets of dried cassava	24	Teacher W (Kaonde)	Mr. L's son took them to teacher's home.
6	Jan. 30	A bucket of dried cassava	6	Stranger 2 (Kaonde)	Child came to buy cassava.
7	Feb. 3	A bucket of dried cassava	5	Teacher J (Kaonde)	
8	Feb. 6	Two buckets of dried cassava	n.d.	Stranger 3 (Uncertain)	She came to seek cassava from Mufumbwe town.
9	Feb. 21	Two buckets of dried cassava	10	Friend T (Kaonde)	
10	Feb. 25	Dried residues of cassava tubers	6	Stranger 4 (Uncertain)	Residues were for brewing spirit from maize.
11	Feb. 26	A bucket of dried cassava	n.d.	Stranger 5 (Kaonde)	She came to seek cassava from the neighbouring ward.

Note: The author interviewed household L daily from January 16, 2014 to February 28, 2014 (44 days).

\* Capacity of bucket is 5 litres.

Source: by author

purchased four buckets. Mrs. L charged 6 kwacha for a bucket of dried cassava, which is the same price as another household selling cassava. Mrs. L sometimes sold the dried cassava for 5 kwacha if the customer was a friend. During this survey, 5 strangers, from Mufumbwe town and the neighbouring ward, came to purchase the dried cassava. During the rainy season, many of the Kaonde come to buy cassava from Mrs. L.

Mrs. L bartered cassava with friends and gave it to other friends and relatives (Table 3). She also gave cassava flour to Mrs. H, a neighbour who asked for some to make food for her children, on January 20, 2014. Mrs. L gave three fresh cassava tubers to the son of a friend on February 3, 2014. She also gave a bucket of dried cassava to her mother on February 8, 2014.

Cassava was bartered on six occasions. Household L bartered the dried cassava for common beans with Mr. K and Mr. M of the Kaonde. Often, those Kaonde with an insufficient amount of grain visit friends of the immigrants cultivating cassava and offer them fresh common beans. Although Mrs. Y did not have any beans to barter, she worked to make mounds in fields belonging to household L and obtained a dish (approximately 70 cm in diameter) of fresh cassava tubers in return.

The Kaonde, who cultivate maize as a staple crop and to sell, often have insufficient food and money during the rainy season. They have to obtain their daily food through bartering for cassava in return for beans and their labour. The rainy season is the off-crop season for grains, but it is the harvest season for beans and vegetables

**Table 3.** Records pertaining to the giving and bartering of cassava by household L

	Date	Given goods	Received goods	Customer	Situation
1	Jan. 20	Cassava flour for one meal	—	Neighbour H (Luvale)	She did not have any flour for her children.
2	Feb. 1	A bucket* of dried cassava	0.3 buckets of common beans	Friend K (Kaonde)	
3	Feb. 2	Two buckets of dried cassava	0.6 buckets of common beans	Friend K (Kaonde)	
4	Feb. 3	Three tubers of fresh cassava	—	A son of a friend (Uncertain)	
5	Feb. 3	A bucket of cassava flour	0.5 buckets of maize flour	Neighbour A (Lunda)	
6	Feb. 8	A bucket of dried cassava	—	Mother (Chokwe)	
7	Feb. 13	A bucket of dried cassava	Five pieces of bread (5 kwacha)	Friend M (Kaonde)	
8	Feb. 22	Four buckets of dried cassava	0.5 buckets of common beans	Friend M (Kaonde)	
9	Feb. 24	A dish** of fresh cassava (15 kwacha)	Piecework for making mounds	Friend Y (Kaonde)	She appealed to offer cassava tubers.

Note: The author interviewed household L daily from January 16, 2014 to February 28, 2014 (44 days).

\* Capacity of bucket is 5 litres.

\*\* Diameter of dish is approximately 70 cm.

Source: by author

and also represents a busy time for farmers. It is important for the Kaonde to obtain cassava by helping to make mounds. Meanwhile, immigrants who cultivate cassava receive help with the work during the busy season by trading their cassava.

## VI Discussion

### 1 National agricultural policy and food security of small-scale farmers

Maize has been the national staple crop of Zambia ever since it was supplied by the government as a staple food for urban workers during the colonial period (Marter, 1978; Lukanty and Wood, 1990). Maize became an important cash crop for small-scale farmers because the government encouraged its cultivation as a food for urban residents. Maize cultivation is maintained by subsidies provided by the government. Agricultural policy changes have a direct influence on the livelihoods of small-scale farmers (Xu et al., 2009; Mason et al., 2013).

Farmers suffer food shortages when the government interrupts the supply of subsidised fertiliser. During the 1994/1995 season, fertilisers were provided in the middle of the rainy season and those households that obtained them quickly used them for *faamu*, although most had already given up on planting maize in northern Zambia, as they did not receive the fertilisers (Oyama and Takamura, 2001).

The Kaonde have cultivated maize as a subsidiary crop alongside sorghum since before the start of the subsidy program (Crehan, 1997). They adapted to maize cultivation as a source of cash income. The unstable supply of subsidised fertiliser resulted in an unstable subsistence for these farmers. Therefore, the cooperatives have

tried to distribute fertilisers to all their members when they are faced with a shortage of fertiliser. Some farmers postponed sowing maize, and mixed D-compound and urea together to fertilise their crops. In this way, they tried to prevent poor maize yields.

The unstable distribution of fertilisers often causes low maize yields. The grain yields are also influenced by fluctuations in rainfall. This means that the Kaonde often experience hunger during the rainy season. Survival during the off-crop season for grains is still a big issue for the Kaonde. They do cultivate sweet potato and pumpkin, harvest green maize, and eat *kisaka* during the hunger period.

The Kaonde regard the eating of *kisaka* as only being suitable for the very poor; instead, they prefer to eat nshima every day. The Kaonde often grate green maize and dry it to cook nshima during the rainy season. In the 1940s, during the hunger period, the Kaonde were given many cassava tubers by the Luvale who live in the neighbouring district (White, 1959). The Kaonde have relied on neighbouring ethnic groups to maintain their food supply of nshima during the rainy season. The Kaonde have based their choice of staple crop on national policy, but they live alongside the immigrants and can obtain cassava from them to prevent food shortages.

## 2 Regional food security achieved with cassava brought to the Kaonde area by immigrants

Agricultural practices have never been shared among the Kaonde and the immigrants. Cassava is also a good staple food for the Kaonde because they can harvest it throughout the year to cook nshima. The Lunda, Luvale, Chokwe and Luchazi are familiar with cassava cultivation methods and processing; the Kaonde can easily obtain dried cassava throughout the year, as they live alongside the immigrants. Here, several ethnic groups practicing different agricultural systems live together, which ensures regional stability of food supplies.

Cassava is sold throughout the year and its price does not fluctuate. Cassava is cheaper than maize during the rainy season. Most households earn a cash income through selling maize, which means that they do not have enough money during the off-crop season. It is difficult for the Kaonde to purchase staple foods every day during the rainy season. They barter for cassava tubers using beans, vegetables, and labour (i.e. making mounds for cassava planting). In this way, those Kaonde who do not have any money can obtain food.

In African rural society, people try to prevent the uneven distribution of food and materials, and a prominent position for any individuals within a community, based on kinship. Disparities between households are minimised within a community (Kakeya and Sugiyama, 1987). The residents of Shukwe have built a multi-ethnic community. The immigrants relied on their friends and colleagues in town before arriving in Shukwe, where they have no connections. The immigrants have been accepted and integrated, and their numbers in Shukwe have doubled since the 1960s.

Bartering for food between households takes place in this multi-ethnic community. The Kaonde buy dried cassava from the neighbouring immigrants and barter for cassava using beans and labour when they face food shortages. If the Kaonde have no food or money, they often ask the immigrants to give them some cassava. Cassava is thus transferred from the “haves” to the “have nots”. In the multi-ethnic community, bartering for cassava between different ethnic groups has minimised food disparities between households, and has brought food security. Villagers are able to sustain a self-sufficient lifestyle by obtaining food from within the community. If they have no money, they can maintain their self-sufficiency through bartering for cassava.



Despite people in rural mainly have access to food from own production, dependency on market purchase is increasing significantly among the small-scale farmers in sub-Saharan Africa (Khalif and Nur, 2013). Small-scale farmers living in vulnerable social conditions did not depend on maize alone, and showed flexibility in coping with prevailing national policy (Oyama and Takamura, 2001). People in rural Zambia have coped with unstable national agricultural policy by undertaking several activities to ensure their food security, such as adopting different agricultural systems, using *kisaka*, engaging in cassava cultivation, and bartering for cassava. All the farmers have undertaken each type of activity to ensure food security in their daily lives; in this manner, they have realised regional food security in the local community.

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## ザンビア北西部における農業政策の転換と地域の食料安全保障

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本稿の目的はザンビアにおいて、農業政策の転換によって変動する食料生産に対する農民の対処を明らかにすることである。ザンビアではトウモロコシが最も重要な主食である。植民地政府が都市労働者への食料供給を目的としてトウモロコシ生産を奨励し、トウモロコシ栽培がザンビア全土にひろまった。ザンビアの小農はトウモロコシを主食作物としてだけでなく、換金作物として栽培することで現金収入を得ている。このトウモロコシ栽培は、政府からの補助金によって安価に供給される化学肥料を使用することで成り立っている。しかし政府の農業政策は、そのときの政治状況に大きく左右され、ときに化学肥料の遅配が発生し、トウモロコシの生産量は大きく変動する。本稿で取りあげるザンビア北西部では、先住のカオンデという民族がトウモロコシやモロコシといった穀物を中心に栽培する一方で、他地域から移り住んだルンダ、ルバレ、チョークウェ、ルチャジという民族の移入者たちはキャッサバを栽培している。穀類の端境期にカオンデは食料不足におちいるため、移入者からキャッサバを入手することで、日々の食料を確保していた。農民たちは政策によって大きく変動するトウモロコシ生産に依存するわけではなく、食料不足時にカオンデは移入者からキャッサバを入手することで、世帯および地域における食料の安全保障が確保されていた。

キーワード：トウモロコシ、キャッサバ、補助金制度、カオンデ、移入者、ザンビア