

# World market food price fluctuations and food security in Sub-Saharan Africa

The impact of fluctuations in the world market price for staple foods on food security in Sub-Saharan Africa

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BSc Thesis  
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August 2012

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## Summary

This literature research examines the impacts of the fluctuations in the world market price for staple foods on food security in Sub-Saharan Africa and compares the vulnerability to food insecurity of different countries and population groups. Since 2006, world food markets have been characterized by high price peaks for staple foods and high price volatility. To examine the effects on food security, the focus is on two aspects of food security: availability and household access to food.

It is concluded that net food importing countries (as compared to net exporting countries) are more vulnerable to increasing food prices because of high dependency on the world market. Furthermore, low-income countries are more vulnerable than middle-income countries because the former have little financial capacity to absorb the impacts of high food prices. This means that Sub-Saharan Africa is a very vulnerable region with high poverty rates and many net importing countries. Its vulnerability is further aggravated by the numerous conflicts in the region.

The impacts of high food prices in Sub-Saharan Africa are worst for the poor, who spend a large share of their income on food. Recent price fluctuations have decreased access to food for poor households and have increased malnutrition. The (severity of) the impacts differ for the population groups examined. Net consumers in both urban and rural households are mostly hit hardest. Although many households in rural areas have possibilities of food production and self-sufficiency (diminishing dependence on international food markets), rural households are often the poorest among the poor and are therefore very vulnerable to high food prices. For large (rather than marginal) net producers, the high food prices may have increased income from agriculture and thereby improved food security. Because of uncertainty and supply constraints, not all food producers face the positive effects of the recent price fluctuations.

Finally, the impacts of international food price fluctuations are mediated by price transmission. The degrees of price transmission are found to be impacted by domestic food policy, market protection, market integration, infrastructure and remoteness. International prices are generally transmitted to urban and coastal areas in countries with liberalized trade policies, whereas pass-through is low in countries with interventionist trade policies, weak market integration and infrastructure and in rural areas.

# 1 Introduction

## 1.1 Problem description

The first decade of the 21<sup>st</sup> century was a turbulent one when it comes to world market prices of agricultural commodities. While before 2005, for a long time food prices were low and decreasing, the world witnessed an exceptionally high peak in food prices between 2006 and 2008 (often referred to as the food crisis). After this spike, prices remained volatile and peaked again in 2011. Both situations were considered to be alarming and questions were raised on how these fluctuations would affect poor populations in developing countries. It was argued that low prices would harm the farmers in developing countries, pushing them out of competition and into poverty because of the little earnings from their products, while high prices would harm consumers in developing countries because they would not be able to pay the price for their food (Swinnen 2011). This idea that both high and low prices are 'bad for the poor' and increase food insecurity, leads to conflicting messages in the (academic) media and policy advice.

As stated by Swinnen (2011), these messages and policy recommendations lack nuance, as not all developing countries and population groups within these countries are equally affected by price fluctuations, if they are affected at all. Distinctions can be made between importing and exporting countries, producers and consumers and rural and urban areas. Furthermore, price fluctuations can harm one group, but benefit the other.

## 1.2 Research Aim

The aim of this literature study is to link food prices to food security and clarify how households in developing countries are affected by the recent fluctuations in the world market price for food. Another aim is to determine which population groups are especially vulnerable when it comes to negative impacts on food security. Hereby the focus will be on countries and households in Sub-Saharan Africa and the fluctuations of the prices for *staple foods*. Hence, the main question will be:

*What is the impact of fluctuations in the world market price for staple foods on food security in Sub-Saharan Africa?*

The regional focus will be on Sub-Saharan Africa, because this region is perceived to be the most vulnerable to price shocks and food insecurity (Dia Kamgnia 2011). The study also has a focus in time, namely 2006-2010 when the latest food crisis took place. In this period commodity prices came from historical lows and rapidly increased, leading to a major price peak in 2008. Because this price volatility had global causes and consequences and because the consequences are still felt now, this is an interesting period to study.

Concerning the focus on staple foods, based on country case studies done in eastern and southern Africa by Comesa (2010), maize, wheat and rice are the main staple foods consumed and traded in Sub-Saharan Africa. Cassava and other staple crops that are typical for the region are also important in many countries, but they are not traded a lot internationally. Which staple commodities are most affected by price fluctuations on the world market will be explored in more detail. The sensitivity to price fluctuations and its impact on local food security is likely to differ per crop, depending among others on where the crop is produced, how much is traded and whether there are possibilities of substitution for consumers.

To analyse the vulnerability of different population groups, comparisons will be made at different levels: first, at a macro-level to distinguish between net importing countries and net exporting countries. Second, at a micro- or regional level to distinguish the rural from the urban population

and the net producers from the net consumers. Within the rural and the 'producer' groups, differences in vulnerability may be found with respect to scale and type of production and livelihood.

Finally, the concept of price transmission will also be included in the study to see whether the (fluctuations of) the world market price for staple foods are effectively passed through to the local markets. The analysis of price transmission will be based on domestic policies and institutions concerning markets and trade and its effect on price transmission.

### 1.3 Research questions

In order to answer the main question, the following sub-questions are formulated:

1. What is food security?
2. How did world market prices for staple foods fluctuate during the period of 2000-2010?
3. Which population groups in Sub-Saharan Africa are impacted by world market price fluctuations for staple foods?
  - a) What type of countries in Sub-Saharan Africa were vulnerable to domestic food price fluctuations due to fluctuations in the world market price for staple foods?
    - Importers versus exporters
  - b) Within a country, what population groups were vulnerable to domestic price fluctuations for staple foods?
    - Rural versus urban
    - Producers versus consumers
4. What is the role of price transmission in the impact of food price fluctuations on household food security?

The first question will elaborate on the definition of food security. Question 2 will give a general picture of the developments of the world market prices for (staple) foods between 2000 and 2010 and its causes. In order to answer this question, data on food prices on the world market and African domestic markets will be used. Together, these first two questions will form a general introduction to the remainder of the thesis.

Question 3 studies the main question at different levels. The question is twofold and, first, will give insights in which countries are affected by food price fluctuations and in what way.

Second, it will give insights in which population groups within a country are affected by domestic food price fluctuations and in what way. The main population groups compared here will be urban households (which mostly are net consumers) and rural households (which can be producers and/or consumers). In order to answer this question, data are collected on trade, production and consumption patterns in Sub-Saharan Africa and within countries in this region.

Question 4 is formulated to study the extent and effect of price transmission on the way domestic households are affected by world market price fluctuations. Hence, this will clarify whether world market prices are important at the household level in the first place, and if so, to what extent. The focus in answering this question will be on the role of domestic policies and institutions in mediating the pass-through of food prices from the international to the local market. In order to answer question 4, data are collected on policies, institutions and interventions of governments and (international) organisations in Sub-Saharan Africa and within countries. Furthermore, data on the quality and the impact of such policies are also collected.

Questions 3 and 4 will result in two more applied chapters. Finally, there will be one chapter dedicated to conclusions and answers to the main question. In this conclusive chapter, the four sub-questions will be linked and compared.

## 2 What is food security?

### 2.1 Introduction

In order to find a working definition of food security to use throughout this thesis, the concept will be explored and described in this chapter. First, different definitions of food security are presented. Next, the way thinking about food security changed over the last few decades is examined and different perspectives on the concept are explored, using the 'shifts' in thinking defined by Maxwell (1996). Finally, conclusions will be drawn about the concept, selecting useful and workable aspects for this thesis.

The official definition of food security used by the FAO is as follows:

*"Food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life"* (FAO 2003, p. 28).

This extensive and detailed definition was formulated in 2001 and is the result of several decades of development and refinement of the concept of 'food security'. Although it is widely used and often referred to in the literature, it certainly is not the only definition employed and its detailed formulation has pros and cons. On the one hand, it is clear and complete, but on the other hand it is hard to determine whether someone is food secure by checking all the aspects of the definition.

According to Maxwell (1996), three main shifts in thinking about food security throughout the years can be identified. The first shift is a shift with respect to the level of analysing food security: from the global and national level to the household and individual level. With this first shift, also the idea of *access to* as opposed to *availability of* food became important. The second shift was to include a livelihood perspective: food security became recognized as a part of a sustainable livelihood rather than a primary need in itself. Finally, the third shift was a change from objective measurement of food security to subjective perception, recognizing that food security is not only about quantity but also about quality and acceptability of food.

Those three shifts form a useful tool to investigate what the FAO definition really means and which aspects are useful.

### 2.2 Shift 1: levels of analysing food security

Food security is not only dependent on the available food supplies. Local or national food insecurity and even famines can coincide with sufficient food supplies at the global level (Maxwell, 1996). Distribution of food between countries and within countries plays a major role in reaching food security for all households within a region. Some scholars have argued that the household level is not the smallest or most interesting unit of analysis, because intra-household distribution of food and individual food security should be taken into account (Maxwell and Smith 1992). Intra-household relationships and rules may cause unequal allocation of food between members and thus leave one member more food secure than another. Furthermore Smith et al. (2000) argue that at the individual level, 'nutrition security' is also important in order to translate food security to 'an active and healthy life' (part of the FAO definition). To reach nutrition security, health and care are also necessary to make sure that the individual can consume a nutritionally adequate diet. Hence, here the nutritional components of food (such as sufficient calories and micronutrients) and the biological uptake of those components by the individual are important. Aspects of the quality of food will be discussed in more detail in section 2.3.

Related to these different levels of analysis are the concepts of *self-sufficiency*, *availability* and *access to food*. According to Duncan et al. (2002) self-sufficiency of food is only relevant at the global

level, assuming that there is unrestricted trade. In other words, there must be sufficient food supplies to meet the demands of the world population. The food supplies depend among others on crop yield, fertilizer and water availability and weather circumstances, whereas demands depend mainly on population and income (growth). In isolated areas, or when trade barriers are in place, self-sufficiency within countries or regions becomes more important. However, according to Duncan et al. (2002), overall individual- or household level *access* to food is more important than self-sufficiency.

Smith et al. (2000) also point to 'insufficient national food availability' on the one hand and 'insufficient access to food by households and individuals' on the other hand as the two main causes of food insecurity. The national food availability in a country is the result of the food production in the country plus net imports and (possibly) foreign food aid. Smith et al. (2000 p. 201) explain that "access to food may be gained through (1) production or gathering of food, (2) purchase of food on the market with cash income and/or (3) receipts of in-kind transfers of food" and recognize that food insecurity has different causes in different regions of the world. However, they do conclude that problems of access to food are closely related to poverty and that "poverty is the leading cause of food insecurity for most developing countries" (p. 210), also when food availability in the country is sufficient. Especially countries in Sub-Saharan Africa (SSA) are often burdened by both poverty (i.e. insufficient access to food) and insufficient availability of food at the national level, further aggravated by problems of health and care (Smith et al. 2000).<sup>1</sup>

The idea of inaccessibility and essentially poverty being the main cause of food insecurity was initiated by Amartya Sen and his theory of 'household entitlement to food' (FAO 2003). This refers to the means of a household to effectively gain access to food through production or income-generation and is thus essentially a matter of access to income (Duncan et al. 2002).

These different levels of analysing food security also imply different measures and events that influence it. At a global level, when it comes to supplying enough food for everyone, food security is mainly dependent on weather circumstances and production technologies. This is also important at the national level, but here it is complemented by trade policy and the possibility of trade, impacting the distribution of food between countries. Next, at the household level, when access to food comes into the picture, domestic policies and infrastructure within a country have an influence, together with poverty and income distribution. Then, finally, at the intra-household or individual level, intra-household decision-making and power relations are vital and are among others dependent on cultural values.

### 2.3 Shift 2: Food security as part of a livelihood

The second shift described by Maxwell (1996) recognizes that food and access to food are part of a livelihood that an individual or a household wants to maintain. In this livelihood, food security is one objective but not the only one and people might take a risk of becoming food insecure in order to fulfil other needs or objectives. From this perspective, food security is not treated as a fundamental need because one might have other priorities above avoiding hunger (Maxwell and Smith 1992). For example, a household might rather consume less food to be able to pay for education or to make sure they do not have to sell their (capital) assets. Time preferences can also play a role here, when a person or household rather goes hungry now to save for later (Maxwell, 1996).

Maxwell (1996) further argues that, from this perspective, *resilience*, *security* and *sustainability* of a livelihood are conditions for food security. This means that a household or individual has to be able

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<sup>1</sup> For their research, Smith et al. (2000) used the daily per capita dietary energy balance (DEB) as an indicator for national food availability. DEB measures whether the dietary energy supplies (amount of energy in national food supplies) of a country meet the dietary energy requirements of its population. As an indicator for access to food, they used income-based absolute poverty in a country. Furthermore, they employed child malnutrition as an indicator for nutrition security.

to manage risks and adapt to new circumstances and shocks to be food secure. Different degrees of vulnerability or sensitivity of households to shocks can be identified, ranging from 'enduring' to 'fragile' (Maxwell 1996, p. 158).

These conditions for food security relate to the part 'at all times' in the FAO definition of food security. A fragile household is highly vulnerable to shocks in its livelihood and cannot adapt quickly. Hence, it bears a risk of not being food secure at all times.

The dimension of time in the concept of food security is also related to livelihoods when it comes to, for example, seasonal variance in livelihoods and food supplies. As described by Maxwell and Smith (1992), food insecurity can be chronic, transitory (e.g. in case of a shock) or cyclical (e.g. in case of seasonal change). Transitory and cyclical changes in the food supplies can affect availability and access to food and its quantity and quality. Storage facilities can (partly) overcome such shortages and can also improve the quality of the food that is saved for later.

## **2.4 Shift 3: Subjective perception of food security**

The third shift is one of objective measurement of food (in)security to its subjective perception by the food insecure themselves. Objective measurement of food security includes, for example, prescriptions for the optimal calorie intake per person per day and other measurements of adequate nutrition. Although of course it makes sense to take into account what food components are biologically needed for a person to live an active and healthy life, it is hard to objectively say what is optimal nutrition (Maxwell 1996). One reason is that optimal nutrition may be very different from one person to the other depending on living conditions and activities. Apart from this, as Smith et al. (2000) indicate, access to adequate nutrition does not guarantee optimal biological utilisation, because health and care also impact nutrition. Furthermore, personal and cultural preferences for certain kinds, quantities and preparations of food play a major role in what will finally be eaten and how secure a person feels of having enough, adequate food. Taking into account this issue of individual or household perception of food security, Maxwell defines food security as follows:

"A country and people are food secure when their food system operates in such a way as to remove the fear that there will not be enough to eat. In particular, food security will be achieved when the poor and vulnerable, particularly women and children and those living in marginal areas, have secure access to the food they want." (Maxwell 1996, p. 159).

Hence, although nutrition security through adequate nutrition is necessary for being food secure, it is not sufficient (Maxwell, 1996). Food habits and preferences and perceived household risk also play a role. To clarify this, one can think for example of a person who has access to enough and adequately nutritious food (with the necessary food components, such as proteins) because he/she has access to pork meat. However, because of religious beliefs, the person does not consume pork meat. If there is no other source of protein available or accessible, this person still is food insecure because the effectively consumed diet lacks protein.

## **2.5 Conclusion - Focus in this thesis**

It can be concluded that food security is a complex and contested concept, in which many aspects of food availability, access and consumption can be taken into account. Although the FAO definition from 2003 is often referred to, it may not be suitable in all cases because of its complexity and limitations in practical applicability.

There are many factors impacting food security at different levels and it is considered valuable that this is recognized in the FAO definition. However, for this thesis, not all these aspects and factors will be taken into account. The focus will be partly on the national but mainly on the household level of food security. Although the individual level and intra-household relationships are interesting, these are beyond the scope of this thesis as this is hard to analyse with respect to trade and price fluctuations. Furthermore, nutritional adequacy will not be examined completely because there is a focus on staple foods only, rather than all relevant commodities for a balanced diet.

Aspects of food security which are important for this thesis are *availability* and *access*. Food availability will be examined, and how it is affected by production and international trade. Access to food will also be explored, and how it is affected by price changes and producers' income changes. Finally, the impact of policies and institutions on the availability of and access to food by households in a country will also be analysed.

### 3 Fluctuations in world market prices for staple foods during the period of 2000-2010<sup>2</sup>

This chapter serves to create some understanding of the latest developments in food prices on the world market. This is necessary in order to analyse the implications of world market price fluctuations for SSA.

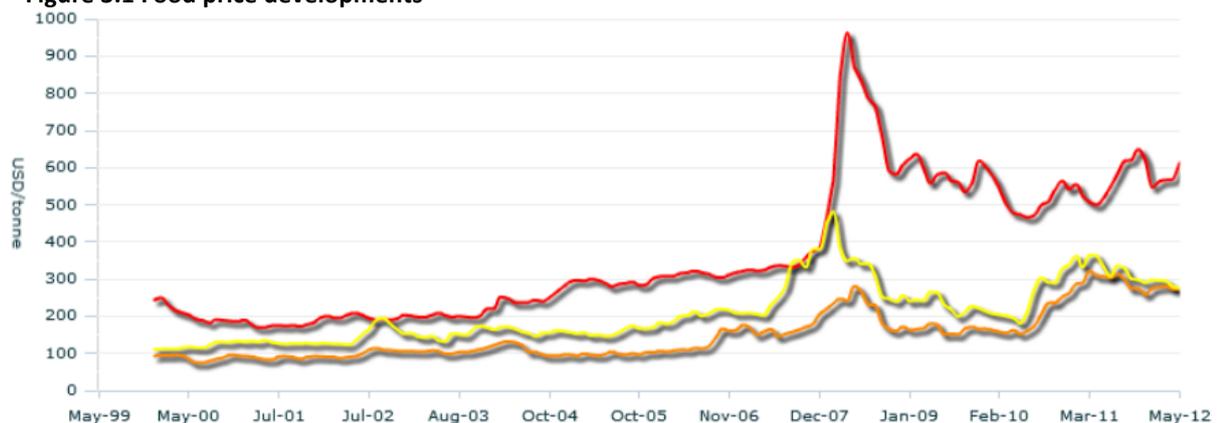
This chapter will present the main factual (price) developments during the last decade and the food crisis (the major commodity price spike in 2008) specifically. To be able to see this crisis in a historical perspective, historical trends in food prices will also be touched upon.

Next, the causes of the crisis will be examined. Many different theories exist on the developments behind this crisis. However, they are sometimes contradicting and contested, for instance because of doubtful causality. Hence, some theories seem more convincing than others and will be dealt with more extensively.

#### 3.1 Recent food price trends

A graphical representation of world price trends of three main staple crops (**rice**, **maize** and **wheat**) during the last decade is given in figure 3.1. The international prices used are considered to be the leading benchmark prices for the three commodities (FAO 2012).

**Figure 3.1 Food price developments**



Legend:

	INTERNATIONAL PRICES, Thailand: Bangkok, Rice (Thai 100% B), Export, (USD/tonne)
	INTERNATIONAL PRICES, USA: Gulf, Maize (US No. 2, Yellow), Export, (USD/tonne)
	INTERNATIONAL PRICES, USA: Gulf, Wheat (No. 2 Hard Red Winter), Export, (USD/tonne)

Sources:

	Jackson Son & Co. (London) Ltd., Thai Department of Foreign Trade (DFT) and other public sources
	International Grain Council and USDA
	International Grain Council and USDA

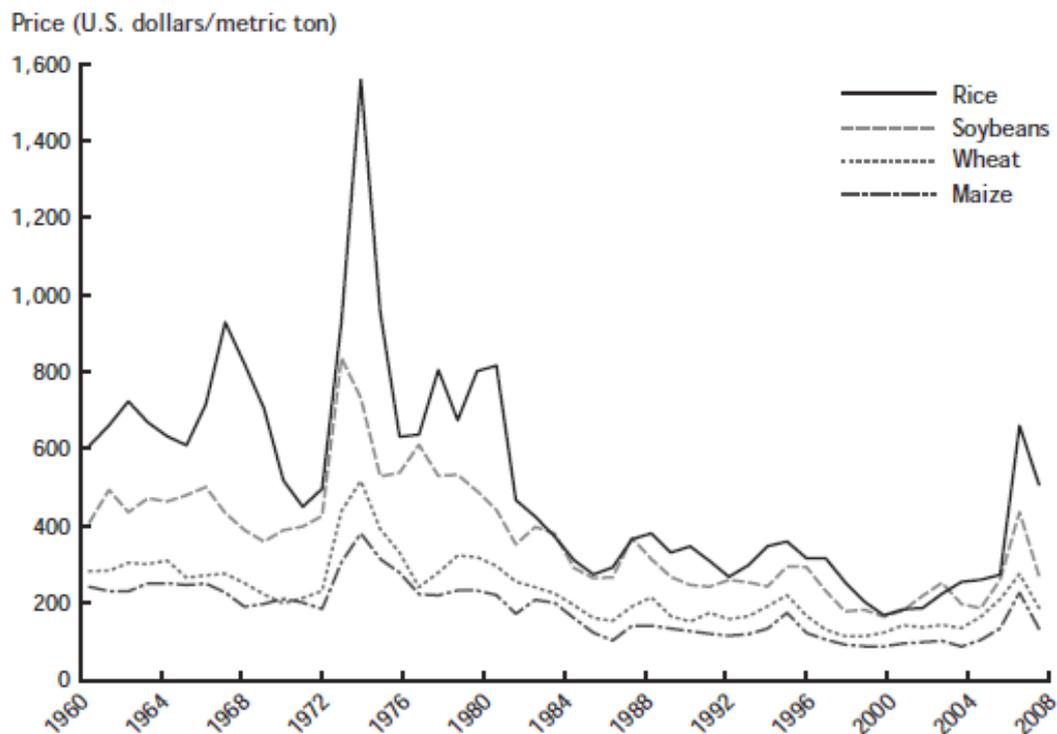
Source: FAO – GIEWS database (2012)

<sup>2</sup> The main sources for this chapter are two articles by Headey and Fan (2008; 2010) on the food crisis and its causes.

From figure 3.1, one can conclude that from 2000 to 2006, prices have been stable and low, while after rising and plummeting again very rapidly in 2008, they have remained high and volatile until 2012. Furthermore, price fluctuations in the rice market are more extreme than in the market for maize and wheat, and the timing of the peaks varies between commodities.

As illustrated by figure 3.2, the previous major price spike occurred in 1974, when rice also spiked more than other commodities. According to Headey and Fan (2008), in the 2008 crisis, food prices were almost as high as they were in the late 1970s in real terms. The two crises show a similar development, with prices of many commodities rising and plummeting rapidly. The graph also shows that in the decades before the latest price peak, food prices overall have been steadily decreasing for almost thirty years, which means that in the first half of the last decades, food prices were ‘at an all-time low’ (Headey and Fan 2008, p. 376).

**Figure 3.2 Price developments for major commodities, 1960 – 2008**



Source: Headey and Fan (2010)

## 3.2 Causes of the food crisis

It is generally agreed upon that there is no single cause for the recent price spikes and volatility. Instead, a variety of factors contributing to rising food prices are suggested including long-term developments and short-term shocks, both on the demand and the supply side. Some explanations are crop-specific and some are sector-wide. As McCalla (2009) states, the predominant story in the literature “argues that there is a confluence of permanent and transitory factors that are driving the current price situation... Structural change in supply and demand... are pushing agricultural commodity prices up. When perturbed by shocks or rapid shifts in parameters, price increases are magnified.” (McCalla 2009, p. 26).

### 3.2.1 Demand factors

Among the long-term, macroeconomic factors behind rising food prices on the demand side are population growth, economic growth and rising incomes (mainly in emerging economies such as India and China), urbanization and increasing demand for biofuels (McCalla 2009, Headey and Fan 2010, Meijerink, Berkum et al. 2011). Population growth, economic growth and urbanization may

contribute to rising food prices because they increase demand for food in general and more processed and refined foods such as meat specifically. Hence, according to this trend, world demand for food will keep increasing steadily.

Headey and Fan (2010) however, place doubt on the role of emerging economies India and China in the recent price spikes and the problem of 'feeding' these countries. This doubt is based mostly on the relative independence of these countries from cereal imports, so their increasing national demand does not directly affect world market prices. There may nevertheless be an influence on world grain markets indirectly, because of the changes in diets and consumer preferences, e.g. through increasing demand for meat.

The increasing demand for biofuels has to do with increasing oil prices and hence substitution to biofuels. A growing demand for biofuels may contribute to rising food prices because it leads to more competition for agricultural land; more land will be allocated to crops for biofuels at the expense of food crops, which become more scarce (Headey and Fan, 2008). Also the competition for the use of crops increases, because corn for example will be allocated more to biofuel production rather than the food market. This way, a higher demand for biofuels leads to a decline in staple food supply and thus to higher food prices. In this sense, it is also a supply factor. The biofuel-argument is mainly an explanation for rising maize prices, but through substitution effects it can also be an indirect cause of increasing prices of other commodities (Headey and Fan, 2008).

### **3.2.2 Supply factors**

Long-term developments on the supply side are decreasing agricultural productivity and yield growth, possibly due to declining investments and falling R&D in agriculture (McCalla 2009). As also argued by Meijerink, Berkum et al. (2011), productivity and yield growth have been falling together with investments in agriculture during the last decades, which, especially combined with increasing world demand, leads to a tightening market with higher food prices. However, this explanation is questioned by Headey and Fan (2010), because productivity decline is not a very long-term observation and is not observed in all regions. In fact, it is mainly observed in SSA, where it is especially critical in combination with rapid population growth in this region. Another counterargument here is that growing regions such as South and South East Asia are essentially self-sufficient in cereals, so this lowers pressure on the world market (Headey and Fan 2010).

A second factor is the fact that not only staple food prices increased, but simultaneously also a wide range of other commodities (Headey and Fan 2008), although not all of them increased so fast and so much. Among these commodities are oil and energy (prices increased with 80-120%). Because of increasing market integration between food and fuel markets and because oil is strongly related to agricultural production, increases in these prices also affect food prices. Oil prices affect energy, fertilizer and transport costs in agricultural production, so the oil price rise affected food prices through increasing agricultural input prices (Headey and Fan 2008). Moreover, the US are a major player in agricultural commodity trade (mainly maize, wheat and soybeans) and US agriculture is highly oil-intensive (Headey and Fan 2008). This aggravates the effect of oil prices even further.

A third factor coinciding with and contributing to the surge in food prices is the depreciation of the US Dollar against the Euro, Yen and other currencies from 2002 onwards. Many world food market prices are measured in dollars, which means that these nominal prices increase when the dollar depreciates. The recent increase in prices would be less severe if the prices were measured in Euros for example (Headey and Fan 2008).

Apart from the long-term factors behind the surge in food prices, more short-term shocks on the supply side can also be identified.

The first factor is the weather, inducing supply shocks due to poor harvests. In the last decade, this has mainly been the case for wheat, after droughts and very poor harvests in Australia in 2005-2006 and to a lesser extent in the US and Russia (Headey and Fan 2008). Sudden supply declines can lead to higher prices on the world market, but according to Headey and Fan (2008), this explanation

is not as convincing as it seems. Shortfalls in wheat supplies are not rare and have occurred regularly in the last decades without directly leading to a price spike.

The second short-term factor is the decline in stocks. In several countries, stocks of staple foods have been well below the FAO benchmark of 17-18% of consumption in the years before the price spike, possibly leading to less stable and higher prices. However, this explanation is also contested as a direct cause (Headey and Fan 2008). According to Dawe (2009), declining stocks was not a major cause of the price spike because world stocks did not decline that much if China is not taken into account. Although it might not be a direct cause, stock decline can still be critical in combination with, for instance, the weather shocks mentioned above. When stocks serving as a buffer decline, it becomes harder to bear the burden of a supply shock and prices are more bound to increase.

The third factor are trade shocks caused by export restrictions. This cause is mainly applicable to rice prices. Between 2005 and 2008, several countries in South and South East Asia launched export bans on rice in a reaction to the significant price increases, in order to keep their domestic prices stable. These export bans and high precautionary imports in a relatively thin market (only a small percentage of global rice production is traded) led to a sudden surge in prices in 2008 (Headey and Fan 2008). Hence, the measures to maintain domestic price stability went at the expense of international market stability. Once the export bans were abolished again, the rice prices plummeted rapidly.

Additionally, one other potential cause of the price spikes mentioned by many scholars is speculation on future prices and food stocks (Headey and Fan 2008). Speculation might have caused a so-called price bubble in international food markets, comparable to the financial markets, but this is a very contested explanation and its actual impact on prices has not been proven.

### 3.3 Conclusion

After steadily declining for some decades, a large number of commodity prices increased rapidly and strongly in 2008, plummeting again a few months later. The progress of this food crisis shows some similarities with the major commodity price peak in 1974, as well as with some (but not all) of its causes.

Many causes of different types and strengths can be identified, of which the most important and least contested are:

- Population growth, urbanization and an increasing demand for biofuels (on the demand side)
- Rising oil and energy prices, depreciation of the US dollar, weather shocks and export restrictions (on the supply side)
- For SSA specifically, decreasing agricultural productivity and investments are important on the demand side.

Other indirect, specific and less obvious factors also play a role, altogether causing a so-called 'perfect storm', leading to a sector-wide price spike. Josette Sheeran, executive director of the World Food Program, used this term referring to confluence and interaction of rising food prices, (weather) emergencies and political instability, together causing the food price crisis (WFP 2011).

## 4 The impact of increasing world market prices for staple foods on different population groups in Sub-Saharan Africa

### 4.1 Introduction

This chapter identifies the countries and population groups that are affected by increasing food prices and that are the most vulnerable when it comes to food security. Because many aspects and levels are involved in this topic, it is divided into two sub-questions:

- a) What type of countries in SSA are vulnerable to increasing world market prices for staple foods?
- b) Within a country, which population groups are vulnerable to increasing prices for staple foods?

The first question is dealt with in section 4.2. This section looks at impact and vulnerability at the international level and draws comparisons between different types of countries (mainly importers versus exporters).

The second question is dealt with in section 4.3. This section is about the distribution of vulnerability and impacts within a country and looks at the gainers and losers of high food prices. The focus in this part will be on the differences between rural and urban areas on the one hand and net producers and net consumers on the other hand.

As described in chapter 2, vulnerability with respect to food security has a lot to do with availability and access. Availability is generally more important at the country-level than at the household or individual level. This will be taken into account in section 4.2 when answering the question: 'which countries bear the highest risk of food shortages due to high international food prices'? Access is also important at this level, because a country is vulnerable when it cannot guarantee access to food for its population, but it is more prominent on the household level. These dynamics will be discussed in section 4.3. High prices will cause some households to gain access to food because they earn more money, but other households will lose access to food because they can buy less of it. Hence, poverty is the main measure of access in this chapter. Food insecurity and malnutrition are results of poverty, because less -or less nutritious- food can be consumed because of high prices. Even if enough calories are consumed, poor people may be rendered malnourished because they substitute nutrient rich food for cheaper less nutritious grains (Wodon and Zaman 2010). Of course, the risk of malnutrition also depends on the initial food dependence and the local diet. If the diet is highly dependent on one crop, the risk of food insecurity and malnutrition is higher when the price rises than if a variety of food sources is available and acceptable.

The above is summarized by Ivanic and Martin (2008) as follows:

*"The overall impact on poverty rates in poor countries depends on whether the gains to poor net producers outweigh the adverse impacts on poor consumers. Whether higher food prices improve or worsen the situation of particular households depends importantly on the products involved; the patterns of household incomes and expenditures; and the policy responses of governments."*

## 4.2 International level: importers versus exporters

### 4.2.1 Vulnerability

When comparing the impacts of food price changes among countries, different levels of vulnerability can be identified. According to Dia Kamgnia (2011), Sub Saharan Africa is the most vulnerable region in the world when it comes to food insecurity and impacts of food price spikes. She based her analysis of vulnerability on more general research by De Janvry and Sadoulet (2008). These authors have identified three criteria which increase the vulnerability of a country to international food price fluctuations. The criteria are (De Janvry and Sadoulet 2008, p. 2):

- High food dependency as measured by the share of cereal imports in total cereal consumption
- High food import burden as measured by the share of cereal imports in total imports.
- Low income as measured by a Gross National Income (GNI) per capita in 2006 of less than \$905, or lower middle-income with a GNI per capita between \$906 and \$3,595 (World Bank, 2007).

The first and second criterion express the importance of imports for a country to reach food sufficiency for its population and its dependence on other countries. The second criterion is especially important, because countries with a high food import burden have very little opportunity to increase food imports when domestic food supplies are insufficient. Compared to other countries, they have little room for substituting imports of other products for extra food imports. The third criterion refers to the capability of a government to react to a food crisis and protect vulnerable population groups from food price spikes, for instance by financing safety nets and trade interventions (Dia Kamgnia 2011). The three criteria lead to a classification of SSA countries with respect to vulnerability to food price shocks, presented in table 4.1.

**Table 4.1 Vulnerability of countries to international food price shocks**

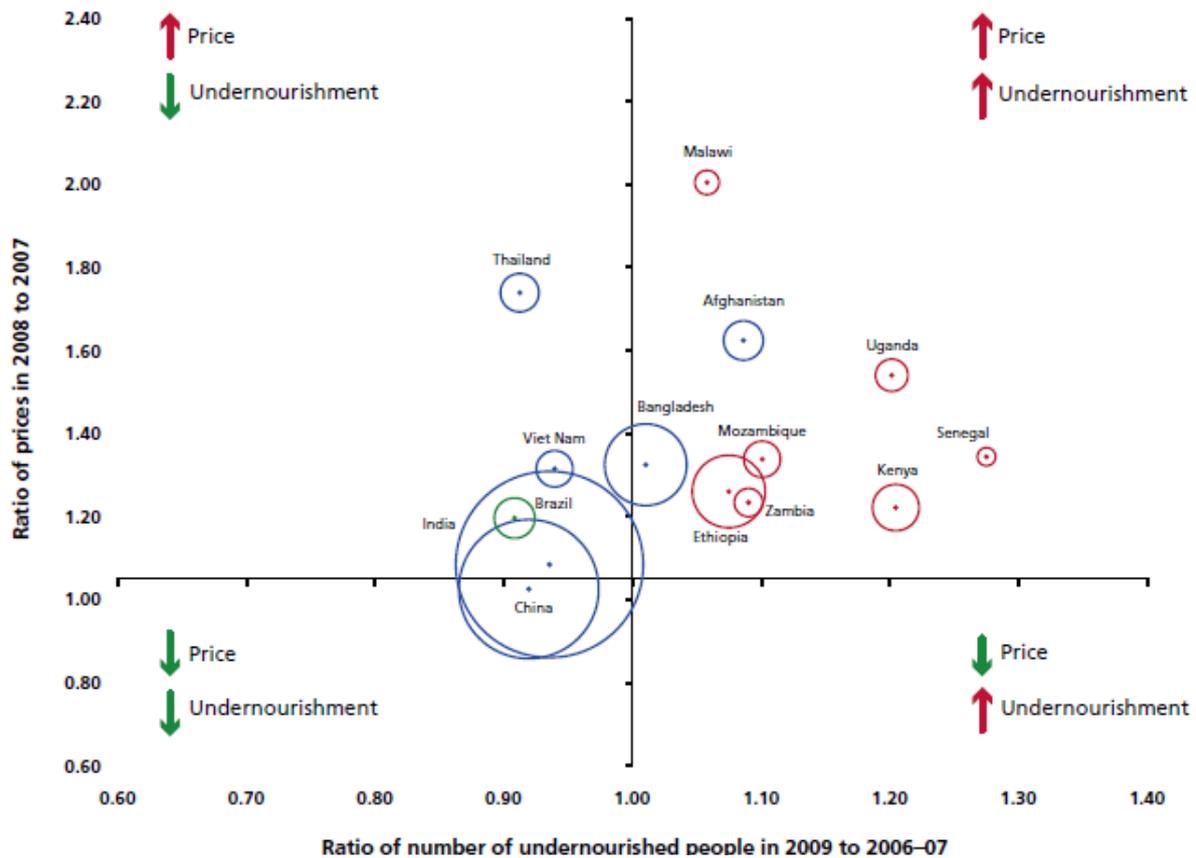
Food Dependency	Food import burden	Vulnerability to food crisis	Low income countries	Lower middle income countries
Cereal imports/Cereal consumption	Cereal imports/Total imports			
High	High	<b>Most vulnerable</b>	DR Congo, Côte d'Ivoire, Eritrea, Gambia, Guinea-Bissau, Liberia, Senegal	Swaziland
Low	High	<b>Highly vulnerable</b>	Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Ethiopia, Ghana, Guinea, Kenya, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Sierra Leone, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe	
High	Low	<b>Somewhat vulnerable</b>	Angola, Somalia	Namibia

Source: Adapted from De Janvry and Sadoulet (2008, p. 3). The classifications on income in columns 4 and 5 are based on UNSTATS (2012).

Note: Only the Sub-Saharan countries are presented.

Dia Kamgnia (2011) argues that the SSA region is very vulnerable compared to other regions and that part of the domestic food price increases in developing countries can be attributed to the specificities of African countries. Although her analysis does not clarify what these 'African specificities' are, the difference in vulnerability and impacts between SSA and other regions is also emphasized in other studies. The outcome of an FAO study on resilience to high food prices around the world concerning undernourishment is illustrated in figure 4.1. All the African countries see an increase in undernourishment as a result of rising prices, whereas most Asian and Latin-American countries witnessed a decline in undernourishment.

**Figure 4.1 Differences in resilience to food price shocks across countries**



Source: FAO (2011)

Notes: The size of the bubbles is proportional to the number of undernourished in 2008. African countries are shown in red, Asian countries in blue and Latin American countries in green. Prices used are inflation-adjusted retail prices of major staple foods in main markets, weighted by the population of each market and the share in energy intake of each staple food.

Using De Janvry and Sadoulet's three vulnerability criteria and focussing on the second criterion, Dia Kamgnia (2011) concludes that net food importing countries are more vulnerable to international price increases than net food exporters. Net food importers are price takers and depend on international markets for their domestic food security situation. As the costs of maintaining food security in the country increases, the trade balance of the net food importing countries deteriorates whereas it improves for net food exporters. Of course, these trade effects on importers and exporters are the other way around when food prices are low, as they were until 2005. Furthermore, although high food prices have a positive effect on the current account balance and large-scale international trade for net exporters, they are no guarantee that the households in these countries are necessarily better off (or the opposite for net importers). The effects within a country will be dealt with more extensively in section 4.3.

Next to the increasing costs of food imports, the vulnerability of a country to high food prices may also appear in the form of increased public expenditures (Dia Kamgnia 2011). Governments of highly vulnerable food importing countries may implement interventions to keep domestic prices stable

and/or to create social safety nets and food programs to support people who are pushed into poverty and suffer from malnutrition. Higher international food prices also require more funds for humanitarian food aid programmes of international agencies (Ng and Aksoy 2008).

#### **4.2.2 Additional factors affecting vulnerability**

Besides the trade pattern of a country, Dia Kamgnia (2011) and Ng and Aksoy (2008) also recognize other factors that affect countries' vulnerability to price shocks.

##### *Conflict*

Countries that experience a (civil) conflict tend to be more dependent on food imports and thus are more vulnerable to increasing international food prices. Such countries are instable and often poverty rates and other problems of access (e.g. lacking infrastructure, unemployment) are already high. Agricultural production often suffers from conflicts, hence increasing the dependence on food imports, while government administration and public expenditure to protect the population from high food prices also decline (Dia Kamgnia 2011). However, findings from Ng and Aksoy (2008) suggest that the impact of a conflict is very different for a low-income country compared to a middle-income country. They found that during modest food price increases between 2000 and 2004, the high vulnerability of low-income conflict countries became very clear because their food imports grew much faster than their exports. Although less extreme, this was the trend for all examined low-income countries, whereas middle-income countries (including the conflict countries) on average experienced a higher growth in food exports than in imports (Ng and Aksoy 2008). Their observation is that middle income countries do not experience the negative effect of modest food price increases. This can be explained by the higher rate of agricultural GDP growth in these countries, allowing the sector to react more quickly to price changes (Ng and Aksoy 2008).

##### *Oil exports*

Net oil exporters also tend to have relatively large food deficits, yet they are not affected that much by increasing food prices because they can compensate with the revenues from oil exports. Hence, their trade balance does not deteriorate so much and may even improve when oil prices are also rising (as was the case during the 2008 food price spike). Revenues from oil exports mostly raise government budgets, which also means that in these countries there is more room for intervention and public financing to reduce the burden on the consumers when domestic food prices rise.

For oil exports to be beneficial for a country, it is of course critical that oil revenues in these countries are indeed used for these purposes and such interventions and support are actually implemented. Whether this is also the case is a question beyond the scope of this thesis.

##### *Reinforcing factors*

Many interrelations between the causes of vulnerability to high food prices can be identified and some of these factors reinforce each other. High poverty rates and a low (agricultural) GDP increase the vulnerability of a country to international price shocks. If a country is also a food importer, its trade balance will deteriorate when such a shock occurs. This then leads to higher public spending to reduce the burden on the vulnerable population, together with increased poverty rates rendering the country even more vulnerable. These developments may also lead to (political) instability and conflicts among civilians, as also happened during the 2008 food crisis with several food riots mainly in urban centres. This can further increase the vulnerability and dependence on foreign aid and imports.

Table 4.2 is adapted from table 4.1, but now includes the status regarding fuel exports and conflict for each country and the effect on the vulnerability to food price shocks. For some countries, data on fuel exports are not available so the effect cannot be indicated. For Nigeria and Sudan, the effect is ambiguous because these countries are fuel exporters (which improves the current account balance

and decreases vulnerability), but they are also involved in (civil) conflict so the net effect is unclear. Of course, these issues can be related: oil and other natural resources may lead to conflicts on property rights and profits (the so-called natural resource curse).

**Table 4.2 Vulnerability of countries adjusted to oil export and conflict**

		Fuel exporter in 2008	Conflict in 2008	Effect on vulnerability
<b>Most vulnerable</b>	DR Congo	n.a.	Yes	↑
	Côte d'Ivoire	Yes	No	↓
	Eritrea	n.a.	Yes	↑
	Gambia	No	No	-
	Guinea-Bissau	n.a.	No	-
	Liberia	n.a.	No	-
	Senegal	Yes	No	↓
	Swaziland	n.a.	No	-
<b>Highly vulnerable</b>	Benin	n.a.	No	-
	Burkina Faso	n.a.	No	-
	Burundi	No	Yes	↑
	Cameroon	Yes	No	↓
	Central African Republic	n.a.	No	-
	Ethiopia	No	Yes	↑
	Ghana	No	Yes	↑
	Guinea	No	No	-
	Kenya	No	Yes	↑
	Madagascar	Yes	No	↓
	Malawi	No	No	-
	Mali	Yes	Yes	-
	Mozambique	Yes	No	↓
	Niger	No	Yes	↑
	Nigeria	Yes	Yes	<b>Ambiguous</b>
	Rwanda	No	Yes	↑
	Sierra Leone	n.a.	No	-
	Sudan	Yes	Yes	<b>Ambiguous</b>
	Tanzania	No	No	-
	Togo	n.a.	No	-
	Uganda	No	Yes	↑
	Zambia	No	No	-
	Zimbabwe	No	Yes	↑
<b>Somewhat vulnerable</b>	Angola	Yes	No	↓
	Namibia	No	No	-
	Somalia	n.a.	Yes	↑

Source: Column 1 and 2 are based on De Janvry and Sadoulet (2008, p. 3). Column 3 is based on data from the World Bank (Bank 2012) and the WTO (2009). Countries where fuel exports are at least 5% of total exports are categorized as 'fuel exporters'. Column 4 is based on data from the Uppsala Conflict Data Program (2012).

### 4.3 Domestic level: rural versus urban and producers versus consumers

Naturally, within any country (whether high- or low-income) it is the poor who are most hurt by price increases. Their access to products becomes limited and they have little reserves or savings to use as a buffer when prices rise. In the case of food prices, the poor are even more vulnerable because the poorest people spend up to three quarters of their income on food (Ivanic and Martin 2008). Hence, a rise in food prices has a major negative effect on their purchasing power. High prices force households to cut back their food consumption and/or shift to cheaper and less nutritious foods. The

food crisis has led to widespread food poverty and malnutrition, especially among children and has increased the number of undernourished people by 24 million in SSA (HLPE 2011).

Based on simulation results, Wodon and Zaman (2010) claim that a 50 per cent price increase for major imported food products in several SSA countries leads to an increase in the poverty headcount of 2.5 to 4.4 per cent on average, pushing up to 30 million people into poverty. The actual rate depends on whether positive impacts on producers are taken into account or not. Furthermore, they find that the poverty gap<sup>3</sup> increases because it is mostly the poor who are affected and become even poorer due to price shocks. The impacts vary substantially through different areas and regions within countries. Differences between effects in urban versus rural areas depend for instance on livelihoods, initial poverty rates and government policy (Wodon and Zaman 2010).

This part of the chapter is about the question which population groups are hurt most due to rising international food prices in developing countries (SSA specifically) and whether there are also (poor) people who benefit from rising prices. On the one hand, one could argue that high food prices are bad for the poor because most poor people are net consumers (Ivanic and Martin 2008). On the other hand, most of the world's poor live in rural areas and many of them earn money through food production so high food prices may lead to higher (rural) incomes (Dia Kamgnia 2011).

Hence, comparisons will be drawn between rural and urban dwellers on the one hand and net producers and net consumers on the other hand, because not all rural poor are net producers and not all urban dwellers are net consumers.

#### **4.3.1 Rural versus urban**

When looking at access to food in terms of poverty prevalence, one could argue that the rural households are generally hit hardest by an increase in food prices because most of the world's poor live in rural areas and rural households tend to be poorer than urban households (Aksoy and Isik-Dikmelik 2008). However, according to Ivanic and Martin (2008), when staple food prices rose between 2005 and 2007, poverty and poverty gaps in 9 developing countries<sup>4</sup> increased by 3% on average and the increase was higher in urban areas than in rural areas. This observation is more in line with another strand of reasoning, namely that rural households can benefit from higher food prices because many of them are net producers (Dia Kamgnia 2011). From this point of view, the low and declining food prices before 2007 can be identified as a cause of the high rural poverty in many developing countries (Aksoy and Isik-Dikmelik 2008, Swinnen 2011).

Several other reasons can be identified for the argument that rural dwellers benefit more (or suffer less) from increasing food prices than urban dwellers.

Firstly, in rural areas there are more possibilities than in urban areas for households to be self-sufficient or at least produce a part of their food themselves. For this reason, in rural areas imported products (with high prices) may be less important for food security than they are in cities. Because of the possibility for household food production, rural households also have more means of substitution when a commodity becomes very expensive. Hence, a price increase of food products does not immediately threaten their food security situation because they often have more choices between food sources. In short, rural households generally are more flexible and less directly dependent on (expensive) food imports than urban households. Because of easier adaptation, rural dwellers may suffer less in the case of a price increase, and they may even benefit if they can anticipate by shifting from net consumption to net production. This argument does need some nuance, because there is always a time lag in agricultural production due to price transmission, production seasons and just the time a crop needs to grow. Hence, it takes time and careful planning to adjust and shift from one

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<sup>3</sup> The poverty gap is the mean shortfall from the poverty line expressed as a percentage of the poverty line, reflecting both the depth and the incidence of poverty.

<sup>4</sup> The 9 countries examined in this study were Madagascar, Malawi and Zambia from SSA and Bolivia, Cambodia, Nicaragua, Vietnam, Peru and Pakistan from other regions.

crop to another. Moreover, the effects of such adaptations to prices are generally marginal because it concerns small quantities and small farmers (FAO 2011).

Secondly, according to Wodon and Zaman (2010), there are also differences between rural and urban areas in the labour market effects, especially on the short term. Wages are more likely to adjust to increasing food prices in rural areas than in urban areas, because rural wages have a closer link to food production. This is an advantage for rural households compared to their urban counterparts. Ivanic and Martin (2008) examined the labour market effect of the increase in commodity prices between 2005 and 2007 in 9 developing countries, and found that the effect diminishes the increase in poverty rates. However, they observe that the effect in urban and rural areas is almost the same and does not reverse the general trend of increased poverty.

Table 4.3 presents the poverty rate impacts of increases in staple food prices between 2005 and 2007 in the three SSA countries examined by Ivanic and Martin (2008). Compared to the other 6 countries in their study, the poverty rate impacts were strong in SSA. The total impact of all the price increases (column 6) was higher than the average 3% poverty rate increase observed in all 9 countries in the study. The African countries do not exactly follow the average trends described. As mentioned above, one trend was that the poverty impact was greater in urban areas than in rural areas, but among SSA countries this is only true for Madagascar. In Malawi and Zambia, rural populations face strong poverty increases, especially due to maize prices. The wage impact slightly diminishes the poverty increase (mainly in Madagascar), but only in Malawi this effect is higher in rural than in urban areas.

**Table 4.3 Poverty rate impacts of 2005-2007 global staple food price increases, % change**

		Initial	Maize		Rice		Wheat		All (7 commodities)	
			NW	WW	NW	WW	NW	WW	NW	WW
<b>Madagascar</b>	<i>Rural</i>	76.8	0.2	0.2	2.6	2.3	0.5	0.6	3.5	3.1
	<i>Urban</i>	50.4	0.3	0.3	2.5	1.4	1.7	1.7	5.6	3.9
	<i>Total</i>	61.0	0.2	0.3	2.5	1.8	1.2	1.3	4.7	3.6
<b>Malawi</b>	<i>Rural</i>	23.3	4.3	3.9	0.0	0.0	0.2	0.2	4.6	4.1
	<i>Urban</i>	3.7	2.8	2.5	0.0	0.0	0.1	0.1	3.3	3.0
	<i>Total</i>	20.8	4.1	3.8	0.0	0.0	0.2	0.2	4.4	4.0
<b>Zambia</b>	<i>Rural</i>	72.2	6.4	6.3	0.1	0.1	0.0	0.0	7.4	7.4
	<i>Urban</i>	79.5	1.8	1.5	0.1	0.1	0.0	0.1	2.5	2.3
	<i>Total</i>	75.8	4.1	1.0	0.1	0.1	0.0	0.0	5.0	4.9

Source: adapted from Ivanic and Martin (2008, p. 413)

Notes: NW = no wage impacts included; WW = results with wage impacts. In column 6 (all commodities), poverty rates impacts of changes in the price of beef, dairy, poultry and sugar are also included.

Nevertheless, there are also arguments against the idea of increasing food prices being less problematic for the rural compared to the urban poor. Results from a study in Mali show that after increasing food prices, food poverty has increased more in rural than in urban areas. This can be explained by the fact that urban households generally have more possibilities to cut back on non-food expenditures, keeping their food consumption stable (HLPE 2011). Furthermore, the rural flexibility when it comes to self-sufficiency and food production can also be seen as vulnerability. Because many rural households may in fact depend solely on food production for their livelihoods, they are hit hard when harvests fall short due to drought for example. In other words, if food production is the only livelihood strategy of a household, it actually increases vulnerability rather than leading to more flexibility.

Moreover, compared to the rural poor, the urban poor tend to be more empowered and influential when it comes to politics and protests (Bezemer and Headey 2008). The 'successful' or at least striking food riots during the 2008 food crisis occurred in major cities, where the protesters have the advantage of the urban masses and better means of organization as compared to rural

areas. Moreover, Bezemer and Headey (2008) argue that domestic and international organization of trade, aid and private and public spending generally has an urban bias, thereby neglecting rural households. Related to this urban bias is also the lack of agricultural investments and the lack of support to prevent price increases or ease their effect domestically.

The effect of domestic policies and variations in price transmission will be discussed in chapter 5, as these effects matter a lot for the eventual effect of global price changes on different population groups.

### **4.3.2 Net producers versus net consumers**

In urban areas there is little possibility to produce food, so most (but not all) urban households are net food consumers. In rural areas, there are many more net producers, but the urban-rural difference is not as clear-cut as it seems. Certainly not all rural households are net producers and also producers buy staple foods (Dia Kamgnia 2011). Besides food production, rural dwellers earn incomes among others through cash crop production, remittances, industry and trade in non-food products.

Rural net producers may benefit from high food prices directly because they get a higher revenue from their sales. Furthermore, related to the labour market effects (see section 4.3.1) there might be an indirect multiplier effect on the rural net buyers when the sellers spend more money on other products and services and thereby increase the incomes of non-agricultural workers (Aksoy and Isik-Dikmelik 2008).

At first sight it seems that rural net producers benefit from increasing food prices, but this is not necessarily the case. The adjustments in production depend very much on the price elasticity of agricultural supply and generally will occur more and faster in net exporting countries, where the higher prices work as an incentive for producers (Dia Kamgnia 2011). In net importing countries, the adjustments might also occur, but with a time lag. Hence, the producers in the most vulnerable countries do not profit as much as in less vulnerable countries. This is reinforced by several supply constraints faced by the rural poor: small plots of land, unclear property rights over land, high and increasing input prices (agricultural input prices and food prices often rise simultaneously) and distance to markets all constrain quick and adequate supply responses to increasing output prices for food production (Wodon and Zaman 2010).

Moreover, many food-producing households in rural areas are smallholders and aim to be (at least) self-sufficient. This means that they can be marginal net buyers in one year but net sellers in another year or season when the yield is higher or the prices are better. Fluctuations in food prices impact sales rather than production of a household, so there are little positive or negative effects for marginal net producers (Aksoy and Isik-Dikmelik 2008).

According to Compton, Wiggins et al. (2010), the people who were worst affected by the 2008 price spike were “casual wage labourers (both rural and urban), land-poor farmers who have no or only a very small surplus for sale, petty food traders and brewers, and producers of commodities whose terms of trade declined significantly against food grains”. Hence, these are mainly net consumers and marginal producers.

## **4.4 Conclusion**

At the national level, net food importers with a low GDP are most vulnerable to food price shocks, because they are dependent on international markets to ensure food security for their population and therefore bear the brunt of high prices. Compared to net importers, net exporting countries often can react faster to higher prices due to a higher agricultural GDP. For food producers in net importing countries it takes more time and effort to adjust, so they do not benefit that much from high world market prices for their products.

Low-income countries are hit harder by a price crisis than middle-income countries, because of little resilience and financial capacity to absorb the impacts of higher import costs. Moreover,

international food inflation puts pressure on public expenditures which are often already low in low-income countries. Hence, the means of governments to protect their population from high food prices, for instance by food programmes, also become more limited.

Two additional factors of importance are (civil) conflict and oil exports. If a country is involved in a conflict, the negative effects of increasing global prices are exacerbated because of depletion of the domestic agricultural sector, declining public expenditures and general instability and problems in food access. Again, this effect is much stronger for low-income countries than for middle-income countries.

On the contrary, if a country is a net oil exporter, the negative effects of increasing global prices are less grave because these countries have a more favourable current account balance. Theoretically, they have more financial capacity to cope with increasing food import costs and may see an improvement in their terms of trade when oil prices rise simultaneously with food prices.

Many countries in SSA are net cereal importers, have a low GDP and conflict also occurs rather frequently, altogether making the region vulnerable to negative impacts of global food price increases.

At the domestic level, the comparisons in vulnerability to food inflation and the risk of food insecurity among population groups are less clear than at the international level.

In theory, the rural net producers are the least affected by price rises whereas the urban net consumers are the most harmed, but in practice there are many ifs and buts which make it hard to compare the final effect on food security of the different groups. On the one hand, the rural population is generally the poorest among the poor, so these households are more likely to be food insecure because poverty decreases access to food. On the other hand, many rural households are also producers and are at least partly self-sufficient, thereby increasing their direct access to and availability of food. Rural (marginal) producers may be more flexible and have more means of substitution in light of expensive imported foods, but very few of them actually benefit from high prices because of market-, production- and adjustment constraints. Food production can be approached as an opportunity and increased flexibility, but in many cases it may actually be a restriction and a lack of a better way to maintain a livelihood. This perspective then stresses the vulnerability of the poorest households in rural areas.

The urban net consumers are vulnerable because they are more dependent on (international) market prices and generally have no opportunities to be self-sufficient. However, on average they are less poor and more influential than rural households and they tend to benefit more from pro-poor government policies.

Hence, although the results of these comparisons are very ambiguous it can be concluded that landless households and (informal) wage labourers are hit hardest by increasing food prices, because they have the least opportunities to substitute and/or somehow gain from higher prices. This might be exacerbated in rural areas because initial poverty is the highest there.

## 5 The role of price transmission in the impact of food price fluctuations on household food security

### 5.1 Introduction

To study the household impact of international food price fluctuations, it is important to examine price transmission from world markets to domestic markets. Price transmission can be described as the effect of price fluctuations in one market on prices in another market and is mostly measured in terms of transmission elasticity (Minot 2010). Transmission elasticity is the percentage change of a price in one market given a 1% change in another market.

The degree of price transmission from international markets to domestic markets is important for the food security situation of households in a certain country, because the prices on local markets determine decisions made about consumption and production of food.

A high degree of price transmission may lead to the 'import' of high and volatile international prices to local markets (of course, if international prices are low and stable, this trend is also imported). As already concluded in earlier chapters, food price fluctuations often do not have a clear-cut positive or negative effect on a population, but high price volatility is generally an undesirable phenomenon. Volatility increases uncertainty, risk and distrust, especially among producers, and hinders efficient decision making. Domestic prices for staple foods in SSA are generally more volatile than for other products, because markets for staple foods are relatively thin. Many (small-scale) producers sell only a small part of their production and adapt their sales to actual prices, expectations and total harvest. The flexibility of marginal producers and consumers combined with the inelastic demand and supply for staple foods leads to an instable market. Small changes in harvests, food stocks, government policy and also future expectations can have large influences on the market prices and food security (HLPE 2011).

Hence, the desirability of price transmission leads to a dilemma because on the one hand, international prices can serve as a stable buffer when local prices are volatile. On the other hand, a low degree of price transmission forms a protection against volatile international prices (Rapsomanikis 2009). Many governments choose to protect their domestic markets to prevent price transmission and keep prices stable, because they fear higher volatility due to international price fluctuations. Especially after 2006, when high prices and high volatility characterised the world food markets, many changes in policies and interventions were made by governments. The intended and unintended effects of these policies and other factors influencing price transmission will be studied in section 5.4. Before doing so, the concepts of price transmission and market integration will be explained in more detail in section 5.2 Afterwards, the actual measured price transmission during the food crisis in various SSA countries will be examined and described in section 5.3.

### 5.2 Defining price transmission

Price transmission is perfect or complete when price fluctuations of any commodity in market A are exactly reflected in market B. Perfect price transmission occurs almost immediately (transmission only takes the time for the commodity to be transferred from A to B) and indicates efficient markets (Keats, Wiggins et al. 2010).

Where there are trade flows between efficiently functioning markets, prices will fluctuate along the same pattern due to spatial arbitrage (Comesa 2010). Spatial arbitrage occurs when traders buy products in low-price markets and sell them in high-price markets. This process reduces the price difference between markets, which should on the long term be equal to the cost of transferring the commodity. If the transfer costs ( $c$ ) are larger than the price difference between markets, there will be no trade ( $c > P_A - P_B$ ). Without trade, there is no market integration and there will be no co-movement of prices, unless the different markets are both linked to the same third factor (e.g. production seasons or the price of another commodity) (Comesa 2010).

The degree of price transmission is very dependent on spatial arbitrage and the integration of markets, which reflects the interaction between markets of different goods and locations (Kodwo Ansah 2012). Market integration can refer to spatial, vertical (different levels in a production chain) or cross-commodity integration, but the focus in this chapter will be on spatial integration. Market integration is generally encouraged because it fosters competition and efficient decision making by consumers and producers (Kodwoh Ansah 2012).

The opposite of integrated markets are isolated markets, without trade and therefore also without price transmission. According to Abdulai (2007), isolation of markets decreases efficiency because price information in such markets is inaccurate and producers' decisions are distorted.

Of course, most markets are somewhere between perfect integration and complete isolation: markets do not function perfectly efficient and prices are passed through between markets, but not completely. This phenomenon is also called asymmetric price transmission (APT) and occurs in different forms.

Meyer and Von Cramon-Taubadel (2004) define three criteria to classify asymmetric price transmission:

1. Asymmetry of the speed versus the magnitude of price transmission. If the speed of price transmission is asymmetric, it means that a change in  $P_A$  leads to the same change in  $P_B$ , but only after a certain period of time. If the magnitude of price transmission is asymmetric it means that a change in  $P_A$  leads to a change in  $P_B$ , but not by the same amount. This phenomenon is also called incomplete price transmission.  
A combination of speed and magnitude asymmetry is also possible: price adjustment is slow and incomplete.
2. Positive versus negative price transmission. Positive asymmetry refers to a situation where price transmission from  $P_A$  to  $P_B$  occurs faster or more complete when  $P_A$  increases than when  $P_A$  decreases. For negative price transmission the opposite occurs, so  $P_B$  reacts faster or more complete when  $P_A$  decreases.
3. Vertical versus spatial price transmission. When APT affects vertical price transmission, it occurs in a food or production chain. For instance, when wholesale prices are not completely transmitted to retail prices for the same product. In the case of spatial price transmission, APT occurs in spatially separated markets. For instance when there is a time lag in the adjustment of domestic prices to world prices for the same product.

In this chapter the focus is on price transmission of staple food prices from international markets to domestic markets in SSA countries, so on spatial rather than vertical price transmission. During the 2008 food crisis, APT regarding speed and magnitude did play a role, but because the focus is on price increases, the difference between positive and negative transmission is not taken into account.

Minot (2010, p. 6) has listed common factors which inhibit market integration and price transmission. In fact, all factors are real-world violations of the perfectly competitive market:

- Very often, imported products and local varieties are not homogeneous because of quality differences and consumer preferences. If the different varieties are imperfect substitutes, different prices are charged. The prices may move together and be partly transmitted, but not perfectly. This situation is applicable in several African countries where the local white maize variety is preferred to the internationally traded yellow maize (Rapsomanikis 2009). In this case, household food security is more dependent on domestic food price fluctuations (for the local variety) than international price fluctuations.
- In some markets, not all traders are small price-taking players. There may be a small number of traders with market power who transmit international price increases but impede the pass-through of price decreases (positive APT).

- Traders, producers and consumers might not have perfect information on price developments in other markets. This inhibits spatial arbitrage to level prices in different markets and thereby impede price transmission.
- Trade often does not occur instantly, especially international trade, to landlocked countries and remote areas. It takes time for imported commodities to arrive in the domestic market and this causes time lags in the transmission of international prices to local markets.
- In practice, many (SSA) countries implement policy barriers to trade at their borders, restricting international trade and reducing and delaying price transmission.
- Transaction costs in general and transportation costs specifically reduce international price transmission. This is particularly true for staple foods, where transport costs are relatively high compared to the commodity value, and for SSA, where transport costs are high due to poor infrastructure and large distances.

The last two points on trade policy and transport costs will be discussed in more detail in section 5.4. An additional factor preventing world price transmission to domestic markets pointed out by Keats, Wiggins et al. (2010) is the fluctuation of exchange rates. Due to the depreciation of the dollar during the 2008 food crisis, some countries experienced lower price increases in their domestic currency than the price increases on the world market.

The concept of price transmission and the factors influencing it can be summarized as follows:

- $\Delta P_w \rightarrow \Delta P_d$  (price transmission from world market to domestic market)
- $\Delta P_w \rightarrow \Delta P_d + X$  (an exogenous factor X affects  $P_d$ , but as long as X is constant, price transmission continues)
- $\Delta P_w \rightarrow \Delta P_d + \Delta X$  (exogenous factor X fluctuates independently from  $P_w$ , thereby breaking the direct link and transmission from  $P_w$  to  $P_d$ )

( $P_w$  = world market price,  $P_d$  = domestic market price, X = exogenous factor)

For example, if markets are integrated and X is transport cost, prices are, to a certain extent, transmitted from the world market to the domestic market. However, when the cost of transport changes independently from  $P_w$  (for example due to rising fuel prices or a deterioration of infrastructure), market integration and price transmission are reduced or even entirely abolished.

### 5.3 Evidence of price transmission

Results on price transmission in SSA are ambiguous and differ per study. Minot (2010) has done research among 83 food prices in twelve<sup>5</sup> SSA countries during 2007-2008 and found an average increase in food prices of 63% in USD, which represents 71% of the price increases in international markets. There was a lot of variation between countries and the increases ranged from 25% in South Africa to over 100% in Ethiopia and Malawi.

The study showed a clear difference between landlocked countries and coastal countries. Almost all the landlocked countries had price increases above the average while almost all the coastal countries were below the average (Minot 2010). One potential explanation for this difference is higher transportation costs and this topic will be explored further in section 5.4.

Next to variation among countries, price increases also varied between commodities. On average, prices increased most for the three main staple foods (maize, wheat and rice) and much less for other African staple foods such as cassava (Minot 2010). This variation is related to the degree of tradability of a commodity. Maize, wheat and especially rice are traded much more within SSA and with other regions than the typical African food crops and hence are much more affected by international price fluctuations.

<sup>5</sup> The 12 countries included in Minot (2010)'s research are Cameroon, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Senegal, South Africa, Tanzania, Uganda and Zambia.

Considering price transmission, the result of Minot's (2010) research was that a median level of 54% of an increase of international food prices was transmitted to domestic prices in the twelve African countries. This 54% value is based on a median price elasticity of 0.54. It is different from the average 71% mentioned earlier because it is based only on the few domestic prices in the study which show a long-term significant relationship to world market prices, whereas the 71% is based on general observations of recent price increases (Minot 2010).

This 54% is higher than the average transmission to Asian markets, where about one third of the food prices is transmitted (HLPE 2011), but again there is a lot of variation between countries and commodities. A summary of the data found by Minot on domestic food price increases per country and commodity can be found in tables 5.1 and 5.2 respectively.

**Table 5.1 Summary of food price increases by country**

Country	Nbr of price series	Increase in domestic price (in US\$)	Increase in domestic price as a pct of the increase in world price
Cameroon	18	32%	32%
Ethiopia	6	119%	174%
Ghana	3	32%	39%
Kenya	10	57%	69%
Malawi	9	127%	158%
Mali	4	55%	53%
Mozambique	4	69%	78%
Rwanda	3	54%	54%
Senegal	17	60%	50%
South Africa	3	16%	25%
Tanzania	3	75%	78%
Zambia	3	52%	73%
Average or total	83	63%	71%

Source: Minot (2010, p. 21)

**Table 5.2 Summary of food price increases by commodity**

Commodity	Nbr of price series	Increase in domestic price (in US\$)	Increase in domestic price as a pct of the increase in world price
Beans	9	41%	45%
Cassava	5	12%	13%
Maize	26	87%	112%
Millet	5	43%	62%
Plantains	2	9%	9%
Rice	24	62%	41%
Sorghum	4	56%	81%
Wheat	7	65%	111%
Average	83	63%	71%

Source: Minot (2010, p. 22)

Minot (2010) concludes with his trend analysis that African domestic food prices seem to move together with international prices as they have followed the fluctuations during the food crisis, although with a slight delay. However, the econometric analysis carried out in the study shows very few statistically significant relationships between domestic and international prices on the long or short term. Different explanations are offered for the disparity between these two observations on price transmission. The 'coincidence' of the co-movement of African prices with international prices may be caused by a combination of exogenous factors: high fuel costs leading to increasing transport costs, export restrictions and inflationary processes. Moreover, there may be difficulties with measuring small effects of international prices, especially when coinciding with domestic supply changes (Minot 2010).

Findings from a study by Rapsomanikis (2009) confirm Minot's (2010) trend analysis and suggest co-movement of SSA domestic prices with world market prices on the long term, although price adjustment is generally incomplete and takes 3 to 9 months.

Both studies draw the conclusion that international food prices generally are transmitted to African domestic markets, but transmission occurs asymmetrically and is often hard to measure because of many other (exogenous) factors interfering and impacting on price transmission. This variety of factors and especially the impact of domestic policy will be examined in section 5.4.

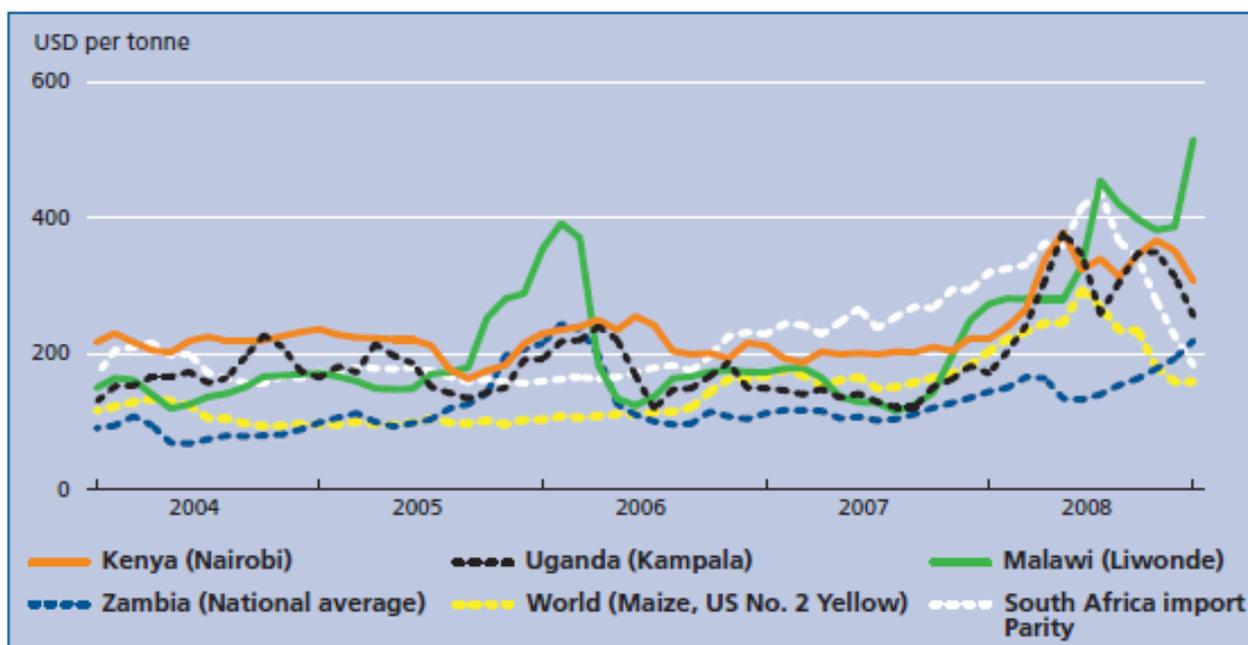
#### *The special case of African maize markets*

An interesting finding of Minot's (2010) study was the clear difference between maize and other commodities with respect to market integration. Whereas half of the domestic rice prices are significantly related to world market prices, this is only 10% for maize prices. This resembles low market integration for maize. An explanation for this difference is the fact that (African) markets for maize are much thinner than the ones for rice and that many countries have a policy of domestic self-sufficiency regarding maize production. Hence, there is relatively little international trade in maize, whereas several SSA countries depend heavily on international trade to satisfy domestic rice consumption.

As a result, price transmission and dependence on international markets for maize is low. Nonetheless, the average domestic price increases were observed to be highest for maize and rose even more than the average international market price (see table 5.2). Based on a study of domestic and international prices between 2004 and 2008, Rapsomanikis (2009) also concludes that maize markets are integrated and co-movement of prices is moderate to strong for yellow maize markets in South Africa, Kenya, Malawi and Zambia. Maize price developments in 5 African markets and the world market are shown in figure 5.1. Indeed, it can be concluded from this figure that African and world market maize prices have followed roughly the same trend since 2006 and 4 of the 5 African prices spiked even above the world price in 2008. The latter can possibly be explained by large domestic maize price increases in many countries due to domestic factors such as supply shocks and trade policy, rather than international factors.

Keats, Wiggins et al. (2010) also recognize the extraordinary developments in African maize markets during the 2008 food crisis. Prices in most other food markets in the world were passed through, but not completely, so domestic prices did not spike as high as world market prices. In some SSA countries however, the increasing world prices may have been exacerbated by fluctuating local supplies in thin markets, government interventions, high fuel and fertilizer prices and speculation (Keats, Wiggins et al. 2010).

Figure 5.1 Maize prices (January 2004 - November 2008)



Source: Rapsomanikis (2009, p. 30)

#### 5.4 Domestic factors affecting price volatility and price transmission

As concluded, domestic food price variability in African countries is partly caused by the transmission of international food price variability. However, in many cases there are more factors causing domestic food price fluctuations independently of international markets. Besides this, there are factors which (intentionally or unintentionally) impact the degree of price transmission to domestic markets. Three main factors here are (1) transportation costs, (2) governmental intervention, and (3) the quality of (market) institutions and infrastructure. These three factors will be discussed more extensively in the following subsections.

These three factors are not the only ones that play a role in domestic price volatility and price transmission. Other causes and explanations for the large variety in findings about price transmission over countries and commodities are briefly summarized below.

- High dependency on food imports and/or food aid increases the degree of price transmission (HLPE 2011).
- Price transmission is higher in countries with many possibilities and partners for international trade, in ports and other places with good market access (Comesa 2010). Hence, price transmission is generally higher in coastal countries compared to landlocked countries.
- Domestic food production patterns are important because a country can be (close to) self-sufficient in e.g. a major staple food like maize and thus not be involved in international trade for this commodity. In this case, price transmission from international markets is lower and the effects of domestic production on price volatility are higher.
- Domestic shocks in demand and supply, for example due to seasonal change, weather shocks or conflicts, have a large effect on domestic food price volatility for locally produced commodities. Especially for staple foods, such events have a large impact on prices because markets in SSA countries for these commodities are generally thin.

### **5.4.1 Transportation costs**

Transport costs may have an impact on price transmission to domestic markets and (partly) explain the higher degrees of transmission in coastal countries and in areas close to ports compared to landlocked countries. Transportation is also a part of Minot's (2010) explanation for the disparity between the findings of his trend analysis and his econometric analysis of price co-movement.

First, transportation costs lower price transmission (Rapsomanikis 2009). High transportation costs create wide margins around the world market price. Within these margins, trade does not take place because the transport costs are higher than the price difference between markets and spatial arbitrage is not profitable (Minot 2010). In such isolated markets, prices are not passed through. Even if trade does take place despite high transport costs, price transmission is often limited. Weak infrastructure and communication inhibit or delay market integration and the pass-through of price signals. Hence, adjustment to international food prices by local producers and consumers in remote areas only occurs partly and slowly because of the time lag.

Secondly, according to Minot (2010) and Rapsomanikis (2009), transportation costs increase domestic prices of tradable commodities in landlocked countries and remote areas. Of course, normally this should not lead to higher price increases in landlocked countries than coastal countries when international prices rise, because the relative price of transport costs compared to the commodity price would stay the same. However, in the last decade fuel prices rose simultaneously with food prices, thereby greatly pushing up transportation costs and local market prices of staple foods further inland. Therefore, price increases in the last decade have been exacerbated in landlocked countries (Minot 2010).

These effects can be linked to the difference in food prices between rural and urban areas that was mentioned in section 4.3. According to Rapsomanikis (2009), rural households often do not notice much of fluctuations in the world market price for food because of limited market integration, lacking communication on price information and slow, incomplete price transmission. Regional – and household self-sufficiency in food consumption also reduces dependence on international food markets in rural areas. Compared to rural households, urban dwellers probably are impacted more by high price volatility transmitted from international markets. This does not mean that food prices in rural areas are not volatile or increasing, because local supply fluctuations can also cause price volatility.

In landlocked countries and remote areas where food imports are an important share of the total food supply, rising fuel prices have probably exacerbated the rising international food prices in the 2008 food crisis. This way, transportation costs have led to higher food prices in rural areas compared to urban areas closer to the market.

### **5.4.2 Trade and market policies implemented in SSA**

In the last decade, many different interventions and measures have been designed and implemented in SSA countries. Most food market and trade interventions have the aim to keep domestic food prices low and/or to reduce volatility as to reduce uncertainty and inefficient decision making (HLPE 2011). These measures are mostly intended for the short term, to manage the immediate implications of the world food crisis. Few long term interventions have been implemented. Examples of long term policy are investments in infrastructure and (market) institutions and research.

Figure 5.2 presents an overview of the food market policies implemented by African countries. Although there are many different types of government interventions with different effects on price transmission and domestic food price volatility, three main policy types will be discussed here. These are (1) import tariffs, (2) export restrictions and (3) market management. All three types are common practice in African countries (Minot 2010).

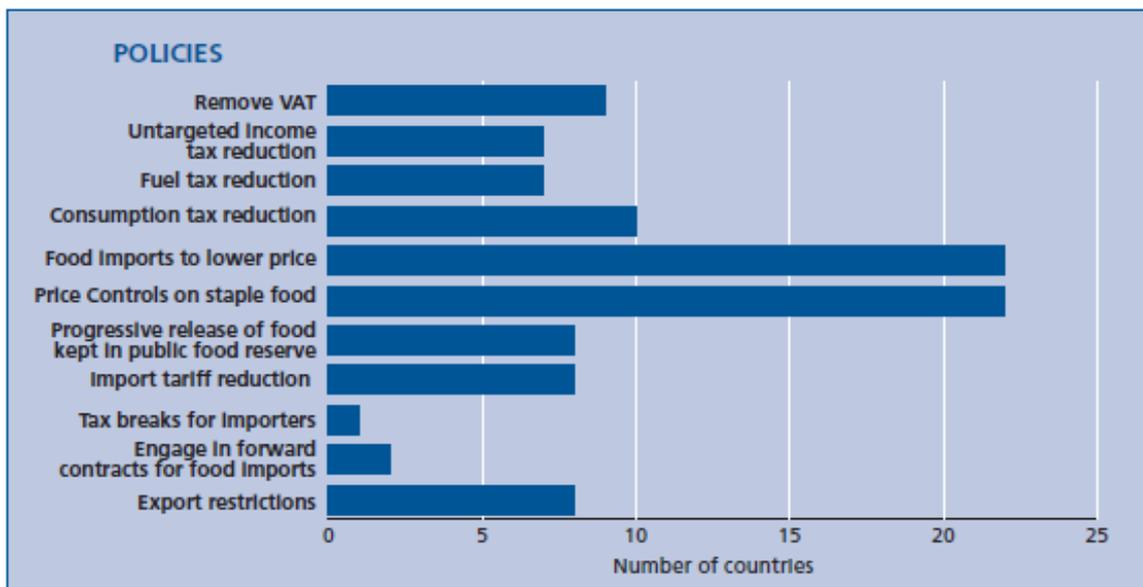
As indicated in figure 5.2, quite a few countries in SSA and other regions in the world have reduced or abandoned import tariffs for staple foods. This means that these commodities from international markets become relatively cheaper and more accessible. This measure is thus good for

consumers because of maintained purchasing power, but might be bad for producers because they lose their protection in the domestic market. Reductions of import tariffs are essentially a reduction of trade barriers and lead to more integration in the international market. Therefore, lower food import tariffs lead to more price transmission (Rapsomanikis 2009).

Export restrictions are also pro-consumer measures and in fact function as a tax for domestic producers, because they can no longer participate on international food markets where prices are higher (Minot 2010). The aim of such policy is to ensure sufficient domestic food availability, as export restrictions should increase domestic supply. Increased supply should lower prices, making food more affordable for domestic consumers. Export restrictions insulate domestic markets from international food prices and therefore lower price transmission.

The third type of government intervention in domestic food markets is so-called market management and comprises the management of public food stocks, price controls and trade restrictions (Rapsomanikis 2009). Essentially, the government becomes a more prominent player in the domestic food market, which becomes less liberalized. The aim of this policy is to keep domestic prices low and stable (by price controls), ensure sufficient food affordability and availability (by using public food stocks and government imports from international markets) and often a goal and result is also to lower price transmission (Rapsomanikis 2009).

**Figure 5.2 Food market policies implemented by African countries**



Source: Rapsomanikis (2009, p. 53)

#### *Limitations of food policy*

A problem limiting the effectiveness of market management is informal trade, which is often an important form of trade in developing countries, undermining government rules and effectiveness of policy (Rapsomanikis 2009). Next to informal trade, several other policy limitations are regularly encountered in SSA countries.

According to Comesa (2010), SSA countries with highly interventionist and ad hoc domestic food trade policy have experienced high food price volatility and low production growth. On the contrary, countries like Mozambique with more liberalized and stable food market and trade policy experienced high production growth and remarkably lower food price volatility. These observations on the effectiveness of interventions are related to some limitations of food and trade policy and its implementation, which are common and recurring in several SSA countries.

The first is the fact that this policy often comes at high costs, while the government budgets of many countries are rather limited. This leads to a dilemma, because instead of costly interventions

and market involvement, the budget could also be used for more direct expenses on poverty reduction and safety nets, for example.

Secondly, and this is especially valid for market management, policy requires mutual trust between government, consumers and producers, coordination and communication (Rapsomanikis 2009). Whether policy interventions function properly is furthermore very dependent on the quality of institutions and infrastructure in a country, which will be discussed in more detail in section 5.4.3.

Thirdly, a lack of trust and coordination, combined with the fact that very often in SSA trade policy is implemented ad hoc and unpredictably, can have dramatic and adverse consequences (HLPE 2011, Minot 2010 and Rapsomanikis 2009). The reason is that it increases distrust and uncertainty among consumers and producers, leading to risk-averse and inefficient behaviour. Because of this uncertainty, policy designed to stabilize prices can lead to the opposite effect and increase domestic food price volatility (HLPE 2011). Unpredictable (short term) policy implementation may also harm food markets and food security on the long term, as it discourages investments in agriculture by producers (Rapsomanikis 2009).

### **5.4.3 Quality of institutions and infrastructure**

Beekman and Meijerink (2010) argue that much of the outcome and effectiveness of governmental food policy is dependent on the quality of (market) institutions and infrastructure in the country. Besides this, they also have an effect on price transmission from international to domestic food markets.

Beekman and Meijerink (2010) have classified SSA countries based on the quality and strength of their institutions and infrastructure. To do so they have used criteria on corruption (Corruption Perception Index by Transparency International) and the 'doing business' ranking by the World Bank. To classify based on infrastructure they have used three World Bank Indicators on infrastructure about mobile phone subscribers, internet users and paved roads in a country. These criteria led to the classification of countries presented in table 5.3.

As shown in table 5.3, most SSA countries have weak institutions and infrastructure, while only 3 countries are in the 'solid' category. If institutions are weak it means that the (governmental, formal or informal) rules, regulations, organizations and policies do not function properly and efficiently. Causes of inefficiency can be corruption, distrust, the lack of social capital and weak infrastructure which limits communication and increases transaction costs.

Poor institutions and infrastructure reduce price transmission from international markets because they insulate domestic markets. Imperfect information, slow adjustment and time lags prevent the pass-through of price signals to local consumers and producers.

Furthermore, weak institutions and infrastructure limit the effectiveness of government policy and, in combination with instable demand and supply, can even magnify domestic price volatility (HLPE 2011). Beekman and Meijerink (2010) make some policy recommendations in their report for the different categories of countries. They suggest that in the case of soaring and volatile domestic food prices, countries with weak institutions and infrastructure should not immediately implement ad hoc food trade and market management policies. When based on poor institutions, such policies do not function effectively and may even have an adverse effect. Instead, governments should first assist their poor populations with food aid and safety nets, reduce market failures and invest in (market) institutions and infrastructure. Afterwards, when institutions and infrastructure are emerging or solid, trade policy and market interventions may be less needed, but when they are they can probably be implemented more successfully (Beekman and Meijerink 2010).

**Table 5.3 Sub-Saharan Africa country classification: market institutions and infrastructure**

<b>Solid</b>	<b>Emerging</b>	<b>Weak</b>
Mauritius a)	Gabon	Nigeria
South Africa	Madagascar	Togo
Botswana	Namibia	Equatorial Guinea
	Cape Verde	Benin
	Kenya	Burkina Faso a)
	Ghana	Cameroon a)
	Swaziland	Congo, Dem. Rep.
	Zimbabwe	Eritrea
	Malawi	Lesotho
	Sao Tome and Principe	Liberia b)
	Senegal	Mali a)
	Congo, Rep.	Mozambique
	Côte d'Ivoire	Niger
	Ethiopia a)	Sudan
	Gambia	Tanzania
	Rwanda b)	Central African Republic
	Uganda	Chad
	Zambia	Comoros
		Somalia
		Angola a)
		Burundi
		Guinea
		Guinea-Bissau
		Sierra Leone a)

a) Doing Business top reformers; b) Among 10 top reformers in the world.

Source: Beekman and Meijerink (2010, p. 77-78)

## 5.5 Conclusion

Different studies lead to different conclusions on the degree of price transmission from international to domestic food markets in SSA. Generally, it can be concluded that price transmission does occur and has been around 54% during the food crisis, but there is a lot of variation between countries and commodities. Because many SSA countries produce a large share of their own maize consumption, price transmission is much lower for maize prices compared to rice prices for example. Coastal countries and urban areas near ports generally experience higher price transmission than landlocked countries and more remote rural areas.

Analysing food price transmission to SSA domestic markets is difficult because of many interfering domestic factors (e.g. supply shocks in thin markets) which for example led to soaring domestic maize prices independent of world market fluctuations.

Moreover, price transmission is negatively affected by transportation costs and protectionist domestic trade policy such as trade barriers and export restrictions. On the other hand, it is positively affected by well-developed (market) institutions and infrastructure and liberalized trade policy.

Many SSA countries have implemented new trade policy and market interventions since international prices soared and remained volatile in 2006. The main types of interventions are reduction of import tariffs, food export restrictions and domestic food market management. Most of the government interventions aim to keep food prices low and stable domestically and thereby ensure food security and prevent uncertainty for producers.

However, government policy is often unpredictable and implemented ad hoc and this may cause the policy to be ineffective or even increase domestic prices and price volatility, especially when market institutions are weak. Also the thin markets for staple foods and instable demand and supply often lead to high domestic price volatility, regardless of price transmission and protectionist policies.

## 6 Discussion & Conclusion

In this thesis, the aim was to answer the question: “What is the impact of fluctuations in the world market price for staple foods on food security in Sub-Saharan Africa?”. In order to answer this question, firstly the recent price fluctuations and the concept of food security had to be examined and defined.

During the last 5 years, the fluctuations on the world staple food markets have been characterized by rapidly increasing prices and (still remaining) high price volatility. Worldwide, many different factors on different levels were interacting and reinforcing each other, causing a so-called ‘perfect storm’, leading to the 2008 food crisis.

According to the FAO food security is “a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO 2003, p. 28). This definition has different levels and many aspects, of which the most important for this thesis are availability and access to food. Availability affects food security at the national level, because it is impacted by domestic food production and international food trade. Access affects food security at the household level because it is impacted by livelihoods and purchasing power of individuals.

It can be concluded that Sub-Saharan Africa is the region most vulnerable to impacts of the food crisis on food security. Many countries in SSA are net food importers and are therefore dependent on international markets to ensure domestic food security. Furthermore, the high poverty rates and numerous conflicts in the region exacerbate the negative impacts and increase the vulnerability. Finally, high and volatile food prices also demand for higher public expenditures to protect the domestic population and provide national food security, while in many poor SSA countries, public administration and budgets are already limited.

When it comes to the household level, impacts of food price fluctuations are ambiguous and differ between consumers and producers as well as between rural and urban population groups.

The 2008 food price spike pushed many people into poverty, often widened the poverty gap and increased malnutrition because people can afford less and less nutritious food. High and volatile food prices decrease household food security of consumers by decreasing purchasing power. High prices are especially harmful for households and individuals spending a large share of their income on food, which is the case for many households in SSA.

On the contrary, the recent high food prices can affect household food security of net producers positively when income from agriculture and access to food increase. Price volatility, however, is also negative for producers because it increases uncertainty and hinders efficient decision-making and investment.

Theoretically, the urban net consumers are most vulnerable to food price shocks, while rural net producers are least vulnerable and may even benefit from high prices. In practice however, this is not clear-cut. Rural households are often in a highly vulnerable position because they are mostly the poorest and most marginalized group to start with. Many of these people are highly dependent on food production. On the one hand, this may serve as a buffer, more direct access to food and less dependence on volatile world food markets. On the other hand, it leads to increased poverty and vulnerability when harvests fail.

All the potential impacts of food price fluctuations on household food security are dependent on the degree of price transmission from world markets to domestic SSA markets. For some commodities, the impact of world market fluctuations on international markets seems to be limited. For example for maize, many countries are largely self-sufficient through domestic production, thus feeling mainly the impacts of domestic rather than international supply fluctuations.

Although there is high variation in price transmission between countries and commodities, it is generally concluded that (be it incompletely and slowly) prices are passed through to domestic markets. Price transmission is generally higher in countries with liberalized, open-border trade policies, coastal countries and in urban areas near ports. On the contrary, it is generally low in countries with ad-hoc interventionist trade policies and high domestic market protection, landlocked countries and rural areas. Furthermore, price transmission is constrained by weak market institutions and lack of infrastructure.

Hence, the recent price fluctuations have probably decreased access to food for many households in poor, net-importing SSA countries, thereby increasing food insecurity and malnutrition. At the same time, some larger net producers may have benefited from the high prices because of higher revenues from their production. This would have a positive effect on their food security. However, because many food producers face supply and adjustment constraints and because high price volatility also leads to uncertainty, this positive effect seems to be limited for most food producers.

Finally, the eventual extent of these impacts varies with the degree of price transmission. This may mean that although poor rural households in remote areas are very vulnerable to rising food prices, the impact of *international* price fluctuations is limited because of low price transmission.

A limitation of this literature research is the lack of (accessible) comparable on e.g. trade, food production and malnutrition for Sub-Saharan Africa since 2007. This lack of data presented difficulties in analyzing the vulnerability of countries and households, for example in terms of dependency on the world food market during the 2008 food crisis.

### **Future prospects**

Recently (summer 2012), world market prices for staple foods have risen again strongly. Droughts and failing maize harvests in the USA have led to price increases for maize, and also soy bean prices have gone up. Although this type of maize is mainly used for feed rather than food (and hence does not directly affect the world staple food market), new price spikes may again lead to faster and more extreme decisions by traders and governments, causing instability and uncertainty on the world food market.

In an interview in the Dutch television program *Nieuwsuur* (28<sup>th</sup> of July 2012), professor Louise Fresco (agriculture- and food scientist and former Assistant-Director General of the FAO) has called the situation alarming and pointed to the vulnerability of SSA. According to her, food security is threatened by rising food prices, combined with the increasing competition for agricultural land between food and biofuel production. In her point of view, SSA countries need to increase the agricultural yields by making production more efficient, leading to higher pay-offs for farmers who produce a marketable surplus. This should lead to higher local food availability and less domestic price volatility.

Another strategy to increase food security in SSA derived from the findings in this thesis is to promote poverty eradication (improving household access to food) and better coordination and communication in domestic food policies. This may decrease domestic price volatility and uncertainty for producers.

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