Food Reserves and Regulating Market Volatility in Africa

The aim of this study is to examine public food storage systems in developing countries, particularly Africa. In which context is it pertinent to set up one type of stock over another? What conditions have to be met to ensure the institutional and economic feasibility of this type of instrument? How can undesirable effects be avoided?

To answer these questions, this report is based on the current status of theoretical debate, a review of the evolution of public storage systems and the teachings from three national case studies (Ethiopia, Burkina Faso and Egypt). The analysis emphasizes the real and theoretical role of stocks in the management of different types of risk with which households are confronted. Buffer stocks, in principle, make it possible to act on product price and in so doing stabilize the revenue of producers and consumers. However, their efficacy depends strongly on the technical, financial and institutional resources of public authorities. Emergency stocks, which are part of the range of social security nets, are theoretically capable of supporting vulnerable households in the face of all types of shocks, but their efficacy is also very much linked to available resources.

This publication comes at a time when the question of public stocks is also high on the agenda of the ninth ministerial conference of the WTO (December 2013. Bali).

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Past issues in the collection (see page 191)

[ Foreword ]

The analyses and conclusions presented in this document are the authors’ alone. They do not necessarily reflect the positions of the AFD or FARM.

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Contents

Executive Summary 5

Introduction 11

1. Current Status 15
   1.1. Renewed Interest in Public Food Stocks in Developing Countries 16
   1.2. The Issue of Stocks 21
   1.3. The Debates on Buffer Stocks 26
   1.4. Debates on Emergency Stocks 50
   1.5. Conclusion 57

2. Case Studies 61
   2.1. Ethiopia Case Study 62
   2.2. Burkina Faso Case Study 86
   2.3. Egypt Case Study 111

3. Implications For Decision-Makers 133
   3.1. The Position of Stocks Among Risk Management Instruments 134
   3.2. Decision-Making Assistance to Analyze Stock Relevance 136
   3.3. Decision-Making Assistance to Analyze Public Storage Systems’ Feasibility Conditions 147

Overall Conclusion 163

Acronyms And Abbreviations 169

References 173
Executive Summary

Background

One of the consequences of the increased volatility of international prices starting around 2005 is found in the renewed debate on the (national, regional and international) agricultural and food market regulation policies. It is against this backdrop that public storage systems have been placed under the spotlight, notably because of the many different roles assigned to them. Indeed, a public stock can be intended to fight price drops or hikes or stabilize prices within a price band. It can also (or alternatively) be destined to mitigate the effects of price spikes, production drops or conflicts on the most vulnerable households. Finally, it can correspond to a determination to secure a country’s supply when the regional or international context is deemed unstable. The question of stocks is, in this way, an important component in the debates on risk management policies, whether these risks are related to price shocks or other types of shocks.

Study Objectives

Given both the intensity of these debates and the requests by several African countries that the AFD fund storage infrastructures, FARM (Fondation pour l’agriculture et la ruralité dans le monde) and the AFD decided to launch production of the present study together. The objective assigned to this study is twofold: (i) provide an overview of current theoretical debates and recent policy changes when it comes to public storage of agricultural products; and (ii) elaborate a framework of recommendations for decision-makers in developing countries and their partners involved in preparing or setting up public storage systems.

Terminology

There is no one, single, unanimously utilized classification of types of stocks. The diversity of terms used reflects the diversity in the main functions assigned to the stocks according to national context; the terminology has also evolved over time. Based on an examination of the literature and the lessons drawn from case studies, the present study distinguishes between four main types: (i) private stores; (ii) public buffer stocks, one of the instruments used by states to protect producers from exceptionally low prices
Executive Summary

and consumers from exceptionally high prices; (iii) public emergency stocks, which can limit food insecurity among vulnerable populations in the case of sudden drops in food availability and/or purchasing power; and (iv) strategic stocks that allow countries to protect themselves from possible supply ruptures on the international market.

What problems can public storage systems address?

Among researchers and policy-makers, there is currently a fairly broad consensus that one of the main goals of public action in developing countries must be to lessen the hazards that weigh on household activity systems. Because of their low incomes, these households are very risk averse. If they have no private, collective or public way of lowering income fluctuations, agricultural households will limit their agricultural investments and favor self-consumption, which can help drive up agricultural price volatility on domestic markets. In the event of a shock (supply rupture or price hike, for example), urban households (and net buyer households in rural areas) will be led to lower their food consumption, thus affecting their food and nutrition security.

When market mechanisms (futures contracts, harvest insurance, credit instruments, mutual health insurance schemes, etc.) can cover all risks facing households, then market equilibrium is optimal and public intervention is not needed. When this is not the case, the public authorities can intervene in two ways: first, by developing social safety nets to cover vulnerable populations (that do not have the means to obtain private risk coverage instruments) and “disaster” and “systemic” risks; and second, by acting to reduce the incidence of certain risks, notably price risks. In the latter case, the range of possible interventions is fairly broad: financing the infrastructures necessary to drive trade, supporting private storage, and acting directly on prices (tariff and non-tariff measures, domestic price control, supply volume regulation, etc.).

The relevance of public storage systems may be analyzed in light of this issue of risk management. In principle, buffer stocks allow one to influence the price of the products stored directly and thereby stabilize incomes and food budgets for households. Emergency stocks, seen as belonging to the range of social safety nets, are theoretically able to respond to all types of shocks within the limits of their size and the time needed to rebuild them. As for strategic stocks, they are mainly designed to mitigate the effects of political shocks.
In terms of decision-making assistance, the analysis of the relevance of public storage systems cannot easily be dissociated from that of their feasibility.

Based on the literature and the results of three case studies (Ethiopia, Burkina Faso and Egypt), it seems that these two analyses are closely linked and depend primarily on context.

Indeed, when it comes to buffer stocks, the competitive storage model (the analytic framework of reference in this area) can highlight a certain number of potential drawbacks (notably the eviction of private stores), but it is difficult (even impossible) to apply it to concrete situations because it is based on highly restrictive assumptions, particularly when applied in developing countries. However, academic writings on the subject and the review of past experience show that, in the face of significant price risk, the issue of the public authorities’ (financial, institutional and technical) resources is decisive in the effectiveness of buffer stocks.

When it comes to emergency stocks, while their legitimacy is rarely questioned, the decisions as to their size and nature (physical and/or financial reserves) are, also, very dependent on the type of risk to cover and the resources available to public actors.

**Public Buffer Stock Effectiveness Conditions**

Public buffer stocks are easier to set up and less costly for importer countries where agricultural productivity (in which access to production factors is a major condition) has room to improve. In this case, it is possible to favor a substantial increase in harvests. The floor and ceiling prices must then be set in reference to smoothed import (for the floor price) and export (for the ceiling price) parity prices. The price band thus defined must be sufficiently wide to minimize the eviction effect on private storers. However, it must not be too wide or it will not have a stabilizing effect and storage costs will become too high.

Buffer stocks, when relevant, must meet fairly restrictive conditions to fulfill their purpose. These are notably: availability of sufficient financial resources; existence of efficient information systems; control over import and export trade flows; transparent governance ensuring that the policy is predictable and credible; and measures taken to lessen inequalities in market integration and endowment with production factors.
In the debates on buffer stocks, the consequences of the possible generalization of these stocks often come up. The detractors of this type of stock insist, rightly, that without international market regulation mechanisms, if major players in markets or a large number of small countries build their own buffer stocks, then there will be a high risk of increased volatility on international food markets. The occurrence of such risk is very low in African countries (the geographic focus of this study). Indeed, African countries are mainly importer countries with very modest weight in the global food trade, with the exception of Egypt. In addition, the scenario in which they all set up buffer stocks and then all decide to temporarily cease imports to defend their floor prices when world prices are low is highly unlikely. The other scenario—i.e. an amplification of international price spikes because of a temporary export ban in all African countries that have buffer stocks (to defend ceiling prices)—is even less probable because most African countries are not (and will not be in the medium term) structural grain exporters.

Public Emergency Stock Effectiveness Conditions

The relevance of emergency stocks is rarely challenged. However, several points need particular attention when they are implemented: balanced, even connected, distribution of resources among instruments aiming to lessen structural food insecurity (social safety nets) and those destined to prevent or mitigate temporary food insecurity (including emergency stocks); the relative weight of financial and in kind reserves; coordination across the various levels of intervention, from local to regional; and the quality of information systems. Finally, the question of governance is complex because managing emergency stocks involves stakeholders whose legitimacy principles, and therefore strategies of action, differ.

Strategic Stock Effectiveness Conditions

The need to set up strategic stocks seems limited to very specific situations (high level of dependency on imports combined with high risks of ruptures in external flows). When a government decides to create such a stock, it is important to conduct actions simultaneously to increase the population’s confidence in supply stability so as to optimize stock size.

[1] Egypt, the world’s largest wheat importer, is a special case. Given the weight of imports in the country’s total food consumption, the hypothesis of a temporary stop to imports does not seem plausible (even to defend a possible floor price).
Executive Summary

Is it time to abandon the excessively strict dichotomy between the various types of stocks?

In many African countries, the borders between buffer stocks and emergency stocks are not, in practice, as distinct as the theories would imply. However, assigning a plurality of objectives to any given instrument does not seem to result in greater effectiveness.

Analysis of specific cases, as part of the present study, and of other research shows that it is ultimately not very realistic to ask emergency stocks to play a role in regulating prices. The main reason for this is that the volumes—and therefore financial resources—involved are not the same. In addition, trigger criteria and intervention methods are different.

In many African countries, conditions do not currently seem to be in place\(^2\) to allow buffer stocks to be set up that could act effectively. Yet, this does not mean that governments absolutely cannot work to foster better market operations. “Temporary” regulation can in part be accomplished through (national and in some cases regional) border instruments, taking into account both commitments and latitude for action in trade agreements and within the World Trade Organization. Above all, public action can focus on improving the “structural” performance of domestic markets (facilitating trade, lowering transaction costs, limiting oligopolies, etc.). Food insecurity reduction instruments can in this way play a role to facilitate markets by, for instance, strengthening market information systems or segmenting calls for tender launched during technical rotations in emergency stocks.

In other words, since the conditions for establishing a buffer stock in the short or medium term seem to be present in few African countries, it is possible—and even desirable—to seek optimal integration of food insecurity reduction instruments, including emergency stocks, with the aim of improving the performance of agricultural and food markets.

\(^2\) At least on the national scale. In some cases, it is possible that the (financial, institutional and technical) resources needed could be mobilized regionally.
Introduction

The question of staple food reserves has always been a major concern for states, from Ancient Egypt’s Middle Kingdom to contemporary nation-states. Nevertheless, a mere ten years ago, it would have barely been conceivable to conduct a study on the interest of public storage policies as a way to regulate food markets. Indeed, from the 1980s to around 2005, there was a relatively strong international consensus that the public authorities should abstain as much as possible from intervening in the price formation mechanisms of agricultural and food markets. In other words, the coordination of agents by a market arising from the “free” interaction of supply and demand was seen as the optimal way to foster growth in the agricultural sector and ensure people’s food security.

Starting in 2006, international price volatility and, above all, the price spike in 2007/2008 significantly changed the terms of the debate. Indeed, these events shed light on the extent to which international markets could now run riot. This situation, unseen for roughly thirty years, was the result of a combination of several factors, notably: the lack of a country acting as international storer; the financialization of agricultural markets; the speed at which demand in emerging countries is growing; the competition between food and non-food uses (energy mainly) for agricultural produce; etc.\(^3\) In addition, since the early 2000s, the idea that agriculture drives growth and poverty reduction in many developing countries has progressively taken root.\(^4\) It was in this context that the issue of the relevance and feasibility of price stabilization policies returned to center stage. This issue was advanced by leaders of developing countries, anxious to find a solution to the strong social tension created by price fluctuations on their domestic markets. It was also relayed in international arenas, in particular the G20 during the French presidency in 2011, and the FAO Committee on World Food Security (CFS). In addition, the multiplication of food crises in recent years (particularly in the Sahel and the Horn of Africa) have focused greater attention on instruments to prevent and manage such crises, including emergency stocks.

\(^3\) As we shall see in Section 1 of this study, price volatility on international food markets has been researched extensively since 2008. However, while researchers agree, more or less, on which factors led to the situation, no consensus has emerged on the respective influence (or importance) of these factors.

Accordingly, we see a recrudescence of research on food markets and the formulation of diverse proposals aiming to improve how these markets operate. However, until now, consensus within the international community on which measures to take has been minimal. It mainly covers the establishment of an information system (AMIS) and a warning and coordination mechanism in the case of strong market tension. What is more, believing that one must not intervene directly on price formation mechanisms, most donors think that support for public storage policies in developing countries must be limited to emergency stocks as food crisis risk response instruments.

In the face of this stance by the international community, various developing countries are trying to regulate their food markets more fully. In many cases, storage is one of the instruments that the public authorities intend to promote on the local, national or regional scale. For instance, several African countries have asked the AFD to finance storage infrastructures and provide technical support to manage these infrastructures.

Objectives and Expected Outcome

In this context, the AFD and FARM decided to commission a study that could formulate specific recommendations on the issue of public storage and its feasibility conditions based on the current state of affairs.

Based on the terms of reference, the main expected outcomes were as follows:

- production of a report outlining the current state of theoretical discussions and recent policy shifts on public storage of agricultural products;
- discussion of the feasibility of combining storage and other public policy instruments aiming to improve food security and/or stabilize prices for agricultural goods;
- examination of the policy feasibility of implementing such instruments by developing countries, as well as donors’ support, in the framework of existing trade agreements and in light of international policy negotiations;
- production of three case studies on African countries (Burkina Faso, Egypt and Ethiopia) to analyze the conditions needed to set up pro–public storage policies; and
• proposal of a framework of recommendations, public actions, and support for national and regional, institutional and professional partners in developing countries involved in examining or setting up storage systems.

Method

The method used relied primarily on analyzing a very large body of documentation. This documentation was comprised of academic research, various studies for the preparation or assessment of policies and instruments (“gray literature”), and positions taken by public institutions. This bibliographic summary made an initial distinction, present in much of the research, possible between buffer stocks whose purpose is to act on prices, and emergency stocks that aim to prevent food crisis risks. Given the intensity of the controversies on the subject and, consequently, the abundance of writings available, this bibliographic summary places more emphasis on buffer stocks. It notably benefited from the state of the art report produced as part of the study recently conducted at the request of the French Ministry of Agriculture (Gérard et al., 2012).

The second stage was the production of studies in three African countries whose public storage policy “profiles” were relatively diverse: Burkina Faso, where public stocks aim more to prevent food crises based on relatively strict triggering mechanisms; Egypt, where public stocks—which are considerable in volume—make up one tool in a policy of very strongly administered prices spanning production through imports to consumption; and finally, Ethiopia, whose public stocks are, primarily, part of a social safety net policy for vulnerable populations and where the government recently announced that it intended to use public stocks to help regulate agricultural product prices. These case studies were preceded by the elaboration of an analysis grid aiming to gather key information on the official policies and their real outcomes and by so doing facilitate later comparative analysis of storage policy feasibility conditions.

The third and final stage focused on drawing up the lessons to be learned from the desk review and case studies with an eye to decision-making assistance for both the authorities of developing countries and their technical and financial partners.

Each of these stages was marked by close interaction between the team in charge of the study and the Steering Committee. In addition to the representatives of the institutions commissioning the study, the committee brought together representatives of other
Introduction

French government bodies, research institutes, and socioprofessional organizations. This work also benefited from the active involvement of AFD agencies in Cairo, Addis Ababa and Ouagadougou when preparing and following up on the case studies.

Report Structure

The final study report, the writing of which was coordinated by Raphaël Beaujeu (IRAM) and Jérôme Coste (IRAM), is organized in three major sections:

- The first—the current status of the debates—corresponds to the desk review. After a review of the issue of stocks, this section discusses the debates underway on buffer stocks and emergency stocks. It concludes with a presentation of the risks associated with public storage policies as identified in the literature studied. This first section was prepared by Françoise Gérard (CIRAD) and Raphaël Beaujeu. It received detailed feedback from Johny Egg (INRA), Franck Galtier (CIRAD), Christophe Gouel (INRA), and Peter Timmer (Harvard University).

- The second section consists of summaries of the three case studies. Burkina Faso was studied by Raphaël Beaujeu and Salifou Konaté. The policy analysis for Ethiopia was conducted by Henri Leturque (IRAM) and Gezahegn Ayel. Finally, Egypt was examined by Roger Blein (ISSALA), Pierre Rayé (IN VIVO), and Galam Siam.

- The third section—implications for decision-makers—is divided into two sections. The first analyzes the relevance of public buffer stocks, emergency stocks and strategic stocks respectively. The second sets forth the (institutional, political and technical) feasibility conditions for implementing public storage policies. This section was prepared by Raphaël Beaujeu and Jérôme Coste in close conjunction with the authors of the case studies.

[5] The members of the Steering Committee are: Claude Torre (AFD), Jean-Rene Cuzon (AFD), Jean-Christophe Debar (FARM), Mathilde Douillet (FARM), Damien Barchiche (French Ministry of Foreign Affairs - MAE), Pierre Claquin (French Ministry of Agriculture, Food and Forests, MAAF), Valerie Vion (MAAF), Marine Renaudin (MAAF), Nicolas Bricas (Centre de coopération internationale en recherche agronomique pour le développement - CIRAD), Arlene Alpha (CIRAD), Alexandre Gohin (Institut national de la recherche agronomique - INRA), Bernard Valluis (Association nationale de la meunerie française, ANMF).
1. Current Status

This review of the current status of the debates on public storage policies is organized in four sections: the first provides a rapid overview of changes in public food storage policies in developing countries; the second section draws a connection between storage systems and the overall issue of risks that affect households; the third and largest section provides the most complete report possible on the debates around public buffer stocks; and the fourth and final section discusses the debates surrounding emergency stocks.

Given the diversity in the terms encountered in the literature and used by operators, Box 1 discusses terminology issues and presents the terminology used in this report.

Box 1  Terminology Considerations

The generic terms “food stock” and “food reserve” cover several types of systems, each fulfilling a specific function. In addition, a stock may be called by different names for the same function (e.g., buffer stocks may, in some cases, be called “regulation stocks” or “intervention stocks”). Also, we can see that there is no one single stock classification used in a uniform manner throughout the literature on the subject.

For example, the FAO distinguishes between operating stocks (i.e., stocks held by private actors), buffer stocks and emergency reserves (FAO et al., 2011). For its part, the World Bank uses three categories in its latest report on food reserves: buffer stocks, emergency reserves, and safety net reserves whose purpose is to supply safety net programs (World Bank, 2012).

We can also note that the term “reserve” is becoming very widespread. This notion is generally used when the storage mechanism includes the holding of resources in both physical and monetary form.

Bernard Valluis (2013), for his part, proposes a more detailed classification: strategic stocks depend on defense systems; data on their volumes are not public; they can be measured in armed force consumption months. Intervention stocks are agricultural policy instruments corresponding to mandatory government purchases at minimum guaranteed prices set with the aim of protecting producers’ incomes. They are not limited in volume and the obligation to buy at a minimum price may lead to the accumulation of stores from several harvests. Buffer stocks are set up as part of national policies or international agreements; they aim
1. Current Status

1.1. Renewed Interest in Public Food Stocks in Developing Countries

1.1.1. Public Stock Policies in Africa from Independence to the 2000s

In Africa, the 1960s and 1970s—decades marked by strong state intervention in economic activity—were the “golden age” of public buffer stock systems. During this period, public offices were in charge of buying foodstuffs at low administered prices from producers, storing these foodstuffs to sell them throughout the year on the market and ensure low prices for consumers, most of whom in urban areas. The quantities and prices of imported products were also controlled. In addition, agricultural product exports were heavily taxed. Taxes on foreign trade were the main source of finance for public
1. Current Status

spending, whose level was commensurate with state intervention in the economic field. This type of policy did not generate economic growth for the new independent states and did not allow them to avoid the first serious food crisis in 1972/1973. In many cases, the interventions of stabilization boards—which discouraged production by their inability to maintain the announced intervention prices (prices to farmers too low) and accentuated the pro-urban bias in economic policies—made these policies even more ineffective. The outcome was an increasing deterioration of public finances and the balance of payments, with countries’ heightened dependency on imports.

Faced with serious public finance difficulties starting in the 1980s, African states were obliged to call on the international community for aid, especially the World Bank and IMF. These institutions made their support conditional on the application of structural adjustment programs. In addition, in 1995, many African countries adhered to the World Trade Organization (WTO). In this context, until around 2005, the agricultural and food policies of African countries were struck by successive waves of deregulation, characterized in particular by the end of administered prices for producers and consumers.

Starting in the early 1990s, the national grain offices, which had a monopoly over sales, saw their principal mission reduced to managing national emergency stocks. These stocks were no longer instruments serving market regulation policies but rather fell under the scope of national food crisis prevention and management systems, which grew considerably during this period with the support of the international community.

It is important to note that starting in the mid-1980s, donors themselves undertook a long process of deregulating their agricultural sectors, which in Europe notably took the form of a series of reforms to the EU Common Agricultural Policy (CAP). These reforms came, in part, from overproduction in several sectors, and in part from European countries’ need to fulfill their commitments in the framework of the Agreement on Agriculture signed following the Uruguay Round of multilateral negotiations (1986-1994). These deregulation processes notably led to a sharp drop in public grain stores in the United States and the European Union.

1.1.2. International Initiatives and the Debates on Public Stocks Set Off by the 2008 Food Crisis

The sharp rise in international agricultural prices in 2007/2008 and the hunger riots it triggered put the question of agricultural market regulation back on the agenda. These events revealed the need to find a coordinated global solution to the issue of food
price volatility. This question took on all the more magnitude as a new international consensus had emerged since the start of the 2000s on the agricultural sector’s key role in development. It was in this context that, in 2011, the agricultural sector was placed, notably under the impetus of France, at the center of the G20 discussions. The G20 chose the fight against commodity price volatility as one of the six main priorities to address.\[6\]

Simultaneously with the debates in political arenas, much research has been done on the causes of the 2008 price hike and the risks of greater price volatility in coming years (Abbott et al., 2008; Banse et al., 2008; Berthelot, 2008; Sarris and Hallan, 2005; Headey and Fan, 2008; von Braun, 2007). This research converges around the existence of a bundle of causes: (i) rapid growth in demand from emerging countries such as China and India; (ii) poor weather conditions in certain key producer regions such as Australia and Eastern Europe; (iii) the weakness of the American dollar; (iv) high oil prices; (v) biofuel production; (vi) speculation; and (vii) export restriction policies. Since the mechanisms at work interact with each other, it is not possible to weigh the relative importance of each factor in the price spike based on the literature.

While certain causes are controversial, most of the analyses mentioned above cite the weakness of global stocks (public—in particular due to reforms in the main exporting countries in compliance with WTO commitments—but also private) and agree on the fact that speculation has sometimes exaggerated market reactions (Gérard et al., 2012). But the low level of stocks is a twofold symptom. First, it seems to show that private operators were nowhere close to having predicted such a possible price change, otherwise they would have held stocks and turned a large profit.\[7\] Second, it reveals a long-term imbalance between supply and demand trends. This episode also reminds us that international agricultural product markets are likely to be highly unstable, subject to feverish periods and even panics.

Experts also agree on the probability that markets will be more unstable in the coming decade because of a combination of several factors, in particular: climate change; the imbalance between supply and demand arising from low investment in agriculture over the past 25 years (World Bank, 2008) combined with strong population growth in certain parts of the world; greater pressure on natural resources; and competition between agrofuels and food crops for the use of production factors.

\[6\] See G20, 2011.

\[7\] Even if private operators were able to avoid prediction errors, low stock levels would still be possible if there were several poor harvests in a row.
1. Current Status

Accordingly, the relevance of public stocks as instruments to manage price volatility is once again front and center on the international stage. The recent positions taken by international organizations and expert groups mobilized on this subject are

Table 1

Summary of Positions on Public Stock Policies in the Main Reports Released on Price Volatility Following the 2008 Crisis

<table>
<thead>
<tr>
<th>Source</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFPRI Report (IFPRI, 2011)</td>
<td>1. International creation of a small emergency stock and a virtual intervention fund to discourage speculation and the upward trend in prices.</td>
</tr>
<tr>
<td>Report by the CFS’s High-Level Panel of Experts on Food Security and Nutrition (HLPE, 2011)</td>
<td>2. Low stock levels are necessary for price volatility; therefore, developed countries must get organized to constitute a minimal global stock of food products so as to avoid price hikes, as they did with oil because of its strategic nature.</td>
</tr>
<tr>
<td></td>
<td>3. Private storage is not necessarily optimal for developing countries (food occupies a large share of consumer spending; traders are risk averse; the history of international buffer stocks designed to withstand price drops does not teach us anything about rising price trends).</td>
</tr>
<tr>
<td>Inter-agency report to the G20 on food price volatility (FAO et al., 2011)</td>
<td>4. Recognizing that the countries themselves are the first ones responsible in this area, the governments of G20 member-states could provide support when needed to improve the ability to implement emergency food reserve systems.</td>
</tr>
<tr>
<td></td>
<td>5. The governments of G20 member-states could help the World Food Programme to develop, by the end of 2011, an economical and effective system of small emergency food reserves that are strategically well positioned.</td>
</tr>
<tr>
<td>GREMA report (Gérard et al., 2011)</td>
<td>6. The national buffer stocks in developing countries, like other public price regulation instruments, should not be banned a priori. Their success depends on the conditions in which they are implemented. There have been a few successes.</td>
</tr>
<tr>
<td>Report by Mr. Tangermann for the International Centre for Trade and Sustainable Development (Tangermann, 2011)</td>
<td>7. Buffer stocks and virtual reserves do not work because it is impossible to identify appropriate trigger prices.</td>
</tr>
<tr>
<td></td>
<td>8. Physical stocks have a role to play, but this role can only be minimal given the cost of reserves. Three categories of reserves can be envisaged and are justified: national emergency reserves in importer countries; decentralized international emergency reserves administered by an international organization; and the formation of grain reserves in the framework of the International Grains Agreement to respond to shortages in exporter countries.</td>
</tr>
<tr>
<td>Foresight report to the British government (Foresight, 2011)</td>
<td>9. The idea of an international reserve to intervene on prices is not a solution. International agreements of the same type (e.g. sugar) have cost more than they have provided in the way of benefits.</td>
</tr>
<tr>
<td></td>
<td>10. However, an emergency food reserve in low-income countries could be envisaged.</td>
</tr>
<tr>
<td>World Bank study commissioned by the CFS to define a code of conduct for stock management (World Bank, 2012)</td>
<td>11. Public buffer stocks in developing countries are not feasible in light of experience.</td>
</tr>
<tr>
<td></td>
<td>12. There are conclusive experiments with emergency stocks (to supply social safety net programs). These initiatives deserve to be encouraged.</td>
</tr>
</tbody>
</table>

Source: Compiled by the authors.
1. Current Status

summarized in Table 1 above. While storage does seem to be the natural remedy to fluctuations in harvest and price levels over time, most authors limit public intervention to emergency reserves\(^9\) as instruments to lower the effects of price volatility on vulnerable populations as long as the size of these stocks and how they are mobilized disturb market operations as little as possible. These reports, however, remain very cautious as to the relevance and/or feasibility of buffer stocks to lower price volatility. On this last point, it is worth noting that the World Bank’s position on public storage policies has hardly evolved since the period before the 2008 price hike.\(^{10}\)

On the political level, during the preparatory discussions for the G20 ministerial meeting in June 2011, some exporting countries, Brazil in particular, expressed their concern about measures that would aim to control or regulate commodity prices in producer countries (claiming that the price spike was not caused by producer countries but by growth in emerging countries and financial speculation).\(^{11}\) No negotiations on this subject were therefore able to be held. The final declaration of the G20 Ministers of Agriculture in June 2011, which includes the action plan on price volatility, aligns with these positions because it does not mention any public market regulation instruments. Rather, the declaration supports the idea of a regional emergency food reserve, inviting international organizations to elaborate a feasibility study and code of conduct for the design and management of these reserves (G20, 2011). The G20 ministers also adopted the idea of establishing a global agricultural market information system (AMIS) whose main function would be short-term market forecasting for the main foodstuffs (wheat, corn, rice and soy).

1.1.3. Storage Initiatives in Developing Countries, Notably in Africa, since 2008

Following the 2008 crisis and faced with the reduction of stocks in the main exporting countries, developing countries have become aware that periods of skyrocketing food prices on international markets are in danger of becoming more frequent, compromising their ability to obtain foodstuffs at reasonable prices on these markets. This is notably taking the form of an increase in food stocks in developing countries, the volume of which rose from 228 million tonnes in 2006/2007 to 328 million in 2010/2011. Although there are no data that allow us to distinguish between public and private stocks, and the existing data are not very satisfactory, combining several sources of information leads one to believe that the observed increase also involves public

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\(^{9}\) Or “emergency stocks” to use the terminology adopted in the present report.

\(^{10}\) See notably: World Bank, 2005.

\(^{11}\) Le Monde, February 18, 2011.
1. Current Status

1.2. Stocks

1.2.1. Background: The Various Shocks Affecting Households

Following the 2008 food crisis, the debates on public storage systems focused narrowly on the specific issue of managing price volatility and the reliability of international markets to supply local markets in emergencies. However, it is important to recall that the fundamental problem is not price volatility in and of itself, but rather its potential effects on household incomes and available budgets, agricultural development (agriculture being a major economic activity in many countries), and indirectly on poverty and households’ food and nutrition security. It is notably because of the volatility in their incomes (caused by price volatility and harvest volatility) that producers favor self-consumption (which causes narrow surplus markets and thereby increases price volatility on these markets) and do not invest enough in production. Similarly, food...
price hikes may cause some households to reduce their food consumption. Income volatility has an even stronger behavior on households’ behaviors when they are risk averse, in other words when they prefer a relatively certain gain over a larger but less certain gain. One major assumption on which the economics of uncertainty are based is that risk aversion drops as wealth increases. Because of this, price instability has larger consequences for the poorest households.

Of course, price volatility is not the only shock to which households are vulnerable. In the case of Africa, a retrospective analysis of the past ten years identified three types of shocks to which the continent is subject (ECOWAS Commission, 2012a), the intensity and frequency of which vary over space and time.

- **Shocks linked to natural risks:**
  - large-scale production shocks, more or less closely associated with market failures, which can trigger large food crises;
  - localized disasters (such as floods), plunging their victims into temporary but acute situations of dependency;
- **Shocks linked to price variations:**
  - large price spikes on markets or market supply ruptures, whatever their cause (local or widespread production shortages, political tensions, operators’ behaviors, etc.);
  - price shocks on international markets; and
- **“Political” shocks triggered by sociopolitical crises and conflicts.**

In recent years, price shocks and the shocks caused by conflicts have had a tendency to intensify in Africa. Unlike shocks linked to conflicts—for which public interventions may be defined based on considerable hindsight and the existence of international intervention standards—recommendations in the case of price shocks, in particular price hikes, have largely shifted over time and are still the subject of debate.

### 1.2.2. What Problems do Storage Policies Solve?

Households potentially have mostly private instruments to hedge against the various risks associated with price and harvest variations or variations in their income directly. Price risk management instruments are mainly futures contracts and purchase or sale options, but these are not very frequent in Africa. In addition to managing price risk, producers can also protect themselves from harvest variability through harvest and/or weather insurance, although on the African continent these instruments have not progressed much beyond pilot experiments. Finally, there are mechanisms that allow
producers and consumers to manage income variability directly such as credit, mutual health insurance schemes, etc.

In economic theory, when markets are what is called “complete,” the private instruments listed above are enough to cover all of the risks with which all types of households are confronted (both in scope and type). But, when markets are incomplete, as is the case in most developing countries, particularly African agricultural markets (Binswanger and Deininger, 1997), public intervention can improve the well-being of individuals. Public authorities can then intervene in two ways: through social safety nets or directly by acting on markets to lessen the occurrence of these risks.

By developing social safety nets, the public authorities may seek to attain a situation equivalent to that of market completeness (the optimal policy according to economic theory). In theory, these instruments complete insurance mechanisms by covering both vulnerable populations that do not have the means to access private risk management instruments and “catastrophic” and “systemic” risks that the market cannot cover. The transfers operated by social safety nets may be permanent to overcome structural problems, or temporary to tackle short-term crises caused notably by price spikes in markets. Households can receive: (i) transfers (cash, food, food vouchers, inputs) without requirements in exchange; (ii) transfers with a monetary counterpart in the form of input subsidies or subsidized food; (iii) transfers in exchange for labor in the form of money (cash for work), food (food for work) or food vouchers. The World Bank (World Bank, 2005, 2012) and many international institutions recommend use of social safety nets in priority to protect poor populations from economic shocks that they would not be able to withstand without assistance.

When public and private risk management systems on their own cannot cover the risks facing private actors, one pragmatic approach is to attempt to reduce the incidence of these risks directly. This can be done through public support for market mechanisms. In economic theory, these measures are seen as second-best solutions, behind social safety nets (they are said to be second-best optimums). To mitigate price risk, for example, the state may seek to facilitate spatial and temporal trade-offs by supporting trade infrastructures or subsidizing private storage. It may also intervene directly in markets through measures that regulate supply (public stores, customs duties, etc.) but in economic theory these measures are seen as inferior to the preceding measures. Similarly, to mitigate political risks, the state can set up conflict management mechanisms.

The interest to be found in storage policies can, then, be re-analyzed in light of the different sources of and instruments for risk management. In this way, buffer stocks
1. Current Status

can potentially act directly on price risk—one of the sources of instability for household incomes and food budgets. Emergency stocks, seen as social safety net instruments, do not seek to act directly on the risks but rather to reduce income instability and make food affordable and available through an offsetting system via transfers. As such, emergency stocks are theoretically able to respond to all types of shocks, within the limits of their size and how quickly they can be formed. Finally, like emergency stocks, the purpose of strategic stocks is not to act directly on the sources of income instability; they are an offsetting system, but one mainly designed to offset political shocks. In the recent context of a sharp increase in international market price volatility and successive food crises in Africa, we can understand why storage systems are regularly brought up in the debates and are seen as an important part of the solution to this price volatility and food insecurity.

Among all these instruments, which one or ones should be favored? Selecting among these various instruments is an immanently political decision, still the subject of intense debate. From the 1980s to the 2007/2008 crisis, the dominant strategy, recommended by the main international bodies, consisted of keeping public intervention in markets to a minimum by mobilizing insurance, price risk coverage and/or credit instruments combined with aid mechanisms and transfers targeting vulnerable populations. This approach was based on three major postulates: (i) the problem with shocks (such as price volatility) came from agents’ ability to manage risk; (ii) public regulation policies hindered the development of private price stabilization instruments (trade, storage, stabilized production, etc.); and (iii) private price stabilization instruments cannot develop without the existence of efficient risk coverage instruments (insurance, futures contracts, etc.). However, following the 2007/2008 crisis, the debate was revived sharply; more and more actors came to acknowledge that insurance and risk coverage mechanisms might not always be enough, and that this could justify stabilizing prices, but only through private instruments. In addition, it was increasingly recognized that these different approaches, far from competing with each other, were in reality complementary, notably when there were several market imperfections present, and that it is necessary to combine different instruments within a policy mix.

The work of A. Dorward et al. (2004) and Poulton et al. (2006) clearly illustrates the shift in the theoretical formalization of the coexistence of several market failures justifying several simultaneous public interventions. Indeed, they show that without competitive markets, prices no longer provide a signal that can be used to coordinate the actions

[12] The table presented at the start of Section 3 provides a brief overview of the various instruments to withstand natural, price and political shocks.
of private actors so that these actors act in a complementary manner and to the same ends. In this case, actors will be confronted with a “coordination failure” which reveals two types of risks: coordination risk (return on investment is insufficient because of a lack of complementary investments by other actors in other links in the value chain), and the risk of opportunism (the complementary investments are made but in this case provide a dominant position to an operator likely to grab an excessive share of the value added within the value chain).

Indeed, there is a degree of consensus on the fact that economic development difficulties in many poor regions are largely the result of poor market operation and its corollary, the existence of particularly high transaction costs, and strong price instability that generally leads actors to minimize their relations with the market (De Janvry et al., 1991). In these conditions, producers tend to limit their sales to meeting their incompressible monetary needs and favor self-consumption. In this case, there is no incentive to increase yields, particularly when output prices are very unstable, as investment returns are uncertain. As a corollary, use of inputs is very low, which makes it possible to reduce cash needs to a minimum (Dorward et al., 2004).

This explains the “poverty trap” phenomenon: the lack of investment explains the low labor productivity, at the root of low incomes and low investments. When possible, some of the household’s labor force is allocated to non-agricultural activities, through more or less temporary migrations. In this context, the low level of economic growth in non-agricultural sectors constitutes an additional difficulty. These high transaction costs are the result of low public investment in rural areas, its ineffectiveness, and sometimes its diversion, leading to a lack of adequate public goods (roads, electricity, access to health and education). The low population density, which makes infrastructure building all the more costly (Fafchamps et al., 2003), partially explains this situation. The environment is, in this case, little conducive to economic activity. The lack of agriculture infrastructures such as irrigation schemes, storage warehouses or extension services further reduces labor productivity.

The existence of coordination failures creates a vicious circle (a “poverty trap”) in which investments by several interdependent actors are simultaneously discouraged, justifying the concomitant implementation of a certain number of public policies aiming to act on the various “missing links” at the root of coordination failures.

The various price shocks that have hit populations in recent years show that the solution to the problem will not be found in one single instrument, as an isolated instrument cannot resolve the issue alone, but rather in a combination of public and private price
stabilization and risk coverage instruments, among which food stores hold a central position.

1.3. The Debates on Buffer Stocks

As emphasized in the previous section, the potential usefulness of public stocks to intervene in emergency situations (emergency stocks) has been the subject of a consensus in recent international discussions, but there has been strong reluctance to condone direct intervention in markets by public authorities. Two types of reasons are put forth to justify this reluctance. First, the theoretical literature seems to have promoted the optimal nature of private stores over public storage. Second, there are doubts as to governments’ ability to avoid creating even more distortions than benefits when intervening in markets, given the failures of many past public buffer stock experiments. The goal of this section is to review and discuss the main arguments put forth in these two justifications.\(^{[13]}\)

1.3.1. Overview of Buffer Stocks

What are Public Buffer Stocks?

Public buffer stocks have often been designed based on a single intervention price (either floor or ceiling), depending on whether the target is more producers or consumers. Until present, public buffer stocks set up in industrialized countries and in developing countries have mainly consisted of stabilizing producer prices on the local market by attempting to maintain a floor price. The policies thus implemented have often led to more stable prices for producers but average prices were also higher, transferring income from consumers to producers (World Bank, 2012; Jayne et al., 2006; Mghenyi, 2006; Mude and Kumar, 2006).

Public buffer stocks can also be designed to limit external price fluctuations. By releasing stores when prices are too high or collecting stores when they are too low, public stocks can smooth price variations. Intervention rules can seek to keep prices between a floor and ceiling (within a “price band”) or set prices at a single price. However, stabilizing prices at one set price is a pitfall to avoid because it is not sustainable over the long term.\(^{[14]}\) Indeed, we know that if the timeline is long enough, the stock is unable to operate because it is empty when it would need to release stores or already full when it

\(^{[13]}\) Much of this section is based on the desk review in Gérard et al. (2012).

\(^{[14]}\) In addition, price stabilization is frequently the source of tensions because one must choose between favoring consumers (low prices) or producers (high prices).
1. Current Status

needs to collect more stores, as shown by Newberry and Stigliz (1981). The price band, if limited to keeping prices within import and export parity prices, should minimize the probability of this happening.

It is important to note now that other stabilizing mechanisms are at work, in particular private storage and foreign trade. The question of the usefulness of public buffer stocks can therefore be asked in light of the effectiveness of these other regulating mechanisms.

Public buffer stocks seek to lessen inter-annual price volatility, not intra-annual or seasonal price variations. Seasonality generates cyclic price instability but this instability is largely predictable (even if harvest dates may vary by a few weeks from one year to the next). However, price variability (volatility) from one year to the next caused notably by random supply shocks (crickets, floods, etc.) is by nature unpredictable, and raises problems that are much more difficult to resolve.

Foreign trade can have a stabilizing effect on domestic prices (within the limits of international price fluctuations). Indeed, when markets operate well, international prices, exchange rates, border measures, and the costs of transfer from one market to another define floor and ceiling prices on local markets. When the local price reaches the international price plus the necessary costs to move the product to the local market (the import parity price), it becomes more interesting for a trader to buy on the international market than on the local market. The import parity price therefore constitutes a ceiling that the local price cannot exceed (unless imports are restricted by a financial constraint or dysfunction, for example). Symmetrically, when the domestic price is sufficiently low, it is more profitable to export than sell on the local market, and a floor price is therefore set by the export parity price. In this way, trade determines a price band that depends, in each local market, on import and export parity prices but is, however, as unstable as international prices. Private storage can reduce price variability within the band determined by foreign trade. The effect of private stocks is positive if prices are projected to change by more than storage costs; it therefore depends on both price variations (and actors’ projections of these changes) and storage costs.

When storage costs are high (due to market imperfections)–which is probable in poor economies where infrastructures are little developed–private storage may be below

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[15] However, for the floor price to be effective, the country must be able to export when the domestic price falls below the foreign price, but this ability is sometimes entirely theoretical in the case of a small country that imports massively.
optimal levels. For example, if the cost of storage is 20%, it will only be profitable for private operators to stock up if the predicted price increase is greater than 20%. Yet, in poor countries, vulnerable households may spend more than 50% of their budgets on staple foods. An inter-annual price increase of 20%, below which private storage is not profitable, is therefore already unsupported because it means a food crisis. This type of situation, encountered frequently in the real world, leads one to recommend use of private storage subsidies, which amounts to cutting storage costs.

Buffer stocks intervene within the price band set by import and export parity prices. Their trigger mechanism is very different from that of private storage: they react to absolute prices and a pre-determined price band, not to the probable gains associated with the sale of stocks. These stocks therefore do not depend on short- and medium-term price projections. They must absolutely be associated with measures preventing imports (exports) when stocking (de-stocking) operations are needed when the import (export) parity price is lower (higher) than the intervention price. This configuration appears when international prices are depressed and there is overproduction in the country or, inversely, when prices are very high on international markets and domestic prices reach the intervention level. In both cases, without control over foreign trade, the buffer stock will not be able to maintain the intervention price because of traders’ private decisions. In the first case, the difference between the intervention price and the import parity price generates a profit on import and it is therefore in importers’ interest to import. By so doing, they increase supply on the market and annihilate the buffer stock’s defense of the floor price. Since storage capacities are limited, the stock will necessarily fail. The same phenomenon takes place with exports when outside prices skyrocket. When the export parity price rises above the intervention price, it becomes more interesting to export than to sell on the domestic market. The quantities released by the buffer stock to stabilize prices are then exported and prices on the domestic market rise mirroring outside prices (Gerard et al., 2012).

In the case of a structurally importing country, and in the absence of outside control, the public stock will have a hard time stabilizing domestic prices for the reasons evoked just above. However, it is not impossible, as Larson et al. (2012) have shown, but this implies that: (i) the country is large compared to the world market and that it also stabilizes the world market, which is very expensive; (ii) public storage is vast enough to completely overshadow imports (either because import volumes are small or because the public stock is huge); (iii) domestic prices and world prices are completely disconnected from each other, for example through import subsidies to protect against price hikes, which is also a potentially very expensive solution.
When these conditions have not been verified, it is important to emphasize that for the stock to be able to play its role, it is imperative to (i) temporarily ban imports in the case of public stock accumulation to defend the floor price when the import parity price is lower than the intervention price; and (ii) temporarily ban exports in the case of public de-stocking to defend the ceiling price when the export parity price is higher than the intervention price. Variable taxes can be used. Such a policy raises the question of states’ capacity to control their borders and prevent certain actors from illegally benefitting from informal cross-border trade. The country’s geographic characteristics and institutional situation therefore play a crucial role. These issues will be covered later, in 1.3.4. on the risks involved in buffer stocks, and in Section 3 in the section on storage policy feasibility.

**Buffer Stocks in Response to What Type of Price Volatility?**

The origin of price instability determines to a great extent the effectiveness expected of various price risk management instruments. One aspect of the discussions focuses on the effectiveness expected of buffer stock policies according to the various possible causes of price volatility. These causes can be of external or internal origin.

On the scale of a country, volatility of internal origin comes either from “natural” causes linked to the seasonal and variable nature of production, or from “endogenous” causes which correspond to the volatility of agents’ projections. These internal causes of volatility have an even larger impact on prices when market mechanisms to facilitate the spatial (primarily trade) and temporal (private stores) trade-offs of economic operators (producers, traders, consumers) are insufficiently developed. The hindrances to improving these market mechanisms are the weakness of transportation, communication and private storage infrastructures, and of market institutions such as grades and standards, warehouse receipt systems or stock exchange systems to ensure centralization and match supply to demand. As we shall see, public regulation policies are also invoked to explain the weakness of market mechanisms.

External causes correspond to the variability of international prices for foodstuffs or the variability of freight costs and exchange rates. This type of volatility therefore can potentially impact the price of goods that are traded on international markets (whether import or export) and their potential substitutes. In regard to internationally tradable products, the causes of price volatility can therefore be both internal and external. For these products, stepping up trade with the rest of the world is a private price stabilization mechanism, within the limits of international price fluctuations.
1. Current Status

In this case, the difficulty is to determine which factors cause price volatility. In concrete empirical situations, price instability is often caused by a combination of things (Boussard, 2008). For example, we have natural and endogenous instability when harvest instability fuels speculation. Some producer countries with shortfalls obtain supplies from local production part of the year and from imports part of the year. In this way, they are subject to natural instability and imported instability depending on the time of year.

There is, however, a consensus on the type of instability that can be managed effectively by buffer stocks. In the case of volatility due to external causes, a public storage policy aiming to regulate supply and demand on the domestic market would be inappropriate, but a different kind of policy, regulating foreign trade for instance, would be preferable.

From the above, it would seem that, depending on the origin of price instability, buffer stocks are not necessarily the most suitable instrument to correct price volatility problems. This observation shows the need to shift the debate to a comparative analysis of the various instruments by which to manage price risks.

Competition or Complementarity with Other Price Risk Management Instruments?

Instruments to manage agricultural price volatility can be categorized based on their purpose (stabilize prices or lessen the effects of instability) and their methods (private or public). By crossing these two dimensions, we obtain the following four categories (Galtier et al., 2009):

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Stabilize Prices</th>
<th>Lower the Effects of Instability on Incomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Market-Based</strong></td>
<td><strong>Category A</strong> instruments aiming to facilitate spatial and temporal trade-offs</td>
<td><strong>Category B</strong> instruments aiming to smooth the effects of price instability on incomes</td>
</tr>
<tr>
<td><strong>Based on Public Intervention</strong></td>
<td><strong>Category C</strong> instruments aiming to keep prices within a given range</td>
<td><strong>Category D</strong> instruments aiming to transfer resources to households</td>
</tr>
</tbody>
</table>

Source: Galtier et al. (2009)
Storage schemes can be found in categories A, C and D of this matrix.

- The central idea behind A-instruments is that decisions by market operators tend to smooth out prices over time and space, which in principle reduces their variability. These instruments deal with market institutions (such as the existence of grades and standards, warehouse receipt systems or stock exchange systems to ensure centralization and match supply and demand), information systems, and transportation, communication and storage infrastructures. It is therefore in this category of instruments that we find private stores. To attempt to lower price volatility, the state may therefore support the development of these private stabilization instruments, notably private stores. Regarding support methods, Lowry et al., (1987) show that supporting private stores through compensatory payments is the best solution, whereas Gardner and Lopez (1996) show that, to encourage private stores, subsidizing interest rates is less appropriate than direct grants. More recently, Gouel and Jean (2012) also determine that subsidizing private stores is the optimal storage policy.

- B-instruments cover insurance mechanisms and risk coverage instruments such as futures contracts, purchase options, etc. They do not cover storage measures.

- C-instruments are public intervention instruments whose purpose is to keep prices within set limits. Depending on the case, they may be floor prices, ceiling prices, or price bands or tunnels. C-instruments notably include production control instruments (quotas, input subsidies, etc.), foreign trade management instruments (duties and subsidies, whether flat-rate or variable, on imports or exports, quantitative measures such as quotas or bans) and finally, public buffer stocks (also called “regulation” or “intervention” stocks).

- Finally, D-instruments are public intervention instruments aiming to support the incomes of poor or vulnerable households during periods of high prices, also called “safety nets.” They operate through transfers generally limited to certain categories of vulnerable households (targeting). The instruments can also vary according to the nature of the goods transferred (cash, vouchers, food or sometimes inputs), the degree of coverage (grants or simple subsidies as in the case of sales at low prices), and the existence or not of a counterpart (usually work). Emergency stocks (also called “safety reserves”) belong to this category of instruments.
1. Current Status

Thus, the various instruments by which to manage price volatility may complement each other in some situations and compete with each other in others. A summary of the main interactions between buffer stocks and other price management instruments is outlined below.\[16\]

- Public buffer stocks and A-instruments: As mentioned above, it is generally thought that public regulation policies hinder the development of “market-based” price stabilization instruments and that these two types of instruments consequently compete with each other. The central idea is that public buffer stocks have an eviction effect on private stores. However, when markets are incomplete, public storage can complement market-based price stabilization instruments. The specific issue of the risk of evicting private stores is covered in detail below in 1.3.2.

- Public buffer stocks and B-instruments: Once again based on the argument of private sector eviction, these two types of instruments work against each other. The main idea is that the state’s provision of free protection against instability discourages recourse to private instruments that protect against price risk and therefore discourages the development of these types of instruments. But it is also possible to see these instruments as complementing each other: the state can utilize insurance-based mechanisms to protect against price risk (e.g. purchase options) to bring down the budgetary cost of the buffer stock policy.

- Public buffer stocks and D-instruments: As both of these types of instruments are based on public intervention, they compete with each other for the use of limited budget resources. One should note, however, that public buffer stock operations have much higher costs than social safety net programs. Nevertheless, when the state has considerable financial resources, safety nets, which target certain segments of the population, and buffer stocks, which benefit all actors, may complement each other. This complementarity is all the stronger when regulating production prices. In this case, the buffer stock policy to regulate prices benefits all producers that have marketable surpluses, whereas social safety net programs can target those who do not produce enough to sell on the market and who therefore do not benefit from the stabilization policy.

- Public buffer stocks and C-instruments: All these instruments aim to stabilize prices by regulating supply and demand by acting either on production, public

\[16\] Adapted from Galtier, 2012.
stored, or imports and exports. Even though there are differences between
these instruments when it comes to their effectiveness, length of time, cost
and unwanted affects to attain the target price, they can a priori be used
interchangeably. However, in certain contexts, these instruments can also
complement each other or may be inseparable in the case of buffer stocks and
instruments to regulate foreign trade.

In all, complementarity or competition between public storage and other risk
management measures depend on many factors, notably linked to the country’s
degree of development. For some authors (Galtier, 2012), setting floor prices and ceiling
prices with the aim of protecting producers and consumers respectively is justified
in countries where agricultural productivity is low, or where the share of household
budgets devoted to food is high and where there are many obstacles to setting up
market-based risk management instruments. However, public intervention to stabilize
agricultural prices thanks notably to storage measures seems less and less necessary
when these factors are no longer present—which is generally the case in developed
countries. Food price stabilization policies must therefore be understood from a
dynamic perspective that allows for the possible evolution in instruments used based
on the unique situation in each country.

1.3.2. Buffer Stock Theory: The Implications and Limitations of the Competitive
Storage Model as Frame of Reference

The competitive storage model holds a crucial position because it has imposed itself as
the model of reference in economic theory. This model contains three types of actors:
consumers (whose demand drops as prices rise), producers (whose supply increases
with price expectations), and storers\(^{[17]}\) (who stock up when they predict that price
changes will cover storage costs). Two important characteristics of the standard version
of this model are neutrality in the face of risk and rational expectations by all actors.
The fact that these actors are risk-neutral means that they face fluctuating prices but
do not take this into account and behave as if future prices were known. The fact that
they have rational expectations means that they anticipate prices that are identical to
past prices based on the information that they have. Thus, this model does not exclude
the possibility of a price hike because of the succession of several production shocks
or strong demand that would not have been predicted. Market equilibrium makes it
possible to determine the price that would equalize supply and demand, taking into

\(^{[17]}\) This is a theoretical model and therefore a simplified representation. In reality, producers and consumers form stocks.
account stock variations. The model can easily be extended to an open economy and be used to evaluate the impacts of public storage (Williams and Wright, 1991).

**Implications of the Standard Model**

According to the model, increasing private stores increases overall well-being because doing so stabilizes prices. However, the magnitude of the gains depends on both the elasticity of demand (because this determines price variability in the model) and storage costs because these two variables determine when private storage is profitable. Compared to a situation without storage, producers (who, in the model, are risk-neutral) lose out due to a more stable but lower average price whereas consumers come out ahead. The average price is more stable but lower because the high price hikes seen “without storage” are compressed here (Williams and Wright, 1991).

The results of the standard competitive storage model are not favorable to use of buffer stocks. Under the conditions defined in the model for how the economy operates, the optimal situation is attained with private storage (Scheinkman and Schechtman, 1983). This only allows partial stabilization, but this is enough. Public stocks are therefore useless because they are in addition to the necessary volumes stored privately. Since they are costly, they are bad for the general well-being. Empirically, studies show that private storage allows for partial price stabilization and a high degree of complementarity exists between recourse to foreign trade and storage. In the absence of import delays, recourse to foreign trade allows price instability to be lowered in a less costly manner than public storage (Srinivasan and Jha, 2001). This obviously implies that one is not trying to protect against external instability. Interest rates and transport costs play a crucial role (Brennan et al., 1997; Brennan, 2003). In the case of unstable yields, price instability remains the same with private storage and recourse to international trade (Makki et al., 2001).

According to the model, public buffer stocks can discourage private interventions. This has been empirically verified in cases where public storage has led to prices that do not fluctuate enough, the variation in which does not cover storage costs, and in cases where price uncertainty is high if the public storer’s decision-making rule is not known, fluctuates, is followed randomly (because of rent-seeking behaviors, misuse of the policy by actors for their own gain) or is overly rigid (the public authorities are unable to follow rapid changes in national and international conditions). These behaviors are

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[18] Studies prior to 2008 never envisaged deviations in international prices of a magnitude similar to what was seen during this period.

at the root of the loss of well-being for society (Williams and Wright, 1991). This is the eviction effect: in the presence of public storage aiming to ensure that prices remain within a predetermined band, private storage is weaker, particularly when the ceiling is low and the floor is high. This is an essential argument in the literature against public buffer stocks (Newberry and Stiglitz, 1981). An eviction effect among private traders on foreign trade has also been noted in the case of state intervention (Chapoto and Jayne, 2009; Tshirley and Jayne, 2009). Generally speaking, the main idea in the literature is that the state’s provision of free protection against instability discourages recourse to private instruments that protect against price risk and therefore discourages the development of this type of instrument.

Empirically, the eviction effects of public storage on private stores have been confirmed (Mirrand and Helmberger, 1988; Jha and Srinivasan, 1997), as has the costly nature of public buffer stocks. Subsidizing private stores is less expensive but inefficient below a certain level of price instability (Jha and Srinivasan, 1999). However, one can note the importance of the assumptions made as to interest rates and storage costs in assessing the advantages of public storage (Brennan, 2003). Accordingly, a lot of theoretical work uses storage costs on the order of 2% of the value of the product. This seems especially low, in particular in the context of sub-Saharan Africa, since these costs cover the financial cost of immobilizing capital, the costs involved in physically holding the stocks, and the cost of infrastructures. Few studies in academic literature mention real storage costs; Pinckney (1993) uses an estimated storage cost of between 15% and 25% of the value of the product in a study on Malawi, Zambia and Zimbabwe. With storage costs of this magnitude, without public intervention, private stores are likely to be relatively small. In this context, public buffer stocks have a limited eviction effect on private stores and can therefore be socially beneficial.

According to the model, if the price band seeks to stabilize prices at a level far from parity prices, prices are distorted, causing more or less long-term costs for the economy as a whole compared to the no-intervention situation.

Ultimately, the competitive storage model is therefore not favorable to public storage. However, in the opinions of the authors themselves, the theoretical results are obtained under very restrictive conditions: lack of risk aversion, rational expectations, and no market failures. Yet, much academic research also emphasizes the existence of risk aversion (Lowry et al., 1987; Osborne, 2004) and many market failures; actors’ expectations are also the subject of major theoretical debate.
1. Current Status

The lack of risk aversion means that actors face fluctuating prices but do not take them into account and act as if future prices were known. This viewpoint is made coherent, for producers, by adding the assumption of rational expectations. Since actors make few prediction errors, and when they do, they are not systematic, they do not take into account risks. It is mostly because considering risk aversion greatly complicates the numerical resolution of the model that it is largely missing from the standard model.[20]

But authors largely justify this absence with two types of arguments. First, they assert that insurance systems exist for producers. Yet, this argument stands up poorly to the facts as such systems are currently little developed in the poorest countries despite many pilot initiatives. In addition, the multitude of available products are said to offer insurance to consumers through substitution effects and the small share of each in budgets (Newberry and Stiglitz, 1981). The argument is acceptable for commodities such as coffee, cocoa or rubber. However, it is much less acceptable in regard to the food consumption of vulnerable households in poor countries (Gouel, 2011). For instance, in Mali, households devote 71% of their budget on average to food: 85% of the poorest rural quintile, and 55% for the wealthiest urban quintile (Gérard et al., 2008).

The Limits of Modeling Risk Aversion

The interest of including risk aversion in the model is emphasized by many authors (e.g. Wright, 2001). Consideration of consumers’ risk aversion alone is, however, enough to change the results of the competitive storage model (Gouel, 2011).

Few models take into account risk aversion because of the complexity of the associated formulations. It is to maintain a degree of simplicity in modeling these phenomena that Gouel and Jean (2011) limit themselves to risk aversion among consumers and give up on introducing producers’ risk aversion despite its importance, which the authors acknowledge, especially in the case of poor countries. Consideration of consumers’ risk aversion alone is, however, enough to change the results of the competitive storage model. The authors analyze two types of measures—(i) storage subsidies to encourage storers to store more, and (ii) customs duties (either positive or negative) on imports or exports—and look for the optimal combination of these two measures. They show that subsidizing storage alone without applying related trade policies does not improve consumers’ well-being. Indeed, it can prevent prices from dropping too low but does not prevent price spikes. However, combining an international trade taxation/subsidization policy with a storage policy can effectively stabilize prices and improve overall well-

[20] Note that the standard competitive storage model has not yet been solved analytically. It was solved numerically at the end of the 1950s.
being, with gains for consumers thus exceeding the sum of producers’ losses and the cost to taxpayers.

But above all, producers’ risk aversion is what justifies setting up a public buffer stock. Indeed, it has been shown that price instability discourages investment, particularly among poor producers (Timmer, 2000; Poulton et al., 2006; Hazell et al., 2010).

The Difficulties in Modeling Expectations
The question of expectations is a central controversy with major implications for the type of policy recommendations derived from the results of the model. In the competitive storage model, economic actors’ predictions play a key role in storers’ and producers’ decision-making processes. The issue is therefore to define prediction processes. The competitive storage model assumes rational expectations. This assumes that economic actors base their decisions on rational processing of all available information (Muth, 1961). In these conditions, many of the models applied assume that agents’ expectations are almost perfect even though this approximation differs slightly from Muth’s initial proposal. The assumption is thus made that price instability can be ignored in the representation of the economy or simply included with an error term, generally assumed to be Gaussian and added to supply functions, for example.

In the competitive storage model, storers’ expectations are “rational” in a rather specific sense: we assume that operators, in addition to costs and demand, also know the state of stores when they make their decision to stock or de-stock, along with storage capacity and the law of probability for the hazards likely to affect future harvests. The model is resolved by difficult calculations (Gouel, 2011) and precise information on market conditions for all future periods—which is questionable when we know the limits of agents’ calculation capacities and the limitations of the information they have. Williams and Wright (1991) insist that this calculation is not necessary for economic agents because they receive information as they go along, unlike the modeler who must include the entire anticipation process in the model from the start.

The question is what information is available to agents and how well are they able to process it. Other theories on predictions have been formulated based on “bounded rationality” such as adaptive expectations (Nerlove, 1958). Most are based on the idea that the quantities of information available to agents and their calculation capacities are less than the theory of rational expectations implies. These “bounded rationality” models have major consequences for price dynamics by generating endogenous instability from anticipation errors, as shown by the “cobweb” theory.
1. Current Status

Using bounded rationality for expectations in the competitive storage model, that is to say based on past prices (backward looking), would compromise the internal consistency of the model. Yet, if expectations do not ensure this internal consistency, we can no longer distinguish, when testing policies, gains in well-being due to the policy and those due to fewer prediction errors. The authors also emphasize that backward-looking prediction processes do not allow changes in economic policy to be included in actors’ expectations when in reality agents take them into account (Williams and Wright, 1991).

This is why the competitive storage model uses forward-looking rational expectations assuming that there is no systematic error, which seems plausible to the authors. This question of predictions and their quality remains a major controversy in economics. It is extremely complex because it is not only agents’ prediction processes that are at work but their market-wide aggregation, with different agents most likely following different processes that come together in the market to form an average prediction that cannot be observed directly.

Yet, it is possible that two market operation regimes exist: normal operations in which expectations comply with fundamentals, and periods of crisis—skyrocketing or collapsing prices, linked to panics—in line with what we see on financial markets (Kindleberger, 1996). Several bodies of work explain some of the 2008 price hike in this way (Piesse and Thirtle, 2009; Headey, 2011). It is unlikely that actors’ price expectations come true right before and during these feverish periods. The whole question is, in this case, whether these episodes are sufficiently rare for us to act as if they do not exist or if they are likely to be more frequent in the future than they have been in the past and must consequently be taken into account.

It is then a question of the law of probability at work—mild or wild randomness. A central hypothesis assumes that price fluctuations from one year to the next are generated by laws of probability that remain the same over time and whose parameters can be known. It also assumes that these laws of probability are of a type frequent in statistics and have at least an average and variance (and perhaps a dissymmetry coefficient, the third-order correlation). Yet, it is the need for calculations that leads to these assumptions rather than observation of reality. From this standpoint, Mandelbrot (1973) proposes distinguishing between mild randomness (Gaussien) and wild randomness (“Paretian”, generated by anticipation processes). Orléan (1989) shows how this phenomenon can be generated by sheep-like behaviors. He insists on the rationality of such behaviors when actors find themselves in a situation of total ignorance: either the imitated individual does not have more information and the imitator’s position is unchanged or he has information and
the imitator’s situation is better. In this way, we can find ourselves in a paradoxical and extreme situation where one rational behavior causes a situation in which each agent bases his or her behavior on the behavior of his or her neighbor and prices no longer contain any information. In such a situation, the assumption of rational expectations in the competitive storage model is no longer valid.

These questions, centered around imperfect information and its consequences, have occupied economists for a long time and constitute a major objection to the competitive storage model and its applied results (Greenwald and Stiglitz, 1986; Keynes, 1936; Stiglitz, 2002).

Rather than seeking to justify the assumption of rational expectations, which deals with an unobservable variable, some researchers have attempted to validate the model. Despite many attempts (Deaton and Laroque, 1991, 1992, 1995, 1996; Cafiéro et al., 2005 and 2011), we can conclude that validating the model remains difficult and limited to very restrictive assumptions that are unlikely to reflect the diversity of real situations.

Finally, while the standard competitive storage model has long been used to argue that public buffer stocks are useless, we have seen that in the case of price instability, the presence of market imperfections—notably the lack of insurance for actors, producers or risk-averse consumers, - justifies public interventions that can then improve overall well-being. In addition, Poulton et al. (2006) show the persistence of the vicious “poverty trap” circle, even with deregulation. Dorward et al. 2004) insist on the amount of time needed to develop infrastructures and set up private interventions. And Dorward et al. (2007) emphasize that trading and private storage activities do not stabilize prices enough because of transaction costs, and therefore result in a shortage of coordination. Considering all these elements, there are examples that illustrate that price regulation, notably through storage, can be a socially beneficial policy.

1.3.3. The Benefits of Public Buffer Stocks

Timmer (2000) analyzes how price stabilization allows both large gains in productivity and the growth of agricultural production. Such a process does not harm urban populations insomuch as food prices drop; it can pull a population out of poverty rapidly. He bases his theoretical demonstration on Indonesia. Indeed, in this country, a rice price stabilization policy has been enacted by the BULOG since 1965, based on using public stocks to keep prices within a set range and regulating foreign trade. This policy made it possible to attain food self-sufficiency in 1984 although the country had been one of the largest rice importers 20 years earlier. Public intervention only dealt
1. Current Status

with relatively small volumes, less than 10% of the quantities sold, and domestic prices followed international prices over the 1970-1997 period. The policy was continuously adjusted to a changing national and international context, and considerable expertise and financial resources were devoted to it. Adapting this policy to the current situation in Indonesia, when there is little room for increased productivity and poor consumers pay high prices for rice is, however, not without problems (Timmer, 2004).

By keeping domestic prices stable, the Indonesian government chose to lower the risks associated with farming while preserving social peace by guaranteeing consumers that the price of staple foods would not skyrocket. The importance of stability in staples for the well-being of the poorest populations has been proven repeatedly (Newbery, 1989; Timmer, 1992). This policy also helped keep salary costs low, a vital element in industrial competitiveness and attracting foreign capital. On the supply side, logistical support for the introduction of new high-yield rice varieties (extension, input subsidies, credit) completed the market regulation policy.

Ultimately, these positive results from public intervention seem to have been the fruit of a combination of factors, in which stabilization was only one component: (i) an effective and credible stabilization policy based on qualified experts and efficient information systems, taking care not to discourage private marketing activities; (ii) technical innovation allowing strong growth in yields (the “green revolution”), and (iii) public investment, not only in infrastructures such as roads and irrigation facilities but also in human capital (for example, farmer advice services).

Dorward et al. (2004) propose seeing this type of policy as transitional, linked to a given level of development; they assert the need for both its establishment to break the vicious circle of poverty traps and its withdrawal at a later stage. In this analysis, the scale of transaction costs and risks, exacerbated by the low population and infrastructure density, is seen as constituting a market failure, and the overall situation is seen as able to be improved through public intervention. Public intervention is therefore necessary, not only to develop public goods but also to remedy market failures, for instance by stabilizing prices or setting up systems to allow access to credit.

Poulton et al. (2006) analyze the different forms of intervention possible, the difficulties setting them up, and their advantages for each type of actor. They defend the need for direct state intervention in markets by setting up a system modeled on Indonesia’s success. They propose forms of contracting by the state: (i) with farmers’ organizations to buy set quantities at a stabilized price to avoid excessive surplus management costs, and (ii) with private storers for the quantities the state wants to stock to minimize eviction
effects and public storage costs simultaneously. The authors defend this position but are aware of the difficulties setting up such a policy. Analysis of past experience can help identify the conditions needed for its success.\[21\]

Finally, analysis of real situations shows that this type of policy is easier to set up and less costly for countries with high agricultural potential. When there are gains in productivity, this type of policy is in fact likely to enable a large increase in production. This outcome needs to be anticipated before one ends up in a situation of overproduction that would drive up costs unbearably and risk resulting in subsidized exports that would be costly and harmful to partner countries. Two options exist in this case: (i) adjust floor prices to avoid overproduction, or (ii) include, with price stabilization, quantitative measures limiting production in the form of contracts between the state and farmers’ organizations to minimize transaction costs as much as possible.

The process is undeniably costly in the short-term, but price stabilization can enable remarkable progress in the area of food security and poverty alleviation when it is done well and avoids in particular the pitfalls related to overproduction. These advances are, however, progressive and cannot be clearly felt in the short term, which intensifies the difficulties associated with these policies.

1.3.4. The Risks Associated with Public Buffer Stocks

This section discusses the risks linked to implementing a buffer stock strategy\[22\] based on past experience.

Eviction of the Private Sector

Defining price bands is tricky. Setting a lower limit with the export parity price and an upper limit with the import parity price while taking into account the cost of the transfers necessary to reach each local market can be socially beneficial, but in the case of international price instability, it will be necessary to smooth parity prices to some degree. If the band is wide enough, authorizing price rises and potential gains greater than the storage costs born by private storers, the eviction effect described above should be minimized. Contracting with private storers to hold public stocks can also minimize eviction effects. According to Timmer (2010), by limiting oneself to smoothing external fluctuations, price distortions are minimized and one avoids the classic agricultural

\[21\] See below, the section proposing an analysis grid for the feasibility of public storage policies.

\[22\] Most country experiences mentioned in this section are drawn from country case studies in the study conducted by GREMA. See Gérard et al., 2011.
1. Current Status

Policy dilemma: whether to favor consumers with low prices or producers with high prices. Since domestic prices are alternatively above or below parity prices (depending on international price fluctuations), export or import bans are very occasional (except in long periods of very low or very high prices on international markets) and the profitability of parallel markets and illegal trade is minimized. Nevertheless, this implies strict control of foreign trade.

Excessively High Costs for Public Finances

When a buffer stock policy seeks to stabilize prices at levels very different from outside prices, or within an overly narrow band, this can generate such high costs that the government can no longer afford it. Between 1975 and 1984, the Indonesian government decided to narrow the gap between the floor and ceiling prices with the aim of maintaining low prices for consumers without discouraging rice production. The cost of the stabilization program then rose rapidly by approximately $40 million per year over the 1974-1979 period and by $80 million over the 1979-1984 period, necessitating an emergency reform to avoid the scheme’s bankruptcy (Timmer, 1997).

From the standpoint of the cost associated with public storage, the definition of the optimal width of the price band remains a tricky question. On one side, the narrower the band, the less stocks will be immobilized over long periods, which lowers storage costs by as much (Miranda and Helmberger, 1988; Williams and Wright, 1991; Gouel, 2011). On the other, the narrower the band, the more frequent the interventions, which increases management costs linked to stocking/de-stocking operations. In addition, as noted above, too small fluctuations in prices on local markets, caused by an overly narrow price band, can evict private storage.

<table>
<thead>
<tr>
<th>Country</th>
<th>Spending on the Buffer Stock (% of GDP*)</th>
<th>Agriculture Spending (% of GDP)</th>
<th>Spending on Agricultural Research (% of GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>0.5 (2008-2010)</td>
<td>0.8 (2008)</td>
<td>0.05 (2003)</td>
</tr>
<tr>
<td>Philippines</td>
<td>0.4 (2005/2006) - 1 (2009)</td>
<td>0.8 (2005)</td>
<td>0.06 (2002)</td>
</tr>
<tr>
<td>Zambia</td>
<td>0.3 (2009) - 1.9 (2011)</td>
<td>0.6 (2010)</td>
<td>0.15 (2010)</td>
</tr>
</tbody>
</table>

* GDP = Gross Domestic Product  
It is therefore necessary to estimate the potential cost of buffer stocks accurately before setting them up, and ensure that the corresponding financial resources are available. From this perspective, the budgetary cost of a buffer stock policy must be reasoned in terms of relative costs/benefits compared to other uses of public finances. Thus, since public budgets are generally limited, the cost associated with this type of policy can have the consequence of lowering the budgets allocated to other economic policy instruments (agricultural research, infrastructure investments, education, health, etc.). Yet, the spending needed for a public buffer stock policy is considerable in comparison to other areas of agricultural policy (Table 3).

The Risks of Overproduction

In certain circumstances, particularly when public storage aims to stabilize producer prices at an overly high level, overproduction can be triggered, making it impossible to maintain the floor price. Many countries have been in this situation, which has often resulted in the failure to respect the announced floor price and the failure of the system. Anticipating the response on the supply side in relation to market absorption capacities is, therefore, crucial when assessing a buffer stock system. A detailed analysis of the situation and access to reliable data are essential.

The country’s position as an importer or exporter is also decisive for both the policy’s impacts on trade partners and its cost. The shift from importer to exporter generally requires radical reforms in the buffer stock. The present study is limited to importer countries, but the case of countries that are alternatively exporters and importers cannot be neglected. For instance, in Malawi, the price support policy came with many periods of overproduction that caused massive stock accumulation or exporting at a loss and therefore the government’s inability to maintain producer prices at the announced level. During certain periods, these operations cost nearly 15% of total public spending, not counting the destabilizing effects on the macroeconomic level (Chapoto and Jayne, 2009). In 1985, Indonesia, now self-sufficient in rice, had to face overproduction when its stores were already full. The price of rice dropped 20% to 30% under the floor price, and without an emergency reform including notably a revision of the intervention price, analysts predicted the failure of the system within five years (Timmer, 1989).

The Difficulties Controlling Trade Flows and the Constraints of International Commitments

As explained in detail in the previous section, a state that is unable to control its foreign trade is also unable to maintain a price band. It was stated that countries with open economies must necessarily link their buffer stock strategies for tradable goods to import restriction measures (quantitative or tariff-based) to defend their floor
1. Current Status

prices and export restrictions to defend their ceiling prices when international price fluctuations cause the floor price to rise above the import parity price or the ceiling price to fall below the export parity price. Nevertheless, this assumes that the country can fully control flows and its foreign trade policy. This assumption is questionable for three reasons:

The first is the relative porosity of the borders of many developing countries. This relates to the issue of policy effectiveness and governments’ ability to control and enforce their directives (see Section 3). Thus, many countries do not have the institutional or logistic capacity to ensure that customs duties on imported or exported merchandise are effectively applied or even that export or import bans are not circumvented through illegal trade. During the 2005 and 2008 crises, the Malian government set up export ban measures but these decisions were not respected by private actors who decided to export across unsupervised borders or thanks to deals with customs agents (Galtier et al., 2009).

The second reason is that some countries participate in one or more regional trade agreements (RTAs). In this case, the country in question cannot maintain its price band because it will be unable to control its foreign trade with other countries that have signed the RTA when it takes the form of a free trade zone or with outside countries when the RTA takes the form of a customs union.

The third reason comes from the relatively binding nature of international trade agreements in regard to trade policy measures. As things currently stand, World Trade Organization (WTO) member countries must comply with the provisions of the 1994 Agreement on Agriculture, and are not able to establish quantitative or tariff restrictions on imports or exports to support stocking/de-stocking operations. WTO agreements are generally very strict in regard to trade restriction measures, and even more so in the case of temporary instruments, which generate uncertainty for trading partners and can be the subject of especially discretionary management by governments. For this reason, flat-rate customs duties are tolerated as trade policy instruments whereas variable tariff or quantitative measures are prohibited.[23] Only the special safeguard clause planned in the Agreement on Agriculture allows for a temporary increase in customs duties until they were banned, however, variable levies were an essential tool in the EU’s CAP and contributed to the strong growth of European agriculture from the 1960s to 1990s.
above the bound rates\textsuperscript{[24]} but this clause can only be invoked if import prices plummet or skyrocket. What is more, it can only be invoked for products that underwent the tariffication procedure, which in practice means that most developing countries cannot invoke it because very few of them chose to submit to this procedure. Developing countries proposed a new, more flexible special safeguard mechanism (expanded eligibility criteria) providing greater protection in 2008; it is still under negotiation at this time. Furthermore, this mechanism still only concerns price drops but not hikes\textsuperscript{[25]} and does not allow bound rates to be exceeded. Similarly, the special and differential treatment granted to developing countries and LDCs, which covers only the pace at which trade protection measures will be dismantled, does not provide a special regime for temporary trade policy measures.

When it comes to export restrictions to accompany de-stocking operations, the Agreement on Agriculture is not binding because it was negotiated at a time when world agricultural prices were chronically low. This gap is all the more remarkable as Article XI of the 1947 GATT allows the adoption of certain quantitative export restriction measures in the case of food shortage. But these measures are only authorized under very specific conditions (critical situations) and can only be applied temporarily. It is on this legal foundation that Ukraine and Russia seem to have limited their wheat exports in 2010.

Temporary export bans to defend a ceiling price have been portrayed as being responsible for the price hike in 2008. These measures, while necessary to prevent skyrocketing international prices from driving up prices on the domestic market of a country that wants to regulate its prices, obviously have harmful effects on international price stability when the country is a major importer in the international market. Let us note, however, that unlike structural export regulation measures whose goal is explicitly to transfer instability within a country to outside markets, the countries that utilized this practice in 2008 had simply decided to refuse to share the cost of adjustment linked to a sharp rise in prices on foreign markets. When recourse to export bans is not possible, the national buffer stock will ultimately be exported by traders in the case of international price hikes, and the domestic market will be infected by spill-over from

\textsuperscript{[24]} Outside the special safeguard clause, WTO agreements stipulate that countries can increase their customs duties, without compensating trading partners, as long as the tariff does not exceed bound tariff levels, that is to say those that were notified to the WTO during the Uruguay Round and that countries promised not to exceed. Let us note that, for most sub-Saharan African countries, these bound duties are generally high because the baseline period used for their calculation corresponds to a period of low international prices and therefore high protection levels.

\textsuperscript{[25]} A “reverse” safeguard mechanism that would act in the case of both hikes and drops has been proposed and is currently being discussed. See Baris et al., 2011.
the outside price hike (Gérard et al., 2012). If it is a “small country,” these exports will drive domestic prices up sharply but will not change world prices. In the current context of a risk of repeatedly skyrocketing prices on international agricultural markets and the condemnation of export ban measures, it is assuredly not advisable for a country to conduct a price regulation policy through public storage, because this is costly and the country will not benefit from its advantages. In addition, when markets are tense, it is undeniable that this type of behavior is of a kind to amplify the price hike by amplifying panics (Piesse and Thirtle, 2009; Timmer, 2010; Headey, 2011).

WTO agreements are also binding for buffer stocks when it comes to domestic support reduction commitments. They do however leave some latitude for so-called “food security” stores (see Box 2).

**Box 2 Public Agricultural Stores and the WTO**

Public buffer stocks enter, indirectly, in the regime reserved for domestic agricultural production support measures, applicable notably to price support. These measures are covered in Article 6 “Domestic Support Commitments” and in Annex 2 “Exemption from the Reduction Commitment” of the Agreement on Agriculture. Article 6 provides for a mandatory reduction in the Aggregate Measurement of Support (AMS) by 13.3% over 10 years for developing countries (that receive special and differential treatment) and by 20% over 6 years for industrialized countries. Least Developed Countries (LDCs) do not have any reduction obligations.

In addition, the reduction exemptions contained in Annex 2 must not involve “transfers from consumers” and may not “have the effect of providing price support to producers.” Formulated in this way, Annex 2 excludes certain measures from the reduction obligations such as decoupled aid and direct payments to producers, aid in the case of natural disasters, and environmental protection programs. Buffer stocks are not among the exceptions.

In its third paragraph, however, Annex 2 also excludes from reduction obligations public stocks for food security purposes, understood as the “expenditures (or revenue foregone) in relation to the accumulation and holding of stocks of products which form an integral part of a food security programme identified in national legislation. […] The volume and accumulation of such stocks shall correspond to predetermined targets.
related solely to food security. The process of stock accumulation and disposal shall be financially transparent. Food purchases by the government shall be made at current market prices and sales from food security stocks shall be made at no less than the current domestic market price for the product and quality in question.”

Disguised support is therefore not tolerated, nor is any ultimate goal other than food security.\textsuperscript{[26]} Stabilization as a factor in development and growth does not meet the exemption criteria set forth in Annex 2.

This provision is notably contested by the G33, the negotiating group composed primarily of food-importing developing countries, including India and Indonesia. Within the framework of the Doha Round talks, and with an eye to the WTO ministerial conference in Bali in December 2013, India proposed, in the name of the G33, deleting the phrase “provided that the difference between the acquisition price and the external reference price is accounted for in the AMS” and adding a phrase indicating that “the acquisition of food stores in developing countries with the aim of supporting low-income farmers or resourceless farmers” would be exempt from AMS calculations. The aim would therefore be to ease the disciplines on domestic support to facilitate the constitution of public stocks aiming to improve food security and help poor farmers. But this proposal is not without controversy, far from it. Indeed, many countries, including exporter developing countries, fear the threat to the distinction in the Agreement on Agriculture between domestic support that distorts trade (classified in the Amber Box) and support that is supposed to have “no, or at most minimal, trade-distorting effects or effects on production” (notified in the Green Box).

We can keep the binding nature of WTO agreements in proportion by emphasizing that complaints are very rarely filed against developing countries that have not met their obligations. Generally speaking, no Least Developed Country (LDC) has been the subject of a complaint to the WTO even though, during the latest episodes of skyrocketing prices, a number of them decided to use temporary export bans to protect their domestic markets. Similarly, some LDC members of the WTO now have buffer stocks even though this market intervention instrument is strictly regulated. The risk of complaints by industrialized countries cannot be definitively eliminated, but in practice this risk seems extremely small because they have little commercial interest in

\textsuperscript{[26]} Nevertheless, there is some debate on how the phrase “for food security purposes” should be interpreted.
1. Current Status

LDCs. The only WTO members possibly inclined to file complaints are more probably emerging countries that export agricultural products.

Information System Inadequacies

Poor performance of statistical systems allowing detailed analysis of changes in a country’s production and prices can prevent a government from intervening “in time” to be able to defend or change its price band.

Market information systems (MISs) pursue a two-fold objective: (i) improve market transparency and lower information imbalances for market actors; and (ii) monitor markets (mainly prices and quantities) and provide public decision-makers with analyses to guide policies and assess the impact of measures implemented. These systems therefore hold a central place in public buffer stock policies because they provide the analyses necessary to trigger the stock. The efforts deployed to improve these systems enabled a new generation of MISs (“2GMISs”) that better meet the information access needs of the private sector. However, in many African countries, MISs continue to be inadequate when it comes to their ability to collect and transmit data and, above all, their ability to process and analyze the data.

Information systems on production (trends in recent years, harvest predictions) and consumption also play an important role in storage policy effectiveness. Nevertheless, in many African countries that have implemented agricultural revival plans, such as Malawi, data on agricultural production have had a tendency to be manipulated extensively by the public authorities to back the success of their policy. Thus, the reliability of these data has considerably diminished in recent years (Jayne and Rashid, 2010).

The Uncertain Impacts on Poverty Alleviation

Buffer stocks benefit farmers in proportion to their participation in the market. The farmers best equipped in production factors (land, water, capital) are, what is more, the ones best able to increase their production rapidly to profit from regulation. On the contrary, farmers who produce mainly for their own consumption only benefit from the measure in proportion to the surplus they sell.

This type of storage policy can therefore increase inequalities when access to the productive resources (land, water, capital, etc.) enabling the supply of products targeted by the intervention is highly unequal. Yet, when such a policy is not favorable to the poor, it loses some of its interest (see above, 12). In Zambia, where approximately 40%
of farmers grow their crops one hectare or less and 74% of them are either net buyers or self-consumers (Tembo, Chapoto et al., 2009), the strengthening of the producer price support policy since 2005 has primarily resulted in a rise in exports and has not had any (or very little) effect on food security. In Kenya, the agricultural sector is also characterized by a dual structure: 10% of farmers produce 85% of the goods sold on the domestic market while 62% of small farmers are net buyers. Because of this, the National Cereals and Produce Board’s (NCPB) buffer stock policy aiming to increase corn prices from 1995 to 2004 acted as an income transfer from three million urban consumers and more than 16 million small net buyer farmers to only five million small farmers located in high-potential zones and a thousand or so large net seller farmers. Detailed analysis of the situation in each country and the specific measures for the poorest farmers (input subsidies, credit), in particular when they have little access to productive resources, is therefore crucial for a buffer stock to have a positive impact on food security.

1.3.5. Initial Conclusions as to the Conditions Needed for a Public Buffer Stock

The preceding sections have attempted to summarize and clarify the controversies surrounding buffer stocks in regard to academic reflections based on models and the results of past experience.

Because of two key elements in reality that are missing from the standard competitive storage model—i.e. forecasting difficulties, and the importance of uncertainty in behaviors—it is difficult to reach, from a review of the academic literature, a conclusion as to the impacts, positive or not, of buffer stocks on overall well-being in real life situations.

Above all, the analysis confirms the complexity of mechanisms at work and the importance of the local context in the probable impacts of public buffer stocks. The main criteria to consider are: distribution of productive resources, agents’ access to these resources, location of production, border control and taxation mechanisms, the structure of foreign trade (importer or exporter country), the delays associated with trade (Coleman, 2009), and transportation costs (Brennan et al., 1997). The analysis also highlights the magnitude of the costs and difficulties involved in setting up buffer stocks, while noting that there have been some successes (Indonesia, Europe).
1. Current Status

Thus, detailed case studies of real situations are needed to determine the usefulness of setting up buffer stocks (see Section 2).

This section does provide warnings as to the various risks involved in public buffer stocks and can be used to propose minimal conditions for such stocks to improve well-being. These feasibility conditions will be discussed in Section 3.

1.4. Debates on Emergency Stocks

1.4.1. How Useful are Emergency Stocks during a Crisis?

Extent of the Shock and Possible Responses

Unlike buffer stocks, emergency stocks do not aim to modify supply and demand levels in markets to alter prices. Instead, they aim only to mitigate temporary food insecurity among vulnerable populations by lessening the effects of shocks on these populations.

Insomuch as it is admitted that the people helped during food crises would not be helped without public (or private non-profit) intervention, the legitimacy of this type of stock is not the subject of any real debate, unlike buffer stocks. The discussion focuses more on the advantages and disadvantages of this type of instrument during periods of crisis compared to other intervention methods. The alternatives available to governments in the absence of food reserves therefore depend mainly on the type of shock that triggered the food crisis. Although expectations of emergency stocks have partially evolved in recent years, these reserves are still usually designed to respond to food resource “availability” problems caused by production shocks or localized disasters. However, these systems are much less well prepared to respond to “accessibility” problems, notably market access, generated by price shocks. This is their main weakness when responding to the diversity of food crises on the African continent today.

When a food crisis triggered by a disaster or localized grain shortage hits, the government can obtain supplies on national, regional or international markets (through commercial imports and/or by calling on emergency food aid) if it does not have emergency stocks. When the country is facing a production shock that triggers a widespread shortage throughout the country and region, the government has no alternative but to obtain supplies from the international market.
Compared to purchases on the national market, supplying foodstuffs through the intermediary of an emergency stock makes it possible to prevent a shock on the local market from adding to other shocks. An extensive body of writing has long insisted on the unwanted effects that recourse to emergency food aid from the international market may have during periods of crisis. The multiplication and diversification of food crises have contributed to the implementation of a major reform of all sectors of humanitarian action, led by the United Nations from 2005 to 2008 to improve the predictability and effectiveness of international humanitarian responses.

Emergency Stocks or Recourse to Food Imports?
Today, emergency food aid may be allocated in many ways, which are differentiated based on the mode of transfer (food, vouchers, cash), type of counterpart (none, labor, social obligations), and targeting method (universal, limited, administrative) (Galtier et al., 2009). The two most classic sources of emergency food aid are increased food imports from the international market (done rapidly) and a local physical emergency stock, either national or regional. Three parameters can be discussed to compare these two instruments: (i) supply times, (ii) costs, and (iii) currency resources.

Initially, mostly national emergency stocks—often called “national safety stocks” (NSSs)—were developed to partially compensate for the time needed to deliver aid from the international market. But many countries have also set up local emergency stocks to cut down on the time needed to deliver food aid as the delay can be harmful to people whose situation requires immediate intervention. More recently, the relevance of regional emergency stocks has been under examination.

When it takes too long to deliver food aid, it can cause non-negligible disruptions in the market. In most African countries, production instability is such that the value of aid for recipients is very sensitive to the real delivery date (seasonal and inter-annual dimension). This value could even be negative in the case of delivery during the harvest period. All forms of food aid are therefore more economically valuable for the recipients if the aid is distributed when market prices are highest. When the aid policy cannot intervene within the same agricultural cycle, it intervenes almost blindly and the risk of delivery at an non-optimal moment is very high. Shortening the scheduling-to-mobilization cycle to a total duration of less than six months can place one in the zone “revealed” by early warning systems and therefore considerably improve the “temporal targeting” of aid operations.

[27] It should be noted that emergency stocks are themselves partially composed of international food aid.
1. Current Status

Yet, the length of time between the launch of the call for tender procedure for a purchase on the international market and the arrival of food at its destination currently ranges from 90 to 120 days depending on the country’s degree of isolation and the state of transportation infrastructures, although delivery times could reach 12 months just twenty or so years ago. Today, international aid delivery times are less of an issue for their disruptive effects on crop years, but still problematic for assistance during the very first months of a food crisis.

Setting up emergency stocks may be justified by the specific characteristics of the food demand in the country considered. In this case, the stock should obtain its supplies locally. For example, teff, a grain produced almost exclusively in Ethiopia and one of the staples in the Ethiopian diet, is not sold on the international market.

In terms of costs, the advantages expected from recourse to emergency stocks over buying on the international market depend on two parameters that work in opposite directions:

- The positive effect from delayed purchase: Since African countries are small “price taker” countries, when prices on local markets are high, this means that international prices are also high. Because of this, purchases on the international market in response to a price hike on local markets are generally made at high prices. Emergency stocks are, however, not subject to this constraint and can be formed through international aid at a different time of year when prices are lower. The positive effect of the lapse of time between purchase and sale also plays its role fully when emergency stocks are composed of local products and rigorously administered, because de-stocking operations take place during pre-harvest periods when prices are high and stocks are rebuilt after harvest when prices are low.

- The negative effect linked to storage costs: While emergency stocks make it possible to acquire foodstuffs less expensively, immobilizing these goods comes at a cost but makes it possible to avoid mobilizing international emergency aid only once the crisis has been declared. Thus, in the EFSRA program in Ethiopia, the cost of storing a ton of grain is $13 for a stock immobilized for less than 3 months and $41 for a period of 6 to 9 months.

[The WFP considers three months to be the average time needed to deliver international aid. The SADC regional reserve in the process of being elaborated also plans on three months. The reserve implemented by Ethiopia plans to cover four months of needs (ECOWAS, 2012).]
1. Current Status

Finally, compared with acquiring foodstuffs on the international market, recourse to emergency stocks allows one to partially avoid the constraint weighing on countries’ currency resources during a shock. Insomuch as the countries affected by food crises are often net importers of consumption and industrial goods, and are not attractive enough to draw foreign capital, their balance of payments is generally in the red. Because of this fact, it is uncertain whether these countries will have the currency reserves necessary to make international purchases once a food crisis has begun. In this context, holding an emergency stock, which can be built locally during a surplus period or through imports at a time of year when the country has the currency to do so, is therefore a way to secure resources for emergency interventions.

1.4.2. The Risks Associated with Emergency Stocks

A review of past experience with emergency stocks can identify several risks associated with their implementation.

Systems Poorly Suited to the Complexity of Factors behind Food Crises

The periods of food crisis that African countries have undergone over the past ten years bear witness to the complexity and diversity of circumstantial factors at work: agro-climatic shocks caused by weather events (inadequate rainfall, flooding) or ecological events (locust outbreaks), price shocks on local or international markets, and even crises caused by conflicts or socio-political factors. Not only do these three risk factors

### Table 4

<table>
<thead>
<tr>
<th></th>
<th>≤ 3 months</th>
<th>3–6 months</th>
<th>6–9 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantities (tonnes)</td>
<td>67,440</td>
<td>26,184</td>
<td>7,996</td>
</tr>
<tr>
<td>Total Cost (thousand USD)</td>
<td>921</td>
<td>715</td>
<td>327</td>
</tr>
<tr>
<td>Cost (USD/ton)</td>
<td>13.7</td>
<td>27.3</td>
<td>40.9</td>
</tr>
</tbody>
</table>

Source: Rashid, 2011.
not operate independently, they reinforce each other. What is more, these different shocks take place in an overall context marked by strong structural vulnerability for populations, lowering households’—particularly poor households’—ability to resist these shocks (ECOWAS, 2012).

As noted previously, the primary function of an emergency stock is to help manage temporary crises. Faced with the complexity of factors behind food crises, emergency stock systems face two major risks: (i) being unable to cover all temporary shocks; and (ii) not taking into account the inter-related nature of short-term and structural factors behind food crises. Yet, the current configuration of emergency stock systems in African countries leads one to believe that these systems are still poorly suited to the complexity of factors behind food crises for the following reasons:

Very often, the criteria to trigger use of emergency stocks are too restrictive to cover all food crisis situations. In countries subject to food crises, early warning systems (EWSs) serve the purpose of providing up-to-date estimates of the number and location of food-insecure people nationally and regionally (for regional EWSs). When a contingency plan exists and can rely on an efficient information system, it is the preferred instrument to trigger the emergency stock. Food insecurity thresholds are generally classified by degree of severity, and triggering the stock may be conditional on, for example, exceeding stage 3 “severe food insecurity” or stage 4 “extreme food insecurity” depending on the contents of the contingency plan. The contingency plan makes it possible to reason and anticipate responses based on the specific characteristics of the crisis (magnitude and nature) by defining modalities to mobilize instruments and the responsibilities of various actors on the local and national levels, and by synchronizing the interventions of all involved: government, international organizations, NGOs and bilateral aid agencies (ECOWAS, 2011). However, for many national EWSs, the criteria by which to determine the level of insecurity in this or that region are still too frequently based on foodstuff “availability” indicators, mainly grain shortfall levels, and are not very effective at handling food “accessibility” indicators.[29] In particular, insomuch as they rarely include the data provided by national MISs (when these operate), the “price” dimension is rarely taken into account in the analysis. An emergency stock aiming to manage the effects of a price spike could therefore not use this type of system as a trigger.

[29] The EWSs in some countries (e.g. Mali, Niger) include accessibility indicators such as the terms of trade between millet and small ruminants (that act as savings in kind).
Trigger procedures may be too rigid for the system to adapt to the constantly changing factors behind food crises. Defining clear and objective procedures to administer emergency stocks is a crucial element in their good governance and therefore in the effectiveness of these policies (see 3.3.1). Inversely, setting up a too complex or too rigid system can hinder the ability to react promptly. In West Africa, states and technical and financial partners have set up systems to co-administer emergency stocks with the aim of lowering stock governance problems by setting intervention criteria, but these criteria have sometimes turned out to be poorly suited to crisis situations.

The various response modalities allowed by emergency stocks do not cover all food crisis situations. Most emergency stocks are still exclusively composed of physical resources. In the case of food crises, transferring resources in kind has many advantages: it increases food consumption much more than the equivalent in cash would, it makes it possible to guide households’ food consumption (in ways that encourage improvements in nutritional status), it is immediately available, it can replace a market when the market is deficient, and unlike monetary resources, it is not subject to inflation. However, while transfers in kind are particularly well suited to responding to availability problems (production shocks), they are often much less well suited to responding to price shocks than cash transfers. In this case, if efficient markets exist, it is often preferable to use cash transfers because transfer costs are lower, the money can be converted into food rapidly, and there is less risk of interfering with the market (ECART, 2009). In addition, holding financial reserves eliminates logistical food storage costs.

When it comes to transfer modalities—whether aid in kind or in monetary form—there is also the risk of inadequate targeting, limited to geographic targeting based on an inefficient information system. This risk is greater when local actors already present in the area who have in-depth knowledge of the diversity in household situations are not (or not sufficiently) involved in aid distribution. Indeed, local organizations often have instruments enabling more precise targeting than the targeting usually done by government bodies (see 3.3).

Stock Levels Insufficient for Needs[30]
To the extent that the quantities released are not sold on the market (or are sold at a subsidized price) but distributed in the framework of relief operations, the risk of emptying the emergency stock is particularly strong. During years with production crises, most African countries face a lack of availability and skyrocketing prices. In this

1. Current Status

case, there is a strong risk of not being able to rebuild the stock or of considerably lowering its working capital and consequently the volume of physical stores.

Furthermore, the authorization generally given to the government to borrow from the national emergency stock for its own operations[^31] also increases the risk of depleting the stock. Indeed, for various reasons, it frequently happens that the stock is not returned completely, not returned at all, or pushed back to a later crop year. For all of these reasons, the stock rarely matches its contractual level, which can have serious consequences. This was the case during the food crisis in Niger in 2004/2005[^32]. When the national system elaborated its emergency plan (in November 2004), the emergency stock had a total of 23,000 tonnes of grain (instead of the contractual 50,000 tonnes). This “shortfall” in the emergency stock played a non-negligible role in how the crisis unfolded because, due to tensions in the regional grain market (and the export bans declared by neighboring countries), the system was not able to buy on the market and had to amputate its emergency plan.

Let us also note that the low stock levels can also come from a lack of regular revision of contractual level based on changes in the number of food insecure people.

**Risks of Market Interference**

Although the ultimate goal of an emergency stock is not to alter prices, it is obvious that its impact on the market (in terms of prices or the role of private actors) will never be nil when it buys on the local market despite the smallness of the flows involved. Stock movements can sometimes perturb markets, notably when intervention times are too slow. The effects are then the same as those caused by too slow international aid: de-stocking happens once the marketing phase of the new crop year has begun, placing downward pressure on prices.

Risks of interfering with the market are also present when the emergency stock is used deliberately with the aim of regulation. In the framework of crisis prevention/management systems, national emergency stocks are more and more often called on to support the diversification of the intervention tools in safety net programs (see 3.3.1.1): in this way, sales of grain at moderate prices, the various food-for-work operations, and the decentralized endowment of grain banks are operations that, like food aid distribution, will mobilize foodstuffs from the emergency stock. Since deregulation policies prohibit

[^31]: In countries where emergency stocks are “co-administered” by the state and the main technical and financial partners, such authorizations are notably part of the agreements governing these stocks.

the state from intervening in the market, these interventions “under cover” of crisis management become in practice the only public interventions in food markets. In addition to these interventions, there is a technical operation that will play an important role some years: the annual renewal of a portion of the emergency stock (often one third). This technical rotation is necessary to ensure the quality of the foodstuffs stored and prevent their degradation. Calls for tender launched in this framework can have an impact on prices (limiting drops during harvest periods), particularly as other operators (WFP, NGOs) also go to the market at the start of the year (Egg, 2009).

1.5. Conclusion

The review of academic literature and positions taken in international arenas leads to a twofold observation. First, there is a consensus on the potential usefulness of emergency stocks to prevent or mitigate food crises. Second, many authors express strong reluctance when it comes to buffer stocks because of the distortions they may generate, in particular the risk of evicting private stores, in light of past experiences deemed mostly unfavorable.

In regard to public buffer stocks, on the theoretical level, they potentially allow one to act directly on price risk. Although the dominant model—the “competitive storage model”—concludes that there are no gains for society, the assumptions on which this assertion is based, in particular the lack of risk aversion and the specific treatment of uncertainty, limit the model’s reach as a decision-making tool. In fact, some research taking into account risk aversion seems to show that public stocks are of interest for society as a whole. On the empirical level, the literature above all emphasizes the complexity of the mechanisms at work in the key relations between buffer stocks and all public measures aiming to stabilize prices by acting on production, public and private stock levels, and imports or exports. While these different instruments have different degrees of effectiveness, time needed, cost and undesired effects on prices, they can a priori be used interchangeably. However, in some contexts, these instruments can also complement each other or even be inseparable in the case of buffer stocks and instruments addressing foreign trade. In addition, when it comes to market-based tools to manage price risks, since price volatility is a key component of their risk premium, a public buffer stock policy that attains its stabilization goal can therefore also lower the risk premium and by so doing help make private price risk management tools more attractive. Finally, a large body of work insists on the decisive role played by how storage
1. Current Status

policies are implemented and how well they suit the national context in these policies’ effectiveness.

But the different types of instruments based on public intervention in fact compete with each other for the use of limited budget resources. In particular, it should be noted that buffer stock systems are much more expensive than emergency stock systems. Nevertheless, when the state has considerable financial resources, safety nets, which target certain segments of the population, and buffer stocks, which benefit all actors, may complement each other (Galtier, 2012). This complementarity is all the stronger when regulating production prices. In this case, the buffer stock strategy to regulate prices benefits all producers that have marketable surpluses, whereas social safety net programs can target producers that do not produce enough to sell on the market and who therefore do not benefit from the stabilization policy (Gérard et al., 2011).

Whether it be buffer stocks or emergency stocks, the experience of developing countries shows that the institutional conditions for policy implementation count as much as—sometimes more than—the nature of the instruments used. On this level, the issue of how storage policies are governed, as with other public policies, is raised in terms of credibility, predictability and effectiveness.

The credibility of the storage policy is manifest in the degree of confidence actors show in regard to the state’s will and capacity to attain the objectives it has announced. By acting so that private actors’ expectations (for example, as to the producer floor price for the coming season) coincide with the objective they announced, the authorities increase the probability of attaining this objective.

This credibility obviously depends on the effectiveness of the policy rolled out, or in other words the way in which the measures planned in the framework of the policy are really implemented by the state and the way that private actors comply with them. Policy ineffectiveness is particularly present in countries that are not able to enforce the law or whose institutions lack legitimacy. When it comes to buffer stock policies, this can take the form of the modification of ceiling or floor prices compared to the initially announced goals or even actors’ non-compliance with the measures imposed by the state (illicit trade, embezzling for personal gain among agents working in the system). For instance, in the case of emergency stock policies, policy ineffectiveness can take the form of the re-sale on local or foreign markets of some of the stocks released that had initially been destined for safety net programs or emergency food aid operations.
Finally, the success of a public storage policy also relies in large part on its predictability, which is itself determined by the amount of communication on the storage policy’s objectives and implementation. When it comes to buffer stock policies, private actors must know in advance and with certainty what the floor and ceiling prices will be and when market interventions will take place so that they can correctly anticipate the government’s actions and position themselves accordingly. When it comes to emergency stock policies, the question of predictability is also decisive insomuch as it influences humanitarian aid actors’ ability to coordinate their actions, a key element in the success of emergency interventions.

These risks in relation to storage policy governance modes can nevertheless be contained by implementing certain systems or measures (see Section 3).
1. Current Status
2. Case Studies

The case studies presented in this second section correspond to national storage issues that are simultaneously very different (from each other) and representative of a large portion of the discussions covered in Section 1.

The economic performance of Ethiopia, a landlocked country, has been relatively good over the past few years, including in the agricultural sector. However, a large portion of its population is still structurally or temporarily food insecure. For roughly a decade, in addition to food aid programs based on a vast emergency stock, the government has set up a broad program of social safety nets seen as relatively effective, mainly with outside funding. However, the government’s will to set up a buffer stock runs the risk of weakening the complementarity between social safety nets and the emergency stock without any guarantee that the sought-after price stabilization objectives will be attained.

Burkina Faso, also landlocked, is undergoing—as are the other Sahelian countries—a major reversal in its food crisis prevention and management policy. Until recent years, the policy addressed food insecurity mainly in terms of availability. Today, under the effects of greater crisis frequency, the government is paying greater attention to accessibility problems. This shift has had, and should continue to have in the future, implications for the emergency stock system’s characteristics (composition, trigger criteria, etc.). Another striking characteristic of the storage issue in Burkina Faso is the importance of the regional dimension, both as regards the emergency stock (with the upcoming establishment of a regional food reserve by ECOWAS) and the buffer stock (establishment of a CET for WAEMU and, more recently, ECOWAS[33]). The supranational nature of trade policy, combined with weak budget resources, heavily limits the ambitions of a national price stabilization policy.

Egypt, a country with a large seafront and the worlds largest wheat importer, is also at a turning point in its agricultural and food policy. Until now, public stocks held large volumes and were part of a policy of strongly administered prices, for both locally grown and imported grains. The cost of this policy, which guarantees relatively high prices for producers and moderate prices for poor consumers, has risen steadily every year and

[33] Burkina Faso belongs to both of these regional organizations.
is becoming more and more difficult to fund given the Egyptian government’s budget situation. Various vast reforms and public intervention modalities are under study. The Egyptian authorities would like to accompany the probable deregulation of the food sector by forming strategic stocks equivalent to six months of consumption to protect the country against possible supply ruptures. This option raises many questions.

2.1. Ethiopia Case Study

2.1.1. Characteristics of the Agricultural and Food Situation in the Country

Food Supply and Demand

Steady Growth in Agricultural Production over the Last 20 Years

Between 1997 and 2008/2009, the production of major food crops rose from 7.4 to 17.0 million tonnes with annual average growth of 4.3%. Grain yields were 11.6 quintals per hectare in 1997 and rose to more than 16.8 quintals per hectare in 2010. At the same time, land used to grow grain nearly doubled, contributing more to production growth than productivity. Farmers have a tendency to expand their fields on marginal lands to meet increasing demand for grains, fueling concerns about land degradation. Average farm size is very small (less than one hectare on average) and decreasing.

In addition to steady production growth over the last two decades, the other major characteristic of Ethiopian agricultural production is its variability. The overall growth trend has been punctuated with poor harvests such as in 2007. In 2002 and 2003, two poor harvests in a row led to the most severe food crisis since the 1984 famine.

In terms of cultivated area, teff is the dominant grain, followed by wheat and corn. In terms of production, corn comes first (3.3 million tonnes), followed by equal amounts of teff, wheat and sorghum (about 2.4 million tonnes each). Production is not evenly distributed over the Ethiopian territory because of diverse agro-ecologic conditions and food habits: over 90% of grain production is concentrated in the four major regions of Oromia, Amhara, SNNPR and Tigray. Simultaneously with the expansion of cultivated areas, fertilizer use dropped between 2000/2001 and 2007/2008 in most regions. When grain prices became attractive, fertilizer utilization grew again after 2007/2008.

Ambitious Targets and Controversial Statistics

Based on estimated production (excluding pulses and oilseed) of 18 million tonnes in 2010/2011, the Growth and Transformation Plan set a target for grain production at 22 million tonnes in 2014/2015. This target is all the more ambitious since current production levels are debated: according to independent opinions, some of which
2. Case Studies

Figure 1  National Production Trends in Ethiopia

Map 1  Map of Dominant Crops in Ethiopia


Source: Chamberlin and Schmidt, 2011.
based on local surveys (e.g. Dercon et al., 2009), official production growth statistics may be slightly too optimistic. Rapid inflation in food prices (see below) tends to support the opinion that food production per capita has not grown as rapidly as the Central Statistical Agency (CSA) data report.

**Food Consumption: Grains Dominate Except in the Southern Highlands**

Grains account for 65% of energy, 63% of protein and 23% of fat in the country’s overall dietary intake. They make up the largest share of calories and protein in national diets, except in the southern parts of the country where the diet consists primarily of enset. Teff is the most-eaten food in urban areas, while another grain dominates in rural zones. Food represents 46% of household expenditure in Ethiopia, one of the highest percentages in the world (Tadesse, 2010). Grain expenditures account for more than 50% of household food budgets in most regions.

**Population: Rapid Growth and Still Overwhelmingly Rural**

Rapid population growth inevitably raises major questions about the country’s ability to feed itself in the future. With population growth at about 2.9%, the addition of more than 2 million people per year puts tremendous pressure on Ethiopia’s environment, the economy and ability to deliver proper services. By 2050, the Ethiopian population is expected to reach 145 million people, with projections fluctuating between 125 and 166 million people. The Ethiopian population is still overwhelmingly rural, with 16.2% living in cities. The capital Addis Ababa has a population of 2.7 million (approximately 3.7% of the total population). Accordingly, as indicated below, food markets are still very small and underdeveloped.

**International Trade**

Food imports come through two different channels: commercial imports by private and public operators, and development assistance. Every year, the country imports between 300 and 800,000 tonnes of grain, and receives 500 to 1 million tonnes of foodstuffs in the form of aid (these figures may be higher in crisis years).

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[34] Enset (E. ventricosum) is commonly known as “false banana” for its close resemblance to the domesticated banana plant.

[35] United Nations Department of Economic and Social Affairs (UNDESA).
The export of traditional grains, such as teff, wheat and corn, is very limited given production levels. Grain exports are mainly limited to teff, for which demand is strong among Ethiopian expatriates and in Eritrea. In 2006, the government banned grain exports in response to rising grain prices. However, it is said that small quantities of grains and legumes continue to be exported under the table. Official legume exports, mainly to the Middle East and South Asia, have been on the rise since 2002.

The trade balance has improved significantly since 1992, especially from 1996 to 2010, reflecting the strong demand for commodity exports on world markets. In 2010/2011, the total value of exports rose by approximately 37%, driven by high world prices for key export commodities such as coffee, gold, leather goods, meat, legumes, flowers, khat and oilseeds (WFP, 2012).

Food Market Dynamics and Structure

A Relatively Isolated Market
During the 10 years just prior to the 2008 food price hike, Ethiopian food prices had varied within the band set by import and export parity prices. This band is relatively wide because of high transportation costs from the port of Djibouti (approximately 60 USD per ton). Thus, food price fluctuations are fairly strong, notably because of significant endogenous and natural price volatility.

Food Market Dynamics Since 2008: High and Volatile Prices
Since 2007/2008, food markets in Ethiopia have been turbulent, as they have in the rest of the world, with high prices as shown in Figure 2.

Although food prices follow international prices with a lag, much of Ethiopian food market dynamics over the last few years have been caused by internal factors. Analysis shows that the main drivers of price fluctuations are clearly internal rather than imported:

- general inflation fueled by economic growth, urbanization and foreign investments in the local economy;

- food prices rising more rapidly than general inflation, a phenomenon that a number of authors believe is inherent to growing urban demand, but there are

[36] It has been reported that processed food exports (such as injera which is a sour dough bread made from teff) increased after the ban.


2. Case Studies

2. Ethiopia: Case Study

Also signs that the food supply has not increased as quickly as national statistics seem to indicate;

- the devaluation of the birr, which helped push up prices throughout the period;

- the 2011 harvest[^37] that was affected by the regional drought (poor belg harvest in the south); and

- the seasonal nature of Ethiopian prices (particularly for corn), which contributes to the gap between national and international price dynamics.

Why did domestic prices spike so rapidly in 2007/2008 and 2011/2012? Fuel prices had also gone up and contributed to a large deficit in the balance of payments and the poor performance of export value chains over the last few years. When local prices overtook import parity prices, foodstuffs were no longer accessible to traders because the Central Bank had rationed currency. Faced with limited currency reserves, the authorities prioritized fertilizer and food imports. The resulting delays in food imports fueled the 2008 price spike.

[^37]: Although officially better than the 2010 harvest.
2. Case Studies

A Narrow but Increasingly Efficient Market

Frequent fluctuations in national production and seasonal price variations are among the main possible factors in natural price volatility but understanding structural characteristics of grain markets is crucial to determine the respective weight of endogenous and natural factors in price volatility.

With around 85% of the population living in rural areas, most of whom engaged in agriculture, the marketed share of agricultural production remains limited. There are few available data on marketed surpluses, which are probably increasing as the country is urbanizing. Three studies produced between 1995 and now suggest that less than 25% of national grain production is marketed.

However, the Ethiopian food market has progressively become much more integrated over the past 10 years. Spatial price variations have reduced drastically since the early 2000s due to a steep drop in transport costs as a result of greater competition and an improved road network. Better telecommunications have also helped the market integration process by allowing better distribution of commercial information.

In this large, very populated country with varying weather conditions, food markets are diverse. Food production is very regional, as is demand. However, despite these characteristics, food markets seem to be closely interconnected—a sign of a more efficient and more integrated domestic market. Wheat and corn prices are in line with world prices, but to a lesser extent than other food products within the country.

Stocks: A Relatively Vague Idea of Overall Storage Capacity

As stated above, around 75% of national grain production is not marketed, suggesting that about 12 million tonnes of grain are stored on-farm, and the rest (imports and marketed surpluses) by other actors.

Public Stores: Public storage capacities are about 1.2 million tonnes, distributed as follows: 380,000 tonnes are managed by the Emergency Grain Reserve Agency, and 800,000 tonnes by the Ethiopian Grain Trade Enterprise (EGTA) and largely underutilized.

International Agencies: The WFP reports an emergency stock of 120,000 tonnes; and we have no overall figures for NGO stocks, but an estimate of between 50,000 and 100,000 tonnes would seem fair.

Private Stores: The national surplus is almost entirely managed by private operators and cooperatives. In addition, private storage capacities should be more than four million
2. Case Studies

tonnes (marketed surplus). A recent study on farmers’ involvement with cooperatives revealed that about 28% of farmers sell grain though co-ops, and an even smaller share of total grain is marketed through this channel.

**Characteristics of Food Insecurity**

Chronic food insecurity levels are still very high in Ethiopia. The country is ranked fourth in the world by the IFPRI Global Hunger Index.\(^{[38]}\) FAO estimates of undernourishment indicate that Ethiopia also ranks fourth in the world in terms of the number of undernourished people (behind India, China, and Pakistan), acting as host to the largest number of undernourished people in Africa, approximately 34 million in 2012. Ethiopians are not all equally exposed to chronic food insecurity. Prevalence is much higher in Tigray and Amahara and probably in the Somali region, although statistics for this region are not available in the Ethiopia Regional Hunger Index (ERHI) report.

The situation seems bleak, but things are improving. Poverty has declined rapidly in the country over the last 20 years, both in prevalence and number of people concerned. Food insecurity has declined too, more quickly than in many other countries. Food availability, in particular, has improved considerably since the end of the Derg regime and, as indicated by the ERHI, child underweight and child mortality have also significantly declined.

Temporary Food Insecurity: Every year, two seasonal assessments are organized jointly by the government and development partners to determine emergency food aid needs throughout the country. According to these estimates based on biannual surveys, the number of people requiring emergency aid has fluctuated between 2.3 and 4.6 million since 2005.

**Overall Policy Context**

Progressive deregulation starting in the early 1990s. The post-1991 period was marked by a multi-dimensional economic reform marking the shift from a planned economy to a more deregulated economy. Since 2007, Ethiopia has adopted and institutionalized a Comprehensive Africa Agriculture Development Program (CAADP) within the Agricultural Development Led Industrialization (ADLI) strategy included in the consecutive Poverty Reduction Strategy Paper (PRSP) and later followed by the PASDEP\(^{[39]}\) (2005-2010) until the current GTP\(^{[40]}\) (2010-2015).

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\(^{[38]}\) Data are not available for the districts affected by conflicts.

\(^{[39]}\) Plan for Accelerated and Sustained Development to End Poverty

\(^{[40]}\) Growth and Transformation Plan
Significant changes occurred in the marketing of grains during this period (Rashid et al., 2009), namely: (1) a smaller role for the public authorities in food marketing, (2) an increase in grain processing, (3) an increasingly larger role for cooperatives in marketing, and (4) the introduction of a warehouse receipt systems for foodstuffs. Among other things, and although this has not yet had much impact on grain markets, all coffee and legume exports are now done through the Ethiopia Commodity Exchange and the Ethiopian Grain Trade Enterprise, which plan to enter grain markets in the future.

Agricultural and rural development have been given priority. While the government has demonstrated commitment to the sector by allocating more than 15% of total public expenditure to it, a significant portion (approximately 60% in 2011) of this allocation is earmarked for the Disaster Risk Management and Food Security (DRMFS) program in charge of disaster management and the national Productive Safety Net Program (PNSP) launched in 2005.

Strong international support. The amount of aid from donors to Ethiopia rose from US$600-700 million at the end of the 1990s to US$1,823 billion in 2004—up more than 250%. USAID is the main provider of foreign aid to the agricultural sector.

**Food Security Policy**

**Addressing Structural Food Insecurity**

Until 2003, the national food security policy focused mainly on managing food crises. After a disastrous year with more than 13 million people in need of food aid, a large-scale consultation process led to the country’s adoption of an ambitious program of reforms in regard to food security. The Productive Safety Net Program (PNSP) was created in 2005 with the aim of addressing chronic food insecurity and preventing temporary food insecurity.

The current food security program (2009-2014) contains four distinct components:

- **Productive Safety Net Program (PNSP):** This program targets chronically food insecure households, and more specifically households that have a food deficit for three months or more, even during normal years in vulnerable woredas (districts). The target group includes chronically food insecure households and households located in woredas that have volunteered to take part in a public interest program improving community infrastructures.
2. Case Studies

- **Household Asset Building Program (HABP):** This program targets both chronically and temporarily food insecure households in **woredas** designated as vulnerable. The HABP was designed as a complement to the PSNP (the PSNP protects assets while the HABP helps build them) providing households with subsidized credit.

- **Resettlement Program:** This program targets food insecure households with adequate able-bodied adult workers who voluntarily apply for resettlement.

- **Community Infrastructure Development:** This fourth component aims to improve access to basic infrastructures for populations living in chronically food insecure **woredas** or districts.

**Key Policy Issues**

**Coverage:** The PSNP only covers one third to one half of the 8.3 million people in its target demographic.

**Cash or food aid:** It is generally accepted that monetary transfers are more effective than transfers in kind. However, because of rapid food inflation, and the slow (and overly limited) reevaluation of PSNP wages, workers receiving cash wages have lost purchasing power, reducing demand for cash-based assistance.

**Graduation:** It seems that the PSNP is effective for households vulnerable to food insecurity, but how many people has this program pulled out of poverty traps? Graduation rates have been limited so far, and the Household Asset Building Program—a program affiliated with the PSNP—is meant to bridge that gap.

**Meeting transitory needs through the PSNP’s institutional set-up:** The PSNP is equipped with risk mitigation instruments: (1) a contingency budget managed by the **woredas** and used to adapt wage levels and caseloads to local circumstances, and (2) a risk financing mechanism that makes it possible provide approximately 3 million people with emergency food aid in PSNP **woredas**. While the risk financing instrument was originally designed so that it could be triggered twice in a 5-year period, the emergency budget (20% of funds available in each **woreda**) has, for its part, been used every year.

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[41] Interview with Matt Hobson, World Bank.
2. Case Studies

Addressing Temporary Food Insecurity
Ethiopia has developed a fairly effective disaster management system based on biannual joint assessment, biannual emergency plans, and strong coordination mechanisms.

Between 2.8 and 6 million people have received emergency food aid every year since 2005 (peaking at 13 million in 2003). The annual cost of emergency food aid operations has fluctuated between US$150 and US$350 million depending on the number of people in need and the cost of food on international markets. One of the PSNP’s major successes has been preventing a large number of rural households from needing emergency aid. In 2011, emergency aid needs were better controlled in Ethiopia than in any other country on the Horn of Africa (Sida et al., 2012).

Prevention activities are coordinated though the disaster operation coordination center and the multi-agency coordination office. Emergency operations are largely country-led, and the UN Cluster coordination system is fully integrated into national administration systems. In addition, prevention activities are conducted by sector-specific bodies, deconcentrated government bodies, and humanitarian organizations (UN bodies, international NGOs and domestic NGOs).

The trigger and mobilization level of the contingency fund and the risk financing mechanism are established based on “Livelihoods, Early Assessment and Protection” (LEAP), an early warning system managed by the government of Ethiopia, developed since 2006 with the support of the WFP. LEAP relies on the combination of meteorological and agro-ecologic data collected early enough in the crop year to decide on the overall scope of the financial schemes in time and by so doing allow safety net systems to transfer resources at the right time, increasing if needed the transfer level and/or population covered by the PSNP.

2.1.2. The Position of Stock Within the Country’s Agricultural and Food Policy

Public Food Storage Institutions
The public storage strategy in Ethiopia is implemented mainly by two quasi-governmental institutions with different objectives: market stabilization and emergency relief.

The Emergency Food Security Reserve Administration (EFSRA)
Emergency food aid is administered by an independent institution created in 1982. In 1992, EFSRA was reformed with the aim of establishing it as an autonomous agency by making significant changes to its operational procedures. The goal was to facilitate operations in the case of temporary shortages if repayment within an agreed-upon
timeframe was guaranteed. Nevertheless, food provision for other programs, such as price stabilization and safety net programs, formally remained under its mandate. EFSRA’s stocks were increased greatly—from about 200,000 to 407,000 tonnes of grain—following the 2002/2003 drought in the country.

EFSRA loans were initially supposed to be used only for emergency actions. Since 2000, the PSNP has been using EFSRA stocks and more recently, the EGTE has started to use EFSRA stocks for price stabilization purposes (see Figure 3).

**Figure 3** Ethiopia: EFSRA Withdrawal Trends, by Program Type, 1994-2009


**EGTE**

EFSRA’s primary function is resource management, and EGTE is largely responsible for market stabilization operations. Like the EFSRA, the EGTE has undergone several structural changes and mission adjustments. The role of the EGTE was revised to stabilize consumer and producer prices and maintain buffer stocks. Yet, until recently, the EGTE has played only a minor role in grain purchasing and price stabilization. It has only enabled the purchase of 2% of marketed surpluses.

The EGTE’s storage capacity is up to 800,000 tonnes of grain, or almost double EFSRA’s grain stocks. Currently, the EGTE operates about 240 warehouses throughout the country (mainly in urban settings in surplus areas and in Addis—approximately 200,000 tonnes). Warehouses are located in 118 sites, with capacities ranging from 300 tonnes to 100,000 tonnes (the Saris site in Addis). A large number of warehouses are rented out
to the private sector or to the ECX. EGTE warehouse are not really intended to store grain for long periods; instead, most of them are seen as transit facilities for grains, cash crops and fertilizer.

Figure 4 shows the volume of grain operations by EGTE over recent years, which account for a significant share of the market (approximately 15% in 2008/2009 and 2011/2012; this percentage is even higher for wheat). In 2008 and 2011/2012 when prices were skyrocketing, the lion’s share of EGTE operations involved imports.

On the effectiveness of regulation attempts, a study by Dorosh and Ahmed (2009) indicates that government sales of imported wheat lowered real wheat prices on domestic markets by roughly 25% compared to prices in October 2008. However, given the volumes involved, the same authors estimate that a price drop to the order of 34% could have been expected. The borderline effectiveness of the system is probably explained by the fact that traders who obtained subsidized products did not sell all the goods, and by the fact that imported wheat is not entirely substitutable for domestic wheat and sells for less. Even though not estimated by the Dorosh and Ahmed study, one should recall that actions to regulate the wheat market are expected to only partially be passed on to markets for other food products. Finally, this analysis estimates that approximately 30% of the sums invested in regulation actions were captured by value chain agents and not passed on to consumers.
Toward a New National Grain Reserve Policy Framework

With the Growth and Transformation Plan (GTP), the government of Ethiopia presented a new vision and new ambitions for the national food storage policy. The GTP plans to increase the productivity of major grains through various strategies and programs such as the Agricultural Growth Program (AGP). While EFSRA’s mandate was solely focused on securing the emergency food pipeline, the GTP’s orientation hinted at the use of national stocks for other purposes. The underlying assumption is that the new policy will generate a national surplus and that part of this surplus will be held in public stocks.

### Box 3 Ethiopia: National Food Reserve Agency (NFRA) Plans

#### 3 Strategic Objectives

- Emergency interventions: secure delivery of emergency food aid.
- Price stabilization via sale and purchase operations involving targeted grains.
- Promote trade: promotion of grain exports.

**In what form?**

- Larger stocks (3 million tonnes) to enable both emergency response and price stabilization. Nevertheless, this requires building up a large storage capacity in the central highlands, in conjunction with already existing regional warehouses (EFSRA).
- A reform of the institutional system to optimize coordination in line with different strategic objectives: system managed by a single agency, under the authority of the Prime Minister, and the result of a merger between the Disaster Risk Management and Food Security Sector (DRMFSS), the EFSRA and the EGTE.
- More efficient storage systems and better maintenance: from bags to bulk, coordinated with the WFP initiative to build bulk storage infrastructures in Djibouti.
- Obtain supply from local production, reduce dependency on imports, save foreign currency.

#### Limited Progress to Date

1. Plans for a 300,000 ton bulk storage facility (silos) in Adama prepared by the government. The Ministry of Agriculture has submitted a proposal to several donors, including the AFD.

2. The AFD has promised to help the government of Ethiopia build this facility through a soft loan in the amount of €60 million.

3. The government has commissioned ATA to conduct a stock study. This study, implemented jointly by ATA and McKenzie, is almost complete.
to reduce the country’s dependency on food aid. The national grain reserve would then help stabilize the market to encourage national production. The main measures in the reshaped national grain reserve blueprint as envisaged by current national strategy and policy documents are listed in Box 3.

**Functioning of Ethiopian Public Food Stocks**

This section mainly covers the EFSRA. Indeed, while EGTE buys and sells grain, it only stores grain for short periods and does not really operate as a stocking agency. Also, with the stepping up of its price stabilization activities in recent years, EGTE has increasingly called on EFSRA to act as a storage agent.

**EFSRA: A Simple Mandate and Clear Mission**

EFSRA’s mandate is very focused. Its role is to guarantee food stock availability for aid agencies to secure the proper execution of their food aid programs. “The purpose of the Emergency Reserve is to provide a short-term buffer stock of emergency response commodities and items on loan to agencies engaged in relief activities until they can mobilize replacement resources through other mechanisms.”[42]

Its main users are:

- the DRMFSS, for emergency food operations;
- the Food Security directorate, to supply PSNP pipeline;
- the EGTE, using EFSRA stocks to supply price stabilization operations;
- the WFP, to supply emergency relief and PSNP operations; and
- NGOs, to supply emergency relief and PSNP operations.

EFSRA neither buys nor sells food. It operates as a warehouse facility, and provides food on credit to its users promising to replenish the stocks with the same quantity and quality. EFSRA loans must be co-signed by a third party, either a donor or an accredited government agency.

**Reactive Governance**

The agency is managed by a General Manager, reporting to a Board of Directors composed of ministers from the Ministries of Finance, of Agriculture and of Trade. The Board of Directors meets twice a year.

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[42] Document presenting the EFSRA’s mandate and operational procedures.
2. Case Studies

The General Manager is also advised by a technical committee bringing together representatives of the EGTE, the WFP, the EU and CIDA, along with the directors of EFSRA’s planning and operations departments. The Technical Committee meets monthly. Development partners are not members of the Board of Directors but of the Technical Committee and are authorized to grant small loans.

The organization in itself is fairly small: it is responsible for seven sites, with a storage capacities ranging from 37,000 MT to 97,000 MT. The head office employs around 25 people, the storage sites employ approximately 150 permanent staff in total, and the annual operating budget is approximately one million US dollars.

Box 4 Ethiopia: Stock Mobilization Procedures

**Trigger Criteria:**
- The EFRSA does not have pre-established rules but complies with the criteria put forth by the executing agency for food security management programs.
- Based on biannual crop forecast reports, Early Warning System (EWS) alerts, and a humanitarian plan.
- Outside of emergencies, requests must be in line with the PSNP’s operational plan.
- No clear triggers for price stabilization.

**Loan Eligibility Criteria:**
- The organization must be legally recognized as engaged in aid activities.
- The food provided on loan must be used for emergency relief distribution, through either employment-generating schemes or free distribution.
- The organization requesting the food loan must have a confirmed funding pledge for foodstuffs that will allow it to repay the loan in kind with an equal quantity of equal quality food.
- The organization requesting the loan has no previous record of defaulting on loans.
- The borrowing organization enters into an agreement obliging it to cover all costs related to loading, unloading, weighing, delivery and transportation.

**Application Procedure:**
- Signed letter by a high authority in the borrowing organization clearly indicating: amount requested, purpose, type of aid program through which the food will be distributed, geographic zone targeted for the planned distributions, number of beneficiaries, and planned repayment date.
2. Case Studies

EFSRA Activity Level

The EFSRA stock (physical and on loan) is calibrated at 407,000 MT. The rationale is that reserves should be sufficient to cover the basic food needs (12 kg of grain per person per month) of 8.4 million people for 4 months prior to the arrival of food aid shipments. Physical stock has hovered at around 200,000 MT since the early 2000s. EFSRA’s storage capacity is about 388,000 MT, but its effective capacity is less than that (about 284,000 MT) because the warehouses located along major supply routes must always have room to receive food aid deliveries.

The official target for EFSRA stock composition is 70% wheat, 20% corn, and 10% of sorghum. EFSRA also manages a stock of non-food emergency items, but emergency non-grain food stocks (oil, CSB[^43], therapeutic foods, etc.) are managed directly by the DRMFSS, the Ministry of Health and international partners. The relative share of various grains, as defined by official directives, was mostly followed until 2007. Since then, this has been much less true and today, EFSRA only stocks imported wheat.

Three reasons explain the predominance of imported grain in EFSRA’s stocks:

- Local purchases have been banned for the WFP and NGOs since 2007, except for the “P4P” program that supplies limited quantities of grain (200 MT supplied in 2012 from January to September).

[^43]: Corn-Soy Blend: a corn-soy based enriched flour.
2. Case Studies

- EFSRA has strict quality standards, which are often hard for local production to meet.

- The EGTE has been using EFSRA storage capacities as a way to regulate bulk grain imports, and its replenishment has always been done through imports since 2007.

Warehouse Locations
EFSRA manages a network of 7 storage sites with capacities ranging from 37,000 MT to 97,000 MT. The network is very well organized for its emergency stock mission, with storage sites near or in shortfall areas; all storage sites are connected to a central hub. All the storage facilities are all conventional warehouses, organized in 5,000 MT units within storage sites.

EFSRA’s Operational Efficiency
EFSRA has been recognized as an effective emergency grain reserve (Rashid and Lemma, 2011). Even in 2003, it helped prevent major food aid pipeline breaks by handling more than 1 million MT, despite its 380,000 MT capacity. In the early 2000s, most foodstuffs (about two-thirds) stayed no longer than three months in storage, guaranteeing low loss levels and manageable financial storage costs. Two changes happened between 2005 and 2007:

- NGO involvement in the food pipeline stopped. The food pipeline is now fully managed by the WFP and DRMFSS. The fact that the WFP has its own storage capacities (120,000 MT) and more secure pipelines contributed to the drop in overall borrowing from EFSRA.

- The EGTE started to borrow from EFSRA to supply food price stabilization operations.

Stock levels have changed since 2007. Previously, physical stocks oscillated between 250,000 MT after the *mehar* harvest (February) and 100,000 MT at the end of pre-harvest period (September). Since then, stocks have been depleted twice (2008 and 2011) when EGTE borrowed significant quantities for price stabilization interventions and replenished the stocks after a relatively long delay. There is an explanation for longer replenishment times by the EGTE: since the purpose of these loans is market

stabilization, it makes sense to wait for better international prices before placing orders to repay the loans. Yet, this fuels defiance among partners who think that EFSRA should not be used for stabilization purposes and feel that the decisions to use EFSRA’s capacities were not made in a transparent manner. This is a threat to EFSRA’s legitimacy and credibility, which it had built and demonstrated during the course of previous years.

Physical stocks have dwindled in warehouses located in food deficit regions and anecdotal evidence suggest that EFSRA has become less responsive to emergency food loan requests.

With lower storage capacity utilization levels over the course of the last few years, one could have expected more rapid stock rotation cycles at the same time. But the opposite has occurred. In 2011, almost 70% of stocks were more than one year old, while in 2005-2007, between 62% and 70% of grain was held for less than three months. Emergency stores and prices stabilization stocks have different cycles and management principles. However, the use of EFSRA stocks for stabilization purposes has clearly reduced EFSRA’s ability to fulfill its primary purpose.

There are no statistics on losses but Rashid and Lemma (2011) consider that these should be relatively limited as average storage duration is relatively short. EFSRA’s planning department estimates that most storage losses are due to spillage during bagging or re-bagging (shrinkage) and mentions a figure of 1.5% to 2% for such losses.
2. Case Studies

no available figures on losses due to pests and moisture, which should increase with the length of time in storage, implying that the costs below are likely to be underestimated, especially for longer storage periods.

### Table 5 Ethiopia: EFSRA Estimated Storage Costs

<table>
<thead>
<tr>
<th>Type of Cost</th>
<th>Cost/MT</th>
<th>birr/MT/year</th>
<th>USD/12 months</th>
<th>USD/9 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Costs</td>
<td>8% of annual lending rate</td>
<td>640</td>
<td>37.60</td>
<td>28.20</td>
</tr>
<tr>
<td>Shrinkage</td>
<td>2%</td>
<td>160</td>
<td>9.40</td>
<td>9.40</td>
</tr>
<tr>
<td>Pest and Moisture Losses</td>
<td>no data</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fumigation / Stock Unit</td>
<td>per year</td>
<td>80</td>
<td>4.70</td>
<td>3.50</td>
</tr>
<tr>
<td>Sub-Total 1</td>
<td></td>
<td>518.0</td>
<td>41.20</td>
<td></td>
</tr>
<tr>
<td>Handling Costs / Bag or Ton</td>
<td>loading and unloading</td>
<td>19</td>
<td>11.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Re-bagging</td>
<td>0.65/q</td>
<td>6.50</td>
<td>0.40</td>
<td>0.40</td>
</tr>
<tr>
<td>Warehouse Management Staff</td>
<td>1 site manager, 1 quality manager, 4 warehouse keepers, 4 clerks, 8 cleaners</td>
<td>16</td>
<td>0.90</td>
<td>0.70</td>
</tr>
<tr>
<td>Energy / Unit of Storage Capacity</td>
<td>energy is free for some warehouses; no data available for others</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Internal Transport Costs</td>
<td>average cost of transport from import to warehouse based on WFP data</td>
<td>530</td>
<td>14.70</td>
<td>14.70</td>
</tr>
<tr>
<td>Sub-Total 2</td>
<td></td>
<td>17.10</td>
<td>16.90</td>
<td></td>
</tr>
<tr>
<td>TOTAL (USD/MT)</td>
<td></td>
<td>68.9</td>
<td>58.1</td>
<td></td>
</tr>
</tbody>
</table>

Note: calculations based on cost of 8,000 birr per ton.  
Source: Compiled by authors from various sources.

These cost estimates are consistent with those of Rashid and Lemma (2011), who estimate a cost of 46 USD per ton for 9 months of storage. They are relatively low, especially since inflation rates have been fairly high over the last few years, implicitly lowering financial costs that account for the largest share in overall costs. Yet, the effects of pests and moisture need to be more closely monitored: they could be relatively high for longer storage periods.
2.1.3. Current Challenges and Stakes

What can we learn from the storage policy implemented by the Ethiopian government in the past and today? From this perspective, this conclusion offers up the following indications in response to the questions below:

- To what extent is Ethiopia exposed to agricultural price volatility, and what are the main factors in this volatility?

- How relevant and effective are current price volatility management instruments, including public stocks, when it comes to stabilizing prices?

- What does this tell us about the relevance, appropriateness and coherence of the NFRA’s vision for the future?

- What recommendations can this study make to the AFD for its program to support strengthening and modernizing storage capacities in Ethiopia?

Price Volatility in Ethiopia

Food prices are particularly volatile in Ethiopia—more so than world prices—for a number of reasons. Ethiopian food production fluctuates greatly. Ethiopian agriculture is particularly sensitive to climatic conditions, and uses limited inputs. The very small size of farms is seen by many as an impediment to the modernization of agriculture. Food prices are naturally very seasonal, especially corn prices for which on-farm storage is more problematic than for other staple grains. Ethiopia is a landlocked country, which makes imported grains cost approximately 60 USD/MT more than their CIF value in the port of Djibouti. The Djibouti port is very congested, which helps drive up import costs, and can also delay food imports.

In recent years, the hike in food prices has been higher in Ethiopia than the rise in prices for the same goods on world markets and the general price increase in the country. Although national statistics suggest that agriculture production per capita has grown steadily over the last 25 years, a number of independent sources (including survey-based studies) suggest that official figures on national production are optimistic. The inflation in food prices clearly seems to express tension on the national food balance. This tension is exacerbated by the fact that economic growth is encouraging consumption. The elasticity of food consumption in relation to income is still high, both in rural and urban areas. Urbanization is also helping drive up prices, especially for teff.
2. Case Studies

Ethiopians are particularly sensitive to both the volatility and general inflation in food prices. Despite considerable progress over the last 20 years, poverty levels are still very high in Ethiopia, and food expenditure makes up a large share of household spending (46% on average). A significant proportion of Ethiopians are net food buyers: urban dwellers, people in the drylands, and—the largest in sheer numbers—very small landless farmers in the highlands are all net food buyers and vulnerable to both food price inflation and volatility. Although food market efficiency has increased significantly over the years, market failures still exist, notably in remote drylands where the transport network is less efficient and markets are less competitive.

Effectiveness of Price Volatility Management Instruments

Price Stabilization: A More Efficient Grain Market and a Resurgence of Market Interventions. The major trend since 1990 has been the progressive deregulation of the grain market and capital investments in transport infrastructures. Better communications have also helped improve market performance. Food exports are banned and imports are still highly regulated, with the WFP and EGTE being the largest operators. Public purchases on local markets are now very limited. From its reform in the early 1990s to just recently, the EGTE has not played a significant role in market stabilization, acting on only approximately 2% of marketable surplus. The EGTE’s role in stabilizing prices has been revived since 2007, through regular interventions in urban markets, mostly in the form of subsidized sales of significant volumes of wheat (from 200,000 MT to 500,000 MT per year).

Mitigating Food (PRICE) Shocks: A Full-Fledged Policy Framework

Reducing chronic food insecurity and preventing temporary food insecurity: Since 2005, Ethiopia has developed the ambitious Productive Safety Net Program (PSNP), offering a large-scale public employment scheme with the aim of securing the livelihoods of vulnerable households and building or restoring public facilities in rural areas. The PSNP target around 7.8 million people in approximately one third of the woredas in the country—the zones most affected by chronic food insecurity. Until now, roughly half of PSNP transfers were in food and the other half in cash, with the latter tending to increase in proportion. Cash transfers are advantageous in terms of management cost and, until recently, were favored by recipients. However, recent food inflation has influenced recipients’ preferences, and they now prefer to receive their wages in the form of food.

Addressing temporary food insecurity: Despite a significant reduction in emergency assistance requirements since the PSNP was introduced, Ethiopia remains vulnerable to food shocks. More specifically, the woredas vulnerable to temporary food insecurity
are located in the southern parts of the country, in drought-prone areas poorly covered by the PSNP. To tackle temporary food insecurity in these zones not covered by the PSNP, Ethiopia has set up an efficient half-yearly emergency needs assessment system led by the DRMFSS, following a call for tender procedure. The main challenge is to speed up the resource mobilization process. Food aid dominates relief programs, the emergency food aid is almost entirely imported, and the EFRSA plays an important role in securing the food pipeline. In woredas covered by the PSNP, two main instruments to mitigate risks have been added to address temporary food insecurity: (1) an emergency budget managed at woreda level and used to adjust transfer levels and number of beneficiaries based on local circumstances; and (2) a risk financing mechanism able to support about three million people with emergency food aid.

**Effectiveness of instruments based on food stores:** The EFSRA was until recently seen as one of the most effective emergency food reserves in Africa. Stock rotation was quick, costs were low, and physical stores were always available in or near the main regions facing food deficits. A mandate limited to managing and holding stores for emergency food aid operations, combined with a transparent and inclusive governance system were key to EFRSA’s performance.

But things seem to be changing. Indeed, EFSRA stocks have increasingly been used for food price stabilization purposes, which has been criticized by a number of development partners who see this as a misappropriation of its original mandate. At the same time, the emergency food pipeline has been consolidated, and the number of EFSRA users has declined along with the volume of food managed by the organization. The operational implications for EFSRA have been slower food stock rotation and the depletion or near depletion of food stocks on several occasions since 2007.

**Relevance, Appropriateness and Coherence of NFRA Strategic Blueprints**

According to the Growth and Transformation Plan (GTP), the new National Grain Reserve Agency will focus on three objectives: (1) secure the emergency food aid pipeline, (2) help stabilize grain markets, and (3) promote international trade.

The first objective is clearly relevant, as Ethiopia is and will probably remain sensitive to food shocks and has limited access to world markets. Holding larger grain stocks in the country may be an effective way for the country to end its long dependence on international food aid. The second objective is relevant too, as food prices on Ethiopian

[45] PSNP coverage is weaker in the Somali Region, despite high food insecurity, notably because of higher implementation costs in these areas where population density is slight.
2. Case Studies

markets are particularly volatile and follow an upward trend. Bringing together the conditions for effective local purchasing to supply national reserves could also contribute—albeit in a modest way since volumes are limited—to preventing prices from skyrocketing. There are, however, major questions as to how much the government of Ethiopia wants to stabilize prices, what type of resources can be mobilized for that purpose, and how to protect emergency stocks from negative interference. The third objective is very ambitious. Although production per capita has been growing over the past 10 years, food imports have not dropped and food prices have risen. Food prices have almost never fallen below export parity prices in the past 10 years, and it would be difficult to find buyers on the international market for food products that have been stored for more than 12 months.

Moving from 400,000 MT to 3 million MT of stocks: Most stakeholders find this target overly ambitious. Indeed, given the GTP’s first objective, the current storage capacity seems sufficient, particularly as the overall food supply chain is becoming more predictable (PSNP, fewer operators involved) and the volumes necessary to meet emergency needs have tended to drop in recent years. In regard to price stabilization, the second GTP objective, a stock of 3 million tonnes seems excessive compared to the current national marketed surplus (approximately 4 million tonnes).

From seven medium-sized conventional warehouses to a more extensive storage network with bulk storage facilities: The current system has been effective to ensure the emergency pipeline. Until 2007, rapid rotation kept storage costs and losses down. With the increased use of EFSRA stocks for price stabilization purposes, new constraints emerged. The overall stock is too small to pursue stabilization objectives; in addition, longer and less predictable rotation cycles demand technical solutions that allow for longer and safer grain storage. In this context, a shift to bulk storage facilities would be justified.

A new institutional arrangement: Because multiple objectives have been assigned to the National Grain Reserve Agency, a single agency will facilitate coordination and coherence. Yet, there is a need for strong “walls” to protect the reserve’s emergency function. Representatives of the private sector (agricultural producer organizations, chambers of commerce, etc.) must be included in the governance structure.

Strategic coherence: The vision of a NFRA supporting 3 complementary objectives comes with promises of strategic coherence. The idea of reconciling the safety net and food aid policy objective with the goal of stabilizing and developing the agricultural market has been effectively implemented in various countries, including India that has
been a source of inspiration for the Ethiopian administration. However, the current policy is not conclusive because there is a ban on the grain export policy. The NFRA plans need to dovetail with a very clear policy and strategy for export markets. This policy and strategy must notably be consistent with Ethiopia’s regional commitments (adhesion to COMESA) and international obligations (future adhesion to the WTO). Questions do remain, however, about the strategic coherence of NFRA plans.

- The ambition is to use national production for food supply. Yet, no sufficient net surplus is available, and local purchase is prohibited for the moment.
- The PSNP was developed, but it has not been using the EFSRA reserve as much as emergency operations and moreover it is moving towards the “cash first” principle.
- The government of Ethiopia wishes to support cooperatives and private operators. Heavy investment in public market interventions may jeopardize some of these efforts.

**What Needs Improvement?**

*Policy consensus:* A number of key development partners doubt the relevance and appropriateness of current NFRA growth plans. The main concerns deal with using grain reserves for stabilization purposes. USAID has ceased funding programs that use EFSRA emergency stocks. Since USAID is by far the largest donor in the PSNP and food aid in Ethiopia, this withdrawal may have serious repercussions on the implementation of the Ethiopian government’s plans.

*Better coordination with private sector development objectives:* It is not fully clear how consistent the NFRA plans are with the will to support the development of the private sector; yet the development of grain markets, and in particular, of regional trade, requires a predictable environment.

*Robust agriculture statistics:* Reliable information on markets and food production is indispensable for planning, calibrating and then managing a reserve aiming to stabilize domestic markets. The EGTE’s market information system provides quality data, but many stakeholders doubt the reliability production statistics. The national capacity to produce reliable and trusted agriculture statistics needs to be strengthened in the future.
2. Case Studies

Market analysis: Both in 2007/2008 and 2011/2012, public interventions in the market contributed to higher price spikes on the Ethiopian market than on the international grain markets, distorting prices. Such public interventions require highly technical market analysis skills, and most stakeholders believe that these skills are not currently available within the EGTE.

Building capacities for bulk storage management: Qualified human resources are important, particularly in maintenance and quality control.

2.2. Burkina Faso Case Study

2.2.1. Characteristics of the Agricultural and Food Situation

Food Supply and Demand

National availability is relatively satisfactory, with shortfall and surplus zones in close proximity to each other. Despite population growth of more than 3% over the past 15 years, the aim of meeting demand with national production is within the country’s reach. Indeed, analysis of the growth in national production shows that production was high enough in five of the past eight years to cover domestic grain requirements. The situation is nevertheless not uniform across the country: surplus regions (Boucle du Mouhoun, Hauts-Bassins, Cascades and Sud-Ouest) rub shoulders with regions where the balance is precarious (Centre-Ouest, Plateau Central, Centre-Sud and Centre-Est) and shortfall regions (Nord, Centre, Centre-Nord, Sahel and Est). Furthermore, surplus or balanced regions may contain provinces that have shortfalls. This is notably the case for the provinces of Houet, Comoé and Boulkiemdé which are home to the major urban hubs that make up the main consumption centers. Similarly, surplus provinces, such as Zoundwéogo, can be found in parts of the country that have structural deficits or are balanced.

A problem with access to a balanced diet. Burkina Faso is faced with a real problem of food diversity: products other than grains are, for the most part, sold rather than eaten at home, resulting in a diet which is not balanced and particularly low in fats, proteins and micronutrients. The 2011/2012 food balance report published by the DGPER indicated per capita daily availability of 120.8 g of proteins, 60 g of fats and 586.5 g of carbohydrates, or respectively 11%, 3% and 86% of recommended macronutrient intake. The specific problem of malnutrition is particularly present in the Sud Region where malnutrition levels are among the highest in the country even though availability problems are not present there.
2. Case Studies

Maps 2, 3

Burkina Faso: Structural Grain Shortfall by Region and by Province in 2011/2012

Source: DGPER.
2. Case Studies

Dependence on markets combined with limited capacity to access food products due to the existence of market imperfections. One of the main conclusions of the Household Economy Analysis (HEA) in Burkina Faso is that households depend on the market for their food needs in all areas of the country, including the surplus zones in the south. However, analysis of the structure of the local grain value chain reveals a marginal share of marketed products (20%) and a very oligopolistic market characterized by the presence of a myriad intermediaries (collectors) dominated by about ten operators who own the majority of storage and transport facilities. A recent study conducted in the provinces of the regions of Boucle du Mouhoun, Centre, Hauts Bassins and Sahel (Dabat, 2011) identifies a number of different types of relationships between the market and food security, notably: (i) situations in which households that depend heavily on markets for their food encounter food problems because markets are not very physically accessible or are poorly supplied; and (ii) situations in which markets operate satisfactorily but products are barely affordable. Supply problems or limited physical accessibility are mainly identified in the provinces of Nayala and Banwa in the region of Boucle du Mouhoun whereas in these provinces, the market is the main source of food for almost 80% of households.

Domestic market imperfections cause structural price volatility. The figures below illustrate the corn and sorghum markets in Burkina Faso. Both the price series on the various markets within the country and the seasonal variation coefficients (SVC) indicate that until 2007, price volatility for local products (corn, sorghum, etc.) was stronger than grain price volatility on international markets. The seasonal nature of these price fluctuations is also very strong. The charts clearly illustrate the major importance of the natural and endogenous factors of price volatility in Burkina Faso and the other countries in the Sahel belt. Furthermore, price volatility on the international market—which has grown since 2007/2008—severely impacts West Africa. The soaring prices on the international market over the past five years make the price of imported products more unstable than the price of local products in both shortfall zones (Dori) and surplus zones (Banfara, Dédougou, Faramana).

High structural and temporary vulnerability. The accessibility and, to a lesser extent, availability problems mentioned above create a situation in which 9%—more than 1.5 million people in 2012—of the population is undernourished, that is to say chronically insecure and/or nutritionally vulnerable. Furthermore, temporary food insecurity tends to become structural due to its frequency: nearly half of the last eight crop years
were characterized by food crises of varying degrees of severity. The most recent, the 2011/2012 crisis, affected almost 2.8 million people (i.e. 17% of the population). Vulnerable households are primarily located in regions with chronic shortfalls although they can also be found in cities and the regions that frequently have a surplus.
2. Case Studies

Overall Policy Context
Over the past 20 years, three strategies to reform the country’s economic policy have followed after each other: (i) structural adjustment, (ii) poverty alleviation, and (iii) accelerated growth and sustainable development. At the beginning of the 1990s, after two decades of independence marked by economic interventionism by the government through planning, Burkina Faso, with the support of its TFPs, launched a process of economic liberalization characterized by the implementation of structural adjustment programs (SAPs) that culminated in the adoption of the Poverty Reduction Strategy Program (PRSP) in 2000. In light of the mixed results from PRSP implementation, the government adopted an accelerated growth and sustainable development strategy (SCADD, “Stratégie de croissance accélérée et de développement durable”) in December 2010, primarily targeting the intensification of private sector investment, recourse to public-private partnerships, and growth centers.

The deregulation process in the country opened the agricultural sector to the market and delegated price regulation to the regions. Starting in 1991, as part of the agricultural sector structural adjustment program (ASSAP), Burkina Faso launched a process of trade liberalization for agricultural inputs, the elimination of grain import monopolies, the liquidation of the national body intervening in the market (OFNACER), the gradual elimination of agricultural produce export monopolies and the state price-setting system, and finally the lowering of taxes and the lifting of non-tariff barriers to export. Since the crisis of 2008, the state has attempted to assign regulation objectives to certain agricultural policy instruments (see the Stock Commercial de Régulation [commercial regulatory stock] below) but the resources allocated have not enabled these policies to achieve their price regulation objectives. Furthermore, the measures taken unilaterally by Burkina Faso with regard to foreign trade policy deviate somewhat from community discipline. Indeed, since the implementation of the WAEMU Common External Tariff (CET) in January 2000 and the current finalization of the ECOWAS CET, management of the foreign economic flows of countries within the region has been transferred to regional level.

Insofar as the country does not have control over its foreign trade policy, a national buffer stock policy is difficult to envisage. In the case of an open economy such as that of Burkina Faso, creating a buffer stock aimed at maintaining a price band for grains on the domestic market must necessarily be accompanied by measures enabling exports and/or imports to be controlled as soon as the ceiling price is lower than the import parity.

[46] The re-categorization of the products within the five tariff bands of the ECOWAS Common External Tariff was finalized in June 2012.
price and/or the floor price is greater than the export parity price. Without control over exports, the risk is that the quantities released from the stock would be exported on the international market without impacting domestic prices and that it would be impossible to defend the ceiling price. Similarly, without implementing quantitative or tariff restrictions on imports, there is a risk that traders would purchase their supplies on the international market at lower cost, thereby making it impossible to defend the floor price. The country therefore does not have foreign trade regulation instruments suitable for the establishment of a buffer stock, nor does it have the technical and financial resources needed for such a storage policy (see below). In this context, setting up a buffer stock—at least nationally—is not in practice one of the country’s current priorities.

The National Food Crisis Prevention/Management Policy
This policy is marked by the strong presence of donors in the food crisis prevention and management. Since the creation of the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS) following the great drought in the 1970s, Burkina Faso like the other countries in the Sahel has had a food crisis prevention and management mechanism based notably on an early warning system (EWS). In 1994, as part of the reforms adopted in the wake of the introduction of the ASSAP, the monitoring and warning system was incorporated in a comprehensive food security system. Four main measures were taken within the context of these reforms: (i) the creation of the Stock National de Sécurité (SNS [national security stock]) and a financial stock; (ii) the elaboration of a national emergency aid organization, coordination and rehabilitation plan (PNOCSUR) that sets the rules for triggering food aid operations according to the magnitude of the crisis and defines the roles and attributions of the various parties involved; (iii) the creation of a body responsible for coordinating and analyzing information on food security; and (iv) the creation of dialogue forums between the state and the technical and financial partners (TFPs).

After a number of years of use marked by difficult relationships between the state and the donors, the comprehensive system showed its limits, in particular: (i) a lack of consultation among the various actors, (ii) insufficient coordination of food aid, [47] (iii) poor performances by the food security information system, (iv) the non-perpetuation of funding for the structures, and (v) the low or limited involvement of the private sector, farmers’ organizations and NGOs. In particular, it should be emphasized that the outcome of the discussions between the state and the partners were deemed to

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[47] In particular, the red tape and inflexibility in making and implementing decisions in crisis situations negatively affected the effectiveness of actions in favor of the population.
be mixed due to the antagonistic relationships surrounding management of the SNS (MAHRH, 2009).

In light of these various dysfunctions, the state implemented a certain number of reforms between 2000 and 2009, notably: (i) the adoption of the Stratégie Nationale de Sécurité Alimentaire (SNSA [national food security strategy]); (ii) the revision of two documents—the General Cooperation Framework between the state and the TFPs relating to food security and the PNOCSUR that establishes the relationships between the state and the TFPs with regard to food crisis management; (iii) the introduction of a revised food situation assessment and information mechanism through the creation of the Comité de Prévision de la Situation Alimentaire et Nutritionnel (CPSA [food and nutritional situation forecasting committee]) incorporating all the operators involved in monitoring the growing season and food situation (TFPs, FOs, NGOs, the government); and (iv) the implementation of a more comprehensive and coherent mechanism called the Conseil National de Sécurité Alimentaire (CNSA [national food security council]) with a view to facilitating consultation and monitoring implementation of the SNSA. More recently, in 2011/2012, in order to obtain a better understanding of household lifestyles and target vulnerable populations and their needs more accurately, the DGPER finalized Household Economy Analysis (HEA) reports for the nine lifestyle zones pre-identified by the FEWS-NET mechanism. This work contributes to the process of Burkina Faso adopting the “Harmonized Framework for Permanent Analysis of Current Vulnerability in the Sahel and West Africa” shared by all ECOWAS member-states.

Private operators and civil society organizations remain somewhat on the sidelines of the food crisis prevention/management policy. The technical and financial partners are more involved in implementing and evaluating the national food crisis prevention/management policy in Burkina Faso than private operators and civil society organizations. Indeed, the latter are very little represented on the food security mechanism’s committees, including within the CNSA’s decentralized bodies. With regard to the private operators, despite a certain recognition of the importance of their role in supplying markets, they are kept on the sidelines of crisis prevention/management in the country because they are sometimes perceived—rightly or wrongly—as exacerbating and/or taking advantage of food crises.

[48] The members of the CNSA finally took office in April 2006.
2.2.2. The Role of Stocks in National Agricultural and Food Policy

Overview of the Food Storage Policy
Currently, the storage system in Burkina Faso comprises four different instruments.

The Stock d’Intervention (SI [intervention stock]) pursues two objectives. First, it aims to promote grain value chains, notably corn and rice, by improving the quality of the grain sold on the market. Second, it aims to improve operating conditions for the grain market by selling in the pre-harvest period and/or in poorly supplied zones in order to limit price increases and by acting as a buyer when the new harvest is marketed. In this way, almost every year, the government uses the SI to lessen the impact of localized grain deficits, even when the national grain balance is in surplus. Under the sole management of the state, the SI was created in the wake of the 2004/2005 crisis, primarily to cope with the difficulty mobilizing the SNS, which has highly restrictive trigger criteria. The SI can buy from the SNS during its technical rotations.

The Stock National de Sécurité (SNS [national security stock]) was created in 1994 and comprises only millet, corn and sorghum. The SNS is intended to improve food security in the country by ensuring a physical food reserve is available on-site. It is jointly managed by the TFPs and the government. This reserve can only be released in the event of a major crisis and in accordance with the terms and conditions stipulated in the PNOCSUR (see “triggering rules” below) once the intervention stock has been used and while awaiting the arrival of grain products that will be imported through either the Fonds d’Appui à la Sécurité Alimentaire (FASA [food security support fund]) or food aid.

The Stock Commercial de Régulation (SCR [commercial regulatory stock]) was created in 2010. The SCR was assigned three objectives by the government: (i) regulate prices on the grain market on the same basis as the SI, (ii) support the production and marketing of local grains, (iii) mobilize additional financial resources for the Société Nationale de Gestion des Stocks (SONAGESS [national stock management company]). This stock is under the sole management of SONAGESS. The SCR can purchase from the SNS and the SI during technical rotations.

The Stock Financier [financial stock] housed within the Fonds de Sécurité Alimentaire (FSA [food security fund]) complements the physical stock and is intended to allow the state to purchase supplies in the event of a crisis. This stock is jointly managed by the government and the TFPs and was created in 1994 immediately after the signature of the state-partner cooperation framework. This financial stock is one of the components of the FSA. The FSA, for its part, consists of four functions: three are co-managed by the
2. Case Studies

State and its partners (the financial stock, maintaining SNS levels, and food distribution costs) while the fourth (coordination in the framework of CNSA activities and their outside assessments) is managed solely by the state. The budget line corresponds to SI financing.

Within the overall crisis prevention/management system, the public storage strategy strictly speaking involves five types of actors as follows. Under the direction of the DGPER, the Système d’Information sur la Sécurité Alimentaire (SISA [food security information system]) uses information provided by the EWS and the MIS to monitor the criteria chosen to trigger the release of food stocks. When a crisis is declared, it proposes an action plan (zones to cover and resources to deploy) which must be approved jointly by the government, the CNSA’s Technical Committee and the TFPs. If the action plan is accepted, the CNSA’s TC releases the physical and financial stocks according to the chosen trigger criteria. The management bodies responsible for the financial stocks (the CNSA’s Executive Secretariat) and physical stocks (SONAGESS) are then responsible for ensuring the food is made available through the CONASUR. Since this action concerns the SNS, SONAGESS is obliged to allocate at least 10% of the stock to free food distribution operations, the remainder being destined for sale at a

Diagram 1 Burkina Faso: The Public Food Storage Policy’s Institutional Set Up

Source: Adapted from PNOCSUR, revised 2012.
reduced prices. For this last distribution method, SONAGESS is responsible for the pre-positioning food in the target locations. Through its decentralized bodies, CONASUR is responsible for distributing the food (free and at low cost) mobilized from four types of stock.

Operating Procedures for National Stocks

Stock Size and Suitability to the Objectives Pursued

SONAGESS has a storage capacity of 60,000 tonnes, in part inherited from the OFNACER era, which is largely sufficient to house the various stocks. With regard to the SNS, the conventional level is set at 35,000 tonnes, but the SNS was under 28,225 tonnes at the end of 2011. When it was created in 1994, the financial stock—which completes the SNS—was endowed with the sum of 3,224,253,959 CFA francs allowing approximately 25,000 tonnes of grain to be purchased. As this stock has not been mobilized since it was created, it now totals 5,624,993,037 CFA francs, including interest—the equivalent of about 40,000 tonnes of grain. The intervention stock is at a theoretical level of 10,000 tonnes but given that it changes with every crop year, it is difficult to estimate its real level. During the post-harvest period of the 2010/2011 crop year, it totaled 5,080 tonnes. Finally, the level of the SCR may vary according to trading opportunities open to SONAGESS. On the eve of the 2012 food crisis, it had reached almost 14,535 tonnes. In all, Burkina Faso therefore has a total stock of 87,840 tonnes of grain, of which 47,840 tonnes require storage facilities (not including the financial stock). Some of SONAGESS’s storage capacity is also occupied by bilateral food aid that is not part of the SNS.

With regard to the objective of supporting vulnerable populations in crisis periods, the SNS and financial stock levels would appear insufficient. With 2.85 million people affected and requiring emergency aid, the 2012 food crisis was the most serious shock Burkina Faso had experienced over the past 10 years. As mentioned above, the SNS and financial stock are intended to facilitate intervention while waiting for imported grain to arrive. Given that the average amount of time between the launch of an international call for tender and delivery of aid to the distribution site is three months, and taking into account a monthly ration of 15 kg/person,[49] the SNS and financial stock should in theory have been able to provide 128,250 tonnes of grain, whereas response capacity right before the crisis was only 68,225 tonnes.

[49] These average times are those seen by Catholic Relief Services, one of the main providers of American food aid in Burkina Faso. The per person ration is the WFP standard.
2. Case Studies

The same is true of the SCR and the SI with regard to their price regulation function. The SI was set up in the wake of the 2004/2005 food crisis that had been caused primarily by a problem of availability; its objective is to limit price hikes by reallocating resources from surplus zones to deficit zones during the crop year. However, while this stock can limit food crises in shortfall zones, the SI is not large enough to regulate prices. The operations generated by this stock can therefore influence price levels but only intra-annually and in a very location-specific manner. The SCR, which was set up in 2010 following the 2008 food crisis was also assigned the task of regulating prices. In reality, its main function is to generate new resources for SONAGESS, whose remit was extended as part of the new 2010/2012 contractual plan. With average production of more than 3.5 million tonnes in recent crop years, approximately 700,000 tonnes of which were marketed, it is difficult to imagine that a stock of about 14,500 tonnes could have a national impact on prices. A discrepancy therefore exists between the objectives announced for the SI and SCR and their real raison d’être.

Complementarity Between the Local, National and Regional Levels

At the local level, the country has roughly 2,000 grain banks (GBs) whose storage capacities range from 15 to 30 tonnes. By grouping supply in structurally surplus zones and establishing purchasing cooperatives in structurally deficit zones, these “local storage” facilities often represent the first line of defense to meet the needs of the population. Unfortunately, assessments have shown a high failure rate among GBs. For instance, of the 2,000 GBs set up in Burkina Faso, 1,200 are unable to function (Blein, 2009). Nevertheless, it would appear that the GBs could be viable enterprises under certain conditions.

Burkina Faso should benefit from current initiatives underway to endow ECOWAS with a regional food security reserve (see Section 3, Box 8). This initiative is based on a three-fold observation. First, countries do not have sufficient national storage capacity

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Table 6  *Burkina Faso: Needs Generated by the 2012 Crisis*

<table>
<thead>
<tr>
<th>People needing emergency aid in 2012 (in thousands)</th>
<th>Share of the total population</th>
<th>Estimated annual needs (in tonnes)</th>
<th>Three-month needs (in tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,850</td>
<td>18%</td>
<td>513,000</td>
<td>128,250</td>
</tr>
</tbody>
</table>

Source: Authors, based on Emergency Database (EM-DAT) data.
to cover national needs. Second, the region must cope with correlated shocks requiring states coordinate their interventions. In particular, this is the case in Burkina Faso that was affected at the same time as Niger and Mali by five major crises in 1998, 2001, 2002, 2005 and 2012. Third, deficit zones characterized by low stocks coexist alongside surplus zones. In the case of a food crisis, this regional reserve will be called on to play the role of “third line of defense” by supporting, if needed, the actions undertaken at the local and national levels.

Stock Trigger Mechanisms

Revised trigger thresholds enabling the SNS and financial stock to cope with “localized” availability crises. Until the food crisis in 2012, the rules for mobilizing stocks within the framework of the national emergency relief organization and rehabilitation plan (PNOCSUR) were as follows: (i) the SNS was mobilized when the net national grain deficit was at least 5%, and (ii) the financial stock was mobilized in response to a net national deficit of at least 7%. However, these activation criteria had the major disadvantage of being badly suited to the nature of the food crises: grain deficits are often recorded in specific zones even though the overall national grain balance remains positive. Between the 2005/2006 and 2010/2011 crop years, Burkina Faso’s grain balance stayed positive while in some provinces shortfalls meant that grain needs were not covered. Thus, until 2012, the SNS and the financial stock could not be mobilized because the national grain deficit never reached the required 5% deficit threshold. In light of this, the government and the TFPs decided to alter the trigger thresholds for these two instruments when they drafted the new PNOCSUR in March 2012. At present, the thresholds are as follows: (i) the SNS can be mobilized at a 5% of the gross national deficit, or a provincial deficit of 50%; (ii) the financial stock can be mobilized at a 7% gross national deficit or a provincial coverage rate of 45% in at least fifteen provinces.

However, the financial stock has remained frozen since its creation despite the changes in the trigger threshold. Insofar as only three provinces have a coverage rate less than or equal to 45%, the financial stock, representing about 50,000 tonnes of grain, could not be mobilized again this year despite the magnitude of the food crisis that affected the country and the paucity of resources available to cope with it.

The trigger thresholds continue to be based on the notion of grain deficit. While the entire revised PNOCSUR fully integrates the Cadre Harmonisé Bonifié (CHB [supplemented harmonized framework]) approach based on a systemic vision incorporating the “availability” and “accessibility” factors of food insecurity in identifying at-risk zones, defining food insecurity indicators and thresholds and choosing which
2. Case Studies

Map 4  Burkina Faso: Grain Deficit by Province 2011/2012

Map 5  Burkina Faso: Food Insecurity Zones According to the Harmonized Framework in January 2012

Source: DGPER.

Source: CILSS.
types of action to implement, mobilization of the SNS and the financial stock is still based solely on the criterion of grain deficit. However, the stock trigger indicators based exclusively on a grain deficit do not grasp the full complexity of food crises. Hence in January 2012, the food insecurity indicator incorporated in the CHB was an aggregate of eleven indicators (production, price, nutrition, food diversity, livelihoods, etc.) and identified certain provinces as being “critically” or “moderately” food insecure even though the grain balance in these same zones was in surplus.

The system still depends on the political use made of it. It is not uncommon that, for various reasons, the government does not take account (or does so only partially) of the information communicated to it by the EWS. In October 2011, the national EWS sent a warning to the government based on the estimated grain balance for the 2010/2011 crop year at a time when Chad, Niger and the regional information system (AGRYMETH) had already declared a crisis. Despite this, the state of alert was not recognized by the national decision-making bodies until March 2012. A further illustration of this “political bias” is how grain from the stock has been distributed: although the EWS had identified the different food insecurity thresholds for each municipality, the government opted to distribute the same amounts to the municipalities of each province in order to avoid conflicts between municipalities.

**Methods of Funding Stocking and Re-Stocking Operations**

*Uncertain funding to reconstitute the SNS following use in the conditions stipulated by the PNOCSUR.* The primary function of the FASA’s Food Security Fund, managed by the CNSA’s TC and co-financed by the state and TFPs, is to guarantee the stocking, re-stocking and maintenance of the SNS and financial stock (invested in an account earning 8% interest) after an intervention triggered by a large grain deficit or a technical rotation operation. Following the revision of the PNOCSUR that modified the trigger criteria, the SNS in its entirety was able to be mobilized in response to the food crisis of 2012, raising the question of how to fund its re-stocking now. While the re-stocking operation is in part guaranteed by the revenue from sales at reduced prices by SONAGESS, this sum remains largely insufficient to fund the difference between the subsidized sale price and the market price, in the context of sales at reduced prices and the portion of the SNS distributed free of charge (10%). In the re-stocking plan currently being developed, it is estimated that the EU will contribute 10 million euros through budgetary support, given that approximately 38 million euros have already been allocated to the SNS by the EU in the past decade. With regard to the state, no budgetary lines seem to be earmarked to re-stock the SNS. This imbalance in SNS
funding between the state and the TFPs is somewhat problematic as it weakens the government’s position in a co-managed system.

_Difficulty re-stocking the SNS after its mobilization in conditions not stipulated in the PNOCSUR._ The state or any technical partner can borrow from the SNS on condition they repay the loan “grain for grain.” SONAGESS can also sell part of the SNS for food aid operations or during technical rotations. These operations explain why the SNS level has varied in recent years even though the deficit threshold was never reached. The SNS level reached in recent years shows that repayment of loans or products sold rarely allow the SNS to recover its original level. Indeed, SONAGESS sometimes faces very long reimbursement timeframes by borrowers. Furthermore, the stock rotation operations often generate considerable losses, either because SONAGESS cannot find buyers at prices enabling an identical stock to be rebuilt or because it cannot find enough suppliers able to deliver the quality and quantity of grain agreed upon in the call for tender.

**Supply Sources**

_The possibility of using imports to stock or re-stock the SNS._ According to the state-SONAGESS contractual plan of 2010, the SNS must not be stocked or re-stocked using local grains acquired, in decreasing order of preference, in Burkina Faso, the sub-region and in last place, outside the sub-region. In practice, the stocking or re-stocking of the national security stock (SNS) has always been done with local purchases from national suppliers (private grain operators and FOs) that are supplied via the national market in post-harvest periods. This has always minimized the presence of imported products in the SNS despite trade relations between grain wholesalers in the sub-region and the absence of obstacles to the movement of food during good crop years. Furthermore, beyond the sub-region, only corn could be imported to ensure the regular re-stocking of the SNS, but the proportion of corn has remained generally modest.

_A relative absence of imported products in the SI._ The intervention stock, a seasonal stock, is collected in surplus zones to supply shortfall zones or zones with supply disruptions. Consequently, it consists of local seasonal products released before new harvests. SONAGESS can, however, buy grain from the technical rotation of the SNS for use in the SI. In contrast, when the national shortfall is large, as it was in 2011/2012, the country can look to the outside for supplies to cope with the emergency. In this way, even though they came to nothing, inquiries were made in Ghana, Malawi and Brazil in 2012 with a view to coping with the food crisis.
A theoretical composition using exclusively local products for the SCR. According to the contractual plan, the SCR is only composed of local grains and their agrifood derivatives. Nevertheless, the stocking/re-stocking mechanisms and procedures are determined by SONAGESS according to the food risks in the country and the market behaviors. Furthermore, with the authorization of the government, SONAGESS can acquire grain from the Stock d’Intervention (SI [intervention stock]) or from SNS technical rotations to stock the SCR. In short, depending on the situation, the SCR may contain imported products.

Probably positive effects on local production. Local purchases during the post-harvest period intended for the different stocks help minimize the collapse of producer prices and thus help support production in the major production basins, which are traditionally in surplus. This benefits agricultural households capable of generating marketable surpluses. In pre-harvest periods, the provision of the stocks allows both structurally in deficit agricultural households and agricultural households suffering temporary food insecurity to avoid decapitalizing their means of production and maintain farm employees able to participate fully in the work for the next crop year. However, for large grain producers who traditionally delay the marketing of their crops to wait for better opportunities and/or prices, de-stocking or technical rotation operations during the pre-harvest period may interfere with their marketing strategies. The same is true for certain mechanisms promoting local production, such as the warehouse receipt systems in which the best settlement period is the pre-harvest period.

Stock Composition

Dietary staples chosen for the main national stocks. In accordance with the provisions of its creation, the SNS is made up of dry grains (millet, corn and sorghum). During the initial stocking, the intent was to store 40% sorghum, 30% millet and 30% corn. This stipulation was abandoned with the very first technical stock rotations for a number of reasons, including supply availability and acquisition cost. Temporal analysis shows that the proportions of the different grains varied from one year to the next during the 2004-2009 period, generally with a very strong proportion of sorghum in the stock (approx. 50%).

With regard to the intervention stock, the contractual plan states that it is to consist of local grains (millet, corn, sorghum and rice) and cowpea. In 2010, the SI contained corn, millet and sorghum, and in 2011 corn made up more than half of the stock (55%).
2. Case Studies

The Stock Commercial de Régulation [commercial regulatory stock] must be composed primarily of local grains such as corn or rice, processed products made from these grains (semolina, flour, bran, etc.), and cowpea. In 2009, however, the SCR was only composed of cowpea and local rice while in 2010, the range was more varied with the inclusion of corn, sorghum and corn semolina as shown in the table below. In 2011, however, it again consisted of only local rice and cowpea totaling 14,535 tonnes. Overall, the SCR consists predominantly of cowpea, local rice and corn.

Stock Location

A SNS relatively well situated in relation to shortfall regions. In accordance with the contractual plan, SONAGESS’s role is to maintain the SNS in good condition for consumption in the storage sites listed on the map below, representing a total available capacity of 36,500 tonnes. These sites are spread out through the Centre, Centre-Nord, Nord, Sahel and Est regions. With the exception of Aribinda, the sites are provincial capitals or even regional capitals in the case of Ouagadougou, Kaya, Ouahigouya and Dori. In all, there are sites in five regions where structural deficits are seen. However, there are other regions with structural deficits or in a precarious balance, such as Plateau Central, Centre-Sud and Centre-Est, with no SNS storage sites. These regions are nevertheless relatively close to the Centre region that has two large-scale storage sites that can be used to supply these regional capitals quickly thanks to the presence of paved roads.

A need to strengthen the SNS’s position to cope with “localized” deficits. Furthermore, with the frequency of temporary food crises capable of seriously affecting delicately balanced regions and even surplus regions as was the case in 2012, and with the revision of the conditions for mobilizing the SNS to now allow triggering in the case of provincial deficits (a deficit may occur in a province within a surplus region), it seems important to revise the list of SNS site locations. This list could include two locations, one in a surplus region (Bobo-Dioulasso or Dédougou) and another in a delicately balanced region (Tenkodogo or Fada) with relatively good access. These sites already have SONAGESS warehouses that currently house part of the SI or SCR. As capacities are under-used, they could also be used to house the SNS without the need for additional investment in new facilities.

The theoretical location of the SI is different from reality since the quality of SI monitoring at SONAGESS is fairly mediocre compared to monitoring of the SNS. As with the SNS, the contractual plan identifies SONAGESS storage sites for the intervention stock offering a total available capacity of 10,500 tonnes in six regions: two surplus regions
2. Case Studies

(Boucle du Mouhoun and Hauts-Bassins), two deficit regions (Sahel and Centre) and two delicately balanced regions (Centre-Est and Est). As the SI was created in 2005, there is no detailed, coherent and reliable data series on the quantities handled per crop year and per storage site. Overall, there is very little compliance with the directives of the contractual plan on SI locations.

SONAGESS has freedom to act in situating the localized commercial regulatory stock despite the stipulations in the contractual plan. While the volume of the stock depends on SONAGESS’s financial capacity and market opportunities, a level of 5,000 tonnes per year is stipulated in the contractual plan along with SCR storage capacity. In practice, however, the SCR is for the most part allocated independently of the contractual plan. This results in relatively little proximity to customers for certain products such as local rice.

**Distribution Methods**

*Little diversity in transfer methods.* Currently, 90% of the food released by the SNS is intended for sale at reduced prices in municipal stores with the remaining 10% reserved
for free distribution. This leaves no room for any other method of transfer in kind (food-for-work, for example). Furthermore, the difficulty of selling at reduced prices lies in setting the “right” price as the price may be lower than the market price but still too high for a large number of people. Thus, during the food crisis of 2012 when the prices of the main grains reached record highs, the high cost of a 30 kg bag of rice led to a slump in rice sales in almost every municipality. Similarly, the 100 kg bags sold for 12,000 CFA francs found no buyers among the poorest.

Aid limited to providing commodities in kind. Insofar as the financial stock has never been released, the public de-stocking operations have never given rise to monetary transfers with or without a counterpart.

The lack of relevant tools for targeting vulnerable populations. In addition to the fact that the allocation of commodities from public stocks essentially takes the form of sale at reduced prices, these sales are done with no methodology for targeting vulnerable populations. During the response to the 2012 crisis, the sales at reduced prices were conducted directly by the mayors of the municipalities through municipal stores, and not through CONASUR’s decentralized technical services as should have been the case. As the mayors and municipal agents have no specific training in targeting, their role is primarily restricted to storing and selling the food provided by the public stock. Furthermore, while the EWS had quantified intervention needs according to the gravity of the crisis, the same amount of food was ultimately allocated to each municipality in order to avoid conflicts.

Insufficient coordination of national public storage policy actions with other emergency relief and rehabilitation activities. Despite the efforts made to improve coordination of emergency interventions (revision of the PNOCSUR, general state-partner food security cooperation framework), in particular during the 2012 crisis (with the elaboration of the first support plan for people vulnerable to food crises), the exchange of information on government action, through the operations carried out by SONAGESS, and the actions of other partners remains difficult.

2.2.3. Current Challenges and Stakes

With regard to the analysis of the storage mechanism presented above, it is possible to draw the following main conclusions.

Affected by recurrent crises in recent years, Burkina Faso is currently undergoing a wide-reaching reform program concerning the national crisis prevention and management
policy which benefits the public storage policy. Although the country had to cope with the worst food crisis of the past 10 years in 2012, with price levels much higher than those reached during the crisis in 2008, there were no “hunger riots.” Events are still too recent for us to see indications of any serious impact, but the TFPs and the government agree that, generally speaking, the crisis was managed successfully. The new PNOCSUR in Burkina Faso, revised in 2008, was finally approved this year, enabling the previous version dating back to 1999 to be adapted to fit the current framework of the national food security policy and the SNS trigger criteria to be altered in order to facilitate the release of food this year. Furthermore, for the very first time, an operational support plan for vulnerable populations was developed in response to the 2012 crisis with the participation of all humanitarian aid operators.

The need to increase food crisis response capacities. The magnitude of the 2012 crisis brought into sharp relief the quantitative weakness of the country’s crisis response instruments. The country’s needs during the first three months were estimated at 128,250 tonnes whereas the SNS, financial stock and SI combined only reached barely 73,000 tonnes. The national storage system will not be able to reach this level of stock without an active contribution at local level (local stocks) and regional level (ECOWAS). Furthermore, this top-up must be added gradually over time so that accompanying measures can be implemented in parallel (see below). Increasing stocks to be able to respond to food crisis situations falls under both the National Rural Sector Program (2011-2015) and ECOWAS’s regional food security storage strategy.

Give priority to increasing the resources allocated to the Food Security Fund (FSA) in response to the need to diversify means of transfer to vulnerable populations (see below). Burkina Faso has a physical and financial stock enabling the state to provide vulnerable populations with assistance in the form of food aid in kind but has no other transfer instrument (see below). It is therefore important to increase the financial reserve (FSA) by incorporating an additional budget devoted to funding cash transfer operations with or without counterparts, such as the distribution of food vouchers, etc. Indeed, supporting households’ purchasing power is a strategy that is more efficient than food distribution in areas where markets seem to be working normally and where households’ physical access to these markets poses absolutely no problem. A physical proportion of the stock must nevertheless remain in order to be able to intervene in zones where markets malfunction and/or are not financially or physically accessible to vulnerable populations.
2. Case Studies

Box 5  Burkina Faso and CEDEAO’s Regional Storage Strategy

Insofar as this strategy is based on the principle that regional intervention must only happen to complete measures taken by states, it also includes a national stock growth plan. As with the regional reserve, this growth plan targets the year 2020. For Burkina Faso, based on an annual ration of 180 kg per capita, it is estimated that a shock similar to that of 2012 (18% of the population affected) applied to the population in 2020 would generate an annual requirement of about 718,000 tonnes. Of this annual requirement, it is assumed that the first three months would be covered by the national and regional level, totaling 60% and 40% respectively,[50] while the other months of the year will be covered by the extra-regional level. The needs to be covered by Burkina Faso by 2020 therefore total 107,649 tonnes.

Assuming a growth of local stocks (GBs) from 12,000 tonnes at present to 20,000 tonnes in 2020, national stocks should reach a level of 87,649 tonnes in 2020 compared to 73,303 tonnes today (SNS + SI+ financial stock), representing an increase of 14,346 tonnes.

Source: Commission de la CEDEAO (2012a).

[50] Let us note that landlocked countries receive greater regional support than coastal countries (40% vs. 20%).
The relative cost of increasing the physical stock incorporates two components: (i) the cost of purchasing additional food products, in the present case consisting of 15% millet, 46% sorghum, 33% corn and 5% enriched flour, which corresponds to current composition of the SNS, except that the quantity of sorghum has been cut by 5% to include enriched flour; and (ii) the annual cost of stock management and maintenance by SONAGESS, which represents about 9% of the purchasing price of grain. For informational purposes only, this ratio is much the same as that of the national agency responsible for stock management in Mali (OPAM).

### Table 7  Estimate of the Cost of Grain Stocks (in FCFA per tonne)

<table>
<thead>
<tr>
<th>Unit Cost</th>
<th>FCFA Cost/Tonne</th>
<th>% of average grain purchase price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain purchase and reception costs</td>
<td>118</td>
<td></td>
</tr>
<tr>
<td>Sale and removal of grain costs</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td><strong>Purchase and Sales Costs</strong></td>
<td><strong>183</strong></td>
<td><strong>0</strong></td>
</tr>
<tr>
<td>Grain Management Costs</td>
<td>842</td>
<td></td>
</tr>
<tr>
<td>Vehicle Costs</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Store maintenance costs</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Other expenses</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td><strong>Monthly management costs</strong></td>
<td><strong>912</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Annual management costs</strong></td>
<td><strong>10 944</strong></td>
<td><strong>7</strong></td>
</tr>
<tr>
<td>Grain analysis costs</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Grain processing</td>
<td>189</td>
<td></td>
</tr>
<tr>
<td><strong>Monthly phytosanitary costs</strong></td>
<td><strong>207</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Annual phytosanitary costs</strong></td>
<td><strong>2 484</strong></td>
<td><strong>2</strong></td>
</tr>
<tr>
<td><strong>Annual cost estimate other than grains</strong></td>
<td><strong>13 611</strong></td>
<td></td>
</tr>
<tr>
<td>Average grain purchase price</td>
<td>151 571</td>
<td>9</td>
</tr>
<tr>
<td>Annual cost estimate including grains</td>
<td>165 184</td>
<td></td>
</tr>
</tbody>
</table>

*Source: Commission de la CEDEAO (2012a).*
The relative cost of increasing the financial reserve also includes two main items: (i) the constitution of a sufficient financial volume to be able to obtain supplies of additional food products on the market; and (ii) the cost relative to intra- and inter-annual price variations that the stock must meet if it is to keep its purchasing capacity constant in terms of product volume. This is therefore a sort of provision for price risk set at 15%. Finally, the interest received by the FSA from the investment of the financial reserve in an interest-bearing account is deducted from these costs. Based on the rate received between 2004 and 2012, the interest rate is set at 3%.

Several options open to the government were simulated: (i) it simultaneously increases the physical and financial portions of the stock; (ii) it increases the financial reserve of the stock without touching the physical reserve; and (iii) it increases the physical stock without touching the financial reserve. The costs of purchasing and managing the additional commodities stocked are given in the table below. The costs generated by the need to rebuild the stock after each intervention are not included in the calculation as this would involve making assumptions as to the occurrence and magnitude of food crises. Furthermore, the aforementioned argument of prioritizing an increase in the FSA to meet the need to diversify the means of transfer supports scenario 2.

**Table 8** Estimate of the Cost of Increasing Food Crisis Response Capacities

<table>
<thead>
<tr>
<th>(in millions FCFA)</th>
<th>Scenario 1 (SP =+7.827 t; RF=+6.519 t)</th>
<th>Scenario 2 (SP =0 t; RF=+14.346 t)</th>
<th>Scenario 3 (SP =+14.346 t; RF=+0 t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of increasing physical stock</td>
<td>1600</td>
<td>0</td>
<td>2 756</td>
</tr>
<tr>
<td>Cost of increasing the financial reserve (FSA)</td>
<td>954</td>
<td>1 561</td>
<td>0</td>
</tr>
<tr>
<td>Total increase cost</td>
<td>2 463</td>
<td>1 561</td>
<td>2 756</td>
</tr>
</tbody>
</table>

*Source: Commission de la CEDEAO (2012a).*

At the same time as the resources allocated to the FSA are increased, the current storage system must be improved. Upstream from the storage system, this involves finalizing ownership of the Harmonized Framework that the ECOWAS member states promised to adopt to harmonize methods by which to identify and analyze vulnerable zones and groups within the region. The efficiency of the operations carried out through the various public stocks depends for the most part on the country’s ability to analyze and
anticipate food crises. An effective warning system ensures that emergency operations will be triggered “in time” while also helping improve the quality of targeting for in-kind and/or cash distribution operations. The food security monitoring system is currently being modernized but does not as yet provide any warnings based on food insecurity thresholds as recommended in the Harmonized Framework (five insecurity thresholds determined by comparing eleven different indicators).

With regard to the system itself, the following measures would also be worth taking or finalizing:

1.  **Clarification of the objectives assigned to the stocks.** There is a large discrepancy between the objectives assigned to each stock and their actual use. This lack of clarity can undermine the good governance of the policy and discourage certain TFPs from becoming more involved in the process. In particular, the intervention stock and the commercial stock were not designed to be able to regulate prices but this function is clearly part of their respective remits. This function was assigned to the commercial stock when it was created in 2010 when agricultural market regulation was in vogue but the resources required to implement such a policy were not provided. This vagueness puts off donors no matter how much they agree with the principle of buffer stocks. Generally speaking, the storage policy should work towards a merger of the SI and SNS. While the rigidity of the criteria was behind the non-mobilization of the SNS since its creation in 1994 and was the rationale behind the creation of the SI, the revision of the trigger criteria in 2012, while not yet perfect, should enable the SI to be incorporated into the SNS. The SNS must be designed to respond to all food insecurity situations, whether national or localized, caused by availability or accessibility problems in specific conditions and with specific modalities, and not be completed by an SI for which the operating rules are much less strict.

2.  **Clarification of the rules on mobilizing stocks.** Originally based on the criterion of overall grain deficit, SNS triggering rules have been revised, “disaggregating” this criterion on provincial level in order to enable the system to respond to “localized” food crises. While this reform enabled the SNS to be mobilized—for the first time since its creation—in 2012 within the framework of the PNOCSUR, these new trigger rules have still not enabled the financial stock to be used. The current definition of these criteria is therefore still problematic. More generally, this calls into question the relevance of the grain deficit as the only trigger, and encourages the pegging of stock trigger criteria to the food insecurity thresholds defined by the CHB using a multi-factor approach to food insecurity.
2. Case Studies

3. Clarification of funding for the storage system. Financing of the main reserve targeting food security in the country relies mainly on outside financial support, which explains the government’s difficulty obtaining a greater degree of flexibility in utilization conditions. Until the government makes a noteworthy contribution to funding the SNS, governance through the joint state-TFP management of the SNS will be not effective. Furthermore, improving the SNS funding mechanism also requires the application of SNS trigger rules outside the PNOCSUR framework, in particular with regard to loan repayment schedules.

Finally, downstream from the system, the above analysis reveals certain elements which would help improve the impact of food released from the stock to recipients, notably:

4. Strengthen coordination between the actions implemented by the government and those undertaken by the technical partners in the field. Despite the state-partner dialogue framework designed for this very purpose, the information on their reciprocal interventions is not circulated sufficiently between the TFPs, NGOs and the government (through the actions of SONAGESS). In relation to the current situation, the food available via the SNS and the SI could be more complementary with that provided by the partners.

5. Diversify the methods of transfer to the vulnerable populations. In particular, this requires new tools be developed. Currently, 90% of SNS resources are intended for sale at reduced prices, without thorough targeting, in municipal stores and the remainder is set aside for free distribution without any counterpart. There are therefore two means of transferring physical resources—a very small number compared to the wide range of tools available to specialized NGOs today. Similarly, the Fonds de Sécurité Alimentaire (FSA [food security fund]) does not currently earmark funding for cash transfers with or without counterparts or even the distribution of food vouchers. The use of these new tools goes hand in hand with an improvement in the current targeting methods, in particular those implemented during the 2012 crisis and deemed largely insufficient. In operational terms, improving the quality of transfer operations requires stronger technical, financial and institutional capacities in the technical body responsible for distributing food (CONASUR). CONASUR staff members do not have skills equivalent to those in many NGOs present in the country in terms of targeting methods and the sometimes complex mechanisms of certain transfer methods, in particular cash transfer operations. Furthermore, CONASUR does not have a sufficient political or institutional base to ensure its role in the system is recognized, in particular with regard to SONAGESS.
2.3. Egypt Case Study

2.3.1. Overview of the Agricultural and Food Situation in the Country

Food Supply and Demand: Dwindling Self-sufficiency

Egyptian agriculture developed in extremely restrictive soil and climate conditions. At a very early stage in its history, Egypt began to irrigate its crops to feed the population and this is one of the technical success stories making up one of the pillars of ancient Egyptian civilization. Due to high population growth, the country is now challenged by its own natural limits and very dependent on foreign supplies for its food.

Farm land accounts for less than 5% of the total surface area of the country. According to the FAO, 99.8% of farm land is irrigated and water resources are limited to 54 billion cubic meters per year, the equivalent of Egypt’s quota of water in the Nile. The main production zones are located along the banks of the Nile and in the Delta.

The development of export crops has remained modest (fruits, vegetables, onions, sugar and rice), with national production serving above all to satisfy domestic needs. Corn and in particular wheat occupy a central role in the crop rotation. Dual cropping is extensive, but farms remain small in size. The country’s agricultural system is dominated...
2. Case Studies

Figures 10, 11

Egypt: Main Agricultural and Food Imports and Exports (2008)

2. Case Studies

Figure 12  
*Egypt: Evolutions in Wheat Imports*  
(1960-2012)

Source: FAO

Figure 13  
*Egypt: Evolutions in Wheat and Rice Prices*  
(2006-2011)

Source: WFP
2. Case Studies

by subsistence farming within which it is difficult to disseminate technical progress. A vast program of agricultural reforms aiming to increase production in order to eliminate the country’s dependency on the outside was launched at the end of the 1980s. According to official figures, wheat production has more than doubled in twenty years!

At the beginning of the 1960s, the population of Egypt was less than 30 million; today it is more than 80 million and continues to increase at a rate of 1.6 million people every year. According to the USDA, Egypt consumed 2.5 Mt of wheat in 1960 and more than 18 Mt in 2012. Annual population growth is causing an automatic increase in national consumption of more than 270,000 tonnes every year, assuming consumption of 160 kg per person per year. The employment-resource balance shows that wheat consumption is even higher, likely because of the use of subsidized wheat for animal feed.

As a result of this explosion in food needs and an increase in production that remains hampered by the soil and weather conditions, the dependency on imports has grown significantly over the last 50 years with wheat imports increasing from almost 1 Mt in the early 1960s to more than 11 Mt in 2011. Today, the value of agrifood imports is 6.9 times greater than the value of exports. As a result of this, and due to its accessibility (two long coastlines on the Mediterranean and Red Sea), Egypt is one of the countries most sensitive to price fluctuations on international markets. Moreover, the main cities are generally less than two days’ travel from import ports. Thus, for non-subsidized food products, the sources of consumer price fluctuations are more closely linked to the instability of international markets than to local market supply disturbances.

A Delicate Food and Nutrition Situation

Access to food is above all curbed by the high level of poverty among the population: 22% of Egyptians are considered poor and 40% live on less than 2 USD per day. While Egyptians consume an average of 2,783 kcal per day (higher than needs), 20% of the population are unable to satisfy their caloric needs. Certain segments of the population are more particularly concerned by this phenomenon of undernourishment. It is strongly linked to household size, income level, the other dimensions of poverty (health, education, isolation, etc.) and more generally the household’s degree of vulnerability.

In particular, as can be seen in Table 9 (below), there are major disparities between:

- urban and rural inhabitants: 22% of the rural population is concerned by undernourishment compared to less than 18% of the urban population.
2. Case Studies

- 13.9 million rural inhabitants, i.e. 30% (2010) are deemed to be poor. Most rural households are net food buyers. Before the international price spike in 2008, food spending already accounted for two-thirds of the spending of these households.

- Lower Egypt and Upper Egypt: more than 40% of the population of Upper Egypt is under the poverty line. The incidence of poverty in rural areas is particularly high in Upper Egypt due to small land structures (75% of farmers have less than 2 feddans\(^{[51]}\) compared to 62% in Lower Egypt), high population growth, the poor access to high value added markets (in particular export markets).\(^{[52]}\)

From the nutritional standpoint, the prevalence of early childhood malnutrition is high (as are increasing obesity problems). This is surely related to:

- insufficient access to food for a significant share of the population (see above);

- the poor quality of subsidized staples and the lack of food diversity in poor households, notably iron and folic acid deficiencies. Thus, respectively 33.3% and 59% of the population suffer from a diet that is too poor or insufficiently diverse; and

- the other decisive factors in malnutrition: education, health and hygiene, etc.

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[51] The feddan is the benchmark farm surface area in Egypt. It corresponds to 0.42 ha.

[52] Traditional crops account for 92% of land area and generate 85% of the income in Upper Egypt, compared to 62% and 54% respectively in Lower Egypt.
2. Case Studies

Agricultural and Food Policy: Pronounced Interventionism

The food policy is based on large-scale social safety nets and a policy of production incentives through guaranteed prices for producers, in particular for wheat.

Food subsidies date back to the World War I in response to the rising wheat prices. From 1952 onwards, subsidized bread became a symbol of the social contract between the Nasser regime and the people. It was a matter of guaranteeing the population access to the basics (food and energy) at low prices in a context of high population growth and urbanization. Then, ration cards were introduced in the mid-1960s in response to the unpredictable nature of American food aid and the supply disruptions that forced

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**Egypt: Food and Energy Subsidies**

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Source: authors’, from Egyptian administration data.
Egypt to use its foreign currency reserves to pay for wheat imports. They were intended to ensure minimum supply security for households and not to subsidize consumption.

From this era onwards, the two pillars of the social policy of subsidizing basic necessities have remained unchanged:

Consumer subsidies for *baladi* bread,[53] theoretically affordable for all Egyptians. Every Egyptian consumes between 140 to 190 kg of bread a year; 250 million subsidized 130-gram *baladi* breads are produced every day (an average of 3 loaves per inhabitant).

Ration cards (coupon system), which are primarily intended for poor households, concern 62 million people[54] (75% of the population) and enable holders to buy four staples (rice, oil, tea and sugar) at subsidized prices.

**Box 6 Egypt: Ration Cards**

The quantities allocated per person and per month through the ration card have been revised on several occasions, notably in 2008:

- **Sugar:** 2 kg, sold for 2.50 E£
- **Cooking oil:** 1.5 kg, sold for 4.50 E£
- **Rice:** 2 kg, sold for 3.00 E£
- **Tea:** one pack, sold for 0.65 E£

The food card represents 25% of the total cost of food subsidies.

While the structure of this policy has changed very little since the 1960s, its financial scope has grown considerably. Under Anwar Sadat, food subsidies grew considerably, from 0.2% of public spending in 1970/1971 to 14% in 1980/1981 (Alderman, quoted by IFPRI, 2001), notably because of the rise in grain and oil prices during 1973 crisis causing the cost of wheat imports to triple. Several reforms were subsequently introduced to curb the increase in this spending and better target populations in need.

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[53] *Baladi* bread: a flat, round bread that is a cornerstone of the Egyptian diet and whose production is subsidized by the Egyptian government.

[54] In response to the food crisis of 2008, the government extended ration cards–previously available to “only” 40 million people–to significantly more people.
2. Case Studies

Despite these reforms, the diagnosis remains the same; the food subsidy system is characterized by: (i) its high cost (although it is less than the cost of energy subsidies); (ii) considerable embezzling due to the difference between the price on the free market and the subsidized value chain (to such an extent that subsidized bread is used as animal fodder); (iii) under-investment in the value chain and the encouragement of fraud due to the low remuneration from the state for the services provided at the different stages of the chain (storage, mills, bakeries); and (iv) a targeting process that does not allow the system to protect the poorest. Baladi bread is deemed to be mediocre in quality and it distribution, anarchic. These last two elements do, however, contribute to a form of self-targeting of the most vulnerable.

The WFP estimates that losses amount to 39% of the subsidies paid by the state, i.e. 700 million euros per year.

2.3.2. The Role of Stocks in Egyptian Agricultural and Food Policies

Storage, an essential link in the supply chain, is far from a simple unit in which grains are “stored” until they are needed; it is a powerful tool for organizing and streamlining trade. We cannot, therefore, tease out the analysis of a country’s storage policy without a precise understanding of the structure of its market. The situation in Egypt is characterized by strong government control, in particular in the wheat value chain. In this specific case, the state absorbs the price volatility on the international markets in order to guarantee the population constant access to low-cost food. At the very heart of the food policy, public storage is as much a price regulation tool as it is a tool to manage and optimize value chain operations in terms of both import management and domestic collection (see diagram below).

The State, Administrator of the Wheat Value Chain

In order to guarantee its citizens access to bread at a very low prices (5 Egyptian piastres), the state intervenes at all the stages of the value chain by means of a myriad of semi-public structures.

Local production collection is controlled by the state. From 1987, a host of reforms were undertaken to encourage production.

- In October, the state, through the General Authority For Supply Commodities (GASC), sets a guaranteed farm-gate price at a level substantially higher than

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[55] Upper Egypt is home to 61% of the poor but receives only 35% of all subsidized flour. The major cities, home to 5% of the poor, receive 21%.
import prices (international prices may sometimes reach this level during the procurement season in May-June). Very often, it is the only buyer. The “procurement season” runs from April 20 to July 15.

- The GASC goes through storage bodies to purchase local harvests: (i) the Principal Bank for Development and Agricultural Credit (PBDAC, a public bank); (ii) the Food Industries Holding Company (FIHC, a public mill); (iii) the Egyptian Holding Company for Silo and Storage (EHCSS, a subsidiary of the GASC); and (iv) the General Company for Silo and Storage (GCSS, a subsidiary of the FIHC). These four operators represented 60%, 26%, 9% and 5% respectively of collections in 2011.

- Farmers either deliver directly to these storage organizations or sell through local traders.
2. Case Studies

**The wheat/bread sector in Egypt**

<table>
<thead>
<tr>
<th>Imports (estimated at 10-11 MT per year)</th>
<th>Local production (estimated between 4-8 MT per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 MT</td>
<td>Farmers and merchants</td>
</tr>
<tr>
<td></td>
<td>Farmers and rural households</td>
</tr>
<tr>
<td>4.5 MT</td>
<td>GASC (Min. of Supply)</td>
</tr>
<tr>
<td></td>
<td>CGSS and other silos</td>
</tr>
<tr>
<td></td>
<td>GASC/FHIC and Agricultural Development Bank</td>
</tr>
<tr>
<td>3.5 MT</td>
<td>Private mills under contract to Ministry of Supply</td>
</tr>
<tr>
<td></td>
<td>Village mills (private)</td>
</tr>
<tr>
<td></td>
<td>Different types of flour and bran (mainly 100%)</td>
</tr>
<tr>
<td></td>
<td>Rural households</td>
</tr>
<tr>
<td>3.8 MT</td>
<td>Private and public mills (FHIC)</td>
</tr>
<tr>
<td></td>
<td>Private importers and FHIC</td>
</tr>
<tr>
<td>1.2 MT</td>
<td>GASC/FHIC under contract (A/O) to the Ministry of Supply</td>
</tr>
<tr>
<td></td>
<td>Private and public mills (FHIC)</td>
</tr>
<tr>
<td></td>
<td>Flour 72% Free pricing</td>
</tr>
<tr>
<td></td>
<td>Bran</td>
</tr>
<tr>
<td></td>
<td>Flour 76% subsidized</td>
</tr>
<tr>
<td></td>
<td>Bran</td>
</tr>
<tr>
<td></td>
<td>Flour 82% subsidized</td>
</tr>
<tr>
<td></td>
<td>Bran</td>
</tr>
<tr>
<td></td>
<td>Different types of flour and bran (mainly 100%)</td>
</tr>
<tr>
<td></td>
<td>Rural households</td>
</tr>
<tr>
<td></td>
<td>GASC/FHIC and Agricultural Development Bank</td>
</tr>
<tr>
<td></td>
<td>CGSS and other silos</td>
</tr>
<tr>
<td></td>
<td>GASC/FHIC and Agricultural Development Bank</td>
</tr>
<tr>
<td></td>
<td>CGSS and other silos</td>
</tr>
<tr>
<td></td>
<td>GASC/FHIC and Agricultural Development Bank</td>
</tr>
</tbody>
</table>

**Consumption (160kg/year/inhabitant)**

**Source:** France Export Céréales.

- As collected production remains the property of the GASC, removal is at its discretion according to its needs to produce *baladi* flour.

While historically the GASC accounted for almost all wheat imports, the deregulation of the flour mills in 1999 has led to an increase in imports on the part of private operators. The GASC reserves its imports for the subsidized *Baladi* value chain. Private operators import wheat to produce higher-quality flour.

Three types of flour are produced depending on the rate of extraction:
2. Case Studies

- **Baladi flour with an 82% extraction rate (64% of the flour produced):** This value chain is administered; the GASC sells the wheat and purchases the flour from mills at administered prices. The mills are remunerated through a subsidy system, the payment of a milling fee, and the sale of bran on the free market. The FIHC’s publicly-owned mills account for 64% of this type of flour while the remaining 36% is produced by private mills.

- **Taba’i flour with a 76% extraction rate (9% of flour):** This flour is produced by public or private mills using wheat purchased at market prices. It is purchased by the GASC by means of a call to tender to be resold at a subsidized price.

- **Fino flour with a 72% extraction rate (27% of flour):** This flour is produced using imported wheat by public or private mills, which are entirely free to set the price and determine production.

250 million loaves of bread are sold every day by 17,500 traditional bakeries, 150 public bakeries (FIHC and Ministry of Solidarity), 142 bakeries in the police sector, and 42 state organization bakeries. There are no restrictions on the sale of bread from the *fino* value chain. In the case of *baladi* bread, the bakeries under contract with the GASC purchase the flour at a subsidized price of 160 E£ per ton and sell 130-gram loaves of bread at the subsidized price of 5 piastres.

**How Is Local Collection Managed and Stored?**
Variable from one year to the next, local collection totaled 2.1 million tonnes in 2010 and 2.6 and 3.7 million tonnes in 2011 and 2012 respectively.

Founded in 1931, the PBDAC is an essential player in the agricultural sector as it is the main source of funding for farmers to buy inputs at interest rates subsidized by the Ministry of Finance. Playing a central role in managing and storing wheat collection, with almost two-thirds of volumes passing through its facilities, the PBDAC has a capacity of almost 2 Mt spread across 362 sites (called *shounas*). The grain is stored in the open air in hessian bags, often on dirt floors. It is commonly accepted that there is a 10% loss rate.

The storage activities are remunerated directly by the GASC at a rate of €0.60 per ton per month in 2012[56] whereas according to PBDAC data, the costs amount to €11.50 per year. This would explain the considerable under-investment in domestic collection.

[56] In France, monthly storage costs are €0.96 per ton.
2. Case Studies

storage facilities over the past 30 years and the intense discussions with the GASC and various ministerial bodies to revise payment for services upwards.

Box 7 Egypt: The Entry-Exit Flow for Wheat in the Shounas

- The farmer or trader delivers the wheat, often in polypropylene bags.
- The wheat is weighed on certified scales at the seller’s expense.
- Samples are taken to test the quality of the wheat, its impurity rate, etc. and are judged by a commission including an agent of the GASC.
- Domestic wheat generally arrives at a humidity rate of almost 12%.
- The farmer or trader will be paid some days later based on the quality determined and on a weight with regard to which the collector enjoys a degree of latitude (a few percentage points).
- The polypropylene bags are emptied so that the grain can then be repacked by hand in 100-kg hessian bags to facilitate fumigation. Between these two operations, the wheat may be kept loose outside for several days. Labor-intensive, this operation is difficult during periods of the year when agricultural workers are busy in the fields.
- The bags are piled on wooden bars to avoid all contact with the ground and piled 10 bags high to limit broken grain.
- The grain may be covered with a tarpaulin.
- Then, the wheat is gradually be removed throughout the year according to a schedule announced every week by the GASC.
- The wheat is weighed when it leaves the shouna but the quality is not checked.

These handling and conservation conditions cause losses and quality deterioration at several stages of the process: bags punctured when handled with hooks, an excessive amount of stones, dust or impurities, difficulty monitoring the development of parasites, the risk of rodents proliferating, the lack of protection from rain, etc. There is a desire to modernize these storage facilities by installing cement floors, hard walls and roofs. Some warehouses have already been built and some covered or cemented storage areas exist, but a great deal remains to be done. This is why the Ministry of Agriculture recently encouraged the PBDAC to launch another investment program. This also means an increase in the prices paid by the GASC. The PBDAC has therefore decided to modernize 100 shounas over a period of 10 years.
2. Case Studies

Storage in bags is rarely called into question. However, bagging costs account for more than one quarter of expenses. Bulk storage seems more economical and would also facilitate better qualitative monitoring of stocks. Beyond infrastructures, the first bottleneck is on-farm collection. The basic unit for small farmers is the 100-kg bag and they deliver de facto in this format. The entire collection and delivery organization must be reviewed and modernized but the volume marketed per producer is limited and the cooperative organization is little involved in managing marketing.[57]

Finally, coordination of the storage activities between the various public infrastructures must be tackled. Twenty-five new silos (30,000 tonnes each) have been built as part of a national 50-silo plan under the authority of the EHCSS. These are located inland and could be used to manage local collection. However, the rate of grain removal in these new silos is quicker than in the open-air storage areas, and little wheat from the shounas are dispatched to these new silos, mainly used for imported wheat whereas they have very modest rotation rates of four times a year.

At present, managing domestic collection would appear to be the most serious problem with considerable room for improvement.

The Challenge of Imports

Egypt is the world’s largest wheat importer, far ahead of Brazil in second position with 7 Mt. In 2011/2012, 11.7 Mt of wheat passed through Egyptian ports. Corn imports have also risen considerably, reaching 7 Mt in 2011/2012. Rationalizing the storage of imports therefore requires combining wheat and corn to measure the magnitude of the logistical challenge. Soy, meal and proteaginous plants should also be added as they account for 14% of imports of grain and meal (21.7 million tonnes in total).

While the private and public sectors currently enjoy an equal share of wheat imports, corn imports are the exclusive domain of private operators. Nevertheless, the public sector remains an essential player with regard to port storage facilities through the General Company for Silos & Storage (GCSS), even if the private sector has developed its own facilities.

The GCSS is the main storage operator in the country with a storage capacity of almost 1 Mt. The GASC uses its infrastructures almost exclusively for wheat imports. It is a subsidiary of the Food and Industries Holding Company (FIHC). The aim of the GCSS is to guarantee millers, and thus its main shareholder, the FIHC, access to grain. It has a

[57] In two shounas, we saw two vertical silos, both empty. One, according to our interlocutor, had never been operational.
2. Case Studies

fleets of trucks and is very present in ports, boasting high-capacity installations—520,000 tonnes—most of which were built in the mid-1980s (Alexandria, Safagua, Damiette and Port Said). Depending on the port, 10 to 20 annual rotations are undertaken (12 on average for wheat, probably 15 including corn), which is very high, even close to saturation. The GCSS bills the GASC for the service within a price bracket ranging from 1.20 to 2.30 per ton per month, depending on the port. The price billed to private operators is 2 to 3 times higher than for the GASC, ranging from 3 to 3.50 per ton per month). The GCSS also has 401,000 tonnes of inland storage capacity (suburbs of Alexandria and Cairo).

Private stores are estimated at approximately 1 Mt. More precise estimates would require further investigation, because they are more scattered than public stores. Mills are said to generally store ten days of consumption, which corresponds to 400,000 tonnes including FIHC mills and private mills. For the remainder, private operators such as Abou don Gol, Cargill, Venus, El Sorat, Arab Brothers, Sea Green and more have considerable supply capacities for their customers or their own mills. In addition, the GASC regularly rents out storage capacity to private operators. It has recently increased its rates to encourage private investment, seemingly with success.

The Government Taking the Initiative in the Public Storage Strategy

The government launched a proactive policy of expanding its storage capacities at the beginning of the new millennium. Among other things, it gave rise to the creation of the Egyptian Holding Company for Silos and Storage (EHCSS), a semi-public structure placed directly under the aegis of the GASC. It is responsible for implementing the strategy of developing 50 silos, each with a capacity of 30,000 tonnes (i.e. 1.5 Mt total) adopted in 2002 with a view to (i) reducing storage losses on domestic collection and (ii) satisfying the country’s food security needs by developing and increasing its strategic reserves.

To date, 25 metal silos have been built, i.e. 750,000 tonnes, used for storing local collection and dispatching imported wheat. They were financed by a state fund and aid from Saudi Arabia, Denmark and the Principal Bank for Development and Agricultural Credit (PBDAC). For the remaining silos, no deadline has been set; they will be built as funding is released.

The average grain rotation in these silos will be four times per year, a figure which seems entirely acceptable for inland silos. However, the amount of local harvests that they handle remains very modest (less than 300,000 tonnes). What is more worrying is that the volume barely increased this year despite a record wheat collection. This leads us to
question both the suitability of these new silos for Egypt’s needs and the coordination between the various public institutions responsible for storage.

2.3.3. Current Challenges and Stakes

Egypt is currently experiencing a period of trouble and instability, from both a political and economic point of view. The uprising of 2011 (Arab Spring) brought about the fall of the old regime and, after a transition period controlled by the military, an elected president took office and a new constitution was adopted. This period of political instability exacerbated the economic fragility of the country, which is caught between the jaws of crushing debt (85% of GDP) and low growth. It is against this backdrop that the current government is envisaging, and has already partially launched, a reform of its food policy. The form of the storage infrastructures to be developed will depend on the results of this reform, even though certain orientations can already be decided.

The Reform of the Overall Food Security Policy

For more than ten years, more and more work has been undertaken to reform the food subsidy system, in particular the subsidies to the baladi bread value chain. Among other things, the new party in power has placed the notion of “morality-building” at the heart of the policy it wishes to implement. Within this framework, the desire to reform the bread value chain is clear, although no specific plans have yet to be put forward.

It is clear that the state wishes to continue to place food at the heart of its social policy. It will continue to absorb the price variations for basic necessities in order to ensure that the population has access to them. Several possibilities for reform have already been examined:

- The shift to a cash transfer system instead of consumption subsidies. Siam and Croppenstedt (2007) demonstrated the advantage of this shift, which would avoid misuse and better target social aid. However, beyond the technical difficulties linked to this reform, opinion polls conducted by the Information and Decision Support Center of the Cabinet show that public opinion is very reluctant to make the switch to this type of system. The households indicated concern about their purchasing power in the event of sudden price hikes for staples. Still at the discussion stage, this change is unlikely to be introduced in the near future.

- A mixed system combining the ration card and cash transfers for the poorest individuals.
2. Case Studies

- The withdrawal of the state from the *baladi* value chain, the elimination of subsidies at the various stages of the chain (included guaranteed farm-gate prices) and direct household consumption subsidies by including *baladi* bread in the basket of products available with a ration card.

The government seems most inclined toward this last solution. The introduction of such a reform—which can be rolled out step by step—will depend on how well it is accepted by public opinion. Ultimately, the will seems to be to deregulate the value chain while retaining a food safety net for bread and ensuring the continuity of supply in the country. This would lead to: (i) bread being sold at its real price; (ii) the import chain being opened completely; (iii) the domestic wheat chain being liberalized; (iv) the flour market being fully deregulated, opening the door to total competition between mills for price and quality; and (v) *baladi* bread being included on the food card, giving card-holding households the right to a certain number of loaves a day. In the wake of this withdrawal of the state from the commercial value chain, the state would refocus its attention on a more basic government function: securing supplies for the country by setting up a strategic stock.

The government has already taken a few steps toward liberalizing the value chain, in particular with the launch of a pilot project in the Governorship of Port Said where the prices of wheat and flour have been deregulated. If the project is successful, it could be extended to the entire country.

**Suitable Storage Infrastructures as a Prerequisite for Improved Resilience in the Food Value Chain**

An efficient network of storage facilities allows the flow of goods from supply zones (both domestic and ports) to consumption zones to be streamlined. This has two major implications: (1) by minimizing the risk of supply disruption, domestic price volatility is reduced; and (2) by minimizing losses along the value chain, the need for—and therefore cost of—imports is reduced.

**Support the Structuring of the Value Chain and Storage of Domestic Wheat**

The problem of managing local collection is currently the most acute issue. It is in this segment of the value chain that storage losses—10%—are highest. Addressing this issue should lead us to examine the appropriateness of (1) investing in the qualitative improvement of storage capacities (modernizing the *shounas*), and (2) better coordinating management of collected harvests by facilitating transit between PBDAC collection facilities and the new EHCSS dispatch silos.
Among other things, two medium-term issues need to be studied in greater detail:

- The complete shift of collection management from bag to bulk as bagging costs represent 25% of PBDAC storage costs and eliminating them would cut costs significantly.

- Greater involvement by farmers and their cooperatives in managing collection and organizing the local wheat value chain. The study did not allow for investigations of this depth. The literature is limited on the topic of producer strategies and organization. However, deregulating the wheat value chain could be an opportunity to shift from a vision of peasantry “highly supervised” by the state to more autonomous small-scale farming. In a deregulated system, organized producers could take ownership of storage, currently performed by the PBDAC, and make it an instrument enabling them to consolidate their market power. This choice will depend on how the development of storage capacities within the local value chain are supported.

**Prepare for the Increased Importance of the Import Value Chain**

Egypt imports 500,000 tonnes of additional grain every year, and it is clear that the facilities will have to keep pace. The prime objective of the port infrastructures is to maximize transit capacity. In the case of importing countries, this means optimizing and streamlining the entry and penetration of goods in the country. This involves several types of actions:

- maximizing boat unloading capacity;

- organizing handling inside silos to ensure loading and unloading speeds; and

- finally, truck movements must be streamlined so they can withdraw the goods as efficiently as possible in order to supply inland intermediary silos or initial processing industries.

Even though existing public silos date back to the end of the 1980s and their rotation rate exceeds an average of 12 times a year, the time seems right to launch a new investment plan. As with inland storage, the government wants to strengthen its capacities in port areas.
2. Case Studies

As a preliminary, a certain number of questions deserve to be examined further:

- What is the exact storage capacity of private operators and where is it located?

- Where should new storage capacities be built? Given that land in port areas is expensive and limited: Should we attempt to maximize transit in port infrastructures to then storing stocks in in-land storage facilities which can be built less expensively? Should we, on the contrary, continue investing in ports and then deliver directly to industries (including mills) thereby avoiding transshipment operations? These two options are not mutually exclusive and should be developed simultaneously.

- What size should strategic stocks be? Indeed, depending on the size and location of the strategic stock, the need for port silos could differ significantly.

Prospects Opened by the Deployment of Strategic Stocks

With the prospect of a possible liberalization of the value chain, public institutions in Egypt promote the establishment of strategic public stocks. The outlines of this strategy have yet to be defined. This raises a number of questions concerning the inclusion of this or that tool in Egypt’s food policy.

Specify the Objectives of the Strategic Stock

Several guidelines are indicated for the deployment of strategic stocks. These stocks could be used to address a broad range of objectives. Ultimately, they will likely combine the three types of public stock that appear regularly in the debate on storage policies:

- emergency stocks, intended to build a food security reserve for people affected by a shock;

- strategic stocks, which aim to guard against ruptures in affordable international supplies; and

- buffer stocks, intended to be an instrument for regulating the interplay of players and the market against a backdrop of deregulation and privatization of the value chain, or even an instrument for exerting pressure on the redefinition of the roles of the different operators in the wheat value chain.
This strategic stock is, ultimately, intended to guarantee regular, unbroken supply in the wheat value chain in order to avoid disruptions in the supply chain. This is government’s main fear in the context of deregulation as such disruptions would have a high social and political cost.

Nevertheless, the country is faced with such dependence vis-à-vis the exterior for its supply that it would be difficult or even impossible to influence international price volatility for more than a few weeks without massive intervention with regard to imports. It would appear, then, that the option adopted within the framework of liberalization is to transfer the price instability in the world market to consumer prices and use consumer subsidies targeting vulnerable households to mitigate the impact of this.

In operational terms, however, it is essential that the government specify the aim of this stock in order to establish the management rules that enable the other players in the value chain to position themselves both for their investments and for their commercial activities.

**How Large Should the Strategic Stocks Be?**

Evaluating calibration means examining two parameters: (i) the needs linked to assessment of various categories of risk, and (ii) the costs involved and possible funding.

It is difficult to evaluate risks as there is no historic baseline for the country. It is therefore closely linked to the perception of risk by the state, the population and operators. This has a pronounced psychological dimension that should not be forgotten in light of Egypt’s geostrategic position, regional conflicts, the tensions beginning to mass on the world’s agricultural commodities and food markets, etc. According to official sources, the strategic stock could tend to cover the equivalent of six months’ consumption, or 4.5 Mt of wheat if the basis for calculation refers to the *baladi* value chain or 7 Mt of wheat if total wheat consumption is considered. For an easily accessible country, the stock needed to guarantee the continuity of consumer supply is relatively low—certainly less than one month’s supply. A target of six months’ of supply would therefore appear excessive. This evaluation is based notably on a few comparative indications: (i) on the global scale, the estimated stock level is less than 6 months’ consumption (even noting that, on this scale, grain harvests occur regularly throughout the year); (ii) major importing countries such as Japan do not need more than three months’ stock; and (iii) western European countries have less than two months’ consumption in stock at the end of a crop year (see table below).
2. Case Studies

Table 10  
**Egypt: Stocks and Wheat Consumption (Compared to a Few Other Countries)**

<table>
<thead>
<tr>
<th></th>
<th>Egypt</th>
<th>Morocco</th>
<th>Algeria</th>
<th>Japan</th>
<th>France</th>
<th>Germany</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic consumption</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of crop year stock</td>
<td>19</td>
<td>9</td>
<td>9</td>
<td>6</td>
<td>19</td>
<td>20</td>
<td>689</td>
</tr>
<tr>
<td>Number of months of consumption covered by end of crop year stocks</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Sources: USDA and national agencies.

Irrespective of the hypothesis retained (4.5 or 7 million tonnes), the infrastructures to be built would be extensive as this stock must be built over and above current storage capacities used for the operations of commercial value chains.

We can certainly imagine the state devoting a proportion of its 1.5 Mt of storage capacity, under the aegis of the EHCSS, to strategic stocks. However, the GCSS’s port capacities are already devoted to handling imported wheat and the *shounas* are currently dedicated to managing collections. Transporting and handling such quantities simultaneously in a deregulated value chain would therefore require substantial investments.

**What Relationship with the Private Sector in Managing Deregulation and Strategic Stocks?**

At present, there is no foreseeable or clearly defined dialogue and negotiation framework between the state and the private sector. Switching from a value chain structured through public intervention to an entirely deregulated value chain will require that this type of framework be set up, or even intermediate mechanisms based on forms of joint management for the transition.

Once the strategic stock size has been set, its implementation modalities will need to be defined:

- Could a system of contracts with importers partially satisfy the function of strategic stock? Such contracts could, for example, grant import licenses in exchange for maintaining a permanent reserve corresponding to X days or months of consumption in the port areas.
2. Case Studies

- Should a public stock owned and managed by the state be favored?
- Could a system of purchase options partially replace physical storage?
- Could the system of intervention stocks used in Western Europe and France be reproduced with the state owning the stocks and entrusting them to the private sector that is paid to provide storage services (ONIC contracts).

Several means of funding can be explored:

- direct public funding of these infrastructures, which are state property; or
- private sector funding by means of an incentive system with attractive interest rates, a guarantee system and the security of rental contracts. This option would be in line with the service provision development perspective (private storage capacities rented to the state).

How Should the Food and Storage Policy Reform Be Accompanied?
The food policy reform will be difficult to implement due to the resistance of the public who are attached to the current system of subsidies and the presence of public and private operators taking advantage of this system and its excesses.

Reform is nevertheless essential in order to improve market operations and better meet consumers’ expectations, cut down on corruption, losses and embezzling, and improve the targeting of aid.

In this context, it is essential to accompany the state’s will for reform, if it is confirmed following the legislative elections. For France’s aid system (the 2nd largest donor behind the United States), it is in particular a question of contributing to a broader dialogue (state/private sector/donors) on the reform of food policy, the stages involved, the needs for accompaniment, etc.

In light of what grain and food security represent throughout the Mediterranean Basin, and the existing international cooperation policy instruments and frameworks, cooperation in these areas between the European Union and the Mediterranean would appear to be a precious instrument to develop approaches and strategies combining:
2. Case Studies

- political dialogue that could incorporate the question of securing supplies and strategic reserves, and partnerships between professional operators or even forms of joint ventures;

- the development of long-term contracts and call for tender specifications, etc.; and

- development and investment aid making complementary use of aid tools and banking instruments (EIB, AFD, etc.).

The Egyptian government currently seems very eager to invest in storage infrastructures. While it has considerable funding needs, this period is conducive to laying the foundation for collaboration between Egypt and the international community in this area.
3. Implications for Decision-Makers

This third section aims to derive operational lessons from the previous two sections. The goal is to allow public decision-makers in the countries concerned and their partners (members of parliament, private sector representatives, civil society organizations, technical and financial partners) to forge a position that is as substantiated as possible on a proposal for public intervention in the field of food storage. By “proposal” we mean new policy components (e.g. setting up a buffer stock in Ethiopia), reforms of existing policies (e.g. the reflections underway in Egypt), and the adjustment of certain instruments (e.g. changes to the rules on mobilizing Burkina Faso’s national security stock).

The proposed method contains three main stages:

1. The first stage is to examine the relevance of the policy proposal. This section analyzes the three types of stocks encountered in the case studies in turn, specifically buffer stocks, emergency stocks and strategic stocks. The aim is to define criteria by which to determine whether a public storage strategy is a priori a good solution, taking into account the specific agricultural and food security issues in each country. It is also here that the question of competition or complementarity with other risk management instruments is addressed.

2. If the proposal is deemed relevant, it is then examined further in a second stage that aims to assess the feasibility of the policy by assessing whether the various (institutional, technical, financial, etc.) conditions needed for effectiveness are present. Insomuch as most implementation conditions are crosscutting and affect the various types of stocks, implementation conditions are not discussed by type of stock but by topic.

3. Accordingly, some questions pertaining to relevance can only be answered after analysis of implementation conditions, which requires a somewhat iterative process.
3.1. The Position of Stocks Among Risk Management Instruments

It is possible to place the main types of stocks encountered in the case studies in context with all public and private risk management instruments. The various risks that households face to different degrees over space and time have been divided into three categories: natural risks that involve both individual and collective production incidents (weather, epidemics, etc.); price risks on local, regional and international markets, whether rising for consumers or dropping for producers; and political risks caused by sociopolitical crises and conflicts, which can cut communication routes, cause supply ruptures, worsen economic activity, etc. What is more, it is possible to distinguish between public and private instruments that aim to reduce the likelihood of these three types of risks occurring and those whose purpose is to mitigate shocks once the risks have happened.

Within this matrix, buffer stocks are seen as public instruments whose primary purpose is to reduce the likelihood of price risks occurring. Emergency stocks, for their part, are classified with social safety nets whose purpose is to mitigate all types of shocks, no matter what their nature. Finally, like emergency stocks, strategic stocks are public instruments that can offset shocks, specifically political shocks.
### Table 11: Risk Management Instruments

<table>
<thead>
<tr>
<th>RISKS</th>
<th>TOOLS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PREVENTION / REGULATION</strong></td>
<td><strong>COMPENSATION / ADAPTATION</strong></td>
</tr>
<tr>
<td>Market</td>
<td>Public</td>
</tr>
<tr>
<td>Market</td>
<td>Public</td>
</tr>
<tr>
<td>Market</td>
<td>Public</td>
</tr>
<tr>
<td><strong>NATURAL RISKS</strong></td>
<td>• diversification</td>
</tr>
<tr>
<td></td>
<td>• conservation agriculture / agroecology</td>
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<tr>
<td></td>
<td>• individual savings</td>
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<tr>
<td></td>
<td>• improved seed suited to climate change</td>
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<tr>
<td></td>
<td>• training/advice</td>
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<tr>
<td></td>
<td>• disaster risk management and emergency plans, civil security, contingency plans</td>
</tr>
<tr>
<td></td>
<td>• early warning systems (EWSs)</td>
</tr>
<tr>
<td><strong>PRICE RISKS</strong></td>
<td>• modernizing production and processing: irrigation systems, research, input and production subsidies/loans</td>
</tr>
<tr>
<td></td>
<td>• development of market instruments: transportation, storage, marketing infrastructures, MIs, warehouse receipt systems, commodity exchanges, futures, grades and standards</td>
</tr>
<tr>
<td></td>
<td>• Buffer Stocks</td>
</tr>
<tr>
<td></td>
<td>• fixed or variable taxes on imports and exports</td>
</tr>
<tr>
<td></td>
<td>• market information systems (MIs)</td>
</tr>
<tr>
<td></td>
<td>• multi-risk contingency plan</td>
</tr>
<tr>
<td></td>
<td>• EWS</td>
</tr>
<tr>
<td><strong>POLITICAL RISKS</strong></td>
<td>• emigration</td>
</tr>
<tr>
<td></td>
<td>• conflict management mechanisms</td>
</tr>
<tr>
<td></td>
<td>• emigration</td>
</tr>
<tr>
<td></td>
<td>• private insurance</td>
</tr>
</tbody>
</table>

| **EMERGENCY STOCKS** | • Emergency Stocks                                                 |
|                      | • structural and temporary social safety nets                       |
|                      | • disaster funds                                                    |
|                      | • guarantee funds and credit facilities                              |
|                      | • government insurance                                               |
| **STRATEGIC STOCKS** | • Emergency Stocks                                                  |
|                      | • structural and temporary social safety nets                       |
|                      | • international support/crisis or conflict                           |

Source: Inspired by the AFD’s work following the workshop on integrating risk management instruments in CAADP investment plans, May 2012.

[58] e.g.: drought (Malawi) and weather (Ethiopia) insurance, WFP/AU proposal: African Risk Capacity.
3.2. Decision-Making Assistance to Analyze Stock Relevance

3.2.1. Buffer Stocks

The relevance of a public policy must be assessed according to the objectives assigned to it. Among risk management instruments, buffer stocks aim to manage one of the types of risks facing households, specifically price risk, by stabilizing prices. Public decision-makers must therefore first ask if the country is faced with high price volatility. As stated in Section 1, buffer stocks are more appropriate to stabilize prices when the source of the instability is domestic but they cannot be the only price stabilization instrument. This measure may notably need to be combined with private price stabilization instruments such as strengthening international trade, stabilizing production, developing private stores, etc. When the causes are external, measures such as border policies are preferable.

What Are the Causes of Price Volatility?

In Burkina Faso as in Ethiopia, two landlocked countries, it can clearly be seen that, for certain products such as corn, price volatility is mostly due to internal causes (natural causes in Burkina Faso and Ethiopia; endogenous causes in Ethiopia—the effects of state intervention) insomuch as prices on the local market fluctuate much more than international market prices. Egypt is very strongly connected to the international market and, because of this, the price instability for non-subsidized food products is more closely tied to variations in international market prices than to possible supply disturbances on local markets.

When faced with a high price risk, Section 1 pointed out that two cases may present themselves:

- Markets may be complete, that is to say all households exposed to price variations, no matter what their income, have access to market instruments that allow them to protect themselves from all types of price shocks, whether individual or collective, whether small or large. In this case, households do not suffer from price volatility and the public authorities have no reason to intervene.

- Or, markets may be incomplete—not all households exposed to price variations are covered against all types of price risks, and public intervention may therefore be justified.

The number of people affected during the latest episodes of skyrocketing prices clearly shows to differing degrees that none of the three countries studied (Burkina Faso,
3. Implications for Decision-Makers

Ethiopia and Egypt) currently have private risk management instruments (insurance-based mechanisms) able to adequately cover the main price risks confronting the various categories of households.

Table 11 notes that public decision-makers potentially have several instruments available to them to manage the specific problem of price volatility in their countries. In light of the debates reviewed rapidly in Section 1 and the experiences drawn from the case
studies, the decision to allocate additional resources to develop a buffer stock (before examining the issue of feasibility) rather than other price risk management instruments depends on the answers to several questions:

**Could the public buffer stock compete with other price risk management instruments already set up?**

If the answer is yes, the main danger is that the positive effects expected of the buffer stock be “canceled out” by the disappearance of other instruments. It has previously been shown that the public buffer stock can potentially compete with three other types of price risk management instruments. This phenomenon is analyzed below based on case studies.

*Potential competition and complementarity with private price risk coverage instruments:* Section 1 recalls that these two instruments may potentially compete with each other inasmuch as the free provision of a protection against price instability would discourage recourse to private price risk protection instruments and because a certain degree of effective price regulation could be conducive to the development of a more attractive supply (lowering risk premiums). However, in Burkina Faso as in other West African countries, the development of private price risk coverage mechanisms has not taken off as expected, even despite the steady withdrawal of the state since the early 1990s. Today, there are still not enough risk coverage instruments accessible to all farmers, or in other words able to overcome the problems of moral hazard and adverse selection intrinsic to private insurance-based mechanisms, and these mechanisms are still used by very few operators. In Burkina Faso, the lack of fully developed risk coverage instruments therefore does not seem to come from public regulation policies. In Ethiopia, private risk coverage instruments are also very little developed. A commodity exchange—the Ethiopia Commodity Exchange (ECX)—was created in 2007 notably for grain thanks to the technical support of IFPRI and the financial support of various donors. Originally, the goal of this initiative was to facilitate the grain trade and enable, after a few years, its introduction in futures markets (the exchange is currently limited to spot transactions). However, this exchange is now mostly used for the coffee trade and very little wheat and corn are traded.

*Potential competition and complementarity with public price risk coverage instruments:* Buffer stocks and social safety nets can potentially compete with each other inasmuch as both are financed with limited public funds. At the same time, these instruments

[59] What is more, the complementarity of instruments is analyzed as a feasibility condition for buffer stock policies in section 3.3.1.
3. Implications for Decision-Makers

Complement each other because social safety nets target vulnerable populations unlike buffer stock policies although certain stock calibration elements can improve the targeting of the later (see 3.3.2). The question is therefore to know whether, in any given country, the current safety net system is effective and if the public authorities have sufficient financial resources to conduct the two types of policies together. In Burkina Faso, social safety net instruments are still very little developed and government action in this area is limited mainly to the distribution of staple foods for free or at subsidized prices during crises. Safety net programs are mainly implemented by international NGOs. What is more, the state already does not have the financial resources to renew the SNS, which precludes the ability of financing a much more costly buffer stock policy (see 3.3.1.). In Ethiopia, the government has been developing an ambitious integrated strategy since 2003 based on a portfolio of activities aiming to reduce structural food insecurity and prevent temporary insecurity problems. In addition, the emergency stock policy implemented by the Ethiopian Food Security and Reserve Administration (EFSRA) was until recently seen as an example of good practices. However, since 2007, the government has undertaken price stabilization operations without increasing the total stock volume. This has reduced the amount of stores available for emergency operations.

Potential competition and complementarity with private price stabilization instruments: These two types of instruments can potentially compete with each other insomuch as buffer stocks can hinder the development of “market-based” price stabilization instruments, private stores in particular. In Egypt, private wheat stores account for 1 Mt, or approximately 20% of annual production, while in Ethiopia, private grain stores account for 4 Mt (compared to 1.2 Mt in public storage) or the equivalent of approximately 22% of national production. In these countries, private stores therefore play a central role in smoothing supply over time and stabilizing prices on the domestic market. The exposure to the risk of private stores being evicted by public storage is therefore real, but the probability of this happening depends in large part on institutional and technical feasibility conditions for the implementation of the public buffer stock (see 3.3).

Whenever potential for competition exists between buffer stocks and other price volatility management instruments, it becomes necessary for the countries concerned to weigh the costs and benefits of the various instruments. This is currently a major challenge for developing countries such as Burkina Faso, Ethiopia and Egypt that, to varying degrees, do not have the technical and financial capacities needed to conduct such analysis.
3. Implications for Decision-Makers

Are the populations affected by the volatility in producer or consumer prices the government’s priority targets?
Section 1 shows the extent to which public buffer stock policies can increase inequalities when the access to productive resources (land, water, capital, etc.) starts out highly unequal. Thus, a producer price stabilization policy benefits farmers in proportion to their market participation, and therefore mostly those farmers who produce enough

Table 12 Relevance of Buffer Stocks: Questions to Guide Decisions

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<thead>
<tr>
<th>Criteria</th>
<th>Indicators</th>
<th>Sources of Verification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the country faced with price volatility that could be addressed with a buffer stock?</td>
<td>• magnitude of inter-annual variations</td>
<td>• price statistics</td>
</tr>
<tr>
<td>To what extent does this volatility affect households?</td>
<td>• Do all households have access to effective risk coverage instruments?</td>
<td>• national and regional systems to monitor and analyze food security</td>
</tr>
<tr>
<td>Could this policy potentially compete with other price risk management instruments?</td>
<td>• Are private price stabilization instruments (storage, trade) developed?</td>
<td>• National Statistics</td>
</tr>
<tr>
<td></td>
<td>• Are private risk coverage instruments (futures markets and insurance-based mechanisms) developed?</td>
<td>• futures markets / commodities exchanges in the country</td>
</tr>
<tr>
<td></td>
<td>• Are the financial resources to develop this policy alongside public social safety net instruments available?</td>
<td></td>
</tr>
<tr>
<td>Are the populations affected by the volatility in producer or consumer prices the government’s priority targets?</td>
<td>• If the government wants to target vulnerable populations, are poor producers/consumers the main beneficiaries of the producer/consumer price stabilization policy?</td>
<td>• public accounts</td>
</tr>
</tbody>
</table>

Source: authors
3. Implications for Decision-Makers

to generate a marketable surplus. In Burkina Faso, only 20% of production is marketed, and less than 25% is marketed in Ethiopia. The number of producers with marketable surpluses and their income profiles are therefore criteria to consider when analyzing the relevance of a producer price stabilization policy whose aim would be to target vulnerable populations.

Similarly, consumer price volatility affects households in proportion to the weight of the market in their overall supply sources. The largest beneficiaries of a consumer price stabilization policy are therefore net buyer households, or in other words urban households and those rural households who obtain their supplies mainly on the market. In Burkina Faso, as in Ethiopia and Egypt, the majority of the population and all of the vulnerable population are net buyers of agricultural products. Recent analysis of household livelihoods in Burkina Faso also shows that, among all food supply sources, the proportion of market purchase increases with the level of poverty.

The decision to stabilize consumer and/or producer prices must take into account the income transfers that the public buffer stock system may generate; if needed, it may be appropriate to accompany the buffer stock with other pro-poor measures (see 3.3.1).

3.2.2. Emergency Stocks

In regard to emergency stocks, the question of relevance is not raised in the same terms as for buffer stocks. Unlike when the state is faced with a problem of price volatility, it is not a matter of asking what type of public intervention is relevant so as to complete rather than compete with the private sector. Social safety nets, which include emergency stocks, are specifically designed to cover risks that the market and private sector cannot cover.

The question of relevance has to do with other possible options that are available to the state to deal with supply ruptures. What is the added value of holding emergency stocks? The answer to this question depends in large part on the type of crisis that the country must face. The most recent food crises in sub-Saharan Africa show that supply ruptures can manifest themselves as an availability problem when granaries are empty or when markets are poorly supplied, but they can also manifest themselves as an affordability problem when products are available on the market but households do not have access to the products because physical access to markets has become difficult or because the products are too expensive. Faced with the increased dependency of populations
3. Implications for Decision-Makers

on the market for their food security, problems with the physical accessibility and affordability of the market are tending to become increasingly decisive factors in food crises. It should, however, be noted that food crises can be caused mainly by one clearly identified factor or by a combination of factors. The 2005 food crisis in Niger is a good illustration of this second case: against a backdrop of constantly worsening living conditions for households, low production in Niger and mediocre harvests in Nigeria (which amplified the price hike on Nigerien markets) triggered an overall food crisis.

The experience drawn notably from case studies shows that most countries attempt to withstand food crises by forming physical or financial stocks. This leads one to consider successively the advantages of holding physical stores and a financial stock in relation to the various ways the state can respond to crises triggered by a problem of accessibility, availability, or both.

When poor product availability or insufficient physical market accessibility are among the factors that triggered the food crisis, the various options available to the state to address these problems outside of recourse to emergency stocks depend on the extent of the shock. When the shock is localized (for instance, a flood that destroyed harvests and upset transportation), the state can act in place of the market by buying food in well supplied areas and distributing it in different ways to the people facing a supply rupture. When the shock is of a larger magnitude, causing a lack of foodstuffs throughout the territory, the state has no choice but to turn to imports from the international market. The advantage of having physical or financial emergency stocks must therefore be analyzed in relation to the alternative option, which is to buy on either the national or international market. Faced with a food crisis, the need to act rapidly justifies the fact that intervention time is the priority criterion by which to choose between these two options.

In regard to this criterion, the main advantage of having physical emergency stores is to avoid supply delays, which can vary considerably depending on how local food markets operate and the degree of connection to the international market. In Ethiopia, despite constant improvements over the past ten years, notably in regard to market integration, the market is still narrow (less than 25% of grain harvests is marketed) and relatively

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[60] In West Africa, recourse to the market accounts for between two thirds and 90% of households’ food supply sources for their consumption (see “Étude sur les marchés alimentaires urbains en Afrique de l'Ouest, au Cameroun et au Tchad”, Afristat-CIRAD-AFD, 2012).

[61] For instance, in the Sahel, the 2011-2012 food crisis was caused mainly by a production shock, whereas the 2008 crisis can be attributed mainly to skyrocketing market prices.
isolated from the international market.\(^{[62]}\) Similarly, in Burkina Faso, where only 20% of the grain produced is marketed and where certain provinces are poorly supplied and/or difficult to access, local market operations are very different, and the country is generally isolated and poorly connected to international markets. Let us note, however, that other countries such as Egypt have or want to form emergency stocks even though they are relatively well connected to the international market. This comes from the fact that even with reactive markets, supply times are never instantaneous. Based on this concern, it would therefore seem that the fact of having a physical emergency store is always relevant and the appropriate question to ask focuses more on how many days of consumption the stock needs to cover based on supply times, which brings up the issue of stock size (see 3.3.2.).

The main advantage of having a financial stock is to avoid the lapse of time needed to mobilize the resources needed to purchase foodstuffs on local (in the case of local crises) and international markets. Indeed, most African countries facing this type of crisis do not have own funds sufficient to finance these emergency purchases and it generally takes a long time to mobilize resources. For instance, Burkina Faso, like most Sahelian countries, has theoretically had a financial stock, housed in the Fonds de Sécurité Alimentaire (FSA), in addition to its physical stores since 1994 to allow the state to buy grain on the local or international market once a crisis has begun.

When financial inability to access markets is the or one of the factors behind a food crisis, the state’s possible options to address this problem, other than recourse to emergency stocks, are broader than to address problems of availability or physical access to markets. As above, states can help populations suffering from supply ruptures by buying on the local, regional or international market and distributing the goods in different ways. But, when markets are physically accessible and well supplied, the state can also provide the affected populations with cash transfers to allow them to buy on markets themselves.

As when the country is faced with a problem of availability or physical access to the market, the advantage of having a physical stock is that it allows the state to provide immediate food aid, avoiding the lag time caused by public purchase operations on local or international markets. But holding a physical stock above all allows one to avoid the inflation that can be caused by large public purchases, which would then intensify pressure on prices. Finally, the last advantage of having a physical stock comes from

\(^{[62]}\) This can be seen in the large difference between price dynamics on Ethiopian markets and price dynamics on international markets, as well as the very high transportation costs from the Port of Djibouti.
the “positive effect of deferred purchase” already mentioned in Section 1: while an emergency stock can be built up when prices are low, buying during a crisis on the local or international market is done when prices are high. This requires the administration to have either relatively large sums of available cash to acquire foodstuffs or a smaller response capacity.

Similarly, having a financial stock is an advantage for the same reasons as those evoked previously in the case of a crisis of availability or physical access to the market, specifically the immediate availability of the financial resources needed for public purchases. But it also has several advantages over holding physical stores.

First, holding a physical reserve has the main inconvenience of costing more insomuch as it generates management and storage costs (security, fumigation, maintenance and product standardization), and the loss ratio is more or less high depending on the quality of the storage whereas holding financial resources only comes at the cost of immobilizing the capital and can even make money if it is invested. Holding a financial stock can sometimes come with a “price risk” to the extent that the physical quantities able to be mobilized with a given sum vary with current market prices. Based on these elements, it is estimated that in Burkina Faso it would be roughly twice as expensive to increase the physical stock as it would to increase the financial stock. Nevertheless, physical stocks are indispensable when markets operate poorly and the state is in this case not able to rapidly convert a financial stock into foodstuffs to help vulnerable populations. What is more, holding financial resources has the advantage of being able to mobilize a diversity of crisis response instruments other than direct transfers in kind (vouchers, cash transfers, etc.) through specialized institutions and as part of the safety net program (see 3.3.1).

As we have just seen, the relevance of emergency stocks can be analyzed in comparison to the other ways the state can respond to a temporary shock. However, as with buffer stocks, this analysis also leads one to question the possible competition between this instrument and other risk management instruments. The main danger is, then, that the positive effects expected of the emergency stock may be “canceled out” by the disappearance of other instruments. The competition with public risk reduction instruments such as buffer stocks has already been discussed above (see 3.2.1). While the question of competition between emergency stocks and private risk coverage instruments is not an issue for the reasons mentioned earlier, the question arises for other social safety net instruments. Indeed, emergency stores whose purpose is to lessen households’ temporary vulnerability can potentially compete financially with other programs to reduce structural vulnerability because both are financed with
limited public resources. Until now, this has rarely been the case insomuch as instruments addressing structural vulnerability are often funded by local and international NGOs. In addition, these two types of instruments may be able to substitute for each other.

### Table 13  
**Relevance of Emergency Stocks: Questions to Guide Decisions**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Indicators</th>
<th>Sources of Verification</th>
</tr>
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<tbody>
<tr>
<td>Are households facing supply ruptures requiring emergency food aid?</td>
<td>• the country regularly faces (or can face) temporary food insecurity</td>
<td>• number/frequency of temporarily food insecure people</td>
</tr>
<tr>
<td>Are emergency stocks necessary to provide this aid or can market supply suffice?</td>
<td>• supply times on the national and international markets allow immediate intervention</td>
<td>• how available are the funds needed for purchasing operations</td>
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<td></td>
<td></td>
<td>• degree of dependency between international and national prices (the country’s connection to the international market)</td>
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<tr>
<td></td>
<td></td>
<td>• regularity and diversity of market supply; distance of consumption centers from markets; state of transportation infrastructures, etc.</td>
</tr>
<tr>
<td>How should the stock be divided between physical and financial stores?</td>
<td>• proportion of households facing problems: 1. of food availability or physical accessibility, justifying holding a physical and financial stock 2. affordability justifying holding a financial stock 3. to both types of problems</td>
<td>• proportion of rural/urban population</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• regularity and diversity of market supply; distance of consumption centers from markets; state of transportation infrastructures, etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• assessment of household purchasing power: comparative analysis of price trends and household incomes</td>
</tr>
<tr>
<td>Does an emergency stock of sufficient size potentially compete with the other public risk management instruments?</td>
<td>• availability of public resources to have emergency stocks, alongside the regulation policies and safety nets already in place and deemed relevant</td>
<td>• budget share allocated to emergency policies in national food security programs</td>
</tr>
</tbody>
</table>

Source: authors.
3. Implications for Decision-Makers

In Ethiopia, one of the major successes of the Productive Safety Net Program (PSNP) set up in 2005 to address chronic insecurity and prevent temporary food insecurity, has been to prevent a large number of rural households from falling into a situation requiring emergency intervention. Because of this, in 2011, emergency aid needs were better controlled in Ethiopia than in any other country on the Horn of Africa. Finally, in some conditions, emergency stocks and structural vulnerability reduction programs can even complement each other (see 3.3.1).

3.2.3. Strategic Stocks

Very little is known about strategic reserve systems insomuch as they are essentially part of defense systems and are top secret or covered by the rules of military secrecy. In developed countries, especially Europe, many countries that remember the supply difficulties during World War II and the post-war period maintain strategic stocks. The largest and least-known is said to be held in Germany. Similarly, Switzerland, because of its landlocked nature, strong dependency on foreign supply, and experience with the consequences of various conflicts and energy crises, has held strategic reserves of food, energy and pharmaceuticals since 1983. Finally, we can cite the best known: the reserve formed by OECD member countries following the oil shock of 1973/1974 and in response to the cartel-like organization of oil producing countries within OPEC. The main system formed by the International Energy Agency consists of the obligation that the states that signed the agreement maintain sufficient strategic reserves to cover normal consumption for at least 60 days without net oil imports. This commitment was rapidly increased to a minimum of 90 days.

In light of specific food security stakes, the relevance of a strategic stock must be analyzed by considering both the issue of supply for the country’s food security, and the probability of supply ruptures.

Is the country at risk for supply ruptures?
A country is at risk for supply ruptures when it is heavily dependent on imported food products to ensure its population’s food security. Thus, in Egypt, the government wants to increase its storage capacities to protect the country from a break in the international supply of wheat, a product that is heavily imported and makes up a large share of the Egyptian diet. Indeed, with per capita bread consumption of 140 to 180 kg per year, wheat has a central place in the Egyptian diet because it accounts for 35% of...

3. Implications for Decision-Makers

calories consumed. Yet, Egypt is currently less than 50% self-sufficient in wheat, and is the world’s largest wheat importer, importing approximately 11 Mt every year.

**Is it very likely that a supply rupture will happen?**

The probability that the risk of a supply rupture will occur drops with the degree to which the country is connected to the international market. However, a certain number of other factors must be taken into account to assess this risk with precision. As experience with strategic stocks illustrates, the geopolitical context is often the largest risk factor considered for the establishment of this type of storage policy.

Egypt wishes to increase its storage capacities even though the country is well-connected to the international market: the main consumption zones are less than one day from the ports along the Mediterranean Sea and Red Sea; in addition, foodstuff delivery times from export zones are relatively short (5 days from Russian ports, less than 10 days from French ports). The risk of shortage due to logistical failures therefore seems moderate.

However, the strategic stock notion is also founded on the more or less objective perception among the country’s population and leaders of the risk of supply rupture. In the case of Egypt, the regional geopolitical context is marked by the persistence of strong tensions: the Arab-Israeli conflict, the issue of Iran and the recent developments in the Sudan weigh on national political and social stability and give food supply security a highly strategic nature. What is more, the new ambitions of countries along the Nile River, especially Ethiopia and Sudan, make the issue of water sharing and use extremely sensitive and could be an additional factor in regional instability and conflict.

Finally, assessing the risk of supply ruptures must also include the commercial, economic and financial intertwining of exporter countries with the interests of importing consumer countries. It is notably for this reason that, during the Cold War, exporting producer countries were tempted to use the “food weapon” and some, like the United States, did not hesitate to implement an embargo on soy exports.

**3.3. Decision-Making Assistance to Analyze Public Storage Systems’ Feasibility Conditions**

This section distinguishes between institutional and political feasibility conditions and technical feasibility conditions for public storage systems.
3.3.1. Institutional and Political Feasibility Conditions

Institutional Safeguards for Credible, Effective and Predictable Policy

In order to ensure the credibility, effectiveness and predictability of a public storage system, the institutional framework for this system must be based on a certain number of principles.

There must be a framework for consultation allowing the expression of a plurality of interests (Maître d’Hôtel et al., 2012) in order to ensure that the public storage policy is the result of a dialogue and/or a negotiation process in which different actors are able to defend their interests. Such a system has two main advantages:

It gives each type of actor the opportunity to promote his or her interests, thereby increasing the intervention’s legitimacy and limiting the risk of ineffectiveness thanks to greater adherence among those involved. What is more, the public-private dialogue allows for greater transparency around the objectives assigned to the strategy and therefore improves predictability, thus limiting the risk of private sector eviction.

It offers the possibility of taking into account the plurality of interests within society (consumers’ and producers’ groups, net purchaser or net seller farmers, etc.). In Zambia, policy is clearly influenced by the Zambian National Farmers Union (ZNFU), an influential farmers’ organization, and the import licenses managed in the framework of the trade policy that accompanies the storage policy are delivered in a discretionary manner to a few traders who have close ties with the government. In the framework of systems in which there is no arena for dialogue and negotiations, the buffer stock policy for corn seems to benefit only farmers who are net sellers (Tembo, Chapoto, et al., 2009). However, the mere existence of multi-actor consultation systems is not enough to ensure that some level of balance can be found among diverging interests. On the contrary, these systems can generate rent situations for hegemonic actors, who are often close to state decision-making bodies. The presence of imbalances of power within such bodies must be offset by specific support aiming to build the capacities of the least well endowed actors.

The strengthened dialogue between the public sector and private actors can manifest itself concretely through the establishment of public-private partnerships for the implementation of the public storage policy. For example, the state may choose to delegate some of the logistics of managing its buffer or emergency stock to private storers so as to minimize the costs associated with this activity while simultaneously maintaining control over strategic management of the stores (trigger rules, volumes
3. Implications for Decision-Makers

stocked/released, supply and distribution channels, etc.). In Burkina Faso, SONAGESS, the public company in charge of managing government stocks, rents the services of private stores in areas where it does not have sufficient storage capacities. However, this is not part of any real partnership strategy. Overall, private operators, despite the recognition of their importance in supplying markets, are kept more or less on the sidelines of crisis prevention/management in the country because they are sometimes rightly or wrongly seen as agents who make food crises worse and/or profit from them. In Egypt, there is no predictable and well-defined framework for consultation and negotiation between the state and the private sector. The possible shift from a value chain structured by public intervention to a fully deregulated value chain will require the establishment of this type of framework and even intermediary systems based on forms of co-management.

Clearly defined and non-conflicting objectives can improve the credibility and predictability of the storage strategy. Faced with conflicting and/or poorly defined mandates, the buffer stock strategy runs the risk of not being effective because the state will not be able to keep its various promises simultaneously. What is more, the lack of coherence tends to lower the credibility and predictability of public intervention in the eyes of the private sector. In Burkina Faso, two stocks (the commercial buffer stock and the intervention stock) have, among other things, an official mandate to regulate prices whereas there is in reality no political will to have these stocks play this role, nor are there the financial means to allow them to do so. This ambiguity helps increase the unpredictable nature of government action, which is a difficulty for private operators’ activities. In Ethiopia, the success of the crisis prevention/management system relied in large part on the clear and coherent mandate assigned to the stock management organization, EFSRA, focused on the provision of foodstuffs for emergency operations. Since 2007, the country has been planning to develop a price regulation policy, which comes with a determination to increase exports, notably to allow the buffer stock to find outlets on the foreign market year-round (like the surplus exported by the EU on the international market before the CAP was reformed). However, it seems unlikely that the current competitiveness of Ethiopia’s grain products on the international market would allow the country to find foreign outlets year-round, particularly for the products stored. Finally, in Egypt, with an eye to the possible deregulation of the value chain, the authorities are promoting the establishment of a strategic stock whose objectives are not very clear, making it tricky to determine optimal stock size, operating modalities and its connections with the commercial value chain.

A storage policy based on a simple and flexible institutional structure is also a way to increase policy effectiveness. The more cumbersome and bureaucratic the organization,
3. Implications for Decision-Makers

the more costly it will be and the system’s reactivity risks being hindered. A simple organizational structure means having a decision-making chain clearly formalized by objective triggering rules (see 3.3.2.) to prevent politicizing the system, with a limited amount of hierarchical levels. What is more, the institutional organization must be flexible so it can periodically revise its objectives (at a moderate frequency or there is the risk of losing visibility) following changes in the country’s economic context and food security. As an illustration, for buffer stock policies, the system’s flexibility is crucial to allow the periodic revision of intervention prices when the band is not defined by import and export parity prices alone. Indonesia, which went from being the world’s largest rice importer in the 1960s to being food self-sufficient in the mid-1980s, was rapidly able to reform its regulation policy as a whole and in particular its storage system by lowering the guaranteed price to the international price. Similarly, in Ethiopia, the effectiveness of the emergency stock strategy is ensured by reactive governance thanks to a relatively small system: EFSRA manages seven storage sites, employing 25 people at headquarters and 150 total in the storage sites. The annual budget is less than one million dollars.

The independence of the structure in charge of the storage policy also increases the storage policy’s credibility in the eyes of private actors. Here, we once again encounter the same recommendation as that given to central banks for monetary policy because the issue of policy credibility is posed in much the same terms. The independence of the institution in charge of the public storage policy is a signal sent to the private sector indicating that the institutional system cannot be subjected to political games, thus ensuring a degree of stability in objectives and better predictability. In Burkina Faso in October 2011, on the eve of the 2012 food crisis, the national EWS had alerted the government based on the projected outcome of the 2011/2012 crop year for grain, whereas Chad, Niger and the regional information systems (AGRHYMET) had already declared a crisis. Despite this, the state of alert was not recognized by the national decision-making bodies until March 2012. Another illustration of this “political bias” is how grain from the emergency stock was distributed: even though the EWS had identified different food insecurity thresholds for each municipality, the government decided to distribute the same amounts to the municipalities in each province to avoid conflicts between municipalities.

Sufficient and rapidly mobilizable finances are absolutely necessary for public storage strategies to be effective. A flexible, large budget is a crucial condition for the policy’s ability to defend its price band in the case of buffer stocks or cover vulnerable
3. Implications for Decision-Makers

populations’ needs in the case of strategic and emergency stocks. In Mali, the buffer stock does not have its own funds: stock managers must therefore obtain loans before buying grain. When prices rise sharply, this implies an intervention lag time that results in an inability of the buffer stock to alter market prices. This is what happened during the 2005 and 2008 crises in which only 28,000 tonnes and 53,000 tonnes respectively were available—amounts largely inadequate to counteract skyrocketing prices. On the contrary, other countries that have sufficient own revenues can cover the cost of their storage strategies. This is notably the case for Indonesia and Zambia where the high cost of the buffer stock strategy implemented can be covered by income derived respectively from the oil and copper industries. When it comes to emergency stocks, the available financial resources will determine to a great extent their size and therefore their capacity to meet the needs of vulnerable populations. Although closer to an administered price policy than a regulation policy, the case of Egypt is a good illustration of the need to have considerable financial resources to ensure a reliable consumer price. In this country, starting in the early 1980s, the policy of subsidizing food consumption had to be progressively scaled back because of the cost of the system, which weighs heavily in the budget deficit. The 2007/2008 international price spike took the form of another rise in the cost of food and energy subsidies. Added to the drop in tourism revenues since 2011, this shock put the country in a tricky budget situation and pushed it to now attempt in-depth reform of its subsidy policy.

Storage costs comprising grain stocking/de-stocking expenses, stock maintenance (including quality control), losses, etc. are fairly difficult to estimate in practice. This is in part because stock management organizations can fulfill other functions and their yearly operating costs cannot be attributed solely to their storage activities. This is notably the case with SONAGESS in Burkina Faso that is also in charge of managing the MIS, and the PBDAC in Egypt that expanded its activities in many sectors in addition to its storage activities. In regard to SONAGESS, this causes difficulties insomuch as it does not yet have cost accounting. It is also difficult to obtain reliable data on losses due to bagging and rot because how stock inflows and outflows are recorded and transcribed in the books seems insufficiently developed, notably for SONAGESS and PBDAC. Interviews with the main stakeholders concerned and the analysis of occasional audits of storage organizations do, however, give an idea of the main expenses related to day-to-day stock management. The figures given in the table below do not include the financial opportunity cost linked to immobilizing capital as grain. In some countries such as Ethiopia, where interest rates are very high notably because of inflation, these

[64] Let us note, however, that the quantities needed to alter market prices are incommensurate with the volumes needed to help vulnerable populations and, as a result, an emergency stock policy is generally less expensive.
costs can account for up to 8%, whereas in other countries such as France, these costs are approximately 3%.

### Table 14 Order of Magnitude of Storage Costs in a Few Countries

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<th>Country</th>
<th>Case Studies</th>
<th>Other Available Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>stock management cost per ton (in US$)</td>
<td>Ethiopia (EFSRA)</td>
<td>Burkina Faso (SONAGESS)</td>
</tr>
<tr>
<td></td>
<td>43</td>
<td>27</td>
</tr>
<tr>
<td>stock management cost (% of the purchase price for one ton of grain)</td>
<td>13</td>
<td>9</td>
</tr>
</tbody>
</table>

Source: authors’, from national data.

### Storage Strategy Must Exploit Any Possible Complementarity with the Other Risk Management Instruments

A buffer stock strategy must be coupled with “pro-poor” measures. The first section of this study recalls that a price stabilization policy, even well conducted, will tend to benefit the best endowed actors first when the initial distribution of production factors (land and capital) is highly unequal (see section 1.3.4.). To be a poverty alleviation policy, the buffer stock strategy must therefore come with measures targeting vulnerable farmers, notably those farmers trading little on the market (promoting investments suited to the constraints of smallholder farming, building road infrastructures or irrigation systems in vulnerable zones, input distribution, etc.). Thus, in Ethiopia, the current plans to add the objective of price stabilization to the storage system exist in a context where safety net policies targeting producers and vulnerable consumers are already heavily developed and reputed to be effective.

A buffer stock strategy must be accompanied by other agricultural development policies. The first section of this study emphasizes the decisive role played by public investment to lower transaction costs and set off a virtuous circle leading out of the poverty trap (see 1.2.3). In some situations, in particular when access to public goods such as poor households’ endowment in production factors is particularly low and when the depth

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[65] In percent of the international price of wheat in 2012 for Egypt and Ethiopia, and the weighted average price of corn, millet and sorghum on the local market for Burkina Faso. For Mali, the source is OPAM, for France and Hungary, the source is IN VIVO based on billing data.
of poverty is manifest in almost nonexistent savings, it is probable that a storage strategy aiming to stabilize prices, even well conducted, would not be enough. For a virtuous circle of growth and investment to take off, it is necessary for several conditions to be met. The countries where a buffer stock strategy effectively came with a significant increase in production had simultaneously set up other agricultural development policies. In Malawi, the rise in production and yields observed between 1983 and 1993 is mainly explained by the establishment of an agricultural policy “package” that included a buffer stock managed by the National Food Reserve Agency (NFRA) and support for stock farming programs, investments in agronomic research, seed distribution systems, rural infrastructure financing, etc. (Chapoto and Jayne, 2009). The same can be seen in Indonesia (see section 1.3.3).

Similarly, an emergency stock strategy must be integrated within safety net programs to improve targeting and anchor its interventions in a long-term perspective. Safety net programs, offering predictable transfers in cash or kind (food, agricultural inputs) are set up to protect the most vulnerable households against loss of assets in the case of shocks. Although emergency stocks are first and foremost destined to overcome temporary crises and not to lower households’ structural vulnerability, they can have an impact on this last component of poverty in two ways: first, by passing their emergency interventions through the safety net programs already present in the zones affected by a temporary shock, and second by “supplying” these same programs through their technical rotation operations, which make up a source of quality goods with relatively predictable flows. This would make it possible to set up a guaranteed flow of foodstuffs to social safety net programs for which success depends primarily on the predictability and sustainability of interventions. ECOWAS’s regional reserve was designed with this aim. Similarly, in Ethiopia, stock rotations and the related costs have been managed well because most programs distributing food (in diverse ways) are connected to EFSRA, the organization in charge of managing the stock. Since 2005, the country has developed an ambitious social safety net program, one of the main objectives of which is to lower households’ chronic vulnerability. The main operators in this program, such as the WFP and NGOs, obtain their supply of foodstuffs to use for food transfers and cash for monetary transfers from EFSRA.

The Storage Strategy Must Be Part of a Broader Public Action Strategy Covering Several Levels of Geographic Intervention

In the absence of national trade policy instruments, a buffer stock strategy may require supra-national coordination. As noted earlier (see section 1.3.3), buffer stock strategies

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[66] Technical rotation consists of regularly renewing part of the stock to preserve the quality of the products stored.
3. Implications for Decision-Makers

must necessarily be combined with trade policy when the intervention prices set by the price band are different from import and export parity prices. Even if one opts for a band that is as wide as possible, smoothing only fluctuations in parity prices, intervention will imply occasional import or export bans. However, a country may be unable to control its foreign trade flows because its borders are porous or because it belongs to a customs union. In this case, it is then necessary to either renounce the regulation policy or set it up on the regional scale. This situation is similar to that of the EU before the reforms mandated by WTO treaties with the large difference that, here, the regional policy would not seek to support price levels but stabilize them, which would lower the risk of finding oneself in a situation similar to that facing the CAP in the 1980s and 1990s. In Burkina Faso, since the WAEMU CET was rolled out in January 2000 and with the current finalization of ECOWAS’s Common External Tariff, management of the country’s foreign trade flows has been shifted to the regional level. In this context, the country does not have an effective buffer stock at this time, and setting up such a stock—at least nationally—is not one of its current priorities. Ethiopia has also signed a Regional Trade Agreement within COMESA. This regional block does not yet have a customs union but it is in the process of elaborating a Common External Tariff.

Strengthening regional trade integration is a prerequisite for supra-national management of buffer stock strategies. There are currently many regional trade blocks on the African continent (nearly all African countries have signed at least one regional trade agreement) but few of them have an effective customs union or free trade zone. To various degrees, the regions for which trade agreements result in the formation of free trade zones encounter the same types of difficulties, specifically the non-finalization of the intra-regional tariff dismantling process, the persistence of informal duties, the development of non-tariff barriers to trade and the non-harmonization of rules of origin. Similarly, while many regional trade agreements provide for the creation of a customs union, only two (WAEMU and the SACU) of the six customs unions on the continent currently have a stable common external tariff in force. What is more, when there is a common tariff policy for the region, it is only designed to meet the problem of structurally low prices, making it unsuitable to accompany a storage system whose purpose is to lower price volatility. When it comes to variable taxes to withstand temporary shocks, WAEMU has only the Taxe Conjoncturelle à l’Importation (TCI [compensatory import levy]); ECOWAS for its part is currently reflecting on how to integrate safeguard measures in its foreign trade policy to withstand sudden price hikes.

[67] Mid-2012, ECOWAS adopted and finalized the CET structure for the region, but it has not yet been applied.
3. Implications for Decision-Makers

For many countries, in the case of food crisis, national emergency stocks are only one response among those habitually available. During crises, staples may be mobilized through four different supply channels: (i) locally, through local, village or inter-village stocks, generally known as grain banks, village granaries or food security granaries; (ii) nationally through national emergency stocks; (iii) regionally through regional stocks; and (iv) internationally through public purchase offers on the world market. These different levels of intervention very often complement each other, with each having a comparative advantage in managing a food crisis.

In particular, during supply ruptures, local stocks are often the first line of defense to meet populations’ needs, well before the foodstuffs stored at the national level are made available. In addition to the speed of mobilization, intervention on the local level also has the advantage of allowing more precise targeting of recipients. For instance, in Niger, there were 2,851 grain banks in 2002, representing potential storage of more than 40,000 tonnes. In Burkina Faso, it is estimated that the country has approximately 2,000 grain banks, for potential storage in the amount of 15,000 to 30,000 tonnes; Mali’s local storage potential is said to exceed 15,000 tonnes (Blein, 2009).

In the same way that local and national stores can complement each other, the regional level can potentially complement the national level (the regional stock in this case acting as the third line of defense) when a country does not have enough storage capacity to cover national needs or when the region must face interconnected shocks requiring interventions to be coordinated between states. In West Africa, this was the case notably with the four major crises in 1998, 2001, 2002 and 2005 that struck Burkina Faso, Niger and Mali simultaneously. Finally, regional management of stocks can also be useful when shortfall zones characterized by low stocks coexist alongside surplus zones, as is the case in the Sahel.

Finally, regional storage can also complete international-scale interventions when the size of the regional reserve is sufficient to cover regional needs during the period of time necessary to execute a purchase operation on the international market through a public call for tender procedure. Thus, the WFP proposed a regional reserve for ECOWAS able to cover 90 days of regional needs generated by a price shock, which corresponds to the average time needed to mobilize and deliver international food aid (WFP, 2011). What is more, the regional reserve currently being proposed by ECOWAS is also designed to cover 90 days of regional needs while simultaneously making a distinction between coastal and landlocked countries.
3. Implications for Decision-Makers

Several regional reserve initiatives have been proposed by various technical and financial partners, such as the RESOGEST initiative run by the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS) and the “PREPARE” pilot project elaborated by the World Food Programme (WFP). ECOWAS now has a storage strategy that fits into the framework of agricultural policy implementation (ECOWAP). This strategy was validated following the September 27, 2012, meeting of the ECOWAS Specialized Technical Committee on Agriculture, Environment and Water Resources in Abidjan that brought together ministers of ECOWAS member states.

ECOWAS’s strategy includes various mechanisms from the RESOGEST initiative, except the mobilization of 5% of national stocks for the regional reserve because it believes that the regional reserve must be in addition to and not instead of national response capacities. The proposal also integrates the WFP pilot program insomuch as any strong variation in international prices with an impact on national prices is one element triggering the reserve. However, ECOWAS’s proposal expands the criteria to mobilize the reserve by adopting as triggers the food insecurity criteria defined by the Cadre Harmonisé Bonifié (CHB [supplemented harmonized framework]) in which price is only one of 11 indicators.

The reserve is scaled to respond to all types of shocks (agro-weather and price/market) equivalent in scope to those seen in the region over the past ten years. Based on estimated annual needs for each country, applied to projected population size in 2020, 60% and 40% of the first three months are therefore deemed covered on the national (national and local stocks) and regional level respectively with the other months of the year covered by the extra-regional level.

This strategy is based on the principle that regional intervention must only take place as a supplement to measures taken by states, which implies that efforts be made simultaneously by states to increase national and local stocks.

Based on these intervention principles, in the first year a regional reserve of 176,380 tonnes would be built up (60,000 physical tonnes, and 116,380 financial tonnes). The reserve will then grow to attain 411,554 tonnes (140,000 physical tonnes and 271,554 financial tonnes) by year eight. The strategy includes the technical elements of the system (size, physical and financial components, triggers, composition, location, supply), as well as operational elements providing indications as to institutional structure and organization, costs, financing mechanisms and the monitoring and assessment system; the strategy offers an action plan for 2020. The regional reserve is composed of one-third physical reserves.

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[68] For more information on this initiative, consult the full document online at: http://www.inter-reseaux.org/IMG/pdf/Faisabilite_Reserve_Regionale_EN.pdf

[69] Too many stocks have not been readjusted to keep pace with population growth and are currently undersized.

[70] Let us note that landlocked countries receive more regional support than coastal countries (40% vs. 20%).
3. Implications for Decision-Makers

located in warehouses in certain countries of the sub-region, and two-thirds financial reserves placed in an interest-bearing account. This financial reserve is not only funds for the purchase of foodstuffs for emergency operations; it must also finance operations such as cash transfers, purchase vouchers, etc.

3.3.2. Technical Feasibility Conditions

Have Adequate Analytic Capacities and Objective Triggering Rules

No matter which measure is considered—buffer or emergency stocks—access to expertise and solid data is a key factor in success. This concerns staff within the institutional stock management system, which also means the resources to implement to retain qualified staff, as well as the entire information system on which the storage system relies. The challenge of these information systems is to allow the government to act and adapt its rules “in time” and provide “objective” rules to trigger the stock allowing better governance and effectiveness for the policy (see 2.1).

Before setting up a buffer stock, one therefore needs to ensure that the country has an efficient market information system (MIS) and reliable harvest prediction data. Indeed, the previous section recalls (see 1.3.4.5) that this is not always the case in many African countries although it now seems possible to improve these systems thanks to the development of multi-actor consultation frameworks. These systems have shown a degree of ability to improve market regulation policy governance, notably by pooling and validating information from the private sector and the public sector. Public intervention on the Ethiopian market during the 2007/2008 and 2011/2012 crises by the public grain marketing company in Ethiopia (EGTE) whose market analysis capacities are deemed insufficient helped in part generate a price spike on the domestic market that was larger than the one seen on the international market.

Similarly, before setting up an emergency stock, it is important that the country have an early warning system (EWS) based on an effective MIS, all of which integrated in a national contingency plan. Faced with the inability of national early warning systems to predict a certain number of food crises, notably those of 2004 and 2008, the CILSS developed a new framework to analyze vulnerability, the Cadre Harmonisé Bonifié (CHB [supplemented harmonized framework]) that defined, in a consensual way, a set of indicators to monitor vulnerability. This new framework has not yet fully been adopted by the countries. Burkina Faso recently published Household Economic Analysis (HEA) reports for nine zones with modes of life pre-identified by the FEWS-NET system—solid
progress toward the adoption of the CHB, although Burkina Faso’s EWS does not yet provide warnings distinguishing between the five food insecurity thresholds defined in the CHB. What is more, an annual multi-risk contingency plan was adopted by the Burkina Faso government in February 2009.

Based on effective food insecurity monitoring and analysis systems, it is possible to define objective triggering rules based on food security indicators conditioning food stocking and de-stocking. The whole challenge is to find the best balance between objectivity (needed to ensure good stock governance) and the flexibility in the rules needed by the system for it to be able to adapt to changes in the context. For instance, from 1994 to 2012, the physical portion of Burkina Faso’s national security stock was triggered by the country reaching a 5% net deficit, although it has not hit this deficit in the past 20 years.

**Size**
The size of buffer stocks is very difficult to assess. For any given country, characterized notably by its geographic position and trade policy, the size of the stock must be large enough to influence market prices. One way to estimate this impact is to evaluate price elasticity in relation to supply and demand on the market in question. For instance, in Ethiopia, it has been estimated that a stock of 407,000 tonnes would cause a 2.18% drop in prices when the supply is relatively elastic (=0.6) in relation to the price, and a 3.27% drop when it becomes relatively inelastic (=0.4) (IFPRI, 2011). However, supply price elasticity may change substantially according to the chosen stocking/de-stocking methods, notably during the marketing period for de-stocked quantities. What is more, many African countries do not have enough data to be able to use the econometric methods that make it possible to calculate these elasticities. In order to support its ambition of setting up a buffer stock to regulate prices, Ethiopia wants to increase its storage capacity from 400,000 to 3 million tonnes. However, most of the stakeholders involved see this objective as overly ambitious insomuch as the marketable surplus does not exceed 4 million tonnes. Inversely, in Burkina Faso, the two stocks that aim to regulate prices—the SI and the SCR—only accounted for 5,000 and 15,000 tonnes respectively at the end of 2011. This seems insufficient to influence prices given the marketable surplus estimated at approximately 700,000 tonnes.

Determining the size of an emergency stock is also a very difficult exercise that depends first and foremost on the type of needs that the storage policy seeks to cover through its operations. Three questions must be examined: What types of shock should be covered (agro-climatic shock, market risks, socio-political crisis)? How can overall needs be estimated? Among these needs, which will be covered by the storage strategy?
3. Implications for Decision-Makers

An analysis of past and current experience makes it possible to identify four primary methods to assess overall needs (ADB, 2011; ECOWAS, 2012):

- Evaluation of the gap between consumption during a shock and average consumption over a given period. This method has, however, the disadvantage of considering all vulnerable people rather than only those people needing emergency intervention. It also raises the question of the type of shock to consider.

- Evaluation of the gap between imports during a shock and average imports.

- Retrospective analysis of stock-to-consumption ratios.

- Evaluation of future needs according to assistance provided during past crises.

- Evaluation of the proportion of people requiring emergency intervention during a shock converted to food needs and estimation of the proportion of these needs that will be covered by the emergency stock. Generally, coverage of needs vary from 2 to 6 months.

Furthermore, while the stock must be large enough to cover needs, it must also not be too large so as to avoid having a significant effect on market prices.

In Burkina Faso, the 2012 food crisis affected 2.85 million people. The SNS and the financial stock are planned to cover the population’s immediate needs until outside aid can be delivered. Given an average amount of time between the launch of an international call for tender and delivery of aid to the distribution site of three months and a monthly ration of 15 kg/person, the SNS and financial stock should in theory have been able to provide 128,250 tonnes of grain, whereas their response capacity right before the crisis was only 68,225 tonnes.

Strategic stock size is, for its part, very subjective. For instance, in Egypt, it is difficult to assess supply rupture risks because there is no historic baseline for the country. It is therefore closely tied to how this risk is perceived by the state and other stakeholders.

[71] The WFP used this method in its PREPARE study on the ECOWAS regional reserve.
[72] ECOWAS used this method in the feasibility study for the ECOWAS regional reserve.
[73] These average times are those seen by Catholic Relief Services, one of the main providers of American food aid in Burkina Faso. The per person ration is the WFP standard.
3. Implications for Decision-Makers

in relation with the country’s geostrategic position and the prospective evolution of regional conflicts.

In all cases, determining the size of the stock involves comparing two parameters: the assessment of the various categories of shocks (price shocks, natural shocks, political conflicts) as mentioned above, and the financing possibilities in light of the costs generated by more or less large stocks.

Stock Composition (Physical Stores)
When examining the question of the composition of the emergency stock or buffer stock, two questions must be asked: Must the stock be composed only of resources in kind or is it preferable to also plan for a financial portion? If the stock contains a physical resource portion, what must its composition be?

Issues related to the physical and financial portions of the reserve have already been addressed above, in the analysis of the relevance of emergency stocks. The question of the composition of the physical portion of the stock refers, for its part, to populations’ food habits, the importance of various staples in agricultural production and household consumption, and the costs related to their purchase and conservation. For buffer stocks, the composition also depends on the magnitude of the price instability for various products (the stock should focus its intervention on the products with a high degree of instability) and on the difficulty stabilizing the prices of the products concerned. Whether it be for regulation or food security purposes, a certain number of these criteria tend to recommend the storage of food products. Indeed, the prices of these products are generally more unstable than those of imported products; in addition, these products are strategic products in populations’ diets, and provide an additional outlet opportunity for local producers. However, storing these products raises several difficulties. If we consider, for example, West African food products, dry grains such as corn, millet or sorghum can be conserved, whereas products such as cassava or yams must be processed before any lengthy storage can be envisaged. The lack of clear norms and standards for food products also raises difficulties, in particular when determining the technical specifics of products during calls for tender or the establishment of purchasing contracts, as well as for product conservation. What is more, although certain goods such as rice are strategic for populations, they are not necessarily produced in sufficient quantity locally.

In Ethiopia, the emergency stock is officially composed of wheat (70%), corn (20%) and sorghum (10%), which also corresponds to the three most consumed grains on the national level. However, since 2008, this composition has not been respected, and the
stock is almost entirely made up of imported wheat. This shift is notably explained by the fact NGOs and the WFP\textsuperscript{[74]} have not been authorized to make local grain purchases since 2007, and that the EFSRA applies very strict quality standards on the grain stored, standards that local producers have a hard time meeting. In Burkina Faso, during the 2004-2009 period, the national safety stock (SNS) was composed of 51% sorghum, 34% millet, and 15% corn. These three grains are also the ones that provide most of the population’s daily calorie and protein intake. Unlike Ethiopia, the SNS is in principle here entirely made up of local products; however SONAGESS regularly faces considerable difficulty during technical rotations because it cannot find buyers at prices that allow it to re-build an identical stock and/or suppliers able to deliver grain in the quality and quantity agreed upon in the calls for tender.

When it comes to buffer stocks, the degree of “tradability” of the product stored also counts because it will determine the amount of coordination needed between the storage strategy and the foreign trade policy. As mentioned above, a buffer stock strategy can be driven to failure if imports (exports) at prices below (above) the floor (ceiling) intervention prices are made possible by the state’s inability to control foreign trade. The technical feasibility of the storage strategy therefore also depends on the tradable or non-tradable nature of the product stored. Accordingly, it is possible to sort agricultural products into five categories: (i) internationally tradable goods (e.g. corn, wheat); (ii) regionally tradable goods (e.g. fonio); (iii) rice, which is a tradable good but constitutes a separate category insomuch as there is no spot market for this product; (iv) non-tradable goods that may be substituted for a tradable good (For example, for many African countries, the local rice is non-tradable because it is of a very different quality than imported rice. When the two qualities of rice are highly substitutable, the imported rice may nevertheless compete with local rice and cause the failure of the storage operation aiming to defend a floor price for locally produced rice.); and (v) non-tradable goods (e.g. cassava, millet, yarn, the Ethiopian teff).

Supply Sources and Methods
When first constituting the stock and during re-stocking operations, management structures potentially have two supply sources: the local market and the international market. When the goods are available on local markets and meet sufficient quality standards, stock managers have an interest in favoring this supply channel so that the public storage strategy is also an opportunity to provide new outlets for local producers.

\textsuperscript{[74]} Except through the P4P program, but these quantities are very small.
3. Implications for Decision-Makers

There are many supply modalities. Rebuilding the physical stock can be done through direct purchases from producers (as SONAGESS does in Burkina Faso), national or international public calls for tender, public procurement offers, and futures contracts. When financial markets are sufficiently developed, other more modern market management instruments such as purchase options can be used.

The Price of Stocking/De-Stocking

When it comes to buffer stocks, prices are set by the band that determines the storage strategy’s floor and ceiling intervention prices. Insomuch as stocking/de-stocking operations aim to defend specific prices, the stock management office cedes (buys) at the intervention price so as to maintain it. The purchase price can, however, differ from the floor price when the public storer wants to rebuild the stock through purchases on the international market in preparation for a future rise above the ceiling price and unavailability on local markets.

When it comes to emergency stocks, setting cession prices is less obvious. In order to ensure the sustainability of the emergency stock, the office in charge of managing it has three possible options for the sale of its stock to structures in charge of helping vulnerable populations (WFP, 2011). It can (i) sell at the price at which it initially bought the stock, but the risk is that if the price has dropped in the meantime, the buyer may prefer to buy elsewhere. It can also (ii) sell at the average purchase price over a given period of time, which provides buyers with better predictability and gives them a good deal if prices are skyrocketing. Finally, (iii) it can sell at the price it would need to pay to rebuild the stock (over a limited period determined in advance). This last option may be very expensive if prices at the time are high but ensures that the sale price will never be higher than the market price and that the stock’s activity will always be in the black.

[75] The structure in charge of managing the emergency stock cedes the stock (either physical or financial) to an organization in charge of emergency food aid operations, which will distribute the aid in different ways based on the characteristics of the crisis and the affected populations (free or subsidized food distribution, cash, food vouchers, etc.). The cost of providing aid to vulnerable populations is shared among the structure in charge of managing the stock and the organizations in charge of operations in proportions and by methods that vary from one country to the next.
Overall Conclusion

The relevance of public storage systems cannot be analyzed without also examining the conditions under which they are implemented.

Following the investigations conducted for this study, it ultimately seems fairly logical that the question of stocks now occupies an important position in the debates on agricultural policies and food security policies in African countries. While the current period is marked by a great enthusiasm for development through agriculture and by high international agricultural price volatility and successive food crises, there would indeed seem to be a relatively strong agreement on giving priority to lowering the risks facing the most vulnerable households (and/or mitigating their effects). This objective is sought through a combination, that varies according to national contexts, of market action, collective action and intervention by the public authorities (states, local governments, regional organizations). In this framework, public storage systems clearly have a role to play.

However, beyond the consensus on the priority to give to risk management, the debates are still lively on the role that public intervention must play, notably in tackling price risk. This takes the form of entrenched positions about public buffer stocks, although there is a fairly broad consensus on the legitimacy of emergency stocks. Because of this, we sought to separate as systematically as possible the analysis of the relevance and of the feasibility of various types of public stocks.

Ultimately, it seems that the relevance and feasibility of these policies are closely linked and depend mainly on the context in which these policies are implemented. Indeed, when it comes to public buffer stocks, while the competitive storage model (the analytic framework of reference to examine the relevance of these stocks) highlights a certain number of potential negative effects (notably eviction of private stores), it is difficult (even impossible) to apply it to concrete situations because it is based on very restrictive assumptions. However, academic literature and the review of past experience reveal that, faced with significant price risk, the question of the public authorities’ (financial, institutional and technical) resources is decisive in the decision of whether or not to set up a buffer stock. When it comes to emergency stocks, their legitimacy is rarely questioned, but the decisions as to their size and nature (physical
and/or financial reserves) are, also, very dependent on the type of risk to cover and the resources available to public actors.

The question of the available resources overlays that of coherence with other components of the sectoral policy in which the public storage system is inscribed: agricultural market regulation policy (and, beyond this, production support) in the case of buffer stocks, and food security policy in the case of emergency stocks. In other words, the effectiveness of a public storage system will be greatly lessened if it is not designed and implemented with an eye to its coherence and complementarity with the other instruments in the same sectoral policy.

Finally, the (ex ante or ex post) assessment of a public storage system must also contribute to lessening or covering risks that weigh on vulnerable households’ activity systems. This implies, when appropriate, examining synergies or competition between the various types of stocks as well as between them and all risk coverage or reduction instruments. Public buffer stocks can be antagonistic to the proper functioning of market price risk management tools such as futures contracts or options if they aim to strongly reduce price volatility and make them less interesting to private operators, indispensable suppliers of cash. But they can also help, at the same time, lower the risk premium paid by the users of these tools. The challenge for governments is therefore to find the proper dosage, balancing recourse to public stocks—targeting in priority the fight against “excessive” market volatility—and private price risk management instruments.

**The impact of possible generalization of buffer stocks is not much of an issue for African countries.**

In the debates on buffer stocks, the consequences of the possible generalization of these stocks often come up. The detractors of this type of stock insist, rightly, that without international market regulation mechanisms, if major players in markets or a large number of small countries give themselves such an instrument, there is a high risk of increased volatility on international food markets.

The occurrence of such risk is very low in African countries (the geographic focus of this study). Indeed, Africa is composed mostly of importer countries with very modest weight in the global food trade, with the exception of Egypt. In addition, the scenario in which they all set up buffer stocks and then all decide to temporarily cease imports
Overall Conclusion

to defend their floor prices when world prices are low is highly unlikely.[76] The other scenario—i.e. an amplification of spiking international prices because of a temporary export ban in all African countries that have buffer stocks (to defend their ceiling prices)—is even less probable because most African countries are not (and will not be in the medium term) structural grain exporters.

Buffer stocks: when they are relative, the conditions for them to be effective are very restrictive.

When a country faces strong fluctuations in food prices and market mechanisms are not enough to reduce these fluctuations (or mitigate their effects on producers and consumers), public buffer stocks are, in principle, justified. However, attaining the objectives generally assigned to such stocks—i.e. lowering food insecurity and increasing agricultural production—requires several particularly strong conditions be met. These conditions are to:

- have sufficient financial resources so that the size of the stock can effectively influence prices;
- have effective information systems (on domestic and international markets) so as to be able to adjust the range of the price band as international market conditions evolve (smooth import and export parity prices);
- have transparent stock management to ensure that the displayed policy is predictable and credible and, as a result, foster the effectiveness of the regulation policy; and
- take measures aiming to reduce imbalances among farmers in regard to market integration and endowment in production factors to prevent the buffer stock instrument from worsening inequalities.

If these conditions are met, implementing the buffer stock must be accompanied by monitoring and assessment of its effects, notably on production growth. The aim is to anticipate structural surpluses that would require, if they arise, production and agricultural market management instruments to be adjusted.

[76] Egypt, the world’s largest wheat importer, is a special case. Given the weight of imports in the country’s total food consumption, the hypothesis of a temporary stop to imports does not seem plausible (even to defend a possible floor price).
Overall Conclusion

Emergency stocks: ensure they are well integrated in food security policies.

As emphasized above several times, the consensus is that emergency stocks are relevant if certain segments of the country’s population are deemed at risk for temporary food insecurity and the actualization of this risk may lead to a food crisis.

Nevertheless, in light of the outcomes of food crisis prevention and management policies, notably in the Sahel region, several points require particular attention when implementing an emergency stock. These are:

- How financial resources are distributed among instruments that address structural food insecurity (social safety nets) and those intended to prevent or mitigate temporary food insecurity. In many cases, this implies ensuring that the emergency stocks are not potentially too large.

- The relative proportion of the financial reserve in regard to the in-kind reserve in the composition of the emergency stock.

- The coordination between the various levels of intervention, from the local level (role of local governments) to the national level to the regional level.

- The quality of information systems, including how well suited they are to changes in food insecurity problems.

Governance of emergency stocks, and more broadly the food crisis prevention/management policy, is complex and deserves special attention. Indeed, it involves stakeholders whose strategies are difficult to reconcile because they are based on different principles of legitimacy (government versus aid agencies, humanitarian aid actors versus development actors, etc.).

Strategic stocks: limit their establishment to very specific situations.

At the outset of the study, this category of stock was not included in the “range” of instruments to examine. After the desk review and, especially, the production of the case study on Egypt, it became necessary to include it in the typology.
Strategic stocks aim to protect a country as a whole from the risk of a supply rupture on foreign markets. When a country is heavily dependent on imports, what is at stake is not the food security of a segment of the population but the social and political stability of the country as a whole. In recent decades, this risk of supply ruptures in importing countries has hardly ever materialized\(^\text{[77]}\). However, if for its own reasons, the government of a country decides to form a strategic stock, it is important to take action simultaneously on import contracts (diversification, long-term commitment, etc.) and inform the population. By transferring some of the storage responsibility to operators in exporting countries and improving the population’s confidence in supply stability, such measures make it possible to optimize the size of the strategic stock and in so doing limit competition (for resources) with other components of the food security policy.

**Is it time to abandon the overly marked dichotomy between the various types of stocks?**

In many African countries, the borders between buffer stocks and emergency stocks are not, in practice, as distinct as the theories would imply. However, the plurality of objectives assigned to any given instrument does not seem to result in greater effectiveness.

Analysis of specific cases, as part of the present study, and of other research shows that it is ultimately not very realistic to ask emergency stocks to play a role in regulating prices. The main reason for this is that the volumes—and therefore financial resources—involved are not the same. In addition, trigger criteria and intervention methods are different.

In many African countries, conditions do not currently seem to be in place\(^\text{[78]}\) to allow buffer stocks to be set up that could act effectively. Yet, this does not mean that states cannot work to foster better market operations. “Temporary” regulation can in part be accomplished through (national and in some cases regional) border instruments, taking into account the commitments made and latitude available within the WTO. And, above all, public action can focus on improving “structural” market performance (facilitating trade, lowering transaction costs, limiting oligopolies, etc.). From this

\(^{[77]}\) The “food weapon” often evoked during the 1970s has only very rarely been used in practice and when it was used (for instance, the American embargo on grain sales to the Soviet Union following the invasion of Afghanistan in 1979), it was ineffective.

\(^{[78]}\) At least on the national scale. In some cases, it is possible that the (financial, institutional and technical) resources needed could be mobilized regionally.
Overall Conclusion

perspective, food insecurity reduction instruments, including emergency stocks, can play a role by strengthening market information systems, for instance, or segmenting calls for tender launched for technical rotations.

In other words, since the conditions for establishing a buffer stock in the short or medium term seem to be present in few African countries, it is possible—and even desirable—to seek optimal integration of food insecurity reduction instruments, including emergency stocks, with the aim of improving the performance of agricultural and food markets.
## Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ADLI</td>
<td>Agricultural Development Led Industrialization [Ethiopia]</td>
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<tr>
<td>AFD</td>
<td>Agence française du développement [French Development Agency]</td>
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<tr>
<td>AGP</td>
<td>Agricultural Growth Project [Ethiopia]</td>
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<tr>
<td>ANMF</td>
<td>Association nationale de la meunerie française [National Association of French Millers]</td>
</tr>
<tr>
<td>ASEAN</td>
<td>Association of Southeast Asian Nations</td>
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<tr>
<td>ASSAP</td>
<td>Agricultural Sector Structural Adjustment Program [Burkina Faso]</td>
</tr>
<tr>
<td>ATA</td>
<td>Agricultural Transformation Agency [Ethiopia]</td>
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<tr>
<td>CAADP</td>
<td>Comprehensive Africa Agriculture Development Program</td>
</tr>
<tr>
<td>CET</td>
<td>Common External Tariff</td>
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<tr>
<td>CIDA</td>
<td>Canadian International Development Agency</td>
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<tr>
<td>CILSS</td>
<td>Permanent Interstate Committee for Drought Control in the Sahel</td>
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<tr>
<td>CIRAD</td>
<td>Centre de coopération internationale en recherche agronomique pour le développement [French Agricultural Research Centre for Development]</td>
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<tr>
<td>CNSA</td>
<td>Conseil National de Sécurité Alimentaire [Burkina Faso, national food security council]</td>
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<tr>
<td>CRGE</td>
<td>Climate-Resilient Green Economy Strategy [Ethiopia]</td>
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<tr>
<td>CSA</td>
<td>Central Statistics Agency [Ethiopia]</td>
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<tr>
<td>CSV</td>
<td>Coefficient of Seasonal Variation</td>
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<tr>
<td>DGPER</td>
<td>Direction générale de la promotion de l’économie rurale [Burkina Faso, general directorate for rural economic promotion]</td>
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<tr>
<td>DPPA</td>
<td>Disaster Prevention and Preparedness Agency [Ethiopia]</td>
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<tr>
<td>DPPC</td>
<td>Disaster Prevention and Preparedness Commission [Ethiopia]</td>
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<tr>
<td>DRMFSS</td>
<td>Disaster Risk Management and Food Security Sector [Ethiopia]</td>
</tr>
<tr>
<td>E£</td>
<td>Egyptian pound</td>
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<tr>
<td>EAC</td>
<td>East African Community</td>
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<tr>
<td>ECOWAS</td>
<td>Economic Community of West African States</td>
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<tr>
<td>EFSRA</td>
<td>Emergency Food Security Reserve Administration [Ethiopia]</td>
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<tr>
<td>EGTE</td>
<td>Ethiopian Grain Trade Enterprise [Ethiopia]</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>EHCSS</td>
<td>Egyptian Holding Company for Silo and Storage [Egypt]</td>
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<tr>
<td>EIB</td>
<td>European Investment Bank</td>
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<tr>
<td>ETB</td>
<td>Ethiopian birr</td>
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<td>EU</td>
<td>European Union</td>
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<tr>
<td>EWS</td>
<td>Early Warning System</td>
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<tr>
<td>EXC</td>
<td>Ethiopia Commodity Exchange [Ethiopia]</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<tr>
<td>FARM</td>
<td>Foundation for World Agriculture and Rurality</td>
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<tr>
<td>FIHC</td>
<td>Food Industries Holding Company</td>
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<td>FSA</td>
<td>Fonds de Sécurité Alimentaire [Burkina Faso, food security fund]</td>
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<tr>
<td>FSCB</td>
<td>Food Security Coordination Bureau [Ethiopia]</td>
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<td>FSP</td>
<td>Food Security Program [Ethiopia]</td>
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<td>GASC</td>
<td>General Authority for Supply Commodities [Egypt]</td>
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<tr>
<td>GB</td>
<td>Grain Bank</td>
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<tr>
<td>GCSS</td>
<td>General Company for Silo and Storage [Egypt]</td>
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<tr>
<td>GTP</td>
<td>Growth and Transformation Plan [Ethiopia]</td>
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<tr>
<td>HEA</td>
<td>Household Economy Analysis</td>
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<tr>
<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
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<tr>
<td>INRA</td>
<td>Institut national de la recherche agronomique [French National Institute for Agronomic Research]</td>
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<tr>
<td>IRAM</td>
<td>Institute for Research and Application of Development Methods [France]</td>
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<tr>
<td>LEAP</td>
<td>Livelihoods, Early Assessment and Protection [Ethiopia]</td>
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<tr>
<td>MAAF</td>
<td>Ministère de l’Agriculture, de l’Agro-alimentaire et de la Forêt [French Ministry of Agriculture, Food and Forests]</td>
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<tr>
<td>MAE</td>
<td>Ministère des Affaires étrangères [French Ministry of Foreign Affairs]</td>
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<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
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<tr>
<td>MIS</td>
<td>Market Information System</td>
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<tr>
<td>MoA</td>
<td>Ministry of Agriculture [Ethiopia]</td>
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<tr>
<td>MoARD</td>
<td>Ministry of Agriculture and Rural Development [Ethiopia]</td>
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<tr>
<td>MoFED</td>
<td>Ministry of Finance and Economic Development [Ethiopia]</td>
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<tr>
<td>MoH</td>
<td>Ministry of Health [Ethiopia]</td>
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<tr>
<td>MT</td>
<td>metric ton</td>
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<tr>
<td>NBE</td>
<td>National Bank of Ethiopia</td>
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## Acronyms and Abbreviations

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<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>NDPPC</td>
<td>National Disaster Prevention and Preparedness Committee [Ethiopia]</td>
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<tr>
<td>NEPAD</td>
<td>New Partnership for Africa’s Development</td>
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<tr>
<td>NFRA</td>
<td>National Food Reserve Agency [Ethiopia]</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<tr>
<td>OFNACER</td>
<td>Office national des céréales [Burkina Faso, national grain office]</td>
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<tr>
<td>ONIC</td>
<td>Office national interprofessionnel des céréales [France, national inter-branch grain office]</td>
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<tr>
<td>OPAM</td>
<td>Office des produits agricoles du Mali [Mali, agricultural product office]</td>
</tr>
<tr>
<td>PBDAC</td>
<td>Principal Bank for Development and Agricultural Credit [Egypt]</td>
</tr>
<tr>
<td>PNOCSUR</td>
<td>Plan national d’organisation et de coordination des secours d’urgence et de réhabilitation [Burkina Faso, national emergency relief and rehabilitation organization and coordination plan]</td>
</tr>
<tr>
<td>PRSP</td>
<td>Poverty Reduction Strategy Paper [Burkina Faso]</td>
</tr>
<tr>
<td>SACU</td>
<td>Southern African Customs Union</td>
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<tr>
<td>SADC</td>
<td>Southern African Development Community</td>
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<tr>
<td>SCADD</td>
<td>Stratégie de croissance accélérée et de développement durable [Burkina Faso, accelerated growth and sustainable development strategy]</td>
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<tr>
<td>SCR</td>
<td>Stock commercial de régulation [Burkina Faso, commercial regulatory stock]</td>
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<tr>
<td>SI</td>
<td>Stock d’intervention [Burkina Faso, intervention stock]</td>
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<tr>
<td>SISA</td>
<td>Food Security Information System</td>
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<tr>
<td>SNS</td>
<td>Stock National de Sécurité [Burkina Faso, national security stock]</td>
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<tr>
<td>SNSA</td>
<td>Stratégie nationale de sécurité alimentaire [Burkina Faso, national food security strategy]</td>
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<tr>
<td>SONAGESS</td>
<td>Société nationale de gestion du stock de sécurité [Burkina Faso, national stock management company]</td>
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<tr>
<td>TFP</td>
<td>Technical and Financial Partner</td>
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<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
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<tr>
<td>WAEMU</td>
<td>West African Economic and Monetary Union</td>
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<tr>
<td>WFP</td>
<td>World Food Programme</td>
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<tr>
<td>WTO</td>
<td>World Trade Organization</td>
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Acronyms and Abbreviations
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The Regulation of Water and Sanitation Services in DCs
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Los desafíos des desarrollo en América Latina
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À Savoir No 15: The Governance of Climate Change in Developing Countries
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À Savoir No 22: L’enseignement privé en Afrique subsaharienne - Enjeux, situations et perspectives de partenariats public-privé

À Savoir No 23: Les stocks alimentaires et la régulation de la volatilité des marchés en Afrique
What is AFD?

The Agence Française de Développement (AFD) is a public development finance institution that has been working to fight poverty and foster economic growth in developing countries and the French Overseas Provinces for seventy years. It executes the policy defined by the French Government.

AFD is present on four continents where it has an international network of seventy agencies and representation offices, including nine in the French Overseas Provinces and one in Brussels. It finances and supports projects that improve people’s living conditions, promote economic growth and protect the planet, such as schooling for children, maternal health, support for farmers and small businesses, water supply, tropical forest preservation, and the fight against climate change.

In 2012, AFD approved €7 billion to finance activities in developing countries and the France’s overseas provinces. The funds will help get 10 million children into primary school and 3 million into secondary school; they will also improve drinking water supply for 1.79 million people. Energy efficiency projects financed by AFD in 2012 will save nearly 3.6 million tons of carbon dioxide emissions annually.
The aim of this study is to examine public food storage systems in developing countries, particularly Africa. In which context is it pertinent to set up one type of stock over another? What conditions have to be met to ensure the institutional and economic feasibility of this type of instrument? How can undesirable effects be avoided?

To answer these questions, this report is based on the current status of theoretical debate, a review of the evolution of public storage systems and the teachings from three national case studies (Ethiopia, Burkina Faso and Egypt). The analysis emphasizes the real and theoretical role of stocks in the management of different types of risk with which households are confronted. Buffer stocks, in principle, make it possible to act on product price and in so doing stabilize the revenue of producers and consumers. However, their efficacy depends strongly on the technical, financial and institutional resources of public authorities. Emergency stocks, which are part of the range of social security nets, are theoretically capable of supporting vulnerable households in the face of all types of shocks, but their efficacy is also very much linked to available resources.

This publication comes at a time when the question of public stocks is also high on the agenda of the ninth ministerial conference of the WTO (December 2013, Bali).