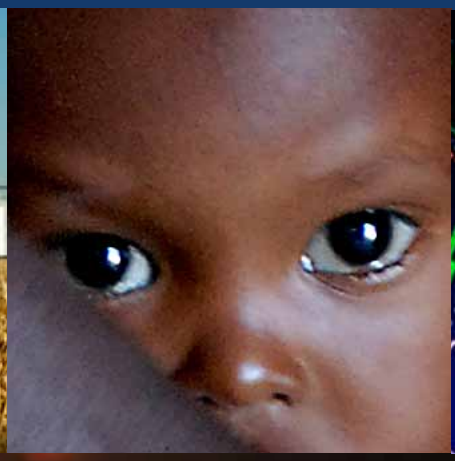
SAFEGUARDING FOOD SECURITY IN VOLATILE GLOBAL MARKETS



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Safeguarding food security in volatile global markets

Edited by Adam Prakash

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Chapter 25

Targeting the most vulnerable: implementing emergency reserves and other food security instruments[1]

Agricultural Support Systems Division (FAO)

Introduction[2]

The evident failure by global cereal suppliers to commit to maintaining importers' uninterrupted access to their exportable grain has highlighted the need for commitment-reinforcing mechanisms for vulnerable countries.

As discussed in Chapter 21, futures contracts eliminate counterparty risk with respect to performance, including delivery at the designated location such as Chicago in the United States of America, or South African Futures Exchange (SAFEX) in South Africa. But in remote countries, risks related to counterparties such as financiers, agents, transport monopolies and neighbouring governments with power over transport routes, remain very high and often impossible to hedge. Furthermore, a regional futures market may be shut down or exports banned by the host country.[3] The difficulty of establishing and coordinating global food reserves and maintaining confidence in them when they are needed most pose too great a risk for national food security. This is clearly the case for landlocked African countries, which rely on transport infrastructure of border countries and are subject to foreclosure of crucial land-based trade routes.

Consequently, for some countries, a national food reserve that aims to meet security goals rather than modify price behaviour might be considered an essential element of a prudent national security policy. In practice though, many public storage interventions are targeted at price behaviour rather than consumption goals. The key question, then, is how large the reserve should be. The answer must depend on the facts of each case, including the diversity of food supplies, dependability of traditional suppliers, likely duration of trade disruptions, effects on private storage, and the cost of running the programme per unit of incremental

1 This chapter is largely drawn from FAO (1997).

2 Adapted from Wright (2010).

3 Both actions were taken in India in 2007. Trading on the domestic rice futures market was halted, and an export ban was announced when world grain markets fell far short of emergency conditions. The United States of America set a modern precedent for agricultural export bans when it briefly banned soybean exports in 1973 under the Nixon administration and in 1980, when the Carter administration embargoed grain sales to the USSR.

storage given the substitution of public for private storage.[4] Such stocks tie up capital for the substantial intervals between releases and can be expensive to maintain.[5] In addition, efficient programme management uses scarce human capital, and temptations for corruption can easily arise.

This chapter provides guidelines for implementing and managing food security reserves. Particular attention is drawn to operational modalities that minimize disruption to the orderly working of markets in times of emergencies and in times of quiescence. The chapter also introduces other market non-distortionary instruments that can serve as the front line of defence during food crises.[6]

Definitions

The concept of an emergency or food security reserve can be set against the generally accepted FAO definition of food security: "a situation in which all people at all times have access to adequate quantities of safe and nutritious food to lead a healthy and active life". This definition requires three basic conditions to be met: 1) adequacy, i.e. supplies from domestic production, stocks and imports are sufficient to meet the nation's needs; 2) availability, i.e. stability of supply both spatially and temporally throughout the year; and 3) access, i.e. the population has sufficient purchasing power to gain access to its food needs. Clearly, emergency or food security reserves play an important role in shoring up food security during times of crisis.

The primary function of such reserves is to provide the first line of defence in the event of a food emergency. In most countries there exist groups of people who are in, or are vulnerable to, a state of food insecurity. Excluding the chronically food insecure,[7] the sectors of the population that are vulnerable to periodic food emergencies are those who are transitory food insecure. Those falling into this category (such as urban dwellers) are normally dependent on the market for their supplies. Urban dwellers would normally have the resources to purchase their food needs from the market, but they can be vulnerable to shortfalls in market supplies and/or exceptionally high prices. Another group who comprise the transitory food insecure are those people in rural areas who are normally self-sufficient but, in times of food shortages resulting from poor harvests or damage to their on-farm stocks, do not have the resources necessary for purchasing their additional food needs from the market.

A food security reserve is the first line of defence for coping with food emergencies because it provides a breathing space between identifying the possibility of a localized or wider food shortage and making the necessary arrangements to mitigate its impact,. For the

[4] Wright & Williams (1982) used a calibrated dynamic programming model of the United States Strategic Petroleum Reserve to show that, on average, one gallon placed in the Reserve would displace roughly one-half gallon of private domestic stocks. The subsequent history of the reserves generally confirms this prediction.

[5] Stocks would be "rolled over" with no net release as frequently as needed to maintain quality.

[6] As these fall into the class of safety nets, issues concerning targeting are not discussed here but are treated in the preceding chapter.

[7] Chronic food insecurity results from structural problems and as such cannot be overcome by periodic interventions of food from the reserve. Its resolution requires programmes aimed at identifying and conquering the underlying reasons for the population's inability to produce sufficient food crops or other economically tradable outputs (e.g. non-food crops) to meet their needs. In the meantime, these populations must have continuing targeted support programmes that provide them with the means to gain access to basic food needs. Meeting the supplementary food needs of such population groups is not normally considered a function of a food security reserve, but rather the task of specialized relief programmes.

purposes of a food security reserve, a food emergency can be defined as: "when there are clear indications that an acute and widespread food shortage, extensive suffering and dislocation in the life of the community on an exceptional scale are imminent, and that these dangers cannot be overcome by the normal supply procedures".

Because the functions of an emergency reserve are essentially humanitarian, many of its operations are inherently non-commercial and will therefore be financially irrecoverable. The humanitarian and social functions the reserve is expected to perform are decided by governments and should be clearly spelled out at the time of its establishment, along with the circumstances and the manner the reserve should be used if adverse conditions arise. A food security reserve is therefore one of the tools available to governments to support its humanitarian responsibilities and social policies. Thus, in order for the reserve to sustain its activities, the government must be prepared to provide necessary financial support through periodic financial injections.

By presenting various options, these guidelines are intended to serve as a practical guide for those involved with determining the need and an appropriate structure for a food security reserve.

Motivation

Food security reserves emerged in response to the events of the 1970s, when a prolonged drought in sub-Saharan Africa resulted in a series of disastrous harvests throughout the region. The seriousness of the situation was compounded by a simultaneous worldwide cereal shortage that led to prices rising to record levels. Limited availability and high prices meant the donor community could provide only limited food aid, resulting in many people from the region experiencing famine. The effects of these events were also felt in many other countries around the world that, because of scarcity and cost, had difficulty making adequate provisions for necessary imports to supplement their own shortfalls in production.

To reduce the severity of such events in the future, governments in several vulnerable countries, in consultation with the donor community, embarked on the development of both programmes to ensure adequate food availability for affected populations as well as national food security strategies. Emphasis was laid on propositioning basic cereal stocks in vulnerable countries to be ready for use in the event of future food emergencies. These stocks were not intended to cope with the entire emergency, but rather to provide for the basic needs of the affected population during the lead time required for arranging alternative supplies. Priority was generally given to ensuring adequate availability for urban populations, i.e. market dependent populations, as it was assumed that rural populations would have either retained sufficient stocks or made other adequate provision for meeting its basic food needs (e.g. through the production of alternative drought-resistant crops such as cassava). Subsequently, it was realized that there were vulnerable groups within rural populations that should also be included when considering releases from the reserve.

Determining the need for a reserve, its size, and arrangements for its management and operation were set by the government, frequently with the help of aid agencies such as the FAO and bilateral donors. The physical establishment of the reserve was often an integral part of donor-supported programmes aimed at strengthening national food security. Typically, an initial quantity of grain would come from a donor, e.g. the World Food Programme (WFP), who expect that this would act as a catalyst for contributions from other donors. Grain from the reserve sold on the world market was expected to be replenished through purchases in the domestic market following the next harvest by the agency responsible for managing the

reserve. Funding for these purchases was expected to come from monies generated from sales from the reserve. It was also expected that continued donor assistance would help replenish those quantities that had been distributed to vulnerable populations during food emergencies either for free or at subsidized prices.

Throughout the period from independence until the late 1980s, grain markets in most countries of the sub-Saharan region were strictly regulated by governments that tended to have a strong bias towards the politically more active urban populations. Low consumer prices were maintained by a combination of low producer prices and heavy subsidies. Pan-territorial and pan-temporal systems were the norm for both producer and consumer pricing, and private sector participation in the market was actively discouraged. Parastatals, or marketing boards, with monopoly rights for marketing designated cereals (and in some instances the provision of inputs), were established to administer the systems. They were also usually in charge of managing and operating the reserve stocks.[8] However, problems faced by governments in providing adequate funds to the parastatals to finance their operations often led to reserve stocks being used for normal market operations.

Financial pressures on both governments and the parastatals resulted in insufficient resources being made available to replenish the reserve stocks at the start of the following marketing year. At the same time, the donor community, facing increasing demands for food aid, was becoming steadily more disenchanted with the way reserves stocks were being used and grew unwilling to provide the resources necessary for rebuilding them. Progressively, the quantities held in reserves dwindled, and eventually ceased to exist in most countries.[9] Thus, for many countries the food security reserve, while continuing to form an integral part of the government's food security programme, tended to exist in theory rather than in practice.

Following the collapse of the socialist system at the end of the 1980s there has been a general move throughout Africa towards economic restructuring and market liberalization, leading many countries to introduce policies aimed at deregulating markets and encouraging private sector participation. Cereal markets, traditionally one of the most politically sensitive areas, were increasingly becoming involved in this transition process. Subsidy schemes were eliminated and governments progressively withdrew from intervention in the market.

To encourage private sector participation, parastatal grain companies lost their privileged monopoly positions and for the first time had to face competition in the market. Price controls were relaxed or eliminated, leaving market forces to set prices while other restrictions which had hitherto served as a barrier to market entry were abolished. However, because of its sensitivity, there was often concern in government circles as to whether a liberalized cereals market, driven by profit-motivated private sector traders, could adequately cater to the needs of the population. There was a reawakening of interest in governments regarding the role food security reserves could play in ensuring adequate availability of basic cereals in a liberalized market, and serve as insurance against the failure of the private sector making these provision, particularly in times of scarcity.

Initiating food security reserves

The mechanisms required for maintaining and operating a reserve under free market conditions are very different from those in a regulated market where the government, or

[8] Food Security Reserve stocks were established in several sub-Saharan countries over the period 1975-1980s, e.g. Burkina Faso, Mali, Mozambique, the Niger, Ethiopia and the United Republic of Tanzania.

[9] Notable exceptions to this generalization include the Malawian grain reserve and the reserves held as buffer stocks within the normal operational stocks of the parastatal grain agency (e.g. Kenya and Zimbabwe).

a government controlled agency, is the only official participant. Due regard must be given to ensuring that the basic requirements of a free market are not violated and that the operations associated with the reserve do not disturb the market's orderly functioning.

While food security reserves in different countries may have similar objectives and common features, their management and operation must take into account specific circumstances and government policy. Other influential factors may include: the likely cause and nature of food emergencies and the available mechanisms for coping with them, or the market structure and effectiveness of its participants to cater to market needs in food emergencies.

Once a decision has been made to establish a food security reserve, governments must consider the requirements and the various options available to them. Steps must be taken concerning the mechanisms required for monitoring market conditions and the ownership, structure, size, location and financing of the reserve.

Information requirements

In a regulated market system, the government, through various departments in the Ministry of Agriculture (e.g. extension and statistics) and parastatal agencies, were in a firm position to fairly reliably amass the information necessary to monitor the overall food situation in the country. However, under liberalization, control over the market shifts from the government's grasp into the hands of other participants, i.e. private traders. Under such circumstances the government must review its information requirements and sources so that it has a reliable overview of market conditions and prospects.

The quantity of grain marketed and stored (either on-farm or in traders'/millers' warehouses) in a free market context is unknown and impossible to obtain without a degree of imprecision.[10] Foreign trade arrangements made in the private sector would also be unknown unless special arrangements were made, for example through a system of import/export licensing. Governments are therefore increasingly forced to rely on secondary data to monitor the current and expected market conditions. This would involve using market prices, price trends and movements as a proxy for assessing market availabilities.

Thus, governments are dependent on the collection and analysis of statistical data to stay abreast of market conditions and to be able to assess likely future market developments. This requires focusing on the quality and reliability of production forecasts and developing market information and early warning systems. The less reliable the available information, the greater degree of uncertainty in predicting likely market developments, and thus more provisions will be necessary to ensure that needs will be adequately catered to.

Governments have traditionally been unwilling to make investments necessary for developing and maintaining effective information systems because of the firm belief that they cannot afford the resources. However, it should be remembered that such information systems can, by providing reliable data, help the government avoid the high costs of coping with an unexpected, or poorly prepared for, food emergency. Clearly, the reliability of the information systems will have a direct bearing on the size of the emergency grain reserve needed to assure the required degree of protection.

[10] Because producers in a free market tend to hold stocks on-farm in the hope of receiving a higher price later in the season, the quantities marketed at harvest are likely to be lower than in a regulated marketing system. These quantities are impossible to determine with any degree of accuracy. Also, for commercial reasons, private sector companies are unlikely to respond reliably to government requests concerning the grain stocks they are holding.

Crop production forecasts Estimates of the production of key crops are usually made during the growing season based on area planted and expected yield. These estimates are finalized after the harvest when the results of crop cutting surveys are normally also included in the calculations. However, the reliability of these estimates varies considerably between countries. Armed with this information, the government is in a stronger position to assess the probability of food shortages arising and the likelihood of demands placed on the food security reserve.

In most countries, past neglect and/or under-resourcing have resulted in relatively unreliable crop forecasting systems. Governments must therefore pay attention to strengthening their crop forecasting systems to improve both timeliness and reliability of information. In some countries, various agencies may be involved in preparing independent crop forecasts. This often leads to substantial variances that can be difficult to resolve. The situation can be complicated by interdepartmental rivalries resulting in reluctance to accept information prepared by others.

An alternative to consider is appointing a single authority to prepare consolidated crop forecasts. The authority would be mandated to bring together those agencies/departments currently engaged in estimating crops, or to usefully contribute to the estimating process by providing appropriate information and to jointly develop a coordinated and consistent approach to crop forecasting. The authority would be responsible for assessing the information provided by each agency/department and for preparing a consolidated forecast. Ideally, mechanisms should also be established for comparing forecasts with the subsequent observed results with the objective of identifying reasons for any significant variance so that procedural adjustments can be made to improve the reliability of future forecasts. Currently such post factum reviews are rarely if ever undertaken.

Market information systems Market transparency is of fundamental importance for the efficient operation of a free market. It requires that information about prices and availabilities in key markets throughout the country are readily available to market participants, i.e. producers, traders and retailers. The availability of this information stimulates market users to exploit spatial price differences by moving produce from low to high priced markets, in other words, it encourages arbitrage, and, despite inter-market handling costs, it leads to equalization of prices between markets. Governments must give high priority to the establishment of a market information system (MIS) that will provide by both governments and traders regular information through media about prevailing market prices and availabilities.

Such a system may also be extended to include market intelligence, particularly in the government's assessment of the country's food situation (e.g. information about production, market demand, estimates of import need or export potential, international prices other information of general interest to the trade). Wide dissemination of such information by the government to traders will help all make more informed judgements of market requirements, thereby improving the efficiency with which the market operates. Such improvements in market efficiency will confer a direct benefit to the government by reducing the provisions it must make to cover any weaknesses in the marketing system.

Crucial to the efficacy, and hence success, of an MIS is the speed with which information is made available to potential users. Common criticisms of the MIS include the problems inherent in organizing the regular collection of price and availability information from selected markets as well as the cost of collection, especially if special teams are employed. These costs can be minimized if the responsibility for collecting information in a standardized

format is transferred to the market authority, often the municipality. The cost of collection can then be recouped through the system of market fees. In this way the users of the market, who are also the main beneficiaries of the information disseminated, would be responsible for covering the costs of collecting, and possibly also processing and disseminating, the information. The service could therefore become self-financing. The information collected in the selected markets would be transmitted directly to a central agency, usually based in the Ministry of Agriculture, which would process the data and then retransmit it to the markets, media and subscribers. The central agency would be responsible for the following: determining the data to be collected, designing a standardized format for the ease of collection and processing, and training and monitoring the data collectors to ensure that they follow established procedures.

Early warning systems Many countries susceptible to food emergencies have established early warning systems for gathering together all of the information that has a bearing on the current and expected food situation and for preparing regular reports assessing the prevailing food situation and its prospects.

Information used for early warning assessments is brought together from a variety of sources including remote sensing, agro-meteorological information (particularly rainfall data) and crop forecasts. The timing of interpreting this information can play an important role in alerting governments and traders to the likelihood of food shortages occurring later in the food year or in the following food year. With such advance warning there should be sufficient time for the government or responsible public agencies (such as the agency responsible for the food security reserve) to take appropriate actions to cope with a pending emergency.

Again, the reliability and timeliness of such information has direct bearing on the size of the reserve required. The better and more reliable the information is with respect to giving advance warning of foreseeable events, e.g. drought or global market turbulence, the lower the requirement for the reserve.

Composition of the reserve

In an ideal world, a food security reserve would comprise a range of cereals reflecting the preferred staple of the potentially vulnerable population. However, such a benevolent approach can cause problems, albeit inadvertently, which not only increase the cost of establishing and maintaining the reserve, but could also increase the vulnerability of some rural population groups to food insecurity. For example, this may occur if populations become accustomed, through releases from a reserve, to a grain type which is agronomically unsuited to the area (e.g. white maize in drought prone areas), or whose normal market price is beyond the population group's normal purchasing power (e.g. rice).

As a basic principle, a food security reserve should comprise cereals that are widely consumed, normally readily available in the domestic market, and preferably locally produced. In selecting the grain type (or types) for the reserve there will always be a trade-off between which grains are preferred by the potential beneficiaries and their cost relative to an acceptable alternative. For example, while, for social reasons, consideration may be given to holding some quantities of rice in reserve, because its cost per tonne is historically double that of white maize, sorghum and millet, and its nutritional value is not markedly higher, it is difficult to justify a rice component. The cost of establishing and maintaining the reserve is also likely to be higher when it contains several grain types, as the need to

maintain different stock combinations in different areas will increase demands on transport, handling and administration. Thus, from a purely cost and operational standpoint, it would be advantageous to have only one type of grain in the reserve, e.g. white maize, as has been the case for most African countries to date, rice in Far East countries and wheat in the Near East.

Establishment of the reserve

Establishing the reserve requires either the provision of finance or the direct provision of grain from donations. It is to be expected that whichever method or combination of methods is used, the reserve will not be fully resourced from the outset, either in terms of cash or stocks, but rather will be built-up progressively as additional resources are made available by government or perhaps by donors. Additional resources may be generated periodically from profitable sales of the reserve. However, these should be considered as windfalls rather than as a regular feature, as reserves are normally considered to be a cost centre requiring periodic injections of cash rather than a profit centre. Thus, for the first few years of operation, purchases are likely to be limited not by the size of the reserve, but rather by the finance available to purchase grain.

Purchase of grain

Accordingly, a prime concern for the management and operation of the reserve should be ensuring that transactions have as little effect on the orderly functioning of the grain market as possible. Specialist reserve agencies are not regular purchasers in the market, as are normal traders; they only enter the market occasionally, usually immediately after a harvest, to make purchases to replenish the reserve. Under these circumstances, it is not advantageous for an agency to set up structures where it is required to purchase directly in the market in parallel, or in competition with, established traders. It would normally be preferable for the agency to either appoint agents to purchase grain on its behalf or use a tendering system. Both of these options harness the skills and energy of the private sector while saving the agency from having to establish and staff its own purchasing structure that would only be required infrequently. By using existing market participants in their normal roles, reserves do not distort the normal functioning of the market except by creating increased demand.

In addition to purchasing grain on the domestic market, reserves may also need to consider purchasing grain on the international market. Under such circumstances, trying to make significant purchases in the domestic market may well cause prices to rise even faster. The extent to which the reserve agency would need to enter the international market would, in turn, depend on the extent to which the private sector is encouraged to import directly on its own account to make good any shortfall. Apart from concerns over not wanting to over-import, other constraints may limit the private sector's ability or willingness to import. These concerns include: difficulty in gaining access to foreign exchange for purchases, lack of experience in importing substantial quantities, small scale of operation of many private sector traders and concerns over possible government interventions. In these cases, the government may wish to provide some mutually advantageous support to the private sector. The government could, for example, act as an intermediate importer or enter into arrangements with commercial banks to underwrite part of the loans for grain imports.

A more advanced option a reserve agency/government may consider is employing other financial instruments for covering all or part of the import needs. Futures and options may be used either to hedge positions or to provide a form of insurance. However, a word of caution is required. While these strategies can considerably help lower costs in a commodity market,

they can also lead to substantial financial losses if not used properly. Detailed knowledge and experience of the international market is essential to take advantage of such systems. In most countries this expertise is not readily available, and agencies considering using these or similar instruments should seek the advice of a reputable trading firm or independent broker.

Size of reserve

The target size of a food reserve has traditionally been determined on the basis of the vulnerable population's cereal requirements during the time-frame between the recognition of an imminent food emergency and the point at which additional supplies can be distributed, i.e. the lead time. For the purposes of calculation it was typically assumed that the cereal requirement was equivalent to some 160-175 kg per person per year and that a lead time of three months would be required to organize and receive additional supplies. The resultant size for the reserve was held static at this level until circumstances were considered to have changed and the calculation was repeated. Usually, recalculation occurred only after several years.

The above-mentioned method for determining the size of reserve stocks assumed that the consumption pattern of the affected population would remain constant and that the so called "food gap" - the difference between availability (production and opening stocks - and consumption requirements - would be filled by a combination of stock reduction and imports. However, in times of food shortages people change their eating habits by switching to alternative foods, e.g. cassava and other root crops instead of maize, or, in extreme cases, by eating less and thereby reducing the demand for the staple food. Thus, there is a tendency to overestimate the size of the food shortfall and consequently the size of the reserve required to cope with it. To avoid this pitfall, determinations of appropriate reserve size must take into account the likely extent to which vulnerable households will switch to alternative foods.

However, by maintaining large reserve stocks on a continuing basis, including during years of good harvests when it is unlikely that a food emergency will arise, the government is asked to bear a needlessly high cost. This is particularly the case for those countries where high interest rates which, under the terms of their structural adjustment programmes, can no longer be subsidized. There is therefore a need to consider alternative methods of maintaining a reserve that will acceptably cope with food shortages while being less financially demanding.

Key factors used by governments in the past to determine and administer the country's food needs were knowledge of the quantity of grain marketed and control over these stocks. Today, governments have neither the knowledge nor control over marketed grain stocks. Instead, they determine market prospects and the likelihood of an emergency by depending on secondary information such as prevailing market prices or market availabilities and price trends. The situation is further complicated for those countries which oscillate between surpluses and deficits, particularly when traders are also involved in importing and exporting grains. Under such circumstances, the government is not necessarily aware whether adequate provisions have been made by the private sector to cater to the country's import needs. To properly monitor the situation, an effective information system, is, as discussed earlier, of paramount importance.

The cost of establishing and maintaining a grain reserve is directly related to its physical size. Reducing the average size held would result in a lower cost to government. This could be achieved without jeopardizing the ability to adequately cope with the initial stages of a food emergency as long as the programme adopts a policy of adjusting the reserve size

according to the prevailing circumstances rather than attempting to maintain a fixed size irrespective of the circumstances.

Within sub-Saharan Africa, the most likely cause of a major food emergency has historically been drought. The implications of a drought on domestic grain production, and therefore on the grain availability in the following marketing year, should be recognized well before harvest. As there is rarely a total crop failure, the impact of the drought on the availability of grain in the market will likely only start to be seriously felt after 3-4 months into the next marketing year. Initially this would be evidenced by higher real market prices for grains, with a possible increase in demand for alternative foods, coupled with prices starting to rise earlier than normal in the marketing year. There should thus be a warning period of at least six months before a likely food shortage. This should provide an adequate lead time for governments to make a reliable assessment of the shortfall size and initiate measures necessary for coping with the situation. By adopting this approach, the physical size of the reserve could be adjusted each year in accordance with the perceived needs. Thus, in years of good production or surplus, when the demands on a grain reserve are likely to be low, the size of the reserve would be reduced. Conversely, in years of poor production, e.g. as a result of drought, the size of the reserve may be increased to enable it to cope with the likelihood of a food shortage.

Box 25.1: Ethiopia: the emergency food security reserve administration

The management of Ethiopia's food security reserve, originally created in the 1970s, became the responsibility of an autonomous unit of government, the Emergency Food Security Reserve Administration (EFSRA) in the late 1980s. The creation of the EFSRA was widely supported by the Ethiopian government, donor agencies and NGOs involved in distributing food aid to the country's various relief and development projects. Over the past 20 or so years, and after a number of reviews of the reserve's structure and function, its capacity has steadily increased from around 180 000 tonnes to 307 000 tonnes in the early 1990s to the current level of just over 400 000 tonnes. The EFSRA, with headquarters in Addis Ababa, is responsible for large bag warehouse storage facilities at seven locations: Dire Dawa, Kombolcha, Mekelle, Nazareth, Shashemane, Wereta, Woliyta and Sodo.

Currently, the EFSRA, despite its title, has less to do with dealing with emergencies and more with smoothing the flow of food aid to relief and development projects. Effective response to emergencies must be prompt and immediate, yet food aid deliveries may take some considerable time to organize. EFSRA stocks have therefore provided a convenient and necessary means of bridging the time between government and donor responses to emergencies and the arrival of consignments of food aid. Agencies can draw stocks from the reserve against pledges to repay similar quantities of food grain within an agreed time.

The reserve was initially established entirely with stocks of imported grain. However, since the mid-1990s the quantity of domestically produced grain entering the reserve, especially maize and sorghum, has been increasing steadily. Food aid agencies may distribute locally procured grain directly to beneficiaries, but most of the grain is delivered to the reserve to repay loans. The arrangement is not without problems. When stock levels in the reserve are high and warehouse space is at a premium, extended delivery routes and high transport costs for locally procured grain may occur. For example, the only available warehouse space for maize procured in the south of the country may be at an EFSRA site in the north.

Raising the level of locally produced grains in the reserve increases the risk of quantitative and qualitative loss. Fortunately, the EFSRA has received considerable donor support (technical assistance, training and equipment) and is able to maintain stocks in satisfactory condition for human consumption over extended storage periods. It is widely acknowledged that the EFSRA maintains a high standard of storage management and that losses owing to pests and spillage are contained below 1 percent annually. Source: Walker & Wandschneider (2005).

Such a system of a variable, or dynamic, reserve size requires that an annual review be undertaken by the responsible government agency (the Early Warning Unit, for example) to determine the food prospects for the coming marketing season. Normally this would be done some 2-3 months prior to harvest, i.e. when reasonable forecasts of crop production should be available. This review would then form the basis for the responsible agency's governing body to decide on the size of reserve required for the coming season. Because of the number and variability of the factors involved, many of which are non-calculable, e.g. the quantities of grain which will be imported by private sector traders or the extent of a switch to alternative foods, size determination must be made on the basis of reasonable assumptions and past experience. It should, however, be remembered that the size can always be adjusted as new, or improved, information becomes available. Even within a season the reserve size should not be immutable, but rather be in a continual state of adjustment to meet arising circumstances. In determining the size for the reserve certain principles should be observed. For example:

- There should be a minimum size for the reserve to act as an insurance against unforeseen circumstances. Initially this could be set at about one month's market requirements;
- While there should be no maximum size for the reserve, it should generally not be greater than the quantity required to meet the market demand for the lead time needed to arrange alternative supplies.

Just as the quantities required for the reserve vary from year to year, so do the financial resources required to purchase and maintain the reserve. This means that either the government must make provisions for a variable level of funding each year, or the responsible agency must be allowed to hold and operate funds on a continuing basis. In the first instance, the reserve would need to make an annual budget request for the funds required to bring its stock to the determined level. This may cause problems for the allocation and release of funds due either to financial constraints on government or to the fiscal year not coinciding conveniently with the crop year, i.e. at the time that government budget allocations are made the requirements for the reserve may not be known. If the reserve agency administers the funds, the necessary purchases may be made as soon as and when required (up to available limits) without recourse to the government.

By using this system, the reserve would hold varying combinations of physical stock and cash, with the cash component representing the residual financial resources available for the purchase and maintenance of stocks after the needed stocks have been purchased. Thus, in years when there is surplus production and the likely demand on the reserve is low, the physical stock would be correspondingly low and the cash account high.[11] The reverse situation would apply in years when poor harvests or high urban prices could lead to food shortages. Depending on the ability of the reserve agency to regenerate its funds from releases onto the market, it may be necessary to periodically request governments for additional funds to finance grain-buying operations. This is more likely to occur in years of poor production when larger reserve stocks are required and domestic grain prices are likely to be higher.

[11] These funds should be kept in a deposit-bearing account, preferably in foreign convertible currencies. This would enable the agency to protect the value of its funds against the risk of local currency devaluation, and also to have funds available to purchase on the international market if necessary.

Location of the reserve

There is often a discussion as to whether it is better to hold physical stocks of grain in the area of production or in the area of consumption. From a pure cost point of view, it is cheaper to hold grain in the area of production rather than transfer it to areas of consumption. In this way, the costs of transport and handling are kept to a minimum and are only incurred as and when it is clear that the grain is required at a particular place. However, reality rarely lives up to theory. Reserves must be held in locations where suitable facilities with adequate capacity for long-term storage of significant quantities of grain exist. As a result of past marketing policies, which were heavily biased towards the needs of urban consumers, modern storage facilities, bag stores and/or silos, are often located in, or within easy reach of, main urban areas.

Many of these facilities become increasingly under-utilized during market liberalization, as the storage pattern changes to take into account new market conditions. More grain will remain on-farm, as producers try to benefit from the higher prices towards the end of the season. Storage demand by private traders is also likely to be low, as traders tend to operate on the basis of rapid stock turnover and small margins rather than on the purchase and storage of grain. Thus, while suitable storage capacity should not be a problem, the location of the reserve will be dictated in the first instance by the location of existing available storage facilities.

While there may be advantages to spreading the reserve across several locations, consideration must be given to maintaining control and supervision over physical stocks. The more fragmented the reserve becomes through storage in different locations, the higher the cost for monitoring stock integrity, and the greater the likely need for subsequent movement. There are therefore advantages to restricting the reserve to a few strategic locations that can be readily monitored and supervised.

Management of the reserve

Although the main function of a food security reserve is social/humanitarian in nature, there are often political connotations at play. Basic principles for reserve management and operation can be established, but the social, and possibly political, implications of food shortfalls can be extremely sensitive. Thus governments generally want to retain some powers of discretion over the use of reserves. This is particularly the case when such decisions cause the government to incur additional costs. The extent to which the government would want to, or should, exercise such control varies from country to country. In designing the reserve's overall structure, it must be decided which responsibilities will be retained by government and which will be delegated to the agency charged with the reserve's management and operation. The main responsibilities that should remain under government control are:

- Monitoring the performance of the entity charged with managing and operating the reserve and taking the necessary action to correct adverse trends;
- Ensuring that the entity is acting in accordance with its approved mandate;
- Monitoring the efficiency with which resources entrusted to the reserve are being utilized;
- Reviewing the audited accounts of the reserve's activities;
- Modifying or otherwise adjusting the entity's mandate, i.e. its authority and responsibilities, to meet changing circumstances;

- Authorizing actions to be undertaken which involve the government incurring additional costs, i.e. increasing the resources available to the reserve, sanctioning releases of grain for relief actions.

As a guiding principle for determining the responsibilities remaining with government, care should be taken to avoid allowing the government to use its authority to interfere directly in the reserve's management. This is particularly important with respect to directing or promoting social actions that may be interpreted as having political objectives, or other actions that could have a damaging impact on the functioning of the free market. Decisions of a purely operational nature should be left to the responsible entity. To preclude future misunderstandings between the government, the concerned entity and traders involved in the reserve's functioning, it is advisable to clearly specify the responsibilities in an Operational Procedures Manual. This would, *inter alia*, provide a clear distinction between respective roles and thereby help ensure that government interference is minimized.

Within the government, institutional responsibility for the reserve may be vested to: a high level committee composed of senior officials from relevant ministries, e.g. the Ministries of Agriculture, Food, Finance, Home Affairs and Health, or the office of a senior minister or designated government department, e.g. the Food Security Department.

Routine operational activities such as warehouse management would normally be under the direct control of the responsible agency. However, it may be considered necessary for a more senior authority to sanction activities related to the reserve's integrity, or those that could impact the market.

The need for operational procedures

The importance of standard operational procedures increases substantially when competitive market functioning is at stake, which otherwise could be perceived by private traders as a potential threat to their market activities and thus decrease their willingness to invest in the food system. To avert any residual apprehension that the reserve may be used as a tool of the government to manipulate the market, there must be transparency in operational decisions and general understanding and acceptance of their manner of implementation. The greater the opacity of operational actions, the more divergences or inconsistencies in applying declared procedures, the more cautious and distrustful private traders will be of the government.

In addition, by maintaining the identity for the reserve, the government's official recognition of an approaching food emergency will assure the donor community that the reserve is only being used for the intended purpose of assuring food security.

Both government and private sector participants must recognize the significant advantages to having clearly designated procedures that specify how, and under what conditions, operational decisions relating to the reserve will be made and implemented. For example:

- the agency responsible for managing the reserve may be held accountable for its actions. This is likely to result in less abuse in reserve use and operation;
- the private sector will be fully aware of the circumstances and manner in which the reserve will be used. This should encourage them to assume, with confidence, an increased role in the marketing of grain, particularly if they are to be involved in some of the reserve operations, e.g. purchasing and storing grain;
- aggrieved parties in the private sector will be able to take the government to task if established operational procedures are circumvented;

- governments will find it more difficult to countermand established operational procedures for their own expediency or political advantage;
- greater private sector confidence and involvement will narrow the difference between market needs and the provision made by the private sector. This may, in turn, reduce the size of the reserve the government must maintain to achieve a particular level of security.

To avoid any confusion or misunderstanding, it is useful to prepare, preferably in consultation with representatives of private sector traders, an operational manual containing a comprehensive set of procedures and actions for managing and operating the reserve. Such a manual would describe:

- the structure, authority and responsibilities of any committees or governing bodies of agencies associated with the operation and maintenance of the reserve;
- the structure, authority and responsibilities of the agency responsible for administering the reserve;
- general information relating to the ownership and purpose of the reserve, such as its size, location and financial arrangements;
- conditions for triggering releases of grain from the reserve for various activities; and
- procedures for:
  - release of grain from the reserve;
  - procurement of grain for the reserve;
  - storage of grain in the reserve;
  - recycling grain in the reserve; and
  - financing reserve operations.

The responsible agency may contract out the reserve storage to either a public or private sector organization with access to suitable storage facilities and expertise in grain storage. This would remove the need for establishing the capacity for direct day-to-day management of the grain stocks. This is also likely to be the lower-cost option, as the agency would only be required to pay for the actual storage capacity used on a cost per tonne per month basis, rather than having to bear the total cost, whatever the capacity used, if it owned and operated the facilities itself. This would be particularly relevant in those countries which vary the size of the physical stock held in the reserve each year, depending on the perceived risk of a shortfall occurring, and therefore the annual storage capacity requirements. If the preferred option is to own and operate the storage facilities directly, arrangements need to be made for transferring ownership or responsibility for the required storage facilities to the reserve agency.

Procurement

The quantities that can be purchased for the reserve will depend on the funds available and the average price per tonne to be paid. To maximize the quantity purchased for a given level of funding, procurement efforts would normally be concentrated in the period immediately following harvest in the main surplus producing areas when market prices can be expected to be at their lowest. Purchases during this period may also have the beneficial effect of increasing demand, thereby providing some support to producer prices at a time when market prices are low. However, depending on market availabilities and sensitivity to changes in demand, it may also be desirable to spread purchases out over a several month period to avoid putting a large demand on the market for a short period of time, and thereby risk causing further price instability.

A promising method for purchasing grain is through a contract, which can either be negotiated directly with a trader or as the outcome of a successful bid in an open public tender. Both methods will result in the supply of grain in an agreed quantity and of a specified quality to be delivered to a nominated location within a stated time frame for an agreed price. Open public tender offers the advantage of transparency and avoids the risk of accusations of unfair competition and collusion between the reserve agency and the contractor, as could be the case when direct contracts are negotiated. Open public tenders would normally be floated by the reserve agency through advertisement in the press inviting bids.

Recycling

To maintain the reserve in good condition, it will be necessary to periodically rotate the grain that has not been required to meet a market shortfall or for relief programmes and is still held in the reserve. While, under the prevailing climatic conditions, it may be possible to hold grain satisfactorily for longer than a single marketing year, it will, even under the best storage conditions, have suffered some deterioration (e.g. shrivelling) as compared with fresh grain. This will lower its acceptability, and thus its price relative to fresh grain, in the marketplace. Therefore, unless there are overriding reasons for retaining the grain for longer than one season, for instance if crop forecasts indicate that there will be a shortfall in production, it would normally be advisable to rotate the residual stocks held in the reserve each year.

Releases

Releases from the reserve will generally be made to counteract market access problems signalled by high and/or rapidly rising prices, and for disaster relief operations. To enable the reserve to fulfil its function, mechanisms must be in place for signalling the need to release grain. While various triggers for releasing grain can be devised for coping with market shortfalls, releases for relief purposes are more difficult to determine and should, because they involve direct cost on government, be sanctioned by the government department responsible for relief programmes.

A typical trigger to initiate the process for releasing grain into the market is when the market prices rise exceptionally rapidly over a 2-3 month period. The definition of "exceptionally rapidly" would depend on what is considered to be the normal seasonal price pattern for a particular commodity and will vary between countries. For example, it might be considered normal for prices to increase at 10-20 percent per month in the middle of the marketing season, however, price rises of 40-50 percent per month over a period of two months would be considered abnormal, and this could signify market shortages necessitating action by the reserve agency. Releases should be made progressively so that their impact on prices can be monitored.

Because the private sector is profit-motivated, any grain it imports will be destined for sale in the market. It would be unrealistic to expect private sector traders to import grain also to meet the needs of vulnerable groups who do not have the resources to purchase grain in the market at the prevailing price. This is a social responsibility for which governments must make separate arrangements, e.g. food for work, food stamps. Traders are also likely to err on the conservative side when arranging imports. For example, they will tend to under-import rather than over-import to avoid being left with high cost stocks at the end of the marketing year when prices can be expected to fall as the new crop comes into the market. Therefore, it may be that the responsibility for ensuring that the market is adequately supplied rests with governments through releases of grain from the reserve to make good the shortfall

of private sector imports. Additionally, the government will continue to be responsible for making provisions through releases from the reserve to meet the needs of those transitory food insecure who are unable to access the market.

Financing the reserve

As the food security reserve is a public institution, it must ultimately be the government that finances the cost of establishing and maintaining the reserve. From the outset it should be recognized and accepted by government that the reserve is likely to be a continuing cost burden. The scale of the costs involved will be related to the size of the reserve and the obligations for social programmes. For those countries where the majority of releases will be for meeting shortfalls in market availabilities, the cost to government is likely to be proportionately lower than for countries where high rural vulnerability to food insecurity is combined with low purchasing power, thereby necessitating increased use of relief programmes. The management and operational structure of the reserve will also have a bearing on its costs.

Costs attributable to the reserve are likely to increase when:

- the reserve agency is responsible for maintaining and operating the storage facilities used for holding the reserve, e.g. recurrent staffing and building costs will be incurred irrespective of the quantity of grain held in the reserve;
- the reserve agency is responsible for maintaining the physical stocks held in the reserve;
- the reserve comprises several different types of grain. In this case some grains will be more expensive than others, and higher administrative, handling and transport costs are incurred (e.g. various grain types must be allocated to different locations where they will be required);
- purchases are made directly by the reserve agency, as the reserve agency will need to establish and maintain the capacity for undertaking such actions, which are only required intermittently; and
- the reserve agency is also responsible for monitoring market conditions and providing market intelligence activities.

Costs are likely to decrease when:

- other government agencies are responsible for monitoring market conditions, e.g. Early Warning Unit and Market Information, and/or Market Intelligence Systems;
- the storage and maintenance of the reserve is contracted out, because the agency would only be required to pay for storage and maintenance of the grain actually held. A private sector company may use the "spare" capacity for storing other commodities either on its own account or under contract for other traders;
- the reserve comprises a single, locally available grain; and
- purchases are made using the facilities and resources of the private sector, i.e. buying and selling by public open tender or through appointed private sector agents or using commodity exchanges.

While the reserve is likely to be used for the most part to cope with market shortfalls, there will be occasions when it has to be used for relief programmes for those groups who do not have the necessary resources to purchase their requirements in the market. In these instances grain will usually be released for distribution through a food-for-work or a special feeding programme. Unlike releases for sale in the market, which can be triggered by predetermined factors, releases for relief programmes must be decided on a case-by-case basis. As such programmes are of a social nature, and therefore require financial support, they will need to be authorized by government and charged to the appropriate government department.

Regional reserves and other food security instruments

There are other diverse instruments that can serve as a first line of defence in the event of a food emergency. A salient feature of any instrument should be to ensure that food supplies can be rapidly released to those most at risk of a global or localized crisis, while minimizing distortions to the functioning of markets (including prices). Once the crisis dissipates it is imperative that markets resume their normal functioning.

WFP's forward purchase facility [12]

The World Food Programme (WFP) started advance financing of operations in 1999, when the Direct Support Costs Advance Facility was established. In 2004 the agency piloted a "Working Capital Financing Facility" using an operational reserve as leverage to advance up to USD 180 million to operations, allowing food to be procured before a contribution to a project had been confirmed. Traditional advance financing has been used by 52 country offices to improve delivery times of 1.2 million tonnes of food to 70 million beneficiaries. The number and size of such loan requests have increased dramatically since 2004.

In 2008, USD 60 million from the Working Capital Financing Facility was used for a pilot Forward Purchase Facility (FPF) to enable WFP to buy food based on estimated aggregated regional needs and funding forecasts to further reduce lead times for the delivery of food. The initiative was targeted towards emergency needs in the Horn of Africa and southern Africa. To enable WFP to gain experience and prove the concept, the parameters of the pilot were simplified to focus on procurement of cereals from South Africa and the Black Sea region. During the initial phase, 315 000 tonnes of cereals were purchased - much of it during the harvest period - and allocated to operations in southern Africa and the Horn of Africa.

Although baseline data was not maintained to track cost and time savings for each consignment of forward purchase, they were estimated by the Secretariat on the basis of 149 135 tonnes of food delivered through the Facility (see Table 25.1): the consignments were delivered on average 53 days earlier than normal and saved the WFP USD 1.3 million - 3.4 percent of the costs. The WFP did not incur additional storage expenditure because the food was delivered to the projects at the right time.

The WFP seeks to purchase food at favourable times at advantageous prices, but there is no certainty that the FPF will generate savings in food purchases because markets are unpredictable. But savings are not the facility's primary objective. The aim is to reduce lead times for delivery to beneficiaries at times when food is urgently needed.

A major reason for the early success of the FPF pilot was that collaboration among country offices, the Southern, Eastern and Central Africa Regional Bureau, the Kampala sub-regional office and Headquarters units for budgeting, programming, procurement, logistics and resourcing, ensured timely deliveries of food to beneficiaries and reduced the risks for the WFP.

Building on the pilot projects, the WFP expanded the FPF food basket to include rice, pulses, and corn-soya blend in smaller quantities in order to provide a nutritionally balanced ration. When food was not readily available in a region, the FPF was used to procure it on international markets, which reduced lead times. The FPF was also expanded to West Africa in early 2010 to help address the Sahel crisis, and to Asia for the forward purchase of rice.

[12] Adapted from WFP (2010).

Ensuring food security with value chain call options [13]

The enormous challenge in terms of food security comes when markets are not in equilibrium. Crisis in international markets, domestic food shortages and gluts can strain value chains to the extent that they no longer function efficiently or, in the extreme, become redundant.

In times of food surplus, the very design of the value chain should ensure that incomes are sustained, because many indigenous foodstuffs - especially root crops like cassava and potato - can be transformed into a host of high-valued products. However, in times of basic food shortages, farmers may be compelled to break contractual arrangements by side selling, or their raw material may become the target of government intervention to bolster food security. There are market-based interventions to value chains that could strengthen food security in times of crisis. One such instrument is the use of options, as discussed in Chapters 19 and 20. Recall that an option is a contract between a buyer and a seller that gives the buyer the right - but not the obligation - to buy or to sell a particular quantity of a commodity at a later day at an agreed price. In the context of food crisis management, the buyer would be a food authority while the seller would be the producer in the value chain. The basic idea is that when food shortages are declared, the authority exercises the options contract to divert predetermined quantities of the raw material for basic food supply at affordable prices, while paying farmers the prevailing contract price agreed with the value chain processor (see on a similar idea the proposal in Chapter 23). The decision to declare the shortage should rest on an independent authority, such as the WFP.

An insurance plan could be sought by the authority that would compensate processors for the loss of revenue, i.e. the incremental profit from transforming the raw material to the processed product. Alternatively, those processors who are sufficiently diversified in raw material use (i.e. they are involved in other agricultural commodity value addition) would be permitted to enter the scheme. The authority also could hedge against the cost of the scheme by taking out options on an international or regional commodity exchange, such as SAFEX of South Africa.

It is assumed that organized, sophisticated exchanges do not exist in the country undergoing the food crisis. The volumes purchased should be made transparent to the public, so that private food traders can factor possible market impacts of such state interventions into their commercial calculations. Of course, the scheme may be modified and fine-tuned, but the basic premise stands: value chains and their proper coordination can provide incentives for productivity-raising investments, foster higher incomes to participants and, during times of crisis, market-based interventions to the value chain can produce non-distortionary impacts that enhance food security and bring long-term stability and sustainability to food systems.

Self-targeted strategies[14]

Countries that do not wish to subsidize a large portion of food consumption, but instead aim to target the most vulnerable, can design such policies while encouraging participation of the private sector in their food markets. For example, Egypt's policy of making coarse baladi bread available at a low fixed price is an example of a self-targeting strategy, which limits leakage of food assistance to those consumers not in need. If public aid is restricted to a commodity favoured only by the poor or desperate, it can leave the rest of the market to the private sector. The public distribution system can be used as a major part of a strategy to

[13] Adapted from FAO (2010).
[14] Adapted from Wright (2010).

"roll over" strategic stocks and keep them viable while minimizing the impact of sales from stocks on the private market. During emergencies the poor can be targeted by pre-planned "food for work" programmes with below-market wages, and by distribution of food in a form not attractive to those who are wealthier.

Conclusions

Food security and emergency reserves have received widespread policy attention following the 2006-08 high food price episode. A food security reserve that responds quickly to emergencies would help speed up responses of governments and international organizations in aiding groups in distress. The free market cannot be relied upon to service this need, because the effected groups lack the resources to bid for the food they need.

Key to the success of such reserves emanates from programme design. First, the organizational structure and management of the reserve must reflect a high level of commitment from the part of governments and aid agencies, supported by clearly defined rules of procurement and distribution. Second, and of equal importance, the procurement and release of food should have minimal disruption to regular market functioning. Also, the presence of the reserve should not "overhang" markets. An overly copious reserve could undermine the confidence and ability of the private sector to invest in grain marketing. Scaling down the size of the reserve to reflect optimum working efficiency would ensure that these uncertainties are allayed.

Food security reserves at the national and international level constitute just one measure to ensure that food supplies are at hand when most needed. Other market neutral instruments purporting to a similar objective include the use of value chain call options on indigenous crops such as roots and tubers. A growing recognition of their amenability to value addition and that such crops are not internationally traded will ensure that they will be potentially locally abundant in times of food emergencies. Self-targeted strategies that distribute income-inferior foodstuffs in times of emergency are also a promising and sustainable relief instrument.

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Table 25.1: Comparison of maize purchases from South Africa using the FPF compared with forecast contribution

Purchases through FPF	Recipient country	Prog. category	Country allocation	Price per mt - FPF	Revised price per mt - WCF Facility	Savings \losses	Days saved
Dec-08	Zimbabwe	PRRO	5 200	269.00	279.76	55 952.00	33
Dec-08	Kenya	EMOP	14 646	269.00	279.76	157 590.96	51
Dec-08	DR Congo	PRRO	1 639	269.00	279.76	17 635.64	63
Dec-08	Zimbabwe	PRRO	10 000	274.80	285.79	109 900.00	32
Dec-08	Zimbabwe	PRRO	1 950	274.80	285.79	21 430.50	33
Dec-08	Kenya	EMOP	1 550	274.80	285.79	17 034.50	54
Dec-08	DR Congo	PRRO	9 485	277.00	287.99	104 240.15	65
Dec-08	Kenya	PRRO	5 515	277.00	287.99	60 609.85	53
Dec-08	Zimbabwe	PRRO	3 150	281.00	292.24	35 406.00	34
May-09	Kenya	EMOP	10 000	290.00	275.50	- 145 000.00	61
May-09	Somalia	EMOP	8 532	290.00	275.50	- 123 714.00	63
May-09	Kenya	PRRO	9 941	290.00	275.50	- 144 144.50	52
May-09	DR Congo	PRRO	1 527	290.00	275.50	- 22 141.50	63
Jul-09	Kenya	PRRO	15 000	199.00	222.80	357 000.00	53
Oct-09	Somalia	EMOP	14 721	212.51	242.26	437 949.75	61
Oct-09	Kenya	PRRO	15 279	212.51	242.26	454 550.25	54
Oct-09	Somalia	EMOP	5 000	398.00	453.72	278 600.00	59
Nov-09	Somalia	EMOP	15 000	234.00	208.26	- 386 100.00	58
Oct-09	Somalia	EMOP	1 000	400.60	456.68	56 080.00	61