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# ANALYSIS OF AFGHANISTAN'S STRATEGIC GRAIN RESERVE PROPOSAL

PREPARED FOR MIKE MARTIN, DIRECTOR, OFFICE OF AGRICULTURE



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Stevens et al. *Analysis of Afghanistan's Strategic Grain Reserve Proposal: Prepared for Mike Martin, Director, Office of Agriculture* / Stevens et al.  
1. Strategic Grain Reserve--Afghanistan. 2. Wheat Reserves--Afghanistan. 3. Food Security --Afghanistan

Printed in the United States of America

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# EXECUTIVE SUMMARY

The Ministry of Agriculture, Irrigation, and Livestock (MAIL) proposes to construct a 400,000 ton Strategic Grain Reserve (SGR). The SGR would have two components: an emergency reserve and an operational reserve. MAIL would use the emergency reserve to distribute wheat to vulnerable groups during major grain market disruptions. MAIL would use the operational reserve to dampen price volatility and support the Minimum Guaranteed Price (MGP) program by making large wheat purchases when domestic wheat prices are low. The proposed SGR would cost \$500 million over the first five years, which includes the cost of building storage facilities, purchasing grain, and managing the reserve.<sup>1</sup>

The Texas A&M Evaluation Team suggests narrowing the scope of the SGR policy proposal by eliminating the operational reserve and only creating an emergency reserve.

The Texas A&M Evaluation Team suggests narrowing the scope of the SGR policy proposal by eliminating the operational reserve and only creating an emergency reserve. We suggest a small emergency reserve capable of providing wheat for one month to the food-insecure population of Afghanistan, which totals about 9 million people (NRVA, 2012). This would require an 118,000 ton wheat reserve—a 70 percent reduction from the proposed reserve size. To minimize the effect of

SGR purchases on the grain market, we suggest filling the reserve slowly over five years, and suggest that purchases for the reserve only occur when domestic wheat production is high. An emergency reserve of this size could be stored in the existing SGR warehouses and silos in Afghanistan and would not require the construction of new facilities.

The MGP policy should be eliminated from the SGR policy proposal. The acquisition of 400,000 tons of grain for an operational reserve and regular purchases to support a wheat price floor would increase price volatility and destabilize the domestic wheat market. An MGP policy would be particularly harmful for the food-insecure population in Afghanistan, since it would likely respond to higher prices with a large reduction in wheat consumption. There is also no evidence that the proposed reserve is large enough to support a nationwide price floor.

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<sup>1</sup> The \$500 million cost estimate of the SGR is likely a lower bound. Given the volatility of wheat prices in

While a small emergency grain reserve would improve food security, it would not address MAIL's legitimate concerns about price volatility. We recommend the Ministry explore other policies to lower price volatility in the domestic wheat market. Policies in the following three areas are especially promising:

1. **Incentivized Storage.** MAIL could lower price volatility and encourage production by incentivizing domestic storage. If MAIL is intent on rehabilitating the existing storage silos, the Ministry could use these silos in a warehouse receipt system. Or MAIL could incentivize storage at a lower cost by distributing self-storage materials, like PICS bags, to wheat farmers.
2. **Improved Forecasts.** MAIL could lower price volatility by improving the Ministry's wheat production forecasting capability. The publication of accurate, timely production forecasts is essential for a well-functioning wheat market. Early and reliable forecasts of domestic wheat production shortfalls would encourage the private sector to increase imports and domestic storage.
3. **Increased Productivity.** MAIL could lower price volatility and improve the grain market by investing in increased domestic productivity. Improving Afghanistan's wheat yield would effectively eliminate the need for an operational SGR.

There is no single policy that will solve Afghanistan's food security problem. An emergency grain reserve would only improve food security if it is part of a broader strategy to increase domestic production and private storage. An operational reserve and MGP would hinder development of a robust grain market in Afghanistan by increasing price volatility, and should not be pursued by the Ministry.

## CHAPTER ONE

# INTRODUCTION

Afghanistan faces severe food security risks because of low domestic grain production and high dependence on imports. The Ministry of Agriculture, Irrigation, and Livestock (MAIL) proposes to address food security and improve the grain market with a Strategic Grain Reserve (SGR). In this paper, the Texas A&M Evaluation Team evaluates MAIL's proposed SGR and explores other policy options to address food security and price volatility in Afghanistan, including incentivized wheat storage, improved grain market forecasts, and production improvement programs.

Wheat price volatility in Afghanistan is driven by factors in the global wheat market—including biofuel subsidies, population growth, energy price volatility, low stock-to-use ratio—and domestic wheat market—including conflict, border closures, insufficient storage, unstable production, and strengthening demand (USDA, 2010; Wright, 2012). These sources of volatility are unlikely to disappear in the near term given. The domestic wheat market lacks the ability to absorb these international and domestic price shocks, which means the volatility is passed through directly to consumers. Without structural changes to the domestic grain market, food security will not improve in Afghanistan.

MAIL proposes to improve the domestic grain market with an SGR that has two components. The first component is a small emergency reserve, which would provide food to vulnerable populations during disasters. The second component is an operational reserve, which would regularly buy and sell wheat to lower domestic price volatility. The operational reserve would also be the mechanism through which the proposed Minimum Guaranteed Price (MGP) is implemented.

Emergency and operational reserves each addresses different problems in the grain market—namely, supply risk and price risk—and each requires a different management approach (Lampietti, 2011). An emergency reserve addresses supply risk, which is the risk that there will not be enough grain in an area to feed the local population, even if there are sufficient funds to purchase. An operational reserve addresses price risk, which is the risk that international grain prices are prohibitively high, which drives down domestic grain consumption, even if there is adequate supply on the international wheat market.

The proposed SGR has four stated objectives (MAIL, 2015):

- I. Respond to emergency needs

2. Provide food access to vulnerable populations
3. Promote orderly market pricing
4. Provide incentives to farmers to increase wheat production

During our visit, MAIL staff mentioned an additional objective,

5. Provide wheat for government use (military, police, universities, etc.)

The emergency reserve would address objectives 1 and 2. And, the operational reserve and MGP would address objectives 3, 4, and 5.

The proposed emergency and operational reserves would jointly hold 400,000 tons of wheat, which would be stored in silos and warehouses throughout the country.<sup>2</sup> The Ministry proposes filling the reserve with 100,000 tons of wheat acquired through the import market and aid organizations by the end of the 2016 harvest. An additional 135,000 tons of wheat would be purchased in 2017, with purchases supporting the MGP program, which would take effect during the 2017 harvest. The Ministry would purchase the remaining 265,000 tons of wheat by 2020. The government could store about 100,000 tons in existing storage facilities and plans to construct storage for an additional 300,000 tons (MAIL, 2015).

The proposed SGR could provide wheat to about 2 million people for one year, or provide wheat to the entire population for one month.<sup>3</sup> The SGR capacity is more than adequate for an emergency reserve, but may not be large enough to support the MGP. Since 2008, annual domestic wheat production in Afghanistan has varied between 3 and 5 million tons. Based on our preliminary analysis, even a modest MGP could require SGR purchases in excess of 500,000 tons following a bumper wheat crop, which would exceed the planned SGR storage capacity.

It is essential that policymakers in Afghanistan recognize these reserves would operate independently, even if wheat is stored in the same location and managed by the same policymakers. MAIL could, for example, build an emergency reserve without building an operational reserve. Since the Ministry does not need to create both reserves, each type of reserve should be analyzed independently.

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<sup>2</sup> The SGR proposal includes plans for small warehouses in every province to temporarily store wheat purchased through the MGP program. These warehouses would send the wheat to larger warehouses and silos in Baghlan, Balkh, Helmand, Herat, Kabul, Kandahar, Kunduz, Logar, Samangan, and Takhar (MAIL, 2015).

<sup>3</sup> MAIL assumes wheat consumption levels of 160 kg per year.



## CHAPTER TWO

# EMERGENCY WHEAT RESERVES AND FOOD SECURITY

A small emergency reserve could be an effective policy to improve food security for vulnerable populations in Afghanistan. Though the private grain market should be relied on to provide food security through trade and private storage, the academic literature has found that a small emergency reserve is an effective policy to respond to short-term food emergencies (Murphy, 2009; Lampietti, 2011). When a country like Afghanistan faces supply disruptions from conflict, border closures, severe domestic production shortfalls, or extreme weather events, an emergency reserve can be the optimal solution, bridging supply and demand in the short term.

The key to a successful emergency reserve is to target consumption rather than price. An emergency reserve should provide food aid directly to vulnerable populations, rather than sell to distributors in an effort to lower market prices. This approach would simplify reserve management for MAIL since the Ministry would only need to identify vulnerable populations and deliver wheat directly to those populations. Further, targeting consumption should minimize the price-depressing effects of food aid on domestic wheat prices.

An emergency reserve is only a stopgap solution, and therefore should not be very large, even if the government anticipates frequent, large supply disruptions. Emergency reserves should only provide immediate relief, allowing policy makers time to secure a more cost effective source of wheat supply during a time of crisis. Optimal emergency reserve size depends on import dependency, frequency of supply disruptions, and tolerance for price volatility. Researchers in the field have provided some guidance on this topic. Rashid and Lemma (2011) suggest holding sufficient emergency reserves to provide 95 percent of a food-insecure population 0.4 kg of cereal per person, per day for four months. Given the fragility of the wheat market in Afghanistan, we suggest holding an emergency reserve capable of providing 100 percent of the food-insecure population<sup>4</sup> 0.44 kg of wheat per person, per day for one month. This would require an 118,000 ton emergency wheat reserve.

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<sup>4</sup>According to a recent NRVA (2012), 30 percent of the population in Afghanistan is food insecure.

According to MAIL (2015), the Government of Afghanistan currently owns flat storage warehouses (FSW) with capacity to store 64,000 tons of wheat and silos with capacity to store an additional 170,000 tons of wheat, though many of these facilities would require significant investments before they could be used in an SGR. Since storage in the FSW is a third of the cost of silo storage, FSW should be the primary emergency reserve facilities, particularly the FSW in Kabul (22,500 ton capacity) and Kandahar (25,000 ton capacity), which do not require major rehabilitation. Only after filling the FSW should a few silos be upgraded and filled with the remaining emergency reserve.

Even though our suggested emergency reserve would be small, MAIL should take care to minimize the price impact of wheat purchases by only purchasing when prices are low and there is excess supply in the wheat market. The burden of determining when to make purchases would fall on MAIL officials. This is a difficult task under ideal circumstances, and MAIL would have to make purchase decisions with relatively sparse agricultural data and without reliable econometric models of the grain market. Mistimed purchases (buying grain for the emergency reserve when prices are high and supply is low) would increase price volatility somewhat (Stevens, 2015). Thus, MAIL should be encouraged to develop their forecasting capacity if an emergency reserve is created (see Section 4.2).

## CHAPTER THREE

# OPERATIONAL WHEAT RESERVES AND THE MGP

The Ministry is right to be concerned about wheat price volatility and production incentives for wheat farmers. However, an operational reserve and a price floor are not the appropriate policy instruments to address these problems. To successfully manage an operational reserve and MGP, policy makers would need to regularly make large wheat purchases and sales when prices are low and high, respectively. MAIL does not currently have the institutional capability to effectively time purchases and sales. If the Ministry does use an operational reserve to support an MGP, MAIL would likely purchase and release grain unpredictably, which would increase domestic price volatility and disincentivize private sector production and storage.

Most attempts to stabilize commodity prices through strategic reserves have failed, and even the best run reserves cost more and are less effective than alternative food security policies (Larson et al., 2013). But, if MAIL does pursue operational storage and an MGP, there are two key management principles that should be followed to limit the damage it will cause to the market. First, the reserve must be managed transparently. This means all purchase and release decisions must be made following publicized rules, and not policy maker discretion. For example, purchases could be limited to years in which domestic production exceeds the previous year's production by a specified level. Second, the MGP should be set conservatively. A high price floor would bankrupt the reserve and erode public confidence in the government's ability to implement policy.

Based on conversations during our visits to MAIL, the Texas A&M Evaluation Team is concerned that an operational reserve would embolden policy makers to pursue unwise policy with respect to Pakistan. Currently, policy makers in Afghanistan do not want to lose access to Pakistan's wheat market, so they are careful not to pursue policies that would cause the Government of Pakistan to cut off wheat and flour exports. MAIL officials indicated that an SGR would allow the Government of Afghanistan to pursue policies that would upset Pakistan, since the Afghan wheat market could be supported by the SGR during a border closure. But, the proposed SGR could only replace Afghanistan's wheat and flour imports from Pakistan for a few months and would be unable to prevent the loss of wheat and flour imports from harming Afghanistan's grain market.

# ALTERNATIVE POLICIES TO IMPROVE THE GRAIN MARKET IN AFGHANISTAN

Our pessimism over the prospects for an operational reserve does not mean food security and price volatility should not be addressed. There are many policies that could be pursued by MAIL to improve the wheat market in Afghanistan. These policies are less expensive and require less institutional expertise than an SGR. Essentially, there are many simple and inexpensive alternatives to an SGR that MAIL could use to increase food security and lower grain price volatility.

## **Incentivized Storage**

A major concern at MAIL, and the principle motivation for the MGP, is the seasonal variation in the price of wheat. This seasonality is driven by a lack of domestic storage. MAIL could directly address this problem by incentivizing wheat storage. Storage incentives could take several forms. The Ministry could construct and operate a warehouse receipt system, which would provide farmers low cost, reliable storage.

A warehouse receipt system allows farmers to deposit grain in a government controlled warehouse where it is pooled with grain of similar quality in exchange for a receipt that can be redeemed in the future for the same quantity and quality of grain. A warehouse receipt system is essentially a democratized strategic grain reserve. In a warehouse receipt system, it is the private sector, not policy makers, which decides when to accumulate and release grain in the reserve. The government's role in a warehouse receipt system is simple: maintain the storage facilities and establish accounting infrastructure to track grain deposits and withdrawals.

These warehouse receipt systems have been successful in Africa, especially in landlocked countries with poor infrastructure like Afghanistan (Lacroix and Varangis 1996; Coulter and Onumah 2002). The systems have improved risk management by increasing storage in undercapitalized regions, which leads to lower seasonal price variability (Lai, Myers, and Hanson 2003). Farmers have also used their receipts as collateral in loans, improving rural credit

markets. A warehouse receipt system can be an effective long-term investment in private grain markets.

An advantage of a warehouse receipt system in Afghanistan is that, unlike a strategic reserve, the system is scalable. An SGR would require MAIL to make an enormous up-front investment without institutional expertise in reserve construction and management. A warehouse receipt system could begin with initial investment by MAIL in a single warehouse. As demand for the warehouse receipt system grows and, importantly, as the Ministry builds institutional capacity, the warehouse receipt system could be expanded.

A warehouse receipt system has two significant advantages over an operational reserve. First, storage levels would be determined by the aggregate decisions of thousands of farmers instead of a few policy makers. Farmers, in aggregate, are likely to have more information about the wheat market than policy makers. Second, warehouse receipts would provide much needed capital in rural areas. This injection of capital, through warehouse receipts, will likely increase farm-level investments.

A less expensive method to incentivize storage would involve distributing small-volume storage systems directly to farmers (e.g. PICS bags). This would encourage decentralized, farmer-controlled wheat storage, which is much more likely to lower wheat price volatility than a centralized, policy maker-controlled operational reserve. Distributing low cost PICS bags to farmers has increased farm-level income and lowered volatility in Sub-Saharan Africa (Jones et al., 2011).

## **Improved Forecasts**

MAIL's interest in the SGR is driven by price volatility in the grain market. A major contributor to grain price volatility in Afghanistan is a lack of information. Accurate, timely forecasts of wheat production and price are not available to market participants or policy makers in Afghanistan. Without these forecasts, the private sector is slow to increase imports and build domestic storage in anticipation of wheat production shortfalls.

MAIL and the Central Statistics Office collect production, price, weather, and satellite imagery data. Though wheat market data is not entirely reliable, it could be combined with remote sensing data to produce useful forecasts of grain production and prices. Weather and satellite imagery data have been used to improve forecasts of crop yields in countries without reliable government agricultural statistics, including Afghanistan's neighboring countries of Pakistan (Bastiaanssen and Ali, 2003), Tajikistan (Thenkabail and Wu, 2012), and Uzbekistan (Shi et al, 2007). Improved yield forecasts could reduce volatility, improve the private grain market, increase investor confidence, and reduce farmer uncertainty. MAIL should develop the staff capacity to exploit data the Ministry already collects and produce grain market forecasts whether or not an SGR is developed.

## **Improved Production (Seed Systems)**

While emergency grain reserves can be a component of a nation's strategy for responding to food needs in an emergency such as natural disaster, domestic social-political disturbance, or disorder in international relations, other key complements to grain reserves are (a) financial reserves for food purchases and/or contracting for future food supplies from friendly nations, and (b), most importantly, increased domestic food productivity. Here we wish to emphasize the need for increased productivity of wheat.

Rainfed wheat production in Afghanistan averages about 0.9 mt/ha. In the best of years it may reach 1.4 mt/ha., or drop to 0.4 mt/ha in drought years. At the farm level such low yields impose poverty, persistent hunger, malnutrition and impaired welfare of the next generation. It is a tragedy that now 50 years after the early breakthrough in new wheat varieties adapted to Afghan farms, Afghanistan has failed to thoroughly take in and utilize the science that is available. It reflects failure by international agencies as well as by Afghan leaders.

Conflict should not be used as an excuse for this failure. Farmers strive to farm, and parents strive to feed their children, even in the midst of conflict. To be human is to try to live. International agencies and local and national leaders should take seriously their duty to provide the means for survival, even prosperity for future generations, in the midst of conflict.

Improved wheat genetics and improved seed systems to deliver good genetics to farmers should be viewed as an essential complement to a wheat strategic reserve. ICARDA and IFDC have made a good start on improving wheat productivity in Afghanistan. The effort to improve wheat genetics and seed systems for rainfed and irrigated areas in Afghanistan should be considerably strengthened by increased funding, targeted mobilization of national research and extension capacity, and donor coordination to increase focus and reduce redundancy.

Some improved genetics are already available from MAIL, Cimmyt and ICARDA, but research and adaptive trials need to be expanded throughout the country. Most importantly, the seed production and distribution system needs to be built up, once and for all. Too many past efforts have been too scattered, incomplete and short-lived. Foundation seed farms, certified seed farms, and seed storage, distribution, and marketing firms need to be incentivized. Seed cleaning and seed laboratories for quality control need to be expanded and utilized.

Here we emphasize genetics and seed systems for improved productivity, because seed are the most potent productivity-enhancing aspect of technology that can be promoted during conflict. When and as possible other technologies need to be brought along as well, including minimum tillage, fertility management, pest and disease control and reduction of post-harvest losses. These improvements in wheat farming can support wheat in successful competition with opium poppy production in irrigated and rainfed areas.

An emergency reserve could provide limited price support for the wheat market, so that increased production would not cause a collapse in wheat prices. By purchasing surplus wheat from newly productive farms for an emergency reserve, Afghanistan can establish its wheat reserve without resorting to international suppliers.

## CHAPTER FIVE

# RECOMMENDATIONS

Texas A&M University AgriLife Research, through the Department of Agricultural Economics, Center on Conflict and Development (ConDev), recommends (1) the establishment of an emergency grain reserve, at a smaller volume than an operational reserve, (2) that the reserve be maintained for response to food emergencies, and not managed for the more complex task of moderating market price fluctuations, (3) that a warehouse receipt system be considered under which farmers can make decisions regarding the timing of storage and sale of their product, (4) that decentralized, possibly community-level, farmer-controlled, small-volume systems of storage be considered; and (5) substantially greater emphasis be placed on increasing grain productivity in Afghanistan, with the result that, (6) emergency grain reserves will be established through the purchase of Afghan-origin grains from emerging surplus regions. The ConDev Center is prepared to support and assist USAID in the further analysis and implementation of any of these measures.

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