

**BASIS OF A PRESENTATION MADE AT THE EAC REGIONAL FOOD BALANCE  
SHEET MEETING IN ARUSHA TANZANIA ON**

**“Proposed Minimum Requirements for Registered Storage Facilities for use in Trading of  
Staple Foods in the EAC Region”**

Many countries in Africa have economies that are both based on and rely on agriculture to create employment and a source of income and food for those involved in farming. The majority of this production is undertaken by the small-scale farming sector, including men, women and children. A lack of market information and the inability to establish market access has led to a reduction in the volumes produced and qualities achieved, as there was little incentive for small-holder farmers to increase production, or to properly grade what is produced. Additionally, post harvest crop losses are in the region of 40%, according to the FAO, due to the inadequacy of the storage facilities available on farm in the smallholder sector.

In many countries in Africa, grains rate as being the most important staple foods. However, because they are produced seasonally and, in many places there is only one harvest a year, which itself may be subject to failure, requiring that production of maize, wheat, rice, sorghum and millet be held in storage for longer periods. Grain storage therefore occupies a vital place in the economies of developed countries and there is a rapidly growing need for this in developing countries as well.

Grain markets, particularly in Africa, see a relatively stable level of demand throughout the year, but are subject to a fluctuating supply situation, partly due to the fact that production relies on rainfall with very little, if any, irrigation systems available, particularly for smallholders, who produce the bulk of the grain in most countries in Africa. This situation is exacerbated where there is only one growing season, which applies in many countries, with grains being freely available over a relatively short period of time.

One of the main functions of storage is to help to even out the supply into the market (whether such storage is private or public sector) by taking grains out of the market at harvest when it is plentiful and releasing it back into the market when supply is less abundant. This can also help to ensure that prices are more even over a longer period of time. The whole market benefits from more stable prices, with processors being able to plan more effectively in the knowledge that they do not necessarily need to hold large volumes of grain to ensure that their operations run smoothly. Likewise, consumers are unlikely to be subjected to unreasonable price hikes, with producers getting more realistic prices for their efforts.

There remains a huge disparity in the standards of storage in the region, making the introduction of the “Green Channel”, a regional warehouse receipt system or reliance and confidence in storage systems extremely difficult to obtain. This disparity has resulted in a lack of confidence in the ability of the industry to safely store commodities, maintain the quality of the goods in

store, deliver goods of the same or better quality than was deposited or the capacity to do so timeously.

In order to address this, it is proposed that there is a need to have acceptable minimum standards for both storage facilities and storage practices, for both warehousing and silo storage, to provide more assurance to the agricultural industry, as well as financial institutions, insurance providers and governments in the region. These standards need to be acceptable not only to the agricultural industry itself, but to a broader spectrum of society as well, including depositors, banks and insurance companies.

This paper sets out to propose the level of these minimum standards, which are considered essential in the context of both regional and international trade, irrespective of other considerations such as warehouse receipt programs, as trade will occur with or without these instruments. It is designed to suggest a more standardized level of storage which meets agreed levels of operational and structural standards, which can be registered on this basis both for regional and international trade.

These proposals seek to encourage investment in storage both from the public and private sectors and are based on good and sound practices. At the same time, they are pitched at a level that ensures the safe and secure storage of commodities, aimed at providing more comfort to the whole agricultural industry, as well as ancillary services, such as banks, insurance companies and collateral management services. Additionally, details are provided regarding minimum staffing requirements, equipment needs and minimum volumes needed to make this a commercially viable proposition.

None of the foregoing is set in stone and will be the subject of debate with regional stakeholders, including storage companies, the public at large and the bi-lateral missions. The paper is broken down into warehouse and silo storage as although there are similarities, there are enough differences to justify this division.

## 1. Warehouse Site

- Warehouse must be easily accessible throughout the year.
- Warehouse must be sited above flood plains and must not be liable to flooding and the area must have good drainage to ensure that excess water is moved away from the store.
- Has a minimum capacity of 500 metric tonnes. (*Note, this may vary from country to country, but to make warehousing both viable for the owners and at the same time attractive to depositors, it makes sense to have higher volume facilities*).
- There must be a quality analysis room on site for grading and testing of moisture content.
- An Office for administration work must be incorporated.
- A separate storage room is essential for non food items.
- **Roof**
  - Must be designed to shed water quickly without leaking.
  - Must keep out pest like rodents, birds, insects, dust and reduce heat.
  - Roof overhang at eaves level should be sufficient to shed rain-water clear of walls.
  - Translucent roof sheets must be put in to improve lighting in dark areas.
- **Floors**
  - Must be above ground level with sufficient elevation to allow drainage.
  - Must be crack-free without loose soil.
- **Walls**
  - The floor must have a vapor proof barrier in the walls to prevent dampness rising in the walls from the ground. *It is not necessary to have damp proofing in the floors, as grain must be stacked on top of pallets All THE TIME and there should be sufficient drainage around the warehouse to ensure that excess water is removed. Poor drainage around results in water accumulating around the warehouse and this will seep into the floor. Under no circumstances should there be stagnant water around a warehouse. If the water is flowing freely from the warehouse surrounds and grain is on pallets, even if the floor has no water proof barrier it will be fine. Damp or waterproofing of the walls is important as water tends to rise up in the wall, through capillary action.*
  - Inside surface must be plastered with cement/sand and mortar (essential for cleaning and pest control).
  - Must have good ventilation. *Whilst there are no common standards for ventilation in warehouses, provided the warehouse has large doors and a few ventilators up all sides, this will be sufficient to adequately ventilate a warehouse. Problems arise when the doors remain closed and the warehouse has inadequate ventilators as air circulation is crucial*

*to the proper maintenance of grains. The operation of warehouses is, particularly air circulation and grain handling is also key to a successful operation.*

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- At least 2 walls must have a door wide enough for receiving and out loading.
  
- **Doors**
- All doors must rodent proof.
- Must be secure and lockable.
- Must be large enough to facilitate intake, dispatch; and
- Permit effective use for supplementary ventilation.
- The store must be well ventilated for the reduction of humidity. Large doors can provide sufficient, controllable ventilation in the absence of eaves-level ventilation in stores that are regularly opened daily when full.
- Pest Proof - Complete exclusion of pests is difficult but all possible points must be screened.
- Hygiene - As with any grain warehouse, the interior should be designed and built to allow easy cleaning.
  
- **Equipment**
- The grading room must have basic grading equipment like moisture meter, sampling probes, grading sieves, grading scales, dividers, test density etc.
- Minimum 500 kg platform scale.
- 1 fumigation sheet.
- 2 Knapsack sprayers.
- Bag stitching machine.
- Pest control chemicals.
- 20 000 empty bags minimum.
- 1000 Stacking pallets.
- Warehouse cleaning equipment.
- Stacking ladder.
- Storage manual.
  
- **Staff**
- Warehouse Manager/Supervisor
- Trained Grader(s)
- Weighbridge Operator
- Clerical staff
- Sound commodity management system

**Examples of Warehouses**



**Grain Storage Solutions Ltd. (GSS) Lusaka, Zambia**



**Grain Storage Solutions Ltd. (GSS) Lusaka, Zambia**



**Refurbished WFP Warehouse in Kasese, Uganda**



**Safe and secure open air bag storage, Nyanga Zimbabwe**

## **2. Silo Storage**

Different Silo suppliers have different designs for their structures. However every silo must achieve the main objectives of handling, storing and preserving the quality of grain. These objectives cannot be achieved by the silo structure alone but also through a good management process and the expertise of the personnel running the facility. This is a guide to what is required of a regionally/internationally trade registered silo facility. However, each facility must be assessed individually to determine if it achieves the stated storage objectives since there are many different designs.

### **Silo site**

- Should be easily accessible throughout the year.
- Should be sited above flood plains and should not be liable to flooding and the area must have good water drainage.
- There should be sufficient space to maneuver delivery or collection vehicles easily.

### **The silo structure**

- Floors must be above ground level with sufficient elevation to allow drainage.
- Floors must be crack-free reinforced concrete without loose soil.

- The floor must have a vapor proof barrier up to the walls to prevent dampness rising in the walls from the ground.

### **Walls**

- If metal it must reflect heat and sunlight to keep the inside cool.
- If concrete the inside and outside surfaces must be plastered with cement.
- Must keep out pests like rodents, birds, and insects, as well as dust.

### **Roof**

- Must be designed to shed water quickly without leaking.
- Must keep out pest like rodents, birds, insects, dust and heat.
- The ancillary conveyor system must enable grain recycling back into the bin or to another bin for inspection and aeration.
- The facility should allow for pest control through fumigation or other methods of chemical control.
- Quality analysis facilities must be available on site for sampling, moisture testing and to determining the quality of grain and this must be manned by a trained grader.
- Firefighting equipment must be available on sight.
- Weighing equipment must have been assized in the past 12 months by the appropriate legal authority and should include a weighbridge(s).
- A proper grain accounting system must be in place.
- Any new facility constructed using approved engineering standards, will generally meet the physical requirements of a storage silo suitable for use in a WRS which should be supplemented by good management Area around the storage facility should be cleared and free of vegetation;
- Area around the storage facility should facilitate the easy movement of vehicles in and out; where possible, the storage facility should have weighbridges; systems and trained staff.

Examples of silo complexes, both old and new.



**An old grain elevator in the USA**



**Built in 1895, this grain elevator in Fleming, Saskatchewan is the oldest existing elevator in western Canada**

## More Modern Silo Complex



### **General Requirements for Warehouses and Silos**

#### **Owner/Operator must have an insurance policy:**

(a) Silo/warehouse owners shall have current insurance policies in place, covering silo/warehouse buildings, equipment and commodities stored therein against the following minimum risks: theft including fidelity cover for employees, fire, earthquake, earth tremor, malicious damage, storm, flood, spontaneous combustion and explosion.

(b) In the event of loss, damage or non-performance, the grain silo/warehouse shall substitute grain of the same quantity and like or better quality at the location as described in the silo certificate.

#### **Owner/Operator must have a minimum net worth**

- A minimum net financial worth of XXXX, which shall be determined as the aggregate of all classes of ordinary and preference shares, share premiums, capital redemption reserve funds, disclosed distributable reserves (including policy holder and member reserves), fully subordinate liabilities or liabilities repayable at the sole option of the company, specifically excluding any non-distributable reserves and tax reserves.
- Applicants with a net financial worth of less than XXXX million may provide sureties or guarantees in a form acceptable to regulator in lieu of such net financial worth.
- A certificate by a public accountant and auditor, confirming compliance with these requirements shall accompany the warehouse or grain silo's application.
- These requirements shall be verified annually or as requested by the regulator.