

SILO STORAGE IN INDIA: A CONCRETE SOLUTION TO CATER GRAIN STORAGE LOSSES

Anamika Walia

Master's Student, Division of Vegetable Science and Floriculture, Sher-e-Kashmir University of Agricultural Sciences and Technology, Jammu, J & K

ARTICLE ID: 013

Worldwide Postharvest losses are a major cause of concern. According to FAO estimates, 10% of stored grain is annually lost worldwide. A substantial amount of food grains is being damaged after harvesting due to a lack of adequate storage and processing facilities. Also, due to variations in periodicity and intensity of climatic events like floods and droughts, temperature, and rainfall patterns significant agricultural production could be impacted.

Currently, food grains in India are stored in archaic warehouses without any use of technology. According to **United Nations' Food and Agriculture Organisation**, produce worth \$14 billion is damaged annually in India due to poor storage. Storage of food grains in silos in India can help the country to overcome huge losses from poor storage facilities.



Current Storage Practice and Concerns

Grain in India is stored using the cover and plinth method (CAP). In this method stacks of bagged grain are kept outdoor, covered with a waterproof material which is very cheap and easy to make. This method of storage becomes risky during the rainy season as with the humidity in the air and the warmth of the summer there is a rampant fungal attack which makes the grain moldy. India stores about 65 million tons of food grain, most of which is stored in conventional open or covered godowns prone to damage and the vagaries of weather.

Silo Storage Concept

Silos with bulk handling facilities are a highly mechanized and modernized way for bulk storage of food grains or fermented feed known as silage. Silos not only ensure better preservation of food grains but also enhance their shelf-life. A scientific method of storing grains is followed in Silo structures, where stored grain is kept dry and aired to prevent fungal and insect attacks. Foodgrains stored in silos are transported in bulk thereby minimizing losses due to theft and pilferage. Silos require approximately 1/3rd land as compared to conventional storage warehouses, can be operated round the clock which enhances flexibility and improves overall efficiency in storage, handling, and transportation of food grains. As such, the construction of silos would be beneficial to the nation besides, creating an efficient food supply chain-management system.



Conventional Storage Vs Silo Storage: Fact Check

- Silos require only 1/3rd of the land as compared to conventional warehouses
- High tech preservation techniques ensure quality and nutrition
- Negligible losses, the lesser threat from weather or other external forces
- shelf life of food grains highly improved
- Real-time monitoring of grains for grain temperature, humidity & infestation
- Transportation to Field Depots by specialized rail wagons in bulk

Types of Silos

Three types of silos are in widespread use today: tower silos, bunker silos, bag silos. Also, according to the movement of the storage silos they can be of two types: one is silos with rail connectivity and the second is standalone silos without rail connectivity.

1. Tower Silo:

The most used silos are tower silos. Tower silos have a diameter of 4 to 48 meters with a height of 3 to 40m. Tower silos are constructed using wood, steel, or concrete. They can be made of many materials such as wood staves, concrete staves, cast concrete, and steel panels. Silos can be unloaded into rail cars, trucks, or conveyors.



Advantages-

- Tends to pack well due to its own weight
- Lower Storage Losses
- Requires less area for construction
- Allows greater mechanization during filling and feed out
- Convenient to unload in winter



2. Bunker Silo:

Bunker silos are trenches, usually with concrete walls, that are filled and packed with tractors and loaders. The filled trench is covered with a plastic tarp to make it airtight.

Advantages-

- Holds large capacity and are less expensive
- Can be filled with conventional farm equipment
- Offers faster unloading rates
- Well suited to very large operations.

3. Silo Bags:

Bag silos are heavy plastic tubes, usually around 8 to 12 ft (2.4 to 3.6 m) in diameter, and of variable length as required for the amount of material to be stored. They are packed using a machine made for the purpose and sealed on both ends. Bag silos are one of the most economical silos.



Advantages-

- Lower capital investment
- A flexible storage system with Lower Storage Losses
- Feed is easily inventoried
- Can be used for small and large herds
- Fewer safety and health hazards

Advantages of Silo Storage in Indian Scenario

- low running costs
- low labor requirements
- rapid handling





- low through spillage and rodents
- less land area requirement
- complete control of aeration
- possible to mechanize all operations
- possible to store the grain for longer periods
- efficient and effective fumigation operation
- possible to store moist grain for short periods.

Current Status of Silo Storage in India

The progress of modernization of storage facilities and construction of steel silos is as given below (up to 31.05.2021):

- **Silos constructed:** 10.625 LMT* (21 locations)
- **Under Construction:** 10.625 LMT (21 locations)
- **Further awarded:** 8.5 LMT (at 17 locations)
- **Awarded to State Govt. on the nomination:** 1.00 LMT (1 location)
- **Locations approved by High Level Committee (HLC) for Hub & Spoke:** 35.875 LMT (100 locations)
- **Locations to be identified:** 18.275 LMT
- **Rice Silos to be implemented in future :** 15.10 LMT
- **Total:** 100.00 LMT

Future Prospects

For a nation such as India which depends on buffer stock for its food security, silos are the ideal mode of storage. All the stakeholders, be it farmers, government, or procuring agencies can be benefitted from this concept. A step for silo storage infrastructure should be taken up starting from states like Punjab and Haryana which are the breadbaskets of India from where nearly two-thirds of the food grain requirement is sourced. Given the monsoon weather conditions which leads to moldy grain, it is high time for India to switch to a silo structure for storing products to ensure food security as well as good health of the people. The government is now planning to roll out new guidelines for the construction of silos. The mandatory requirement of having railway connectivity next to the storehouses will be dropped as a



JUST AGRICULTURE
multidisciplinary e-Newsletter

necessary condition. This will help the government deal with the storage problem of food grains.

