

## Storage Structures & their Significance

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### SUMMARY

About a thousand species of insects have been associated with stored products in different parts of the world. A few pests are considered as pests causing severe damage to the stored grains. The stored grain insect pests can be categorized on the basis of their feeding behaviour as internal and external feeder or as major and minor pests based on the severity of damage. These systems are developed insect management decisions.

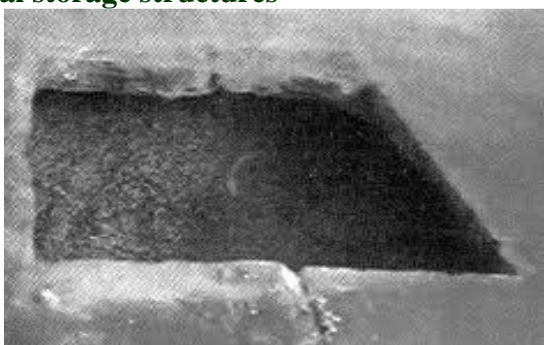
### INTRODUCTION

Grain is an important consumable commodity that is used for human consumption at large scale. The production of different types of grains increased progressively due to implementation of advance production practices but because of improper storage facilities huge amount of grains has been spoiled.

### Types of storage structures

- Conventional storage structures.
- Scientific storage structures.
- Special storage structures.

### Conventional storage structures

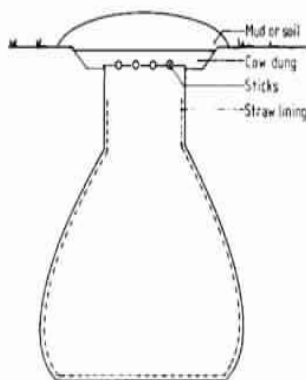
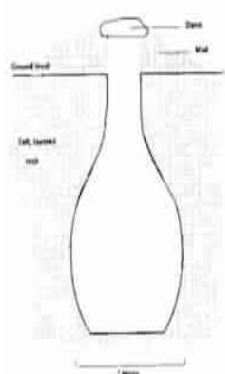


**Underground storage structures**



**Above ground storage structures**

### Underground storage structures



**Hagevu**

### Hagevu

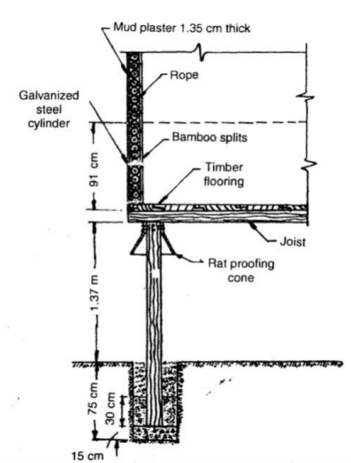
Hagevu is generally considered as outside storage structure made with the paddy straw rope by arranging the straw ropes one above the other in rounded shape and sometimes also constructed as indoor structure for storing less quantity of food grain.

**Above Ground Storage Structures**

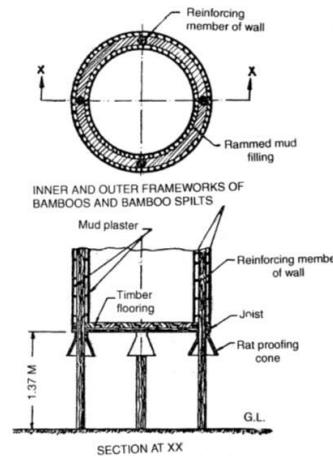


**Kothi**

**Kothi** is a traditional, small capacity and widely used structure different rural community of India, consist wide door for pouring the food grain inside the structure and small outlet is provided for taking out the grains.



**Morai/ Mojar**



**Bukhari**

**Bukhari**

Generally mud, bricks and cement was used for constructing the bukhari in which space is provided in the bottom portion for easy taken out the food grains.



**Wooden bins**

**Wooden bins**

Wooden bin or boxes were rectangular in shape and commonly used in different rural regions of India, Pakistan and Bangladesh as inside storage. Small and large capacity rectangular wooden boxes were known as wooden boxes and wooden bin, respectively.



**Jala or Mutka**



**d) Pala or chatakka**

**Jala or Mutka**

It is a traditional storage structure practiced from long time in rural areas of India and some other parts of Southern Asia region for grain storage. It is cost effective categorized under inside, temporary and small capacity of storage structure.

**Kupp**

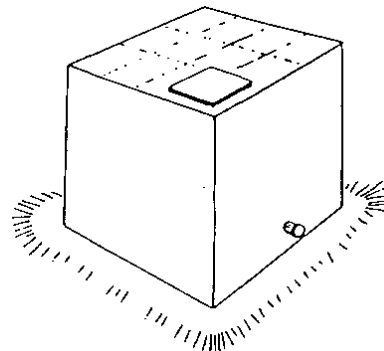
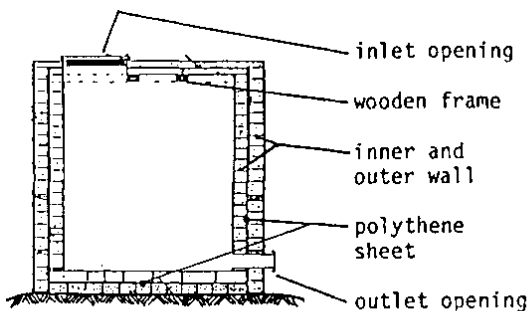
Kupp is an indigenous storage structure used for storing the food grains in agricultural farms itself. It is designed in conical shape with wide circular base for better stability.

**Scientific Storage Structures**

**Indoor storage structures**



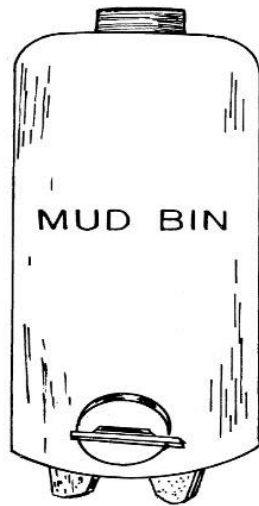
**Indoor metal bins**



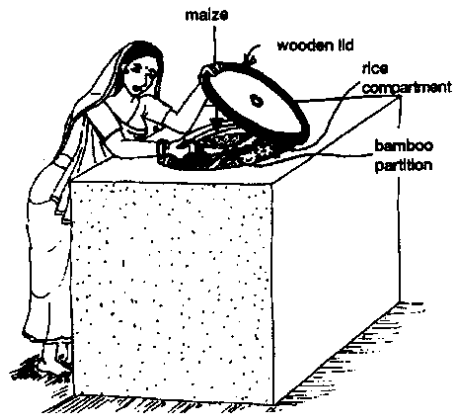
**Pusa bin**

**Pusa bin**

Concept and design of Pusa bin which constructed with the help of mud or bricks has been proposed from Indian agricultural research institute. Polythene sheets was placed within the bricks or mud layers for providing proper sealing which act as moisture barrier. Pusa bin was constructed on the mud bricks platform which covered with plastic sheet of 700 gauges for protecting the stored grain properly that is why it is also known as “low density polyethylene” storage structure.



**Mud kothi (Mud bin)**



**Pucca kothi**



**Aluminium bin**



**Gharelu bhandar**

**Outdoor storage structures**



**Cover and plinth storage**



**Flat bottom metal bin**

**Cover and plinth storage**

Large quantity of food grains was stored with the use of large scale storage structure. Cover and plinth storage (CAPS) structure is constructed with the help of wooden crates which fixed into the grooves of brick pillar and generally first stack has been taken place nearly 1.17 feet height above the ground

**Flat bottom metal bin**

Metal silos with flat bottoms are used to store materials for extended periods of time. While welded construction is available, flat-bottom metal silos are usually built using carbon steel body sheets that are bolted onto a frame made of structural steel stiffeners.



**Hopper bottom metal bin**

**Hopper bottom metal bin**

Hopper bottom metal bin is cylindrical in shape, locally constructed on base of metal tube with the help of bamboo and expandable clothes and another hand in improved structure, bamboos has been replaced with galvanized iron or aluminum sheets for getting more durable structure.



**Silo storage**

**Silo storage**

Silos are constructed either with metal or concrete but according to the economical point of view metal silos are better than the concrete silos.

### Special type of Storage Structures



**Air tight storage**



**Cool / storage**

#### **Air tight storage**

Air tight storage systems used for storing the food grains in absence of oxygen because of insects-pests cannot survive in the storage structure without oxygen. Containers with tight fitting lid (like basket made by bamboo and layered with clay, plastic, metals, etc.) or underground storage structures have been used for storing the grains because unavailability of air retard the micro-organism, insect and pest growth completely and enhanced the storage life of the food grains.

#### **Cool / storage**

Pallets made by either wood laths or poles used for storing the food grain bags in form of stacks. Proper arrangement of stacks is important for adequate air circulation throughout the stacks for maintaining the moisture content and temperature of the food grains and for preventing the stored food grains from water, pallets has been covered with plastic sheets.

### **CONCLUSION**

Adequate and efficient storage structures are required to minimize the losses during grain storage because consumption capacity has been increasing with rapid growth of world population. Mechanized high yielding practices as well reducing the food grain losses up to minimum extent has been essential for accomplishment of supplying the food grain as per capita of food grains amount required. Among the total post-harvest losses of food grains, 10–15% losses are due to unavailability of advance and appropriate storage structures, which contribute huge grain deficit that is why for increasing the per capita food grain availability and better market price a hygienic, economical and scientific storage structure has been needed.

### **REFERENCES**

- Deshwal R, Vaibhav V, Kumar N, Kumar A and Singh R. 2020. Stored grain insect pests and their management: An overview. *Journal of Entomology and Zoology Studies* 2020; 8(5): 969-974.
- Singh V, Verma DK, and Srivastav PP. 2017. *Food Grain Storage Structures: Introduction and Applications*. <https://www.researchgate.net/publication/329744040>.