

Lecture 10

Traditional Storage Structures

Drying & Storage Engineering
(PFE-304)

TRADITIONAL STORAGE STRUCTURE

Popular Traditional structure are different type

1.Morai type

2. Bukhari type

3.Kothar type

4.Mudkothi type

5.Muda type

6.Kanaj type

7.Kuthla type

8. Matka type

9. Basket type

10. Wooden box type

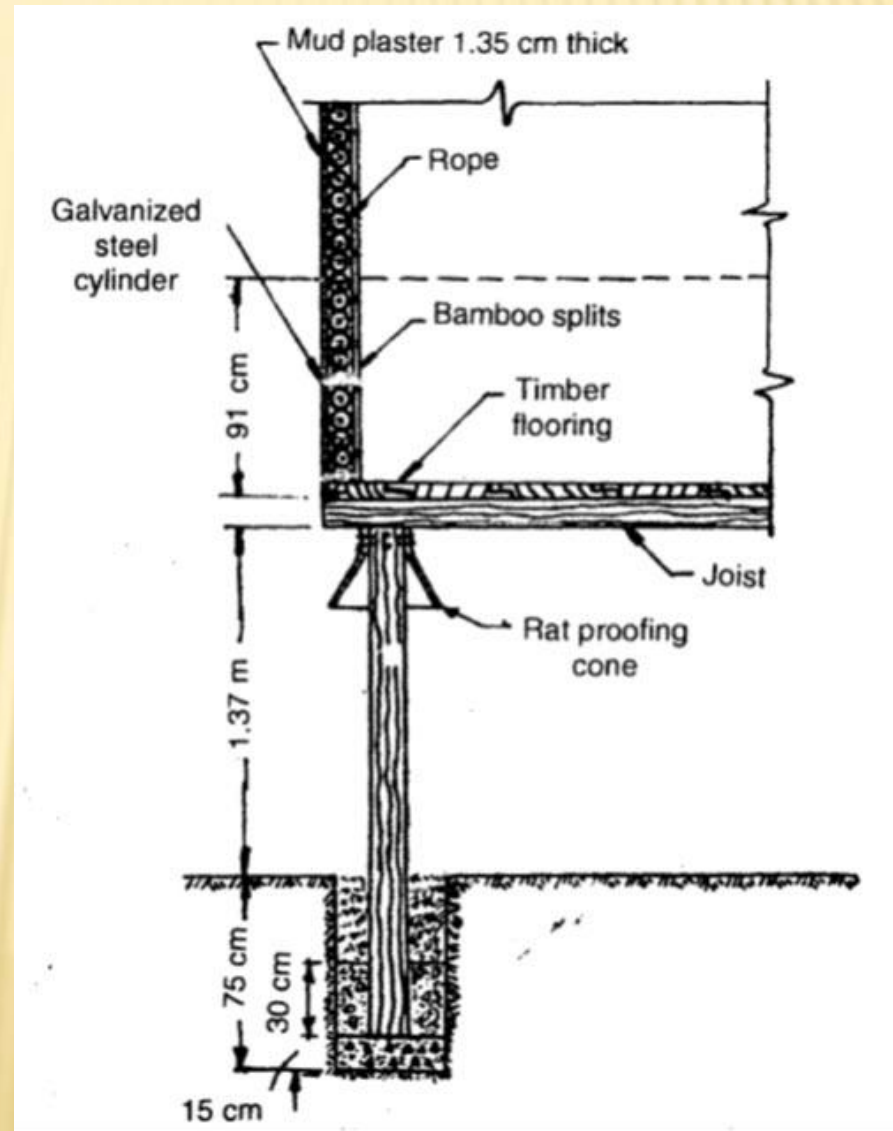
1. MORAI TYPE STORAGE STRUCTURE

- ✘ In rural areas of eastern and southern regions of India
- ✘ Grains – paddy, maize, sorghum
- ✘ Capacity – 3.5 – 18 tones
- ✘ Shape- inverted truncated cone
- ✘ Made on a raised platform supported on wooden or masonry

1. MORAI TYPE STORAGE STRUCTURE

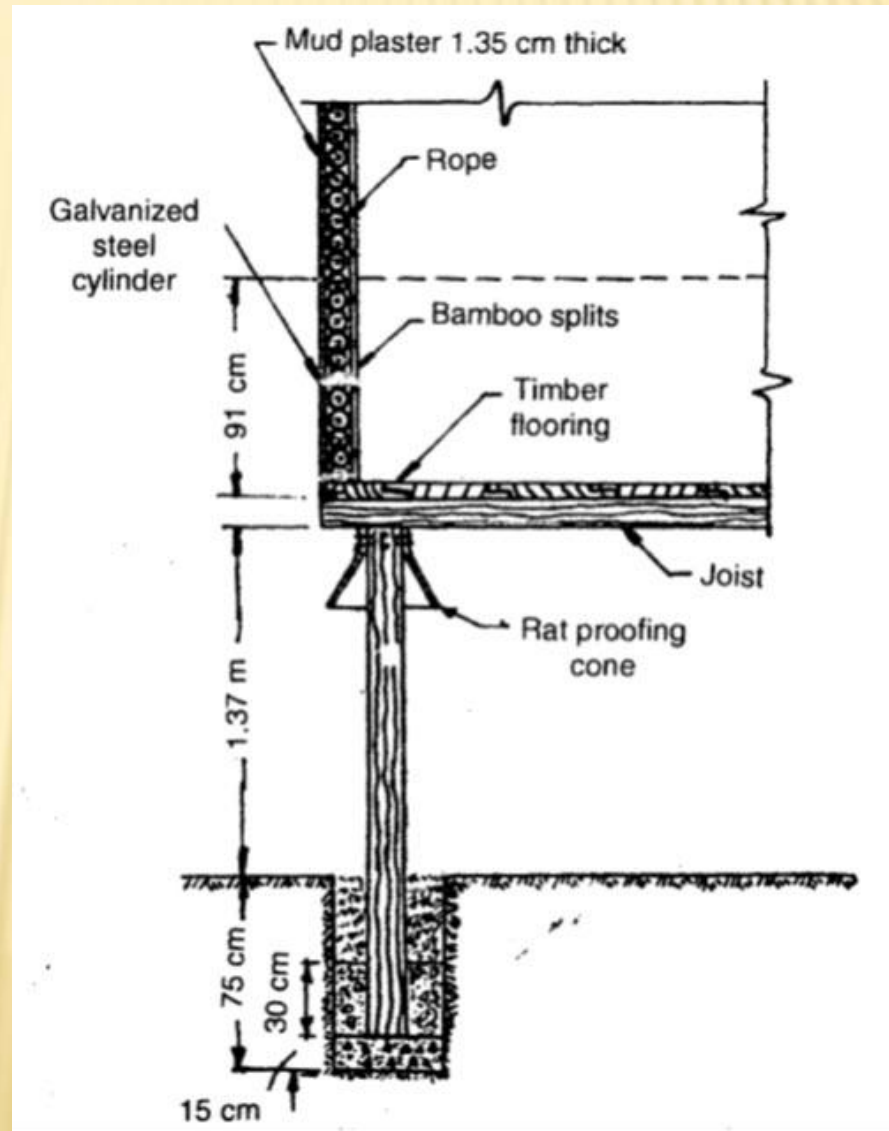
Construction:

- ✘ In improved morai type storage structures, the circular wooden floor is supported on timber pillars.
- ✘ The floor planks are joined together with lap joints.
- ✘ This wooden floor is surrounded by 22 gauge corrugated metal cylinder of 90 cm height.
- ✘ The cylinder is nailed to the wooden floor.
- ✘ Inside the cylinder, 75 cm diameter ropes made of paddy straw or similar material are placed, upto the height of metal cylinder.
- ✘ Then, bamboo splits are placed vertically along the inner surface with no gap in between the splits.



1. MORAI TYPE STORAGE STRUCTURE

- ✘ The height of bamboo splits is kept equal to the desired height of storage structure.
- ✘ Now grain is loaded inside the bin so formed upto a height of 90 cm or equal to metal cylinder.
- ✘ Now, the bamboo split becomes erect in position. Afterwards, loading of grains and winding of straw rope on splits go on simultaneously.
- ✘ The grains are thus loaded upto the total height of morai structure.
- ✘ About 1 cm thick mud plaster is done on the straw rope.
- ✘ The structure is covered with a conical roof with ample overhang all around.

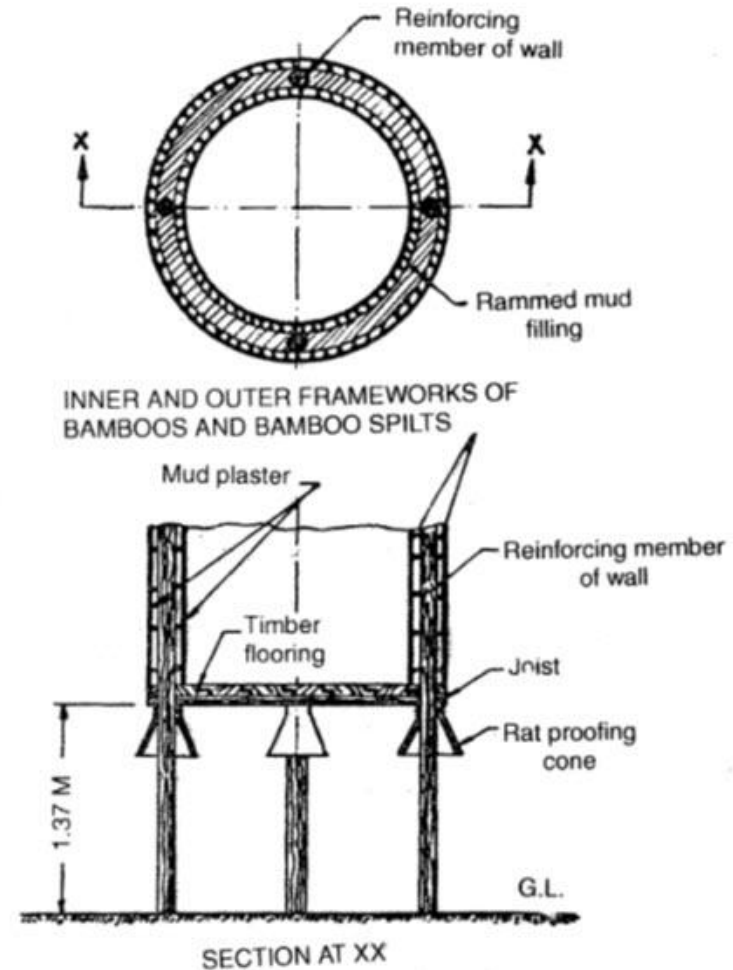


2. BUKHARI TYPE STORAGE STRUCTURE

- × Grains – wheat, gram, paddy, maize and sorghum
- × Capacity – 3.5 – 18 t or smaller
- × Cylindrical in shape
- × Made of mud or combination of mud and split bamboo
- × Raised above the ground by wooden or masonry platform
- × Improved type
- × Rat proofing cones

2. BUKHARI TYPE STORAGE STRUCTURE

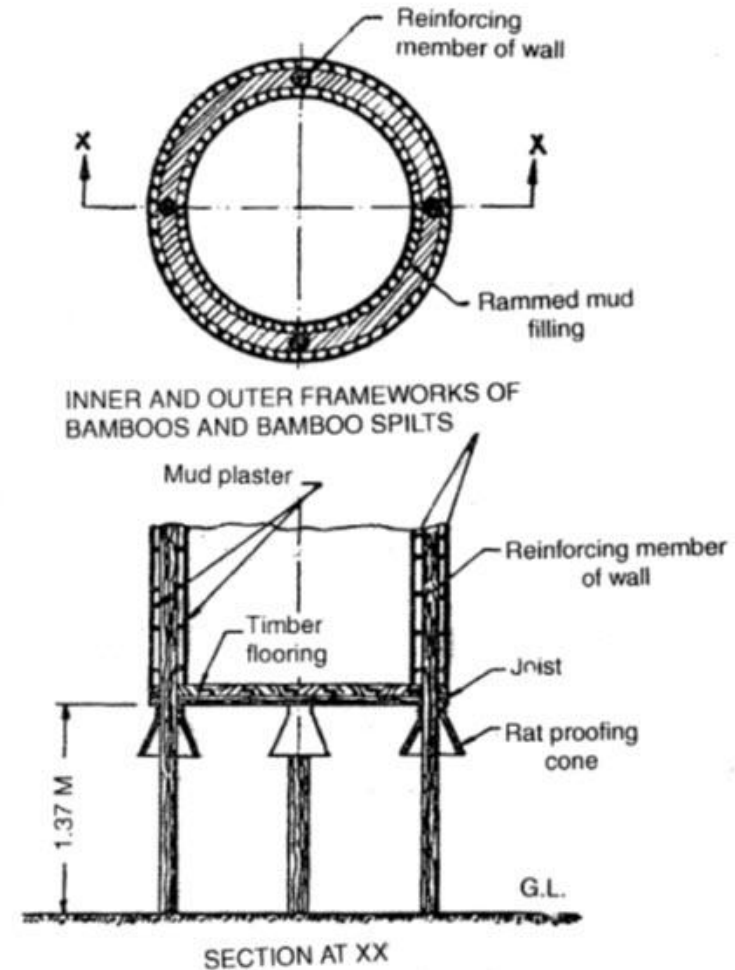
- ✘ The floor of the bin is made either by timber planks or by bamboo splits, plastered over with mud mixed with dung and paddy straw.
- ✘ The walls of the structure are made of timber or bamboo frame work and bamboo matting.
- ✘ Over the walls, mud-straw plaster is applied on both sides.
- ✘ An overhanging cone type roof is provided on the cylindrical structure.
- ✘ The roof is generally made of bamboo framework and straw.
- ✘ In improved bukhari type structure, the basic shape remains the same but the material and method of construction have been improved to make the structure more safe and durable.
- ✘ The circular floor of structure is either made of wooden planks joined by lap joints or by a double layer of bamboo splits closely set at right angles to each other.



Courtesy : Indian Standards Institution

2. BUKHARI TYPE STORAGE STRUCTURE

- ✘ Over the floor, about 5 cm thick mud plastering is provided.
- ✘ The walls of structure are made of two sets of strong bamboo framework.
- ✘ The inter-space is filled with mud.
- ✘ The walls on both sides are plastered with mud.
- ✘ The roof is conical and made of bamboo frame-work and covered with paddy straw or similar other thatching material.
- ✘ The top of the conical roof is covered with 4 to 5 cm thick mud layer to provide additional protection from rains.
- ✘ The structure is raised on timber or masonry pillars to a height of about 1.5 m from ground level.
- ✘ Rat proofing cones are placed on all the four pillars to avoid rats entering the storage structure.



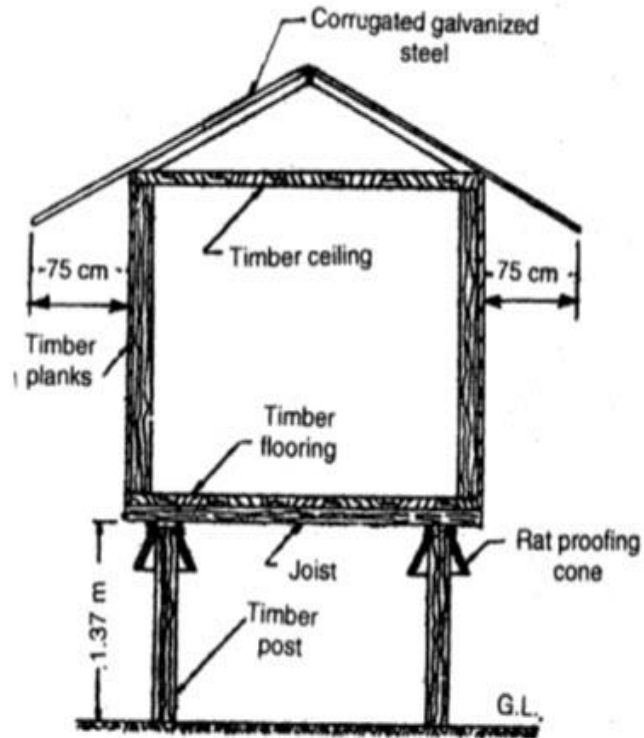
Courtesy : Indian Standards Institution

3.KOTHAR TYPE STORAGE STRUCTURE

- ✘ Store – paddy, maize, sorghum, wheat
- ✘ Capacity – 9-35 t
- ✘ Structure –made of wooden box
- ✘ Improved Kothar – 5cm thick wooden planks and beam
- ✘ Storage structure is raised on timber post to a height of about 1.5m above the ground
- ✘ Rat proofing cone

3.KOTHAR TYPE STORAGE STRUCTURE

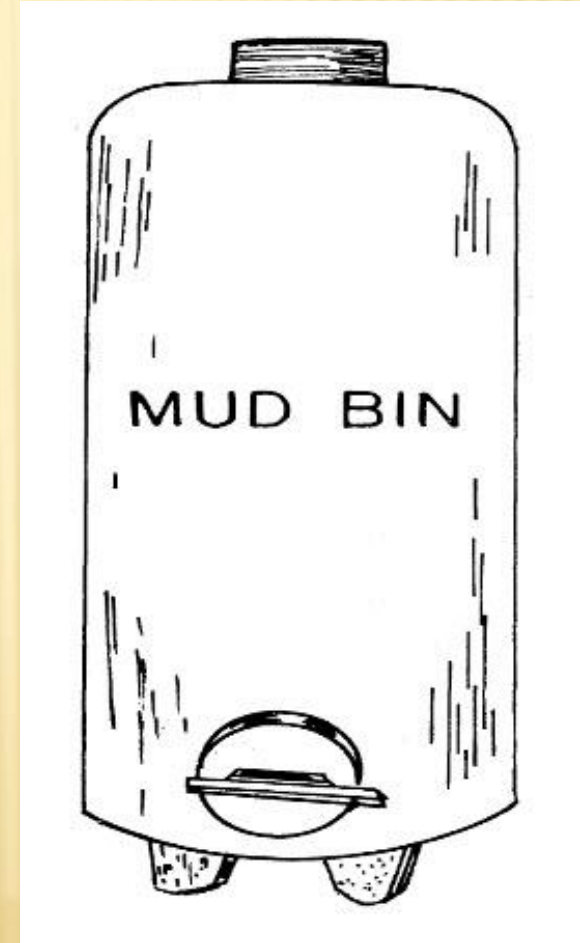
- Both the floor and walls are made of wooden planks whereas the thatched or tiled roof is placed over it to protect the grains from the sun or rain.
- The improved Kothar structure is generally made of 5 cm thick wooden planks and beams.
- The walls and floor are made in such a way that no gap exists between the planks.
- The gabled roof on the top may be made of planks or corrugated metal sheets and should be sufficiently overhang on all sides.
- The storage structure is raised on timber post to a height of about 1.5 m above the ground.
- Rat proofing cones are provided on all posts to avoid entry of rats in the structure.



Courtesy : Indian Standards Institution

4.MUD KOTHI TYPE STORAGE STRUCTURE

- ✗ Used –in rural areas of India
- ✗ Grain – rice, maize , sorghum
- ✗ Capacity – 1-50t
- ✗ Shape – Rectangular, Cylindrical
- ✗ Made – Mud mix with dung straw



HAPUR KOTHI



5.MUDA TYPE STORAGE STRUCTURE

- × Used – rural areas of Bihar
- × Grain – Paddy ,sorghum
- × Capacity – 1-3 t
- × Shape – Cylindrical

6.KANAJ TYPE STORAGE STRUCTURE

- × Used – Rural areas of Karnataka and Maharashtra
- × Capacity – 1-20 t
- × Shape – Cylindrical
- × Made – Bamboo splits and mud
- × Roof – Conical and thatched

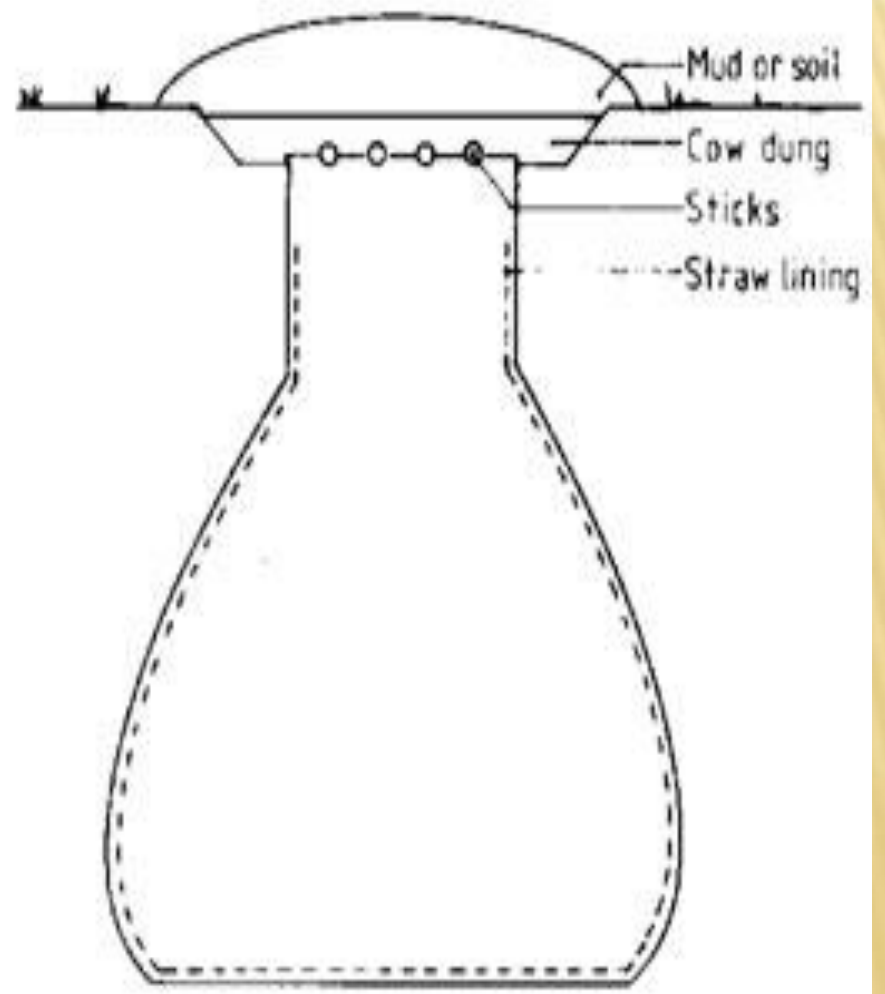
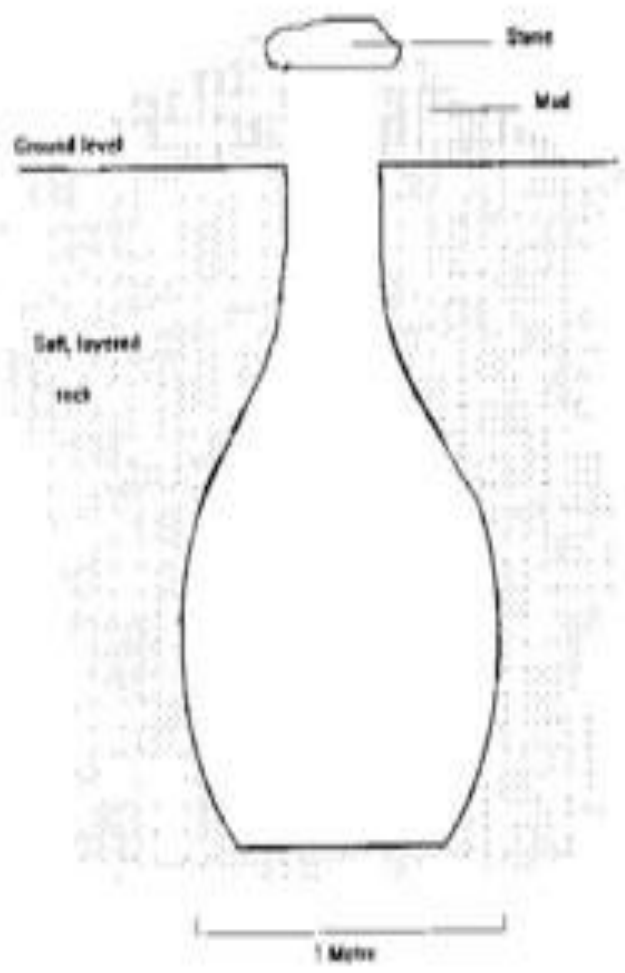
7.KUTHLA TYPE STORAGE STRUCTURE

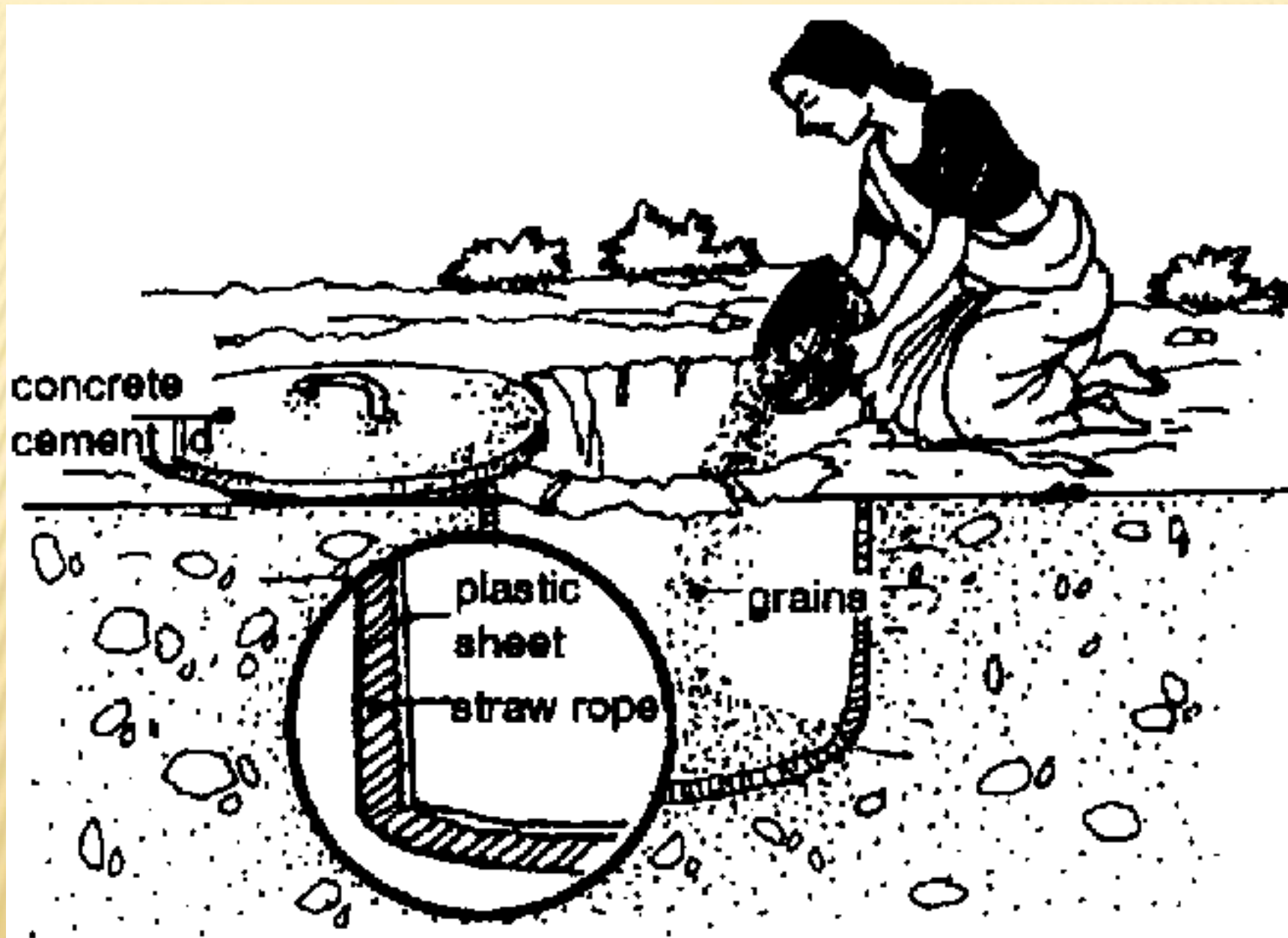
- ✘ Used – Rural areas of Bihar and Uttar Pradesh
- ✘ Made – Burnt mud
- ✘ It is kept inside area



8.MATKA TYPE STORAGE STRUCTURE

- ✘ Used – Haryana, U.P, M.P, Jharkhand
- ✘ Grain – paddy , rice, pulses
- ✘ Made – Sand clay & burnt in fire
- ✘ Painted by water color
- ✘ Capacity – 20 kg , 30 kg depend on size
- ✘ Single opening with cover





9. BAMBOO BASKET STORAGE STRUCTURE

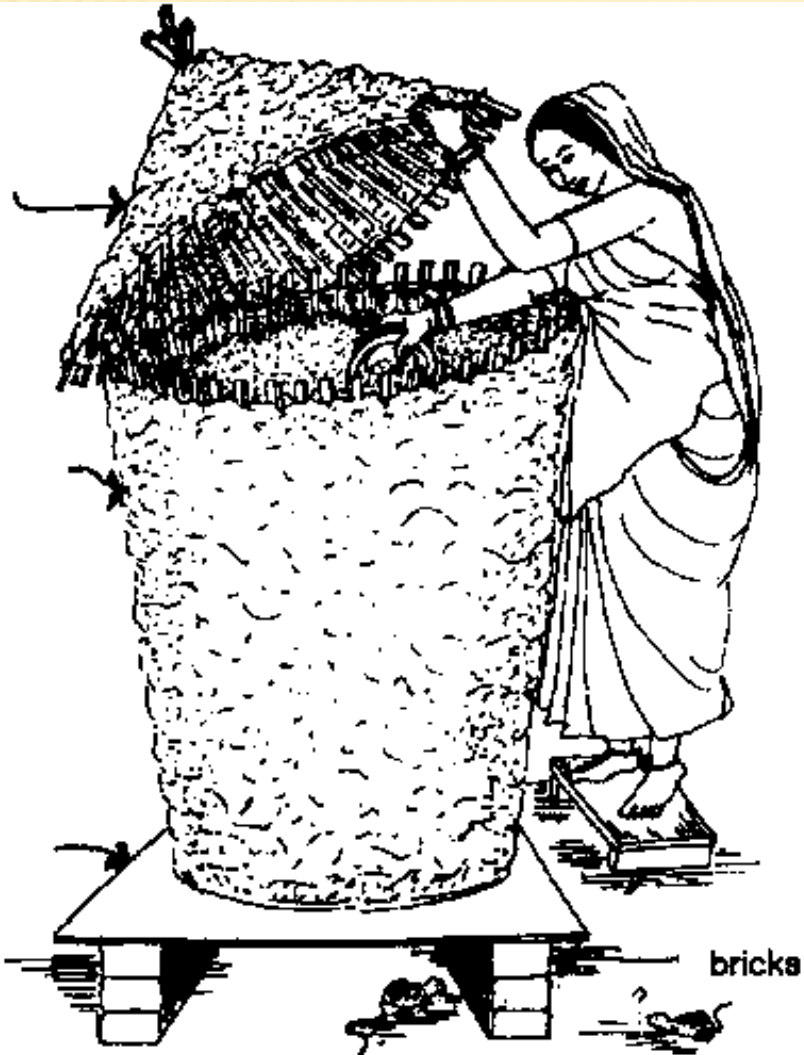
- ✘ Used – Himachal Pradesh, Uttrakhand, Jharkhand, Assam
- ✘ Grain – wheat , sorghum , paddy
- ✘ Made – Bamboo , mud & plastered by cow dung
- ✘ Capacity- 5-10 kg
- ✘ Single opening at upper side



10. WOODEN BOX STORAGE STRUCTURE

- ✘ Used – Karnataka , A.P , M.P , Chhattisgarh
- ✘ Grain – Rice, pulses, wheat
- ✘ Size varies – 2-3” , 2-4” & 4-6” length
- ✘ Made – Wooden
- ✘ Shape – Rectangular , square
- ✘ Capacity – 100 kg

OTHER STORAGE STRUCTURES



Puri



Gade

Thanks