IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

TRADITIONAL SEED STORAGE PRACTICES IN SHIMOGA DISTRICT OF MALNAD REGION KARNATAKA, INDIA

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ABSTRACT:

Traditional knowledge is the accumulated knowledge, skills and technology of the local people which is derived from the local interaction of human beings and their environment**.** The study was conducted at different taluks of Shimoga district, Malnad region. The objective was for documenting the storage practices adopted by the people of malnad region. Documentation was done by direct interview and discussions made with the local people. In this paper seed storage practices followed and traditional seed storage structures were documented.

Keywords: Storage structure, Malnad Region, Traditional storage structure

INTRODUCTION:

Seed storage may be defined as the preservation of viable seed from the time of collection in the field of agriculture until they are required for sowing, consumption or any other purposes. India produces about 259.32 million tonnes of food grains annually. About 60-70 % of food grains are stored by the farmers for their own consumption (Prakash *et. al.,2016*). The Indian farmers prefer to store food grains in traditional ways using different types of storage structures made by locally available materials. While big farmers keep food grains in the storage facilities provided by government agencies like Food Corporation of India. (Prashant and Rama -2014)

The traditional methods of grains storage and preservation dates back to time immemorial which were developed in the communities and passed on from generation to generation. One fourth of developing countries, farmers keep their products at the village level. The traditional storage system is considered to be effective or give satisfaction in which they continue improving so as to sustain grains from damage. Grains can be stored indoors, outdoor or at the underground level in structures ranging from those of mud to modern bins. The storage containers are built from a variety of locally available materials differing in design, shape, size and

functions Storage practices differ and there are small or big storehouses, indoor or outdoor, temporary or permanent and individual or community storage design. These structures have open storage system, semi-open storage system and closed storage system. These traditional approaches have been used for many years with little or no modification and are successful because of the application of scientific values, though accidentally. The choice of a traditional storage system is often relevant to climate, but regional natural resources and customs also influence the choice of the storage methods. (Mobolade *et.al.*,- 2019).

Storage structures are playing key role to prevent the losses and keep the grain safe during storage by minimizing the effect of rodents, microorganism and environmental factors to feed the growing population of the world. Due to application of several modern technologies several modified and advanced grain storage structures come into the picture and widely used by different industries and governments to safely store the grain up to long duration but still advanced storage structures and modern practices has not been available as much it is needed to store the entire surplus food grains of world due to which a huge percentage of total produced food grains (nearly 10–20%) of world were going to waste every year.(Vishal Singh *et. al* -2017).

MATERIALS AND METHODS:

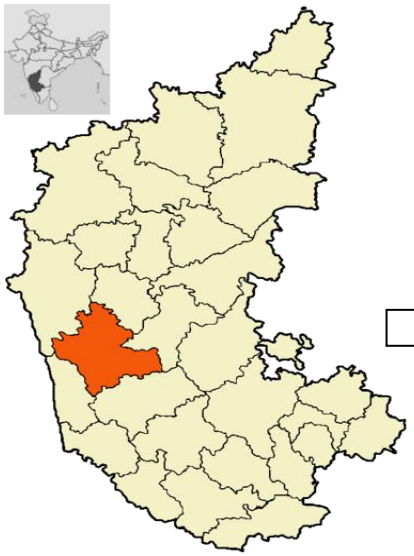
FIELD SURVEY:

Field survey was undertaken to different taluks of Shimoga. Seven taluks like Soraba, Bhadravathi, Thirthahalli, Sagara, Shimoga, Hosanagara and Shikaripura were considered for the field work. It was learnt from the literature that except Thirthahalli, Hosanagara and Sagara, other taluks were found as semimalnad regions. However, two villages representing each taluk were visited to study the storage practices followed in each village. During the visit, local people were communicated for collecting the information regarding all the details through one to one discussion. The details pertaining to the storage structure, type of material used for construction, method of construction, longevity of seed storage, type of crop and its management were collected from the owners of the storage structure and was documented accordingly and compared.

STUDY AREA:

Shimoga district is located in the central part of the state of Karnataka, India. The city lies on the bank of the Tunga River. Being the gateway for the hilly region of the Western Ghats, it is nicknamed as "***Gateway of Malnad***". It covers an area 8477.84 sq.km and lies in the western part of the Karnataka state. A region known for plentiful rainfall and lush greenery and it is a world heritage site. Shimoga is part of Malnad region, it receives more rainfall in a year and the rainfall aggregates up to 3295mm of precipitation with an average high temperature of 35.5°C. In summer (April–May), temperature crosses 36 °C at Shimoga. In such conditions seed storage is a challenge. However, the people of this area follow the traditional storage practices to preserve the seeds from atmospheric moisture, insects and pests.

Shimoga seven thaluks at the rate of two major villages representing each taluks was considered for the studies. (Table-1).



Study site

Major thaluks of Shimoga

RESULTS:

TRADITIONAL SEED STORAGE STRUCTURES:

Table: Studies on the major storage structures in study area

Sl No.	Taluks	Villages	Storage structure found	Type of seed stored	Longevity
1	Hosanagara	Arasalu	Kodambae	Paddy	10 years
			Bamboo structure/Thombe	Paddy	10 years
		Rippenpete	Kodambae	Paddy	10 years
			Bamboo structure/Thombe	Paddy	10 years
2	Sagara	Chippalli	Wodden structure	Paddy	20-30 years
			Mud pots	Paddy	10 years
			Cloth bag	Paddy	5 years
		Chikkanellur	Wodden structure	Paddy	10 years
			Kodambae	Paddy	10 years
3	Thirthahalli	Guddekoppa	Wodden structure	Paddy	10 years
			Kodambae	Paddy	10 years
			Bamboo structure/Thombae	Paddy	05 years
		Guddekeri	Wodden structure	Paddy	10 years
			Kodambae	Paddy	5 years
4	Shikaripura	Kattigehalla	Calabashes	Vegetable seeds	2 years
			Kodambae	Maize	2-3 years
			Bamboo structure/Thombae	Maize	5 years
		Esuru	Kodambae	Ragi	5 years
			Bamboo	Ragi	5 years

			structure/Thombae		
5	Soraba	Byrekoppa	Cloth bag	Ragi	10 years
		Bhadrapura	Cloth bag	Paddy	10 years
6	Shimoga	Choradi	Underground storage structure	Paddy	10 years
			Earthen pot	Pulses	2 years
			Cloth bag	Pulses	2 years
		Gajanur	Cloth bag	Paddy	10 years
			Earthen pot	Pulses	5 years
7	Bhadravathi	Bhadravathi	Bag storage	Ragi	1-2 years
				Paddy	1-2 years
				Pigeon pea	06 months
		Agasanahalli	Bag storage	Pigeon pea	06 months

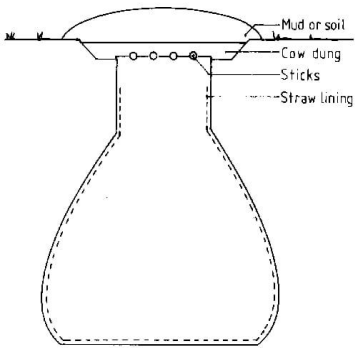
A) <u>LARGE SCALE:</u>-

Bamboo structure/Thombe:-

Bamboo structure is one of the types of old storage structure. It is very common in paddy and Ragi growing areas and mainly cereal type of seeds can be stored. It is the accumulated knowledge of house hold practices over the generation by observation. This knowledge of the people has been termed as indigenous knowledge. Capacity of seed storage in this structure is 500 kg or more.

Maximum time duration to store the seeds are 5 years. This structure is made by bamboo shoots in the form of cylindrical shape with wide base and narrow mouth. A mature bamboo is splitted then dried thoroughly under the sunlight. A cylinder shape structure is prepared after all the walls of storage structure are sealed with plaster or coated with cow dung slurry on both sides then dried thoroughly then with paddy straws and the upper portion of the straw covered by gunny bag.

Underground storage structure:



Underground storage structures is conventional seed storage structure which were used in earlier days this structures was used to store bulk of seeds hence referred as bulk storage structure.

These underground storage structures are also modified by constructing brick and cement sometimes circular pits are 100-400cm depth and 50-100cm diameter at neck and 250-300cm at the bottom was made for filling and emptying the seed on opening is maintained at the top before filling the seeds the bottom and side are packed with husk straw further after filling the seeds it is covered with sticks above the neck and molded with straw and mud and smeared with cow dung. This structure is exclusively used for storing the cereals for about 100-200 quintal.

Kodambae:-

It is one of the indigenous storage structure used in most of the malnad areas. It is used as a bulk storage structure. Generally it is built in a suitable area at back yard. It is constructed by placing a big stone in a concentric form. Above the stones wooden sticks are placed to form a platform above which one meter long wall is constructed either by using mud/cement. The top of this structure is covered with a bamboo sticks or coconut/palm leafs one side of the roof had a small door like opening inside this door there is a space made out of a wooden board convenient for a person to enter and collect the stored seeds. Another person may stand outside and collect it. There is a wooden stick for keeping the door open. Sometimes ladder is also used to climb the roof. Farmers generally keep an inverted part at the tip of the roof to avoid rain water seepage. Studies have revealed that these storage structures are durable for a minimum of 100years.

Wooden structure:-

This is one of the old storage structures. Wooden structure is very common to store a paddy or cereals type of seed can be stored. Capacity of seed storage in this structure is 5-10 quintals. Time duration for store the seeds are 10-20 years. This structure is made by wooden boards, local woods is painted black. The height of wooden boards is 1.5-2 meter and it builds 8cm above the ground level and support with four wooden poles. The whole unit is split into four equal parts and each unit used as a drawer for storage purposes. Tight wooden board is placed at the top as a roofing material small outlet provided at the base 30*15cm is removal of seeds from the storage structures and also provide inlet about 30*20cm the capacity of storage structure is 1000kg.

Mud bin:-

These storage structures are quite common in rural areas for storage of grains and other seeds. The capacity of such storage structures varies from 1 to 50 tones. There are made from mud mixed with dung and straws. These structures are generally rectangular in shape but cylindrical bin is also common in some region. There are many size and dimensions of bin made for storing grains.

To provide moisture proof and airtight conditions polyethylene film of 700 gauge thickness on all the sides of the mud bin. It was mainly used for storing maize, wheat, paddy and daira.

This structure is plastered and painted by clay and cow dung and opening at upper side of mud bin for filling the grains. The opening is made of same materials. After filling the grains it is plastered and painted with clay and cow dung.

B) SMALL SCALE:-

Earthen pot :-

With the help of clay, straw and cowdung in ratio 3:3:1 earthen structures are made, sun dried and then a burnt in fire used for storage of paddy, wheat , sorghum, oil seed and pulses pots are arranged one above the other depending upon the size of the pot. Life is 8-10 years. During rainy season it may develop cracks and moisture absorption following by insect and mould infection. Capacity is 5 to 10 quintol.

Cloth bag:-

Cloth bag is one of the old seed storage structure. It can be used to store a seeds and in this storage structure, gaseous exchange and moisture exchange occurs between the storage material and external atmosphere as there is gaseous exchange. Seeds can be stored for a long period. Cloth bag is useful to store a seeds because it maintains a seed health. Cloth bag is very easy for transportation. This is also one of the type of old storage structure and it will be done initially with the help of cloth from households and is very common in cereals/pulses type of seeds storage.

Calabashes, gourds:-

These small capacity containers are most commonly used for storing seeds and storing pulse grains such as cowpeas. Having a small opening, they can be made hermetic, by sealing the walls inside and outside with liquid clay and closing the mouth with stiff clay, cowdung or a wodden with cloth.

DISCUSSIONS:

Field survey was undertaken to seven taluks of Shimoga district. Two villages representing each taluk were visited to understand different storage structures used to store the seeds. About 14 villages were visited. Based on the information from the local people, houses we visited and visual observations were made and documented. We could able to study about eight different common storage structures used as traditional storage structure for storing the seeds and grains. Out of eight storage structures, Kodambae was very common in the backyards. However cloth bags were also found as uncommon. Calabashes were very rare however they found to be most durable storage structure maintained by the people. In majority of the places surveyed, Paddy was found as a common storage material which was stored for a period of 10-20 years. However pulses and vegetable seed storage ranged from 6 months to 2 years only.

Malnad regions were known to have heavy rainfall in earlier days. Therefore people used to practice the traditional storage structures due to unavailable climatic conditions. Also as malnad is known to grow mainly paddy, people have practiced storing paddy for a long period.

The storage structure studied were very good old practices and were considered as the heritage by the local people. Most of them were moist proof storage structures as the area was with heavy rainfall. However these structures were found to be disadvantages in handling seeds and observed that due to the long term storage, the seeds were suppose to loose their viability with fermented smell.

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