

Endangered Traditional Seeds Conservation through Community-Based Seed Banks

ABSTRACT:

Community seeds are conserved through volunteering farmers who kept a small area of their land specifically for growing endangered, vulnerable crop varieties. The Self help groups collect seeds from diver's origin. One by one can borrow these seeds, which are returned in double the quantity of what they borrowed. The federations have also organized' to promote awareness and practices for traditional seed conservation. After that setting up the pioneer seed bank by the people's organizations at Balehalli in Hassan District in early 2000-2001 has been replicated in many villages. Jayanthi and Vasantha of Hullikere village of Hassan district are skilful in community seed bank management and train many other women in setting up and managing community seed banks. That has further increase the process of setting up community seed banks in innovative agricultural areas like Balehalli, Belavaneralu, Hullikere, Hanthanakere, Bellathahalli blocks etc.

I.INTRODUCTION

Traditional Community based Seed Banks accomplish different purposes of sustainable agriculture for small and marginal village farmers. Community based seed banks are more beneficial for small and marginal farmers who are involved in subsistence agriculture for their self-sustenance rather than commercial agriculture. These community based seed banks serve as focal point in conserving, protecting traditional indigenous seed diversity of farm involving farmers' community. Community based seed banks serve local farmers to form an informal seed distribution system prevailing in villages since ancient time at no or very low cost. Community farmer's participation in managing indigenous biological diversity provides too great self esteem to farmers and sense of belonging for local landraces (Malik SK *et al*, 2013).

Community based seed banking system is run, maintained and promoted by SHG'S to facilitate good quality seeds. These farmers very well understand the importance and qualities of their land races as they are growing these for centuries for their home consumption. Community based Seed Banks are places of storage where indigenous, endangered seed varieties are conserved and managed by community members. These external conservation places provide farmers with free and easy access to indigenous seeds under the condition that a farmer returns double of the quantity of seeds he or she borrowed. It will not only reduce farmer's dependence on agri seed agencies but also help conserve the biodiversity of their rural villages (Community Seed Banks in Nepal Past, Present, future Proceedings of a National Workshop, Pokhara, Nepal 2012).

Storage of seed in mud pots or in granaries or in containers made of ropes and plastered with mud or in well baked clay pots, are the some specific practices found in use during these periods. Community based seed banks are established by BIRD-K, efforts for biodiversity conservation through community training, awareness and empowerment. The community seed banks are managed mostly by women, community seed banks have successfully harnessed the role of women in Indian agriculture as curator of biodiversity. Traditionally, it has been women who collect and store seeds after every harvest. Field staff

of BIRD-K facilitates the set up of these seed banks by building a strong relationship with the community. Beneficiaries are trained on seed selection, collection, mode of transport, keeping storing seeds in the proper manner, lending seeds to those who request them and keeping records of seeds returned.

A very important duty of Community based Seed Bank members is promoting traditional agro based practices through the use of locally available seeds. These members are responsible for maintaining the quality of seeds by monitoring the farming techniques of members who contribute to the seed bank and ensuring that they employ non chemical farming method. They are, therefore, trained in seed selection, collection and storage methods and other aspects of seed bank management. After setting up a seed bank, members of existing women's SHG's within a community are invited to a meeting. A group is then selected from among these members to manage the seed bank. Meetings are held regularly in order to carry out the seed bank functions. The federations have also organized' seed mela's to promote awareness and practices for diverse seed protection and conservation. With setting up the first seed bank by the people's organizations at Balehalli in Hassan district in early 2000-2001 it has been replicated in many villages. Community based seed bank net work project was implemented from 2001 to 2005 as a partnership with NGO's across various agro-climatic zones of Karnataka (Website: www.birdk.org.in).

The aim and objective of the project was to ensure the seed security of farmers by redirecting them to traditional self-reliant agricultural practices so as to reduce their vulnerability. Identifying important traditional seed varieties and orienting the agricultural community towards conserving and cultivating them and focusing on indigenous seed varieties, setting up community based seed banks for seed exchange, distribution and utilization. The experts in seed bank management and training many other women in setting up and managing seed banks. This has further accelerated the process of setting up seed banks in new areas like Balehalli, Belavaneralu, Hullekere, Hanthanakere and Belathahalli villages.

II. MATERIALS AND METHODS2.1 STUDY AREA:

Study area:



Figure 1 Arasikere Taluk Map

Arsikere is a town and taluka in the Hassan district in the state of Karnataka, India. This area is known for its coconut production and the Malekallu Tirupathi hill. As of 2001 India census, Arakere had a population of 2,206 with 1,126 males and 1,080 females. Arasikere is located at 13.31°N 76.26°E. It has an average elevation of 807 meters (2,648 ft). Arasikere is situated about 44 kilometers from Hassan and 166 kilometers from Bangalore. The winter temperature averages between 14 °C (57 °F) and 26 °C (79 °F). Summer temperature average between 19 °C (66 °F) and 33 °C (91 °F). Coffee, Black Pepper, Potato, Paddy and

Sugarcane are the major agricultural crops. Hassan district lies partly in the "mala nadu" tract and partly in the southern "maidan"(plains) tract.

2.2 Formal and Informal Meeting:

The genuine work was done in respective stages. First informal discussions with farmers and the community and self-help groups were held to find out and revive the endangered, vulnerable and vanishing local varieties. From which the village showed an interest in conserving them, a formal discussion was held to do seed mapping that is, determining species that grow vigorously in the region. Vulnerable species were then collected and seed banks were created to preserve them for multiplication. Community seed banks was managed by local self-help groups, the seed banks collect, distribute and multiply local varieties of seeds in an organized manner. This is to ensure farmers' increase seeds, which reduces their dependence on markets for their supply. From the above a Seed Management Committee, which is a federation of community seed banks, was created, which meets regularly to share information and discuss various issues. After project withdraws from the area, this community seed bank will take over the management of the community seed banks. Periodical interaction and training of associated farmer families and farmer members of Seed Bank Monitoring Committee to make them aware of latest innovations in informal seed system and to get their input to improve on going system.

2.3 Training for Self-Help Groups:

During the project work in the villages, BIRD-K has consistently promoted organic farming, and has held workshops periodically on seed banks, vermi composting, green manure and bio-pesticide preparation to self-help groups in managing the seed banks especially in the area of seed viability assessment, seed storage methods, importance of seed moisture content and humidity, fumigation techniques, seed grading, maintaining seed purity and quality, packaging and data recording. To maintain transparency in managing the Community seed banks, display of information and regular updating of all data including relevant information pertaining to seed bank in its premises on black board. Assessing the quality of seed at the time of distribution and while taking it back from the farmers for storage. Linking the seed banks with farmer producer and marketing company for generating the market for the surplus seeds available in the seed banks to extend financial support to the farmers and seed banks.

2.4 Community Seed Mela's:

Community seed mela's or festivals are also held at certain times of the year according to the agricultural seasons, which is easily disseminate information, seeds, and spread the messages, believes.

2.5 Management Monitoring seed quality and health: Seeds stored for the long term should be regularly monitored for their moisture levels, safe storage without any external damage to containers and most importantly it should not be infected with pest or pathogen during storage. Separation of inert material, weeds and seeds of other crops from the seed lot is known as cleaning. Removal of smaller and wrinkled seeds from the well filled healthy seeds. After cleaning and grading seeds moisture content of seeds in the community seed banks can be accessed through touching or chewing the seed. In case of high moisture, the seeds need to be completely dried under the sunlight. After complete drying the seed need to be stored in the clean and dry containers. In case of unfavorable weather conditions, drying

must be done artificially Seed obtained from the threshing floor is dried to the appropriate moisture level. Traditional method of seed storage is use of outer casing of gourd vegetables are used to store the seeds of vegetable crops. Community seed banks store the cereals in tall mud pots or bins, which is known as vaade or panaja or kanaja in Kannada. These are made up of clay soil and plant fibers. The mud pot of about 1-2 m height has a narrow opening at the top and covered with a tight lid. Seeds and grains can be stored in it can be taken out only through the top opening. In some villages earthen pots made of clay to a convenient size are used from olden days for storage purpose. Walls of the pots are coated with clay and the mouth of the pot is closed with cow dung paste. Pots are arranged vertically one over the other depending upon the size of the pot.

In some villages gunny bags are used for storing seeds which is durable and inexpensive. Take required amount of neem, pongamia and vitex leaves and shade dry till it becomes dry. Seeds are filled up to quarter of a storage bin and covered with a clean leaves. Mix the above leaves and spread a hand full on the surface of the seeds in the storage bag or bin. This method can also be followed in bigger storage containers. Place unripe papaya fruit pieces in the corner of the storage go down. When rats eat these fruits, the mouth tissues get damaged due to the chemical substance in the papaya fruit. For one room, we can keep 3-4 pieces of the fruit.

III. RESULTS AND DISCUSSION

The study reveals that the traditional storage in the entire Hassan district are made with the help of outer casing of gourd vegetables are used to store the seeds of vegetable crops. Then it should be tightly plastered with mud. In community based seed banks store the cereals in tall mud pots or bins, which are known as vaade or kanaja in Kannada. These are made up of clay soil. The mud pot of about 1-2 m height has a narrow opening at the top and covered with a tight lid. Seeds and grains can be stored in it can be taken out only through the top opening. In some villages earthen pots made of clay to a convenient size are used from olden days for storage purpose. Leaves of neem, vitex are shade dry till it becomes fiber. Seeds are filled up to quarter of a storage bin and covered with a clean leaves of neem, vitex and cloth. Mix the above leaves and spread a hand full on the surface of the seeds in the storage bag. Rodents are control through using unripe papaya fruit pieces in storage go down to control rats. More than 70% storage bins are made up of mud pots and rest are made of gunny bags. The seed or grain protection measures are applied at two stages by the community seed banks. In the first stage, the storage bins made up of plant material are plastered with the help of cow dung and cow urine. This mixed material made a paste is used to plaster the storage mud pots on both sides and sun dried very well. The cow urine is acts as a repellent of storage insect pests. This is one of the oldest indigenous practices of seed storage in Hassan. This have identified and learnt from their ancestors. The important methods of storage grain or seed protection applied by the local farming communities of Hassan district are described in (Table 1).

185 Table 1. Community seed Banks, Plant Parts and other Materials Used for seed/grain
186 protection in Hassan district.
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Village	Taluk	District	Organization / NGO	Maintained by	Agro-climatic Zone	Plant parts and other materials used for seed /grain protection	Major crops Seeds storage at community seed Banks
Balehal li	Arasi kere	Hassan	BIRD-K Tiptur	Self help groups	CDZ-8	Neem, and vitex leaves and Cow urine	Maize: (Bili jola (sorgum) mekke jola Kempu jola). Ragi:(Fingermillet-Doddaragi). Paddy: (Hamsa , Basumathi, Byranellu). Other seeds: Coconut, Gourd seeds Green gram , Red gram Pigeon pea, Horse gram Chickpea, Potato, Garlic Zinger Chilli, Brinjol, Tomato Sesamum, Sun flower, Field bean etc.
Kuriyar apalya	Arasi kere	Hassan	BIRD-K Tiptur	SHG's	CDZ-8	Neem, and vitex leaves and urine	Maize: (Bili jola, mekke jola kempu jola) Ragi:(Fingermillet-Doddaragi) Paddy(Hamsa , Basumathi Byranellu). other seeds: Coconut, Gourd seeds Green gram, Red gram Pigeon pea,

							Horse gram Chick pea, Potato, Garlic, Zinger Chilly, Brinjol, Tomato Sesame, Sunflower, Field bean etc.
Balavan erlu	Arasi kere	Hassan	BIRD-K Tiptur	SHG's	CDZ-8	Neem, and vitex leaves and urine	Maize: (Bili jola, mekke jola kempu jola) Ragi: (Fingermillet- Doddaragi) Paddy(Hamsa , basumathi Byranellu) Other seeds: Coconut, Gourd seeds Green gram ,Red gram Pigeon pea, Horse gram Chick pea Sugar cane Potato Garlic Zinger Chilly Brinjol Tomato Sesame Sunflower Field bean etc.
Hullike re	Arasi kere	Hassan	BIRD-K Tiptur	SHG's	CDZ-8	Neem, and vitex leaves and urine	Maize: (Bili jola, mekke jola kempu jola) Ragi:(Fingermillet- Doddaragi). Paddy: (Hamsa , basumathi Byranellu). other seeds: Coconut, Gourd seeds Green gram ,Red gram Pigeon pea,Horse gram Chick pea,

							Potato, Garlic, Zinger Chilli, Brinjol, Tomato, Sesamum, Sunflower Field bean etc
Belavat hahalli	Arasi kere	Hassan	BIRD-K Tiptur	SHG's	CDZ-8	Neem, and vitex leaves and urine	Maize: (Bili jola, mekke jola , kempu jola) Ragi:(fingermillet- Doddaragi) Paddy: (Hamsa , basumathi Byranellu). Coconut, Gourd seeds Green gram ,Red gram Pigeon pea, Horse gram Chick pea, Sugar cane Potato, Garlic, Zinger Chilli, Brinjol, Tomato Sesamum, Sunflower Field bean etc.

IV. Conclusion

The study revealed that the indigenous methods of seed conservation are very effective and eco-friendly. Detailed survey of these five villages was establishment of Community seed banks based on existing informal seed system, farmers families involved, diversity of crops, number of landraces available, infrastructure available at village level etc. Local inhabitants do not use any chemical pesticides for storage and seed protection. Thus it can be concluded that the innovations of our ancestors were based on scientific rationales, which are still being practiced popularly. In the present publication a case study of five community seed banks established in the five villages viz. Balehalli, Kuriyarapalya Balavanerlu , Hullikere and Belavathahalli of Hassan district. Detailed interaction with farmers and SHG'S was undertaken during the survey and suitable location was identified, in most of the cases NGO's, village resource centers were preferred for establishing the seed banks.

Role of non-governmental organizations and local civic bodies working in village is very important in establishment, operation and management of community seed banks. These

organizations provide desired support in the form of established community seed bank centers self help groups, infrastructure such as human resources, where ever required. The pre existing trained human resource was of great help in motivating the small and marginal farmers to participate in this community seed distribution system. Therefore, the farmers have enthusiastically participated and supported the establishment of community seed banks in the targeted villages to take maximum benefit out of this venture.

References

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