Indigenous Technical Knowledge of the Tribal Farmers of Visakhapatnam District of Andhra Pradesh

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A huge and unwritten wealth of knowledge on traditional crops, cultural practices, pest and disease management in agriculture, cropping systems and indigenous seed storage methods was found to exist with the farmers and some of it was documented. Practices like hanging maize cobs from kitchen roof for seed storage, use of ash to control pumpkin beetles and aphids, bird catching by using jackfruit latex and planting *Jatropa* around the fruit plants to protect them form external enemies, were of much interest and great practical value.

Key Words: Documentation, Exploration, High altitude tribal area zone, Indigenous technical knowledge

India is the treasure land of biological wealth, indigenous traditional knowledge and spiritual wisdom. The term 'Indigenous technical knowledge' (ITK) is used synonymously with 'traditional' and local technical knowledge to differentiate the knowledge developed over generations by a given community from the knowledge acquired from schools of learning. Further ITK is dynamic and not static, it covers the whole range of human experience. It has been tried and tested over centuries and against different agro-climatic conditions. The knowledge, which was found fit for the mankind has been used and passed on from generation to generation. According to Haverkort (1995) indigenous technical knowledge is the actual knowledge of a given population that reflects the experiences based on tradition and also includes more recent experiences with modern technologies.

However, many of our indigenous practices in agriculture and allied fields have been replaced by the so-called modern technologies and they have become obsolete, especially among the younger generations. Now these indigenous practices are dwindling and there is a possibility for them to become extinct particularly during this era of globalization, liberalization and commercialization.

High Altitude Tribal Area (HAT) Zone of Andhra Pradesh is rich in traditional knowledge. Such knowledge can be utilised effectively for the development of agriculture of this region. This would definitely help to evolve location specific technologies and would give boost to the sustainable agriculture

Material and Methods

Exploration trips were conducted from Regional Agricultural Research Station (RARS), Chintapalle under "Network Project on Tribal Area Crops of Madhya Pradesh, Andhra Pradesh and Orissa" to collect ITK. ITK was gathered by individual contact with the farmers of Anarbha, Bonangipalli, Boytili, Cherapalli, Gondipalli, G.M.Kotturu, Kappagondi, Karakaputtu, Katragadda K. Kodapalle, Kondrupalli, Korapalli Kottapakalu, Kottavalasa, Kottaveedhi, Minumuluru, Modapalle, Mondigedda, Nimmlapadu, Panasapalli, Pedakonda, Peddalanka, Pilligedda, P. Kotturu, Porlu, Singarbha, Rallagadda, Rohungaputtu, Thimulagunta, Thimulamamidi, Vanchela, Vartanapalli and villages of Paderu, G. Madugula and G.K. Veedhi, Chintapalle Mandals of Visakhapatnam District and a few villages viz., Chitrakonda, Maliguda, Dontuguda, Doraguda and Thimulamamidi of Andhra-Orissa State boarder. Around 20 exploration trips were conducted to collect germplasm as well as ITK. ITK was collected on various crops grown, their cultural practices, cropping systems followed, disease and pest control and seed storage methods.

Results and Discussion

Some of the ITKs on agriculture of this HAT zone is discussed below:

Cultural practices

Deep summer ploughing is done to control pests (especially paddy stem borer) and diseases like redgram wilt, to conserve soil moisture and to reduce soil erosion due to flow of rainwater. This finding is in agreement with Kasyapa (1998).

Pulse crops are generally affected by water logging conditions. Hence, pulses like red gram (*sirikandi*) black gram (*minimulu*), rice bean (*timmerlu*) and beans (*sriram chikkudu*) are generally grown by the tribal farmers along the mild hill slopes to avoid water logging due to heavy rains and to ensure the optimum moisture retention. Besides, it acts as vegetative cover in controlling soil erosion and helps in better management of sloppy and marginal soils.

Due to limited availability of plain and leveled land in the tribal areas, paddy (*budamalu, mettudhanyam*) cultivation is taken up in small and fragmented portions of land at the foothills by preparing the land into terraces along the slope with a mild gradient popularly called as bench terracing. This has been found to be highly effective in water management for paddy crop in the kharif season.

Importance of cow dung in tribal agriculture

In India the importance of cow dung to induce rooting was long known and it is a common practice of tribal people to place cow-dung mixture on the top of the cuttings in rose and *Manihot esculenta* for early and successful rooting.

One kg cow dung mixed with 100 ml cow urine (10:1) is applied during early vegetative stage by drenching the root zone of the chilli, tomato and brinjal plants at 15 days after transplanting. It acts against chilly fruit borer (*Spodoptera litura*) due to its ovicidal effect and induces tolerance due to the hormones and nitrogen present in the urine. The fresh cow dung emits an offensive odour and acts as an insect repellent. The adult insects find an unfavorable environment either to feed or perpetuate on the sprinkled crop and thus this practice is also eco-friendly. Similar practice is followed in Tripura to control bacterial blight in tomato (Chowdhuri, 1998).

Cow dung mixed with mud (4:1) is pasted in and around bamboo baskets (*Granary*) for grain storage. Cow dung is pasted on the floor and walls of huts. Cow dung and urine is used in ritual ceremonies called as *suddhi.*

Pest and disease management

Marigold is grown as an intercrop to control chilli nematode *Meloidogyne incognita* (*nulipurugu*). The disease is locally called as *pasuputeegelu.* The root exudates may act as antagonists to nematodes. Similar practice is followed by the farmers of Uttar Pradesh (Ambedkar, 1998).

Ash is dusted in the early morning to control pumpkin beetle and aphids in dolichos bean, rice bean and pumpkin. The abrasive nature of the ash is supposed to control these pests. The finer the ash, higher will be its effectiveness as the surface area of contact and abrasiveness of ash will increase with increase in fineness. It also blocks the trachea of the soft insects and causes asphyxiation, thus the aphid population can be kept under check by the combined action of both these factors. Similar practice is followed by farmers of Tamilnadu (Vivekananda, 2000).

Jatropa (*Adavinepalam*) plants are planted as a hedge around the field and vegetable crops. Jatropa twigs are also planted around jackfruit, mango and banana plants. Similar jatropa planting was reported to have been followed in Nigeria (Apantaku, 1998). The jatropa plant is repellent to goats and cattle. Therefore, it protects the trees from cattle browsing. It also acts as a binder in preventing soil erosion.

In field crops like paddy, small sparrows infest the crop at the time of maturity. To catch them or to drive them away, tribal farmers adopt a bird catching technique using the latex of jackfruit as an adhesive gum. *Artocarpus heterophyllus* latex and *Semicarpus anacardium* resin/ tannin extracts of seed are used for preparing adhesive gum. First the unripe seeds of *Semicarpus* are collected, resin/tannin is extracted with the help of locally made bamboo crusher. Sufficient quantity of *Artocarpus* latex is collected, a little amount of oil is added and the mixture is heated in an earthen pot with constant stirring until it attains setting stage (a thick jelly like gum).

Cropping systems

Some of the cropping systems followed in this region are as follows:

Coriander + Ginger + French bean mixed cropping: Ginger is grown at a distance of 50 cm by forming ridges and coriander is sown in between the ridges. Beans are planted in rows at every 4m distance. The beans are given support with bamboo stakes. Ginger takes more time for sprouting leading to weed growth. Coriander growing in the ginger field prevents the weed growth. Coriander is harvested early (one month) as leafy vegetable when ginger is in vegetative growth, thus coriander will not compete with ginger. Bean is a border crop and provides partial shade to ginger crop.

Maize + Lima bean mixed cropping: Maize is planted early in the season whereas lima bean is planted later

i.e., at its silking stage. Maize plants which are left in the field after the harvest of the cobs act as a live support to the lima bean.

Maize + Long pepper + Turmeric: In this system turmeric, a long duration crop is grown to get extra income, long pepper which is having spreading habit is grown to reduce weed problem. Long pepper and turmeric will not compete with each other for nutrients. Maize also helps in resting of birds to leaf eating caterpillar control.

Seed storage

Maize cobs are tied together (20-25 cobs approximately) with the help of a small rope and kept suspended from the roof of the kitchen. The same practice was reported from North Eastern hill region (Prakash *et al.,* 1999). Keeping cobs and seeds on kitchen roof will keep then in dry condition. The smoke of the kitchen drives away the insects as well as prolongs the storage period.

Seeds of pumpkin are stored by mixing them with ash. Similar practice in snake gourd was reported by Balajirao (1998).

Red soil and Ash (3:1) is mixed with pulse @ 5g/kg seeds and stored. This protects the seeds against stored grain beetles, especially bruchids. Similar practice was reported by Balajirao (1998).

Seeds of pulses/oilseeds crops are stored in a dried bottle gourd. The opening is plastered with mud. In case of ricebean, the mixing of the seed with ash and salt (10:1) is followed, however viability of seed is lost within a year.

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References

Ambedkar V W (1998) Pests also pollinate: When does an insect become a pest. *Honey Bee* **9:** 11-12.

Balajirao S S (1998) Woman's Wisdom: Storage of seeds and shedding of flowers. *Honey Bee* **9:** 12.

Chowdhuri S 1998 Indigenous technical knowledge from Tripura. *Honey Bee* **9:** 17.

Haverkort, B (1995) Agricultural Development with a focus in locate resources Idea's view on indigenous knowledge. In: *The Cultural Dimensions of Development: Indigenous knowledge systems* (D M Warren, L J Slikkerveer and D Brokensha eds.) Intermediate Technology Publications Ltd., London pp 454-457.

Kasyapa L S 1998 Innovative pest management: Gram pod borer. *Honey Bee* **9:** 4-5.

Prakash N, P P Pal, P Sundarambl, Kumar R and B Bihari (1999) Indigenous technological knowledge followed by the tribal farmers of North Eastern hill region in agriculture. *Indian J. Hill Farming* **12:** 52-57.

Vivekananda P (2000) Getting nematodes out of the way. *Honey Bee* **11:** 9.