

Indigenous Technological Knowledge in Agriculture in Different Zones of Karnataka for Environmental Sustainability

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Abstract—Indigenous Technological Knowledge (ITK) is local knowledge- knowledge that is unique to a given culture or society. It contrasts with the international knowledge system generated by universities, research institutions and private firms. ITK is the basis for local-level decision-making in agriculture, health care, food preparation, education, natural resource management and a host of other activities in rural communities. Hence this paper deals with various ITK practices followed by the farmers in different zones of Karnataka for achieving environmental sustainability in agriculture. Indigenous Technological Knowledge (ITK) is important for development activities to be successful. If it has not been recorded, it means largely inaccessible to development workers and researchers. Solutions offered by a development project may fail because they do not fit with the local knowledge. Indigenous knowledge may suggest alternatives. Methods used effectively by one society could be used to solve problems faced by another. A blend of approaches and methods from various systems may be appropriate for sustainable development in grassroots.

The school of thought now dubbed ITK, indigenous knowledge systems, aims to elicit the expert systems of indigenous people-

peasants-who are some-times not thought of as experts. These knowledge systems are brought back to agricultural research centers and used to educate agricultural scientists and policy makers so that they can design better technologies and policies to improve peasant's standards of living.

The documentation of ITK's showed the time richness of the tested traditional knowledge for agriculture, horticulture, plant protection and livestock. Though, all ITK's practiced by farmers are effective but need to be validating scientifically along with identification of active ingredients present in the materials used. Such studies will provide the scientific rationality for use of ITK's for future. Since ITKs are cheaper, locally, less side effects and easily acceptable by the people. ITK's can be encouraged but while they need to be modified scientifically to make them scientifically rational. Therefore this paper concentrated on ITK's that were followed in Agricultural crops, horticulture, plant protection, post harvest and livestock since ages in different zones of Karnataka for achieving environmental sustainability.

1. INDIGENOUS TECHNICAL KNOWLEDGE

Sl. No.	Description of ITK	Farmers Logic	Probable Scientific Explanation	Zone where the practice is in vogue
A. Agricultural production				
1	Pagadi planting: Ragi seedlings are transplanted equidistant at spacing of 22.5 x 22.5 cm under rainfed conditions	Vigorous growth and higher yields	Facilitates intercultivation in both directions, conserves moisture, controls weeds and enhances tillering leading to higher yields especially during drought years	4, 5 and 6
2	Mixed cropping of ragi with jowar, tur, avare, niger, mustard, milltes, cowpea, etc.	To meet the family requirement	a. Efficient use of land and light due to differential growth period. b. Insurance against the risk of crop failure. c. Mustard as a trap crop and reduces pest incidence.	4,5,6 and 7
3	Puddling paddy field and incorporation green leaf manure 2-3 days prior to planting instead of 15 days	Easy transplanting	Keeps soil surface loose for transplanting especially in sandy soils.	4,6,7,9 and 10
4	Covering the roof top of the rearing house with coconut leaves/hay/sugarcane trash and sprinkling water	Keeps the rearing house cool	Acts as a physical barrier to solar radiation (Insulation)	5

5	Using Ammonium Sulphate in jaggery preparation	Improves quality and colour of the jaggery	Sulphur acts as clarifying (oxidizing) agent improving quality of jaggery	4 and 6
6	Along with potato sowing French bean seeds in potato rows	To identify the potato rows	In transitional zone, heavy rains leads to huge weed infestation and unable to identify the potato rows 15 after sowing	Zone -7
	Application of tank silt To increase the fertility and water holding capacity of soil	To increase aeration, soil fertility and water holding capacity of the soil	In sandy soils, if tank silt is loamy or clay type increases water holding capacity and soil fertility. In clay soil soil aeration improves	4,5,6,7
B. Horticultural production				
1	Mulching dry leaves in cardamom	Reduces button shedding and rhinoceros insect incidence	Leaf mulching helps in retaining moisture in soils; Checks weeds and conceals capsule from vertebrate pests	9
2	Application of 200 ml butter milk to curry leaf plant every week	Improves aroma	Ensures availability of enzymes, vitamins and micronutrients	5
3	Cultivation of Mango and Banana together in saline-alkaline soils	Banana plant reduces salinity	Banana absorbs soluble salts to bring down the soil pH	4
4	Sowing coriander seeds between jowar rows	Controls striga-a root parasite of jowar	The alkaloids in coriander exudates inhibit growth of striga	2,3,4 and 6
C. Seri Culture Production				
1	Tying wet gunny clothes to windows of the rearing house	Evaporative cooling effect inside the house	Air passing through wet gunny clothes get cooled	5 and 6
2	Keeping non-spinning worms in paddy straw or eucalyptus leaves and exposing to sun-light and covering with gunny cloth	Encourages spinning activity	Warm temperature induces spinning	5
3	Removal of bottom leaves upto 8" above ground before chopping	Eliminates soil/dust/yellow and over matured leaves	Prevents soil borne infection and avoids feeding of over matured leaves	5
D. Plant Protection				
1	Maize is grown around vegetable gardens	Prevents cattle and insect damage to main crop	Acts both as a physical barrier to cattle and trap crop for insects	3 and 4
2	Calotropis (Ekka) branches are placed at the water inlet in paddy fields	Controls insect pests	The alkaloid present in latex acts a insect repellent	4 and 6
3	Smoking of rat burrows with paddy husk and dry chillies	Cost effective rat control method	Pungent smoke generated by paddy husk and chillies causes suffocation and kills rats. It is cost effective and eco-friendly measure	10
4	Spraying jaggery solution (0.4%) to red gram	Control pod borer	Ants and other insects attracted by jaggery destroy pod borer eggs	4
5	Cultivating Marigold with red gram	Controls pod borer	Acts as pod borer trap	5
6	Discarded cattle horn filled with kerosene and burnt	To dispel wild bores	The odour of burn horn act as repellent	9
E. Post Harvest Technology				
1	Horse gram is stored in empty common salt bags	Insect damage is reduced	Salt prevents hatching of storage pests eggs and also acts as a preservative	All zones
2	Coating red earth to overnight soaked redgram and drying in shade	Reduces insect damage and facilitates miling	Wetting and drying (Thawing) process loosens huck from kernel and earth acts as physical barrier to the storage insect	All zones
3	Storing Avare: Slight warming	Enhances keeping quality and facilitates Storability for long period	Slight warming destroys insect eggs a.	4,5 & 6
4	Putting thick layer of sand on the properly dried pulses and covered with tight lid	Controls storage pests	Sand act as physical barrier and also die to due suffocation	4,5 & 6
5	Putting 10-15 red chillies in one quintal rice bag	Prevents storage pests	Pungent odour acts as repellent	9
6	A layer of rock salt is spread at the base of a storage structure for pulses and other grains	Cost effective de-worming medicine	Acts as a anti-helminter	5 and 6

7	Paste made by mixture of cow dung, locally available dried leaf and chopped straw small round cake and dried in sunlight for 2-3days	Used as fuel wood	Burns slowly and when smoke comes acts as repellent for insects	5
F. Animal Health				
1	100g of fresh papaya seeds are crushed and administered in 1 liter of water to calves	Cost effective de-worming medicine	Acts as anti-helminter	4 and 5
2	Administering a handful of salt 4 liter of water or a handful of mixed in cattle feed	Stops diahorea	Restores electrolyte imbalance	4 and 5
3	Application of fresh cow dung to wounds of cattle	Fast healing of wounds	Acts as antiseptic and soften the wound site	4 and 5
4	Tender beetle leaves of paste was prepared by grinding over a rock is fed to young calves	For indigestion	Beetle leave act as post meal digestive stimulant, natural antiseptic, anistrigent, diuretic and nerve tonic.	

2. CONCLUSION

I TK practices were adopted by the farmers in different zones of Karanataka in order to obtain higher profit from the agriculture by utilizing indigenous knowledge for efficient use of resources in crop and soil management and minimizing the cost on external inputs in agricultural and maintain pollution free environment.

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