Indigenous Technical Knowledge (ITK) in Cereal Crops: A Contribution for Sustainable Agriculture

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ABSTRACT

Indigenous Technical Knowledge (ITK) has enormous innovative potential. The majority of the indigenous communities in India have their own distinct traditional knowledge and technological background. Despite the latest technologies and breakthroughs, the farming community still has a deep belief in their traditional knowledge.ITK is the sum total knowledge and practices which are based on people's accumulated experiences in dealing with situations and problems in various aspects of life and such knowledge and practices are special to a particular culture. Many of these knowledge and technologies are at par with the modern knowledge and technology system and have been provided the indigenous communities with comfort and self-sufficiency. The total socio-economic development of the communities can be significantly influenced by these traditional knowledge and technology. The application of indigenous and modern knowledge is not properly matched. It has been observed that there is an instant need to document and preserve the Indigenous Technical

Knowledge (ITK) of different communities, many of which are at the brink of extinction. An appropriate association between the traditional and modern knowledge and technology systems has immense potential to benefit the society. These ITKs are able to maintain the agricultural sustainability as well as food and nutritional security.

INTRODUCTION

Indigenous Technical Knowledge (ITK) is the actual knowledge of a given population that reflects the experiences based on tradition and includes more recent experiences with modern technologies. The advent of the concept of sustainable agriculture in late eighties in Indian agricultural scenario has evoked interest on ITK that has the element of use of natural products to solve the problems pertaining to agriculture and allied activities. ITK is regarded as the information gained over a period of time passed on from generation to generation by the word of mouth. Local or indigenous knowledge refers to the cumulative and complex bodies of knowledge, know-how, practices and representations that are maintained and developed by local communities, who have long histories of interaction with the natural environment. Such knowledge is collectively owned, developed over several generations and subject to adaptation and imbedded in a community's way of life as means of survival (Sumit and Shivani, 2021). It is the local knowledge that is unique to the given culture of society. It is the basis for local-level decision-making in agriculture, healthcare, food preparation, education, natural resources management and a host of other activities in rural communities (Agrawal, 1995).

1. Objectives of Indigenous Technical Knowledge (ITK)

- To keep sound environment.
- No cost of pesticides.
- No health hazards.
- No pollution occurs.
- Less labour cost.
- Use of local materials.

2. Importance of Indigenous Technical Knowledge (ITK)

- ITK is easy to skill and experience dependence. So the people of a community can solve their problems easily.
- Many ITK has scientific value. ITK may use for scientific research.
- It is subjective and linked with farming and involves low-cost input use.
- ITK is eco-¬friendly for the agricultural system.
- ITK of a specific community helps the extension worker to measure the depth of knowledge.
- The knowledge is localized and situation-specific. So, ITK helps the farmer to take the decision in their own way.

3. Characteristics of Indigenous Technical Knowledge (ITK)

- ITK is not static but dynamic.
- Exogenous knowledge and endogenous creativity brings change to ITK.
- ITK is intuitive in its mode of thinking.
- ITK is mainly qualitative in nature.
- ITK study needs a holistic approach.
- ITK, if properly tapped, can provide valuable insights into resources, processes, possibilities and problems in particular area.
- ITK is recorded and transferred through oral tradition.

- ITK is learned through observation and hands on experience.
- ITK forms an information base for variety.
- ITK reflects local tradition.

4. Classes of Indigenous Technical Knowledge (ITK) in Agriculture

- Climatology
- Local soil and taxonomy
- Soil fertility
- Primitive cultivar
- Intercropping
- Agronomic practices
- Irrigation and water management
- Plant protection
- Post-harvest technology and methods

5. Activities of Indigenous Technical Knowledge (ITK)

- ITK can aid development efforts.
- ITK can facilitate local people's participation.
- ITK is a valuable source of developing appropriate technologies.

6. Scope of Indigenous Technical Knowledge (ITK) Analysis

- New biological and ecological insight.
- Protected areas and conservation education.
- Resource management.
- Development planning.
- Environment assessment.

7. Role of Indigenous Technical Knowledge (ITK) in Cereal Crops

i. Rice (Oryza sativa)

- Soaking the paddy seeds in diluted cow urine before sowing, considerably reduces the incidence of leaf spot and rice blast.
- Treatment of paddy seeds in diluted biogas slurry for 12 hours increases resistance of seedlings to pest and diseases.
- During panicle formation in paddy, the flowers of Cycas circinalis are placed on sticks in paddy fields at 10 per ha. Its unpleasant odor repels ear head bugs.
- 'T' shaped bamboo stands are placed in many places in the paddy fields so that birds can sit on them and feed on the larvae and adults of rice pests.
- Pre-soaking of paddy seeds in milk increases its resistance against tungro and stuntvirus.
- Sowing on 18th day (Aadipperukku) of Tamil month Aadi (Jul. - Aug.) ensures good harvest.
- Good harvest can be obtained from the crop transplanted during Aavani (Aug.-Sep.)
- 7kg rice bran + 1.5 kg jaggery (or) molasses + 1.5 lit.kerosene are mixed thoroughly and placed in plastic glasses in the BPH affected paddy crop. It helps in repelling the BPH population completely for 1.0 acre area.
- Crop transplanted during October - November will give reduced yield.
- Crop will establish better if it is transplanted along the wind direction.
- Planting the 'samba' (Aug.), crop thickly and 'navarai' (Feb.) thinly.

- Practice sheep penning for the first season and green leaf manure for the second season for better yield.
- Apply the neem seeds at 100 kg per acre as basal to get more yields as compared to the equal quantity of neem cake.
- Irrigate the fields, allow the weed seeds to germinate and then plough the fields to incorporate the weeds into the soil before sowing or transplanting of rice crop to control weed growth.
- Cultivation of sunhemp or daincha helps to control the nut grass (Cyperus rotundus) weed.
- Neem (Azadirachta indica) oil cake extract is sprayed to control thrips in rice.
- Dragging the branches of country ber or Aloe sp. on the affected field to control the leaf roller.
- Neem oil is mixed with water at 30 ml/lit and sprayed to control stem borer in rice.
- To control the ear head bugs, 10 kg of cow dung ash is mixed with 2 kg of lime powder and 1 kg of powdered tobacco waste and dusted on the rice crop during morning hours.
- Applying neem cake before last plough to control root rot and nematode problem.
- A mixture of 5 kg of common salt and 15 kg of sand is applied for 1 acre to control brown spot disease.
- Soaking the paddy seeds in 20% mint leaves solution before sowing will control the brown leaf spot.
- Spraying the leaf extract of Adaathoda vasica to control rice tungro virus.
- Palmyra (Borassue flabellifer) fronds are tied on to poles and kept on the corners of rice fields so that the noise produced by them scare away the birds like ducks, sparrows etc. and save the grains being damaged.
- When one ear head contains about 100 grains, the yield will be 20-22 quintals per acre.
- One hundred and twenty grains found in a rice ear head indicates the full yield.
- Putting the leaves of notchi (Vitex negundo) and pungam (Pongam pinnata) inside the Kulumai to ward off storage pests.
- Mixing the paddy grains with the leaves of pungam (Pungam pinnata) or notchi (Vitex negundo) or neem (Azadirachta indica) before storage to avoid storage pest attack (Sundaramariet al., 2011).

ii. Wheat (Triticum aestivum)

- Wheat grains are dried in sun and then lime at 2kg and wood ash as 10 kg per quintal is rubbed by 2-3 persons for about one hour. By using this practice the grain can be stored for two to three years without any spoilage by the store grain insect pests.
- In rainfed areas, sometime wheat sowing is delayed upto end of December or beginning of January. The farmers are spreading well rotten FYM at the upper layer of soil after sowing the wheat. Due to black colour of FYM temperature of the soil rises. Increased temperature enhances the germination and tillering and thus the yield of the crop.

CONCLUSION

Inspite of advancement in scientific knowledge in agriculture, ITK based practices still remain in use by the vast majority of the farming community particularly in resource poor farming situations, without the knowledge of its scientific rationality. ITK plays an essential role in sustainable grassroots innovations. Such grassroots innovation

largely differs across different sectors with respect to the characteristics, sources, actors involved etc. However, it is possible that through flexibility, modification and mutual respect and trust, traditional knowledge experts can and may work with the experts from modern scientific institutions to generate more effective solutions for contemporary problems. In this context, blending of indigenous knowledge with modern scientific technologies is the need of the day to support sustainable development of agriculture and allied sector in our country.ITK is socially desirable, economically affordable, sustainable, involves minimum risk and focus on efficient utilization of eco-friendly resources. An appropriate coalition between the traditional and modern knowledge &technology systems has immense potential to provide food security.

REFERENCES

Sumit S., Shivani, R., 2021. Indigenous Technical Knowledge (ITK) for Sustainable Agriculture in India. Agriculture and Food E-Newsletter 1(3), 31-35.

Sundaramari M., Ganesh S., Kannan G.S., Seethalakshmi M., Gopalsamy K., 2011. Indigenous grain storage structures of South Tamil Nadu, Indian Journal of Traditional Knowledge 2, 380-383.

Agrawal, A., 1995. Dismantling the divide between indigenous and scientific knowledge.

http://agritech.tnau.ac.in/technology_ppfm.html