



# Indigenous Technical Knowledge in Plant Disease Management

Hari Prasanna Sahu<sup>1</sup> and Rakesh Roshan Satapathy<sup>1\*</sup>

<sup>1</sup>Department of Plant Pathology, Siksha O Anusandhan (Deemed to Be) University, Bhubaneswar, Odisha, India.

## Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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## ABSTRACT

The origins of indigenous technical/traditional knowledge are local, rural & community. It's utilised in forecasting of weather for better seed germination, soil, water, and soil fertility management, disease and insect pest control of plants & animals, and post-harvest management, among other things. India has a variety of indigenous agricultural practises which are still popular in organic agriculture in India's many states and are sustainable, environment friendly, profitable, and cost-effective. This review paper contains an overview of Indigenous Technical Knowledge in Plant Disease Management to help researchers in the future.

**Keywords:** *ITK; indigenous agricultural practices (IAPs); plant disease control.*

## 1. INTRODUCTION

Indigenous Technical Knowledge (ITK) is a term used to describe the distinct traditional local knowledge that exists within and is developed around specific conditions by indigenous women

and men in a certain geographic location. Indigenous technological knowledge covers a wide range of fields, spanning crop production, animal raising, management of natural resource, preparation of food, healthcare, insect pest control, and so many more.

\*Corresponding author: E-mail: [agrico.rakesh1000@gmail.com](mailto: agrico.rakesh1000@gmail.com), [rakeshsatapathy@soa.ac.in](mailto:rakeshsatapathy@soa.ac.in);

Indigenous Technical Knowledge (ITK) is a population's actual knowledge that reflects traditional experiences as well as more recent encounters with new technologies [1]. Indigenous agricultural practises (IAPs) are a body of knowledge that is not written down. There is no systematic record of who they are, what they do, and how they do it, as well as how they can be modified, their operations, boundaries, and applications. It exists in as many distinct brains, languages, and skills as there are now in as many diverse groups, civilizations, and circumstances [2]. As a result, the Indian people are under tremendous pressure to collect, conserve, validate, and use IAPs in order to reduce reliance on external inputs, lower cultivation costs, and promote environmentally friendly agriculture.

Non-chemical pest control and crop protection are becoming increasingly popular in a number of nations, including India. Government-developed and promoted integrated pest management solutions increasingly include the application of extracts from plant. If a researcher has tried to produce Indigenous Technical Knowledge based goods on a small scale, that may be a financially a viable choice for the long-term development of pesticides that are good for the environment.

### 1.1 ITK and Plant Disease Management

Indigenous Technical Knowledge is a type of local knowledge that is specific to a particular culture or society. It stands in opposition to the global knowledge system created by universities, research institutes, and private businesses. In rural communities, it serves as the foundation for local decision-making in agriculture, health care, food preparation, education, natural resource management, and a variety of other activities [3]. ITK is a society's information base, which aids communication and decision-making. The introduction of the concept of sustainable agriculture into the Indian agricultural landscape in the late 1980s gained significance in indigenous technical knowledge (ITK), which includes the use of natural resources to solve problems in agriculture and related activities.

Indigenous technical knowledge is an important aspect of a community's culture and history [4]. It is indigenous peoples' knowledge from many parts of the world, each with its own methods, customs, skills, and culture [5]. ITK refers to unique, conventional and local expertise that has

emerged inside and around certain areas an original to a given place. To supplement the development process, we must learn from local populations [6]. ITK refers to the abilities and practises that native communities have evolved through time by the accumulation of experiences and insight, and which are passed down from generation onwards [7]. ITK is a repository of information, skills, and strategies for farming system management. They are passed on through the exchange of knowledge of culture and custom.

ITK is long-term since it emerged from years of experience & observation. They are crucial instruments for progress since ITK are farmer-friendly, allow for the development of site-specific crop management methods, natural resource conservation, resilience to climate change, and food security [8]. Traditional agricultural practises should be fostered and encouraged within farming communities as a means of not just tapping local knowledge but also agricultural management that makes use of locally available resources.

Farmers' traditional crop security techniques were founded on eco-friendly cultural practises that were accepted., sensible rotation of crops, and awareness of pests and their life-cycles, which they learned from their large contact with the land, its fauna, and its flora.

Some plant disease control methods are;

- A little dusting of ash, spraying of liquid waste of tanned leather in tribal places in case of bunchy top illness in chillies.
- To treat fungal disease, such as damping off and dieback, farmers used to spray fresh cow dung in the chilli plant's collar region.
- Farmers used fresh cow dung slurry (1 kilogramme cow dung in 5 litre water) to treat ginger and turmeric seeds for disease management and enhanced germination.
- For soil-borne disease management, in betelvine growing areas farmers used sesame, mustard, and neem cake.
- For chickpea wilt disease management, in Sagar district farmers blended 30 kg seed of chickpea with 0.5 mg Heeng + 200 gm Salt in one litre of Butter milk. Pulse seeds sprayed with cow urine to protect against soil-borne fungus and improve development.

- Root rot and collar rot are controlled with castor cake, Karanja cake, and neem cake in the case of soil-borne disease.
- 20 kg *Casuarina equisetifolia* leaves are boiled for 20 minutes in water. The solution should be filtered when it has cooled. The extract is then diluted with water and used to treat bacterial and fungal infections.
- Make a solution with 2 kg fresh papaya leaves in 3-4 litres of water and leave overnight. After filtering, the solution is diluted with 50-60 litres of water and 250ml soap solution added to control rice brown spot disease.
- Controlling bacterial infections with marigold cultivation followed by solanaceous vegetable crops is efficient.
- To manage brown spot disease of rice, place khair (*Acacia catechu*) leaves in a water channel.

Indian farmers have learned to cultivate food and survive in tough circumstances over ages, and the rich heritage of ITK has been woven into their agricultural techniques. Leaving this rich history of ITK aside would make it hard to improve the quality of life of Indians who, for the most part, live in and rely on agricultural production systems. Indigenous technological knowledge has a unique set of characteristics [9]. It is 'local' in the sense that it is based in a specific community and placed within broader cultural traditions; it is a collection of experiences created by residents of those communities.

Changes in rural people's socioeconomic conditions, as well as changes in farming operations, as a result of decrease in the application of traditional knowledge and a shift to latest practises. A lack of ITK documentation, understanding of its scientific reasoning, and slow research progress are the key barriers to wider ITK application [7]. Recognizing the creativity of traditional communities is critical for the protection of biodiversity as well as the intellectual variety of the community's farmers to be passed down to future generations [10].

## 2. CONCLUSION

Indigenous technological knowledge contributes to the efficient utilisation of natural resources and provides appropriate help for long-term development. Congenital farming practises are mainly organic, eco-friendly, sustainable, practical, and cost-effective, and are applied in various components of the farming system.

However, these approaches must be explored, verified, modified, and scientifically validated before they can be widely used and applied.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Haverkort B. Agricultural development with a focus on local resources: ILEIAS view on indigenous knowledge. In *The Cultural Dimensions of Development: Indigenous Knowledge Systems* (Eds. D. M. Warren, L. J. Slikkerveer and D. Brokensha). Intermediate Technology Publications Ltd., London. 1995;454–457.
2. Atteh OD. Indigenous local knowledge as key to local-level development; 1989.
3. Warren DM. Using IK for agricultural development. *World Bank Discussion Papers*127. Washington DC: World Bank; 1991.
4. Borthakur A, Singh P. Indigenous technical knowledge (ITK) and their role in sustainable grassroots innovations: An illustration in indian context. *Proceedings of International Conference on Innovation and Research in Technology for SustainableDevelopment (ICIRT)* held at India. 2012;38-42.
5. Bruchac M. Indigenous Knowledge and Traditional Knowledge. In Smith, C. (Ed.), *Encyclopedia of Global Archaeology*. New York: Springer. 2014;3814-3824.
6. Pongel A. Integrating Indigenous Knowledge for Food Security: Perspectives from the Millennium Village Project at in Nyanza Province in Kenya. *International Conference on Enhancing Food Security in the Eastern and Horn of Africa regions*. Kampala, Uganda; 2011.
7. Devi R., Pandit A, Kashyap D. Assessment of applicability of Indigenous Technical Knowledge (ITK) in aquaculture as perceived by fish farmers in Assam. *Indian Journal of Fisheries*. 2014;61(3):104-110.
8. UNFCCC. Best practices and available tools for the use of indigenous and traditional knowledge and practices for adaptation, and the application of gender-sensitive approaches and tools for understanding and assessing impacts, vulnerability and adaptation to climate

- change. United Nations Framework Convention on Climate Change; 2013.
9. World Bank, 1999 - World Development Report 1998/1999: Knowledge for Development.
  10. Jena M. Community Health Knowledge Register. The Tradition. 2007;5:6-10.

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