

## Significance of Indigenous Technical Knowledge (ITK) in Agriculture

Amit Anil Shahane<sup>1</sup> and Yashbir Singh Shivay<sup>2</sup>

<sup>1</sup>Assistant Professor, College of Agriculture, (Central Agricultural University, Imphal), Kyrdemkulai, Meghalaya.

<sup>2</sup>Principal Scientist, Division of Agronomy, ICAR–Indian Agricultural Research Institute, New Delhi.

ARTICLE ID: 48

### Abstract:

The rapid and extensive spread of agrochemicals and input intensive modern agriculture leads to categorization of the ancient agricultural knowledge in to separate section named as Indigenous Technical Knowledge (ITK). The ITK is time tested, community based and client specific knowledge transfer and enriched from generations to generations. It is having more socio-economical acceptance and now a day also considered as important strategy for climate change adaptation. The ITK is also important for organic farming due to its organic and in-situ in nature with availability of large array of option and best example is different biodynamic formulation for soil enrichment, plant growth enhancement and for plant biotic stress management. Considering the present emphasis of government on natural farming, increasing area and demand for organic produce, higher prices of agricultural inputs and need to reducing use of agrochemicals due to its adverse effect on plant-animal-human being food chain, the ITK expected to get major assignment in future agriculture. This article discuss the significance of ITK and its scope in present context along with discussion on the constraints in collecting, documenting and evaluating ITKs and remedies for overcome these constraints.

**Keywords:** Biodynamic formulation, organic farming, time tested knowledge

### Introduction:

In present scenario, dependence of agriculture on external inputs mainly for nutrient, weed and water management (fertilizers, agrochemicals for insect-pest, disease and weed management) is a matter of concern for increased production cost, deterioration of natural resource base, declining factor productivity, decreased profits to the farmers and also environmental sustainability. The use of these external inputs were important precursor for green revolution in India; while in the changing world, complete dependence on external inputs

and new technological knowledge do not cater the need of agriculture. At the same time, excessive use of these external inputs causes the degradation of valuable natural resources along with increasing pollution from agriculture and ultimately makes agro-ecosystem more unsustainable. Use of new technology always need modification and standardization with changing challenges in agriculture such as degraded resource base, increased cost of purchased input and changing climate. The traditional knowledge and practices developed by local peoples serve as important base for development of new technology. Therefore, traditional practices and knowledge need to be conserved through collection, documentation, evaluation and their dissemination. This will serve the need of future agriculture in era of climate change.

The traditional practices and knowledge now-a-days studied in separate section called by different names, such as traditional knowledge (TK), traditional ecological knowledge (TEK), traditional ecological knowledge and management systems (TEKMS), local knowledge (LK), indigenous knowledge (IK), indigenous knowledge system (IKS), indigenous technical knowledge (ITK), community knowledge, rural peoples' knowledge and farmers' knowledge (FK) etc. These knowledge systems are mostly local in nature developed by the peoples of local community to tackle difficulties, cater the need of community. The Knowledge and techniques are used and modified by community over several years as per the requirement and hence are time tested. The concept of Indigenous technical knowledge may be defined as "A sum total of knowledge based on acquired knowledge and experiences of people in dealing with problems and typical situation in different walks of life". It is the knowledge, which has been accumulated by the people over generations by their observations, experimentation and also handling on old peoples 'experiences and wisdom in any particular area of human behaviour.

The country like India has large base of tradition knowledge in both documented and non-documented form (orally transmitted from generation to generation). Some of the examples of documented scripts having the tradition knowledge for crop and livestock production, natural resource management and health care include 4 Vedas, 4 Upvedas, 108 Upanishads, 14 Sastras, 2 Epics, Bhagwad Gita, Brahmasutras, 18 Purana, Manu Sniriti, Kautilya Shastra and Smritis along with the teachings of innumerable sayings, proverbs and sages.

#### **Significance of ITK:**



- The ITK time tested knowledge and transmitted from generation to generation. At every generation it is modified with incorporation some new knowledge and/or discarding part of previous one. Therefore, it will be valid over longer duration.
- The ITK is community based and client specific (also an important characteristic in present day farming system research) and therefore, address the specific problem.
- The cost involved in generation and modification of ITK was less than scientific technology generation as it done by the community as a whole and generally do not involve any specialist or scientific staff. Now-a-days non-Government Organizations (NGOs) and other social organizations along with the farmers are actively involved in generation and modification of ITKs.
- In most of the cases, the ITK have more socio-economical acceptance, as it is developed on farm with considering different factors such as social, cultural, economic, technical, political, and ecological, etc.
- The diversification of agriculture is need of the hours due to increased repentance on few and industrially generated off-farm resources. This diversification need large knowledge base and one of the important components to cater this need of large knowledge base is ITK.
- In the era of climate change, all sort of agricultural activities are going to be affected at varied and unknown level. Hence, there is need to develop climate resilient agricultural technologies and for this purpose, ITK are very important due to two reason viz. time tested technology modified over longer duration and location-specific with community orientation in technology development. Therefore, ITK is now-a-days viewed as adaptation strategy for climate change.
- The investment in documentation, validation, research, development and dissemination of ITK helps in generating large array viable options related for the problems in agriculture. For example, formation of different biodynamic formulation such as *Panchagvya*, *Dasagvya*, *Neemastra*, *Brammastra*, etc.
- As most of the ITK is developed at local or community or at most regional level, it helps in reducing the dependence of farmers on profit making multi-national companies.

- The use of ITK ultimately going to contribute the doubling of farmers' income through cutting down the cost of purchased off-farm inputs. At the same time, it also helps in cutting down the risk in agriculture.
- The ITK in the present scenario also considered an important component of organic farming as generation of ITKs were started even before the use of external inputs and are compatible to be used in organic farming. Similarly, in conventional farming also ITKs were adopted as primitive methods for management of biotic stresses especially insect-pest and diseases management.
- The utilization of ITKs have positive effect on the environment as it reduces the use of agrochemicals and which ultimately reduces their harmful residues in environment (soil, plant and water). It also reduces the GHG emission due to reduction in use of agrochemicals.
- Most of the ITKs are complimentary with natural environment and going to positively influence the biogeochemical cycling of nutrients. Another important point to mention here is that, the biodynamic formulations used (ITKs) also acts as food for microbes and ultimately enhances the microbial life in soil.
- As the ITKs are developed by local peoples and mostly biodegradable material is use (less use off-farm inputs), they are mostly complimentary or supplementary relation with natural environment/ agro-ecosystem.
- The use of ITKs provides the opportunities to mimic natural ecosystem which is the best ultimate way for bringing sustainability in natural ecosystem.
- The ITKs serve as a best avenue for the recycling of on farm inputs which helps in achieving the goal of increasing resource use efficiency in the era of human induced energy scarcity.
- Use of ITK also helps in providing safe food with fewer residues of agrochemicals and therefore prevents their bioaccumulation in food web.
- The use of ITKs enhance the knowledge base of new generation which is attracted towards fast and rapid results through agrochemicals without due consideration to natural resource conservation.
- **HUMAN FOOTPRINT ON NATURE:** All the above discussed positive effect of ITK also contributes to reduction in human foot-print on nature.

**Scope for use of ITK:**

- **Increased awareness:** Awareness about the potential of ITK, about their positive effect on quality of farm produce, about significance ITKs in organic farming and also about importance of agro-waste in preparation of different biodynamic formulation (the process of enrichment of ITK) and thereby increasing the potential of a substitute for conventional practices. This leads to increase in possibilities for the use of ITK in present day agriculture.
- **Entrepreneurship development:** As the area under organic farming and demand of organic produce is increasing, there will be increase in demand for ready to use different biodynamic formulation. This can be taken as venture (business) by trained B.Sc. agriculture graduates. Thereby they will serve the farming community with quality inputs and reduce the malpractices made by companies.
- **Policy initiative:** Projects on collection, documentation validation and dissemination of ITK at regional and national level were founded by Indian Government as well as different state universities. This will create awareness among the society about the use of ITKs.
- **Increase in area under organic farming:** In India, 3.56 million ha and in world 69.8 million ha area is under organic farming. At the same time, demand of organic produce is also increasing faster. According to one estimate in 2019-20 showed that the demand of organic produce in increases by 15–18% annually.
- **Increased emphasis on environment assessment of agro-industries:** Agro-industries produce large amount of biodegradable waste which are rich in nutrients. For e.g. molasses, press mud, bagasse, waste for food processing sector, etc. They are disposing the waste with much treatment as it is biodegradable and do not cause the adverse effect as that of waste from other industries. The environment assessment dose not allows these wastes to be dispose as it is. Therefore, now agro-industries also searching innovation and productive ways to dispose of this waste and here different ITK can be utilized for transforming this waste in to useful inputs in agriculture. For e.g. waste from vegetable treatment plants can be used as input for biogas plant which generate the cooling gas and leftover material is used as compost/enriched compost preparation.

**Constraints in collecting, documenting and evaluating ITKs:**

- Difficulties in finding out the person or group of persons having ITKs

- Difficulties in collecting the ITKs as people are not willing to share their knowledge due to different unknown reasons.
- Increased and fast modernization of agriculture also leads to wash out large number of ITKs.
- Incomplete information collection and difficulty on understanding the local names used by different communities to a particular plant.
- Lack of facilities provided and secondary priority given to the collection and documentation of ITKs.
- Sometimes, numbers of ITKs collected are in large number and their evaluation and validation are not possible in available resources. Similarly, if the number is large than their documentation is also time taking processes.

**Constraints in use of ITKs:**

- The ITK used in one place may or may not be effective at other place and therefore less attention is given for collecting ITKs.
- The numbers of evaluated ITKs are in large number but the returns by using these ITK are very low.
- The performance of ITK sometime depends on other factor of crop production and therefore, it will not be possible to use get return form ITK if these factors of productions are not available.

**Remedies to overcome the constraints:**

- Educate the people about the need and significance of collection and documentation of ITKs.
- Arranging ITK scouting competition and provide awards to winners.
- The rewards for outstanding ITK should be given in order to promote the other people and communities to come forwards for documentation of ITKs.
- Provide information to communities about the legal ways to protect their right on the ITK such as PPV & FRA and Biodiversity act.
- Communicate the documents and reports in which the ITK collected from any society were published.





- The funding from concern organization may be given to the person or group of people involved in conservation of ITKs such as few species of crop, techniques and procedure for preparation and use of some biodynamic formulation, etc.
- Promote regional institutes as well as NGOs for promoting the ITK programmes related to collection, documentation, evaluation and dissemination of ITK.

**Summary:**

Considering the significance of Indigenous Technical Knowledge (ITK) in meeting the need of organic farming, cost effectiveness, in-situ nature and capacity to reduce use of agrochemicals in agriculture they are expected to play a great role in future agriculture in changing climate. This significance also creates scope for collecting, documenting and evaluating ITKs across the nation and their spread from one region to another. Besides that, different ITK based product or input production (especially biodynamic formulation) will be an important bio-entrepreneurship for rural youth considering the increased demand of such products in organic farming as well as conventional farming to reduce cost on purchased agrochemicals.