



Practice of Traditional Agricultural Methods in North-East India

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ABSTRACT

Local, rural, and community-based communities are the origins of Indigenous Technical/Traditional Knowledge (ITK). Weather forecasting, healthy seed germination, soil fertility management, soil and water management, controlling insect pests and plant and animal illnesses, processing, storage, and fishing are some of the uses for it in North East India. In addition to sharing an international border with other eastern nations, the Northeastern region, which consists of eight states, is strategically significant due to its diversity, which includes untapped natural resources, hills, wetlands, flora and fauna, rich indigenous knowledge and techniques, and a variety of farming practices that are unique to the region. Agriculture continues to be a major occupation in the region, with over 70% of the population relying on it for a living (NITI Aayog, 2021). With its vast potential and wealth of resources, the area is becoming a center of economic activity that offers exciting prospects for both rural development and the working people in this section of the nation. One of India's most ethnically varied areas is the northeastern one. Every one of the seven states has a unique culture and customs. Eight administrative divisions, referred to as the "seven sisters" and one brother, currently make up this region: Arunachal Pradesh, Assam, Meghalaya, Manipur, Mizoram, Nagaland, Tripura, and Sikkim. The ancient agricultural knowledge, which was developed by the ancestors of a previous civilization, is epic knowledge. Traditional knowledge in agricultural



practices refers to the use of ancestral agricultural knowledge from areas such as plant protection, farm equipment and tools, livestock, crop production, storage grain pest management, agricultural rituals, value-added produce preparation, etc. Indigenous knowledge practices were used by farmers in most of northeastern India for weather forecasting, testing of seed germination, managing soil fertility, controlling insects, pests, and illnesses in plants and animals, storing value-added products, and other purposes. The farmers in the rural community retain and disseminate this information, passing it forward to the present generation of deployment. By teaching the current generation about historical and experiential approaches, the agricultural database on traditional conversions preserves biodiversity integrity and agricultural resources.

Introduction:

Agriculture is the backbone of India's rural economy. Shifting cultivation has conventionally been regarded as an environmentally and economically enviable form of land use. Traditional agriculture pertaining to shifting cultivation (locally known as Jhum cultivation) is being practiced in Northeast India. Indigenous traditional knowledge (ITK), which use natural materials to address issues related to agriculture and related activities in Indian agriculture, has gained attention as a result of sustainable agriculture. Farmers have been using the knowledge they learned from their predecessors to cultivate food and survive in hostile situations for generations. Their agricultural methods are entwined with the rich legacy of ITK. Indigenous knowledge refers to the methods and beliefs that a group of people have developed over many generations as a result of a comprehensive awareness of their local environment. There are numerous more noteworthy ways in which this information is different from other types of knowledge, all of which are included in it. These include originating from within the community, maintaining an unofficial line of communication, being jointly owned, changing over many generations and being adaptable, and being deeply embedded in a group's culture as a means of subsistence. Farmers' acquired and transmitted knowledge of their environment, including the land, water, trees, plants, and other living things, is known as Indigenous Traditional Knowledge (ITK). Through the development of several processes, a number of judgments, and the efficient allocation of resources, this knowledge has aided in issue solving. According to Anwasha and Pardeep (2012), indigenous technical knowledge



refers to the common and local knowledge of farmers from many regions across the world who have their own culture, beliefs, traditions, rituals, and rites.

Agriculture improves Farmers Communities

The quick growth of farmers markets in the current environment is also a good thing for agriculture. Farmers markets not only give small farmers more opportunities to communicate with customers directly, but they also remove the need for long commutes. Transportation, the food system stays in the local economy, and demand for locally produced food increases since it is more affordable and healthier. Not only are local consumers benefited by this type of market facility, but farmers also gain from the new avenues for selling their produce, and their kids can get first-hand knowledge from the exchange. Whole communities they serve may also benefit from this type of farmer-market equipment connection. In addition to providing food for a nation's whole population, agriculture also gives farmers the chance to network and engage with all of the other businesses in that nation, making it a vital sector of the global economy.

Role of Agriculture in our Daily Lives

The process of growing crops using land, water, seeds, and other resources is known as agriculture. We cannot imagine living without agriculture since it provides us with essentials like food that allow us to lead healthy lives. In addition to providing several advantages, agriculture also plays a big part in our daily life. Consequently, agriculture's significance in our lives increases. Particularly in nations like India, where over 60% of the population makes their living from agriculture. Especially in rural regions where most people live entirely off of agriculture. This is due to two factors. The first is that they inherited the farming knowledge and abilities of their ancestors. The absence of industries and other sectors that are exclusive to metropolitan regions is the second cause. Since moving commodities from one place to another generates the majority of the transportation sector's revenue, the sector is strongly dependent on agriculture. Usually, farmers use highways and railroads to transport their produce from farms to factories. In addition, small farmers need vehicles such as pickup trucks or tractors to move their crops from their farms to the marketplace for sale.

Traditional Agricultural Knowledge Practice

The physiographic features of North-East India, which include diverse terrain, a range of soil types, and an unequal distribution of rainfall and temperature, are the main factors influencing the state of agriculture in this region. The region's plains, which have alluvial soils, are the Brahmaputra Valley of



Assam, the Barak Valley, and the Tripura plains in the south, while the Imphal Valley of Manipur makes up only 10% of the state. Approximately 70% of the region is made up of mountains and hills with red, lateritic, and mountain soil, which primarily cover Arunachal Pradesh, Mizoram, Nagaland, Meghalaya, Sikkim, and half of Tripura, one-fifth of Assam, and nine-tenth of Manipur. The application of ancestral agricultural knowledge from the areas of plant protection, farm equipment and tools, livestock, crop production, storage grain pest management, agricultural rituals, value-added produce preparation, etc., is implied by traditional knowledge in agricultural practices.

In Arunachal Pradesh, a traditional method of storing colocasia, rice, maize, and millet is quite scientific. In order to prevent insect and pest infestation, most farmers store their food grains close to the kitchen, where the smoke from burning firewood seeps in. With years of expertise and knowledge, the farmers in Arunachal Pradesh's West Siang area have created a customary method of storing rice, maize, millet, and other grains known locally as Nahu.

In Sikkim, farmers utilize forest litter as bedding material for compost manufacturing, or they use rotting forest litter or organic matter-rich top soil to place over potato seed in rock or grooves. Terraces have traditionally been used for the cultivation of maize and rice. This technique manages surface runoff, stops rills from forming, and slows the growth of gullies that are already there. Traditional huge cardamom drying kilns (bhutti) don't require foreign input materials or highly specialized capabilities. The kilns are constructed with four sides of stone masonry walls and mud that is readily available locally.

The primary supply of water for agricultural and household purposes in the hills comes from naturally occurring perennial streams. Farmers in Meghalaya's Jaintia Hills use bamboo drip irrigation to irrigate arecanut and betel vines that are planted on steep hill slopes with bouldary soil. The arecanut is cured by the Khasis (Meghalaya) in the flowing water.

The "Gurung" rat trap is used by the Nishi tribe of Arunachal Pradesh. Tauk, or thin bamboo, with a long internode, is used to make the trap. The Meghalayan Garo tribes utilize wooden poles, bamboo, and thatch grass to make their grain storage structures.

Because of its significance in creating a high-potential environment and sustainable management, recording ancient wisdom has attracted a lot of attention globally in recent years. Finding and applying this indigenous wisdom from tribal and rural elders will undoubtedly close the gap between modern science and traditional methods.

**Traditional Agricultural Methods of NE India:**

The local hunt-and-gather method, which gives communities enough food to sustain themselves, and modern agricultural methods, which produce food in large quantities for distribution around the world, are frequently seen as stepping stones to traditional agriculture. For the benefit of future generations, this ancient agricultural method strikes a balance between preserving natural resources, providing for our current needs, and safeguarding the environment. By encouraging food and nutritional security, the creation of income and jobs, the reduction of poverty, and the wise use of natural resources and ecological surroundings, the diversified farming system is a crucial instrument for boosting agricultural growth. A sustainable agricultural system must take into account a number of aspects, including soil, climate, resource availability, land, water, labor and capital, economic return, and managerial talent.

Jhum Cultivation: Hill farmers use jhum farming, which involves slashing, clearing, and burning systems from January to March, to make the most of the natural resources available to them in order to maximize yield and reduce agricultural hazards [5]. Cereals (rice, maize, millets), legumes (beans, pigeon pea, rice bean, pea, soybean, cow pea), oilseeds (ground nut mustard), root crops (cassava, potato, colocassia, yam, sweet potato), cucurbits (bottle gourd, snake gourd, pumpkin, cucumber, bitter gourd, melons, ridge gourds, etc.), seeded vegetables (okra, chilli, brinjal, tomato), fruits (banana, papaya, citrus, etc). It is also known as shifting cultivation or slash-and-burn cultivation. In contrast to crop rotation, shifting agriculture is a farming method that maintains soil fertility through plot (field) rotation. A piece of land is cleared and farmed for a brief period of time in shifting agriculture, after which it is left fallow and allowed to return to its natural vegetation while the cultivator moves on to another plot. When the soil exhibits symptoms of tiredness or, more frequently, when weeds take over the field, the cultivation phase is typically over.

The slash-and-burn method is one shifting agriculture land-clearing technique that enriches the soil with ashes from burning standing plants, leaving only huge trees and stumps in the field. After clearing, the ground is often cultivated using a hoe or digging stick rather than a plow.

Shifting agriculture has always been seen negatively because to its detrimental effects on the environment. However, a thorough examination of the significance of shifting agriculture to the native tribes can help to clarify why they continue to engage in shifting.

Terrace Farming: Planting crops on graduated terraces carved into the slope of hills or mountains is known as terrace farming. Despite requiring a lot of work, the technique has been successfully used to



save water loss and soil erosion while increasing the amount of arable land in a variety of terrains. The terrace is often a low, level ridge of earth that is constructed over the slope, with a water drainage channel situated directly above the ridge. Terraces are typically constructed on a small slope to allow water that is trapped in the channel to slowly flow toward the terrace exit. Level terraces can be used if rainfall is generally modest and soils can absorb water easily. For hilly farmlands, terrace farming is a productive and frequently the only option. However, it has certain benefits. The value of terrace farming extends well beyond the cultivation of otherwise unusable land for agriculture. Additionally, terrace farming helps to conserve soil by halting soil erosion. These days, the technique makes it possible to grow a variety of crops, and internet agricultural software makes managing them easier.

Challenges of agriculture:

- Due to antiquated agricultural methods, poor irrigation systems, and improper fertilizer and pesticide use, the industry suffers from low productivity, which lowers yields and reduces farmer profitability.
- Farmers' capacity to use new farming methods and raise yields has been hampered by their ignorance of the application of contemporary technology and industry best practices.
- Climate change has caused unpredictable weather patterns, protracted droughts, and floods, which have affected food availability and production and raised consumer prices. The agriculture industry is particularly vulnerable to these effects.
- Small and marginal farmers, who have little access to resources and inputs, dominate India's agriculture industry and find it challenging to compete with bigger firms.
- Farmers find it challenging to get their goods to markets due to a lack of infrastructure in rural regions, such as bad roads, inadequate storage facilities, and restricted access to financing. This has also led to a lack of investment in the industry.

These difficulties have impacted the livelihoods of millions of farmers and led to India's agricultural growth standstill.

Different types of Agricultural Practice in India:

Subsistence Farming

On the opposite end of the spectrum from commercial farming is subsistence farming. Subsistence farming, sometimes referred to as family farming, is when a farmer grows a field to meet their own or their family's requirements. This type of farming is distinguished by:



Labor-intensive procedures Low technological proficiency Using native tools Shifting cultivation or cultivation on a permanent plot of land Low production levels

In rural India, subsistence farming is the primary activity of smallholder families. They mostly grow foods for their own consumption, leaving little or no surplus for the market. Rain-fed agriculture, organic practices, and traditional equipment are all common. Although it gives households food security, it has drawbacks, such as the distribution of tiny landholdings and weather reliance.

Extensive Farming

The term "extensive agriculture" describes an agricultural method that uses little labor and capital inputs while cultivating massive quantities of land. It frequently involves methods like swidden or slash-and-burn farming, where there is little landscape design and it is difficult to recognize using maps or aerial photography. With little to no assistance from inputs like labor, fertilizer, and irrigation, extensive agriculture relies on vast areas. Crops are often widely separated, and not much machinery is used. It predominates in regions that are arid or semi-arid and have limited water resources. This method can lead to erosion and a less amount of harvested items even though it uses fewer resources.

Plantation Farming

A single crop is produced extensively over a huge region in a process known as plantation farming. Crops with significant global demand, like coffee, tea, rubber, cocoa, cotton, sugarcane, and oil palms, are the main crops grown using this technique. In India, plantation agriculture is one of the most prevalent agricultural practices. It describes the extensive production of cash crops like spices, tea, coffee, and rubber. These crops are grown on remarkable properties and require a certain climate. The workforce is usually hired, and there is a prevailing monopoly. Despite the substantial income and exports it generates, it leads to deforestation; instead, forest destruction creates pollution.

Commercial Farming

Crop production and animal rearing for sale are both part of commercial farming. The goal of agribusinesses is to increase productivity in order to maximize revenues. These farms require costly and effective inputs to generate higher output levels. Crops grown in commercial agriculture are mostly sold to the outside world for profit. High-yielding cultivars, chemical herbicides and fertilizers, and sophisticated irrigation systems are a few of the common methods. Although this type of farming can



increase productivity and revenue, it also raises concerns about ecological integrity and the susceptibility of farmers to external influences.

Dry Land Farming

An agricultural method for cultivating land without irrigation is called dry land farming. It can be described as "the practice of producing profitable crops without irrigation in regions that receive 500 mm or less of rainfall annually." Dryland farming is practiced in regions with little rainfall by employing water gathering methods and drought-tolerant crops like bajra, sorghum, and millets. It is crucial to put soil conservation techniques like mulching and bunding into practice. Despite its suitability for arid climates, it can present challenges due to the unpredictable nature of rainfall, which lowers yields.

Shifting Cultivation

Changing one of the oldest farming practices in India is cultivation, also known as Jhum, and it is widely used in northeastern India, notably in tribal communities. A tiny patch of woodland is cleared by the farmers, who then plant crops like maize and peppers and burn the trash to make fertilizer. After a few years, the ground is left bare, and they continue to clear new regions while letting the former location recover. Despite being a centuries-old natural practice, management must be started due to concerns about soil erosion and deforestation.

Another name for shifting cultivation is rotational farming or swidden cultivation. This type of land use is distinguished by:

1. A transition between a brief period of agriculture and a relatively lengthy period of natural or enhanced fallow, and as a result:
2. Fields are regularly, usually cyclically, shifted, and
3. Fallow vegetation is removed, usually (though not always) by fire.

Mixed Farming

To support and satisfy the needs of the farmer in as many ways as possible, a "mixed farming" method combines cattle, poultry, fisheries, beekeeping, and crop production on a single farm. Another kind of farming technique used in India is mixed farming. Crop cultivation and animal husbandry are combined in this ancient and integrated technique. The livestock industry grows a variety of crops, including grains, fruits, and vegetables, and includes cattle, goats, and chickens to provide them with milk, eggs, and dung.



By recycling nutrients and lowering dependency on outside inputs, this produces a closed-loop system. For local communities, it fosters resilience, biodiversity, and sustainable food production.

.Conclusion:

In North East India, where organic inputs are abundant and artificial fertilizers are utilized sparingly, Indigenous Knowledge Practices (IKP) is very successful and feasible for organic farming. By fostering food and nutritional security, generating income and jobs, reducing poverty, and encouraging the wise use of natural resources and ecological surroundings for the tribal people of Northeast India, the traditional farming system is a crucial instrument for boosting agricultural progress. Diversified hill farming systems can increase farmers' production and profitability while preserving the area's indigenous culture, social ties, customs, and genetic resources. The rural population in the area uses herbal plants as a self-help tool at the home level. The locals in the area have their own traditions, customs, and medical practices, and they mostly rely on trees and forest products for daily survival. Tribes in the North-eastern states employ the seeds, barks, rhizomes, leaves, and flowers of several local medicinal plants to treat a variety of illnesses.

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