



INDIGENIZATION A PATHWAY FOR AGRICULTURAL SUSTAINABILITY: A DEVELOPMENTAL PROSPECT

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ABSTRACT

For centuries, farmers have planned agricultural production and conserved natural resources by adopting indigenous knowledge. The development of indigenous knowledge systems, including management of natural environment, has been a matter of survival to the people who generated these systems. With the rapid environmental, social, economic and political changes occurring in many areas inhabited by indigenous people, comes the danger that the indigenous knowledge they possess will be overwhelmed and lost forever. Nowadays, agriculture in developing societies have evolved from location-specific knowledge which are gained through close interaction within natural and physical environments and cultural adaptation, which are now recognized to be eco-friendly and sustainable. Up to the 1980s, the farmers were considered laggards. These days however, the increasing attention and scientific research have made it possible to recognize the farmers as innovators, based on their unique practices in the field of sustainable agriculture.

In this paper, we primarily attempt to rationalize the significance of indigenous agricultural knowledge in the present-day context. The concept of indigenous people, indigenous knowledge and sustainable development, indigenous agricultural knowledge are reviewed. The significance of indigenous agricultural knowledge and sustainable development are in achieving the much talked about sustainable development goals. Also, the paper gives the five indigenous farming practices for sustainable farming systems. We propose that an integration of indigenous agricultural knowledge with modern scientific knowledge has immense potential towards ensuring sustainable agriculture and sustainable development.

KEYWORDS: Indigenous agricultural knowledge, Sustainable agriculture, Traditional knowledge, Sustainable development,

INTRODUCTION

Traditional agriculture is believed to have been sustainable. This stimulates conservationists to analyse and if possible, benefit from the wisdom of indigenous knowledge, at least what has remained from it or can still be remembered by local people. The reason for such a search is clear: world population is steadily increasing, poverty is growing and natural resources are degrading (Agrawal, 1995).

India is primarily dependent on agriculture where than 65 per cent of the country's population depends on it for the livelihood. In 1960s, the green revolution came with the aim to feed the most increasing population because the increased population was followed by indiscriminate use of chemicals to get higher yield in a shorter period of time. Thus, this excessive use of chemicals unreasonably has led to an increase in chemical residues in food which has directly harmed the human food chain especially the health of human beings.

Now-a-days precisely where human want to seek out results much faster than its anticipation, the farmers are also using harmful banned chemicals either to speed up the procedure or to find a shorter way to reach the goal of higher productivity. The result is that this led to the working of the declining factor of productivity in the most fertile and productive plain of the country.

INDIGENOUS KNOWLEDGE

Indigenous knowledge is local or traditional knowledge which is unique to a community or society. It has been developed outside the local system by the researchers, scientists, philosophers *etc.* This knowledge generally is going to be extinct which is currently facing endangered conditions due to forgetting or non-exploring situations. According to Louise Grenier, indigenous knowledge is "the unique, traditional, local knowledge existing within and developed around the specific conditions of women and men indigenous to a particular geographic area" (Grenier, 1998). This knowledge is closely related to survival and subsistence and helpful in making decisions in food security, health, education, resource management, and other community-based activities. The result of a continuous process of experimentation, innovation, and adaptation is dynamic. It has the capacity to blend with knowledge based on science and technology and should therefore be considered complementary to scientific and technological efforts to solve problems in social and economic development. It is typical to capture and stored in a systematic way because it goes orally from one generation to another; hence, this one is the main disadvantage. Traditional knowledge is characterized in various ways as shown in Fig. 1.

The main characteristics of this knowledge: generated within communities, location and culture specific, decision-making and survival strategies, not systematically documented, concerns critical issues of human and animal life, dynamic and based on innovation, adaptation and experimentation, oral and rural in nature.

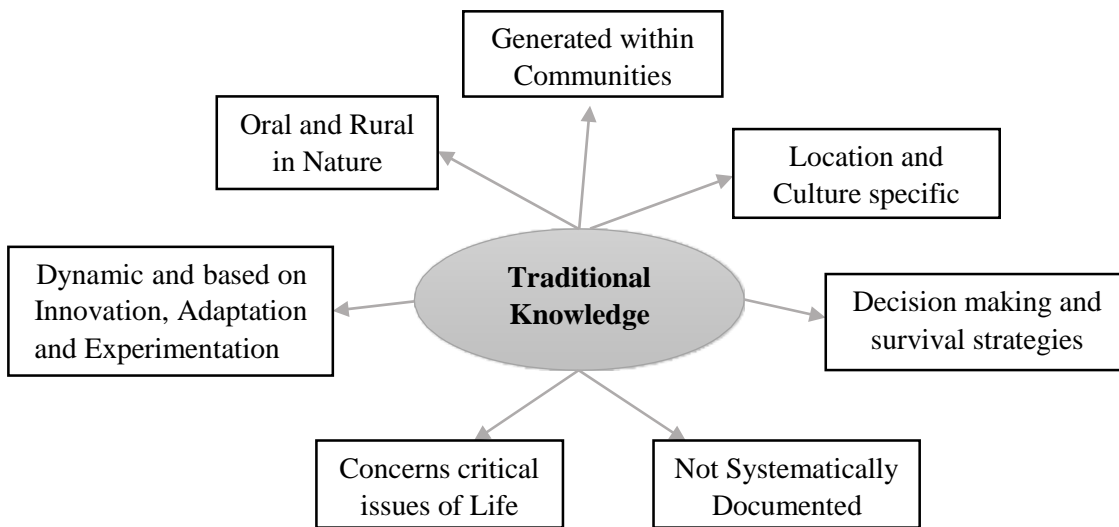


Figure 1: Characteristics of traditional knowledge The role of Indigenous knowledge in India

Recently, the interest in this field has been increased dramatically which is an effective approach to sustainable development. This interest is generally generated within communities for recording and preserving their culture or tradition which are being now the part of institutions in which they are used as a vital natural resource. Nowadays, the people are excluded from the indigenous systems due to modernization or retrogression which is generally called top-down development. In agricultural sector, the yield is maximizing through introduction of new crops in green revolution, but these crops need to optimum availability of fertilizers and water. Hence, on the point of production the green revolution is a success, but its potential totally depends on valuable resources. Indigenous system is very helpful to promote and maintain biodiversity which can help to promote sustainable future through development of caring values (Sultana *et al.* 2018). Indigenous communities always live with the environment so that they have the capacity to regenerate the ecosystem and ultimately manage the biodiversity. On the other hand, it can help in education by providing necessary facilities to the local area. The natives from these areas are being associated directly with the environment by knowing about soil, water, climate, biota, *etc.* This innate knowledge can be easily used in education and it is very useful in nature conservation which has come from the village. Indigenous system is also useful in food production because in many areas new varieties have been introduced to increase production, but these varieties do not fit into these areas. On the other hand, the indigenous varieties do not require fertilizers, insecticides and many other agricultural requirements (De Walt, 1994).

In agricultural development, the indigenous knowledge systems have been used since 30 years to re-green through planting exotic plants and trees because of their resistance to the native environment. So this system is very useful for maintaining ecology of that particular area. One most important role of indigenous knowledge is in medicine use by local people. The knowledge of medicine not only protects people from health threats but also helps in hunger eradication and poverty reduction. In sustainable practices, this knowledge is useful for ecotourism because it has its own vision of development which differs from modern systems. Local people live in most vulnerable ecosystems so that this system is very helpful in knowledge of climate change.

INDIGENOUS KNOWLEDGE AND SUSTAINABLE DEVELOPMENT CONCEPT

The adjectival word “indigenous” means “belonging to a place, native” (Oxford English Dictionary). Thus, Indigenous Knowledge (IK) can be defined as a corpus of knowledge belonging to a particular geographical area. Native knowledge, traditional knowledge, cultural knowledge and civilization knowledge are synonymous terms. It is unique to a given culture, society or a country. “It is seen to contrast with knowledge generated within the international system of universities, research institutions and private firms” (IK papers, 2005). It is stated that “indigenous knowledge system is a cumulative body of knowledge and belief, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment” (Kumaran, Dissanayake and Norbert, 2007).

One of the salient features of IK is that it is a knowledge developed by tribal or rural communities living in a particular geographic location. These early tribal groups are generally referred to as aboriginal people. However, the term IK does not refer only to the knowledge of aboriginal people. Nakata (2002) states the notion that IK



refers to indigenous people's knowledge does not reflect the current usage of the term. According to him, "indigenous people's knowledge could be considered a subset of what is more broadly referred to as 'indigenous knowledge'" As any other knowledge system, IK is also not static and limited only to that particular area where it is originated. It can be observed that IK produced in one particular area or country has transmitted to other areas or countries through travelers and traders. Another important characteristic is that IK is passed down from generation to generation mostly by the word of mouth and to a lesser extent through writing. It is basically an oral tradition.

"Traditional knowledge" and "sustainable development" are contested terms, with widely varying definitions and interpretations. Traditional Knowledge (TK) or other synonymous terms such as indigenous knowledge and local knowledge generally refer to the long-standing information, wisdom, traditions and practices of certain indigenous people or local communities. In many cases, traditional knowledge has been orally passed for generations from person to person. Some forms of traditional knowledge are expressed through stories, legends, folklore, rituals, songs, art and even laws. Other forms of traditional knowledge are often expressed through different means. One distinction that is often made between TK and modern or "western" knowledge is that unlike the latter, TK does not separate "secular" or "rational" knowledge from spiritual knowledge, intuitions and wisdom. It is often embedded in a cosmology and the distinction between "intangible" knowledge and physical things is often blurred. Indeed, holders of TK often claim that their knowledge cannot be divorced from the natural and cultural context within which it has arisen, including their traditional lands and resources, and their kinship and community relations. It is important to emphasize that TK is not, as often perceived, a static phenomenon, but one that is constantly evolving with changes in the internal and external environment of the community concerned.

INDIGENOUS FARMING PRACTICES FOR SUSTAINABLE FARMING SYSTEMS

Five indigenous farming practices that have helped shape sustainable farming systems and practices all over India and the World

1. Agroforestry:

Agroforestry involves the deliberate maintenance and planting of trees to develop a microclimate that protects crops against extremes. Blending agricultural with forestry techniques, this farming system helps to control temperature, sunlight exposure and susceptibility to wind, hail and rain. This system provides a diversified range of products such as food, fodder, firewood, timber and medicine while improving soil quality, reducing erosion and storing carbon.

2. Crop Rotations:

The principles of crop rotation have been successfully used for thousands of years in agriculture and are still used today. Crop rotation is the practice of growing different crops on the same land so that no bed or plot sees the same crop in successive seasons. It is a practice designed to preserve the productive capacity of the soil, minimize pests and diseases, reduce chemical use and manage nutrient requirements, all of which help to maximize yield. The practice of crop rotation builds better soil structure and increases the ability to store carbon on farms.

3. Mixed-/Inter-cropping:

Mixed cropping, also known as intercropping, is a system of cropping in which farmers sow more than two crops at the same time. By planting multiple crops, farmers can maximize land use while reducing the risks associated with single crop failure. Intercropping creates biodiversity, which attracts a variety of beneficial and predatory insects to minimize pests and can also increase soil organic matter, fumigate the soil and suppress weed growth.

4. Polyculture:

Polyculture systems involve growing many plants of different species in the same area, often in a way that imitates nature. By increasing plant biodiversity, polyculture systems promote diet diversity in local communities, are more adaptable to climate variability and extreme weather events, and are more resilient to pests and diseases. Polycultures are integral to permaculture systems and design and provide many advantages such as better soil quality, less soil erosion, and more stable yields when compared to monoculture systems.

5. Water Harvesting:

Water harvesting is defined as the redirection and productive use of rainfall, involving a variety of methods to collect as much water as possible out of each rainfall. Many water harvesting structures and systems are specific to the ecoregions and culture in which it has been developed. This may involve collecting water from rooftops, from swollen streams and rivers during monsoon season or from artificially constructed catchments. This ensures that farmers have a substantial amount of water stored up in the case of drought or limited rainfall.

CONCLUSION

Agriculture is not just an enterprise for livelihood but a socio-economic and cultural activity. While agriculture revolves around seasons, the socio-cultural life of the farmers revolves around agriculture.



Indigenous knowledge systems are seen today as crucial in all discussions on sustainable socioeconomic development and poverty alleviation in developing countries. The focus on indigenous knowledge symbolizes a shift away from centralised and technically oriented solutions that failed to improve the prospects of most of the world's peasants and small farmers. It has been demonstrated that the exclusion of such knowledge from development activities has had disastrous consequences in every region of the world where outsider knowledge has been imposed without regard to traditional knowledge (Cashman, 1989). It was not until the mid-1980s, after recognizing the shortcomings of Farming Systems Research and Development, it was argued that researchers would not need the knowledge generated but should concentrate more on complementing their technical innovations with the local knowledge of farmers, in a participatory research and development process. This idea was supported by international research institutes, which already had a number of innovations that only needed minor adaptations by local farmers.

The sustainable development can only be achieved by developing a science based on the priorities of the local people and by creating a technological base that includes both traditional and modern approaches to problem solving. Sustainable development might be better served by a system that incorporates both indigenous and scientific knowledge systems. The expectation that traditional perspectives and perceptions should play an important role in planning and implementing socio-economic development programmes is yet to be fulfilled. This is mostly attributable to the failure to develop an adequate mechanism for integrating the indigenous knowledge with formal (scientific) decision-making practices.

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