

Evaluating the Role of Indigenous Agricultural Practices in Agricultural Sustainability in Dumka District, Jharkhand

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Abstract

Modern agriculture has played a significant role in increasing agricultural productivity; however, now it's facing a plateau in growth where further addition to technology intensification is creating new environmental problems or increasing the magnitude of them. In this context Indigenous knowledge can play a significant role in addressing these challenges by promoting low-input, eco-friendly and sustainable agricultural practices. It promotes economically affordable farming practices that are particularly beneficial for poor and marginal farmers and helps them secure their livelihood. The present study aims to find and document indigenous agricultural knowledge and analyze its significance in contemporary agriculture. Primary data were collected through field surveys, observation, direct participation, and questionnaire-based personal and group interviews conducted among tribal and local farming communities in selected villages of Dumka district. The study identified several indigenous practices, including organic manure, minimum tillage practices using bullock-driven ploughs, traditional seed preservation methods traditional mixed cropping and community-based agricultural systems. These practices contribute significantly to soil fertility, reduce dependence on external agricultural inputs, and reduce stress on farmers. However, the study also observed that many farmers are losing interest and moving towards modern chemical-based farming for better short-term gains. As a result, indigenous agricultural knowledge is declining due to modernization, changing agricultural aspirations, market influence and weakening inter-generational transfer of traditional wisdom. The study highlights the urgent need to document, preserve, and integrate indigenous agricultural knowledge with modern sustainable farming for agricultural sustainability.

Keywords

Indigenous Knowledge, Agricultural Sustainability, indigenous Agricultural Practices, Traditional Wisdom, Dumka District, Jharkhand.

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Indigenous knowledge, India the country of Rishi and Krishi, has a very rich heritage of traditional health control methods (Ayurvedic, Unani, and Homeopathy) and indigenous agricultural knowledge. (B Subrahmanyeswari and Chander 1991). India stands at the forefront of recognizing the significance of traditional knowledge in advancing sustainable development. Initiatives such as the National Ayush Mission (NAM) and the Traditional Knowledge Digital Library (TKDL) bear testament to the country's commitment to preserving and integrating the rich heritage of indigenous wisdom. By valuing and preserving traditional knowledge, India exemplifies how a nation can progress while staying deeply rooted in its cultural heritage.

Sustainable agriculture emerges as a transformative approach, seeking to meet the ever-growing demand for food while safeguarding the environment and supporting the well-being of rural communities. The management and conservation of the resource base and the orientation of technological and institutional changes in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development is environmentally non-degrading, technically appropriate, economically viable and socially acceptable" (FAO, 1991). Sustainable agriculture can also be defined as a practice that meets current and long-term needs for food, fiber, and other related needs of society while maximizing net benefits through conservation of resources to maintain other ecosystem services and functions, and long-term human development. "Sustainable agriculture is the successful management of resources to satisfy the changing human needs, while maintaining or enhancing the quality of the environment and conserving natural resources". (Consultative Group on International Agriculture Research (CGIAR)2011) The notion that underlies the definitions of sustainability of agriculture is that growth must be achieved without damaging the natural resource base so that such growth can be maintained in the long run. Sustainable agriculture involves multicultural, intercropping, use of farmyard manure, mulching, and the application of integrated pest management. If this is followed, there is no reason for the farmers to be threatened and agriculture becomes an economically viable activity, in addition to being environmentally sustainable (Dwarakanath 2018).

Indigenous knowledge is the knowledge acquired by the local people through their experience, evolved over the time under the influence of traditional knowledge, external factors and agents, and individual innovations Knowledge that people in given community have developed. It is based on experience, often tested over long periods of use, adapted to local culture and environment,dynamics,changing,and laying emphasis on minimizing risk rather than maximizing profits. It is derived from stories, songs, folklore, proverbs, cultural values, beliefs, rituals, community laws, local language, and agricultural practices. Agriculture is not only a means of

survival but also a way of life. Knowledge, skill and survival strategy of farmers operating with low external inputs have often been ignored to promote modern agriculture. (B Subrahmanyeswari and Chander 1991).

Nature of Problem

Agriculture is not only a means of survival but also a way of life. The application of high input technologies in intensive agriculture has undoubtedly increased agricultural production, but now realizing the plateau in the growth, there is serious concern over their adverse effects on agricultural sustainability. Sustainable agriculture aims at achieving permanence through utilization of renewable resources. (Joshi and Singh 2006)

Loss of traditional knowledge- The tribal communities of Dumka district possess rich indigenous agricultural knowledge developed through long interaction with nature. Their indigenous knowledge systems are reflected through their way of life. Today many of them are finding it hard to choose between a traditional and modern lifestyle. With their chose of lifestyle indigenous agricultural knowledge is also changing and the ultimate result if the new generation chose a new trend will be the quick degradation of nature. Many farmers are shifting towards monocropping and external input-based agriculture, which may negatively affect the environment and agricultural sustainability. At present, tribal areas still retain relatively clean soil, low chemical pollution, and eco-friendly farming systems compared to intensive agricultural regions. Therefore, it is important to document, analyze, and preserve indigenous agricultural practices before they disappear completely. Understanding the relevance of these traditional knowledge systems can help promote sustainable agriculture.

Methodology

The present study is based on both primary and secondary data to evaluate the role of indigenous agricultural practices in agricultural sustainability in Dumka district, Jharkhand. Primary data were collected through field surveys, personal interviews, observation methods, and structured questionnaires conducted among tribal and local farming communities in selected villages of Dumka district. Information regarding indigenous agricultural practices, crop diversification, traditional seed preservation systems, organic manure usage, crop rotation, weather forecasting techniques, and socio-economic conditions of farmers was collected directly from respondents during the field survey. Secondary data were collected from sources such as the Census of India 2011, District Census Handbook, ICAR reports, Jharkhand agricultural reports, journals, and previous research studies related to agricultural sustainability and indigenous knowledge systems.

Study Area

Dumka District is located in the northeastern part of Jharkhand and forms part of the Santhal Pargana region. The district is characterized by undulating

topography, forest cover, tribal population, and predominantly rural settlements. Dumka district has a geographical area of approximately 6124 square kilometers and experiences a tropical monsoon climate with an average annual rainfall of nearly 1444 mm, most of which is received during the southwest monsoon season. (SAMETI, n.d.) The district is mainly inhabited by tribal communities such as the Santhal, Paharia, Oraon, and Munda tribes, whose livelihoods are closely connected with agriculture, forests, and natural resources. Agriculture is the primary occupation of the rural population, and the district is dominated by small and marginal farmers practicing traditional and rain-fed agriculture. According to secondary sources, nearly 90% of agricultural land in the district is rain-fed, while only around 10% is irrigated through wells, ponds, and other minor irrigation facilities. (SAMETI)



Agriculture in Dumka district is predominantly subsistence-oriented and monsoon-dependent. The district has approximately 2.18 lakh hectares of cultivable land, of which nearly 50% consists of upland areas, 30% midland, and 20% lowland agricultural land. Paddy is the principal crop cultivated during the Kharif season and occupies the largest share of cropped areas in the district. Other important crops include maize, wheat, pulses, oilseeds, finger millet, mustard, groundnut, gram, and vegetables. Traditional mixed cropping, crop rotation, and rain-fed farming systems are common among tribal farmers. In upland areas, drought-resistant crops such as maize, millets, pigeon peas, black gram, and horse gram are widely cultivated due to low moisture availability and poor irrigation facilities. (SAMETI)


In recent years, vegetable cultivation and commercial farming have increased in some parts of the district using well pumps, tube wells, and river water irrigation. Dumka district possesses significant potential for sustainable agriculture due to the continued existence of indigenous agricultural knowledge systems, low chemical usage in many tribal areas, crop diversity, and eco-friendly traditional farming practices. (SAMETI)

Results and Discussion

The findings of the field survey revealed that indigenous agricultural knowledge is still practiced among tribal and local farming communities in Dumka district. The indigenous agricultural practices observed during the survey have been broadly classified into three major categories: pre-agricultural practices, practices during cultivation, and post-agricultural practices. Pre-agricultural practices include traditional seed selection, seed preservation, soil fertility assessment, and indigenous weather forecasting methods and minimum tillage practices. Practices during cultivation include mixed cropping, crop rotation, use of cow dung manure, ash application, and traditional pest control techniques. Post-agricultural practices mainly include traditional grain storage systems, seed preservation using rice husks, and neem leaves. However, the study also found that many farmers are increasingly

shifting towards modern commercial agriculture, leading to a gradual decline in traditional agricultural knowledge in the region.

Pre TAP	
1	Farmers take 20 to 25 seeds tie them in cloth and shock it overnight the next day they plant them if 4-5 seeds do not germinate it is good but if 8-10 seeds do not germinate then it is not good for sowing. This process helps them to select seeds wisely for better production and save their hard work going waste.
2	For seed selection, clean the seeds with the help of supa.it helps them to separate good seeds from hollow seeds and dust.
3	In hillier parts of Dumka district indigenous people covers their fields with manure of rice husk or ash on top of them to save new seedlings from winter.
4	The village chosen person like local mukhiya told them to start ploughing and announce a date. It guides them to work together so they can help each other to boost overall production of the village or community.
5	Sowing based on local seasonal indicators like the number of flowers in mango trees indicate the behavior of monsoons where high flowers mean good rain.
6	During the field survey, it was observed that farmers place small heaps of kitchen ash and cow dung at different locations across the field before ploughing. This practice helps save time and labour during the cultivation period, as most farmers traditionally use bullock carts and animal-driven ploughs for farming operations. By scattering the manure earlier, farmers do not need to transport and spread fertilizers separately during ploughing season, when agricultural activities are already highly labor-intensive. During ploughing, the ash and cow dung become naturally mixed with the soil. Scientifically, cow dung improves soil organic matter, microbial activity, and moisture retention, while kitchen ash supplies minerals such as potassium, calcium, and phosphorus that help enhance soil fertility and plant growth. This indigenous practice reflects both ecological knowledge and efficient labour management among tribal farming communities in Dumka district.
	
7	Compost Pit Method Tribal farmers dig pits near houses. Organic waste, leaves, cow dung, crop residue, and ash are decomposed. Traditional compost is later used in fields. It's done for agricultural fields far away from home
	
8	Trees like Mahua, Neem, Mango, Sal, Bamboo retained within farms provide fruits and extra income to farmers.

9	Ploughing with bullocks does not deeply plough the land repeatedly. Which helps to maintain soil erosion and keep healthy topsoil in the field. This practice can solve the problem of soil erosion, soil depletion, and prevent salt from coming on top.
During TAP	
10	Cropping system- farmers prefer to grow vegetables near the house in small field called Badi where they follow high crop diversity or sometimes all kitchen essential crops in a single Badi it's also followed in big fields, but the diversity decline with 2-3 crops at a time like pigeon pea+ rice, pigeon pea+ maize, gram + wheat, gram+ linseeds, gram+ mustard farmers also practice crop rotation of different crops and lentils and vegetables based cropping system. It's observed during field survey that tribal farmers prefer to put leguminous varieties in their land for better production and it's also helping them in nitrogen fixation in the land and saving their money from buying expensive fertilizers and boosting their food security.
11	Herbicides and pesticides- tribal and local farmers are not aware about the use of herbicides, instead they consider grass and weeds as a food source for their livestock. It's the daily work for females to go and remove weeds from agricultural fields and give them to animals and they have local varieties of goats, pigs and cows they eat thorny weeds as well they said goats even prefer it. For pest control they use kerosene oil or diesel mixed with Karanja oil prepared by some local community neem oil is also preferred by some farmers.
12	Mix the Mahua leaves with kerosene oil and cow dung. After making the pellets out of this mixture, these are placed in the paddy field. To control ground pests and give some fertility to the ground.
13	Termite attacks are very severe for wheat, maize, sugarcane, potatoes, etc. Farmers adopted the method of water logging to control these pests.
14	Water management- local level and community level ponds are dug to supply water throughout the year. Hardy grass is grown on drainage channels and around the pond to save soil from erosion.
Post TAP	
15	seeds stored in earthen pots, bamboo containers, dried gourds, mud granaries, Neem leaves, ash, and smoke used to protect seeds from insects
16	An indigenous seed preservation technique involving the insulation of seeds with rice husk for protection against moisture, pests, and fungal infestation. This rope is made of husk, and this will be used for next season. In this picture the husk rope left to sun dry. 
17	They make large size storage structure called Mura made from bamboo and rice husk and rice husk rope to bind bamboos together and mud layer is applied on top and around to preserve seeds.
18	Farmers use hand thresh or bull to thresh rice then winnowing with Soop then its sun dried to reduce moisture and parboil to improve shelf life and texture of rice and use wooden structure called Dhekni to remove rice husk. These practices reduce dependence on expensive machinery, conserve traditional knowledge, and support sustainable agriculture.

Conclusion

Traditional agricultural knowledge represents a rich heritage of sustainable farming practices developed through close interaction with nature. Indigenous communities possess deep knowledge regarding cropping systems, seed preservation,

soil fertility management, water conservation, post-harvest practices. These traditional practices are not only environmentally sustainable but also economically affordable and socially relevant for local communities.

However, these valuable indigenous agricultural practices vanishing due to modernization and changing lifestyles, chemical based agriculture and declining interest of younger generations in traditional agricultural system. Many tribal farmers moving away from traditional practices and adopting short term economic gains. As a result, several traditional agricultural practices and local crop varieties are at risk of disappearing. Therefore, identification and documentation of indigenous agricultural practices have become extremely important. Proper documentation helps protect traditional wisdom for future generations and create opportunities in scientific and modern agriculture. Indigenous agricultural practices can provide practical and sustainable solutions to many modern problems such as soil degradation, declining biodiversity, rising cultivation costs and food insecurity.

This study highlights how traditional agricultural knowledge can contribute to sustainable agriculture and community development by using low impute methods and saving farmers money. It also emphasizes that indigenous agricultural knowledge should not be neglected as they contain valuable understanding of agriculture and low-cost farming solutions that are highly relevant for local communities. By promoting direct participation in indigenous agricultural system, we can learn more and help to create balanced agricultural system for future.

Reference

1. B Subrahmanyeswari & Mahesh Chander 20.06.2012, Integrating indigenous knowledge of farmers for sustainable organic farming: An assessment in Uttarakhand state of India.
2. Food and Agriculture Organization (FAO). (1991). *Sustainable agriculture and rural development in Asia and the Pacific*. Rome: FAO.
3. Consultative Group on International Agricultural Research (CGIAR). (2011). *Sustainable agriculture and natural resource management*. CGIAR.
4. Dwarakanath, H. D. (2018). *Sustainable agriculture: Principles and practices*.
5. Joshi CP & Singh BB, Indigenous agriculture knowledge in Kumaon hills of Uttaranchal, Indian J Traditional Knowledge, 2006.
6. SAMETI. (n.d.). *Background information of Dumka district*. State Agricultural Management & Extension Training Institute. https://www.sameti.org/Success%20Story/SUCCESS_DUMKA.pdf