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A Study on Indigenous Technical Knowledge of Tribal Farmers in Agriculture and Livestock Sectors of Koraput District

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ABSTRACT

Indian people are living in varied agro-climatic situations with rich cultural values in diversified societies. Several experiments are being taken by the tribal farmers since long on trial and error basis on agriculture and allied activities to overcome the specific problems or adverse situations in their respective areas. Indigenous technical knowledge system consists of an integrated body of knowledge system which tends to focus on different aspects of agricultural sciences i.e. agriculture, animal husbandry, and natural resource management. The paper is focused on the documentation of various Indigenous Technical Knowledge (ITK) of tribal farmers in agriculture and animal husbandry sectors. Odisha is a state populated by several indigenous communities, most of which have their own set of unique traditional knowledge and technology base. The majority of the tribal farmers had a favorable attitude towards Indigenous Technical Knowledge in the agriculture and livestock sectors. It is a key element of the social capital of the poor and constitutes their asset in their efforts to gain control of their own lives. The flow of indigenous knowledge communication is necessary for the preservation, development, and sustainability of local wisdom. It can be concluded that about 56 per cent of agricultural ITKs are rational against 44 per cent are non-rational. Similarly, 62 per cent of ITKs found in the livestock sector are rational against 38 per cent are non-rational. The rate of adoption in livestock ITKs was 75 per cent and for agriculture 65.72 per cent showing significantly higher rate of adoption in livestock than agriculture. Mainly the farmer's traditional knowledge is vital for all the well-being categories for sustainable development as it has evolved after thousands of years of observation and experience. ITKs being low in cost, it will also benefit the national economy besides sustainable agricultural development.

Keywords*:* Agricultural extension, Indigenous Technical Knowledge (ITK), Documentation and validation

INTRODUCTION

India over several millenniums has been the treasure land of biological wealth, intellectual knowledge and spiritual wisdom. Indian people are living in varied agro-climatic situations with rich cultural values in diversified societies. Several experiments are taken by the farmers since long on trial and error basis on agriculture and allied activities to overcome the problems or adverse situations. The knowledge generated over the years is time-tested and has many attributes of eco-friendliness to farmers and nature. Such knowledge is called the "Indigenous Technological Knowledge (ITK)" or "local knowledge "or "traditional knowledge". Indigenous Technical Knowledge (ITK) has enormous innovation potential, especially at the grassroots level. India is the home of indigenous communities, most of which have their own set of unique traditional knowledge and technology base. Many of this knowledge and technologies are at par with the modern knowledge and technology system and helping the indigenous communities with comfort and self-sufficiency. These traditional knowledge and technologies

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have played a significant role in the overall socio-economic development of the communities.

India's ancient scriptures consisting of 4 Vedas, 108 Upanishads, 2 epics, Bhagwad Gita, Brahmasutras, 18 Purana, Manusmriti, Kautilya Shastra and Smritis as well as the teachings of innumerable sayings, proverbs and sages contain profound literature of ideas, concepts and practices which are designed to address the process of building harmonious relationship among man, animal and nature. India has more than 1000 species of plants are known to have insecticidal properties, 300 species with repellent properties, 30 species possessing insect growth regulatory (IGR) properties and there is wide scope for use of organic manures which can be prepared from plant parts as well as animal byproducts. The enhancement of the quality of life of the Indians who in great majority live in and depend on agricultural production systems would be impossible by keeping this rich tradition of ITK aside. India is classified among the 12 mega diversity centers of the world, concerning crops. As many as 167 species of crops, 320 species of wild crop relatives and several species of domesticated animals have originated here. The genetic diversity within these species is astounding. Some examples are rice (50,000 varieties), sorghum (5000 varieties), mango (1000 varieties), pepper (500 varieties), cattle (27 breeds), goat (22 breeds), sheep (40 breeds), poultry (18 breeds) and Buffalo (8 breeds). This amazing diversity is not a freak of nature, but a result of careful selection and even crossbreeding over centuries by India's farmers and pastoralists. Hence, Indian agriculture, to such an extent, is much traditional and dates back to about 10,000 years.

Interest in Indigenous Technical Knowledge (ITK) has been fueled by the recent worldwide ecological crisis and the realization that its causes lie partly in the over-exploitation of natural resources based on inappropriate attitudes and technologies. Scientists are now recognizing that indigenous people have managed the environments in which they have lived for generations, often without significantly damaging local ecologies. Many feel that indigenous knowledge can thus provide a powerful basis from which alternative ways of managing resources can be developed. The present paper attempted to identify and document the Indigenous Technical Knowledge of tribal farmers in the agriculture and livestock sectors and documented the farmers' coping mechanisms to overcome the constraints identified.

METHODOLOGY

The study was conceived on the theoretical premise that a man tries to adapt to the environment in which he lives and derives his livelihood, he improves his knowledge, skills, and strategies to harness natural resources in a sustainable manner. The knowledge and skills are derived from man's daily interactions with the environment, observations, and experiments. They greatly shape and model the decisions made by people regarding the exploitation of resources. The knowledge, skills, and practices relating to natural resources are passed down to generations through the cultural learning process. It is the outcome of all these among different groups and the environment that is termed as indigenous, local, traditional or people's knowledge. Indigenous knowledge in this study refers to the knowledge which is native to the farmers. This knowledge system is however not exclusive but can be modified with time and requirement, whereas modern knowledge referred to concepts, ideas, values, beliefs which are imparted in the minds of the native by extension workers who are trained in scientific agriculture.

Explorary research design was followed for the study. The steps were taken to accomplish the task included the use of a more qualitative approach. The research design was employed to conduct the cross-sectional survey and the method was deemed suitable because it enabled the required information to be collected on several pre-determined variables of a single point in time and from a cross-section of the fairly uniform group. The district was purposively selected as it is a tribal-dominated district of the state. The study was conducted in 10 tribal villages of Potangi and Semiliguda blocks in Koraput district. From the ten selected villages, 20 farmers from each village were selected, thus making a total of 200 respondents for the study. While technological developments are pivotal in a change in agenda, overall changes that have been taking place in the agricultural and animal husbandry sectors were described. To

synthesize farmers' practices and experiences to draw the useful lessons required participating in, and following several iterative steps. Researchers, extension officers, and district level officials jointly developed checklists with open-ended questions and administered through individual interviews with five key informants and farmers. Purposive sampling was used in selecting 20 farmers from each village basing on their knowledge of the subjects as well as their policy-making and implementation roles.

RESULTS AND DISCUSSION

The tribal culture is so much generous and simple. A deep observation, study, and analysis regarding tribal culture and traditional knowledge will clarify our understanding. Although modernization and the process of globalization have already entered into the hills of the Koraput region changing their lifestyle; yet their costumes, traditionally associated with cultural history will remain evergreen in the vicinity. The technologies developed by the tribal farmers are based on the topography, local agro-climatic conditions, and available resources through non-formal experiments. Mainly the ITKs were confined to agriculture and livestock sectors in all selected villages of the Koraput district. The agriculture sector covered agriculture & natural resource management (nrm), rice, greengram, and groundnut. similarly, in the livestock sector cattle, sheep & goat and poultry bird were covered.

It could be seen from the Table 1 that 63 ITKs were documented across the villages, out of which 35 ITKs which accounts for 55.55 per cent were found rational and 28 ITKs were non-rational. Among all the ITKs, 34.92 per cent of the ITKs were related to agriculture and Natural Resource Management followed by 18 ITKs related to rice crop accounted 28.58 per cent, greengram accounted 19.04 per cent and only 11 ITKs are related to groundnut which was only 17.46 per cent. It shows that the more ITKs on a particular crop shows the importance given by the farmers to the crop. Further, 39 ITKs were documented in all selected villages under the animal husbandry sector. Out of 39 ITKs, 24 ITKs are rational, which accounts for 61.53 per cent and 15 ITKs were found non-rational. Among all the ITKs, 43.60 per cent of the ITK's were related to the cattle; nearly the equal 28.20 per cent of the ITK's were related to sheep & goat and poultry birds respectively. Chandola *et al.* (2011); Chinlampianga (2011); Dey and Sarkar (2011); Ellis and Wang (1997); Manna *et al.* (2011) and Nayak *et al.* (2011) also reported different ITKs related to agriculture and allied sectors in different settings.

It reveals from the Table 2 that the majority of the rational ITKs (65.72%) were adopted by the farmers in all the selected villages. Similarly, about 34.28 per cent of non-rational ITKs were also adopted by the farmers in the district. The extension system while encouraging the adoption of rational ITKs should educate the farmers to discontinue the non-rational ITKs. It could also be seen from the table that 18 rational ITKs were adopted by the farmers across all the villages which contribute 75 per

Table 1: ITKS documented in Agriculture and Animal Husbandry

Main area of ITK	Number of ITK documented	Percentage	Number of Rational ITK	Percentage of R. ITK	Number of non-rational ITK
Agriculture					
Agriculture & NRM	22	34.92	12	34.29	10
Rice	18	28.58	10	28.57	8
Greengram	12	19.04	7	20.00	5
Groundnut	11	17.46	6	17.14	5
Total / Average	63		35	55.5	28
Animal Husbandry					
Cattle	17	43.60	11	45.83	6
Sheep and Goat	11	28.20	6	25	5
Poultry birds	11	28.20	7	29.17	4
Total / Percentage	39		24	61.53	15

Table 2: Rationality and Adoption of ITK in Agriculture and Animal Husbandry

Main area of ITK	Rationality		Adoption of ITKs	
	Number of ITKs	Percentage	Number of Rational ITKs	Number of non-rational ITKs
Agriculture				
Agriculture & NRM	12	34.29	8	4
Rice	10	28.57	7	3
Greengram	7	20.00	4	3
Groundnut	6	17.14	4	2
Total/Percentage	35	55.5	23 (65.72%)	12 (34.28%)
Animal Husbandry				
Cattle	11	45.83	9	2
Sheep and Goat	6	25	4	2
Poultry birds	7	29.17	5	2
Total/Percentage	24	61.53	18 (75%)	6(25%)

cent and about 25 per cent of the non-rational ITKs were also adopted by the farmers in the district. The extension system while encouraging the adoption of rational ITK should educate the farmers to discontinue the non-rational ITKs in most villages.

CONCLUSION

It can be concluded that traditional knowledge is vital for well-being and sustainable development as it has evolved after thousands of years of observation and experience. ITK is also required to be properly documented for the benefit of researchers, planners and development officials. Validation of ITK is a logical step to qualify and quantify the effectiveness of the practices. Suitable modifications of the local practices, through research and development, will help to develop appropriate and acceptable technologies that are more suited to our farming situations. However, there is still a long distance to cover in scientific validation of Indigenous Agricultural knowledge. Farmers have wealth of knowledge, which eventually does not extinct but transfers from generation to generation on its own strength and influence. It is very important to concretize this experience into a system. Identifying, documenting and incorporating ITK in agricultural extension organization are essential to achieving agricultural development. The participatory technologies that are developed through ITK integration will provide diversified technological options. Indigenous Traditional Knowledge being low in cost will also benefit the national economy besides sustainable agricultural development.

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