



Farmers Practicing Indigenous Knowledge For Conservation Of Agriculture Biodiversity

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ABSTRACT

Indigenous Technical Knowledge (ITK) has immense potential for innovation, especially at the grassroots level. India is a country populated by a number of indigenous communities, most of which have their own set of unique traditional knowledge and technology base. Innovations and practices derived out of success stories from rural locale provided zeal to research scholars to probe into these systems of empowerment. It closely interlinks cultural and biological diversity, forming an essential basis for the conservation and sustainable use of global biodiversity. The study draws clear inference on farmers practising traditional Indigenous knowledge (TIK), innovations and agriculture biodiversity conservation. The present paper highlights on the traditional indigenous knowledge of farmers and roles in regulating natural resources management in conserving the agriculture bio-diversity.

Keywords: *Indigenous Technical Knowledge, biological diversity, conservation agriculture bio-diversity*

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INTRODUCTION

India has great diversity of habitats owing to varied climates and altitudes endorsed India's rich and diverse flora. India is fortunately endowed with a wide range of agro-climatic conditions that support the growth of an equally diverse range of plant and animal species. But the loss of Biodiversity is a very serious problem of the country. It has been well recognized that valuable and productive biological resources are crucial for sustainable economic development. The rural population always believes that biodiversity is important for their livelihood and survival. Protecting and conserving biodiversity is our own interest and industries such as pharmaceuticals, cosmetics, pulp and paper, construction, Agriculture and agro industries, Horticulture and waste treatment are dependent on biological resources.

Biodiversity is not just one phenomenon; it is a concept that involves many facets of biological variety [2], genetic differences among them, and the communities, ecosystems and landscapes in which they occur [3]. Biodiversity provides millions of people with livelihoods, helps to ensure food security, and is a rich source of both traditional medicines and modern pharmaceuticals [4]. The term 'Traditional Knowledge' (TK) interchangeably used as indigenous knowledge (IK) is used to describe any information, knowledge, innovation, or practices of the indigenous local communities that is of relevance in ensuring the conservation and sustainable use of biodiversity.

It encompasses all species of plants, animals and micro-organisms and variations between them, which form an intangible component of the ecosystems of which they are part [1]. Such a knowledge is developed and passed on from generation to generation in the form of stories, songs, cultural values, traditional laws, local languages, rituals, healing arts, and agricultural practices, for the collective good of the communities. Traditional Knowledge (TK)

or Traditional Ecological Knowledge (TEK) is important not just for its own sake but for its potential to help design more effective conservation of biodiversity. Many practices used by indigenous people serve to manage species diversity, create habitat heterogeneity on the landscape scale and manage

intensity of use, thereby enhancing the diversity of biological resources available. We assume that for the most part, biodiversity conservation is the indirect income, rather than the objective, of the practices. Traditional knowledge transforms Biodiversity into Bioresources. Biodiversity and associated traditional knowledge are an integral strength of today's developing countries particularly in the areas of agriculture and Horticulture. It holds great potential all over the world that is increasingly being sensitized to Traditional knowledge. Indigenous men and women over generations have bred races of several food, cash crops and Horticultural crops out of wild plants of the forest s called landraces or local or indigenous varieties and these are the basic foundations of modern plant breeding and global food security. Indigenous farming communities have also identified and managed a series of genes through selection and cross breeding. These genes have potential traits of pest(s) and disease(s) resistance, drought tolerance, high salt tolerance, cold tolerance, tolerance to water logging etc. To develop a crop that can withstand global warming and climate changes across agricultural zones, International scientists visit tropical regions for crop varieties that are drought tolerant / resistance and for this purpose they depend largely on traditional knowledge and local farmers. Breeding and selection process with local varieties, they will be able to develop a potential and high yielding crop variety with combinations traits for tolerance to drought or salinity or resistance to pest(s) and disease(s). The overall productivity of agricultural systems may be increased making full use of the available temporal and spatial opportunities for growing a diversity of crops.

MATERIAL AND METHODS

The present survey was undertaken to collect information from people on the use and management of natural resources. The survey made in and around the areas of Coimbatore district of Tamil Nadu. The indigenous knowledge of local traditional practices and the natural resources used for various purposes were collected through questionnaire and personal interviews during field trips.

RESULTS AND DISCUSSION

Soil biodiversity Conservation

Traditional knowledge on biodiversity conservation in India is as diverse as 2753 communities and their geographical distribution, farming strategies, food habits, subsistence strategies, and cultural traditions. Soil is one of the most important natural resources that perform many functions essential for maintenance of ecosystem. It serves the substrate that supporting plant growth, acts as a reservoir of many nutrients, as a storage and purification medium for water as it passes through the soil profile, and as a biological reaction completing the cycle of life through decomposition and recycle of organic materials. The soil conservation techniques improved the productivity of crops as well as maintain soil fertility status and protect the agroecosystem environment from degradation.

i) Mulching

Mulch is a covering layer of material applied over the surface of land. The layer of mulch creates a buffer between the soil and aerial environment. Application of crop residues on field surface is an age old practice followed by most of the farmers. Farmers left considerable portion of crop parts in field just after harvesting the crops. Left over residue ploughed back into the system which released significant amount of nutrients and ultimately reutilized by the subsequent crops. It conserves soil moisture by reducing the surface runoff and erosion and increases water holding capacity too. It supplies nutrients to succeeding crop through the decomposition process thereby improves the fertility status of the soil. It regulates the soil temperature and make a favourable environment for plant growth and microbial activity.

ii) Crop rotation

Crop rotation is the back bone of organic farming practices. To keep the soil healthy and to allow the natural microbial systems working, they are practising crop rotation. Different crops such as cereals, millets, oil seeds, pulses are followed in a sequential rotation. All high nutrient demanding crops should precede and follow legume dominated crop combination. It invariably includes pulses or green manure crops which leave root nodules in the soil and help in improving residual nitrogen content facilitating to economise nitrogen use. Pulses at plants fixing atmospheric nitrogen find its importance as sequential crop, mixed crop, inter crop, alley crop in cropping system depending upon the need and resource availability of the locality. Changing of crops will help in control of weeds in these associations. Insects often are quite host specific, and changing crops may starve out certain pests or reduce their numbers. The use of crop rotation helps to increase soil fertility, reduce erosion and bring biological diversity back to the soil. The better use of crop rotations providing nutrients, disease and weed break for the subsequent crop is an important agronomic management tool for crop management. Broad crop rotations within farmland maintain greater species diversity, soil macrofauna and soil microfauna leads to sustainable ecological balance of the ecosystem.

iii) Cover Crop

Cover Crop means plants or a green manure crop grown for seasonal soil protection or soil improvement. Cover crops help control soil movement and protect the soil surface between crops. Cover crop reduces wind erosion by shielding the soil with vegetation and anchoring the soil with roots. In Coimbatore, green manure crops like Sunhemp, Cowpea, Daincha, Lupins etc. are more commonly used by the farmers. Legume cover cropping in grape, mango, guava and other fruit crops is becoming a common practice in the management of orchards. Cowpea and French beans grow well under guava and sapota tree. In some places to prevent soil erosion, certain permanent cover crops like *Calapogonium muconoides*, *Centrosema pubescens* and *Peuraria phaseoloides* are raised in the alley spaces. They are leguminous crops, establish in a short period, dry up during summer to conserve moisture. With summer showers they come up again because of their profuse seeding habit and spread themselves as a vegetative mat by the time the heavy monsoon starts pouring in. Such permanent cover cropping is a common feature in coconut plantations of pollachi.

iv) Vegetative barriers

Banana is the third important commercial crop in the State and the loss for banana growers in the western part of the State is estimated to be around Rs. 5 crore annually. In Coimbatore and its surroundings alone, banana is cultivated on 30,000 hectares with an annual production of 11 lakh tonnes of fruit. The farmers in the areas of annur are growing casuarinas as a vegetative barrier for wind in banana fields. Farmers chosen the species of casuarina that is normally grown in the inlands for windbreak system. Casuarina trees increased the revenue to farmers and could be harvested in three years and sold to pulp wood industry. Even in the second year, fully-grown casuarina plantation could be harvested as there is a great demand for this wood in gasifier units of the energy production companies.

v) Growing green manure crops

The practice of ploughing or turning into soil under-composed green plant tissue for the purpose of improving physical condition as well as fertility of the soil is referred to as green manuring and the manure obtained by this method is known as green manure. Green manuring is a time-tested strategy to create useful organic manure for additional nutrient supply. Legumes are usually utilized as green manuring crops as they fix atmospheric N and leave art of it for utilization of companion and succeeding crops. Green/green leaf manuring in rainfed land helps to improve physical and chemical properties of the soil, maintenance of organic matter and serves as a source of food and energy for microbial population in the soil

In-situ green leaf manuring: Growing various types of leguminous plants like sunhemp, dhaincha, horse gram, niger, cowpea, jute etc. in the field before 15 days of sowing / transplant-ing and finally incorporating the same in the soil during ploughing.

Ex-situ green leaf manuring: Getting the green leaves, stem and branch-es from the trees grown outside like glyricidia, cassia semia, jackfruit, pongamia, niger etc and incorporating the same within the soil just 15 days before sowing or transplantation of the crop in the field.

The green leaf manure rots and provides more nitrogen to the plants ultimately saving organic manure-application. Addition of various types of green leaves to the soil controls pests and diseases. Two to three tons of green leaf manure can be added to one acre of land.

vi) Intercropping

Growing of two or three different crops within the same field reduces the chance of loss incurred due to failure of a crop being lost due to some constraints. The habit of sorghum+ redgram intercropping encourages the birds to alight especially during the panicle stage of the sorghum. Mixed cropping of different cereals, millets, pulses and oilseed crops simultaneously on the same piece of land with or without any row proportion is also a valid practice to overcome vagaries of weather abnormalities and crop failures. This practice minimizes risk in case of crop failures, acts as barrier for pests, builds soil fertility and makes the farmer self sufficient. Diversity in crops play an important role in pest management. Traditional agriculture systems are highly diverse, this diversity helps to insure against losses due to pests.

CONCLUSION

Traditional knowledge systems and technologies have been found to contribute sustainability in diverse fields such as maintenance of ecosystems services viz., supply of food, fodder and fuel, ecological and biocultural restoration, sustainable water and fertility management, genetic resource conservation and management of other natural resources. Wide ranges of indigenous practices enhance the use of locally available inputs and support the economic growth of the rural people. Sharing of traditional knowledge may be helpful to protect the environment from degradation, sustained crop production, promote landscape heterogeneity and generate employment opportunities.

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