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Poetic Article

Traditional Agriculture System: A Need of hours for Modern World

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Introduction

The twenty-first century is the era of global environmental problems such as increasing population, natural resource degradation, climate change and ecosystem disturbance. Green Revolution though multiplied agricultural production many folds but at the huge environmental cost. Now the time is to quittance the loss by introducing an environment-friendly and climate-smart approach. And Traditional agriculture is the practice which is getting increased attention in the context over the world. The dormant seed of Traditional Agriculture System was again germinated when United Nations announced 2014 as the International Year of Family Farming (IYFF, 2014) to promote family farming or small land holder farming with ultimate aim to end hunger, improve livelihood, manage natural resources and for well-being of rural people. Though, the prevailing farming system of Central Himalayan Region is advocating the true concept and model of family farming from generations. Actually, not just Himalaya but there are so many other ancient farming practices are still in existence those are advocating traditional agriculture system from centuries. For example, the Hani rice terraces of Yunnan Province in south-west of China are one of the well-known traditional agriculture systems of mountainous regions which have been designated as Globally Important Agricultural Heritage System (GIAHS) in 2009 by FAO and World Cultural Heritage (WCH) sites by United Nations Educational, Scientific, and Cultural Organizations (UNESCO) in 2013 [1]. If we derive our nutrient, water, energy and organic matter from surrounding forests, labour from humans and draught power from bullocks, this system of collective inputs is characterized as the traditional agriculture system. It is time-tested and beholds salient features of modern sustainable agriculture system. Low energy inputs, high productivity, biodiversity conservation and climate change mitigation are some of the coherent features of the traditional agriculture system. It is right time to bridge the gap between traditional and modern agriculture system and carry forward the idea of socio-ecological improvement and human-nature relationships. Around 1.9 to 2.2 billion people are already engaged in the system of traditional agriculture worldwide [2,3]. There are proven facts that says traditional agriculture fits well in the category of small land holding farmers and report says "globally about 84% of the farmers have land holding of less than 2 ha and that falls in the same category. This is not it but the counting of small land holding farmers is increasing in exponential fashion year by year [4,5]. And that's how this is the perfect time to make traditional agriculture system as new normal of not just farming but education.

What makes traditional agriculture system different?

- Traditional agriculture integrates crops with livestock which eventually helps farmers to reduce their dependency on external inputs such as fertilizers, pesticides and fossil fuels [6-8].
- Unlike the modern agriculture system where the link between consumer and agro-ecosystem is uni-directional, traditional agriculture system is linked with bi-directional approach which includes recycling of agricultural and agricultural allied wastes [9].
- Agrobiodiversity which is an inherent feature of traditional agriculture system reduce the need of off-farm inputs and thereby supplies range of ecosystem services to agriculture.
- Vermicompost and green manuring improves the soil microbial activities and thereby maintain the nutrient cycle in the soil [10-12].

As per the FAO report, 75% of the world's food-crop diversity has lost in the twentieth century due to replacement of local varieties by genetically uniform High Yielding Varieties (HYV's) and intensive monoculture farming. Whereas traditional agriculture system advocates the polyculture farming as a whole and this may integrate different agricultural practices as detailed in table 1.

S. N.	Agricultural Practices	Description
1	Agroforestry	The integration of trees with crops is known as agroforestry which is an age-old practice. Agroforestry offers multidisciplinary benefits e.g., it enhances soil organic matter, agricultural productivity, carbon sequestration, water retention, agrobiodiversity and farmer's income.
2	Crop rotation	It is a growing a sequence of crops or plant species on the same land. This is an ancient practice that has been used for thousands of years. Crop rotation enhances the soil quality and crop productivity through altering soil structure and aggregation and nutrient cycling.
3	Intercropping	The concurrent application of more than one crop species on the same field is known as intercropping. It is a practical application of fundamental ecological principles e.g., diversity, competition and facilitation. It is one of the highly productive farming practices which reduces the climate-driven crop failure as variety of crops have different climatic adaptability. Intercrops efficiently utilize the natural resources e.g., land, water, light and nutrient and eventually increases productivity, resilience, stability and biodiversity of the agroecosystem.
4	Cover cropping	Cover crop refers to the crop that is grown to cover the ground for reducing soil erosion and nutrient loss. This is a sustainable approach for enhancing soil health, soil microbial biomass and agroecosystem services e.g., moisture conservation, weed and pest control, nutrient cycling and corban sequestration.
5	Integrated forming	The integration of various agricultural practices viz. agriculture, horticulture, sericulture, forestry, fisheries, poultry, piggery, animal husbandry, dairy and beekeeping is a need for hour. This farming system was prevailing in ancient India for generations and today it still has potential to fix not only the agroecosystem problems but also to resolve unemployment and migration problems from rural to urban India.
6	Traditional organic composting and green manuring	Fertilizer-driven Green House Gas (GHG) emission is the largest source of total GHG emission from agriculture sector. Besides, contributing to GHG emission, nitrogenous fertilizers decrease soil microbial activity and bacterial diversity. On the other hand, organic compost enhances fertility and productivity in a joint manner. Composting refers to the natural processes of decomposition of organic matter (e.g., straw, crop residues, agroindustry by-products, livestock waste and kitchen waste) by micro-organisms under controlled condition. It not only removes the waste but also transforms waste into nutrient-rich organic manure.

Table 1: Different agricultural practices and their brief description.

Conclusions

- There is an urgent need to develop a concrete policy framework to protect, execute and boost traditional agriculture system.
- Cooperation and coordination between various stakeholders such as local peasant, researchers and policy makers of the agroecosystem are urgently needed to form effective plans and strategies for implementation of traditional agriculture system.
- Integration of modern agriculture system with traditional agriculture system is a need of hour to boost agriculture-based economy as well as climate change mitigation.
- More inclusive research focused on the identification and exploration of traditional agriculture knowledge at a broader perspective is a need of hour.

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