

Reviving the Spiritual Roots of Agriculture for Sustainability in Farming and Food Systems: Lessons Learned from Peasant Farming of Uttarakhand Hills in North-western India

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Received February 10, 2020; Revised March 18, 2020; Accepted March 29, 2020

Abstract The modern industrial agriculture is in crisis. People are questioning the quality, safety and sustainability of our industrial food system. People are also questioning the wisdom of scientific agriculture as science has eventually succeeded in taking the sacred out of farming. However, the crisis brings with it opportunities for decisive, positive change. Based on our recent studies on agri-food system dynamics of traditional small-scale hill farming in Uttarakhand state of north-western India, we could document some community LEK-based innovations that can bring sustainability in food and farming systems. The lessons learned are presented here in this communication that are expected to help create a regenerative farming system mainly by reclaiming the spiritual roots of farming and food systems.

Keywords: *sustainable agriculture, regenerative farming system, spirituality in farming and food systems*

Cite This Article: Ishwari Singh Bisht, and Jai Chand Rana, “Reviving the Spiritual Roots of Agriculture for Sustainability in Farming and Food Systems: Lessons Learned from Peasant Farming of Uttarakhand Hills in North-western India.” *American Journal of Food and Nutrition*, vol. 8, no. 1 (2020): 12-15. doi: 10.12691/ajfn-8-1-3.

1. Introduction

Agriculture began independently in different parts of the globe, and included a diverse range of taxa. People around the world, for several millennia, produced food using different methods and systems adapted to their local environments. People grew food in ways that were local, deeply integrated into culture, and tied to the land. Farming shaped festivals, customs, languages, arts, and religions. Farms were embedded in local ecosystems: people produced most of the fertilizers, pesticides, and fuel they needed to run their farms and most food was consumed close to where it was grown. In the last century, however, this has changed dramatically [1].

In the 20th century, a new kind of farming was made possible by using modern methods of agriculture that are technoscientific, economic, and political. They include innovation in agricultural machinery and farming methods, genetic technology, techniques for achieving economies of scale in production, the creation of new markets for consumption, the application of patent protection to genetic information, and global trade. This change

made farmers’ survival dependent on their ability to sell (rather than eat) their products, and, in many cases, on their ability to secure loans to purchase necessary “inputs” at the beginning of each year.

The conventional industrial agriculture, world over, is in crisis today. The crisis in agriculture has several root causes, but none is more fundamental or more important than is the dehumanizing and desacralizing of the present food and farming systems [2]. The industrial agriculture is dying from lack of respect for life.

The largely small-holder Indian agriculture is also at crossroads under the conventional “green revolution” regime. The national agriculture policies and the agro-input based companies pressured farmers to adopt the new technologies of industrial agriculture, including commercially produced seeds and fertilizers. The sustainability of the present conventional farming and food systems is, however, being greatly questioned. Growing concerns for the sustainability of industrial agriculture have led to a movement that slowly and subtly is reclaiming the sacred in food and farming. The most visible evidence of emergence and growth of this movement has been the growing popularity of organic and locally grown foods [2].

Table 1. Salient features of hill farming agro-ecologies of Uttarakhand state in north-western India

Representative hill agro-ecology	Arable farming landscapes (%)	Subsistence level (local food self-sufficiency, %) produce and native plant resources to HH cash	State of nutrition transition	External (purchased) inputs used	HH food production and dietary diversity	Incidence of food related non-communicable diseases	State of spirituality in food and farming system	State of Community happiness	
1. Crop-livestock small-scale mix farming landscapes (rainfed farming)*	70	80	24	Low	Nil	High	Low	High	High
2. High elevation areas adjoining Tibet with nomadic pastoralist communities (rainfed farming)**	10-15	60	33	Low to medium	Nil	Moderate	Low to moderate	High	High
3. River valleys practicing improved agriculture (irrigated farming)***	15	100	53	Medium to high	Low to moderate	Low	Moderate to high	Moderate	Moderate

*Data of 10 study sites representing 350 HHs; **Data of 5 study sites representing 100 HHs; ***Data of 5 study sites representing 150 HHs.

2. Salient Features of Hill Farming Agro-ecologies and Food Systems

The traditional farming of Uttarakhand hills in India has its roots in spirituality and these roots need to be revived to make farming and food systems sustainable. In some of our recent studies, we could document several traditional innovations based on farming communities' local ecological knowledge (LEK). These local innovations have scientific merit that can be easily integrated in to the state agricultural policy for bringing sustainability in food and farming systems [3,4,5,6]. The salient features of hill farming agro-ecologies and agri-food systems are presented in Table 1. The lessons learned are presented here in this communication.

We hope that the lessons learned will address the question we are often confronted with - what would a sustainable or regenerative agriculture system look like, paying attention to its resource base and how it regenerates through natural cycles and closed loops. It is expected that this communication will pave way to generate empirical data, on sound scientific principles, on several of these LEK-based innovations related to farming and food systems. The lessons learned are the outcome of participatory focus group discussion (FGD) meetings involving about 500 farmer households (HHs) from 20 farming landscape sites representing three major hill agro-ecologies (Table 1) during 2018-19.

3. Results

The lessons learned and their relevance to regenerative hill agriculture systems are as follows:

- Spirituality in food and farming has been a way of life in hill farming communities of Uttarakhand since millennia. Farmers prayed for rain, for protection from pestilence, and for bountiful harvests. People gave thanks to God even for their daily meal. There are enough examples of age-old customs of farmer HHs in the community conserving many of the indigenous varieties of crops and wild plant food resources for religious or

spiritual purposes. Further, farmers traditionally believe in the old age saying "*you are what you eat*" and duly acknowledge the spirituality aspect to the food that they consume to sustain them physically. Farmers have an understanding that- to be healthy in mind, body and spirit, it is essential to be spiritually connected to the food they eat and to relish the experience of eating. For them the understanding of how to eat is just as important – sometimes even more so – as what to eat. They understand the fact that all food is sacrifice, because all food is gained by death. Traditional farming landscapes and local farming communities, therefore, provide us the opportunity to showcase how indigenous food sovereignty and food systems can contribute for overall health, well-being, and wholesome life of the native communities.

- Except a few river valleys, about 80% hill farming is organic/bio-dynamic/natural or ecological. The small-scale farms relying mostly on resources which were available locally for free. In predominantly traditional crop-livestock mixed farming landscapes, diverse native/naturalized crops are grown as polyculture without using chemical fertilizers and pesticides. Organic farming systems mainly rely on crop rotations, mix-cropping with legumes/pulses, use of forest litter and farmyard manures, aspects of biological pest control, etc. to maintain soil productivity and tilth, to supply plant nutrients and to control weeds and pests. This way safe organic foods are produced for human consumption. These practices intend to help improve human health and preserve the environment for future generations.
- The traditional production landscapes are based on farmers' LEK of 'Analog forestry.' Conventionally it is an approach to ecosystem restoration that considers the process of forest formation and the functioning of forest services to be critical in establishing a sustainable ecosystem characterised by a high biodiversity to biomass ratio. It seeks to optimise the productive potential of the design rather than maximise the production of one crop and to maximise ecosystem services by increasing the

volumetric mass of the photosynthetic component. In the mixed crop–livestock farming system, there exists a dynamic relationship among crops, livestock, CPRs (community agroforestry systems), and forests (community managed). Livestock depend for fodder and grass on CPRs and forest land, and also on crop residues. The CPRs are also source of several wild plant food resources, an important source of HH dietary diversity. In hill farming, to sustain one hectare of farmland, farmers require 6-8 ha of well-managed forests. Therefore, farmlands cannot be seen in isolation in hill farming, and CPRs and forests are integral components of a regenerative farming system and agro-ecosystem restoration.

- The predominantly crop–livestock small-scale mixed farming systems of Uttarakhand hills encourage farmer households to consume more the local crops instead of animal flesh, except for the nomadic pastoralists of high mountainous regions who depend relatively more on animal products. In indigenous animal husbandry of Uttarakhand hills, the livestock are mainly fed on crop by-products while substantive food is mainly reserved for human consumption. Such system saves humans from competing with livestock for food and ensuring food sufficiency. Further, feeding farm animals on crop by-products and forage grasses ensures production of lean meat that helps reduce fat-related complications and diseases.
- Dependence of local communities of Uttarakhand hills on diverse plant resources including wild plants ensures that the plant species are protected, and in this way an effective mechanism of sustainability that indigenous communities can employ to maintain a cosmic balance with the ecosystem.
- A more realistic and often overlooked common practice is - the unique system of crop rotation and keeping the farm land fallow in traditional rainfed hill farming. Keeping the land fallow is a traditional crop rotation practice primarily aimed at fertility and soil-moisture management. The fallow fields during *rabi* (winter) season also serve as grazing ground for cattle and goats. The excreta of these animals dropped during grazing add organic matter to the soil. This organic matter increases soil fertility.
- In the traditional small-holder farming systems, the crop production and consumption decisions of farmer households are often linked. The consumption preferences continue to influence these decisions. The surplus crop produce is sold locally in the community, sometime through bartering. Profit maximization has never been the production objectives of the farmer households and market prices are a small fraction of the private incentive that farmer attach to maintaining crop diversity. Cultural and consumption preferences, therefore, play a major role in decision making of farmer households. Maintaining crop landrace diversity in production systems also has public incentives to farmers and society. Genetic diversity in crop landrace populations has substantially contributed for adaptive response to changing

climate and also has potential to generate novel variations needed to maintain the capacity of crops to adapt to change. The traditional farming systems thus provide an evolutionary service to the society.

- Livestock in traditional hill farming contribute substantially to rural livelihoods, employment, and poverty relief. They integrate with and complement crop production, embody savings, and provide a reserve against risks. While crops provide feed and fodder, livestock provide meat, milk, and milk products for subsistence and as a source of cash income. Livestock also supply draught power to till the land and provide power for other agricultural operations such as threshing and transport. Livestock therefore are integral to the sustainability of the farming communities in Uttarakhand hills.
- The important tradition of harvesting regulations/restrictions commonly practiced in local farming communities/food cultures of Uttarakhand hills also ensures sustainability and helps control human desires which is considered an important learning in environmental education.

4. Discussion

The traditional hill farming in Uttarakhand state of India represents a system truly in harmony with nature, relying on concepts of nurturing rather than dominating or manipulating nature. As we reconnect with the spiritual roots of food and farming, it changes the way we farm and live. We learn to pursue peace and happiness rather than success. We seek harmony among things economic, social, and spiritual, not maximums or minimums. A life of quality is a shared life. A life of quality is a spiritual life. Hill agriculture is ecologically sound, socially responsible and economically viable over time. It is deeply rooted in harmony with the higher order of things, in spirituality.

At global level, giant corporations have taken control of our food. Today, just a few companies control what we eat and how it is produced. For them, food is money: companies and their shareholders aren't interested in what food means to the people who grow and eat it, or what farming means for the environment. They are interested in the profits they can make from it. We need a kind of food system that recognizes the value of people, respects the planet, and provides decent, dignified work (1). The present crisis in global farming and food system therefore brings with it opportunities for decisive, positive change [2]. Concerns for sustainability in food and farming systems are therefore ultimately rooted in philosophy and spirituality that the hill farming of Uttarakhand showcases.

Acknowledgements

We thank the farming households of Uttarakhand hills for effectively interacting and sharing the valuable information they possess on traditional farming and food system across different hill agro-ecologies. Need-based funding support for conducting FGD meetings was available under the UN Environment Implemented GEF project titled "Mainstreaming agricultural biodiversity

conservation and utilization in agricultural sector to ensure ecosystem services and reduce vulnerability in India” presently being jointly operated by Bioversity International (India Centre) and Indian Council of Agricultural Research (ICAR).

Disclosure Statement

No potential conflict of interest is involved.

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