



Organic farming in Himachal Himalaya: Learning lessons from past and present

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Abstract

Organic farming has huge prospects for livelihood security in rural areas. Despite this, the intensification of organic farming is comparatively slower. For farming communities living in the mountainous state of Himachal, farming is the way of life and almost 70 percent of the population directly or indirectly depend on agriculture and allied activities. Until a few years back, it was the age-old indigenous wisdom that sustained the majority of people in farming and allied activities. From the times of yore, Himalayan communities have been using long-established agricultural techniques. Farmers' conventional knowledge of farming included the time-tested organic farming practices in the field. But, the Green Revolution, an ambitious program of agricultural research with the objective of developing genetically improved crops meant for boosting food production, changed the entire situation. This gave rise genetically improved seeds, fertilizers, and pesticides, which considerably increased the production. Recent research however revealed that the use of chemical fertilizers and insecticides has distressing effects not only on soil fertility but on water bodies posing risks to ecosystems, biodiversity, and the survival of mankind. Presently, the agricultural systems and agrarian communities in the hilly areas are passing through an interim phase. In order to prevent the negative implications of chemicals on ecosystems and human life, the scientific community after long debates are advocating restoring of the traditional farming practices, which restricts the use of chemical fertilizers, pesticides, hormones, etc., and encourages the use of conventional methods of crop rotations, organic manures, off-farm organic wastes, and biological methods of nutrient supplementation and pest management. National Mission on Sustainable Agriculture Development boosts the reliable agriculture practices which are indispensable constituents of agriculture development and in this direction organic farming has emerged as the well-accepted instrument. The government has taken a number of initiatives in this direction and the research institutions and Non-Governmental Organizations have also shown their interest in restoring the organic farming in the state. In this paper, an attempt has been made to discuss few initiatives of the two for boosting organic farming in the state.

Keywords: organic farming, traditional farming techniques, sustainable agriculture, bio-fertilizers

Introduction

Land, water, and forests are three major natural resources on which the survival of mankind depends. To meet the requirements of the people, their conservation has been practiced for all time. Farmers are believed to be familiar with the social system for their role in natural resource management. To handle and maintain these resources, wisdom appropriate for a region was indispensable which people gained and developed through constant learning. For centuries, the farmers in the Himalayan region have been using the traditional farming and livestock rearing practices in the varied agro-ecological zones. Himachal is a small hill state situated in the western Himalay with small landholdings, sloping subsidiary farmlands, and rain-fed farming. Organic farming practices formed the basis of subsistent agriculture in the state. Consequently, the agrarian communities still uphold a rich pool of local wisdom linked with organic farming. Much of this wisdom is meant for improving the soil fertility, moisture content of soil, irrigation, and to cope-up with the unpredictable climatic conditions. The heritage of agriculture in the region is quite rich, both in terms of production and quality. Farmers' indigenous wisdom includes the time-tested experimentation carried out in the fields. The use of traditional

plough by farmers in the terraces before rainfall not only saves water but improves the water holding capacity of the terrain. Farmers in the mountainous regions have a liking for mixed cropping which reduces the risks under the rain-fed conditions, thus making the soil cover, confirming the runoff, and checking the soil loss. In view of the soil of the state, the farmers use organic manure. In some rural areas, farmers do not dig manure pits; they as a substitute, sufficiently accumulate the organic material in open areas to permit the natural decay of same. Though this practice is conventional it has a rationale as the decay of organic matter occurs more quickly in open. The farmers uphold the fertility and nutrient content of soil by reutilizing the farming wastes. People have evolved traditional methods of pest management. Most of the paddy growers in the Shimla district grow twigs of *Pyrus pashia* on the edges of fields, after transplanting its saplings for keeping away the insect pests. The farmers are aware of the importance of seeds and have developed conventional pest control methods, for instance, they make use of lime and ash for preventing wheat grains from the attack of pests. The use of eucalyptus and walnut leaves is considered useful for

pest control in stored grain. Farmers in the tribal and remote areas have never used chemical pesticides and fertilizers.

The use of tree trunks and convert them as rainwater irrigation conduits and also evolved traditional technology to harvest rainwater by constructing small dug-out ponds. Therefore, subsistent farming in mountain farmlands remained predominant until the past decade. But, in recent years, traditional farming practices which remained firm, sustainable, and served as the basis for human food security in the mountain regions have been replaced by contemporary ones. The existing agriculture can nourish the growing population, but this is achieved at the cost of ecological degradation. The challenge of present-day is to reveal the ways and means where crop yield can be enhanced by using conventional methods or to develop means of sustainable crop intensification. In the globalized era, the farming communities find themselves in an amazing state, full of challenges. A need has been felt to blend biodiversity conservation with contemporary commercial farming systems which will not only safeguard the biodiversity but will sustain the increasing population without any damage to the ecosystem. Methods such as crop rotation, intercropping, integrated pest management, and green manures have been rejuvenated and encouraged on a commercial scale to decrease the dependence on chemical fertilizers and pesticides. Under this background, over the past decade, farmers, agriculture departments, and state universities have been focusing on organic farming. These efforts are reflected in a number of schemes of the government and similar agencies involved in encouraging advocacy on organic farming. The farmers have established forums, which are linking more and more people to discuss their problems and promote organic farming. Even the scientific community and a number of national and international organizations have shown their concern. Howard's (1940) Agricultural Testament draws attention to soil damage and highlights its consequences besides suggesting methods of restoring and maintaining soil fertility. Bemwad Geier (1999) was of the view that there is no other agriculture system so clearly synchronized by standards and rules as organic farming. According to him, the organic movement has years of experience practicing ecologically sound agriculture which has given the consumers the assurance and reliance in it. Sharma (2001) makes a case for organic farming as the most widely recognized alternative farming system. Veeresh (1999) states that modern technology and a sustainable environment cannot match. Organic farming is considered one of the options to conservative agriculture to maintain production without harming the ecosystem. The Food and Agriculture Organization (FAO) of the United Nations supports organic farming in its member countries. It attempts the management of national organic standards, which are awfully vital to increase worldwide trade in organic products. FAO in association with the World Health Organisation (WHO) has evolved the *Codex Alimentarius* for organic products. According to FAO, organic farming has many benefits besides ecosystem and health protection. Enhanced soil fertility & water quality, prevention of soil erosion, creation of rural livelihood, etc. are some of them.

Secondary data collected from published sources like government reports, websites, books, periodicals, newspapers, etc. have been considerably used for preparing this paper. It deliberates on the initiatives of governmental and non-

governmental organizations in encouraging organic agriculture in the state.

Reinstating Organic Farming

Himachal Pradesh is one of the Indian states, where the farmers, Government, and non-Government agencies have made remarkable contributions in encouraging sustainable farming. The state has a clear vision document with a well-defined mission and an approach for revitalizing organic farming. '*Going Organic*' is the new mantra in the state, with thousands of farmers benefiting from the satisfying prices of organic fruits, vegetables, or pulses. Directorate of Agriculture is boosting organic farming to make farming sustainable and environment-friendly. To endorse organic agriculture and crop diversification, the government has launched a project with the support of the Japan International Cooperation Agency (JICA). The state is producing tonnes of organic manure with thousands of vermicompost units. The practical understanding of farmers in Himachal has demonstrated the value of organic farming in substituting the use of chemical fertilizers and pesticides and decreasing the cost of farming with improved soil fertility. The state is implementing organic farming practices and intends to bring about policy changes in agriculture expansion to ensure sustainable livelihood to the farming communities. Organic farming:

- Combines livestock with farming system
- Depends mostly on adjacent renewable resources,
- Does not use organisms or substances unfamiliar to nature
- Maintains and brighten soil's productiveness,
- Makes cost-effective use of solar energy, and
- Upholds diversity in the agriculture landscape

The base of State's Organic Farming Policy is not only about reinstating inputs, it goes beyond, and safeguards the four principles promoted by the International Federation of Organic Agriculture Movement (IFOAM) i.e., Principle of health, Principle of ecology, Principle of fairness, and Principle of care. The policy document is receiving the spirit of national visualization and approaches behind the development of organic farming. It is formulated on the growth accomplished so far by the organic farmers of the state and includes the lessons of booming experiences of ingenious practices related to the development of organic farming. The vision of Organic Farming Policy states that '*Organic Himachal Pradesh* is where:

- Organic farming is widely practiced by the farmers and they earn its financial and ecological benefit;
- Communities and people have the advantage of pesticide-free safe food, vegetables, fiber, fruits, milk, and water; thus, decreasing human health risks;
- Youth gets involved in self-employment in organic agribusiness and allied areas; and
- State adds to the global objectives of decreasing carbon footprints

So as to realize the vision of organic Himachal, the government is growing and applauding the organic sector, making background for organic farming by developing suitable policies, plans, and support services for organic production of fruits and vegetables, rising yields in low-input areas, conserving biodiversity and natural resources on the farm. The state government is producing an investment opportunity for organic

agri-business and village-based organic agro-tourism. This will not only create possibilities for self-employment but value addition to on-farm & off-farm activities in the rural development sector. The range of Organic Farming Policy is meant for farmlands and crops, livestock and livestock products, forests, pastures, wastelands and common lands, water resources of the state, process foods and beverages, inputs, like manures, compost, biodegradable solid waste, etc. Under the broad vision of Organic Farming in the state, it defines a series of planned initiatives as:

- Arranging farmers into groups for undertaking capacity building;
- Encouraging vermicomposting, preparation of organic inputs at farms, etc.;
- Government's support to organic sector, with incentives primarily for the farmers;
- Initiating awareness programs to educate communities about organic farming;
- Reforming agriculture and allied sector policies to bring these in line with organic vision; and
- Strengthening a critical cadre of scientific manpower capable of undertaking research in organic farming

Organic agriculture is a holistic production management system that promotes and enhances agro-ecosystem health, including biodiversity, biological cycle, and soil biological activity. It includes all the agricultural production systems that promote environmentally, socially, and economically sound production of food and fibers. In this system, soil fertility is the key to successful production. Organic farming aims to optimize quality in all aspects of agriculture by taking into consideration the natural capacity of plants, animals, and land. It emphasizes the health of the agricultural ecosystem and prohibits the use of synthetic herbicides and pesticides, genetically modified organisms, synthetic fertilizers in crop production, and hormones and antibiotics in livestock production. It respects the law of nature to increase yields and disease resistance. Organic farming requires a high level of farm management skills and requires the use of wide variety of resources to solve the problems. Organic farming focuses on;

- Enhance the genetic and biological system and its surrounding;
- Maintain long-term soil health and minimize soil erosion;
- Maximize biological activity in soils;
- Promotion of environmentally friendly use of soil, water, and air thus minimizing the agricultural pollution
- Provide livestock with optimal living conditions for wellbeing and better health; and
- Recycling of materials of plants and animals' origins, nutrients to the land, soil and minimize the use of non-renewable resources;

The efficacy of added materials depends on several factors like the structure of the soil, drainage, etc. It has been found that continuous use of chemical fertilizers has led to several problems in hill soils i.e., reduction in pH, deficiency of secondary and micronutrients, and reduced biological activity. It is customary practice in hills to add organic manures in the soil which also supplement nutrition and improves the physical and biological properties of soil. The most challenging time in organic farming

is the transition phase as the farmer switch from conventional to organic agriculture. During the early stages of convention, a drop in yield is up to 30 percent has been reported by farmers who were dependent on herbicides, fertilizers, and pesticides and it takes about a decade for their yields to recover. But some farmers observed that the yields rebound within just a few years as they were using only minimum inputs. It has also been reported that organic farms have higher yields than conventional farms under stress caused by drought, heat, excessive rainfall, or cold weather. Keeping in view the importance and scope of organic farming, the Government has already notified the policy for its adaptation and fulfillment of need-based organic farming policy objectives.

The main features of the organic policy are as under

- Awareness generation;
- Identifying niche area for organic farming and converting institutional farms, etc.
- Inclusion of organic farming into agriculture development;
- Organic quality assurance;
- Research and technology support;
- Strengthening of organic extension services support; and
- Supply chain and marketing;

The main aim is

- Improve the soil health
- Promotion of eco-friendly agriculture;
- Recycling and use of farm waste biomass, thereby reducing the cost of production;
- To improve the physical and biological properties of soils, shelf life and flavor of farm produce;
- To increase export of farm produce;
- To promote the policy relating to the adoption of organic farming; and
- To reduce the use of inorganic fertilizers

The promotion of organic farming certainly has an impact on the beneficiary farmers as it has helped in reducing dependence on the use of chemical fertilizers and pesticides. Some beneficiaries have adopted vermin-composting as an additional source of income by selling worms and vermicompost. The project besides helping the farmers in improving the quality and quantity of agricultural /horticulture produce also helped them in optimum use of cow-dung thereby ensuring better cleanliness. The farmers appreciated the department for creating awareness on the subject and helped in changing the perception that shifting to organic farming would leave a better legacy for future generations. In Himachal Pradesh, agricultural operations are mostly carried out by women farmers. Providing vermin-compost pits to Mahila Krishak Samoohs may result in better care and proper utilization of the units. Most of the beneficiaries applied organic inputs in their farm and were supplied with sufficient manure and bio-pesticides as per their requirement. The cost of cultivation has decreased by the use of organic manure. The organic farming scheme is an eco-friendly scheme as it is helping the farmers to reduce the use of fertilizers and pesticides. The use of farm yield manure helps in maintaining the fertility of the soil without chemical use. These findings are in agreement with Madhusudan (2016) who study that to avoid soil infertility due to a conventional form of agriculture which is a serious problem, the practice of organic farming helps the soil to maintain fertility and

can get good quality food products which are also healthier. However, it has some minor disadvantages organic farming is a useful and eco-friendly form of agriculture.

Sustaining agricultural productivity depends on quality and availability of natural resources, like soil and water. Agriculture growth can be sustained by promoting conservation and sustainable use of scarce natural resources through suitable location-specific measures. Indian agriculture remains predominantly rain-fed covering about 60 percent of the country's net sown area and accounts for 40 percent of the total food production. Thus, conservation of natural resources in conjunction with development of rain-fed agriculture holds the key to meet increasing demands for food grain in the country. National Mission for Sustainable Agriculture has been framed for enhancing agricultural productivity particularly in rain-fed areas focusing on integrating farming, water use efficiency, soil health management and synergizing resource conservation. NMSA caters to key dimensions of 'Water use efficiency', 'Nutrient Management' and 'Livelihood diversification' through the adoption of sustainable development pathway by progressively shifting to environment-friendly technologies, adoption of energy efficient equipment, conservation of natural resources, integrated farming, etc. Besides, NMSA aims at promoting location specific improved agronomic practices through soil health management enhanced water use efficiency, judicious use of chemicals, crop diversification, progressive adoption of crop-livestock farming systems and integrated approaches like crop-sericulture, agro-forestry, fish farming, etc. The objectives of the scheme:

- To make agriculture more productive, sustainable, remunerative and climate-resilient by promoting location specific Integrated/Composite farming systems;
- To conserve natural resources through appropriate soil and moisture conservation measures;
- To adopt comprehensive soil health management practices based on soil fertility maps, soil test-based application of macro and micronutrients, judicious use of fertilizers etc.;
- To optimize utilization of water resources through efficient water management to expand coverage achieving 'more crop per drop'.
- To develop the capacity of farmers and stakeholders, in conjunction with other ongoing mission, e.g., National Mission on Agriculture Extension and Technology, National Food Security Mission, National Initiative for Climate Resilient Agriculture (NICRA) etc., in the domain of climate change adaptation and mitigation measures.
- To pilot models in selected blocks for improving the productivity of rainfed by mainstreaming rainfed technologies refined through NICRA and by leveraging resources from other schemes/Mission like Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), Integrated Watershed Management Program (IWMP), RKVY (Rashtriya Krishi Vikas Yojana), etc.; and
- To establish an effective, inter and intra-departmental/Ministerial co-ordination for accomplishing key deliverables of National Mission for Sustainable Agriculture under the aegis of National Action Plan for Climate Change (NAPCC).

National Mission on Sustainable Agriculture benefits 640 farmers of Shimla district in the year 2017-18. The MNSA focus

on improved agronomic practices through soil health management enhanced water use efficiency, judicious use of chemicals, crop diversification, progressive adoption of crop-livestock farming systems and integrated approaches like crop-sericulture, agro-forestry, fish farming, etc which make this scheme eco-friendly. MNSA helps in improving the productivity of rainfed by mainstreaming rainfed technologies refined through schemes like NICRA and by leveraging resources from other schemes/Mission like Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), Integrated Watershed Management Programme (IWMP), RKVY etc.

The Directorate of Agriculture is running a centrally sponsored National Project on Organic Farming. Under this project, financial assistance is being provided for setting up model farms, training of farmers, and setting up vermin-hatcheries. Under the scheme, clusters of farmers have been registered. The Department of Agriculture provides financial assistance to the farmer for documentation, database management, capacity building, organic certification, linkage, and value addition. The Directorate of Horticulture is running a centrally sponsored scheme "Horticulture Technology Mission" which incorporates the adoption of organic farming for a maximum area of 4 ha per beneficiary, spread over a period of three years involving financial assistance. The program is also linked with organic certification. The department provides financial assistance for setting up of vermicompost unit and vermin-bed on a pro-rata basis.

The state's universities are adding a lot to the development of organic farming in the state. The Department of Organic Agriculture, Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya, Palampur is generating and broadcasting knowledge on organic agriculture based on farm resource management, developing bio-fertilizers for organic farming, and niche-based cropping systems for organic farming. It is regulating and assessing various organic inputs and plant protection inputs for pest management. The department is running the Niche Area of Excellence Project on Organic Agriculture sponsored by the Indian Council of Agriculture Research, besides other projects focusing on the promotion of organic farming in the state, development of liquid bio-fertilizers and bio-fertilizer-based integrated management, and demonstration of enriched composts for use in organic agriculture. The department has carried out studies on bio-inoculants in compost enrichment. The department conducts training for the farmers & extension functionaries in organic farming and brings out farm bulletin, organizes television and radio talks on organic farming. It transfers the technology by demos on organic inputs and gives consultancy to the public & private entrepreneurs/ institutions.

Department of Vegetable Science of Dr. Y. S. Parmar University of Horticulture & Forestry, Solan has developed a package of practices for vegetable cultivation based on organic production systems. It has evolved protection technology on various vegetables. The Regional Station of the National Bureau of Plant Genetic Research established as Plant Introduction Station under the Botany Division of the Indian Council of Agriculture Research in 1960 at Shimla is undertaking the conservation and management of plant genetic resources of Western Himalay comprising Himachal Pradesh and Jammu and Kashmir. A field gene bank of temperate fruits and newly introduced fruit plants

and the largest germplasm collection of French beans, amaranth, Buckwheat has been maintained at the station. The station acts as National Active Germplasm Site (NAGs) for Amaranthus, French bean, buckwheat, and temperate fruits.

Besides government initiatives, a number of non-governmental organizations are also involved in encouraging organic agriculture in the state. A Kangra-based Sustainable Agriculture, Forest and Land (SAFAL) organization has revived and strengthened traditional agriculture practices while appreciating the contribution of women farmers. SAFAL has been inspiring eco-friendly practices and thus preserving traditional wisdom. It carries out the marketing of green leaf organic manure. The SAFAL team in association with other teams organizes Forest Festival every year. To promote organic farming through community-friendly field-tested technologies and to develop a responsive marketing network for organic products, Paryavaran Avam Gramin Vikas Sansthan (PAGVS), Solan, formed by a group of youth that has successfully promoted organic farming practices in remote terrains. The specific objectives of the project are the promotion of tested organic farming techniques on a large scale and popularization and creation of a market for organic products among the consumers and traders. The project is stressing on the use of organic farming practices on a wider range of crops together with community-owned village-based marketing Arrangements for transportation, packaging, and marketing of organic products. It is also creating public awareness on eco-sustainable agriculture among the farmers through awareness camps and farmer fairs. Away from the eyes of the media, the farmers of Khakrola village in Himachal have been working tirelessly to usher in a fresh green revolution. The Khakrola experiment is part of Rs 15 million model project initiated by the M. R. Morarka Foundation, a Rajasthan-based NGO, working with the State Agricultural Department to promote organic farming throughout the state.

State-based NGOs for instance, Herbs Antique Research Botanical Society, Herbal Organic Growers Association, Aromatic Plants Growers Association of India and 'Rajput Kalyan Sabha' have joined hands to start a new project meant for utilization of barren-land for organic cultivation of herbs and medicinal plants to boost herbal health tourism in the state. Under this project, the land is utilized for herbal and organic farming and the herbs are processed at the state-of-the-art Herbs Antique Research Botanical Society unit. The project aims at launching herbal products like herbal tea, herbal bath, herbal pickles, herbal preserves, herbal spices, herbal vegetables and pulses for the benefit of the tourists.

In the last century, agriculture has been characterized by increased productivity, the substitution of synthetic fertilizers and pesticides for labor, water pollution, and farm subsidies. In recent years there has been a reaction against the environmental effects of agriculture, resulting in organic, regenerative, and sustainable agriculture movements. *Sustainable agriculture*, in terms of food security, rural employment, and ecologically sustainable technologies, such as soil conservation, natural resource management, and biodiversity protection is vital for inclusive rural development. Organic agriculture is a holistic production management system that promotes and enhances agro-ecosystem health. The state has diverse agro-climatic conditions and due to its favorable positioning in the Himalayan region, it has great scope for the promotion of organic farming.

Himachal is among the forerunner states which is promoting ancient farming and livestock rearing for achieving the title of organic state. Current progress in technology, as well as huge Demand for food grains by rapidly increasing population, have changed the farming system with dependence on chemical fertilizers and pesticides. The massive use of chemicals through augmented agricultural production by many folds but has also resulted in ecological degradation. The concept of organic farming has re-emerged in response to the problem related to health, environment, and sustainability. Thus, there is a need for an inclusive structure that blends organic farming with bottom-up reactions, technology dissemination with shared knowledge flow from farmers' institutions, and their innovation. This will help in producing large-scale farmers' support to resolve ecological crises linked with climate change and address health, livelihood, and food security issues in rural Himachal.

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