

Agroecology and the Status of Organic Farming in India

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ABSTRACT

The global food system is at a crossroads. It is working against a backdrop of population growth, increased pressure on natural resources including soils and water, the loss of biodiversity, and the uncertainties associated with climate change. A transition is needed to more sustainable food systems— food systems that produce more, with more socio-economic benefits and with less environmental consequences. Agroecology is based on applying ecological concepts and principles to optimize interactions between plants, animals, humans and the environment while taking into consideration the social aspects that need to be addressed for a sustainable and fair food system. By building synergies, agroecology can support food production and food security and nutrition while restoring the ecosystem services and biodiversity that are essential for sustainable agriculture. Agroecology can play an important role in building resilience and adapting to climate change. Agroecology is based on context-specific design and organization, of crops, livestock, farms and landscapes. It works with solutions that conserve above and below ground biodiversity as well as cultural and knowledge diversity. Organic agriculture, through its systemic approach and avoidance of agro-chemicals, prevents natural resource degradation and the loss of land and productive potential.

Keywords: Population growth, Agroecology, agro-chemicals, food systems, nutrition

The Ecosystem Approach

FAO has defined the ecosystem approach as a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. An ecosystem approach is based on the application of appropriate scientific methodologies focused on levels of biological organization, which encompass the essential structure, processes, functions and interactions among organisms and their environment. It recognized that humans, with their cultural diversity, are an integral component of many ecosystems. The ecosystem approach requires adaptive management to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of their functioning. Ecosystem processes are often non-linear and the outcome of such processes often shows time-lags.

Ecosystem Approach and the Organic Farming

The direct economic value of ecosystem functions for organic farmers is an excellent example of “benefit-sharing”. Organic agriculture is an approach, which is not confined to production alone. Inter-sectoral cooperation between farmers, environmentalists, processors and traders, quality controllers and consumers is a very common characteristic of organic agriculture. To date, no ecological farming scheme other than the organic one has succeeded in providing ecosystem functions and socio-economic goods in a comparably equitable way. The domestic organic food market in India is growing at 25-30% (economic times 2015). A Government of India study projected that domestic organic food market would touch \$ 1.36 billion by 2020. In 2014, the size of organic food market which is highly unorganised was \$ 0.36 billion and organic pulses and food grains took the lions share. India produces all varieties of

organic food products namely basmati rice, pulses, honey, tea, spices, coffee, oil seeds, fruits, processed food, cereals, herbal medicines and the value added products. The production is not limited to the edible sector but also produces organic cotton fibre, garments, cosmetics, functional food products, body care products. The domestic market in India is also growing.

Organic is more of a description of the agricultural methods used on a farm, rather than food itself and those methods combine tradition, innovation and science. Organic agriculture, in simple terms, requires a shift from intensive use of synthetic chemical fertilizers, insecticides, fungicides, herbicides, genetically engineered plants to extensive use of animal manures, beneficial soil microbes, bio pesticides, bio-agents and indigenous technological knowledge, based on scientific principles of agricultural systems. Scientific evidences clearly establish that conversion of high intensive agriculture areas to organic systems lead to reduction in crop yields considerably (up to 25-30%), especially during initial 3-4 years; before soil system regains and crop yields, come to comparable level. In this scenario, if all the cultivated areas are brought into organic production systems, the national food production system may get jeopardized; hence a phased approach may be desirable. Considering this fact on one hand and looking into global scenario of organic agriculture, working group on Horticulture, Plantation Crops and. Organic Farming for the XI-Five Year Plan suggested a spread of organic farming on 1-5% area in the high productive zones and larger spread in the less exploited areas, Such as, rain fed and hill areas. Nevertheless, integrated approach of crop Management — including integrated nutrient management and inter/mixed cropping.

Towards Healthier Ecosystem and Organic Approach

This approach will also contribute to 'more crop per drop and less land, less resource/time and more production' strategies of the government. India has a sizable cropped area in different states, which is more prone to weather vagaries; especially those located in rain fed, dryland and hilly areas. Increasing the agricultural productivity and income of the farmers as well as sustaining soil resource in these

agricultural systems has always been a challenging task for researchers and policy planners. Presently, in these areas use of fertilizers and pesticides is minimal and much below the national average. At first instance, these are the areas which need to be targeted for organic production by devising proper strategies and identifying niche crops (crops which yield higher under organic production systems and have adequate market demand). The domestic and export markets must be exploited for increasing the income of the farmers. Large-scale adoption of organic agriculture in such areas will not only help in conserving the environmentally fragile ecosystems but also help in supplementing overall food production of the country. This can be clearly brought out by the example of Sikkim. During 2002- 03 (before Sikkim Organic Mission) fertilizer consumption was the highest (21.5 kg/ha), the productivity of rice was 1.43 t/ha but 11 years later, i.e., during 2013-14, it increased to 1.81 t/ha, and more interestingly; no field reduction was observed during conversion period. Productivity increase in other crops was also noted to the tune of 11, 17 and 24% in maize, finger millet and buckwheat, respectively.

Table 1: Major sectoral growth trends in Organic Production in India

Organic products	Product growth in 2010-15 (%)	Organic products	Product growth in 2010-15 (%)
Spices (all)	14	Fruits (all)	8
Pepper	5.0	Banana	15
Turmeric	4.5	Mango	5.0
Tea	14	Orange	5.0
Rice	11	Pineapple	5.0
Cotton	8.0	Herbal extracts	8.0

Gain to the Ecosystem with Organic farming

(a) Improvement in Soil Health: One of the fundamental principles of organic farming is to manage soil organic carbon to increase soil health. Because the use of synthetic fertilizers is prohibited, organic producers increase soil fertility by incorporating manure or compost into the soil, leading to increased soil organic carbon. Organic agriculture sustains healthy soils by improving water infiltration and retention capacity through high

levels of organic matter and permanent soil cover, such as cover crops or mulch, which substantially reduce the amount of water needed for irrigation (ifoam.bio).

(b) Improvement in Soil fertility: Organic agriculture sustains healthy soils by improving water infiltration and retention capacity through high levels of organic matter and permanent soil cover, such as cover crops or mulch, which substantially reduce the amount of water needed for irrigation (e-organic.org).

(c) Sustainable resource base: Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved [International Federation of Organic Agriculture Movements (IFOAM) 2009].

(d) Clean water: Soil and water pollution are two major problems today, and non-organic food production is surely a big part of this problem. According to the Food and Agriculture Organization of the United Nations (UN FAO), about 1/3 of the world's soil has already been degraded because of "chemical heavy" farming techniques, and deforestation, which increases erosion and global warming. Water which is extremely valuable farming resource, is also at risk. In a study by water resource society of India, pesticide compounds were found in streams almost 100% of the time. Organically grown and produced food does not use the typical agri-chemical fertilizers and pesticides that can deplete soils over time and pollute our water supplies.

Some successful Organic Ventures in India

(i) Govind Organic Milk: It is an organic farm at Manchar; Pune where it has open cattle sheds. It is growing green fodder in organic conditions and is selling the milk output as "Organic Milk in conversion" at INR 50 per liter. Its current turnover is 750 liters per day. The milk from Manchar is sent to leading retailers - Reliance, Godrej Nature Basket and sold across Mumbai.

(ii) Farmer's Market @ Bandra- which operates from October – March every year sells fresh fruits/vegetables. Farmer groups from Nasik come over to Mumbai every Sunday and sell the produce every Sunday.

(iii) Organic Garden - currently operating 12 stores. They started with first store in October 2011 spread over Mumbai and shortly will be going national.

(iv) Hari Bhari Tokri (HBT) - This is an organic fresh produce movement for Direct-to-home delivery of fresh fruits & vegetables. Consumers are allotted one "share" worth INR 3600 per share for supply of organic fruits & vegetables for sixteen weeks at frequency of one HBT per week. The HBT concept is in operations since 2010- fall; and is open to only 250 consumers per season (two seasons in a year).

(v) Gramin Foods, Madhya Pradesh/ R.D.M. Care, Delhi - an Indian women's cooperative involved in manufacturing of various hand-made food products prepared at home. It's a one of its kind joint venture by a local self-help group (SHG) cooperative and a 23 Indian Organic Foods Market Coffee Oil seeds Honey groundnut Baby food Coconut .

(vi) Conscious Foods - It was set up in 1990, is India's pioneering company in natural and organic food. The company sources most of its products from small organic farms and farming communities all over the country. Products are certified by EOCERT.

(vii) Eco Farms, Jalgaon - Was founded in 1995 with a goal to develop and promote organic methods of sustainable farming. The project over the years spread to the neighboring districts of Amravati, Jalgaon and Wardha. In 2004, the government of Orissa invited the company to start a similar project in Orissa. Today the project has spread across the districts of Kalahandi, Bolangir and Ganjam. Eco Farms today has 20,000 growers who in addition to cotton raise 40 different crops in 60,000 hectares and are rated as No. 1 for organic cotton.

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