

CAN ORGANIC FARMING CONTRIBUTE TO SUSTAINABLE AGRICULTURAL DEVELOPMENT

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Abstract: Organic farming is becoming increasingly popular all over the world. Extensive use of chemicals in inorganic food production technology compelled the health conscious people to explore and support organic farming methods in agriculture. Growing awareness of health and environmental issues in agriculture has demanded production of organic food which is emerging as an attractive source of rural income generation. Organic agriculture currently covers only a small area in developing countries but its extent is continuously growing as demand for organic products is increasing. At present around one percentage of agricultural land of the world is under organic agriculture. The total area under organic agriculture as a percentage of world area was highest in Australia (40%), followed by Argentina (7.4%), US (5.1%), China (4.96%) and India only (1.6%) in 2013. However all over the world, land area under organic agriculture has increased from 37.5 million hectares in 2012 to 43.1 million hectares in 2013. Moreover the states like Madhya Pradesh (37.25%) is contributing highest area under organic agriculture in India followed by Himachal Pradesh (35.34%), Rajasthan (12.69%), Utter Pradesh (2.38%) and Maharashtra (1.86%) in 2013-14. Should organic agriculture thus become a priority in development policy and be put on the agenda of international assistance as a means of achieving sustainable agricultural development? Can organic agriculture contribute to sustainable food security in developing countries? Therefore present paper attempts to answer these questions, and tries to assess the economic, social and environmental sustainability of organic agriculture and identify its problems and benefits in developing countries like India.

Key Words: Organic Farming, Sustainable Agriculture, Sustainable Development.

I. INTRODUCTION

Agriculture sector is vital for the food and nutritional security of the nation. This sector remains the principal source of livelihood for more than 55% of the population and contributes around (13%) to the national GDP of our economy. Organic agriculture can contribute to meaningful socio-economic and ecologically sustainable development, especially in developing countries. Organic agriculture means efficient management of local resources (e.g. local seed varieties, manure, etc.) and therefore cost effectiveness. Organic production reduces the risk of yield failure, stabilizes returns and therefore enhances food security for small farmers' families. Moreover the market for organic products has tremendous growth prospects and offers

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excellent opportunities to improve the income and living conditions of producers and exporters. It offers at least three excellent alternatives to simplified production systems i.e. *Agro forestry* (agricultural production in forestry systems and under shade) trees, *Intercropping* (combination of two or more crops on the same plot and at the same time), *Rotation* (one crop is followed by another crop, preferably from a different botanical family). To protect soil erosion farmers make use of soil bunds and terraces, minimum tillage, contour cultivation, mulching, intercropping and agroforestry. This plays an important role in protection against erosion and landslides, because their rooting system stabilizes the soil. This method of cultivation increases the organic content of the soil, which also has positive effects on water-holding capacity. Organic agriculture should sustain and enhance the health of soil, plant, animal, human and planet as one and individual. This paper focuses on organic farming, and particularly its relationship with the concept of Sustainability.

II. METHODOLOGY & DATA BASE

This paper is based on secondary data and field observation of the researcher. Information about organic farming and its practices made both in India and abroad were collected from the published sources such as publications of European Union, International Federation of Organic Farming Movements (IFOAM), International Trade Centre (ITC), National Programme of Organic Production (NPOP), APEDA (Agricultural Processed Food Products & Export Development Authority), International Competence Centre for Organic Agricultural (ICCOA), National Centre of Organic Farming (NCOF), indiastats database, various reports, journals, periodicals and news papers etc.

III. RESULT AND DISCUSSIONS

The Concept of Organic Agriculture and sustainable development:

Organic agriculture profoundly respects indigenous knowledge, women's knowledge and local solutions. Producers have control over the production cycle and increase their self-confidence. Local and international organic producers play an active role in advancing their production methods and standards. Organic agriculture has a potential to fulfill the food requirement of the world with sustainable resource utilization. Growing awareness of health and environmental issues associated with the intensive use of chemical inputs has led to interest

in alternative forms of agriculture in the world. Organic agricultural is one among the broad spectrum of production method that is supportive of the environment. According to codex Alimentarius (FAO/WHO), 'organic agriculture is a holistic production management system which promotes and enhances agro- ecosystem health, including biodiversity, biological cycles.

Mannion (1995) refers to it as a holistic view of agriculture that aims to reject the profound interrelationship that exists between farm biota, its production and the overall environment.

Scofield (1986) stresses that organic farming does not simply refer to the use of living materials, but emphasises the concept of 'wholeness', implying the "systematic connexion or co-ordination of parts in one whole".

A modern definition of organic farming provided by Lampkin (1994), an authoritative source, states that the aim is to create integrated, humane, environmentally and economically sustainable production systems, which maximise reliance on farm-derived renewable resources and the management of ecological and biological processes and interactions, so as to provide acceptable levels of crop, livestock and human nutrition, protection from pests and disease, and an appropriate return to the human and other resources".

Organic farming is a production system, based on renewal of ecological processes and strengthening of ecological functions of farm ecosystem to produce safe and healthy food sustainability. Organic farming avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators, and livestock feed additives. To the maximum extent feasible, organic farming systems rely upon crop rotations, crop residues, animal manures, legumes, green manures, off-farm organic wastes, mechanical cultivation, mineral-bearing rocks, and aspects of biological pest control to maintain soil productivity and tilth, to supply plant nutrients, and to control insects, weeds, and other pests. In contrast to modern systems, organic agriculture represents a deliberate attempt to make the best use of local natural resources. The aim of organic agriculture, also known as ecological or biological agriculture, is to create integrated, humane, environmentally and economically viable agriculture systems in which maximum reliance is placed on locally or farm-derived renewable resources, and the management of ecological and biological processes. The use of external inputs, whether inorganic or organic, is reduced as far as possible. Recent years have seen a dramatic increase in adoption of organic agriculture in industrialized countries. The important thing for most organic

farmers is that it represents a system of agriculture rather than simply a set of technologies. The primary aim is to find ways to grow food in harmony with nature. The term organic is “best thought of as referring not to the type of inputs used, but to the concept of the farm as an organism, in which the component parts the soil minerals, organic matter, micro-organisms, insects, plants, animals and stable whole.

The global concern for environmental degradation, consumer anxiety for safe and healthy food, growing populations and needs for higher agricultural productivity have come together to support the creation of sustainable rural livelihoods through organic farming in India. Sustainable crop production practices can lead to higher yields over time, with less need for expensive and environmentally damaging inputs. In the case of organic farming, there are significant differences in agronomic practices, integration of animal husbandry in the process, use of antibiotics or hormones, scale of farms, and the decisions relating to packaging, market locations and methods of access to markets which bear relation to the total energy consumption in taking food from farm to fork as against the energy of the food produced. The following tabular comparison sets out some of these differences.

Table 1: Sustainable Agriculture v/s Organic Agriculture

No	Aspect	Sustainable Agriculture	Organic Agriculture
1	Certification	Not required, more a way of life	Necessary
2.	Farm Size	Small farmer, self managed	Can be large, corporate-run
3.	Sustainability	Ecological, economic	Not required
4	Use of chemical fertilizers & pesticides	Not permitted	Not permitted
5	Integrated farming	Natural foraging by animals except in bad weather, night	May be always confined
6	Animal treatment	Humane. No legal restriction on antibiotics, hormones but usually not used & if antibiotics used, time is allowed for full elimination from animal body	Legal bar on use of antibiotics & hormones for animals No compulsion on humane treatment of animals.
7	Markets	Usually local, minimal packing	Not relevant
8	Energy, GHG emissions & water conservation	Aims at energy efficiency, renewable energy use, low emission & high water conservation	Irrelevant to certification

Source: Mission Organic Farming NE.

Sustainable agriculture in India is not of recent origin but it is a modern method with ancient root. The traditional farmers have developed the nature friendly farming systems and practices such as mixed farming, mixed cropping, crop rotation etc. The word sustainable is derived from the Latin, *sustinere*, meaning to keep in existence, implying permanence or long-term support. Sustainable agriculture is one that produces abundant food without depleting the earth's resources or polluting its environment. It is agriculture that follows the principles of nature to develop systems for raising crops and livestock that are, like nature, self-sustaining. Sustainable agriculture is also the agriculture of social values, one whose success is indistinguishable from vibrant rural communities, rich lives for families on the farms, and wholesome food for everyone.

In the context of agricultural production, Ikerd (1993) defines a sustainable agriculture as capable of maintaining its productivity and usefulness to society over the long run, .it must be environmentally sound, resource conserving, economically viable, socially supportive and commercially competitive. The concept of sustainability lies at the heart of the debates that currently exist over the use of the planet's natural resources, yet there is no consensus on its meaning despite its intuitive appeal (Park and Seaton 1996). The nature of organic farming and concept of sustainable development are related with each other. In 1987, in the report entitled "our common future" sustainable development explained. Humanity has the ability to make development sustainable to ensure that it meets needs of the present without compromising the ability to future generation to meet their own needs. Some have argued that, organic farming and sustainable agriculture are synonymous; others regard them as separate concepts that should not be equated.

Our traditional farming systems were characterized mainly by small and marginal farmers producing food, basic animal products for their families and local village communities. Farming was highly decentralized with individual farmers deciding on the types of crops to grow depending on climate and soil conditions. Organic farming was practiced in India since thousands of years. The great Indian civilization thrived on organic farming and was one of the most prosperous countries in the world. In traditional India, the entire agriculture was practiced using organic techniques, where the fertilizers, pesticides, etc., were obtained from plant and animal products. Organic agriculture in India was initiated in 1900 by Albert Howard, a British

agronomist in North India. The traditional farming system was characterized mainly by small and marginal farmers producing food and basic animal products for their families and local village communities. There are a number of reasons to emphasize why organic farming is a way of life. The first is that organic farming pre-dates all other approaches to "environmentally-friendly" agriculture (Scofield, 1986). Second, it is a rapidly developing agricultural sector in many countries, as cited below in table-1. The reasons for this expansion are numerous and there are variations across countries. Consumer interest has grown in response to repeated food safety scares, animal welfare concerns as well as more general concerns regarding the impact of industrial agriculture on the environment. Therefore organic farming is seen today as the best option to attain sustainability in the crop production and hence organic farming appears to be one of the options for sustainability.

Growth of Area under Organic Agriculture:

According to the FiBL report on the world of organic agriculture 2015, there were 43.1 million hectares of land area was under organic cultivation. The regions with largest area of organic agricultural land are Oceania, Europe, Latin America, Asia, North America and Africa. Australia has highest area under organic cultivation (17.2 million hectares) followed by Argentina (3.2 million hectares), US (2.2 million hectares). At present around one percentage of agricultural land of the world is under organic agriculture. The total area under organic agriculture in India was 0.51 Million hectares and its global rank is 15th out of 170 countries (Table-2). However as per the statistics compiled by the IFOAM and FiBL (2014), world over 37.5 million ha land (0.87% of total agricultural land) is being managed organically by 1.9 million producers in 164 countries. Besides this there is another 31 million ha certified for wild harvest collection. Global sales for organic products have reached 75 billion US\$ with US and Europe being the largest consumers.

Table2.Share of Land area of major countries under organic agriculture (Conversion & wild area):
(Area Million Hectors)

Country	2012	Percent of share	2013	Percent of share
Australia	12	32.00	17.2	39.91
Argentina	3.6	9.60	3.2	7.42
United States	2.2	5.87	2.2	5.10
China	1.9	5.07	2.1	4.87
Spain	1.6	4.27	1.6	3.71

Italy	1.2	3.20	1.3	3.02
Germany	1	2.67	1.1	2.55
France	1	2.67	1.1	2.55
Uruguay	0.9	2.40	0.9	2.09
Canada	0.8	2.13	0.9	2.09
India	0.5	1.33	0.51	1.6
Asia	3.2	8.53	3.4	7.89
World	37.5	100	43.1	100.00

Source FIBL-AMI Organic data network survey -2015

Table-3 indicates the state wise area of organic cultivation and its ranking in India in 2013-14. Madhya Pradesh has highest certified area under organic cultivation i.e. 37.25% followed by Himachal Pradesh 35.34%, Rajasthan 12.69%, Uttar Pradesh 2.38% and Maharashtra 1.86% in 2013-14. Around 89.5% area under organic cultivation in India is covered by these five states during same period.

Table 3: State-wise Area under Organic Certification (Including Wild) in India (2013-14):
(Area in hectares)

Sr no	States/ UTs	Total Organic Area	Share of Percent	Rank
1	Andaman and Nicobar Islands	321.28	0.01	25
2	Andhra Pradesh	14325.03	0.30	16
3	Arunachal Pradesh	71.49	0.00	26
4	Assam	2828.26	0.06	21
5	Bihar	180.6	0.00	27
6	Chhattisgarh	30754.82	0.65	14
7	Delhi	0.83	0.00	28
8	Goa	12853.94	0.27	17
9	Gujarat	49363.89	1.05	9
10	Haryana	3865.33	0.08	20
11	Himachal Pradesh	1668176.17	35.34	2
12	Jammu and Kashmir	39035.38	0.83	10
13	Jharkhand	37447.3	0.79	11
14	Karnataka	35450.22	0.75	12
15	Kerala	15162.33	0.32	15
16	Lakshadweep	895.91	0.02	24
17	Madhya Pradesh	1758226.3	37.25	1
18	Maharashtra	87941.66	1.86	5
19	Meghalaya	4673.13	0.10	19
20	Nagaland	12023.16	0.25	18
21	Odisha	52787.35	1.12	8
22	Puducherry	2.84	0.00	29

23	Punjab	1534.39	0.03	23
24	Rajasthan	599173.07	12.69	3
25	Sikkim	64296.17	1.36	7
26	Tamil Nadu	34212.96	0.72	13
27	Tripura	203.56	0.00	30
28	Uttar Pradesh	112133.96	2.38	4
29	Uttarakhand	79779.46	1.69	6
30	West Bengal	2095.51	0.04	22
31	India (Total)	4719816.28	100.00	-

Source:Lok Sabha Unstarred Question No. 3731, dated on 05.08.2014, Accessed from www.indiastat.com

Importance of Organic Agriculture in India:

Organic farming is gaining gradual momentum across the world. Growing awareness of health and environmental issues in agriculture has demanded production of organic food which is emerging as an attractive source of rural income generation. Organic agriculture has made a credible performance during the past ten years. Both, the 11th plan document on organic sector and the report of the National Commission on farmers have recommended it as a tool for second green revolution in the country in particular for agro- eco zones comprising rain fed areas, hilly areas and areas experiencing ecological backlash of green revolution. Organic agriculture can become low cost, sustainable option of farming in the country, particularly by the small farmers in rain fed areas and helps to improve their food and income security. It helps to produce and supply adequate safe and nutritious food to the producers and consumers of the nation. Environmental benefits, health aspects and farmers empowerment are other important factors influencing farmers to shift to organic agriculture. Some of the important benefits of organic farming are organic fertilizers are completely safe and does not produces harmful chemical compounds. The following tabular comparison sets out some of the differences of organic agriculture sector in India EU and USA.

Table 4: Comparison of India's Organic Agriculture Sector with Leading Countries: Europe & U.S.A:

Category	India	European Union	United States
Organic action plan	Absent	Present	Present
Government aids	Less active	Area payment in form of conversion area payment or maintenance payment	Subsidies during conversion period is given provided by Government and state

		or both are given	support its also there in some through EQIP
Inspection cost support	Absent	Present	Present
Vocational training program	Less active	High active/ frequent	High active/ frequent
Global awareness among farmers	Low	High	High
Initial marketing assistance /support	Absent (through few NGOs have taken an effort to do so in few states)	Present(the support is provided through Govt's and& NGO's)	Present(the support is provided through Govt's and& NGO's)
Awareness among domestic consumers	Low	High(Germany stands at second largest country in worlds organic market)	High (U.S.A is the leading country in global organic market
Domestic market	Least focused	High & active	High & active
Export market	Faire Rate	High rate	High rate
Government involvement	Low	High	High

Source: FiBL-IFOAM Survey-2015

Market:

Basically organic farming in India is export intensive hence very less products are circulated in the domestic market. The conventional products are available relatively at a cheaper rate than the organic products so domestic market becomes unstable. Indian consumers are divided into three major classes depending upon their interest in the organic product 1st upper class consumer 2nd upper- middle class and 3rd lower –middle class. In urban centers, diverse range of consumers is now showing more interest in reconnecting with the sources of their food. This phenomenon finds its expression in the increasing popularity of farmers markets and organic bazaars, community-supported agriculture schemes, consumer cooperatives and terrace gardening groups etc. Europe and North America are the major global markets for organic food products. The demand for organic food products is growing in these regions due to high purchasing power and huge presence of health conscious consumers. Compared to western markets, the organic food consumption in India is very low. Organic food market in India is

highly unorganized and fragmented, which offers immense growth opportunities for domestic as well as international players. India majorly exports organic processed food products, organic rice, beverages and other cereals and millets to US, Canada, Europe, and South East Asian countries. India's organic food market provides consumers the opportunity to obtain foods that are free of pesticides and it represents a shift in consumer spending behavior and patterns. With the growth of health concerns pertaining to food latent with herbicides and pesticides, consumers require more organic food to be available. According to "India Organic Food Market Forecast & Opportunities, 2019", the organic food market revenues in India are expected to grow at a CAGR of around 25% during 2014-19. The western region is the highest revenue contributor for the country's organic food market followed by the southern region.

Demand for organic food items is on the rise during the last few years. Organic products are costlier in the country due to demand by consumers for chemical residue free food grown by nature friendly methods without the use of synthetic inputs.

Table 4: Prices of Selected Commodities in Maharashtra:

Sr no	Crops	Organic Products (Price Rs, Per Kg)	Inorganic Products (Price Rs, Per Kg)	Difference (Price Rs, Per Kg)
1	Wheat	50-70	25-80	55-40
2	Rice	75-120	40-80	35-40
3	Grapes	80-130	30-70	50-60
4	Pomegranate	90-180	50-110	40-70
5	Banana	50-80	20-40	30-40

Source:-Authors Market Observations - 2015

Table-4 reveals that the prices of organic products are much higher than the conventional products. Hence it is beneficial to the farmers to switch towards organic cultivation. The author has observed the above prices of Wheat, Rice, Grapes, Pomegranates and Banana at local markets in Maharashtra

The Impacts of the Green Revolution:

After the green revolution comes the advent of chemical fertilizers replacing organic agriculture. Though it seemed that green revolution resulted in increase of crop yield and production, but actually it was observed that these practices damaged the soil structure irreversibly over the years. When the soil productivity graph declined, the farmers resorted to increase the dosage of chemical fertilizers to sustain farm production. The increased chemical inputs resulted in soil toxicity, disturbed the soil micro-environment and there-by impeded

organic matter recycling. The introduction of pesticides led to poisoning of soil, air, water and crops through enhanced bio-concentration of pesticides. The use of pesticides and fertilizers are the main components of green revolution.

Prior to the green revolution, diversity in crops was a key factor in agricultural systems of India. This diversity provided stability and resilience to the systems as well as economic security to the farmers. However green revolution methods emphasize upon mono-cropping and highly mechanized farming focused on single function of single species, and failed to take, yields of diverse species and diverse functions into account. The reason for advocating mono-cropping was the ease in sowing; weeding, fertilizing, spraying and harvesting a single crop that lead to replacement of traditional practice of growing different types of crops (poly-culture). This resulted in the erosion of genetic diversity base of the agro-ecosystems.

IV. CONCLUSION & POLICY RECOMMENDATIONS

Organic agriculture is gaining momentum as an alternative method to the modern system. Many countries have been able to convert significant per cent of their cultivated areas into organic farming. Indian agriculture evolved principally as an ecologically sustainable approach using natural inputs for enhancing crop yield. The demand for organic products is growing fast in countries like USA & Germany. It was clear that area, production and yield of organic produce in India is very low and it varies very widely among different states in India. India has the potential to become a major organic producing country given the international demand for our farm products, different agro-climatic regions for the cultivation of a number of crops, the size of the domestic market and above all the long tradition of environment friendly farming and living. Organic agriculture currently occupies only a small area in developing countries. The good news is that there is room for organic agriculture to continue to spread. Organic agriculture provides a variety of development benefits, including probably increased productivity in low-input agriculture, empowerment of women, increased community organizational capacities and decreased exposure to pesticides in farming communities, improved soil fertility in areas where land degradation is an issue, and reduced vulnerability of farmers to market price fluctuations. However, to make agriculture more sustainable following constraints and measures of organic agriculture need to be addressed.

- Small farmers require improved access in domestic and international markets if organic agriculture is to become a viable option for them. Therefore Well-managed cooperatives and well-trained cooperative leaders can contribute significantly to the success of organic agriculture.
- The cost of organic certification often acts as barriers to the adoption of organic agriculture, especially for small farmers. PGS represent an alternative to third party certification and are a peer-review style organic certification based on active participation of producers, consumers and other stakeholders. Therefore cost effective certification system need to be promoted.
- The labor-intensive nature of organic farming has the potential to revitalize rural economies, providing added economic benefits. Moreover it can redistribute resources in rural areas and promote economic stability through job creation.
- The labour costs of organic farming are higher than conventional farming due to the need for mechanical pest control, creative approaches to marketing and selling of organic products, and labour intensive practices such as weeding.
- Profitability of organic farming depend on crop yields, labor costs and price premiums for organic products, income during a transition period from conventional to organic production, use of nonrenewable resources and purchased inputs etc. Therefore most of these factors are to be considered by the state government to boost the profitability of farmers.
- Organic price premiums give farmers an incentive to adopt more sustainable farming practices. Therefore it is essential that government policies could further boost adoption of organic farming practices and ease the transition for conventional farmers.
- The risk of crop failure due to drought or pest damage is lower in organic production; this is mainly due to higher diversity and improved overall soil fertility.
- Organic farming is the best way to beat the vicious cycle of poverty. It is not only cost effective but also healthy.

REFERENCES:

Deshmukh M S & Babar Nitin 2015, Present Status and Prospects of Organic Farming in India, European Academic Research, Vol. III, Issue 4/ July 2015

- Ikerd, J., 1993. *Two related but distinctly different concepts: organic farming and sustainable agriculture. Small Farm Today* 10 (1), 30-31.
- Lampkin, N., 1994. *Organic farming: sustainable agriculture in practice. In: Lampkin, N., Padel, S. (Eds.), The Economics of Organic Farming. An International Perspective. CABI, Oxford.*
- Lukas Kilcher 2007. *How organic agriculture contributes to sustainable Development, University of Kassel at Witzenhausen JARTS, Supplement 89 (2007) 31-49.*
- Mannion, A.M., 1995. *Agriculture and environmental change. Temporal and spatial dimensions. Wiley, Sussex.*
- Nazeer Udin 2014. *Organic Farming Impact on Sustainable Livelihoods of Marginal Farmers in Shimoga District of Karnataka American Journal of Rural Development Vol. 2, No. 4 pp- 81-88*
- Park, J., Seaton, R.A.F., 1996. *Integrative research and sustainable agriculture. Agricultural Systems* 50, 81-00.
- Ramesh P., Singh Mohan and Subba Rao A 2005. *Organic farming: Its relevance to the Indian context current science, VOL. 88, NO. 4, 25*
- Scofield, A., 1986. *Organic farming-the origin of the name. Biological Agriculture and Horticulture* 4, 1-5.