International Journal of Academic Research
ISSN: 2348-7666; Vol.4, Issue-12(1), December, 2017
Impact Factor: 6.023; Email: drtvramana@yahoo.co.in

Organic farming problems, prospects, certification and status in India

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Abstract: *Organic farming is a form of agriculture that relies on techniques such as crop rotation, green manure, compost, and biological pest control. It uses fertilizers and pesticides if they are considered natural , but it excludes or strictly limits the use Of pesticides, growth regulators, antibiotic use in live stock, genetically modified organisms. It is a unique production management system and eco friendly.The problems of organic farming are limited supply as compared to demand, reduction of yield in initial few years of conversion from pure chemical farming to organic farming, shifting is time consuming, Organic inputs may be difficult to generate on the farm such as biological pest control is very knowledge intensive, decrease in number of cattle households, manual application of cattle dung, urine and farm wastes, green manuring has also become uncommon as the farmers are more interested to grow many crops of economic , lack of market information, for example which products to grow, which markets and distribution channels to choose, competition, market access, e.t.c. with producers in developed countries, is that of certification, which posses not only a technical problem but adds considerable costs to the product, which have to be borne by the consumer in one way or another.*

Key words: *Organic farmig, green manure, problems, pesticides, carcinogens prospects.*

Introduction:

Organic farming is a form of agriculture that relies on techniques such as crop rotation, green manure, compost, and biological pest control. organic farming uses fertilizers and pesticides (which include herbicides, insecticides and fungic ides) if they are considered natural (such as bone meal from animals or pyrethrin from flowers), but it excludes or strictly limits the use of various methods (including synthetic petrochemical fertilizers and pesticides; plant growth regulators such as hormones; antibiotic use in livestock; genetically modified organisms;[1] human sewage sludge; for reasons including sustainability, openness, independence, h ealth, and safety. Organic agricultural methods are internationally regulated and legally enforced by many nations, based in large part on the standards set by the International Federation of Organic Agriculture Movements (IFOAM), an international umbrella organization for organic farming organizations established in 1972.[2] The USDA definition as of April 1995 is: Organic agriculture is an ecological production management system that promotes and enhances biodiversity, biological cycles and soil biological activity. It is based on minimal use of off-farm inputs and on management practices that restore, maintain and enhance ecological harmony.[3] .According to the Food and Agriculture Organization (FAO),

sustainable agriculture "is the successful management of resources for agriculture to satisfy changing human needs while maintaining or enhancing the quality of environment and conserving natural resources".

The 2000 IUCN Red List of threatened species of the world highlights habitat loss as the main threat to biodiversity, with agricultural activities affecting 70 per cent of all threatened bird species and 49 per cent of all plant species. However, despite agriculture being responsible for such well-documented losses in biodiversity, it can also provide a tool for biodiversity conservation if policies and approaches, which combine agricultural production and biodiversity conservation, can be defined and implemented. "We should use organic agriculture and promote it," Dr. Diouf said. "It produces wholesome, nutritious food and represents a growing source of income for developed and developing countries. But you cannot feed six billion people today and nine billion in 2050 without judicious use of chemical fertilizers."[4]Sikkim to become a completely organic state by 2015[5]

"Sikkim 'livelihood schools' to promote organic farming". *Hindu Business Line*. 6 August 2010. Retrieved 29 November 2012[6].

Biological research into soil and soil organisms has proven beneficial to organic farming. Varieties of bacteria and fungi break down chemicals, plant matter and animal waste into productive soil nutrients. In turn, they produce benefits of healthier yields and more productive soil for future crops.[7] Fields with less or no manure display significantly lower yields, due to decreased soil microbe community. Increased manure improves biological activity, providing a healthier, more arable soil system and higher yields.[8]

Organic crop rotations frequently include weed-suppressive cover crops and crops with dissimilar life cycles to discourage weeds associated with a particular crop. Natural mulches can regulate the soil temperatures and moisture, improve soil quality, and suppress weeds in organic crops. Ecological weed management promotes weed suppression, rather than weed elimination, by enhancing crop competition and phyto toxic effects on weeds. Many organic farmers have included propane (LP) flame-burners as an additional tool in their weed management toolbox [9]. Organic standards require rotation of annual crops [10] meaning that a single crop cannot be grown in the same location without a different, intervening crop. Research is ongoing to develop organic methods to promote the growth of natural microorganisms that suppress the growth or germination of common weeds [11].

Methodology:

The paper is based on secondary data. Information is obtained from various sources like published sources like the websites, books and periodicals and news paper reports etc.

Problems and prospects:

Before looking into the problems and prospects of organic farming, it is important to understand the following basic steps in organic farming

Conversion of land from conventional management to organic management takes three years by following the regulations of USDA.

Management of the entire surrounding system to ensure biodiversity and sustainability of the system. Crop production with the use of alternative sources of nutrients such as crop rotation, residue management, organic manures and biological inputs etc.. Management of weeds and pests by better management practices, physical and cultural means and by biological control system etc.

The main problem is a fact that many farmers in the country have only vague ideas about organic farming and its advantages against the conventional farming methods, lack of knowledge in conversion process. The conversion time is 36 months. Sudden shifting to organic may lower the crop yield. After three years, the field is inspected, the soil and water are checked. First step in conversion is complete elimination of chemical fertilizers and pesticides. These are replaced by organic farming techniques, where it involves crop rotation, residue management, organic manures and biological inputs.

Once the crops are chosen, crop rotations are extremely important management tools in organic farming. They can interrupt pest life cycles, suppress weeds, provide and recycle fertility, and improve soil structure .Farmers are not aware of crop rotation. Crop rotation means changing the type of crop grown on a particular piece of land from year to year. It is central to the success of organic farm and boost N, C, P, and K in soils. Rotation confuses the pests and diseases don't become established. Crop rotation knowledge should be acquired by the farmer to boost their economic returns.

Green manure crops such as soybeans, clover, rye and others can be utilized directly. Lack of scientific knowledge in compost making, using the modern techniques and also its application is another problem. The maximum they do is making a pit and fill it with small quantities of wastes. Often the pit is flooded with rainwater and result is the top of the compost remains under composted, the bottom becomes like a hard cake. Proper training to the farmers will be necessary to make vermicompost on the modern lines. Attention on the application of composts/organic manure is also lacking. The organic matter is spread during the months when the right moisture level is absent on the soil. The whole manure turns into wastes in the process. The required operation is of course labour intensive and costly, but it is necessary to obtain the desired results.

The groundnut cake, neem seed and cake, vermi-compost, silt, cow dung, other manures, biofertilizers etc. applied as organic manure and are increasingly becoming costly making them unaffordable to the small cultivators. If these inputs are supplied by the Agriculture department the burden will be lowered. Decrease in number of cattle households, manual application of cattle dung, urine and farm wastes; green manuring has also become uncommon as the farmers are more interested to grow many crops of economic importance.

Organic inputs may be difficult to generate on the farm such as biological pest control is very knowledge intensive. It can be achieved by giving training to the farmers by Govt organizations. Before shifting, the farmer is advised to grow some plants ***Andrographis paniculata*** (Nelavemu), *Sida*

spinosa (Nagabala), *Azadiracta indica* (Neem), ***Embelica ribes*** (Naividanga), ***Acorus calamus*** (Vasambu), ***Allium sativum*** (Vellulli), ***Capsicum frutescens*** (Mirchi) which can be used to control pests in the farm. Cow urine is also used to control in pests. They also guide how much of these biopesticide crops should be required per one acre. No of cattle households should be increased as cow urine is used to control pests. Manual application of cattle dung, urine and farm wastes, green manuring should be replaced by machines.

The yield of organic agriculture, depends on the intensity of external input use before conversion. In traditional rain-fed agriculture (with low-input external inputs), organic agriculture has the potential to increase yields.

Presently stores are only opened in main cities. Agriculture ministry and vegetable and fruit marketing department must try to open more stores and thereby easily sell the produce bought at a reasonable price from farmers who invest in this. Mass media should play important role in promoting marketing information. It should be telecasted in cinema theatres like shrot film; for example which products to grow, which markets and distribution channels to choose, competition, market access, e.t.c. with producers in developed countries,

Organic produce needs certification to ensure that all synthetic inputs are prohibited and soil building approaches are followed. Certification authenticates organic produce for consumers and validate price margin of the product in the market. The certification process aims at converting the growing area to comply with requirements of standard within a period of 3 years. For this reason, farmers who adopt organic management need to wait for up to three years under certification procedures that requires purging of chemical residues. Certificate is given for current year'sharvest only and hence annual certification is required.

In India, the Director General of Foreign Trade, New Delhi, permits the export of organic produce provided that these are produced, processed and packed under a valid organic certificate issued by a certification agency accredited by an accreditation agency designated by the Government of India. The Government of India has recognized Tamil Nadu Organic Certification Department, Agricultural and Processed Food Products Export Development Authority (APEDA), Spice Board, Ministry of Commerce and Industry, Coffee Board and Tea Board for the purpose. However, lack of knowledge, rationale capital and access to certification discourage small farm holders in developing countries including India. Over overcome these constraints the government of India is providing extension services, training and institutional demonstration, fiscal incentives to encourage organic farm sector to strengthen nation's economy and sustainability

Future prospects can be understood well by the principles of organic agriculture. The four principles of organic agriculture are

Principle of health is associated with sustainability and enhance the health of soil, plant, animal, human and planet as one and indivisible.

Principle of ecology is associated with living ecological systems and cycles, work

with them, emulate them and help sustain them. This principle roots organic agriculture within living ecological systems.

Principle of fairness ensures fairness with regard to the common environment and life opportunities. Fairness is characterized by equity, respect, justice and stewardship of the shared world, both among people and in their relations to other living beings. This principle emphasizes that those involved in organic agriculture should conduct human relationships in a manner that ensures fairness at all levels and to all parties - farmers, workers, processors, distributors, traders and consumers. Organic agriculture should provide everyone involved with a good quality of life, and contribute to food sovereignty and reduction of poverty. It aims to produce a sufficient supply of good quality food and other products.

Principle of care is associated with that Organic agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment. Organic agriculture is a living and dynamic system that responds to internal and external demands and conditions. Practitioners of organic agriculture can enhance efficiency and increase productivity, but this should not be at the risk of jeopardizing health and well-being. Consequently, new technologies need to be assessed and existing methods reviewed.

Over the years agriculture has undergone several changes, thus drifting away from nature. The changes in agriculture have taken a quantum jump during Green Revolution. Such changes have resulted in environmental pollution, degradation of soil health, loss of bio – diversity.

Organic crops contained significantly more nutrients, benefit the environment by reducing pollution and conserving water and soil. Another extreme view is that conventional agriculture is highly unsustainable for the soil and environment .It is not just a source of safer, healthier, tastier food. Organic agriculture is not just a method of farming. It is saving the Earth and farmers' lives.

There is lots of evidence to show that **birds**, **animals** and **insects** such as **bees** and **butterflies** are much more common on and around organic farms since these farms don't use any chemicals, which helps in biodiversity conservation.

Long term fertility of soils protected by maintaining organic matter levels, encouraging soil biological activity, and careful mechanical intervention and providing crop nutrients indirectly using relatively insoluble nutrient sources which are made available to the plant by the action of soil micro-organisms. Nitrogen self-sufficiency through the use of legumes and biological nitrogen fixation, as well as effective recycling of organic materials including crop residues and livestock manures. Weed, disease and pest control relying primarily on crop rotations, natural predators, diversity, organic manuring, resistant varieties and limited (preferably minimal) thermal, biological and chemical intervention. The extensive management of livestock, paying full regard to their evolutionary adaptations, behavioral needs and animal welfare issues with respect to nutrition, housing, health, breeding and rearing.

Careful attention to the impact of the farming system on the wider environment and the conservation of wildlife and natural habitats.

As it has many prospects, Government of India is promoting organic farming through various schemes/ programmes under National Mission for Sustainable Agriculture (NMSA)/ Paramapragat Krishi Vikas Yojana (PKVY), Rashtriya Krishi Vikas Yojana (RKVY), Mission for Integrated Development of Horticulture (MIDH), National Mission on Oilseeds & Oil Palm (NMOOP), Network Project on Organic Farming of ICAR.

Under Paramparagat Krishi Vikas Yojana (PKVY)Government is implementing a Cluster based programme to encourage the farmer for promoting organic farming .Under this programme

- Groups of farmers would be motivated to take up organic farming. Fifty or more farmers will form a cluster having 50 acre land to take up the organic farming under the scheme.
- In this way during three years 10,000 clusters will be formed covering 5.0 lakh acre area under organic farming. There will be no liability on the farmers for expenditure on certification.
- Every farmer will be provided Rs. 20,000 per acre in three years for seed to harvesting of crops and to transport produce to the market.
- Organic farming will be promoted by using traditional resources and the organic products will be linked with the market.
- It will increase domestic production and certification of organic produce by involving farmers

In order to implement the PKVY in the year 2015-16, an amount of Rs.300 crore has been allocated.

Organic Agriculture in India

In India, cultivated area under certified organic farming has grown almost 17 fold in last one decade (42,000 ha in 2003-04 to 7.23 lakh ha in 2013-14) Table-1. Government of India has implemented the **National Programme for Organic Production** (**NPOP**) in the year 2001. The national programme involves the accreditation programme for certification agencies, norms for organic production, promotion of organic farming etc. States like; Uttaranchal, Karnataka, Madhya Pradesh, Maharashtra, Gujarat, Rajasthan, Tamil Nadu, Kerala, Nagaland, Mizoram, Sikkim have been promoting organic farming. To augment the research needs ICAR launched a **Network Project on Organic Farming** (**NPOF-ICAR**) under Project Directorate of Farming System Research with 13 collaborating centre across the country and cropping patterns followed is given in Table-2. Organic package of practice for some important crops have been developed under the project.[15] . For area expansion and technology transfer, Ministry of Agriculture launched a **National Project on Promotion of Organic Farming** (**NPOF-DAC**) and earmarked funds for setting up of organic and biological input production units, vermicompost production units and for organic adoption and certification under various schemes such as **NHM** (now **MIDH**), **NMSA and RKVY.**To empower farmers through participation in

certification process and to make the certification affordable for domestic and local markets, Ministry of Agriculture has also launched a farmer group centric organic guarantee system under **PGS-India programme.**

Madhya Pradesh has a maximum certified area of 2.32 lakh hectares under organic farming out of a total 7.23 lakh hectares in India, while Manipur and Mizoram have nothing to show on this front, According to the data placed by Minister of State for Agriculture, organic farming is undertaken in 85,536 hectares (ha) in Maharashtra, 66,020 ha in Rajasthan and 60,843 ha in Sikkim.(**Table 1**)

Certified organic farm area in Odisha is about 49,813 ha, Gujarat (46,863 ha), Uttar Pradesh (44,670 ha), Karnataka (30,716 ha) and Uttarakhand (24,739 ha), the data showed. In the case of Manipur and Mizoram, there is no area under certified organic farming (**Table-2**). State wise major crops grown under organic farming in India (Both certifieed & in conversion) are given in **Table-3.**

Apof Organic Certification Agency (AOCA) is an independent not-for-profit NGO, committed to the cause of providing most efficient and affordable inspection and certification service to the farmers of India. The people behind this organization have gained vast experience in organic agricultural practices through exposure in India and abroad and participated in a large number of training programs specialized in Inspection and Certification procedures.

Andhra Pradesh Commissioner of Agriculture, A. P. conducted a consultation meeting to redraft the AP Organic Farming Policy on the 24th April 2012 at Hyderabad. Officers from Organic Cell, Commissionarate of Agriculture, Certification Agencies viz. **AOCA, VOCA, APEDA, Agri University-**Hyderabad and various NGOs of AP have participated in the meeting and gave their opinions and inputs for drafting a new organic policy.

A "livelihood school" on organic farming, has been inaugurated by the State Agriculture Minister, Mr D.N. Tharkarpa, at Tadongin Sikkim. This is part of the State government's plans to transform Sikkim into a fully Organic State by 2015.[6]. According to the state agriculture department officials, a total of 6,929.15 hectares of land in Sikkim are under process of organic certification. The department is targeting to get organic certification to 18,000 hectares of land in 2010-11, another 18000 hectares of land in 2012 and finally to 14,000 hectares in 2014-15. Officials explained that organic farming conversion is a step by step process. They pointed out that the use of chemical fertilizers and pesticides in the agriculture fields were phased out by the State government since 2003. This period was a transition period as the residues of chemicals in the farms were flushed out and natural ingredients were restored gradually with the use of bio-fertilizers and local organic manure [6].

Conclusions:

Green revolution has saved us from the disaster of hunger and starvation. But it has its own inherent deficiency segments like environmental pollution, degradation of soil health, loss of bio – diversity by increasing use of agrochemical-based pest and weed control. It has so far affected only 40% of total cropped area and 60% is still

untouched by it [14]. This 60% area is easy for conversion to "certified organic". It is worth mentioning that, **north eastern India** has highest potential for organic farming. It has distinct agro-climatic zone and its soil is immensely rich in organic matter. Further, it was aloof of any green revolution and consequently farmers there still use traditional methods.These areas should be given utmost importance for conversion. Agriculture production depends on soil,water,air and energy and biological resources. By practicing organic farming , the quality of environment is enhanced which results in the good quality food and become a "**boon to healthy survival of human beings and protect the biodiversity**" also.For promoting organic farming ,the farmers should be gathered and educated at their villages by trained agriculture field assistant by using LCD screen;by playing success stories and applicable Govt policies like Paramparagat Krishi Vikas Yojana (PKVY), National Programme for Organic Production (NPOP), Network Project on Organic Farming (NPOF-ICAR), National Project on Promotion of Organic Farming (NPOF-DAC). They shold be given training about organic farming by giving free travelling fare,accommodation at traninig centres.After shifting,the field assistants should regulary visit the farmers and guide them. This build confidance among peasants during conversion period of 36 months.

Table 1 State wise Farm area (excluding Forest Area) under Organic Certification during 2013-14

S.No.	State Name	Organic Area (in Ha)
1	Andaman & Nicobar Islands	321.28
2	Andhra Pradesh	12325.03
3	Arunachal Pradesh	71.49
4	Assam	2828.26
5	Bihar	180.60
6	Chhattisgarh	4113.25
7	Delhi	0.83
8	Goa	12853.94
9	Gujarat	46863.89
10	Haryana	3835.78
11	Himachal Pradesh	4686.05
12	Jammu & Kashmir	10035.38
13	Jharkhand	762.30
14	Karnataka	30716.21
15	Kerala	15020.23
16	Lakshadweep	895.91
17	Madhya Pradesh	232887.36
18	Maharashtra	85536.66
19	Manipur	0
20	Meghalaya	373.13
21	Mizoram	0
22	Nagaland	5168.16
23	Odisha	49813.51
24	Pondicherry	2.84
25	Punjab	1534.39
26	Rajasthan	66020.35
27	Sikkim	60843.51
28	Tamil Nadu	3640.07
29	Tripura	203.56
30	Uttar Pradesh	44670.10
31	Uttaranchal	24739.46
32	West Bengal	2095.51
	Total	**723039.00**

Source: APEDA (2013-14)

Table-2-Cropping system being experimented under Network Project on Organic farming under ICAR

Cropping Systems being experimented under Network Project on Organic farming under ICAR

Location	Cropping system
Modipuram (Uttar Pradesh)	Green manure-Rice-Wheat
	Basmati Rice-Potato-Radish
	Babycorn-Potato-Greengram
	Sorghum (F)-Pea-Okra
Jabalpur (MP)	GM-Rice-Wheat
	GM-Rice – potato -Okra
	GM-Rice = Berseem
	GM-Rice-Pea-Sorghum F
Coimbatore (TN)	Maize-Cotton
	Chilly-Onion
	Brinjal-Sunflower
	Turmeric+ Onion
Raipur (Chhatisgarh)	Soybean-Wheat
	Soybean-Berseem
	Soybean-Mustard
	Soybean-Chickpea
Calicut (Kerala)	Ginger
	Turmeric
	Black pepper
Dharwad (Karnataka)	Groundnut -Sorghum
	Soybean- rainfed Wheat
	Potato-Chickpea
	Chilli + Cotton-Onion
	Maize-Chickpea
Karjat (Maharashtra)	Rice-Groundnut
	Rice-Maize
	Rice-Mustard
	Rice-Dolichos bean
Ludhiana (Punjab)	Basmati Rice-Wheat-GM
	Turmeric - Onion
	Maize -Potato-Moong (S)
	Rice -Wheat-Moong (S)
Bhopal (MP)	Soybean- Wheat
	Soybean-Mustard
	Soybean-Chickpea
	Soybean-Isabgol
Pantnagar (Uttarakhand)	Basmati Rice-Wheat-Sesbania (GM)
	Basmati Rice -Lentil-Sesbania (GM)
	Basmati Rice -Pea (veg.)-Sesbania(GM)
	Basmati Rice -Mustard-Sesbania (GM)
Ranchi (Jharkhand)	Rice -Wheat
	Rice -Potato
	Rice -Mustard / Linseed
	Rice -Lentil
Umiam (Meghalaya)	Rice - Carrot
	Rice - Potato
	Rice – French bean
	Rice - Tomato

Table-3. State wise major crops grown under organic farming in India (Both certifieed & in conversion)

State-wise major crops grown under organic farming in India (both certified & In-conversion)

Arunachal Pradesh	Maize/sorghum, Pulses, oilseeds, tea/coffee, herbal/medicinal plants
Andhra Pradesh	Cotton, maize, pulses, oilseeds, fruits and vegetables
Assam	Tea/coffee, fruits and vegetables
Chhattisgarh	Rice, wheat, vegetables
Delhi	Wheat, vegetables
Goa	Fruits, vegetables
Gujarat	Cotton, pulses, oilseeds, vegetables
Haryana	Basmati rice, wheat, maize, vegetables
Himachal Pradesh	Wheat, fruits, vegetables
Jammu and Kashmir	Spices, fruits and vegetables
Karnataka	Cotton, rainfed wheat, maize, sorghum, pulses, oilseeds, vegetables
Kerala	Spices, vegetables, herbals
Manipur	Spices, vegetables, herbals
Maharashtra	Cotton, rice, wheat, pulses, oilseeds, spices, vegetables
Madhya Pradesh	Soybean, wheat, vegetables
Meghalaya	Spices, vegetables
Punjab	Basmati rice, wheat, vegetables
Sikkim	Maize, sorghum, vegetables, spices, herbs
Rajasthan	Cotton, wheat, seed spices, vegetables
Tamil Nadu	Tea, herbs, spices
Uttar Pradesh	Rice, wheat, maize, vegetables
Uttarakhand	Basmati rice, vegetables, maize, sorghum, herbs, spices
West Bengal	Tea and vegetables

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