

Organic Farming: A Sustainable Environmental Ingenuity for Biotechnological Intervention towards a Green World

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ABSTRACT: The phrase “organic” consigns to the approach that farmers implement to cultivate and process different agricultural products in eco-friendly ways. This ingenuity of biotechnological intervention leads to organic food and non-toxic energy. In order to encourage organic soil and water conservation and diminish pollution, organic farming with the application of biotechnology is being promoted among farmers. Farmers are being educated to use natural methods to fertilize crops, manage weeds and to avert livestock infections occurring due to chemicals released from industrial products.

This research paper focuses to restrain and check chemical pollution and facilitate organic farming specifically for small farmers. It emphasizes on the benefit of practicing organic farming over conventional farming, and sustainable issues faced by farmers while putting into practice. Organic food for the community can be generated by the joint effort of government and entrepreneurs. An effort is made to analyze the environment for the posterity assessing the present progress of organic farming in India. It argues on the issues pertaining to augmentation and motivation of farmers for implementation of biotechnology through policy making; which can support the feasibility of farmers. This article shall emphasize on the significance of organic farming along with marketing of organic food products and its export in India.

KEYWORDS: Organic Farming, Sustainable Approach, Biotechnology Intervention, Energy, and Environment.

I. INTRODUCTION

Agriculture has been the major source of revenue, predominantly in the rural areas which constitute about 55% of total population in India. Agriculture significantly contributes to our Indian economy in terms of export, the source of raw material and to mitigate needs of industries in various forms. The term Green Revolution has been the milestone of India's agricultural growth, renovated our country from food deficit to self-reliance by using fertilizers and pesticides. The production in agricultural product increased from 50.82 million tons in 1950-51 to 265.57 million tons during 2013-14 by using fertilizers and pesticides. Excessive use of chemical for agricultural production by means of conventional farming during this period has put forward a question mark on future of sustainability in agriculture. Therefore the role of organic farming plays a vital position in addressing the social, environmental and economic issues. With the increase in awareness of health and concern about the environment, more importance is increasingly given on quality of food products. Extensive consideration is being remunerated towards organic farming. Today the buying behaviour of the consumer is changing due to concern over environmental issues, emphasis on nutritional values of food and its effect on health condition (Laroche et al., 2001). Study on buyer's inclination and insist for an organic produce is a progressively drawing scholarly concern (Misra 1991; Wandel and Hillers, in the year of 1994). Organic products are attained by a process that is eco-friendly, by a farming method that considers both the attributes of the final product and the production methods (Chinnici et al., 2002). Therefore, it is always that for this type of food demand will increase in future. The history of Organic Farming is arguable and was considered by a few as an inefficient move for production of food products. But in today's market demand for the organically cultivated produce and beverages is increasing. The performance of organic farming in comparison with conventional farming is done on basis of four key parameters: productivity, impact on the environment, economic feasibility and social well-being.

International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor & UGC Approved Journal)

Website: www.ijirset.com

Vol. 6, Issue 9, September 2017

Various studies conducted by researchers confirm that organic foods are healthier in comparison with conventionally grown food products and that are produced in the eco-friendly atmosphere (Folkers 1983; Baade 1985; Familieund Gesundheit 1985).[1][2]

II. LITERATURE REVIEW

M S Azam (2015) found that organic farmers were more aware and close to the mainstream whereas conventional farmers are still lacking in many aspects. Matt Lobley (2009) confirmed that the people who operate organic farms are typically younger and educated than their non-organic counterparts and a significant proportion have entered agriculture as an entirely new „career“.[3] M.K. Lwayo (2003) highlighted that policy implementation should be concentrated at the district level to bring it closer to the people. Formal education is vital in promoting farm forestry. Problems experienced during conversion relate to lack of governmental and institutional support and less use of chemicals and improved food quality were highly ranked as benefits.[4] Sammy Comer et al., (2008) highlighted that organic farmers achieved higher score on sustainable agriculture compared to conventional farmers. The results also show that farmers’ affiliation with different organization/groups does affect their perception about organic agriculture. Ramesh et al., (2010) found that despite reduction in crop productivity, net profit of organic farming was recorded high due to the availability of premium price for the certified organic produce and reduction in the cost of cultivation. The net return and profit with or without “Price Premium” has been consistently a debatable issue. [5]

III. INTENT OF ORGANIC FARMING

The main focus of the Organic farming system is on the utilization of organic matters for improvising the quality of soil, reducing health hazards related to the food chain and to accomplish closed nutrient cycles. As per Willer., in the year 2008, the key purpose of organic farming comprises: (1) to produce superior foods of adequate capacity in synchronization with ecological co-ordination's and cycles, (2) enhancing natural cycles contained by the cultivation system linking, (3) sustaining durable soil productiveness and inherent variety of the production system and its environment as well as plant and wildlife, (4) encouraging healthy utilization of water resources with good care of all life therein, (5) creating pleasant-sounding equilibrium (6) diminishing all type of contaminations.[6][7]

IV. WORLDWIDE SCENARIO OF ORGANIC FARMING

The annual growth of organic farming over conventional has been around 20% (Lotter, 2003). More than 130 countries have implemented organic agriculture over an area of approximately 30.4 Mh, which is 0.65% of the total farming territory of the globe. Among countries, Australia resides in the major place followed by different countries (Willer et al., 2008). Our country appears in 13th position on considering the total organic agricultural area engaged organic cultivation. The organic area in India is about 528,171 hectare which is about 0.3% of the total farming territory.[7][8]

V. DEVELOPMENT IN THE FIELD OF ORGANIC FARMING IN INDIA

India being a developing country has incredible potential, mostly unexploited majorly for utilization in the field of organic agriculture. Figure-1 basically indicates India’s organic area in 2005 was 185937 hectares and wild collection area was 2385963 hectares and that has amplified to 510000 million hectares and 5180000 million hectares respectively in 2013. The compound growth rate of India’s organic area and wild collection area was 7.45% and 12.87 % respectively during 2005 to 2013. The compound growth rate of India’s total organic area including wild collection was 11.518% and coefficient of variation was 0.54% during the same period.[9][10][11]

Figure 2, indicates the state wise area manufacturing and yield of organic food products and its ranking in India in 2011-12. Uttar Pradesh has highest certified area under organic cultivation i.e. 2.59 million hectares followed by Himachal Pradesh 0.93 million hectares, Madhya Pradesh and Maharashtra in the year 2011-12. In terms of organic production, Orissa rank first 29016450 MT, followed by Maharashtra 211740.8MT, Rajasthan (7.6%). However in terms of yield Orissa rank first go after by Meghalaya Maharashtra etc. Among all the states, Orissa has highest production and yield of organic crops followed by Maharashtra in India during 2011-12. [12][13][14]

International Journal of Innovative Research in Science, Engineering and Technology

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Vol. 6, Issue 9, September 2017

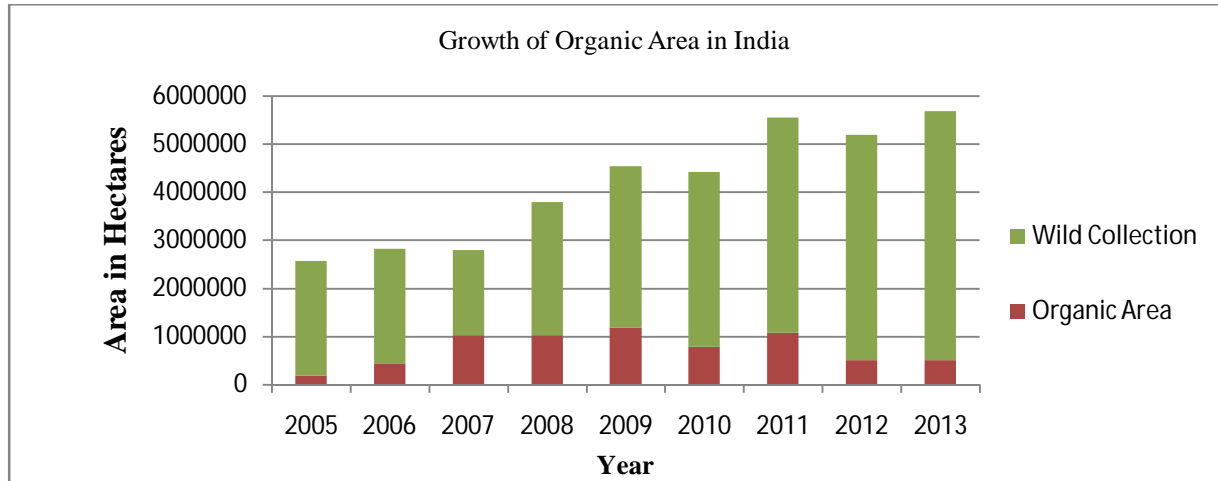


Fig 1: Growth of Organic Area in India
Source: FIBL-AMI Organic data network survey 2000-2015

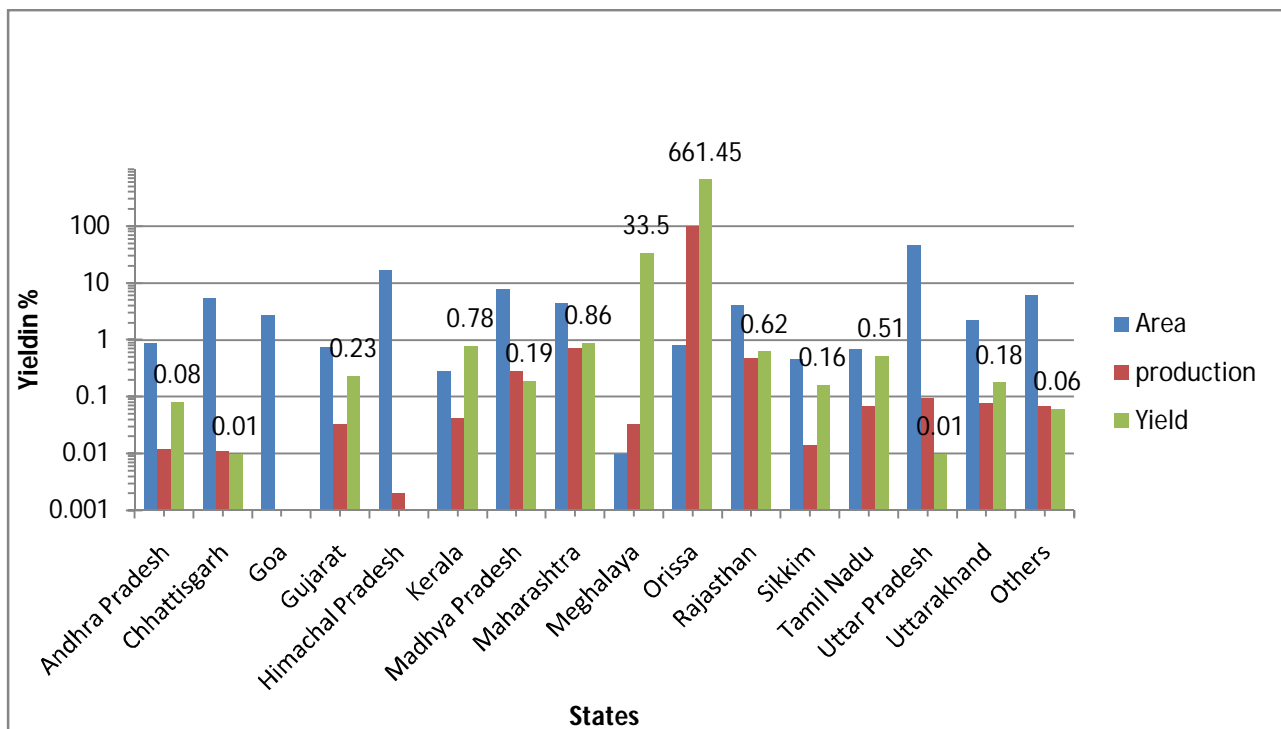


Fig 2: State Wise Production of Organic Products
Source - National Project on Organic Farming Annual Report 2012-2016.

VI. ORGANIC FOOD EXPORT FROM INDIA

The economic growth of organic food products exported from India is depicting a positive trend as referred by Figure 3. There is a slowdown in the domestic consumption but internationally the demand for organic food is high in the US and Europe. India has now turned out to be a foremost supplier of organic herbs, organic spices, organic basmati rice, etc.

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Vol. 6, Issue 9, September 2017

Figure 3 reveals that an export of organic products from India in 2002-03 was 4161MT that went up to 194088 MT in 2013-14.

Similarly, the export value of organic products was Rs.619.6 crores in 2002-03 which has increased to Rs. 2566 crores in 2013-14. The compound growth rate of India's organic products volume and value of export was 51% and 11% respectively during 2002-03 to 2013-14. [15][16][17]

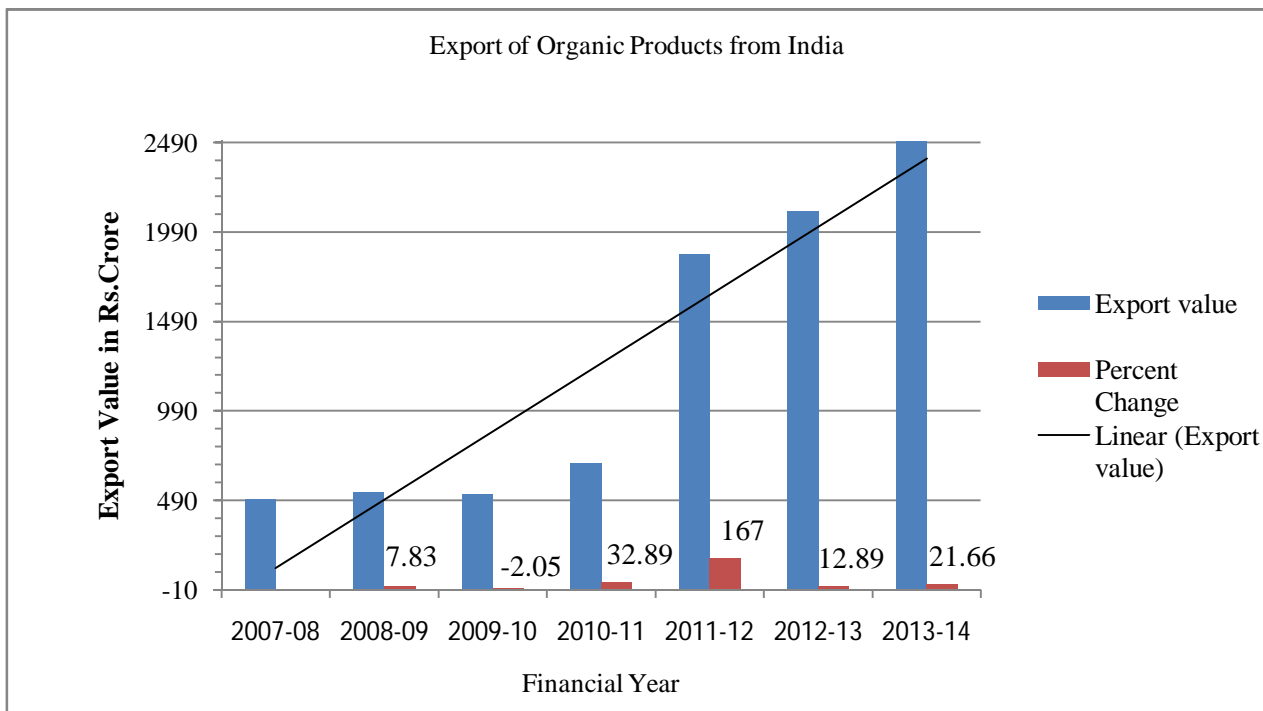


Fig 3: Export of Organic Products from India
Source: National center for organic agriculture annual report 2013-14

VII. THE SUSTAINABLE CONCERN IN ORGANIC FARMING

Ecological Perspective: Generally conventional farming practices have an adverse effect on the several resources by increasing erosion and leveraging greenhouse. Organic farming practices are linked with ecological enhancement in term of increasing productiveness of soil increases the density of top soil to preserve organic substances, reduce the use of harmful chemicals, increase plantation to safeguard soil and improves carbon sequestration.[18][19]

Economic sustainability: Long term economic viability is essential for sustainable agriculture. The long-term economic risk is involved in case of conventional farming than organic farming. [20][21][22] The subjects that require concern are:

1. From economic point of view export oriented production system is given more emphasis than that of domestic demand. The Indian market is basically export oriented for organic products. Balance in trade should be given emphasis.
2. Liability: With green revolution the food production increases by the multi fold. But at the same time, many small-scale farmers was unable to pay back their liabilities. They had taken loans for production of crops but were unable to payback and committed suicide.
3. Market risk: The interest of small farm holders is always at stake due to market fluctuation.
4. Employment: The main source of employment for rural population is agriculture. The organic farming system is basically labor intensive; therefore ample opportunity of employment is generated.

Social sustainability: The main focus of social sustainability is providing justice and social acceptability to farmers. [23][24][25] The major concern is mentioned below

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Vol. 6, Issue 9, September 2017

1. Comprehensiveness: This is a major concern for reducing the gap between rich and poor. Till this gap is reduced we cannot attain social sustainability.
2. Gender: In case of traditional agriculture, heaviest load in terms of labour was carried by women and the benefit was controlled by men. In case of sustainable agriculture, it is ensured that equal load and benefit is divided between male and female.
3. Food security: The conventional farming approach in India considers few crops only and not succeeds in providing a balanced diet. In case of sustainable agriculture, priority is given towards improving quality and a nutritional factor of food products.

Cost-benefit Issues

In case of industrial agriculture, farmers gain profit by a significant increase in crop production but there are long standing hidden costs that are incurred (Subba Rao, 1999). Organic farming methods are being implemented for minimizing issues faced in conventional farming and it is also cost effective. Few programs have been conducted the government of Sweden, Canada, and Indonesia focusing on practicing organic farming and the benefit such reduction on the use of pesticide by 50% to 65% without forgoing harvest acquiesce and value along with incurring lesser expenses (Pimentel et al., 2005). New export opportunities are being created due to growing demand for organic food products and many developing countries including India have created their market of organically produced food products.[25][26]

VIII. CONCLUSION & POLICY RECOMMENDATIONS

Agriculture is considered to be the foundation of economic policies and plays a significant role in economic growth of our country. It provides employment opportunity in rural areas and secures livelihood. Organic farming is attaining thrust as an optional way to the recent system. Many countries have been able to convert significant per cent of their cultivated areas into organic farming. The demand for the supply of organic products is increasing in developed countries like USA & Germany. It is very clear that area, production, and yield of the organically grown products are very low in India as compared with other countries. India has the potential to become a major supplier of organically grown products given the international demand for our farm products. This paper highlights on the number of limitation obstructing farmers, especially small farmer from adopting organic farming. Farmers are getting demoralized by an insufficient supply of organic products. Moreover, lack of access principle, documentation, and cost for the input together with capital-driven instruction by contracting firm strongly rejects small farm holders who comprise over 70% of the farming community in India. The demand for the organic products is increasing in India due to awareness on health and rise in disposable earnings. Initiatives are taken by the government by structuring guidelines specifically for addressing issues related to obstacles faced by organic farming.

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