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Demand and Supply of Organic Food - The Indian Perspective

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ABSTRACT

In order to understand the state of the organic market, it is not sufficient to take into account only the demand aspect where role of wholesalers and consumers 'with respect to purchase of organic products is analyzed. Neither will the analysis of the organic market be complete if only supply of organic products with farmers playing a major role is considered. Both demand and supply factors need to be considered together.

Today, consumers are somewhat aware of the positive effects of organic farming, yet, demand is not increasing much. Some of the reasons being- consumers think that organic products are expensive, they don't have easy access to organic products, also they feel that products may be sold as Organic even when they are not.

To understand the situation on the supply side, it must be understood that it takes three years for farmers to switch over from Green Revolution agriculture to organic agriculture. Initially for two to three years, there will be less yield as the soil takes time to regain its fertility with the use of organic inputs. Only if there is Governmental support in the form of subsidized organic inputs, provision of trainings imparting knowledge for best practices, will there be motivation to switch over to organic farming. However, for farmers already practicing organic farming, yield may be almost same or even higher if best practices are followed. Moreover, on the supply side, there are marketing issues related to selling of organic products at a premium price. The cost of processing and storage of organic products is high and a lot of cautiousness in handling such products also has to be exercised.

This paper will look at the challenges on both the demand and supply sides in respect of the organic market.

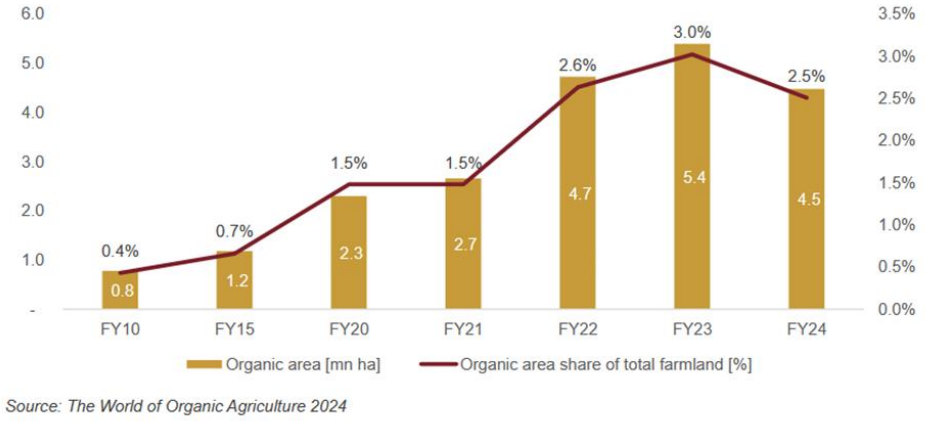
Keywords- agriculture, organic, demand, supply.

I. INTRODUCTION

India as a country practiced Organic agriculture from ancient times till the 1960s. We were going through a period of drought in the 1960s. In exchange for food imports from the US, the Green revolution technology package, a combination of high-yielding variety seeds, chemical-based fertilizers, pesticides, weedicides was thrust upon us.(Shiva, 2015) [1] It was soon realized that this method of agriculture was a threat to health and the environment due to the pollution of air, water and soil. The alternative prescription was Organic agriculture which does not use chemicals and hence is not a threat to soil fertility, aquatic wildlife and human health. (Baweja et al) [2] At the outset, it is important to understand the Organic scenario prevalent in India. On the basis of area under cultivation, India stood at No.2 (4.7 million hectares) in the world. In the world, out of 4.5 million organic producers, India ranks No.1 with 24,80,859 organic producers. (The World of Organic agriculture. FiBL & IFOAM, 2024) [3] As per data from APEDA, Ministry of Commerce and Industry, GOI, India generated around 3.6 million MT (2023-24) of certified organic products, which is not confined to the edible sector.

However, the area of concern is that only about four percent of the net cultivable area in India is under organic farming. There is a lot of potential for Organic agriculture, which can be fruitfully materialised to bring about a change in the agriculture scenario of India. In order to understand the state of the organic market, it is not sufficient to take into account only the demand aspect where role of wholesalers and consumers' with respect to purchase of organic products is analyzed. Neither will the analysis of the organic market be complete if only supply of organic products with farmers playing a major role is considered. Both demand and supply factors need to be considered together.

This paper will look at issues on the demand and supply side together by reviewing existing data and literature in this area pertaining to India. Both demand and supply go hand in hand and are important economic aspects in order to understand why consumption of Organic products is so low and why farmers are not motivated enough to practice Organic farming. If farmers supply adequately and there is no demand or market for the same, there will be unsold items. On the other hand, if loyal organic food consumers do not find sufficient items of their choice, there will be a situation of excess demand which is not good for the organic food market where retailers are trying to do good business. Hence, both buyers and sellers need to be aware of the prevailing situation. Farmers, sellers and exporters are representative of the supply side of the wholesale market, while consumers characterize the demand side.



Source: The World of Organic Agriculture 2024

Fig. 1: Organic cultivated area and share in total farmland in India

This kind of research in respect of Organic food has not been undertaken befor. The following research questions will be dealt with by referring to both Literature Review and the Primary Surveys.

a. Whether there exists a niche market/demand for organic food since it is sold at a premium price (Section 2)
b. The kind of demand for Indian exports that exist worldwide and the challenges faced by Indian exporters (Section 3)
c. The existing challenges on the supply side for Organic products, that prevent the increase in organic agriculture and supply of organic products in stores (Section 4)
d. To find out the ways to increase the demand and supply of Organics (Section 5)
e. The way forward and solutions to improve the situation that will assist policy making (Section 6)

2a. Organic food products are priced higher than conventional produce

Certified organic products are frequently more expensive than conventional products. Organic food production costs more since it requires more labour per unit of output. Organic farming necessitates the separation of organic and conventional output, particularly during processing and transportation. Furthermore, because of the low volume of organic products, marketing and distribution costs are higher.

Organic food costs incorporate a number of other factors not included in conventional food prices, such as:

1) The environment is safeguarded, there are no costs of reducing future pollution.
2) Compensation for the low returns during rotating phases of soil fertility development.
3) In organic agriculture, cost of maintenance of animals are higher.
4) Avoidance of farmers' future medical costs due to incorrect pesticide handling (Food and Agricultural Organization Inter-Departmental Working group on Organic agriculture, nd) [4]

2b. Growing Domestic Organic food market in India

According to the India Organic Food Market Report, 2024, the market size is expected to be USD 2.07 billion. The report also projects a compound annual growth rate (CAGR) of 22.20% from 2024 to 2032, with a market size of USD 10.329 billion by then. (India Organic Food Market Report, 2024) [5]

2c. Increased demand for organic food in India and abroad

There is a rising demand for food produced organically. As a result, more and more land is being used for organic farming. (Jena et al, 2020) [6]

Today, millennials desire to eat healthy and organic food is tastier as well. However, despite the ensuing growth in demand, organic farming has yet to find success in India. The issues are weak policy initiatives and growing input costs. According to the WHO, though 30% of the World's population lives in India, India accounts for about 3% of the overall organic agricultural area. (India's Organic food market is out of its segregated niche, 2019) (7)

3a. APEDA's role in promoting exports of Indian Organic products

The Agricultural & Processed Food Products Export Development Authority (APEDA), an autonomous agency under the administrative jurisdiction of the Department of Commerce, assists organic product exporters through many components of its programme. (Ministry of Commerce & Industries Press Information Bureau report, 2/2/2022)[8]

"Export during 2022-23 was 312800.51 MT. The revenue from organic food exports was around INR 5525.18 Crore (708.33 million USD). India exported in the last three years, processed food, oil seeds, cereals and millets, sugar, spices and condiments, pulses, tea, fodder and coffee." (APEDA website,nd) [9]

The United States and the European Union account for 87% of the market (in terms of value). People are gravitating towards organic foods as their awareness of them grows, according to the Ministry of Agriculture. Domestic and international demand has been particularly strong with the introduction of Covid-19. (Lok Sabha, July 2022)[10]

3b. Promotion of Organic rice

With 26,085 shipments upto May 20, 2023, India is the top exporter of Organic rice followed by Thailand with 7,562 and China with 5,301 shipments." (Volza, 2023) [11]

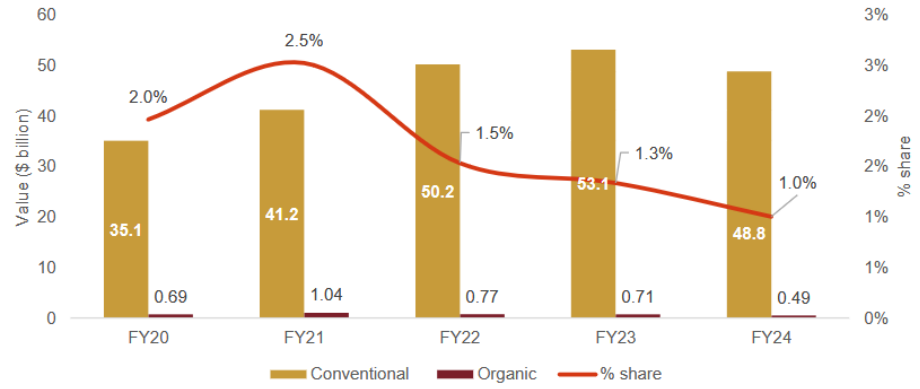
3c. The power of India's Organic agriculture

India has the advantage of having 15 fertile agro-climatic zones, providing security by way of food and nutrition to the world through good agricultural practices. It is not surprising that during the pandemic, India's organic exports grew 51% over 2019-20 levels." (Ministry of Agriculture & Farmers Welfare Press Information Bureau Report, 21st February, 2022)[12]

3d. Export issues in Organic products

In January 2021, the United States Department of Agriculture (USDA) called off its agreement with APEDA which allowed it to accredit organic certification agencies to provide USDA organic certification in India. In July 2022, five certification agencies were barred from clearing exports because of not subscribing to European Union (EU) standards. The presence of Ethylene Oxide (ETO) residue on organic products is the reason for the same. ETO is an insecticide which kills all bacteria, viruses and fungi, however appropriate aeration is required without which ETO residue may be left behind.

As multiple certification has now become necessary to come at par with the USDA certification, certification costs have become expensive. It has become difficult for small players to export organic products. (Anamika Yadav, 2023)[13]



Source: APEDA

Fig 2: Conventional vs organic exports

4a. Cost and Returns of Organic paddy in comparison to Inorganic paddy affects supply

Rajendra Kr. Verma et al. (2019)[14] examines the economics of organic paddy agriculture and inorganic paddy cultivation in Madhya Pradesh by calculating the cost and returns. Though the cost of organic production is less than inorganic, the yield obtained from inorganic paddy was found to be higher than that produced from organic paddy. The net returns from inorganic paddy farming were found to be higher than organic paddy culture.

4b. Issues related to switch-over from Inorganic to Organic agriculture

Over 80% of small Indian farmers lack access to instructions, information from the market and vocational training; there is also the risk of low yield during the first three years at least, issues of certification requirements, and input costs. Hence, switching over to Organic farming from Inorganic farming is a difficult task. (Deshmukh et al, 2015) [15]

4c. The Challenges Faced in Organic Food Delivery (Supply chain issues)

With the exception of grains and pulses, the short shelf-life of most Organic items makes delivery difficult. Furthermore, organic produce cannot be maintained in cold storage since nutrients may be lost. Organic food should be delivered within hours of harvest. Organic produce cannot be delivered if the clients live too far from the farm. The products' manufacture, handling, and transportation all play a factor in how quickly they spoil. Organic foods are frequently imperfect, come in a variety of forms and sizes, and may include a variety of colours due to a lack of exposure to pesticides, fertilisers,

and other chemicals. However, the taste and nutrient content of the items may compensate for this. In the case of organic products, technological innovations and supply chain improvements play a vital role. It is necessary for the temperature to be even from the harvesting of the products to their delivery. (Mamgain. N, 3/6/2019) [16]

4d. Imbalance between demand and supply of Organic goods

Indians consume barely 1% of total organic produce in spite of possessing the world's largest farmlands, which clearly reflects the challenging position of organic food items in the Indian market.

Retailers will always prefer a low-cost product which sells more rather than an organic product which is more costly. Again some organic food products have no supply whereas for some products, there is more supply than demand. This gap must be looked into. The demand for jaggery powder, for example, exceeds the supply in Uttar Pradesh. (Six big challenges for the Indian Organic Food Market, March 2022) [17]

The imbalances in supply and demand in this industry must be addressed appropriately in order to provide stability to the organic food market in the coming days. (Oger et al., 2001)[18].

4e. Limited availability of Organic produce in retail stores

The major hurdle to increasing sales and consumer loyalty is the low presence of organic food in retail establish.ents. Exclusive outlets can be opened by retailers for the well-to-do customer group who prefer buying at exclusive stores. Since commercials are expensive, word-of-mouth advertising can be a very efficient strategy. (Tsakiridou et al.,1999)[19]

5a. Ways to increase demand of Organic products

Brand equity plays an important role in managing the demand for organics. (Horovitz, 2003)[20] Social media can be used extensively by marketers to create awareness about organic products when people share their experiences related to the use of these products, motivating others to buy the same. (A.Gandhi et al, 2019) [21] Consumers are becoming increasingly worried about their health and eating habits. With increased awareness, marketers have a greater potential to increase people's faith in organic food. The labelling of products, as well as their availability are important. (M.Parwez et al, 2022) [22]

A marketer must grasp the factors that influence organic food demand. They should investigate about the elements in attracting non-organic food customers. Further, marketers can develop retention techniques to transform their regular customers into devoted customers. (Rana & Paul, 2017)[23]

5b. Supply issues of Organic produce can be taken care of

In respect of conversion to organic farming, the factors of the external farm environment are the demand, price, availability of markets and technologies, education, peer networks, society's attitudes, and subsidy provision. The most important farm characteristics are the farm's location, farm size, expected costs, profits, information and communication technology use, farmers' age, education, gender, off-farm activities, attitudes, and beliefs regarding organic farming and willingness to preserve the environment. (Karipidis & Karypidou,2021) [24]

It took consistent commitment by the Government of Sikkim for thirteen years for a 100% switch-over to organic farming in a phased manner. From the case study of Sikkim, it is clear that progress in the area of organic farming can happen only with the intervention of the Government and other support Organizations in a consistent manner. (Rai, 2019)[25]

II. RESEARCH METHODOLOGY

Primary survey with-

a) 100 consumers of organic food living across India (15 forms sent online on social media and 85 forms with one- to-one interaction at Farmers Markets and Organic stores of Mumbai, Raigad, Thane) and
b) One to one interaction with 188 organic and inorganic paddy farmers(Organic-94, Inorganic-94) in the districts of Raigad, Thane and Palghar of Maharashtra.

6A Results of Primary survey with consumers

Table 1- Willingness to pay price for respondents

Willingness to pay price	Percentage of respondents
Same price	15
Up to 25% more	59
Up to 50% more	9
Not more than double the price	9
Any price	8

It is evident from the above data that 85% of consumers are willing to pay a higher price for Organic products. This means that there indeed exists a niche market for Organic products.

Reason for 85% consuming Organic is – Not wanting to consume chemicals

20% had health issues, hence consumed Organic. 52% had concerns for the environment. 20% said that they liked experimenting with food.

Regarding people's perception of Organic food, 56% of consumers said that they have issues with the high prices and 7% have trust issues with labeling of products as Organic. 43% consumers said that they have no knowledge of certification and 11% said that the product that they wanted was not available in store.

6B Results of Primary survey with farmers

For the hypothesis tests using SPSS, the following variables have been taken from the survey form in respect of 188 farmers (Organic- 94, Inorganic- 94) for the paddy cultivated in 2022.-

Village, Taluka, District, Age, Gender, Farm size, Rice cultivation area, whether Organic or Inorganic, Family size, Livestock numbers, Education, Labour cost, Seed cost, Bullock cost/Machine cost, Manure cost, Plant protection cost, Irrigation cost, Total cost, Cost/ha, Interest on Working capital/ha, TVC/ha, Yield in kgs, Yield/ ha, Selling price/ kg, Total Revenue, Total Revenue/ kg, Total Revenue/ ha, Income.

Here imputed costs have been used for every cost element, which means that even if there are no transactions as in family labour, seed purchase, use of bullock/machinery, manure, plant protection, the imputed costs are taken. Say for family labour, the labour rates in the locality are applied. Similarly for all the other cost elements, the existing rates in the locality are applied.

Group Statistics

Org/Inorg		N	Mean	Std. Deviation	Std. Error Mean
VC/ha	Inorganic	94	40707.3310	23888.08870	2463.86822
	Organic	94	47964.1064	24248.49075	2501.04086
Y/ha	Inorganic	94	2760.136274	1773.7286574	182.9461422
	Organic	94	2845.544283	1678.5446858	173.1286652
SP/kg	Inorganic	94	23.8776	8.09446	.83488
	Organic	94	34.8830	23.17632	2.39045
TR/ha	Inorganic	94	66467.6032	54170.01465	5587.21040
	Organic	94	92696.2924	79788.69725	8229.57576
Profit/ha	Inorganic	94	25760.2722	52401.10063	5404.76085
	Organic	94	44732.1862	73040.83636	7533.58705

SPSS results

However, a study of the means for the variables, VC/ha, Yield/ha, SP/kg, TR/ha, Profit/ha is not sufficient to get a true picture. We need to study that the difference in the means of Organic and Inorganic agriculture for all the variables is statistically significant. Only then can we understand which of the two methods of agriculture gives better results.

A statistically significant result indicates that the observed effect is unlikely to be due to random chance alone but rather a real effect of the factor being studied.

Using Independent sample T-test for hypothesis testing, we come to the following conclusions:

1. There is no difference in yields of Organic and Inorganic Farming
2. There is difference in variable costs of Organic and Inorganic Farming.
3. There is difference in the Selling price of Organic and Inorganic Farming
4. There is difference in the Total Revenue of Organic and Inorganic Farming
5. There is difference in the Profits of Organic and Inorganic Farming

Results- Hence, the results of hypothesis testing point to the fact that the mean values obtained in the group statistics show that in the survey, for Organic paddy cultivation, though Variable costs are higher for Organic agriculture, since the Selling price and Yields are higher (though not statistically significant), Profits per hectare is higher for Organic agriculture. Hence, for this particular study, Organic agriculture is viable with respect to profitability.

The survey also points to the fact that the reason for farmers not switching over to Organic farming is because of lower yield in the first three years and challenges in the marketing side. Those who have opted for organic farming- some by default because their forefathers were doing it, also because of better health for themselves and their family and to preserve the health of their soil.

III. CONCLUSION- THE WAY FORWARD

It is acceptable by people that organic products are bound to be expensive for they realize that these products are scarce or less in supply. People do realize the advantages in terms of health benefits, environmental advantages and its superior quality and taste and are willing to pay more as the survey with consumers have portrayed.

The Organic food market is growing due to consumer demand for chemical free food. Though demand is increasing, organic farming is yet to taste success in India. Challenges are- less support provided to Organic farmers, increasing input costs and the low market share of organic products.

The organic food market has to consider the entire supply chain of which storage and warehousing are important matters. Export market should be tapped well to make the organic market a booming one, and increase farmers' incomes substantially too.

Labelling of organic products regarding them being organic, helps consumers understand about their authenticity. Marketing is very relevant to draw consumers towards organic food. Consumers desire more product lines. More spread of knowledge about organic products is important for increasing demand which eventually will increase supply, resulting in cheaper prices. Marketers can make strategies to retain consumers, convert regular consumers into loyal consumers.

Government can play an important role by providing support to farmers. The case of Sikkim must be pointed out here where a committed Government ensured that the State was converted into a 100% Organic state within a time frame of 13 years.

It is clear from the above discussion, that for the organic market to flourish, it is not only demand for organic produce propelled by awareness about health, environment, soil fertility that is required but also certification and labelling of products that are supplied, easy accessibility, proper delivery so that the products are in good condition and edible.

Today, consumers are aware of the positive effects of organic farming, yet, demand is not increasing much. Some of the reasons being, as revealed from the survey are- consumers think that organic products are expensive, they don't have easy access to organic products, also they feel that products may be sold as Organic even when they are not.

Only with a proper balance of demand and supply will the organic market flourish. Hence, supply of organic products should be adequate. Our survey with 188 farmers cultivating Organic rice have showed that Organic farming is viable, profits are more than Inorganic farming.

To understand the situation on the supply side, it must be understood that initially for two to three years, there will be less yield. There are Government schemes which promote Organic schemes like Paramparagat Krishi Vikas Yojana (PKVY), Mission Organic Value Chain Development for North Eastern Region (MOVCDNER) and the very recent The National Mission on Natural Farming (NMNF).

Though we say that a complete analysis of demand and supply of Organic food must be undertaken by producers and sellers so as to reap profits under the existing situation and for the demand for consumers to be met by supply, it is practically impossible for the two separate groups, ie. consumers and suppliers to come to a perfect solution. It is quite likely that suppliers will not be able to meet the requirements of consumers for many food items. It is also highly probable that consumer demand may be lacking because of inadequate marketing by suppliers, for eg. placing products in accessible stores or weekly Organic market places.

Hence, to come to an optimum solution, Farmer Producer Organizations (FPOs) can play an important role today by rendering end-to-end services from providing inputs, technical expertise and marketing support. The National Cooperative Organics Ltd. (NCOL), the country's first multi-state cooperative society was launched by the Government in 2023 to overcome the challenges of weak market linkages, small landholdings, and difficulties in aggregation, thereby encouraging the farming community to move towards Organic agriculture.

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