SWOT and Feasibility Analysis of Organic Farming in the Ghaziabad District of Uttar Pradesh, India

Anjali Bhati, Subhash Anand and Shubham Kumar Sanu

Research Journal of Agricultural Sciences
An International Journal

P- ISSN: 0976-1675
E- ISSN: 2249-4538

Volume: 13
Issue: 06

Res. Jr. of Agril. Sci. (2022) 13: 1733–1740

CARAS

Res. Jr. of Agril. Sci. (Nov-Dec 2022)
13(6): 1733–1740

ISSN: 0976-1675 (P)
ISSN: 2249-4538 (E)

www.rjas.org

Full Length Research Article

SWOT and Feasibility Analysis of Organic Farming in the Ghaziabad District of Uttar Pradesh, India

Anjali Bhati[1], Subhash Anand[2] and Shubham Kumar Sanu*[3]

Received: 30 Aug 2022 | Revised accepted: 22 Oct 2022 | Published online: 16 Nov 2022

A B S T R A C T

Organic farming is important to improved soil fertility, carbon sequestration, resource utilization, biodiversity maintenance, sustainability, and environmental protection. Organic agriculture is environment friendly and favorable for land and farmers both thus in India also farmers are shifting towards it. Even the Government of India and the state governments are providing initiatives to encourage farmers toward sustainable food production through organic farming. Considering the significance of organic farming this research work did the SWOT (Strength, Weakness, Opportunity and Threat) analysis of organic farming with reference to Ghaziabad district of Uttar Pradesh. The feasibility of organic farming is measured by the cost analysis and market-oriented elements. The price measures also used to assess the feasibility. The study is based on primary data combined with other secondary sources of data. Stratified random sampling has been used for selecting the household at the block level. The study finds out that are under organic farming has improved over the years. Further, the economic viability of organic farming is most prevalent in Ghaziabad. The social and economic value of organic farming is also very high in the district.

***Key words*:** Sustainable agriculture, Green revolution, SWO T analysis, Agricultural production, Productivity

Organic farming is a system of farming that maximizes soil fertility through the maximum efficient use of local resources. It relies on a variety of ecological farming methods aimed at minimizing the environmental impact of food production, preserving the long-term sustainability of the soil, and maximizing the use of renewable resources [1]. Agriculture is becoming market-oriented these days therefore; it is consuming more and more technology and land for expansion so that it can fulfil the demands of the ever-growing population [2]. Agricultural headways nowadays are not that much environment friendly and putting great pressure on the biodiversity near by the fields. Farmers always try to base their production based on market trends [3]. United Nations came up with 17 sustainable development goals (SDGs) in 2015, accepted by all its member nations, to identify the poverty and deprivations spread over the globe. Among these seventeen SDGs, Zero Hunger (Goal 2) and Good Health and Well Being (Goal 3) highlighted the need to develop agriculture in a way that it goes in the harmony to nature, human health as well as with the pockets of farmers without putting pressure on the pockets of its consumers. Zero Hunger, that is, SDG number 2, emphasize strengthening the role of small-scale farmers because if these small-scale farmers are strengthening in terms of sustainable food production, then it could be a landmark change in reversing the trend of rising in hunger [4]. But it also very important to keep a check on the development of agriculture because this development of agriculture means to go with the harmony to nature which means zero hunger, in a way leads to the path on which sustainable agriculture is very much important [5]. Sustainable agriculture is very much important to support the SDG number 3 that defines good health and wellbeing because conventional methods of agriculture which utilizes synthetic fertilizers, pesticides and other chemicals to support farm production contaminate human health and adverse effects could be seen in the people who are coming in direct contact with these chemicals especially in farmers and on people who are consuming these farm produces, in the form of cancers, allergies and other diseases. Moreover, the negative effects of the chemicals used to maintain farm production are producing a threat to the environment [6].

The Central Government has been promoting organic farming through various government schemes such as Paramparagat Krishi Vikas Yojana (PKVY) and Mission Organic Value Chain Development in North East Region (MOVCDNER). The number of states is involved in organic farming due to it is gaining importance throughout the country. In addition, support is also provided to group/ Farmers Producers Organization (FPO) formation, training, certification, value addition and marketing of their organic produce [7]. The government has also introduced organic cultivation on either side of the River Ganga under the National Mission of Clean Ganga (NMCG), natural farming, large area

* **Shubham Kumar Sanu**
✉ sk.sanu26@gmail.com

[1-3] Department of Geography, Delhi School of Economics, University of Delhi - 110 007, Delhi, India

certification, and support for individual farmers under PKVY to enhance the area under organic farming.

MATERIALS AND METHODS

The study is based on primary data combined with other secondary sources of data. The primary data was prepared by recording the responses of 100 persons from 4 blocks and 8 villages of the district. The responses were recorded through in-depth interviews with the help of a structured questionnaire. Stratified random sampling has been used for selecting the household at the block level. Based on the data set he SWOT evaluation (Strength, Weakness, Opportunity and Threat) used to apprehend the attitude of farmers doing natural farming. The following indicator have used for the assessment of SWOT analysis. Under Strengths: Natural farming provides healthy Food, Improved soil health with Organic farming, Environment suitability, Initiatives by government, like promote organic farming. Under Weaknesses: Lower crop yields, Lack of infrastructure, Lack of Knowledge about organic farming, Shortage of labour with inside the area, Fewer numbers of clients for natural merchandise, Sustainable use of domestically to be had assets, providing monetary stability, Promoting wholesome meals. Under the Opportunities: Sustainable use of locally available resources**,** providing financial stability**,** Promoting healthy food. Under the Threats: Built-up area is increasing day by day**,** Organic product cost is high**,** People's myth of in-organic farming.

Feasibility of organic farming assessment

The farmers are doing organic farming for the purpose of economic gain and stable livelihood. Therefore, the economic element like income generation and other social aspects related to income have to be fulfilled by practice of organic farming. These kinds of conditions are showing the suitability of organic farming among the farmers. For the assessment of Feasibility in the Ghaziabad district the marketing efficiency and market cost analysis methods have been used in the study.

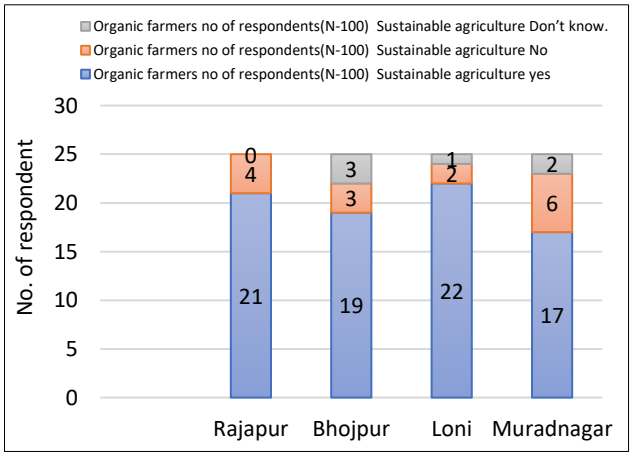

Fig 1 Organic farming as a mean for sustainable agriculture

Support of the Uttar Pradesh government to carry organic farming: Uttar Pradesh government is promoting to make the state an organic state and investments are being done to accomplish the target. In the targeted four blocks of Ghaziabad District, it was found in the survey that 83.55 per cent of the respondents are satisfied with the government providing time to time support through providing them with the accurate knowledge of weather, right techniques, etc. (Fig 2). In case it was found that 100 per cent of the respondents are satisfied with the governmental support extended to help the villagers to carry on with the organic farming techniques. During the survey, it was also found that 16.44 per cent of the respondents were not satisfied with the support provided by the government to the organic farmers.

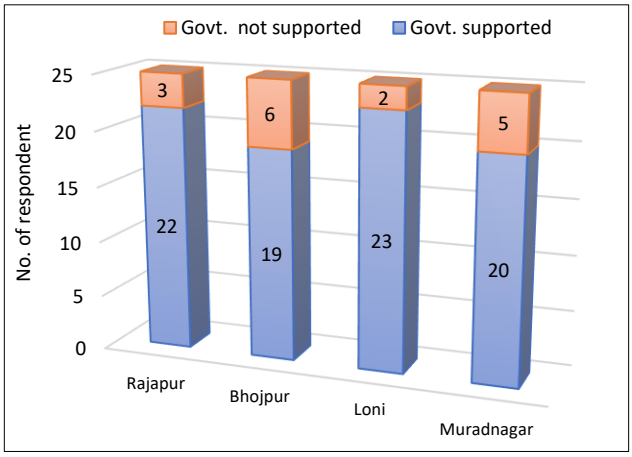

Fig 2 People's perception about government support to carry organic farming

Marketing efficiency

It is the ratio of consumer's price to the total marketing costs and margins. Higher the ratio, higher would be the efficiency and vice versa. In this study, Shepherd's Index [8] has been used to analyse market efficiency as the ratio of total value of goods marketed to the marketing cost as follows [9]:

$$ME = CP / MC + MM$$

Where, ME is Marketing efficiency, CP is Consumers' purchase price, MC is Marketing costs, MM is Marketing margins.

Market cost analysis

To assess the influence of various factors on marketing cost on organic farming, a double log regression model of the following type was fitted, ln MC Where,

$$MC = \ln a + b1 \ln X1 + b2 \ln X2 + b3 \ln X3 + et$$

MC = Marketing cost incurred by farmers (Rs./q)
X_1= Quantity of vegetable marketed in quintal (q)
X_2= Distance transported in km
X_3= Number of labour days engaged in post-harvest operations
a= Constant term
e_t= Disturbance term
b1, b2 and b3 are regression coefficients and ln is the log value.

RESULTS AND DISCUSSION

S.W.O.T analysis

Strength

Organic farming and the concept of sustainable agriculture: The major strength of organic farming lies in its sustainable techniques of farming. Out of the 100 respondents, approximately 75.45 per cent of the respondents agreed that organic agriculture helped them to follow the concept of sustainable agriculture. Only 23.55 per cent of the respondents from the four targeted blocks didn't agree to the concept of organic farming satisfying the terms of sustainable agriculture (Fig 1).

Favourable environment: Ghaziabad district of Uttar Pradesh state is an alluvial plain zone (Table 1). Hindon river is flowing nearest where agriculture is mostly dependent upon

monsoon and other source of water like Tube well, Submersible etc. was found in the villages except the river which is flowing naturally.

Table 1 Favourable environments for organic farming in Ghaziabad

Blocks	Organic farmers no of respondents (N-100)	
	Favorable environment	In-favorable environment
Rajapur	18	7
Bhojpur	15	10
Loni	19	6
Muradnagar	14	13
Total	66	34

In Ghaziabad district, during the survey of the four blocks, it was found that approximately 64 per cent of the people agreed that Ghaziabad has a favourable condition to grow local organic crops. While some 34 per cent disagreed to the environmental condition to be in favour of the organic farming. The disagreement was due to the non-availability of proper water sources and soil fertility was loss due to use of high amount of fertilisers.

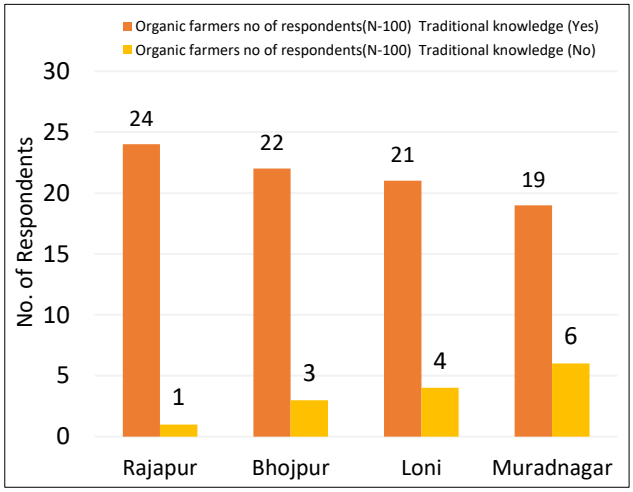

Fig 3 Farmers knowledge about traditional manures

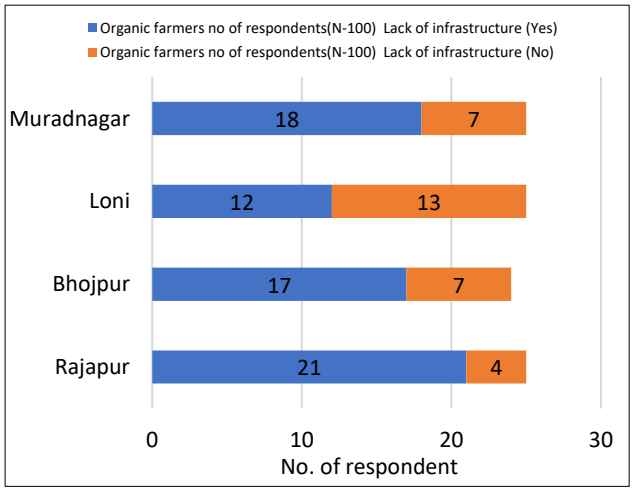

Fig 4 Farmers on the basis of lack of infrastructure in Ghaziabad

Shortage of labour: Most of the farmers of the four blocks of Ghaziabad are looking for opportunities outside the periphery of agriculture to earn more and most of the young generation believe that towns do have more facilities as compared to the dried economic environment of rural area (Fig 5). This is why many of them either migrated to nearby towns and cities or is searching for the opportunity to migrate.

Farmers knowing about traditional farming

Organic farming is done with the help of on farm resources and no external inputs are required to support the products. Even the farmers of eight villages of Ghaziabad agree to the fact that adding chemicals to the field would lead to devastating consequences. In the survey, it was found that all the respondents (100%), whether growing of self-consumption or for the market are growing organic products only using traditional methods of farming which they have learned from their fathers and ancestors (Fig 3).

Weaknesses

Lower crop yields: The major weakness of organic farming is that it cannot match the quantity of production compared to the production achieved doing conventional farming. It is true that conventional techniques of farming are capable of producing more food from the given piece of land but also is capable of putting enormous pressure on the particular land and as a result, the land would lose its fertility and would need more supply of chemical supplements to sustain production but again it would put a negative impact on the local ecosystem. The survey findings also reveals that 85.88 per cent of farmers agreed to the fact that they produce less compared to those farmers who are doing farming with the help of chemicals and other modern technologies. Some 13.77 per cent of farmers agreed that they produce enough for self-consumption and 3.33 per cent of the farmers didn't know about the difference in the quantity produce between conventional and organic farming.

Lack of infrastructure: In the region there is shift of land use from agriculture to built-up due to conversion of agricultural land for increasing housing purposes like gaur city, oxy homes, etc. Therefore, the agriculture supportive infrastructure is lacking in the study area. There is very less scope to develop Ghaziabad agricultural system in a modern way. During the survey when farmers were asked about their concern regarding lack of infrastructure for agriculture, 90 per cent of the respondents agreed to the scenario and 10 per cent of them have accepted the way it is (Fig 4). Therefore, agriculture is losing importance in the regions adjoin the city border because of high built-up density.

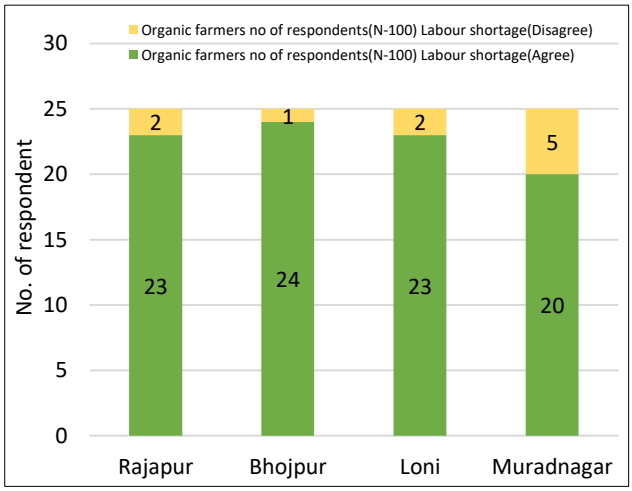

Fig 5 Shortage of labour in the Ghaziabad

Fewer number of customers: Organic products are in demand in cities but farmers' connectivity with the customer is

a major problem. In our study area, distance from the nearby organic product market is too far that's why travelled by road and the costs of connectivity are also higher. The demand for organic products especially for organic vegetables is less due to its high cost compared to the conventionally grown vegetables though the later cannot match the quality of the former still people don't want to spend extra money on organic products. Around 87.77 per cent of the people agreed that people are not willing to buy organic products due to its high cost compared to conventional products. Around 12.22 per cent of the people do not agree that organic products are less in demand as a major part of their products is for self-consumption and they sell only limited products as per the demand of the consumers (Fig 6).

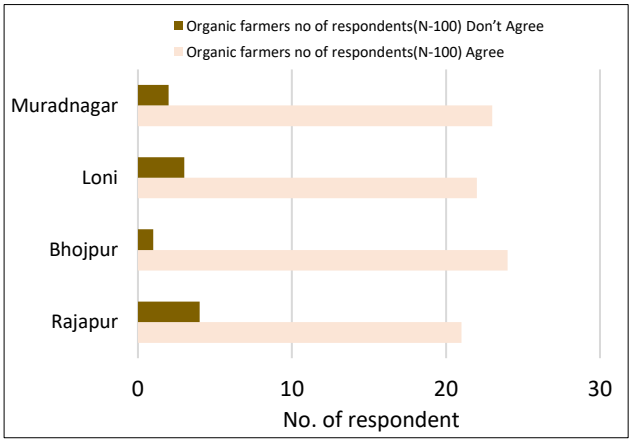

Fig 6 Shortage of organic product market

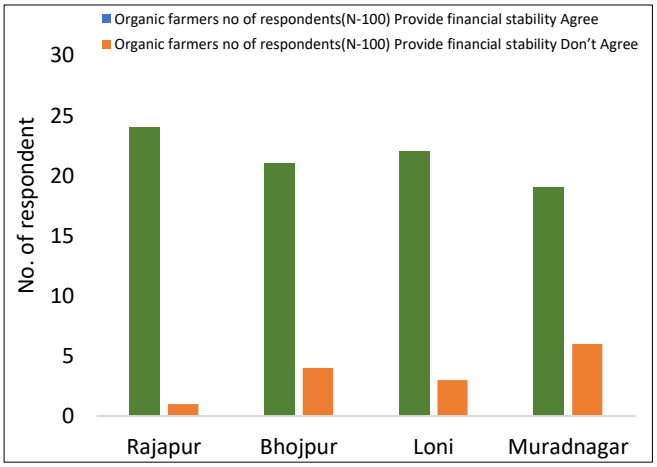

Fig 7 Organic products provide financial stability

Promoting healthy food: Farmers has used chemicals in their farms and those chemicals get absorbed by the crops which directly affects the human health. When these crops are consumed by humans these chemical elements also get transferred to the human body. In this way, the human body is becoming prone to many diseases like cancers, allergies, etc. Even farmers and nearby ecosystem is not spared from the negative impact of these chemicals and the effect is very vigorous because of the direct proximity to the chemically maintained farms. Use of chemicals in farm started five to six decades back to achieve food security in the nation but now consumers are becoming aware and diverting towards the healthy food, therefore, the country is shifting from food quantity to food quality and to maintain food quality organic farming is a best available option for farmers as well as for consumers. When asked to the respondents, 90.75 per cent of them agreed that organic food has a good quality compared to the food grown using chemicals in the field. There were also

Opportunities

Sustainable use of locally available materials: Organic farming is done using locally available resources, mostly those resources that are available within the periphery of the farm. In this manner, a farmer optimally utilizes on-farm resources. When during the survey farmers were asked about their perspective on the utilization of on-farm resources 90 per cent of the respondents agreed that they use only on-farm resources which is obtained from their livestock and forest to maintain their farms. In this way, they maintain the organic status of their farm and check the use of chemicals that could put an adverse effect on the local ecosystem.

Provide financial stability: When farmers approach markets to purchase synthetic fertilizers, pesticides and insecticides they spend a huge portion of their income even though they do not have adequate knowledge of quantity to be applied to the farms. In this way, farmers sometimes get trapped in the vicious cycle of debt. On the other hand, organic farming is done with the help of locally available materials and it eliminates the need for external inputs purchased from the market to maintain the farms. When asked to the selected respondents about the support of organic farming to their financial stability, 86.78 per cent of them agreed that they get everything required to maintain the farm from their livestock and nearby forest and sometimes they use household waste also to make fertilizers for their farm. There were 13.11 per cent of the respondents who do not agree that organic farming provides financial stability to their family, mainly due to large family size (Fig 7).

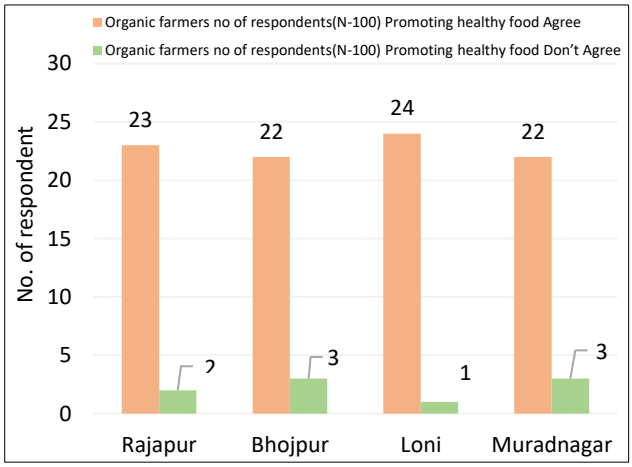

Fig 8 Promoting healthy food

8.61 per cent of the respondents who do not agree that organic farming provide health (Fig 8).

Threats

Incidence of animal attacks due to deforestation: Deforestation to expand agriculture to fulfil the demand of the growing population of Ghaziabad district has led to the introduction of some wild animals to the farms. Due to loss of habitat and food, animals like Monkey, Nilgai, Cow, Wild boar, Deer etc. are moving towards agriculture field for their foods due to which farmers crops get damaged or eaten by these animals. This kind incidents are common in the all four blocks. According to villagers, they made their surveillance spot at higher elevations in their farms. When asked the respondents about the damages caused by animals from the nearby forests, maximum respondent agreed that they have dealt with the loss of productivity.

High input costs: The small and marginal farmers in India have been practicing a sort of organic farming in the form of the traditional farming system. They use local or own farm renewable resources and carry on the agricultural practices in an ecologically friendly environment. However, now the costs of the organic inputs are higher than those of industrially produced chemical fertilizers and pesticides including other inputs used in the conventional farming system. The groundnut cake, neem seed and cake, vermi-compost, silt, cow dung, other manures, etc. applied as organic manure are increasingly becoming costly making them unaffordable to the small cultivators. When respondents from four blocks were asked about their knowledge of traditional product used for organic farming, 76.32 per cent agree higher input cost of organic manures and 22.56 per cent disagree the high input cost of organic manures (Fig 9).

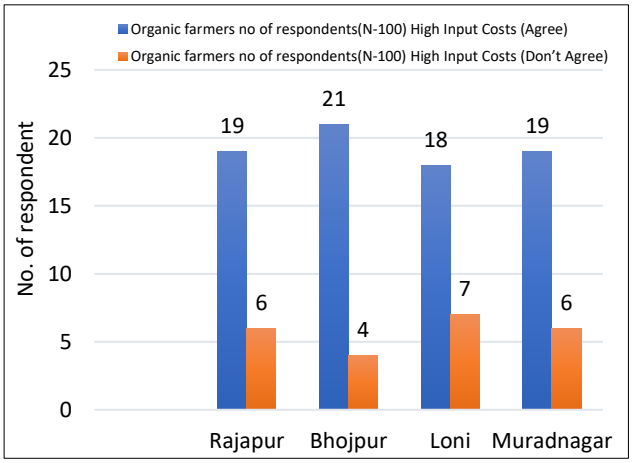

Fig 9 Input cost of organic products

Marketing problems of organic inputs

Bio-fertilizers and bio-pesticides are yet to become popular in the region. There is a lack of marketing and distribution network for them because the retailers are not interested to deal in these products, as the demand is low. The erratic supplies and the low level of awareness of the cultivators also add to the problem (Table 2).

Table 2 Marketing problems of organic inputs in Ghaziabad

Blocks	Marketing problems of organic inputs (Yes)	Marketing problems of organic inputs (No)
Rajapur	18	7
Bhojpur	15	10
Loni	19	6
Muradnagar	14	13
Total	66	34

Higher margins of profit for chemical fertilizers and pesticides for retailing, heavy advertisement campaigns by the manufacturers and dealers are other major problems affecting the markets for organic inputs in Ghaziabad. When respondents from four blocks were asked about their choice of farming, 91.32 per cent of these respondents showed their market problems of organic inputs. Major push factor of Marketing is low knowledge level. But there was 8.33 per cent of the farmers recorded bio fertilisers marketing and distribution network is high.

Competition with conventional farming

Organic farming is based upon primitive techniques of growing food where optimum utilization of naturally available resources was base for farming. Maintenance of farm was done with the resources obtained from livestock and forests.

All the fertilizers, pesticides and insecticides were prepared using locally available materials; thus, farming was less vulnerable to the ecosystem and was also encouraging ecosystem to grow to maintain the supply of the local resource necessary to maintain the farm. Conventional farming is attracting farmers since 1960s when for the first time HYV seeds and variety of chemicals were introduced to the land to produce limitless from the limited given piece (Fig 10).

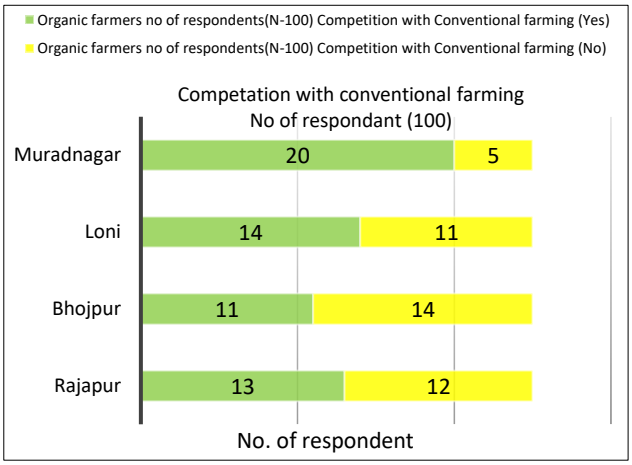

Fig 10 Competition with conventional farming in Ghaziabad

This technique though compromises the quality of food but made country self-sufficient and farmers of plains rich, in many cases. When respondents from four blocks were asked about their choice of farming, 57.66 per cent of these respondents showed their willingness to leave organic farming to do conventional farming. Major push factor to move from the organic way of farming to the conventional way of farming is less customer, more labour and certification process. But there was 43.33 per cent of the farmers recorded who willingly want to continue with the organic farming as it saves them from an extra expenditure from market to maintain farms and they support organic farming because of its chemical-free healthy food keeping their children safe from hazardous ill effects of chemicals.

Feasibility of organic farming in Ghaziabad

The farmers in Ghaziabad district are involve in organic farming are getting enough for their organic produce than it is feasible for them to cultivate the organic farming in Ghaziabad. It describes the economic value of their organic produce by which they survive their life.

Price spread and marketing efficiency under traditional marketing

The marketing costs, margins, price spread and Walden and Shepherd's Index of the traditional marketing channel of conventional farmers have been discussed. Under Channel-I comprising producer - village trader – wholesaler – retailer - consumer, the marketing costs incurred were found to be large. The sample farmers practically experienced no marketing costs while selling directly to the village traders. The farmers getting partially good income from organic product because of lack of bargaining opportunity in the local markets. As the links of supply chain got reduced, the share of producer in consumer price increased, indicating higher market efficiency under integrated supply chain. The cost incurred by the farmers in the way of commissions were not included in working out the price spread to avoid double counting since these items were covered

under profit margin of commission agents. It was found that the crops were available to retailers directly from commission agents at 10 kgs onwards. Farmers selling in wholesale market directly incurred cost on grading, packing, transport, and commission of 15 per cent on the value of sales to the commission agent who arranged for the sales. Commission charges constituted a larger share varying from 4.59 per cent of the consumer's price. But in this case of tomato supply chain the wholesalers were seen performing the role of commission agents as well. They took the title to the goods they handled, they bought and sold on their own gain or loss depending on the difference in the sale and purchase prices.

Marketing cost analysis in traditional marketing

To evaluate the factors influencing marketing cost of farmers, a double log type of marketing cost function was fitted and the results of the regression analysis are presented in table 3 in which the findings revealed that 0.72 in marketing cost of crops was explained by selected independent variables viz. quantity of produce marketed, X_1: distance travelled to the market, X_2: and labour involved in post-harvest operation, X_3. Regression co-efficient for quantity marketed was at negative referring that every increase in quantity marketed would adversely affect the marketing cost, thus favouring the farmer but it was found not significant.

Table 3 Marketing cost suitability for farmers for organic farming

Particular	Co-efficient	Marginal value
Quantity marketed by (X_1)	-0.016^{ns} (0.051)	-0.039
Distance travelled to the market (in km), (X_2)	0.089* (0.067)	1.43
Labour involved in post- harvest operation	0.178**	0.16
Intercept	1.61	
R^2	0.72	

*and **denote significance at 1 per cent at 5 per cent levels, respectively

The distance to the market and labour involved were found positively impacting the marketing cost and were at 0.089 and 0.178 respectively given other variables were kept constant. The marginal values implied that for every kilometre increase in distance to the market from mean level the marketing cost would increase by Rs.1.43 and for every increase in the number of days in labour from mean level, marketing cost would increase by Rs.0.16 per quintal.

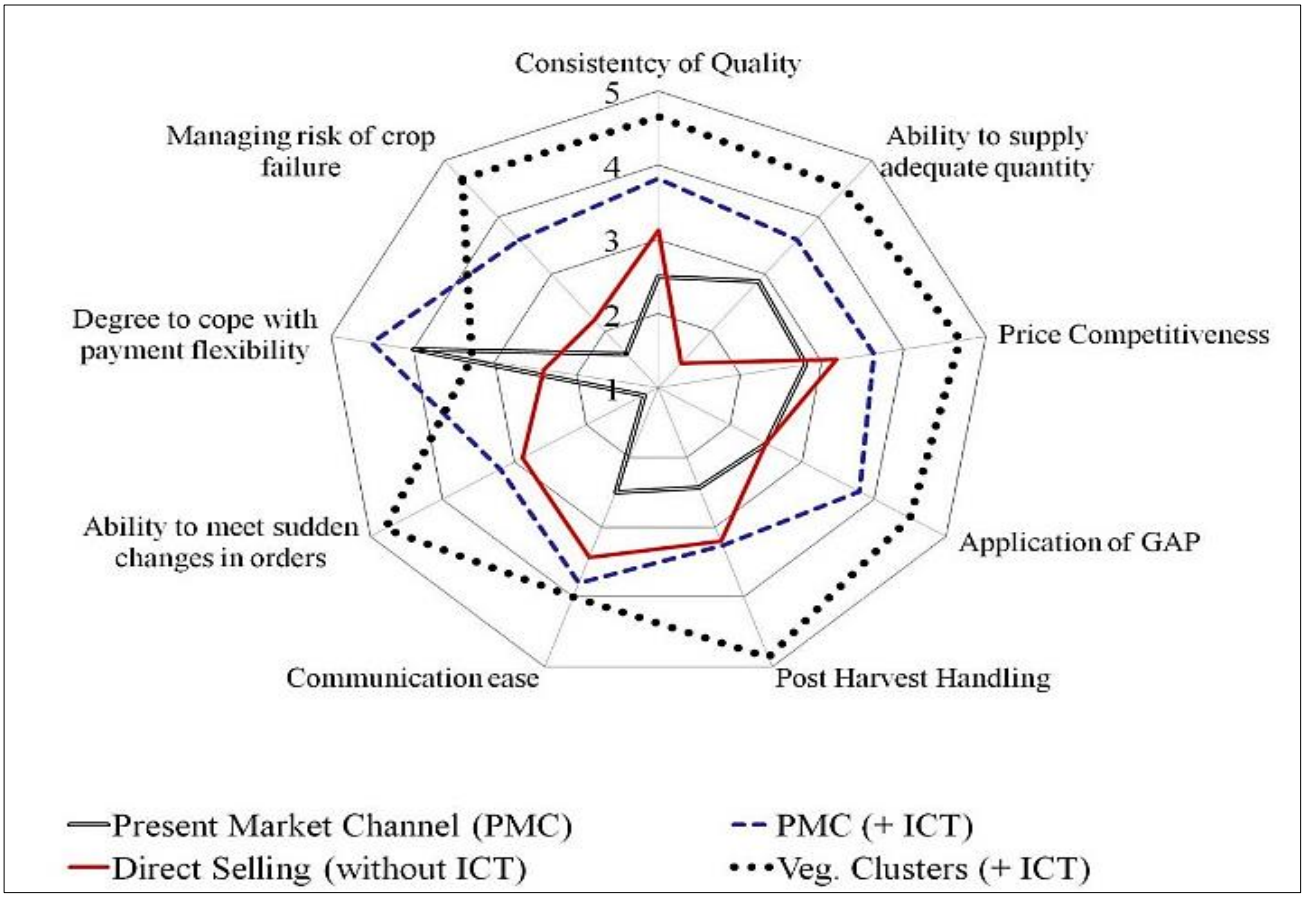

Fig 11 Farmers perception about organic farming feasibility

Farmers' perception on organic farming cluster

The first step in the formation of organic clusters would be leveraging information and communication technology (ICT) tools. ICT is an umbrella term that includes any communication device or application that is put to the service of farmers in both production and marketing aspects. It could be seen from Figure 11 that both the farmers (organic or inorganic) in the study area preferred leveraging the application of ICTs over the present marketing channel. Farmers were also found to appreciate the concept of organic clusters. On a scale of five, farmers perceive that the organic clusters empowered by ICT tools are likely to enable them in both production and marketing aspects. It was perceived that the option of vegetable clusters along with ICT would be the best (4.65) when it comes

to the consistency of quality followed by the option of Present Market Channel + ICT (3.82). However, with the present market channels option, farmers perceived that maintaining consistency in quality is largely difficult (2.5). In all the fronts of post-harvest handling (4.87), ability to meet sudden changes in orders (4.8), price competitiveness (4.69), managing risk of crop failure (4.67), application of good agricultural practices (4.5), and ability to supply adequate quantity (4.5) farmers perceived that the introduction of organic vegetable clusters facilitated by ICT would be a great advantage. Even the introduction of ICT tools in the present market channel was perceived to be beneficial. The only area in which the farmers are comfortable with the present marketing channel was the degree of coping with the payment flexibility (4.0). It seems that the farmers are so familiar with the market intermediaries in the present market channel that even the organic clusters with all its intended benefits were considered to be risky. But it becomes very clear that the ICT tools should be made widely prevalent and easily accessible before integrating all the production and marketing services with organic clusters.

Government programme and policy

Paramparagat Krishi Vikas Yojana (PKVY): The scheme basically promotes cluster-based organic farming with the PGS certification. Cluster formation, training, certification, and marketing are supported under this scheme. Monetary help of Rs. 50,000 per ha /3 years is given - out of which 62 per cent i.e., Rs. 31,000 is provided as an incentive to the farmer for organic inputs [10].

Mission organic value chain development for North Eastern region (MOVCDNER)

The scheme encourages third-party certified organic farming of niche crops of the northeast region through Farmers Producer Organizations (FPOs) with a focus on exports. Farmers are given the assistance of Rs 25000/ha/3 years for organic inputs including organic manure and biofertilizers etc. Support for the formation of FPOs, capacity building, and post-harvest infrastructure up to Rs 2 cores are also provided in the scheme.

Capital investment subsidy scheme (CISS) under soil health management scheme: 100% assistance is provided to State Government / Government agencies for setting up of mechanized fruit/vegetable market waste/ Agro waste compost production unit up to a maximum limit of Rs. 190.00 Lakh per unit (3000 Total /Annum TPA capacity). Likewise, for individuals/ private agencies assistance up to 33 per cent of cost limit to Rs. 63 lakh/unit as capital investment.

National mission on oilseeds and oil palm (NMOOP): Financial assistance at 50 per cent subsidy to the tune of Rs. 300/ ha is being given for different components like bio-fertilizers, supply of Rhizobium culture/Phosphate Solubilising Bacteria (PSB)/Zinc Solubilising Bacteria (ZSB)/ Azatobacter/ Mycorrhiza and vermicompost.

National food security mission (NFSM): Under integrated pest management or plant protection, Rs. 500 per ha or 50 per cent of the cost whichever is less is provided as assistance for a maximum acreage of 2 ha per farmer. Assistance is given for plant protection chemicals, bio-pesticides, and weedicides.

The role of banking /financial institutions for facilitating organic farming

Banking institutions and other financial institutions could help in materializing organized clusters and facilitating contract farming through value chain model. In this connection, the following discussions assume importance:

Crops loans can be extended by banks for high value crops like fruit and vegetables cultivated under organic agriculture. But standard recommended package of practices for organic cultivated are yet to be devised, the cash flow streams are not known. This is one of the issues for not specifying the scale of finance for crops under organic agriculture which forms the basis for extending crop loans. As the transition from organic to inorganic agriculture would be taking quite a while, ranging from three to five years, banking products can be evolved to overcome the income deficit in this gestation period. Organic Agriculture requires an integrated farming model. Banks can also contribute capital investments in the organic clusters towards owning up of cattle and other farm animals. The banks can also devise medium-term pay-back loans especially on activities (like contour trenching, terracing) dealing with the conservation of natural resources. Facilities of sorting grading, packing and pre-cooling can be developed with banking interventions to build an effective supply chain for agri-produce [11]. The concept of a fair price mechanism which ensures a minimum guarantee price to the farmers can be a measure thought of for ensuring a sustained income. A fund can be constituted by banks consisting of the membership fund contribution of the participant members in the organic clusters, the subscription fees and a portion of the amount retained by the participants when prices are realized above reasonable levels in markets. Money can be released from this fund, if the prices slash down below the bench mark prices and money can be pumped if farmers realize above reasonable levels.

CONCLUSION

From the study it is revealed that yields were low in organic cultivation when compared to conventional farming enabled by liberal application of chemical inputs. The organic price was significantly high, reduction in cost of cultivation was noticed to be the major reason for increased income surpluses in organic cultivation. Majority of organic farmers were found convinced with it and were not only ready to continue it in future but also to increase the land area for organic farming. In case of conventional farmers, only a small percentage of them expressed interest to shift over to organic cultivation. Low yields, lack of exclusive markets, unavailability of labour and organic inputs, and lack of awareness among consumers about organic produce were cited as the major drawbacks of organic farming. The analysis has suggested that contract farming could be enabled with the formation of vegetable clusters to insulate the farmers form both production and market risks. Organic clusters spearheaded by ICT tools would possibly create spatial distribution of production, thereby ensuring sustainable remuneration. The role of banks is vital in supporting, improving, and developing organic clusters and facilitating them with contract farming. In addition, widespread use of ICT tools in the development of organic clusters would bring out not only horizontal integration of organic growers but also vertical integration of all the members of the supply chain leading to better the prospects of farm profitability. Conventional agriculture proved to be very beneficial in economic terms but failed to provide a base for environmentally friendly agriculture. Compromising with the environment in the study area is not an option because every resource in the region is tightly bound and supported with other resources. It is very important to conserve soil from infertility and to maintain the

pace of decomposition in the study area. Conventional agriculture practices encourage the use of inorganic fertilizers and chemical pesticides to reduce the impact of pests, weeds and diseases. This farming system also reduces the need for manures and compost made using livestock and other on farm resources. Organic farming on one hand has made farmers produce sufficient but the technological advancements and new chemicals have created a gap between rich and poor farmers. Technological advancements like tractors, other machines have replaced the labour with machines, creating unemployment eventually making rich farmers more rich and poorer farmers poorer sustainable agriculture worldwide has proven that it can help in maintaining soil fertility, quality of crop and can also help in maintaining the uniform decomposition rate under the soil. These farming practices are also helping in maintaining forest covers by controlling deforestation and encouraging afforestation. Sustainable agriculture needs support from the local resources therefore it is bound to encourage the growth of diverse local biotic and abiotic resources, within the farm as well as surrounding the farm. Organic farming is one such kind of farming practice which is sustainable as it takes support from locally available resources and farmers don't find it necessary to communicate with the market to purchase the inorganic fertilizers and chemical pesticides which is not also affordable for many farmers who are cultivating on a very small piece of land.

LITERATURE CITED

1. Reddy BS. 2010. Organic farming: Status, issues and prospects – A review. *Agricultural Economics Research Review Agricultural Economics Research Review*. https://doi.org/10.22004/ag.econ.97015
2. De Clercq M, Vats A, Biel A. 2018. Agriculture 4.0: The future of farming technology. *Proceedings of the World Government Summit, Dubai, UAE*. pp 11-13.
3. Lampkin NH. 1994. Estimating the impact of widespread conversion to organic farming on land use and physical output in the United Kingdom. The Economics of Organic Farming. CAB International, Wallingford, UK. pp 343-358.
4. Ladha JK, Jat ML, Stirling CM, Chakraborty D, Pradhan P, Krupnik TJ, Sapkota TB, Pathak H, Rana DS, Tesfaye K. 2020. Achieving the sustainable development goals in agriculture: The crucial role of nitrogen in cereal-based systems. *Advances in Agronomy* 163: 39-116.
5. Sharma VR, Maurya A, Sachar P, Kumar M, Rani U, Sanu SK. 2021. Mapping the regional imbalances of demographic profile case study of Awadh and Middle Doab, 2011. *The Horizon-A Journal of Social Science* 12: 12-24.
6. IFAD. 2005. *Organic Agriculture and Poverty Reduction in Asia: China and India Focus*. pp 123-166.
7. Reddy BS. 2010. Organic farming: Status, issues and prospects – a review. *Agriculture Economic Research Revision* 23: 343-358.
8. Shepherd WG. 1972. *The Review of Economics and Statistics* 54(1): 25-37.
9. Walden JB, Kirkley JE, Färe R, Logan P. 2012. Productivity change under an individual transferable quota management system. *American Journal of Agricultural Economics* 94(4): 913-928.
10. Yadav M. 2017. Towards a healthier nation: Organic farming and government policies in India. *International Journal for Advance Research and Development* 2(5): 153-159.
11. Murry N. 2019. SWOT Analysis of organic farming with special reference to Nagaland. *Agricultural Reviews* 40(3): 243-246.