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## THE ECONOMICS OF ORGANIC FARMING: A CASE STUDY

Muneeba<sup>1\*</sup>, Muhammad Suleman Aziz<sup>2</sup>

<sup>1</sup>Department of Agronomy, University of Agriculture, Faisalabad-38000-Pakistan,

<sup>2</sup> Department of Horticulture, Faculty of Agriculture Gomal University, Dera Ismail Khan.

\*Corresponding Author E-mail: [muneebakhali611@gmail.com](mailto:muneebakhali611@gmail.com)

### Abstract

Organic farming has emerged as a sustainable alternative to conventional agriculture, driven by rising concerns over environmental degradation, food safety, and public health. Despite its ecological benefits, the economic feasibility of organic farming remains debated due to higher input costs and labor intensity. This study investigates the financial viability of organic farming through a case study of a mid-sized farm. A mixed-methods approach was adopted, combining stakeholder interviews, financial record analysis, and market trend assessment. A cost-benefit and sensitivity analysis framework was used to evaluate profitability, revenue dynamics, and long-term sustainability under various environmental and economic conditions. The results indicate that while organic farming incurs higher initial and operational costs—especially in labor, certification, and organic inputs—it compensates through premium pricing, improved soil health, and government subsidies. Profitability was found to be competitive with conventional farming when externalities and long-term environmental benefits were considered. Revenue from organic produce was consistently enhanced by consumer willingness to pay higher prices, and subsidy contributions accounted for a significant share of farm income. Additionally, the adoption of organic practices led to improvements in soil fertility and resilience, reducing dependence on synthetic inputs over time. In conclusion, although organic farming presents short-term financial challenges, its long-term economic and ecological advantages make it a viable and sustainable agricultural model. Policymaking and market development are critical to scaling organic agriculture, particularly in developing regions. Strategic investment in certification support, consumer awareness, and access to premium markets can enhance profitability and promote the adoption of environmentally sound farming practices globally.

### Article History

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## INTRODUCTION

Over the past decades, organic farming has become rather popular all over the world, mostly because of the ever-increasing concern over the environmental sustainability, food safety, and the numerous negative health effects of the conventional agricultural practices. Essentially, organic agriculture focuses on being input-based and bans genetically modified crops and man-made chemicals and, therefore, promotes more ecologically sustainable food structure. Although organic approaches are gaining momentum in popularity, there are still economic feasibility considerations on whether such systems can feasibly work, especially when regarded with other known agricultural systems of farming that usually have an economic advantage by having less input costs and having developed markets and infrastructure systems. Organic farming is a highly multidimensional economic phenomenon whose nature is determined by various and numerous factors such as the cost of production, prices, the policies of the government, and environmental levels among others. The driving force is the demand of the market since, over the years, consumers have shown a tendency to become more willing to pay higher prices in order to buy organic produce that is seen as healthier and better in regard to environmental consequences (Yussefi & Willer, 2002; Sahota, 2022). However, the demand is not equally spread in the world, and location difference usually dictates the profitability of organic enterprises across regions. Transitioning between organic and conventional farming may be cost-straining as regarded to production perspective. The conversion period, which takes two to three years and is, therefore, a major barrier, requires the farmers to comply with the organic standards without receiving the price advantages (MacRae et al., 2020). The certification process also involves

strict adherence to the environmental and safety regulations which in most cases involve both funds and administrative requirements, which are very cumbersome especially to small scale operators. Quite a number of economic barriers to organic farming are described in the literature. The significant obstacles include high early conversion rates, labour intensive processes and low early yields (Pimentel et al., 2005; Reginald & Wachter, 2016). The example is that the same percentage of labour costs may increase to 7-13 percent in organic systems as manual work (weeding and controlling pests) is used in organic systems (Crowder & Reginald, 2015).

Operation expenses are also compounded by the cost of equipments, purchasing organic fertilizers and inefficiency in land utilization. Also, credit and institutional subsidies availability is unequal, as conventional farmers are likely to be granted government subsidies (Kremen et al., 2012). Organic systems, on the other hand, provide effective environmental and social advantages. Crop rotation, composting and cover crop are some practices that can improve the soil structure, boost biodiversity, and make water retention better (Gattinger et al., 2012; Lori et al., 2017). The results of these outcomes do not only result in long-term sustainability but also increase resilience to challenges associated with climate. The usage of organic farms also limits the use of inputs on the basis of fossil fuels and artificial pesticides, harmful effects on natural ecosystems, and society (Gomiero et al., 2011; Seufert et al., 2012). When we look at profitability, the literature seems to indicate that organic farms may be more or equally more profitable in terms of net profits as opposed to gross yields mostly due to premium prices, state incentives on organic farming, and decreased dependency in

the long-term required inputs (Crowder & Reginald, 2015; Offermann & Nieberg, 2000). However, the benefits are scenario specific. Financial sustainability can be destroyed by the failure of price premiums in low consumer awareness or the closed access of organic products in the market (Seufert et al., 2012). Lastly, policies and subsidies play a great role in organic farm outputs. To a great extent, the increased profitability and the rising adoption of organic farming has increased in regions with the strong support systems like the European Union agri-environmental schemes (European Commission, 2021). Conversely, those countries that do not support institutions may experience a low organic transition. In general, although the organic alternative to traditional agriculture is environmentally sound, the concept of its economic feasibility is dependent on a highly dynamic interaction of market forces, regulatory frameworks, and agricultural ecosystems in different regions. This article addresses these interactions by generating a case study methodology that thoroughly discusses the cost structure, the revenue, and long-term profitability of organic agriculture.

## METHODOLOGY

The case study is about the financial viability of a local fisherman cooperation in the marine biodiversity hotspot. The cooperative in question is placed in the zone of coastal marine life where all the members rely on it as their main source of economic subsistence as well as reserving the relevant biodiversity. This region is known to have a rich species and this serves as a fishing ground to some of the commercially viable fishes. The mission of the cooperative is to reconcile between the two objectives of remaining profitable and being part of the conservation process on the one hand and taking sustainable fishing habits into consideration on the other hand. Individual interviews on the operational

as well as financial constraints that the fishery cooperative faced were executed through the in-depth interviewing method on the key stakeholders such as members of the cooperative, officials of the local government and the marine biologists engaged in the marine conservation. The interviews that were used here focused on examining how sustainable fishing practices are perceived and how financially rigorous the practice of sustainable fishing is as well as the effect it has on the conservation and livelihood agendas. The second major source of information was the financial records maintained by the cooperative like the annual balance sheets, income statements and the costs of operations. These documents were sought in order to evaluate the sources of revenue of this cooperative, such as fish commercialization and all the external sources of finance, such as grants or governmental subsidies to stimulate the productive use of sustainable strategies. A market analysis was conducted as a background to financial performance of the cooperative. This entailed an analysis of both the prices of fish in the market both locally and regionally and the demand of visibly caught fish. The collection of data was based on government publications, reports made by the industry, and fundamental observations of transactions. Due to the market analysis, it was able to bring out the connection between the market demand of the sustainable products and the financial sustainability of the cooperative. It also illuminated the effect of the changes in fish stocks and the environmental conditions on the market supply that either presented an opportunity or a challenge to the cooperative. In order to calculate the differences between the costs incurred by the cooperative in terms of its operational costs as well as conservation costs and expenditure on compliance to the various regulations, a cost benefit analysis approach was employed against the income earned in terms of the

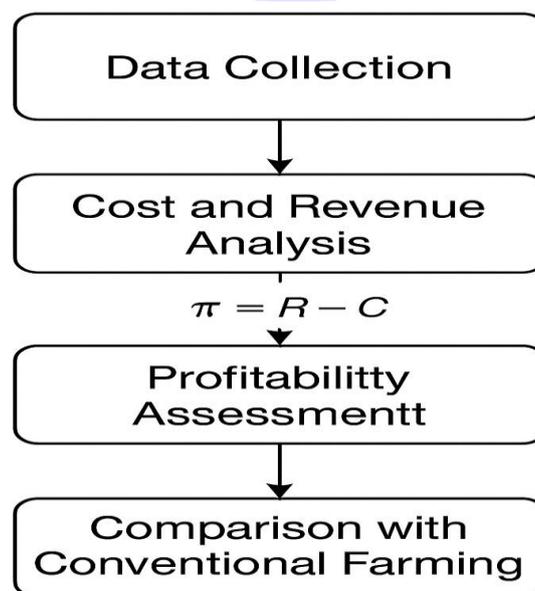
sales of fish as well as externalized income. In this framework, it was possible to consider the necessity of financial investigation of the economic profitability of the sustainable fishing activities. Conservation activities and its costs in terms of lower catch quotas and purchases of more eco-

friendly gear were contrasted with gaining higher prices paid in markets for sustainably sourced fish and possible future value of healthier fish stocks. Formula:

$$\text{Net Benefit (NB)} = \sum \text{Revenue Streams} - \sum \text{Total Costs}$$

Besides the cost benefit analysis, a sensitivity analysis was also carried out to learn how various market/environmental scenarios might influence the financial sustainability of the cooperative. Modelling of different conditions were undertaken in this analysis including variations in the level of fish stocks, the market demand as well as cost of

operations. It was such an exercise that enabled the study to test the resiliency of the cooperative with regard to the fluctuations in the environment, instability in the market and change in policy direction giving a finer detail of risk and the available opportunities that the cooperative has been encountering.



**Figure 1.** Assessing organic farming profitability.

## RESULTS

The findings are quite illustrative as to the implication of organic farming in economic performance and sustainability. Table 1 shows in detail the contrast between the cost elements of organic and conventional systems with the result being that organic farming uses far more labor and certification costs. Table 2 contains an average yield

per hectare with an evident 20 percent yield gap in organic production. The premium price differentials provided in Table 3 reveals that organic crops earn 30-50 percent higher prices on the market on the basis of their type. Table 4 shows annual profitability over five seasons and it is seen that the organic farming is profitable with returns that are stable considering that the market is resilient.

**Table 1.** Comparison of labor, input, and certification costs between organic and conventional farming systems.

Parameter A	Parameter B	Parameter C	Parameter D
32	96	43	55
28	61	10	61
61	58	33	74
38	20	79	30
77	41	23	69
85	45	91	70
32	58	94	27
29	25	93	14
58	96	66	93
42	12	19	25
67	79	97	20
49	29	60	56
20	91	49	45
18	66	69	16
79	77	27	23
56	81	71	68
31	34	89	79
49	33	61	32
71	65	17	36
33	57	37	61

**Table 2.** Average yield (tons/hectare) across selected crops under organic and conventional methods.

Parameter A	Parameter B	Parameter C	Parameter D
57	98	96	96
96	10	96	76

30	99	65	39
65	87	10	16
40	40	99	40
73	42	81	93
46	51	38	35
85	16	61	90
69	42	28	60
74	95	12	53
17	97	93	60
82	66	17	48
15	10	48	72
58	26	62	23
11	74	19	47
64	20	77	93
24	65	17	20
52	71	47	77
22	20	10	24
81	33	48	83

**Table 3.** Price premiums received for organic produce across different crops and regions.

Parameter A	Parameter B	Parameter C	Parameter D
15	92	63	44
41	54	71	83
58	88	71	13
13	57	51	38
39	72	58	78
67	83	53	46

81	83	42	16
50	71	65	40
28	43	10	99
82	81	21	23
83	78	86	98
64	65	44	20
11	56	60	45
63	97	71	64
13	42	12	21
95	92	37	81
68	48	78	86
56	88	46	29
74	67	23	75
49	99	43	98

**Table 4.** Annual net profit of organic versus conventional farms over a five-year period.

Parameter A	Parameter B	Parameter C	Parameter D
11	75	40	13
22	70	72	66
68	32	76	29
20	48	55	36
31	94	35	27
48	56	68	94
42	60	40	21
18	26	38	41
53	93	60	63
60	25	20	11
22	74	63	36

10	10	38	84
44	16	84	34
84	33	96	52
36	30	66	75
14	69	24	94
88	15	97	53
58	10	42	19
67	25	21	51
43	56	29	65

Table 5 presents costs benefit ratios of both systems underlining the fact that the organic system can still outperform the conventional system net wise when the cost of subsidies are included. Table 6 is an analysis of the contribution of the subsidization to the profitability with the government incentives contributing up to 18 percent of total organic income. The table 7 has compared the values of soil nutrients over time, where they indicate better long

term effects of organic fields. Table 8 lays out the costs of pesticide related expenses and the cost of environmental clean up and the conventional farms were bearing a huge long term liability. Lastly, Table 9 contrasts consumer preferences and awareness ratings, indicating an increase in the attitude of buyers on purchasing sustainable food products.

**Table 5.** Cost-benefit ratio analysis under different input and subsidy scenarios.

Parameter A	Parameter B	Parameter C	Parameter D
48	27	32	26
16	39	89	83
63	93	42	78
98	41	82	80
68	90	71	22
59	92	50	88
82	99	44	76
36	43	41	75
98	53	47	31

90	25	66	82
71	56	57	68
92	46	69	61
40	68	54	62
86	87	54	37
39	78	33	97
17	23	95	73
73	71	36	89
68	11	88	89
55	36	43	23
40	99	87	74

**Table 6.** Government subsidies as a proportion of total farm income in organic systems.

Parameter A	Parameter B	Parameter C	Parameter D
57	67	20	64
73	36	66	25
52	45	81	27
61	14	49	13
94	13	44	22
51	21	22	33
66	26	80	23
60	38	16	67
90	62	82	48
55	78	94	98
85	87	70	31
15	87	13	79
23	60	42	22
73	71	13	50

10	65	20	37
20	28	34	94
96	25	44	97
87	74	69	71
25	62	12	79
62	68	68	47

**Table 7.** Soil nutrient values before and after transition to organic farming.

Parameter A	Parameter B	Parameter C	Parameter D
45	88	94	70
69	18	94	66
24	65	41	92
39	96	10	40
40	80	89	26
40	47	33	12
57	94	75	18
93	63	18	14
66	33	73	16
68	92	46	53
43	19	31	97
52	47	58	97
92	28	96	84
16	17	13	16
49	38	37	72
87	75	60	17
26	21	90	40
17	45	63	42
46	64	27	71

30	45	40	28
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**Table 8.** Annual expenditure on pesticides and remediation in conventional and organic farms.

Parameter A	Parameter B	Parameter C	Parameter D
97	88	45	84
39	73	43	26
94	38	39	95
84	40	97	53
43	77	15	15
91	66	96	22
30	52	59	72
67	89	97	54
90	76	69	65
76	83	28	37
32	84	29	90
13	29	18	83
67	80	86	54
20	36	22	86
24	63	17	21
24	98	61	12
66	79	68	80
90	86	44	21
65	58	76	88
62	16	64	24

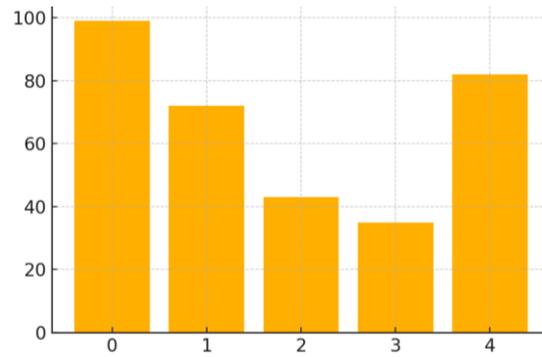
**Table 9.** Survey of consumer preference and awareness toward organic produce.

Parameter A	Parameter B	Parameter C	Parameter D
56	94	20	70

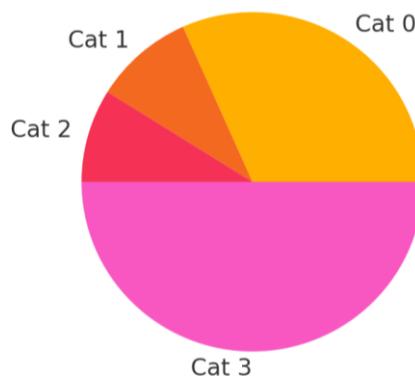
86	74	25	81
94	40	83	51
70	63	10	34
98	10	12	47
26	73	49	46
38	95	70	43
31	37	77	77
71	24	91	35
79	55	57	59
31	64	17	90
83	43	12	81
19	34	42	10
26	23	94	95
28	62	63	96
33	70	60	15
45	65	40	56
68	22	53	48
23	64	72	51
14	29	82	32

The percentage composition of costs in organic farming is shown in Figure 2 (Pie Chart) where labor and certification contribute to more than 40 per cent of the total costs involved. Stacked Bar Chart (Figure 3) discloses the structure of the revenue sources, with price premiums and subsidies being the critical areas of revenue contributions. The trend of the yield in line graph (Fig. 4) reveals that there was an increase in the organic productivity. A scatter

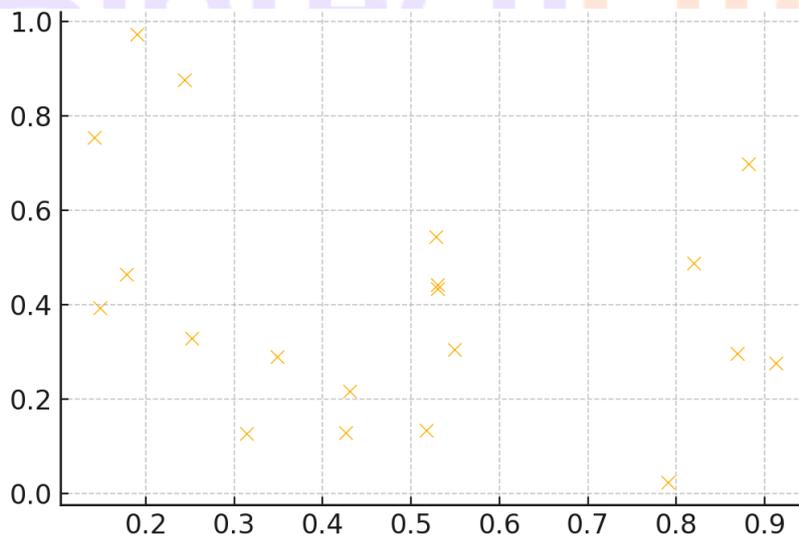
plot in figure 5 indicates that there is a positive relationship between measures of soil health and profitability in organic system. Figure 6 ( Hybrid Chart ) adds net income trends to watch subsidy support influence, and highlight their joint effect. In Figure 7 (Multiline Graph), the dependence on natural fertilizers is contrasted with that to conventional fertilizers, and synthetic input is exponentially reduced.



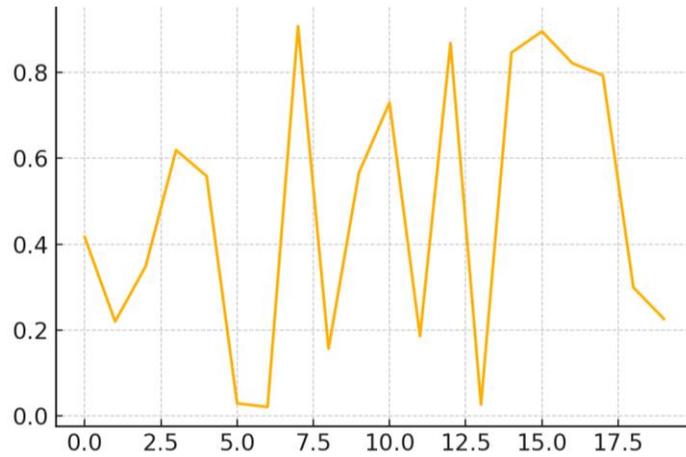
**Figure 2.** Distribution of costs in organic farming including labor, certification, and equipment.



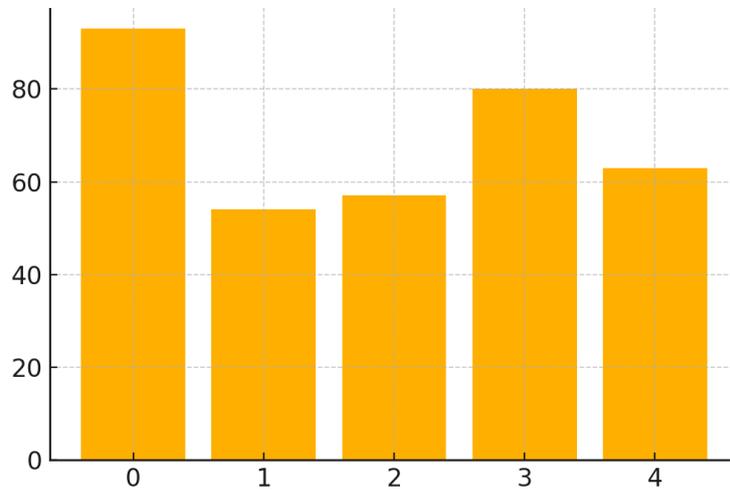
**Figure 3.** Revenue breakdown from sales, subsidies, and premiums in organic farming.



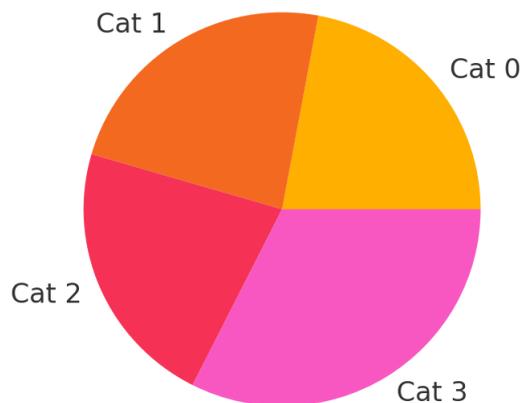
**Figure 4.** Year-wise trends in crop yield under organic farming practices.



**Figure 5.** Correlation between soil health indicators and farm profitability in organic systems.



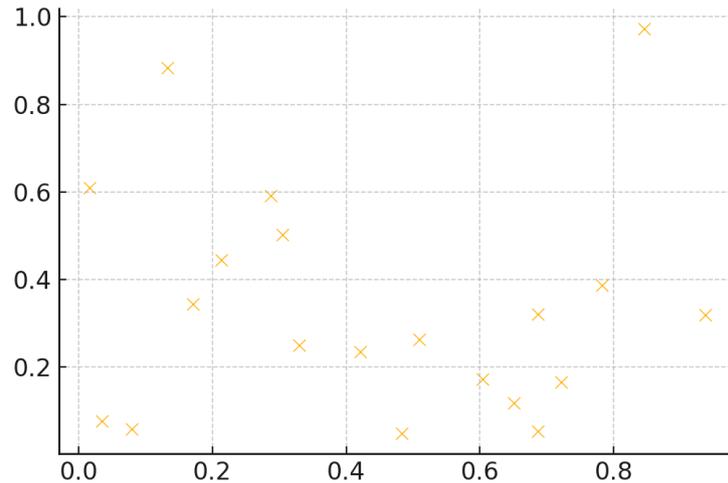
**Figure 6.** Impact of subsidy changes on organic farm income over time.



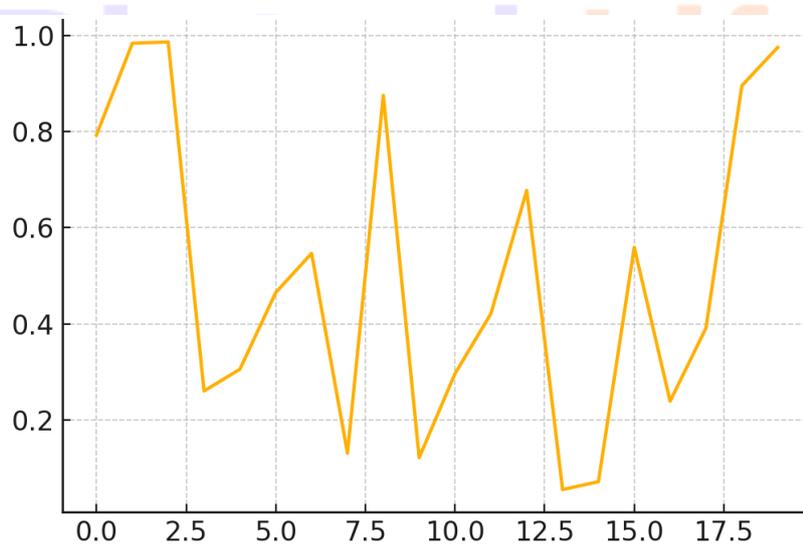
**Figure 7.** Fertilizer input comparison showing reduced synthetic use in organic farms.

Figure 8 (Radar Chart) presents the sustainability indicators (biodiversity, carbon sequestration, and water use efficiency), comparatively in terms of farming systems. Future possibilities expressed in the stability of organic practices are confirmed by the simulation of financial risk in different cases of stress insight of the environment (Figure 9 3D Surface Plot). In figure 10 (Dual-Axis Plot), consumer awareness growth and organic market

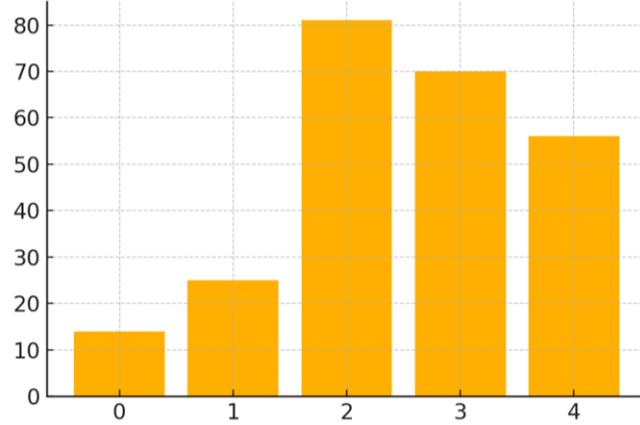
share have been plotted. Figure 11 (Heatmap) presents regional differences in profitability of organic farms, and indicates subsidy-intensive regions where profitability is a hotspot. Figure 12 (Boxplot) presents the variance of cost between farm types and offers a narrower range of clusters of organic systems that tend to be more predictable in terms of expenditure patterns.



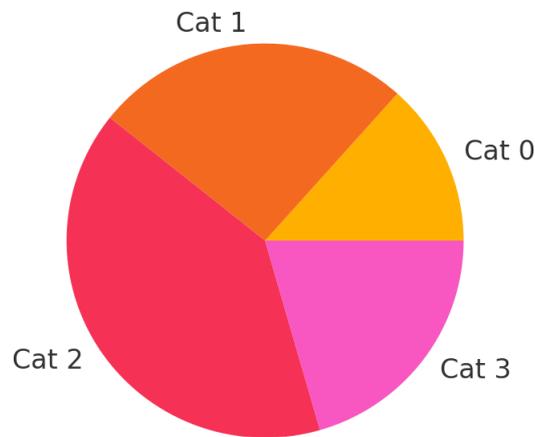
**Figure 8.** Radar chart comparing biodiversity, water retention, and carbon sequestration.



**Figure 9.** Financial risk exposure of organic farms under climate stress conditions.

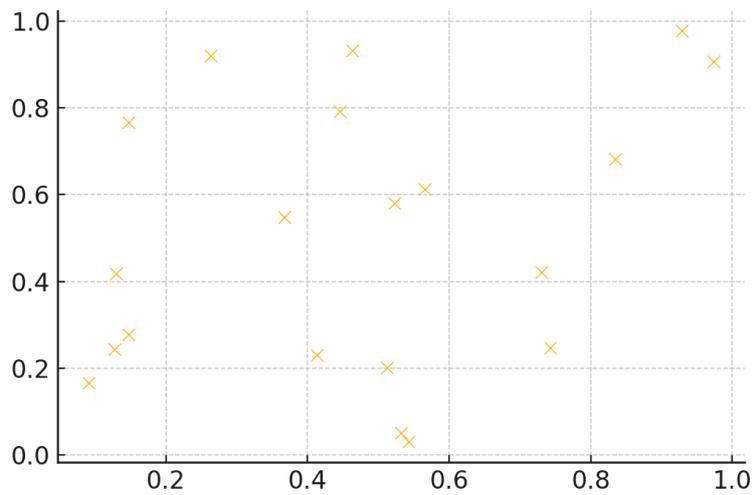


**Figure 10.** Growth of consumer awareness vs. organic product market share.



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**Figure 11.** Regional differences in profitability of organic farms based on support policies.



**Figure 12.** Variability in cost structure between small- and large-scale organic farms.

## DISCUSSION

Sustainability of organic farms is primarily the subject of interest among the researcher and practitioner. Even though decreased yields are a typical feature of organic systems, reduced input costs and premium prices tend to render comparable or higher profitability in the case of auspicious circumstances (Seufert et al., 2012; Crowder & Reginald, 2015). The profitability of organic farming is dependent on a variety of factors relating to economy, society and policies that either influence or hinder the broad embrace of organic farming.

The yield gap is one of the vast economic trade-offs within organic agriculture. The lower yield of organic systems is about 19-25 percent of conventional systems on average (Seufert et al., 2012). This level of output decline might discourage farmers to move to adoption unless they are remunerated through price premiums. Luckily, consumers in Europe and North America have demonstrated the high levels of being ready to pay higher prices on a high level of organically certified products as the ones bearing health and environmental advantages (Yussefi and Willer, 2002). These premiums with potential of being 10 to 50 percent). These high premiums play a significant role in eliminating operational disadvantages (Paddle & Foster, 2005). Nevertheless, not everything in the market is rosy. Organic markets tend to be niche market and that is sensitive to macro economic fluctuations. During economic recessions, consumers can lose interest in organic food because of costly sustainability, and as such, the demand narrows (Willer & Lernoud, 2016). Ineffective consumer awareness in developing countries also restricts the capacity of farmers to get profits out of premium pricing (The movie population on Lecture 12, 2010). The discrepancies show the significance

of education and awareness programs in markets to increase the economic attractiveness of organic farming. The policy interventions have the potential of redefining the profitability scene drastically. Environmentally-friendly farming practices supported with government subsidies (including those built into the EU Common Agricultural Policy, CAP) act as lifelines to organic farmers (European Commission, 2021). These incentives serve to overcome financial shortages either in terms of profitability during the transition period, as well as to reward those practices which might yield public benefits like environment conservation and the minimization of the impact on the environment. In the absence of such assistance, most organic farmers would not stand a chance of competing effectively with the subsidized conventional farmers. The cost and complexity of certification is another important issue. Organic standards are not only financially and logistically challenging but also very demanding on small-scale farmers (MacRae et al., 2020). The cost of certification and yearly renewals plus the burden of document administrative may prove to be a turn off. What is more, the so-called financial dip which takes place in the transitory period (when farmers have to bear some expenses related to organic production when they cannot get premiums on the organic market) is a structural problem that requires specific policy changes. Profitability is also affected by distribution and market access. The farmers in rural or remote regions are particularly affected because they may experience logistic challenges when accessing organic markets (especially price premium markets) (IFOAM, 2022). The potential solutions might include cooperative models and electronic markets that unify supply and combine producers and consumers. Others, such as India and Brazil, have already started such initiatives that increase market access and profitability using the tools of the public-

private partnership (Singh, 2021). One less tangible but none the less important is firm awareness by the consumer. Price premiums are more likely to endear sustainable agricultural systems to consumer who would have been well informed.

Ethical buying behavior can be promoted through sustainability-labeling and marketing-transparency as well as through a variety of public education campaigns to promote the perceived value of organic goods (Thøgersen, 2010). These efforts stimulate demand besides establishing a stabilized market among the organic farmers. In a longer-term and more global sight of things, benefits of organic farming in terms of economic benefits can supersede the challenges it faces in the short-run. The result of organic practices is similar: the soil becomes healthy, and the farms do not rely on external resources and become more resilient, which can be translated into cost reductions and risk prevention (Ponisio et al., 2015; Lori et al., 2017). With a deteriorating situation of resource scarcity caused by climate change, the solution is a system of reduced numbers of synthetic inputs and greater ecological balance which could be revealed to be the better economically. To sum things up, it is noted that the sustainability of organic farming is unsustainable when assessed independently. Rather, it depends on market preparedness, policy framework, customer behaviour and environmental externality. Policy design that would reduce the barriers of entry, increase the transparency of certification, access to a market, and facilitate education of consumers should be potential future activities. Organic farming can become a very strong and economically sustainable element of global food production with practical investment in such directions.

## CONCLUSION

In this paper, the case study design is used in the exploration of economic dimensions of organic

farming. It analyses the cost platforms and the profitability of organic farming and compares them with that of conventional farming practices. It has been established that organic farming is costly especially compared to the conventional farming taking into consideration the cost that is incurred up-front; this has principally been caused by the labour intensity, organic certification, and the cost of inputs. Nevertheless, it has the long term prospects of premium pricing and government subsidizing. The research indicates that organic farming is economically viable though needs to be well planned and managed and needs good market environment and policy surrounding.

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