Green Farming in India: Issues and Policy Perspective

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Abstract

The organic farming system has been used in India since ancient times and is largely focused on achieving sustainable agricultural output in a clean, unpolluted environment. Organic production methods employ natural resources to harness desired agricultural production for human consumption, keeping the ecosystem and ecology alive and in good health. The environmental focus of organic production is on using naturally occurring resources as inputs, such as organic wastes; crop, animal, and farm wastes, aquatic wastes, other biological materials, and advantageous microbes; biofertilizers/biocontrol agents to release nutrients to crops and protect them from insect pests and diseases for increased agricultural production. In 187 nations, organic farming is practiced, and at least 3.1 million farmers used organic practices to manage 72.3 million hectares of agricultural land. Even though India is home to 44% of the world's certified organic farmers, the country's overall certified organic cultivation area, at 2.3 million hectares represents just 3% of the world's total area of 72.3 million hectares under organic agriculture. Against this backdrop, the objective of the present study is to evaluate the current scenario of organic farming in India. To accomplish this, the study will investigate the causality between organic production, the area cultivated under organic production, the number of organic producers, and biofertilizer production by using Granger causality, the augmented Dickey-Fuller test used to find out the stationarity of data. After finding out the causal relationship between the variables, the ARDL model was used to measure the short-term relationship between variables. The ARDL long run form and bound test was used to analyse the long-term relationships. Agricultural and Processed Food Products Export Development Authority, Annual reports of the Ministry of Agriculture, International Federation of Organic Farming Movements, International Trade Centre, National Programme of Organic Production, and Organic Industry Market Report are indeed the sources of secondary data used in the study.

Introduction

Modern agriculture is a rising approach to agricultural developments and farming practices, using high-yielding crops, chemical fertilizers, irrigation water, herbicides, etc. (Gamage et al., 2022a & 2023). Most nations adopted the Green Revolution, which led to greater food production, self-sufficiency, and high-income levels. It also allowed certain nations to go from having a food deficit to a surplus, opening up prospects for exporting food goods (Kansanga et al., 2018). The loss of natural soil fertility, deterioration of soil structure, erosion and the eradication of beneficial insects and microorganisms, depletion of groundwater resources, air pollution, acidification of soil, chemical burn, and mineral depletion are some agricultural characteristics that are seen negatively as a result of the green revolution. As a result, the detrimental effects of conventional farming on health increased worse every day. The condition of asthma, birth defects, neurological problems, cancer, hormone disturbance, and Parkinson's disease make up the bulk of the harmful effects of conventional farming on human health. The extensive usage of inorganic fertilizers in agriculture is caused by high levels of nitrate in groundwater. The availability of sufficient groundwater is crucial for the maintenance of life. Infant methemoglobinemia and a variety of human cancers are caused by nitrate poisoning of drinking water, which is also well-documented as a risk factor for cancer (Gamage et al., 2023).

Artificial inputs such as fertilizers, pesticides, hormones, feed additives, etc. are minimized or completely avoided in organic farming. Crop rotations, crop residues, animal manures, off-farm organic waste, mineral-grade rock additions, and biological nutrient mobilization systems are all used in organic farming to provide maximum plant protection. Organic agriculture is a farming method that promotes the health of soils, ecosystems, and people. Rather than damaging inputs, it is based on biological processes, biodiversity, and cycles specific to local circumstances. Organic agriculture blends tradition, creativity, and science to improve the common environment while also promoting equitable relationships and high quality of life for all parties involved. Organic farming improves the agroecosystem's resilience in the face of the harmful consequences of climate change. It creates robust, ecologically responsible agricultural techniques that can withstand changes in temperature, drought, and soil erosion. Additionally, sustainable management, conservation techniques, and restoration activities are encouraged by organic farming. Organic farming has lower financial requirements than modern agriculture. Additionally, organic farming helps communities and farmers adapt to the possible negative consequences of climate change. Additionally, organic farming meets a significant portion of the standards set forth for efficient adaptation approaches (Muller, 2009; Murmu et al., 2022).

Organic farming has the potential to alleviate the majority of problems facing contemporary agriculture and food production. Organic farming has its origins in the fields of health, the environment, justice, and compassion. As demonstrated by Hammed et al. (2019), organic foods have more nutrients and are often free of chemicals and pesticide residues. Antibiotics and other drugs are not used in the production of animal products when organic agricultural practices are used. It helps to lessen the dangerous spread of germs that are resistant to antibiotics, which is a growing health concern. Organic farming benefits ecological resources such as the ground, soil, air, water, and wildlife, as well as biological diversity, by increasing populations of natural enemies that assist with controlling pests and diseases without the use of chemicals, and by supporting pollinators, which are critical to both maintaining the ecosystem's health and producing healthy foods (Merrigan et al., 2022). Chemicals like pesticides and nitrates are found at lower concentrations in organic products.

Organic farming and Sustainability

The foremost goals of Sustainable Development Goals are to eradicate world hunger, achieve food security, and support sustainable agriculture. When the SDGs are considered as a whole, agriculture contributes, directly or indirectly, to each of the 17 sustainable objectives (Lu and Wu, 2022). For instance, without achieving food security, we cannot alleviate poverty. There has to be enough food that is both affordable and safe for everyone to fulfill the second SDG. A good diet is the first step to good health. We are unable to give high-quality education in the absence of nourishing food since learning depends on it. The productivity of agriculture might increase with equal representation of men and women. Because when a country experiences an economic crisis, food is typically distributed based on gender. Water security might be addressed through sustainable agriculture. Healthy consumers consider cleanliness and access to clean water (Linderhof et al., 2021). Organic farming aids in reducing reliance on fossil fuels. When agriculture expands slowly, it hinders the economic growth of the majority of agricultural-based nations since most people want to have quality jobs (UNEP, 2011). More consumer-friendly agricultural goods, infrastructure facilities, and industry innovation will grow. Rural land can be more fairly accessible through land reform. Any community that engages in organic farming will benefit from improved physical, emotional, and financial well-being. To achieve food security, waste must be reduced. Using the best agricultural practices is essential in combating climate change. 20% of the protein consumed daily comes from fish. Over 80% of the terrestrial biodiversity on
Earth is found in forests (Ukhurebor and Aidonojie, 2021). There are several disputes between the affluent and the poor, which might be a threat to food security. In a significant way, putting an end to hunger can help develop justice, peace, and robust institutions (Gamage et al., 2023).

**Benefits of Organic Farming**

Figure 1

**Figure 1 illustrates** some of the benefits of organic farming. The present review attempts to conclude the aforementioned benefits by reviewing several prior studies (Nemecek et al., 2005; Kramer et al., 2006; Regonald et al, 1987; Siegrist et al, 1998; Niggli et al., 2009; Mader et al., 2002; Pimental et al., 2005; Reicosky et al. 1995; Fliessbach and Mader, 2000; Pretty and Ball, 2001; Rao, 2014).

**World Scenario of Organic Farming**

In 191 nations, organic farming is practiced, and at least 3.4 million farmers used this method to manage 74.9 million hectares of agricultural land (FIBL, 2022). Australia has 36 million hectares of agricultural land that is organic, followed by Argentina with 4 million hectares and Spain with 3 million hectares. All areas have seen a growth in organic agricultural land. More than 120 billion euros were spent on organic food and drink worldwide in 2019 (FIBL, 2022). The latest FIBL study on organic farming found that organic cropland grew by 7.6% in 2019 and that organic retail sales kept rising. In addition to the land set aside for organic agriculture, there are additional areas of organic land dedicated to organic activities. Most of them are places for keeping bees and rearing cattle. Other non-agricultural lands include those used for aquaculture, forests, and grazing grounds. The total area of organic land comprised of these 35 million hectares was 107.4 million hectares (Organic World 2021). In 2019, 3.4 million organic producers were listed. The nation with the fewest producers in Tanzania (1,48,607), followed by Uganda (2,19,566) and India (15,99,010). The majority of small-scale manufacturers are accredited in groups, following an internal control system (FIBL Survey 2022). (https://ncof.dacnet.nic.in/)

**Asia's Organic Farming Dilemma**

The Asian organic operations will continue to make significant strides in 2022. After a few years following the COVID-19 pandemic, the organic activity was resuming. In Asia, organic farming was practiced on more than 6.5 million hectares in 2021. 9% of the organic farmland in the globe was located in Asia. According to the FIBL Report (2023), China has more farmland under organic management than any other country, with over 2753'000 hectares, followed by India (2,657',000), the Philippines (216'000 hectares), and Thailand (nearly 168'000 hectares). In Asia, organic land increased by more than 356 000 hectares between 2020 and 2021, representing a 5.8 percent gain. There were around 1,782,000 organic growers in Asia. The majority of the farmers came from India, which has over 1599'010 times as many farmers as any other country (FiBL Report, 2023). More than half of the organic farmers worldwide are located in Asia. With over 249 000 metric tonnes of goods—primarily oil cakes, rice, and sugar—India was the largest Asian exporter to the United States, followed by China with about 153 000 MT, mostly oil-baked goods, herbs and spices, and nuts, and Pakistan with 45 625 MT of rice (FiBL Report, 2023).

**Organic Farming Practices in India:**

To secure food security, the Green Revolution of 1960 revolutionized agricultural methods by providing farmers with high-yielding crops and fertilizer supplies. Profit was guaranteed by increased productivity, but the land finally went to waste because of excessive fertilizer usage, which made the soil unusable, and pesticide use, which made the produce unfit to consume. In India, organic farming is still in its infancy. Organic products are grown using an agricultural method that is both environmentally and socially responsible by avoiding the use of synthetic fertilizers and pesticides. This farming method works at the microbial level to preserve the soil's capacity for reproduction and regeneration, optimal plant nutrition, and efficient soil management, resulting in the production of nutrient-rich, disease-resistant food. India has a great deal of potential to produce a huge variety of organic goods due to its diversified agro-climatic conditions. In many parts of the nation, organic farming is favorable since it has a long history. This presents the opportunity for organic producers seeking to capitalize on a developing domestic and global market. India is first in the world in terms of the total number of producers and ranks sixth in the world in terms of organic cropping land (FIBL & IFOAM Year Book, 2020). As of March 31, 2022, 9119865.91 hectares were recognized under the National Plan for Organic Agriculture as being subject to the organic certification procedure (APEDA, 2023). There is 4393151.17 ha designated for wild harvesting in addition to the 4726714.74 ha of land that can be used for agriculture. The most land has been certified as organic in Madhya Pradesh, with the next-largest areas being in Maharashtra, Gujarat, Rajasthan, Orissa, Karnataka, Uttarakhand, Sikkim, Chhattisgarh, Uttar Pradesh, and Jharkhand. Sikkim achieved the incredible achievement of certifying all of its cultivable lands—more than 75000 acres—as organic in 2016. In India, 3430735.65 MT of certified organic products were produced in the years 2021–2022, including all kinds of food items like oil seeds, fibre, sugar cane, cereals and millets, cotton, pulses, aromatic and medicinal plants, tea, coffee, fruits, spices, dry fruits, vegetables, processed foods, and so forth (APEDA, 2023). In addition to food-related goods, nutritious foods, natural cotton fiber, and other goods are also produced. Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, and Odisha are the top five producing states. Fibre crops are the most important commodity group, followed by oil seeds, sugar crops, cereals and millet, aromatic and medicinal plants, spices, condiments, fresh fruit and vegetables, pulses, tea and coffee, and fresh fruit and vegetables. The total amount of exports during 2021–2022 was 460320.40 MT. Organic food exports amounted to around INR 5249.32 crore (771.96 million USD). Exports of organic goods go to several countries, including the US, the EU, Canada, the UK, Switzerland, Turkey, Australia, Ecuador, the Korean Republic, Vietnam, and Japan. Processed foods, including soy meal (61%), come in second place in terms of realizing export value after seed oils (12.85%), cereals and millets (12.71%), sugar (4.77%), plantation crop products including tea and coffee (2.16%), spices and condiments (1.72%), pulses (1.1%), and other goods (APEDA, 2023).

**Research Methodology**

The data used for the present examination was gathered from a wide range of sources, including reports, journals, periodicals, newspapers, and publications from the International Federation of Organic Farming Movements, the National Programme of Organic Production, the Agricultural Processed and Food
Products Export Development Authority, the Research Institute of Organic Agriculture in Switzerland, the National Centre of Organic Farming, etc. In this momentous study, the causal associations between organic production, the area covered with organic agriculture, the production of biofertilizers in India, and the number of organic producers have been investigated by using EViews software. The Augmented Dickey-Fuller test was implemented in all three models—without drift, with drift, and with drift and trend—to determine whether the data was stationary. The Granger causality test had been used to determine the causal link between the variables, and the ARDL model was used to measure the short-term and long-term cointegration among the variables. The study also investigated the policy taken by the government to improve organic farming in India.

Results and Discussion

Causality Analysis

The Granger Causality test is used to seek out the causal relationship between the production of biofertilizers and organic production and the area allocated to organic farming. A statistical hypothesis test for testing whether one variable will assist in anticipating another is the Granger causality test.

Equation:

\[ \text{OP} = \sum a_i \text{Ar}_{t-i} + \sum \xi_i \text{OP}_{t-j} + \varepsilon_t \quad (4) \]

\[ \text{Ar} = \sum \beta_i \text{OP}_{t-i} + \sum \pi_i \text{Ar}_{t-i} + \varepsilon_t \quad (5) \]

Where OP represents organic production, Ar = Area under Organic Cultivation, and T = Period.

Hypothesis:

\[ H_0: \text{Organic Production has not had any causal relationship with the Area under organic Cultivation.} \]

\[ H_1: \text{Organic Production has a causal relationship with the Area under organic Cultivation.} \]

From 2010–11 to 2020–21, Table 1 examines the causality analysis of organic production and area under organic agriculture. The findings show that there is no causal relationship between organic production and area. The findings indicate that the area does not cause organic farming production and that the null hypothesis is accepted. In a nutshell, we can state that there is no causality bet.

Equation:

\[ \text{OP} = \sum a_i \text{BP}_{t-i} + \sum \xi_i \text{OP}_{t-j} + \varepsilon_t \quad (4) \]

\[ \text{BP} = \sum \beta_i \text{OP}_{t-i} + \sum \pi_i \text{BP}_{t-i} + \varepsilon_t \quad (5) \]

Where OP represents organic production, BP = Biofertilizer production, and T = Period.

Hypothesis:

\[ H_0: \text{Organic Production has not any causal relationship with Bio-fertilizer production.} \]

\[ H_1: \text{Organic Production has a causal relationship with Bio-fertilizer production.} \]

Table 2 shows a bi-directional causal link between the degree of organic production and the production of biofertilizers; as a result, the null hypothesis is rejected since the p-value is less than 0.05. The findings demonstrate that we may alter the degree of organic agricultural productivity by altering the production of biofertilizers.

As we didn’t find any causality between area and organic production and stationarity in the number of producers so both variables are dropped here and the remaining analysis is continued with organic production and biofertilizer production.

The Augmented Dickey-Fuller Test

The Augmented Dickey-Fuller test, used in all three models without drift, with drift, or with drift and trend, is used to check the stationarity of all-time series variables in the area covered by organic farming and the production of biofertilizers, to facilitate the causal relationship between organic production.

Model 1. Without Drift: \[ \Delta Y_{t} = ZY_{t-1} + a_t + \varepsilon_t \quad (1) \]

Model 2. With Drift: \[ \Delta Y_{t} = B_i + ZY_{t-1} + a_t + \varepsilon_t \quad (2) \]

Model 3. With Drift and Trend: \[ \Delta Y_{t} = B_i + B_2 + ZY_{t-1} + a_t + \varepsilon_t \quad (3) \]

The stationarity analysis of organic production and biofertilizer production is shown in Table 3 using three models: without drift, with drift, and with drift and trend. The measurement of stationarity for organic production reveals that the data is stationary after the first difference and biofertilizer production after the second difference, the p-value is less than 0.05 showing the significance of the model in both variables.
The autoregressive distribution lag model was used to measure short-term and long-term co-integration among the production of organic farming and biofertilizer production.

\[
OP = b_0 + b_1 OP_{t-1} + b_2 OP_{t-2} + b_3 BP_{t-1} + b_4 BP_{t-2} + U_i
\]

Table 4 exhibits the model's significance with an F-statistics (0.003) value of less than 0.05, reflecting the model's significance, and an r square value of 0.95, which is high. After a one-year gap, the model demonstrates the short-term link between organic production and biofertilizer production, biofertilizer production represents a significant variable in the short run.

With the F-bounds test at a 5% level of significance, Table 5 reveals evidence of long-term correlations between organic production and the production of biofertilizers. The value is higher than the upper bound value (29.37 > 4.16) represents the significance of the model and indicates the long-term link between both of these variables, biofertilizer is a significant variable after a one-year gap in the short as well as long-term.

Limitations of the Study

Many other variables affect the production of organic farming in India like the area under cultivation of organic farming at present less than 5% of gross agriculture land is used for organic farming in India and irrigation level many studies represent as compared to conventional farming organic farming consume less water, but in India around 40% area is covered under irrigation facilities (Rao, 2014). Biofertilizer production trends show the declining production of biofertilizers in India most of the farmers used their produce organic inputs for production and the cost of organic farming is very high as compared to conventional farming. Landholding size and soil fertility level in India also contributed as a causal factor in the production of organic farming, at the initial stage of production of organic farming around three years farmers face losses, in India maximum farmers hold small and marginal size land holdings and depend on agriculture income for their livelihood. People's awareness of organic products and their demand for organic products, the lack of premium price of organic products in the market, and the low affordability to buy organic produce is the reason for the low demand for organic product in India which indirectly impact the production of organic farming in India (Rao, 2014) (Gamage et al., 2023). The major limitation of the study is the unavailability of data related to organic farming in India.

Policy Implication for organic farming in India

Figure 2 Initiative taken by the government to improve organic cultivation in India.

Conclusion

Growing concerns about healthy food, improve the demand for organic products in the world market as well as the Indian market schemes like Prampragat Krishi Vikas Yojana, National Programme for organic products and many other initiatives taken by the government improves the productivity of land and the production of organic product in India. The study measured the trend of organic farming in India and revealed that between 2010 to 2021 the area of organic farming was expanded in India, production level shows improvement in India, and the demand for Indian organic products increased in the international market showing improvement in the export of India. The Results of the Granger causality test reveal there is a bi-directional relationship between the production of organic farming and biofertilizer production and ARDL results represent biofertilizer production is a significant variable in the short run as well as long run and cointegration exists among both variables, the policymakers improve the production of organic farming by changing biofertilizer production. Despite the advantages, organic farming in India faces several challenges, such as the absence of improved production and protection technologies for specific crops, inadequate productivity, high expenses for inputs, small and dispersed holdings of land, poor accessibility to markets in potential organic areas, such as hill and tribal areas, poor market and storage infrastructure, not sufficient processing facilities, and the expensive, time-consuming, and difficult certification process for exporters.

Declarations

Competing Interests Statement:
"The authors declare that they have no conflict of interest."

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Author's Contribution:
Dr. Anju, my co-author continuously supervised my work and assisted me by proposing the techniques I implemented for my research; she also performed the statistical work for the report.

Availability of data and material:
Elsevier, Google Scholar, Taylor & Francis, Springer, and Research Gate are used to access prior studies for the present research. The secondary data used in calculations are gathered from various kinds of reports issued by the Agricultural and Processed Food Products Export Development Authority, the Ministry of
Agriculture’s annual reports, the International Federation of Organic Farming Movements, the International Trade Centre, the National Programme of Organic Production, and other sources.

References

1. https://apeda.gov.in/apedawebsite/organic/organic_products.htm#-text=As%2Bon%2031st%20March%202022,ha%20for%20wild%20harvest%20collect

**Tables**

Table 1 Causality Analysis of Organic Production and Area under Organic Cultivation

<table>
<thead>
<tr>
<th>Direction of Causality</th>
<th>Lags</th>
<th>Observation</th>
<th>F-Value</th>
<th>P-Value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production – Area</td>
<td>2</td>
<td>8</td>
<td>1.09</td>
<td>0.43</td>
<td>Accepted H₀</td>
</tr>
<tr>
<td>Area – Production</td>
<td>2</td>
<td>8</td>
<td>0.03</td>
<td>0.96</td>
<td>Accepted H₀</td>
</tr>
</tbody>
</table>

**Source:** Author Calculation

**Note** Indicates results are significant at a 5% level of significance

Table 2 Causality Analysis of Organic Production and Bio-fertilizer Production

<table>
<thead>
<tr>
<th>Direction of Causality</th>
<th>Lags</th>
<th>Observation</th>
<th>F-Value</th>
<th>P-Value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production – Biofertilizer production</td>
<td>2</td>
<td>8</td>
<td>11.13</td>
<td>0.01*</td>
<td>Rejected H₀</td>
</tr>
<tr>
<td>Biofertilizer Production – Production</td>
<td>2</td>
<td>8</td>
<td>6.27</td>
<td>0.04</td>
<td>Rejected H₀</td>
</tr>
</tbody>
</table>

**Source:** Author Calculation

**Note** Indicates results are significant at a 5% level of significance

Table 3 Stationarity Analysis of Organic Production, Area covered under Organic Production and Production of Biofertilizer.
H₀ = Organic Area has a Unit Root or Non-Stationarity.
H₁ = Organic Production has a Unit Root or Non-Stationarity.
H₂ = Biofertilizer Production has a Unit Root or Non-Stationarity.

<table>
<thead>
<tr>
<th>Difference</th>
<th>Organic Production</th>
<th>Bio-fertilizer Production</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t-value</td>
<td>p-value</td>
</tr>
<tr>
<td>Model 1 Augmented Dickey-Fuller Test Without Drift</td>
<td>Level</td>
<td>-0.20</td>
</tr>
<tr>
<td></td>
<td>1st Difference</td>
<td>-3.10</td>
</tr>
<tr>
<td></td>
<td>2nd Difference</td>
<td>-4.04</td>
</tr>
<tr>
<td>Model 2 Augmented Dickey-Fuller Test with Drift</td>
<td>Level</td>
<td>-1.41</td>
</tr>
<tr>
<td></td>
<td>1st Difference</td>
<td>-2.82</td>
</tr>
<tr>
<td></td>
<td>2nd Difference</td>
<td>-2.42</td>
</tr>
<tr>
<td>Augmented Dickey-Fuller Test with Drift and Trend</td>
<td>Level</td>
<td>-1.94</td>
</tr>
<tr>
<td></td>
<td>1st Difference</td>
<td>-1.92</td>
</tr>
<tr>
<td></td>
<td>2nd Difference</td>
<td>-2.71</td>
</tr>
</tbody>
</table>

Source: Author Calculation

Table 4 Autoregressive Distributed Lag Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOFERTILIZER_{-1}</td>
<td>-1.614621</td>
<td>0.177619</td>
<td>-9.002045</td>
<td>0.0008</td>
</tr>
<tr>
<td>BIOFERTILIZER_{-2}</td>
<td>-2.702786</td>
<td>1.351740</td>
<td>-1.099487</td>
<td>0.1162</td>
</tr>
<tr>
<td>ORGANIC_PRODUCTION</td>
<td>0.001263</td>
<td>0.003558</td>
<td>0.354991</td>
<td>0.7405</td>
</tr>
<tr>
<td>C</td>
<td>-915.050</td>
<td>20070.31</td>
<td>-0.458131</td>
<td>0.6706</td>
</tr>
</tbody>
</table>

R-squared 0.556545 Mean dependent var. -3498.791
Adjusted R-squared 0.923954 S.D. dependent var. 16981.6
S.E. of regression 46847.17 Akaike info criterion 24.65402
Sum squared resid 8.78E+09 Schwarz criterion 24.69374
Log likelihood -84.81609 Hannan-Quinn criterion 24.38812
F-statistic 29.35000 Durbin-Watson stat 1.972299
Prob(F-statistic) 0.0003489

Source: Author calculation

Table 5 ARDL Long Run Form and Bound Test
### Conditional Error Correction Regression

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-9195.050</td>
<td>20070.81</td>
<td>-0.468131</td>
<td>0.6706</td>
</tr>
<tr>
<td>BIOFERTILIZER (-1)</td>
<td>5.317707</td>
<td>1.359061</td>
<td>3.912781</td>
<td>0.00144</td>
</tr>
<tr>
<td>ORGANIC PRODUCT...</td>
<td>0.001283</td>
<td>0.003058</td>
<td>0.354061</td>
<td>0.7205</td>
</tr>
<tr>
<td>(BIOFERTILIZER (+1))</td>
<td>-2.702796</td>
<td>1.351740</td>
<td>-1.999297</td>
<td>0.0902</td>
</tr>
</tbody>
</table>

**F-Bounds Test**

<table>
<thead>
<tr>
<th>Test Statistic</th>
<th>Value</th>
<th>Signif.</th>
<th>1(0)</th>
<th>1(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-statistic</td>
<td>25.37255</td>
<td>Asymptotic: n=1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>k</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Sample Size</td>
<td>8</td>
<td>Finite Sample: n=35</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>10%</td>
<td>3.223</td>
<td>3.757</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td>3.957</td>
<td>4.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1%</td>
<td>5.793</td>
<td>6.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finite Sample: n=30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10%</td>
<td>3.303</td>
<td>3.797</td>
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Source: Author Calculation

### Figures

**Figure 1**

**Benefits of Organic Farming**
Figure 2

Initiative taken by the government to improve organic cultivation in India.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- DataOrganicFarming.docx