



## **GROWTH AND COMPOSITION OF EXPORTS OF INDIAN ORGANIC PRODUCTS: AN ECONOMIC ANALYSIS**

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**Abstract:** Organic farming is gaining popularity as sustainable means of cultivation. Farming practices used in this method are environmentally friendly and have greater health benefits compared to the inorganic farming. Farmers in India are shifting to this method of cultivation and exporting their produce since the demand for organic products is high in several developed countries of the world. India is exporting organic products to the U.S.A, European Union, Canada and other countries. The present study is an attempt to analyze the growth rate of organic exports and their destinations. The composition and the growth rate of major organic products exported from India have also been analyzed. The analyses of the study are based on secondary data mainly collected from APEDA and FiBL. To analyze growth trend of organic exports CAGR and percent change has been also calculated to reflect changing dynamics of exports from India. The study revealed that the growth rate of organic products exports has been 23.12 percent from 2012-13 to 2019-20. Category wise CAGR of exports of processed food has been 60.80 percent that is the highest among all selected organic products. The U.S.A is the top destination of Indian organic exports in the year of 2019-20.

**Keywords:** Agriculture sector, economic growth, organic products, growth and composition of exports

**JEL Codes:** F10, O13, Q10, Q17

### **INTRODUCTION**

Agriculture sector has been source of economic growth for countries around the world including India. Contribution of this sector in GDP of the country

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was 16 per cent with 4 per cent annual growth rate in the year of 2019. Despite decreasing share in GDP compared to the other sectors of economy agriculture is main source of employment. Importance of this sector is clear with the fact that 42.6 per cent of total employment is provided by agriculture for the year of 2019 which is more than industry (25.1 per cent) and (32.3 per cent) service share (World Bank, 2021). Agriculture sector faced transformation since independence mainly adoption of HYV seeds in several states which led to green revolution in 1960's. This resulted in high productivity of wheat, rice, millets and some other crops. This process included use of fertilizers, pesticides and chemical means of production. Drawbacks of this method of production have been observed in the past years in terms of decline in production of indigenous crops. Misuse of chemical pesticides, fertilizers and lack of crop diversification resulted in creating land infertility and lower groundwater levels which made farmers to spend more on solving these problems. Loss of nutrients in soil and pesticides accumulation in food characterized it as unsustainable practice in terms of land and health effects (Eliazer *et al.*, 2019). All this raises concerns for more sustainable methods of cultivation.

Organic farming seems suitable alternative since it has potential to fulfill consumer demand of quality products. Organic products are produced with environment friendly methods. Organic farming is more sustainable farming practice as defined by IFOAM (2021), "Organic Agriculture is a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and good quality of life for all involved." Organic farming is based upon four principles. First, principle of health that means organic farming should sustain and improve the health of ecosystems, organisms and human beings. Second, principle of ecology is related with maintaining ecological balance to use inputs in such a way that it help in conservation of resources. Third, principle of fairness means ensure fairness among all people and resources those are engaged and used in process of production and consumption. Fourth, principle of care deals with precautions and responsibility with regard to the management in organic agriculture. Thus all these principles reflect organic farming is based upon more sustainable methods of cultivation. It is increasing popularity all over the world including India. Organic farming systems have enhanced attention over the last one decade because this method

is perceived to offer some solutions to the problems currently besetting the agricultural sector. Since organic farming has the potential to provide benefits in terms of environmental protection, conservation of nonrenewable resources and improved food quality (Charyulu & Biswas, 2010).

In 2001, to promote and implement organic farming India started National Programme for Organic Production (NPOP). Programme lays guidelines for the production and exports of organic farming and deals with accreditation and certification of bodies. Participatory Guarantee System (PGS- India) programme was also launched for local and domestic market to support farmer group centered certification. Both programmes support organic farming. NPOP certified products are traded both domestically and overseas however PGS- India certified products are traded domestically only (APEDA, 2018). Study is based upon exports of organic products from India therefore data under NPOP is considered for analysis.

India is home to largest organic producers in the world. Out of 3.1 million producers in the world 1.36 million producers are from India as per 2019 statistics. There has been 18.6 per cent increase in organic agriculture land in the country from 2018 to 2019 and ten year growth rate of land has been 194.8 per cent (Willer *et al.*, 2021). Country exported 6.389 million MT of organic products in the year of 2019-20 with the worth Rs. 4685.908 crore. (Agricultural and Processed Food Products Export Development Authority, 2021). Organic food exports level had been 6-7 per cent in the year of 2003-04. Exports are increasing with the shift of farmers to organic farming however they are still in transition stage of high initial cost which are expected to reduce with continuation of production (Roychowdhury *et al.*, 2013). Market for organic products is mainly export oriented reason being less demand of these goods in domestic market and raising demand in developed nations. Price of organic products is high in the country that is reason of less domestic consumption and more availability of good for export (Deshmukh & Babar, 2015). Organic products are exported to the European Union, U.S.A, Canada and other developed countries. Demand of these goods is high in North America and Europe regions which capture 97 per cent of global revenue. Category wise major commodities produced under organic management are Cereals which include wheat and rice. Further, Spices include cardamom, black pepper, white pepper, ginger, turmeric, mustard, clove etc. Red gram, black gram pulses and sesame, castor, sunflower oilseeds produced (Ummyiah *et al.*, 2017).

## DATA SOURCES AND METHODOLOGY

The study is based upon secondary data collected from APEDA and FiBL. Compound Annual Growth Rate (CAGR) and per cent change has been calculated for analysis. CAGR calculated by using exponential regression model to estimate trend in total exports, country wise exports and category wise exports.

Method of calculation is given below:

$$\text{CAGR} = (\text{Antilog } \beta - 1) \times 100$$

Study is divided into four sections, First section I cover Review of Literature. Section II explains growth of total exports from India and section III is based on organic exports to top countries from India. Last section is based on explanation of category wise organic exports from India.

## SECTION I: REVIEW OF LITERATURE

Chadha and Srivastava (2020) examined the trends of organic farming in India and provided world scenario from 2005 to 2018. CAGR was calculated by using exponential regression model to measure the trends in organic area, production, exports and number of producers. Coefficient of variation and per cent share of variables was also calculated. Study found organic area increased worldwide and in India also however area under wild cultivation declined in the country. Madhya Pradesh covered largest certified organic area. Sugar, oilseeds, fiber crops, cereals & millets were main crops produced in 2018-19. Study revealed that due to high cost of organic products market of organic produce laid in United States and European Union. Dhiman and Bhardwaj (2019) analyzed growth of organic farming in India with comparison to other countries and performance of different states. Study revealed Australia, Argentina and United States had majority agriculture land. India, Uganda Mexico topped the chart of organic producers. Area under organic management increased in India from 2004 to 2010. Cotton, oilseeds, fruits and vegetables crops were mainly produced. Madhya Pradesh topped the chart of certified cultivated organic area, total and wild area under certification. Hans and Rao (2018) examined nature, pattern, status, sustainability and relevance of organic farming in India. India was world's largest organic cotton exporter. Basmati, non-Basmati, oil crops were exported from India. Sustainability in agriculture included environment, health and economic profitability. Financial constraints, documentation, marketing problems were faced by Indian farmers. Technical and institutional support was required for farmers. Ummiyah *et al.*, (2017) analyzed markets

of organic farming, opportunities and challenges of organic exports. Globally, North America and Europe region demand for organic products was high whereas Latin America, Asia and Australasia were indulged in production and exports. India exported organic herbs, rice, wheat, tea, spices and cotton mainly to Europe, U.S, France, Italy and Canada. Domestically, rice, wheat, cotton, tea, coffee were marketed in metropolitan cities. Awareness regarding health, less coverage of area by chemical fertilizers and low input use technology could be seen as opportunities however standards and certification, maintaining food quality, and high prices are challenges. Riar *et al.*, (2017) examined motivation for cotton cultivation by taking Nimar valley of Madhya Pradesh for study. Authors conducted focus group discussions with farmers, extension workers, research staff and other stakeholders. 60 organic and conventional farmers randomly selected and grouped into small, medium and large farmers. Long term sustainability of cotton was major motivation for large organic farmers, maintain land for next generation was motivation for medium farmers. Small farmers were motivated to make their children farmers. Deshmukh and Babar (2015) analyzed the status and prospects of organic farming in India by calculating CAGR of area, production, yield and exports. Study revealed organic and wild area increased from 2005 to 2013. State wise Uttar Pradesh captured highest share in organic area followed by Himachal Pradesh and Madhya Pradesh. Continent wise European Union, Canada and U.S.A were main destinations of exports and country wise U.S.A. Category wise oil crops exports were highest followed by cotton and basmati rice. Lack of government policy making, insufficient supply of organic supplements, lack of market information and risk of low yield were some constraints faced by organic producers. Grover and Singh (2011) analyzed economic viability of organic wheat in Punjab by using regression analysis. Authors selected two blocks of large organic farmers Nabha from Patiala and Kotkapura from Faridkot for year of 2008-09. Results showed with one per cent increase in expenditure on farmyard manure + jeevAmrit, biodynamic and machine labor organic wheat production increased by 0.114, 0.703 and 0.556 per cent. Total variable cost on per acre cultivation of organic wheat was less compared to inorganic farming. Returns of organic farming found to be high due to high price despite lower crop yield.

## **SECTION II: GROWTH OF ORGANIC EXPORTS IN INDIA**

Agriculture sector exports have potential to contribute towards the economic growth of a country. Organic products are also a sustainable and emerging

export dimension of agriculture sector. Rising awareness among people for consumption of healthy products is raising demand of organic products worldwide. Desire for change and adoption of sustainable mean of cultivation is shifting producers to organic farming practices. India is also showing increasing trend in terms of producers and exports of organic farming. Export of organic products from India for the year of 2020-21 increased by 51 per cent (in million USD) compared to 2019-20 which is worth of Rs. 7075 crore. Total exports in quantity increased by 39 per cent to 888179 metric tons (MT) during 2020-21 (PIB, 2021). This is clear from the trend that total organic exports from India under NPOP increased around 638998 MT from 160276 MT in the year 2019-20. Table 1 indicates quantity of total exports from India.

**Table 1: Total export of organic products Quantity (In MT) under NPOP (2012 to 2020)**

<i>Year</i>	<i>Total Exports (MT)</i>
2012-13	160276.950
2013-14	177765.25
2014-15	285663.09
2015-16	263686.97
2016-17	309766.916
2017-18	458339.017
2018-19	614086.4
2019-20	638998.4
<b>CAGR (%)</b>	<b>23.12</b>
<b>Per cent Change</b>	298.68

*Source:* Authors Own Calculations from the APEDA.

*Note:* CAGR Calculated in SPSS and Excel.

**Table 2: CAGR of Total Exports India**

	<i>Beta</i>	<i>Antilog Beta</i>	<i>CAGR</i>	<i>Per cent change</i>
Country wise total export of organic products Quantity (In MT) 2012 to 2020	.208	1.2312132	23.12	298.68
Organic Exports (Million Euro) 2002 to 2018	.249	1.282742	28.27	4830.76

*Source:* Authors Own Calculations from the APEDA and FiBL, Calculated in SPSS and Excel.

There has been consistent increase in exports with CAGR of around 23.12 per cent followed by 298 per cent change for same time period. In India

2299222 hectare organic area (farmland) is under cultivation for the year of 2019 which is 1 per cent of total farmland. Table 3 depicts that organic exports from India increased from 13 million euro to 641 million euros from 2002 to 2018. Organic exports consistently increased in the given time period with CAGR of 28.27 per cent. Change in terms of percentage has been around 4830.

**Table 3: Organic Exports (in Million Euro) 2002 to 2018**

<i>Year</i>	<i>Organic Exports (Million Euro)</i>
2002	13
2003	13
2004	15
2005	17
2006	49
2007	74
2008	81
2009	87
2010	118
2011	128
2012	291
2013	291
2014	303
2015	268
2016	268
2017	456
2018	641
CAGR (%)	28.27
Per cent Change	4830.76

*Source:* Authors Own Calculations from the FiBL

*Note:* CAGR Calculated in SPSS and Excel.

### **SECTION III: ORGANIC EXPORTS TO TOP COUNTRIES**

Organic farming in India is export oriented and it is clear from the trends given in tables 3 and 4. Top ten destinations of organic produce for the year of 2019-20 are taken to analyze compound annual growth rate of exports. Table 4 and 5 shows growth rate of top ten destinations of year 2019-20. U.S.A topped the chart with 3766070 MT exports to the country in the year of 2019-20 increased from 34292 MT of the year 2012-13. CAGR of country has been 33.1 per cent followed with the highest per cent change of 996 among all countries. Second highest share in exports destination is

captured by European Union with around 175674 MT that increased from 82835 MT of 2012-13. CAGR of exports to the country has been 15.14 per cent in selected time period with 112 per cent change. Canada holds third position in exports destinations and exports to the country increased from 33645 MT to 64225 MT. Exports to the country increased till 2014-15 then showed declining trend up to 2016-17 and started increasing afterwards. CAGR of exports is 12.07 per cent throughout the time period with 90.8 per cent change of exports.

**Table 4: CAGR of Country wise Export of Organic Products under NPOP  
Quantity MT 2012-13 to 2019-20 (Rank 1 to 5)**

Country→ Year↓	U.S.A (1)	European Union(2)	Canada (3)	Switzerland (4)	Vietnam* (5)
2012-13	34292.35	82835.37	33645.8	3455.27	-
2013-14	74942.72	56946.72	38545.57	4306.56	-
2014-15	117206.1	82059.57	76236.65	4763.27	-
2015-16	994491.9	102070.8	42937.58	9072.008	-
2016-17	116595.1	124398.5	42738.97	9427.256	-
2017-18	223853.6	129546.3	82132.72	8925.166	1446.909
2018-19	334113.1	155255.1	101942.9	6199.11	3185.572
2019-20	376070	175674.4	64225.71	5192.009	3270.251
<b>CAGR (%)</b>	<b>33.10</b>	<b>15.14</b>	<b>12.07</b>	<b>8.22</b>	<b>50.38</b>
<b>Per cent Change</b>	<b>996.65</b>	<b>112.07</b>	<b>90.887</b>	<b>50.26</b>	126.01

Source: Authors Own Calculations from the APEDA.

Note: Top 10 countries of 2019 -20. \* denotes Vietnam time period taken from 2017-18 to 2019-20.

CAGR Calculated in SPSS and Excel.

CAGR of Switzerland is 8.22 per cent. Organic produce of 5192 MT exported to the country in the year of 2019-20. Exports to the country consistently increased up to 2016-17 then started declining. In past few years Vietnam made its place in top export destinations of country. Due to this reason CAGR of Vietnam calculated for the years of 2017 to 2020 that has been 50.38 per cent for three years with 126.01 per cent change for the same time period. Exports to Israel increased from around 610 MT to 253 MT and showed fluctuations in between. CAGR are 29.43 per cent. Per cent change in exports has been around 314. CAGR of exports to Australia has been 25.6 per cent with 403 per cent change. Exports to country increased from 468.26 MT to 2357.28 MT from 2012-13 to 2019-20.



**Table 5: CAGR of Country wise export of organic products under NPOP quantity MT Rank (6 to 10)**

Country → Year↓	Israel (6)	Australia (7)	New Zealand (8)	Japan (9)	Korea Republic(10)
2012-13	610.07	468.26	409.68	199.22	332.11
2013-14	312.93	749.95	599.79	309.07	143.48
2014-15	1456.295	1130.538	875.279	456.85	82.932
2015-16	1141.872	1735.402	1519.779	364.119	2095.808
2016-17	620.101	1732.227	1783.201	285.892	940.36
2017-18	1974.249	2690.152	1282.187	1073.32	1611.76
2018-19	3069.917	2130.761	1977.901	750.936	1109.594
2019-20	2531.744	2357.286	1758.116	1368.728	1292.155
<b>CAGR (%)</b>	<b>29.43</b>	<b>25.608</b>	<b>23.12</b>	<b>27.25</b>	<b>39.23</b>
<b>Per cent Change</b>	<b>314.99</b>	<b>403.41</b>	<b>329.14</b>	<b>586.86</b>	289.07

Source: Authors Own Calculations from the APEDA.

Note: Top 10 countries of 2019 -20. CAGR Calculated in SPSS and Excel.

New Zealand's CAGR has been 23.12 per cent and per cent change of exports is around 329. Share of organic products exports to the country increased from approximately 409 MT to 1758 MT. Japan hold ninth position in the export chart with 1368 MT exports to the country that increased from

**Table 6: CAGR of Country wise Export of Organic Products under Quantity (in MT) 2012-13 to 2019-20**

Country	Beta	Antilog Beta	CAGR	Per cent Change
U.S.A	.286	1.331092	33.10	996.65
European Union	.141	1.151425	15.14	112.07
Canada	.114	1.120752	12.07	90.887
Switzerland	.079	1.082204	8.22	50.26
Vietnam*	.408	1.503807	50.38	126.01
Israel	.258	1.294339	29.43	314.99
Australia	.228	1.256085	25.608	403.41
New Zealand	.208	1.231213	23.12	329.14
Japan	.241	1.272521	27.25	586.86
Korea Republic	.331	1.39236	39.23	289.07

Source: Authors Own Calculations from the APEDA. Calculated in SPSS and Excel

Note: Top 10 countries of 2019 -20. \* denotes Vietnam time period taken from 2017-18 to 2019-20.

around 199 MT. CAGR of exports has been 27.25 per cent with 586 per cent change. Korea Republic is last destination in top 10 countries. Exports to the country increased from around 332 MT to 1292 MT. CAGR of country in terms of exports has been 39.23 per cent with 289.07 per cent change in exports for time period under study.

#### **SECTION IV: CATEGORY WISE ORGANIC EXPORTS**

Category wise organic products that consistently hold majority share in the exports since 2014-15 to 2019-20 are taken for analysis. Table 7 shows category wise compound annual growth rate of organic products from India under NPOP. Processed food and oilseeds are top two exported products to the countries U.S.A, European Union, Canada, Israel, New Zealand and Japan in the year of 2019-20. Cereals & Millets hold majority share in exports to Vietnam, Switzerland and Australia followed by processed food in 2019-20. CAGR of processed food has been highest around 60.8 per cent with highest per cent change of about 1615 since 2014-15 to 2019-20. Share of processed food increased from approximately 23626 MT to 405384 MT. Exports of processed food increased consistently except for the year 2017-18. Oilseeds hold second position in terms of exports to the countries Canada, U.S.A, Israel, New Zealand and Japan in 2019-20. However CAGR of oilseeds has been negative around 1.48 per cent with negative 37 per cent change over the period of time. Reason being that share of exports declined from 160559 MT to 100815 MT. Oilseeds despite negative growth rate still holds dominant position among main products exported to other countries.

Exports of sugar increased from 19450 MT to 41940 MT since 2014-15. Sugar is second top commodity exported to the countries European Union and Japan for the year 2019-20. CAGR of sugar is 12.86 per cent with percent change of around 115. Cereals & Millets share in exports declined from 63622 MT to 48677 MT. CAGR is positive but minor 0.1 per cent with negative percent change of around 23 per cent. Spices & condiments share in exports raised to 8053 MT in 2019-20 with CAGR of 28.27 second highest among selected crops and 235 per cent change in export is observed in selected time period. Export of pulses in quantity MT increased from around 2456 to 4829 with CAGR of 7.57 per cent. Percent change has been around 89. Dry Fruits growth rate is 13.54 per cent with percent change of around 53. Share in quantity MT increased from 2416 to 3714.

**Table 7: CAGR of Category wise export of organic products under NPOP Quantity in MT (2014-15 to 2019-20)**

Year ↓	Processed Food	Oilseeds	Sugar	Cereals & Millets	Spices & Condi-ments	Pulses	Dry Fruits
2014-15	23626.18	160559.1	19450.46	63622.14	2403.8	2546.98	2416.8
2015-16	38453.88	131981.6	28654.36	44113.94	3085.505	4817.645	2464.871
2016-17	73859.65	132503.9	31396.4	35356.76	4125.68	13468.09	1558.3
2017-18	1743.09	343936.9	15950.77	52964.77	5656.88	5617.931	4270.34
2018-19	299406.3	176112.8	41119.63	61184.79	6756.16	5180.23	3804.77
2019-20	405384	100815.4	41940.89	48677.64	8053.3	4829.61	3714.48
CAGR (%)	60.80	-1.488	12.86	0.1001	28.27	7.57	13.54
Per cent Change	1615.82	-37.209	115.629	-23.4	235.02	89.62	53.69

Source: Authors Own Calculations from the APEDA

Note: CAGR Calculated in SPSS and Excel

**Table 8: CAGR of Category wise export of organic products quantity (In MT) under NPOP (2014-15 to 2019-20)**

Category	Beta	Antilog beta	CAGR	Per cent Change
Processed Food	.475	1.608014	60.80	1615.82
Oilseeds	-.015	0.985112	-1.488	-37.209
Sugar	.121	1.128625	12.86	115.629
Cereals & Millets	.001	1.001001	0.1001	-23.4
Spices & Condiments	.249	1.282742	28.27	235.02
Pulses	.073	1.075731	7.57	89.62
Dry Fruits	.127	1.135417	13.54	53.69

Source: Authors Own Calculations from the APEDA. Calculated in SPSS and Excel

Organic farming fetches several opportunities and benefits for Indian farmers in form of high premium of organic goods, which generate greater revenue. This reflects in growing production and export trends of goods from the country. Since income of people in the country is low in comparison to many developed countries. Market demand for organic products mainly lies abroad. Growing exports from the country supports this phenomenon. However there are several constraints aligned with this farming practice such as absence of supportive policy, lack of quality seeds, storage and transport system and high cost of certification in India (Barik, 2017).

## **POLICY IMPLICATION AND SUGGESTIONS**

International trade of a nation is positively affected by a sector, which contributes towards exports. This paper attempted to contribute in existing knowledge by analyzing export dynamics of organic products from India and provides insight towards trade potential of this sector. CAGR of total, country wise and category wise exports showed that there has been positive trend in growth of exports from the country except oilseeds category. Thus country has potential to grow in organic farming. Market for organic produce is dominated by developed countries and growth rate has been more than 10 per cent for top destinations except Switzerland. Increase in demand of organic goods from export destinations is reflecting importance of this sector in agriculture trade of the country. Category wise Processed Food showed high growth in demand followed by Spices and Condiments. Results reflect Indian farmers can benefit by choosing organic farming techniques, which are more sustainable and rewarding with respect to export market. Government can further support farmers by adopting such policies which can establish a link and create ease in trade between exporting and importing parties. Some schemes are already in existence to promote organic farming and provide financial assistance in the country. These are Paramparagat Krishi Vikas Yojana (PKVY) to provide support in cluster formation, training, certification, marketing and financial assistance, National Food Security Mission (NFSM) provides financial support for promotion of Bio fertilizers. Mission Organic Value Chain Development for the North Eastern Region (MOVCDNER), Capital Investment Subsidy Scheme (CISS) under Soil Health Management Scheme, National Mission on Oilseeds and Oil Palm (NMOOP) are some other schemes under which financial support is provided for organic farming (PIB, 2020) need more attention in our country.

## **CONCLUSION**

On the basis of the analysis of present study it may be concluded that exports of organic products from India has been increased. The study revealed that CAGR of total exports has been positive in terms of both million euros and million tons. This shows trend of increasing organic exports from India. Country wise growth rate of exports to top ten countries has been positive for all selected nation showing increasing exports to destinations such as U.S.A, European Union etc. Category wise processed food, Sugar, Spices and condiments, Pulses and Dry fruits shows positive growth rate over the period of time. Spices and

condiments shows minor growth rate however growth rate of oilseeds has been negative. To explore the opportunities and remove constraints of organic farming government introduced different programs. Government can further promote exports by initiating steps which can help farmers in realizing full potential of trade market.

### References

- Agricultural and Processed Food Products Export Development Authority. (2018). *National Programme for Organic Production A Training Manual*.
- Barik, A. K. (2017). Organic Farming in India: Present Status, Challenges and Technological Breakthrough. *The 3rd International Conference on Bio-Resource and Stress Management*, 84–93. <http://orprints.org/32247/1/Dr.Barik.pdf>
- Chadha, D., & Srivastava, S. K. (2020). Growth Performance of Organic Agriculture in India. *Current Journal of Applied Science and Technology*, 39(33), 86–94. <https://doi.org/10.9734/cjast/2020/v39i3331022>
- Charyulu, D. K., & Biswas, S. (2010). Economics and Efficiency of Organic Farming vis-à-vis Conventional Farming in India. *Working Paper Series, IIMA*, 1–26. <http://sa.indiaenvironmentportal.org.in/files/rnpworkingpaper.pdf>
- Deshmukh, M.S. & Babar, N. (2015). Present Status and Prospects of Organic Farming in India. *Economic Academic Research*, 3(4), 4271–4287.
- Dhiman, M. & Bhardwaj, M. (2019). Growth and Performance of Organic Farming in India: What could be the Future Prospects? *Journal of Current Science*, 20(01). <https://www.researchgate.net/publication/332080116>
- Eliazer Nelson, A. R. L., Ravichandran, K., & Antony, U. (2019). The impact of the Green Revolution on indigenous crops of India. *Journal of Ethnic Foods*, 6(1), 1–10. <https://doi.org/10.1186/s42779-019-0011-9>
- Grover, D. K., & Singh, I. P. (2011). Economic Viability of Organic Farming : An Empirical Experience of Wheat Cultivation in Punjab. *Agricultural Economics Research Review*, 24(December), 275–281.
- Hans, V.B., & Rao, R. (2018). Organic Farming for Sustainable Development in India. *ACTA Scientifc Agriculture*, 2(12), 96–102. <https://actascientific.com/ASAG/pdf/ASAG-02-0267.pdf>
- IFOAM- Organics International, (2021). *Definition of Organic Agriculture*. Retrieved from <https://www.ifoam.bio/why-organic/organic-landmarks/definition-organic>
- Press Information Bureau.(2020, September 18). *Organic Farming in the Country*. Retrieved from <https://pib.gov.in/PressReleasePage.aspx?PRID=1656146>

- Press Information Bureau. (2021, April 27). *India's Organic Food Products Exports rise by more than 50 per cent in 2020-21 despite COVID-19 Challenges*. Retrieved from <https://pib.gov.in/PressReleaseDetailm.aspx?PRID=1714373>
- Riar, A., Mandloi, L. S., & Poswal, R. S. (2017). *What socially motivates farmers to grow organic cotton in central India ?* 9–12.
- Roychowdhury, R., Gawwad, M. R. A., Banerjee, U., & Bishnu, S. (2013). *Status , Trends and Prospects of Organic Farming in India : A Review*. 2(2), 38–48.
- Ummyiah, H., Narayan, S., Kumar, P., Nabi, A., Ajaz, M., & Magray, M. (2017). Export of organic products : Opportunities and challenges. *Journal of Pharmacognosy and Phytochemistry*, 6(6), 1084–1088.
- Willer Helga, Trávníček Jan, M. C. and S. B. (Ed.). (2021). *The World of Organic Agriculture : Statistics and Emerging Trends 2021*. Research Institute of Organic Agriculture FiBL and IFOAM – Organics International.
- World Bank, (2021). *World Development Indicators*. Retrieved from <https://databank.worldbank.org/source/world-development-indicators>

### **Web Sources**

- <https://apeda.gov.in/apedawebsite/organic/data.htm>
- <https://databank.worldbank.org/source/world-development-indicators>
- <https://www.ifoam.bio/why-organic/organic-landmarks/definition-organic>
- <https://statistics.fibl.org/world/key-indicators.html>