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An Importance of Sustainable Improvement on Organic Forming in India

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ABSTRACT –

Food quality and safety are two critical issues that are gaining growing attention among general consumers. Because of increased pesticide residue, more nitrate, heavy metals, hormones, antibiotic residue, and genetically engineered organisms, conventionally farmed foods have significant negative health impacts. Furthermore, conventionally farmed foods are less nutritious and contain fewer antioxidants. Because of potential health advantages and food safety concerns, demand for organically cultivated foods has expanded in recent decades in the hunt for safer food. Organic farming protects the environment by lowering pollutants, soil degradation, focusing on biological production, and preserving soil from erosion, among other things. This farming method promotes soil fertility without inflicting any harm, unlike traditional agricultural methods. Organic agriculture is gaining popularity across the world because it may improve agricultural efficiency, agricultural revenue, food safety, and environmental protection. In addition, the goal of this paper was to analyse the situation of organic farming in India. Organic farming has the potential to supply high-quality food while having minimal influence on soil, environmental, and human health; nevertheless, large organic farms must produce enough food to feed India's entire population. The current study will aid future research and raise awareness about the advantages of organic farming as well as the advantages of organic food production.

Keywords **–** Organic Farming (OrF), Sustainable, Safety, Organic Food

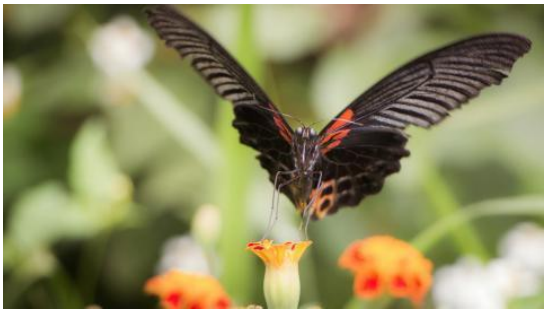
1. INTRODUCTION

In India, population growth has always been a serious issue. Today's fast urbanisation, improved lifestyle, and higher food consumption pattern have resulted in an increase in food demand in the country. As a result, higher food output is critical to maintaining food security and meeting consumer demand. It was for this reason that the Green Revolution was implemented in the 1960s. To increase agricultural productivity, farming adopted contemporary methods, technology, and significant use of chemical fertilisers and pesticides. However, such agricultural intensification resulted in soil fertility loss, pollution of soil, water, and air, and detrimental effects on human health and the environment. Today, the average consumer in India places a premium on food quality and safety. People are becoming more interested in eco-friendly and safe food production procedures as they become more aware of how foods are grown historically. Organic farming has emerged as one of the finest options for both farmers and consumers, since it also employs sustainable farming techniques. It is becoming more popular as a result of its nutritional and health advantages. It is worth noting that about 2.78 million hectares of land in India are utilised for organic farming. Northbourne coined the word "organic" and the notion of "organic farming" in the 1940s. Organic farming is a production practise that does not employ chemical fertilisers, synthetic pesticides, or synthetic substances. Instead, it encourages the use of natural fertilisers, biological pest management created from plant or animal waste, organic manure, and other environmentally friendly farming practises. The primary goal is to reverse the effects of the green revolution and restore ecological equilibrium.

The International Federation of Organic Agriculture Movements - IFOAM - proposes four fundamental principles for organic farming: health, ecology, fairness, and care.

- Health - Organic farming should promote soil health, therefore maintaining plants, animals, humans, and the planet.

- Ecology - Organic farming should assist to preserve natural cycles and living systems.



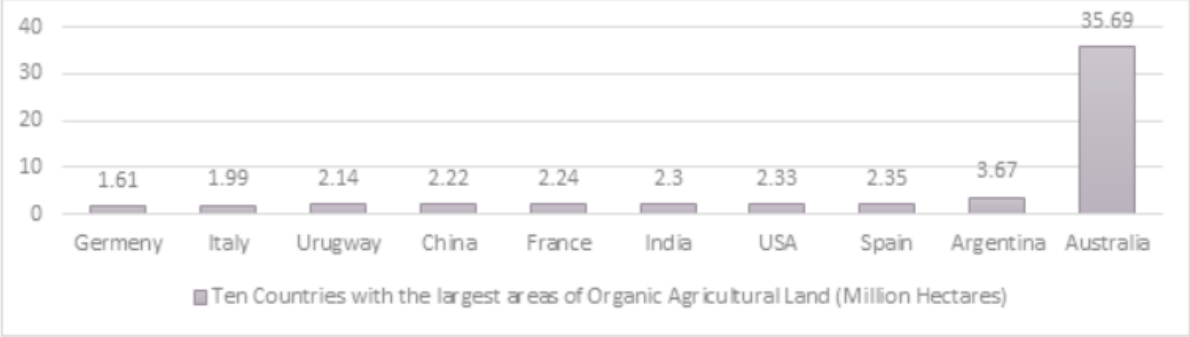
- Fairness - It should be based on solid partnerships that promote environmental, social, and economic justice.

- Care - Organic farming should be done with care, taking into account the environment and future generations.

The major goal is to encourage large-scale high-quality food production by improving soil fertility, minimising pollution, avoiding the use of pesticides and synthetic fertilisers, maintaining genetic variety, and promoting natural farming system cycles.

Organic farming guarantees that nature remains clean and abundant. We will observe a bustle of animal, bird, and insect activity if we visit an organic farm. According to research, there is around 30% more wildlife and plants in ecological production areas than near traditional farming. This is due to the absence of pesticides and the usage of significantly less fertiliser. The Covid-19 epidemic has altered the perspective of organic food, with the emphasis being on safety and nutritional food to create a robust immune system. It is time to talk about nutritional security rather than just food security (which consist only carbohydrates). Organic food is viewed as the favoured choice among a plethora of healthy food alternatives. As a result, organic food has seen an increase in popularity since the outbreak of the epidemic. Organically cultivated foods typically include greater amounts of antioxidants, certain micronutrients, no hazardous chemicals, pesticides, or fertilisers, a superior flavour, and, most importantly, organically grown produce contributes to the planet's sustainability and ecological balance.

According to the FiBL study 2021, India is one of just 187 nations that use organic agriculture. With 2.30 million acres, India accounts for 30% of the world's total organic producers. Total organic agriculture area, 27,59,660 farmers (11,60,650 PGS and 15,99,010 India Organic), 1703 processors, and 745 dealers Of recent years, there has been a significant proportional rise in organic agricultural acreage across the country. Organic agriculture is practised in 187 countries, with at least 3.1 million farmers managing 72.3 million hectares of agricultural land organically. Australia has the greatest organic agricultural land (35.69 million hectares), followed by Argentina (3.63 million hectares) and Spain (2.35 m hectares). Organic agricultural land has increased across the board. In 2019, global sales of organic food and drink exceeded 106 billion euros. According to the most recent FiBL report on organic agriculture in the world, organic farmland expanded by 1.1 million hectares, while organic retail sales increased. Aside from organic agriculture, there are other sections of organic land dedicated to organic activities. The majority of them are natural gathering sites, as well as livestock and beekeeping regions. Aquaculture, woodland, and grazing grounds are examples of non-agricultural areas. There are 35 million hectares in all. And the total area of organic lands was 107.4 million hectares (Organic World 2021).



Organic farming is still in its infancy in India. As of March 2019, over 2.30 million hectares of cropland were under organic agriculture. This equates to 2% of the country's 140.1 million hectares net sown area. Because a large portion of organic farming is concentrated in a few states, a few states have taken the lead in boosting coverage. Madhya Pradesh leads the list with 0.76 million hectares of organic farming area, accounting for more than 27% of India's total organic cultivation area. The top three states, Madhya Pradesh, Rajasthan, and Maharashtra, account for over half of the organic farming area. The top ten states account for almost 80% of total organic agricultural area. The Green Revolution of 1960 altered the agricultural landscape by introducing farmers to high-yielding plants and fertilisers in order to ensure food security. Increasing output secured profit, but the land eventually became barren owing to the over use of fertilisers, rendering the soil infertile, and pesticides, rendering the product unsafe to ingest.

There are several reasons behind the need for organic farming in India -

- The organic food market is rapidly expanding, assuring significant profitability.
- Food security must be addressed in light of the expanding population and dwindling quantity of resources, which is why production must be increased in a practical and sustainable manner.
- Maintaining a clean and green environment is equally crucial, as is environmental sustainability, which may be achieved through organic farming.
- There needs to be an improvement in health since consumption may lead to many diseases such as cancer and infertility, which occurs when the poisonous residue stays in the body, thus human and animal safety is of the highest importance.
- Because of the threats posed by current agricultural techniques, striking a balance between the environment and livelihood has never been more crucial.

Table-Indian Organic Agriculture Statistics for last 10 years (2011-12 to 2020-21)

Sl No.	Year	Area Under Organic Cultivation		Number of farmers		Organic Production (MT)		Biofertilizer production		Total Organic Manure Production (MT)
		NPOP	PGS-India	NPOP	PGS-India	NPOP	PGS-India	Liquid (in KL)	Career Based (MT)	
1	2011-12	5550405	0		0		0	40324.21		34863600
2	2012-13	5211141	0		0		0	46836.82		41157700
3	2013-14	4719816	6064.14		5809		23612.42	2922.38	53838.3	22941500
4	2014-15	5690000	9249.39		11118		1079*	4054.56	80696.45	22986200
5	2015-16	5710384	19281.91		19355		6321660.53	6240.92	88029.3	25478600
6	2016-17	4452987	96291.6		173846		8760810.96	7526.33	109020.11	28029900
7	2017-18	3566538	6455.29		84618		17132676.09	9033.06	121066.54	33872000
8	2018-19	3428639	124989.9		166571		989255.06	22555.27	70417.77	41100974
9	2019-20	3669801	222369.55		365253		2047535.9	30105.94	79446.61	60594104
10	2020-21	4339185	7568.3	1599010	12074	3496800.34	3399520.21	42239.94	192329.29	42940832

Source:

as per IFOAM FIBL The world of Organic Agriculture, Statistics and emerging trends for respective years

PGS-India Web Portal

*As per year wise certificate data available on PGS-India portal dashboard

NCOF Annual report for respective years

CONSOLIDATED ORGANIC AGRICULTURAL STATISTICS FOR THE YEAR 2020-21 (https://apeda.gov.in/apedawebsite/organic/data.htm)

Data Not avilable

Data from source yet to identified

STATE WISE PRODUCTION OF ORGANIC FERTILIZERS IN INDIA (2020-21)

Sl. No.	State	City Compost (A)	Organic manure (B)	Vermi0compost (C)	PROM (D)	Bioenriched Organic Manure (E)	Rural Compost (F)	Farm Yard Manure (G)	Total Manure MT {A+B+C+ D+E +F+G)	Deoiled Cake MT
1	Andhra Pradesh	0	8.02	336.00	0	88.5	0	0	432.52	4108.00
2	Arunachal Pradesh	0	0	0	0	0	0	0	0	0
3	Assam	2350	49100	107731.22	1702	803.6	1312	11945	174943.82	121
4	Bihar	0	29215.1	75556.95	0	0	0	0	104772.05	0
5	Chhattisgarh	3998	829643	76150.46	0	0	515333	1002801	2427925.5	0
6	Delhi	21677	269	1098	0	0	0	0	23044.00	0
7	Goa	0	00	460	0	0	0	0	460.00	0
8	Gujarat	44236.56	87295.6	2128	27446.18	3500	4290	125450	294346.338	7130
9	Haryana	0	223.15	0	4576.410	0	0	0	4799.54	0
10	Himachal Pradesh	0	0	22.00	0	0	0	0	22.00	0
11	Jammu & Kashmir	0	0	0	0	0	0	0	00.00	0
12	Jharkhand	6196	5	360	40	4	0	0	6605	0
13	Karnataka	68824	183769	31355	14704	15092	1011125	37542874	38867743	2031
14	Kerala	9885.88	26038.75	752.5368	144	6489.032	312.6	356.89	43979.68	2330.25
15	Madhya Pradesh	5436.7	28377	25520.9	11140.9	0	0	0	70475.4	0
16	Maharashtra	42231.00	34909.00	13312.00	40993.00	0	0	0	131445.00	7678.3
17	Manipur	0	100	0	0	50	0	0	150	0
18	Meghalaya	0	0	0	0	0	0	0	0	0
19	Mizoram	0	0	6	0	0	0	0	6	0
20	Nagaland	0	15015	1060.5	0	0	12726	52520	81321.5	0
21	Odisha	13153.5	12,102	17064.5	680	785	0	5565	49,350	0
22	Punjab	36005.22	1458.66	545	6116.98	37.22	0	0	44163.08	236.47
23	Rajasthan	17870	2960	12425	11442	70	0	0	44767.00	0
24	Sikkim	0	0	0	0	0	0	0	0	0
25	Tamil Nadu	57456.8	55461.55	4451.042	588.9816	157.7	324149	0	442265	20138
26	Telengana	24706.00	1197.1	29.121	927.3	230.0	0	0	27134.00	0
27	Tripura	0	0	522.015	383.05	85.151	0	0	990.216	0
28	Uttar Pradesh	0	7703	131	7614.75	17789.49	0	0	33238.24	0
29	Uttarakhand	2100	396.64	0	3462.63	0	0	0	5959.27	2700
30	West Bengal	50750	261	2343.09	810.7	7983.84	0	114.69	59294.32	0
31	Chandigarh	0	0	0	0	0	0	0	0	0
32	Puducherry	0	0	0	0	0	600	600	1200	70
	Total	**406876.66**	**1,365,507.57**	**373360.3348**	**132772.8816**	**53077.033**	**1869847.6**	**38742226.58**	**42,940,832.474**	**46543.02**

Source : Data received from states.

Living soil can be maintained by continuous incorporation of crop and weed biomass, use of animal dung, urine-based manures (FYM, NADEP, vermicompost), biofertilisers and bioenhancers, special liquid formulations (like vermiwash, compost tea, etc.) during the crop's duration. Crop leftovers and livestock excreta, as a general rule, should be returned to the plot, either directly or indirectly. As a strategy, the amount of biomass removed from an organic farm for human food and fibre, cow feed, or firewood should be replaced with any other bio-waste on the farm. Mineral grade rock phosphate and lime can also be supplied to phosphorous-deficient and acidic soils, either directly to the field or by compost addition. Compost may be improved further by adding biofertilizers, microbial inoculants, and other ingredients. Unique composts such as biodynamic compost, cowpat pit compost, biodynamic preparations such as BD-500 and BD-501, and special formulations such as Panchgavya, Dashgavya, Biosol, and others are also beneficial and assure maximum production. The use of EM formulation has also been shown to be useful in soil enrichment and compost production. Concentrated manures (combination of oilcakes, chicken manure, and rock phosphate) can also be an appropriate low-cost manuring solution for high nutrient-demanding crops and intermittent soil enrichment.

2. NEED OF ORGANIC FARMING

Organic farming is a farming strategy that has been used in India since ancient times and is primarily targeted at sustainable agricultural output in an eco-friendly, pollution-free environment. Organic agriculture systems maintain the ecosystem and ecology alive and well by harnessing desirable agricultural production for human use. The environment is prioritised in organic production by using naturally available resources as inputs, such as organic wastes (crop, animal and farm wastes, aquatic wastes) and other biological materials, as well as beneficial microbes (biofertilizers/bio control agents), to release nutrients to crops and protect them from insect pests and diseases, resulting in increased agricultural production.

USDA DEFINITION: Organic farming is a system that avoids or largely excludes the use of synthetic inputs (such as fertilisers, pesticides, hormones, feed additives, and so on) and relies on crop rotations, crop residues, animal manures, off-farm organic waste, mineral grade rock additives, and biological systems of nutrient mobilisation and plant protection to the greatest extent possible.

FAO DEFINITION: Organic agriculture is a distinct production management system that promotes and improves agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity, through the use of on-farm agronomic, biological, and mechanical methods in the absence of all synthetic off-farm inputs.

The burden of feeding the expanding population demand on agriculture involves not only maintaining ongoing agricultural production but also increasing it in a sustainable manner. Modern conventional farming, which employs costly chemicals and synthetic inputs, is now confronted with high input costs and diminishing returns surpluses.

Organic agriculture and conventional agriculture are two distinct agricultural methods.

Organic Farming	Conventional Farming
Decentralization of resources	Centralization on limited sources
Independence from monitory inputs	Dependence on monitory inputs
Community participation and healthy competition	Competition only for maximum production by individuals
Harmony with nature for sustainable production	Dominance on nature for maximum output
Ecological diversity	Monopoly with limited crops
Restraint and tolerance	Exploitation and exertion

Component	Organic Farming	Conventional Farming
Land exhaustion	Use of natural resources to improve soil health.	Dependence on synthetic chemicals for primary nutrients.
Fertilisers	Only fertilizers obtained through plant based or biological sources are used	Synthetic chemicals used
Nutrient quality	Healthy and nutritive production	Significant loss of nutrient quality in produce.
Impact on soil	Healthy soil with sustainable production potential	Ignorant about soil health
Impact on the environment	Harmony with ecology	Toxic effect on ecology.
Health safety	Production system is healthy for every component of ecology.	Detrimental to health, even for primary consumer.
Farming methods	Mix farming	Focused on crop production .
Lifestyle change for farmers	Towards sustainability...	Short-sighted approach...

There are two kinds of organic farming.

(a) Pure organic farming - In pure organic farming, any artificial chemical is avoided. Fertilizer and insecticides are obtained from natural sources in the process of clean farming. It is referred to as pure organic farming. Pure organic farming yields the highest yields.

(b) Integrated organic farming - Integrated organic farming includes integrated nutrition management as well as integrated pest control.

There are various approaches used in organic farming in India.

- Soil management - In India, the fundamental approach of organic farming is soil management. Soil loses nutrients during agriculture, and fertiliser levels fall. Soil management refers to the practise of replenishing soil with all required nutrients. Organic farming makes use of natural methods to improve soil fertility. It makes use of microorganisms found in animal faeces. The bacterium contributes to the soil becoming more productive and fruitful. Organic agricultural practises begin with soil management.
- Weed management - The primary goal of organic farming is to eliminate weeds. Weeds are undesired plants that grow alongside the crop. Weeds Sticking to soil nutrients had an impact on crop productivity. There are two strategies for dealing with weeds. Moving or cutting - Cut the weed during this operation. Mulching is a method in which farmers put a plastic film or plant debris on the soil's surface to prevent weed development.
- Crop diversity - Different crops may be cultivated simultaneously using this technology to suit the expanding demand for crops. Crop diversification is a well-known organic farming strategy in India.
- Chemical management in farming - Agricultural farms include both beneficial and hazardous species that have an impact on the farms. To safeguard crops and soil, organism development must be managed. Natural or less chemicals, herbicides, and pesticides are used in this method to preserve soil and crops. To manage other species, proper upkeep is essential across the region.
- Biological pest control - This approach employs the use of live organisms to manage pests, either with or without the use of pesticides. Organic farming techniques are used by Indian farmers in agriculture.

The Benefits of Organic Farming:

- Organic farming in India is particularly cost effective since it does not rely on expensive fertilisers, pesticides, or HYV seeds to sow crops. It has no costs.
- A farmer can achieve a strong return on investment by using cheaper and local inputs. One of the most significant advantages of organic farming in India.

- Organic products are in high demand in India and throughout the world, and they may earn more money through export.
- Organic items are more nutritious, flavorful, and healthy than chemical and fertilizer-based ones.
- Organic farming in India is particularly eco-friendly since it does not utilise fertilisers or chemicals.

These are some of the advantages of organic farming, demonstrating that it is lucrative for everyone. To support organic farming in India, we need to raise knowledge about the benefits of organic farming.

Organic Farming's Drawbacks:

- Organic farming in India offers fewer options, and off-season crops are few.
- In the early years, organic agricultural goods are scarce. Farmers are having difficulty accommodating mass output.
- The biggest drawback of organic farming is a lack of product promotion and inadequate infrastructure.

Reasons to Support Organic Agriculture:

The world's population has reached record levels, making it incredibly difficult to feed everyone. Other negative externalities produced by the usage of fossil fuel-based chemicals such as fertilisers, insecticides, and pesticides include pollution and climate change. Similarly, the necessity of the hour is for sustainable food growing and production.

India's Organic Farming (OrF) Challenges:

- Lack of Awareness - The most significant barrier to OrF growth is farmers' lack of understanding of the OrF and its potential advantages.
- Marketing Issues - Before organic crop production can commence, its marketability over conventional produce must be established. Failure to acquire a premium price for the produce, at least in the early phases, is a setback.
- Biomass Shortfall - There may be a shortage of needed amounts of nutrients, which may simply be insufficient to satisfy the needs.
- Inadequate Infrastructure Support- Despite the approval of the NPOP, state governments have unable to develop a viable implementation mechanism and policies. The certification agencies are insufficient.
- High Input Costs - Organic input costs higher than industrially generated agrochemicals used in the traditional agricultural method.

Measures that are required:

Financial assistance:

- Substantial financial assistance is required to promote OrF.
- OrF does not benefit from government subsidies in India.
- In the case of a loss, an OrF programme must provide full compensation to the farmers, both in cash and in kind.

Market development:

- It is an important aspect in promoting domestic sales.
- The government should play a major role in this direction by assisting producer and consumer organisations in marketing their products.

Awareness:

A robust campaign is required to emphasise the advantages of OrF over traditional farming and raise awareness among farmers and consumers.

Crop identification:

Crop identification is critical for OrF. Cotton farming in rainfed areas, for example, or soybean cultivation in Madhya Pradesh, might have enormous potential.

Certification and marketing for organic products:

In India, the demand for organic produce is progressively increasing, and customers are seeking for certified items to ensure the quality of organic produce. In India, there are two types of certification systems: 1. the Third Party Certification (NPOP) system, which is administered by APEDA, Ministry of Commerce and is primarily focused on exports, and 2. the PGS-INDIA certification system. PGS-India is controlled by the Ministry of Agriculture and Farmers Welfare and is mostly focused on the local / domestic market. Third-party certification carries hefty costs and requires additional documentation, therefore small and marginal farmers are unable to give certification. Participatory Guarantee System (PGS)-INDIA organic certification system was launched in 2011 by Department of Agriculture and Cooperation & Farmers Welfare, Government of India, as an alternative to Third party (NPOP) certification system, to make it more easy, affordable, and simple system of certification that can be accessible by more number of small and marginal farmers to adopt certification and further sale in domestic market. The National Centre of Organic Farming (NCOF), Ghaziabad, and its five Regional Centres (Ghaziabad (HQ), Bangalore, Nagpur, Bhubaneswar, and Imphal, as Zonal Councils, are primarily in charge of implementing the programme. NCOF is a PGS-INDIA Secretariat of the PGS-INDIA System, and the Director, NCOF, as the Executive Secretary, is responsible for the implementation of all PGS-INDIA programme activities in accordance with PGS rules.

CONCLUSION

Organic agriculture is the only way to cultivate the land and regenerate the soil by returning to our original farming methods, which are free of chemicals, pesticides, and fertilisers. Choosing not to utilise chemicals, synthetic materials, pesticides, and growth hormones to produce high nutritional quality food in suitable amounts is a feasible step toward sustainable development.

Farmers in India have been tilling their soil without the use of pesticides from time immemorial, depending mostly on organic leftovers, cow dung, composts, and so on. This is also in line with SDG 2, which aims to "eliminate hunger, ensure food security and enhanced nutrition, and promote sustainable agriculture."

Organic farmers may soon be reclaiming their due place in the global agriculture trade, thanks to increased capacity and producer knowledge. In a globe battered by the COVID epidemic, demand for safe and healthy food is increasing, and now might be an excellent time to seize for a win-win scenario for our farmers, customers, and the environment.

REFERENCES

1) et. al., D. M. R.. (2021). A PAPER ON SUSTAINABLE ORGANIC FARMING IN INDIA. International Journal of Modern Agriculture, 10(2), 1080 - 1088.

2) Dileep Kondepati. "Research Paper on Organic Farming". Acta Scientific Agriculture 3.2 (2019): 92-93.
3) K. M. Nielsen, "Organic farming," in Encyclopedia of Ecology, 2018.
4) F. P. Carvalho, "Pesticides, environment, and food safety," Food and Energy Security. 2017, doi: 10.1002/fes3.108.
5) S. Maitra, T. Shankar, D. J. Gaikwad, J. B. Palai, and L. Sagar, "Organic Agriculture , Ecosystem Services and Sustainability : A Review," vol. 9, no. 4, pp. 370-378, 2020.
6) J. Forman et al., "Organic foods: Health and environmental advantages and disadvantages," Pediatrics. 2012, doi: 10.1542/peds.2012-2579.
7) J. P. Reganold and J. M. Wachter, "Organic agriculture in the twenty-first century," Nature plants. 2016, doi: 10.1038/nplants.2015.221.
8) H. M. Chandrashekar, "Changing scenario of organic farming in India: An overview," Int. NGO J., 2010.
9) Indian Brand Equity Foundation, "Food processing," J. Agric. Food Chem., vol. 3, no. 6, p. 495, 1955.