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Research Article

Nature, Natural, Organic Farming's for Sustainable Eco-Friendly Agriculture Development-A Global Perspective and Policies

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Abstract

Economics rules the world with intellectual tool. Traditional Farming is gig economy and heterodox economy. Globally, Nature, Natural and Organic farming is a modern and a sustainable form of agriculture that provides consumers fresh natural farm products. This study analyzes the growth, potential, principles of Nature, Natural and Organic Farming's and suggest strategies and policies for Sustainable Eco-Friendly Agriculture development. The study employed meta-analysis, scientific and futuristic approach. The results show that "no fertilizer" farming system and agricultural practices align with "laws of nature "called Nature Farming. In Natural Farming No chemical or organic fertilizers added and in organic farming Organic fertilizers and manures like compost, vermicomposting, cow dung etc. are added. The results show that in the world 187 countries are involved with organic agriculture with 72.3 million hectares. The share of organic agriculture is 1.5% of total agricultural land. The top 3 countries are Liechtenstein, Austria, Sao Tome and Principe. The total number of producers are 3.1 million. The organic market for the producers are worth of 106.4 Billion Euros in the world market. The top three organic markets are USA, Germany, France show that organic market is increasing as the consumer demand keeps increasing. By the year 2020, 108 countries are with organic regulations and 719 affiliates with IFOAM organic international. Region wise organic land distribution is 72.3 M. ha in the world, of which Oceania has 35.9 Million ha, Europe 16. 5 million ha, and 8.3 million ha in Latin America in 2019. Continent wise Growth of the organic agricultural land during 1999-2019, shows that Oceania's organic agriculture land increased drastically from 11.4 million Hectares in 2011 to 35.9 million Hectares by 2019. Worldwide sales of organic food from 1999 to 2020, shows that the sale of organic food has increased from 15.2 billion U.S. dollars to 120.65 billion U.S. dollars indicating the significance of organic food and its promising future. Few changes or developments within organic farming can lead to natural framing or ZBNF. By clearly understanding the principles of organic farming, practices can be defined to its true potential for transformation and thus contributing to sustainable agriculture. Whether organic or ZBNF or Nature farming, agriculture still continue global expansion and can be determined by its financial outcomes compared to each other. Policy instruments based on Knowledge is needed to create a favorable environment for education, outreach and innovation in agriculture. Four sustainability goals of Economics, Environment, Production and Social Wellbeing encourages researchers and farmers to innovate and do not limit them. There are numerous obstacles that policymakers must overcome in order to foster the expansion of organic farming and other cutting-edge production methods that become truly sustainable, however, there may be considerably more major consequences for food and ecological security. To overcome these challenges and accomplish, this requires utilizing the full potential of sensible policies, technological, socioeconomic, agricultural, and public involvement.

Keywords: Nature; Organic Farming's; Eco-Friendly; Agriculture Development

Introduction

Importance of topic

Economics rules the world with intellectual tool. Traditional Farming is gig economy and heterodox economy. Globally, Consumers may get fresh, natural agricultural products thanks to the contemporary, sustainable agriculture of Nature, Natural and organic farming. Natural farming, often referred to as traditional farming, integrates crops, trees, and livestock with functional biodiversity and is regarded an Agro-Ecology based diversified farming system which uses no chemicals. In recent decades, organic farming has drawn a lot of attention as a means of sustaining agricultural output. In addition, it has been crucial in addressing the environmental damage caused by conventional agricultural practices. Organic farming not only yields high-quality, nutritious foods but also enhances the soil's fertility and quality [1]. According to a 2008 UN research based on the analysis of 114 African studies, organic farming produces twice as much as conventional farming (UNEP-UNCTAD, n.d.). Most consumers believe organic food to be safer and healthier than conventionally produced food, particularly in industrialized countries [2]. Additionally, wealthy consumers frequently believe that organic farming is better for the environment, climate change mitigation, and animal welfare [3]. Organic farming, especially in Europe, has such a favourable public perception that it is frequently promoted as the model for sustainable agriculture [4]. Organic farming is an agricultural method that supports healthy products devoid of ingredients that could harm people or the environment. Among these, but not restricted to, are commercial pesticides, insecticides, fertilisers, clones, GMOs, chemical drugs, hormones, growth-stimulants, etc. Organic agricultural practises adhere to the four fundamental principles of health, ecology, fairness, and caring [5].

What is nature farming?

In 1936, Mokichi okada, the founder of Church of Messianity established a "no fertilizer" farming system called Nature Farming. An agricultural system, where agricultural practices align with "laws of nature" is called nature farming. This method facilitates natural bio diversity maintenance by encouraging complexity of micro flora and fauna, adapting to sustain along with food plants. This Nature farming is sometimes used as an alternative farming Philosophy of Masanobu Fukuoka. He is a Japanese farmer introduced "The Fukuoka Method", "The natural way of farming" or "Do-Nothing Farming"

International Nature Farming Research Centre in Nagano, Japan established following theories

- Soil is polluted and power of production is weakened by fertilizers
- Excessive use of fertilizers leads to pest outbreak
- Nutritional conditions inside the plant body attributes to resistant and susceptibility to disease incidence.
- Products such as vegetables and fruits produced from nature farming tastes better than those from chemical farming.

What is natural farming?

Natural farming, often referred to as traditional farming, integrates crops, trees, and livestock with functional biodiversity and is regarded an Agro-Ecology based diversified farming system which uses no chemicals.

According to FAO, United Nations, A series of farming techniques known as "zero budget farming" employ neither credit to agriculture nor chemical fertilizers. This is another attempt to increase the viability of production in small-scale farming. The zero-budget farming concept encourages farmers to minimize their outlays on farming and reduces their reliance on loans and purchased inputs. Farming is done in sync with nature and not by using chemicals It encourages use of own seeds and locally available natural fertilizers.

In 2009, FAO, IFOAM and the United Nations Conference on Trade and Development (UNCTAD) along with IFOAM and FAO started the Global Organic Market Access (GOMA) project. The main objective of GOMA is to simplify the trade flow process of various organic products through guaranteed systems, also to extend co-operation in bringing harmony and equivalence in the process.

Farmers first complied with the standards for certification without having a thorough understanding of the certification procedure itself. To them, organic certification was just another "first world" restriction, expensive enough that only buyers from abroad only could afford it (The organic standard, 2001).

Organic agriculture has been described in various ways by various departments as given below

United States Department of Agriculture (USDA) defined "Organic farming is a system which to the feasible extent rely upon off-farm organic waste, crop rotations, animal manures, crop residues, biological system and mineral grade rock additions for nutrient mobilization and plant defense. The usage of synthetic inputs (such as fertilizers, pesticides, hormones, feed additives, etc.) is avoided or substantially reduced under this approach."

Food and Agriculture Organization (FAO) reported that "by utilizing on-farm agronomic, biological, and mechanical approaches in place of all synthetic off-farm inputs, organic agriculture is a distinctive production management system that maintains and increases agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity."

The International Federation of Organic Agriculture Movements (IFOAM) stated, "Sustainable soil, ecology, and human health are all benefits of organic agriculture. Instead of using inputs with negative impacts, it relies on biological processes, biodiversity, and cycles that are tailored to local conditions. Organic farming blends science, creativity, and tradition to benefit the environment as a whole, encourage equitable relationships, and improve everyone's quality of life."

National Program on Organic Production (NPOP)- India have given "Without the use of artificial external inputs like chemical fertilizers and pesticides, organic agriculture is a system of farm design and management that can achieve sustainable productivity."

Organic farming can be defined as 'farming in spirits of organic relationship. System in which everything is connected with everything else' (Sagar M. and A Zaman,2015).

Objectives

- To analyze the concepts, growth, potential, principles of Nature, Natural and Organic Farming practicing in the world.
- To analyze the strategies and policies for Sustainable Eco-Friendly Agriculture development
- To formulate the recommendations of enlightening policies of selected countries in the world.

Methodology

This is meta-analysis, scientific and futuristic approach of Nature, Natural and Organic Farming practicing in the world and suggest the strategies and policies for Sustainable Eco-Friendly Agriculture development. The entire study considers secondary data sources such as FAO, USDA, NITI Aayog, FiBL Survey 2021, Statista 2022, IFOAM and world reviews. Meta-analysis, scientific approach and political policy analysis were done to validate the results. The study suggests the policy measures for Sustainable Eco-Friendly Global Agriculture development (Figure 1).

Review of Nature, Natural and Organic farming's → Meta, Scientific & Political Global Policies analysis →Strategies and Polices of Developed and Developing Nations → Formulation of Policies for Enlightening Agriculture towards Sustainability and Resilience.

Figure 1: Research framework of the current study (*M. B. Dastagiri and P V Naga Sindhuja,* 2021).

Results

Differences in nature, natural and organic farming's.

What is nature farming?

In 1936, Mokichi okada, the founder of Church of Messianity established a "no fertilizer" farming system called Nature Farming. An agricultural system, where agricultural practices align with "laws of nature" is called nature farming. This method facilitates natural bio diversity maintenance by encouraging complexity of micro flora and fauna, adapting to sustain along with food plants. This Nature farming is sometimes used as an alternative farming Philosophy of Masanobu Fukuoka. He is a Japanese farmer introduced "The Fukuoka Method", "The natural way of farming" or "Do –Nothing Farming".

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The key difference between Natural farming and Organic farming shown in Table1. The results show that in Natural Farming No chemical or organic fertilizers added and in organic farming Organic fertilizers and manures like compost, vermicomposting, cow dung etc. are added. Natural farming and Organic farming share few similarities as follows:

- Both systems discourage usage of chemicals like pesticides, fertilizers and are hence poison free farming methods
- They also promote non chemical pest control methods.
- Both systems encourage farmers to use local breeds of seeds, native varieties of vegetables, grains, pulses and other crops

Particular	Natural Farming (ZBNF)	Organic Farming
Fertilizers	No chemical or organic fertilizers added	Organic fertilizers and manures like compost, vermicompost, cow dung etc. are added
Farm Operations	Ploughing, tillage, manuring, weeding not required or done	Ploughing, tillage, manuring, weeding required and done regularly based on crop requirement
Cost of production	Less as the cultivation mirrors natural eco systems	High due to requirement of bulk manures
Impact on environment	No impact as the farming system moulds to local natural eco systems.	Ecological impact on surrounding environments.

Table 1: The key difference between Natural farming and Organic farming.

With all its similarities and differences there arises a question, is this natural farming method or ZBNF really possible?

Global perspective

Organic agriculture's key indicators among the top countries in World in 2019 is shown in Table2. The results show that 187 countries are involved in organic agriculture with around 72.3 million Hectares of land throughout the World. Australia, Argentina and Spain are the top three countries pertaining to organic Agriculture land. The share of organic agriculture to total agricultural land is 1.5% and the top three countries are Liechtenstein, Austria, Sao Tome and Principe. The total number of producers are 3.1 million, shows that the number of organic producers are increasing since 1999. The top 3 Organic producer countries are India, Uganda, Ethiopia. The organic market for the producers are worth of 106.4 Billion Euros in the world market. The top 3 countries in organic markets are USA, Germany and France shows that organic markets are increasing as the consumer's demand for organic products is increasing. The number of countries with organic regulations are 108 and 719 affiliates with IFOAM organic international.

Distribution of organic land - region wise

World organic farmland region wise in 2019 is given in figure 2. In the world, total organic land 72.3 million Hectares. Organic farmland in Oceania is 35.9 million Hectares, Europe 16.5 Hectares and Latin America 8.3 Million Hectares making them top 3 countries with highest organic farmland. From the figure, it is evident that Australia, Spain are 1st and 2nd and India is one among the Top five countries in the world with largest area of organic agriculture land in 2019. There is also scope for bringing more area of agriculture land under organic in India under this category.

The ten countries with largest areas of organic agriculture land in the world

Figure 3 illustrates the top 10 Countries with largest area of organic agriculture land. The top countries that occupied largest areas of organic agriculture are Australia, Argentina, Spain and USA. it can be seen that India is one among the Top five countries in the world with largest area under organic agriculture land in 2019 with 2.30 Million hectares, with a slight difference of 0.03 Million hectares lesser than USA and 0.06 more than France and 0.08 Million hectares greater than China.

Organic Agriculture: Key Indicators		
Indicator	**World**	**Top Countries**
Countries with organic activities	2019: 187 Countries	
Organic agricultural land	2019: 72.3 million hectares (1999: 11 million hectares)	Australia (35.7 million hectares) Argentina (3.7 million hectares) Spain (2.4 million hectares)
Organic share of total agricultural land	2019: 1.5%	Liechtenstein (41.0%) Austria (26.1%) Sao Tome and Principe (24.9%)
Producers	2019: 3.1 million producers (1999: 200,000 producers)	India (1,366,226) Uganda (210,353) Ethiopia (203,602)
Organic Market	2019: 106.4 billion Euros (2000: 15.1 billion Euros)	USA (44.7 billion Euros) Germany (12.0 billion Euros) France (11.3 billion Euros)
Number of countries with organic regulation	2019: 108 countries	
Number of affiliates of IFOAM – Organics International	2020: 719 affiliates	Germany: 79 affiliates India: 52 affiliates USA: 48 affiliates Italy: 46 affiliates

Table 2: World top countries of organic agriculture's key indicators.

Source: FiBL survey 2021.

The growth and share of organic agricultural land

The growth and share of organic agricultural land, shown in figure 4. From the figure, there is a significant growth in area over the decade. Percent in organic share is increasing throughout the world over the span of 10 years from 1999-2019.

Continent wise growth of the of organic agricultural land

Continent wise Growth of the organic agricultural land during 1999-2019 shown in figure 5. In Oceania the organic agriculture land increased drastically from 11.4 million Hectares from 2011 to 35.9 million hectares in 2019. Whereas in Europe, it increased from 10.5 to 16.5 million Hectares. Followed by Latin America, Asia and the least in Africa. It implies that the area under organic production in Asia is the highest increase from 3.7 million Hectares

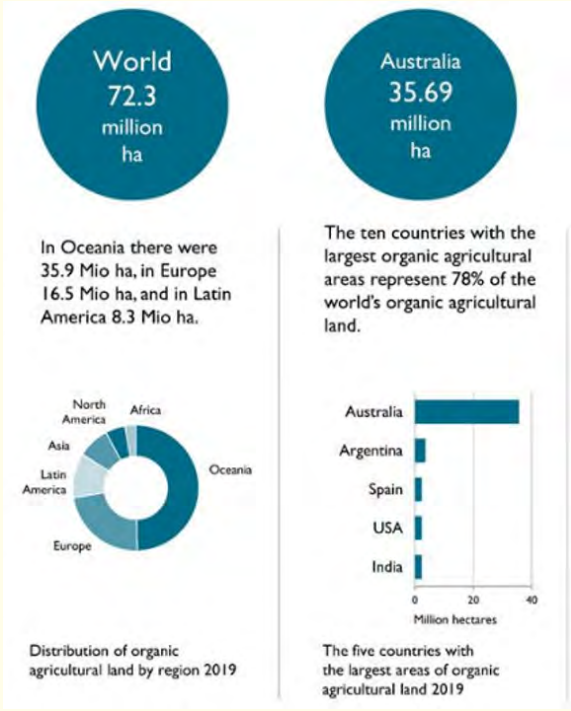


Figure 2: World Distribution of organic land in 2019 by region wise.

Source: FiBL survey 2021.

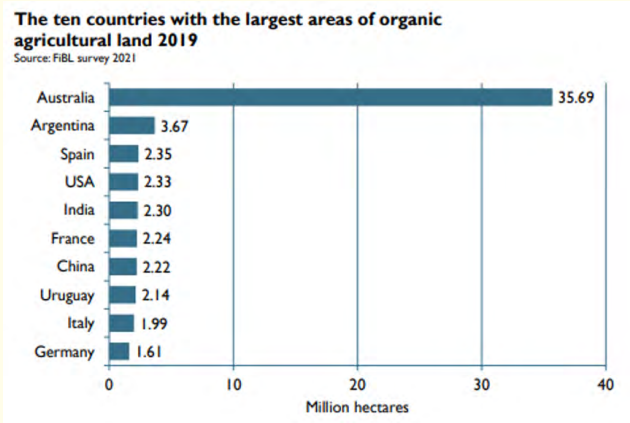


Figure 3: The ten countries with largest areas of organic agriculture land.

Source: FiBL survey 2021.

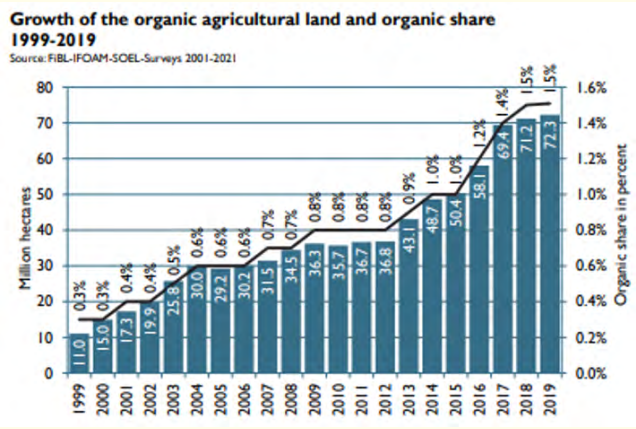


Figure 4: The growth and share of organic agricultural land during 1999-2019.

in 2011 to 5.9 million Hectares in 2019. Which projects a greater chance to increase area under organic farming.

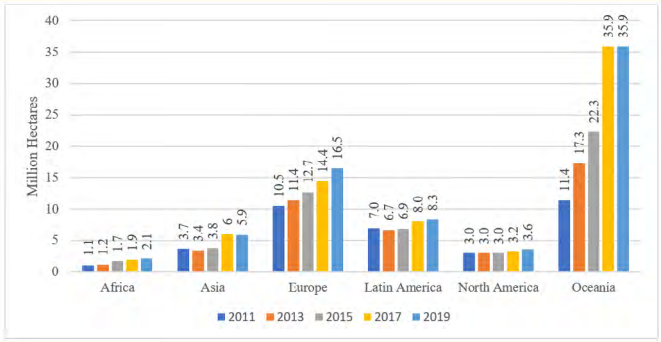


Figure 5: Continent wise growth of organic agricultural land 2011-2019.

The ten countries with the highest increase of organic land

The figure 6 shows that Increase in organic land by 2019 is Highest in India. This clearly shows that India is progressing towards organic farming. This may be due to withdrawal from hazards of chemical farming. Also various schemes in India encouraging farmers to adapt organic cultivation under Paramparagat Krishi Vikas Yojana (PKVY) scheme launched in 2015 which includes Soil Health Management (SHM) and National Mission on Sustainable Agriculture (NMSA). Government and non-government initiatives have given it a clear orientation. The National Project on Organic Farming (NPOF) has outlined the promotion strategy, while the National Programme on Organic Production (NPOP) has defined its regulatory framework under certified organic farming.

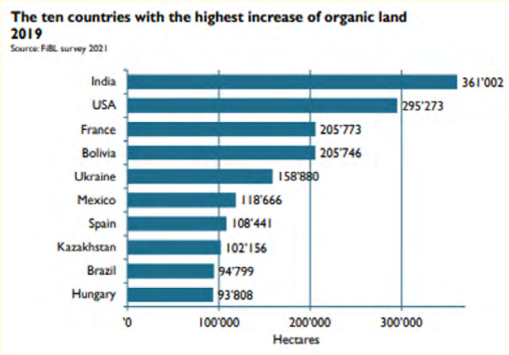


Figure 6: Top Ten Countries with the highest Increase of Organic Land.

Source: FiBL Survey 2021.

Asia: The countries with the highest organic share of land

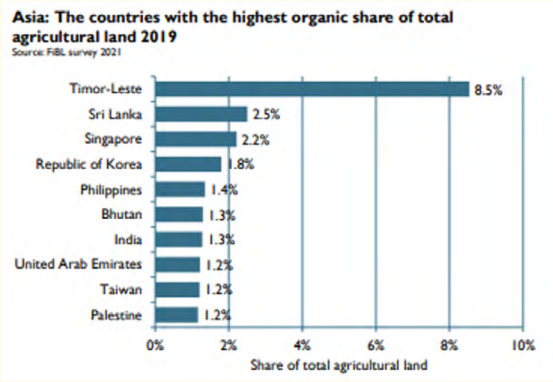


Figure 7: Top Ten Countries with the highest Organic share of agricultural land.

Source: FiBL Survey 2021.

The above figure 7 states that the organic share to total agriculture land is 1.3 per cent in India. Which projects greater opportunity to pull arable land under organic cultivation. This may take few more years but there is still greater chances to achieve this goal.

Agriculture was organic and of zero budget, relied on the manure and farm waste recycling. Only when necessary, very little external input was used. Over the course of many years, sustainable farming techniques merged with cattle raising. Ancient Indian farmers are well known to adopt farming techniques that are nature-friendly and they practiced mixed cropping and crop rotation.

ZBNF agriculture is 28 per cent to 32 per cent energy efficient to conventional systems. Input costs such as seeds, fertilizers, pesticides, hired labour or machinery are also 20% lower approximately in a crop rotation that includes a legume compared with a conventional system [6].

Conventionalization or nature farming is viewed as problematic given that organic farming has gained popularity due to its promise to help protect the environment and promote rural development (CEC).

Worldwide sales of organic food

Worldwide sales of organic food from 1999 to 2020 shown in figure 8. The results show that the sale of organic food has increased from 15.2 Billion U.S. Dollars to 120.65 Billion U.S. Dollars indicating the importance of organic food. Organic agricultural Products and Organic cultivation and has promising future.

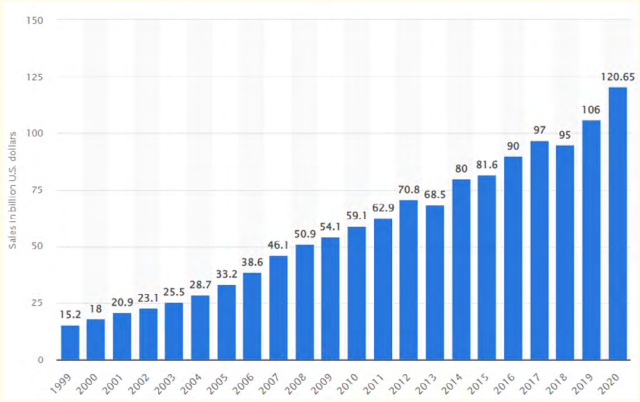


Figure 8: Worldwide sales of organic food from 1999 to 2020 (in Billion U.S. dollars).

Source: Statista 2022.

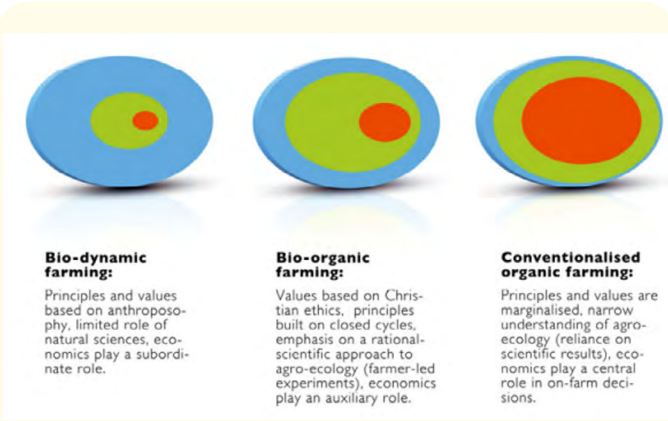


Figure 9: Representation of different farming systems.

Figure 9 represents that's conventionalized organic farming is gaining importance as the economics play a key role in decision making especially on farm as compared to Bio- dynamic and Bio-organic farming as they are mostly based on Values of anthroposophy and Christian Ethics, where Economics play sub ordinate and Auxillary role respectively.

Principles of organic farming

Principles of Organic Farming shown in figure 10. The results show that Few changes or improvements within organic farming can lead to natural framing or ZBNF. By clearly understanding the principles and practices of organic farming, defined to its true potential of transformation hence contributes to sustainable agriculture.

Indian perspective

In India, the Paramparagat Krishi Vikas Yojana, a centrally supported programme, promotes natural farming through the Bharatiya Prakritik Krishi Paddhati Programme (BPKP). The BPKP aims to promote traditional indigenous techniques that use fewer inputs from outside sources. It is mostly predicated on the recycling of biomass inside the farm, with a focus on biomass mulching, the use of cow dung-urine formulations within the farm, periodic soil aeration, and the avoidance of any synthetic chemical inputs. According to the HLPE Report, natural farming will lessen reliance on purchased inputs and thus lessen the burden of debt on smallholder farmers.

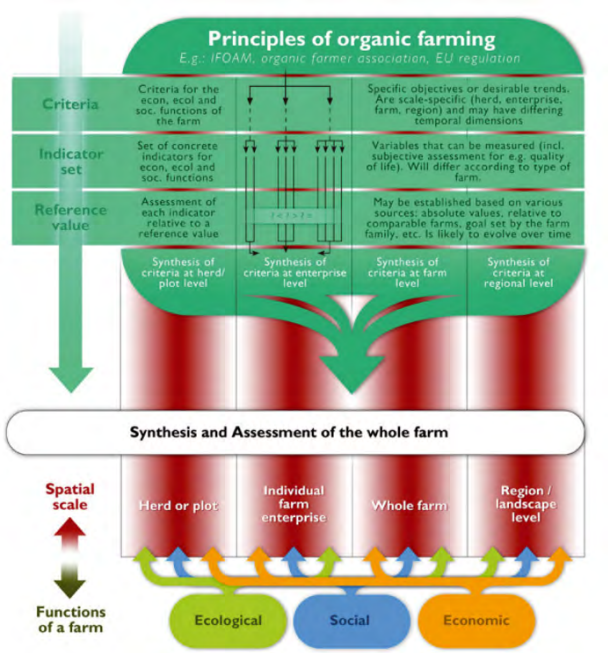


Figure 10: Principles of Organic Farming.

The states of Andhra Pradesh, Karnataka, Himachal Pradesh, Gujarat, Uttar Pradesh, and Kerala have accepted the BPKP programme. Numerous studies have documented the efficiency of natural farming—BPKP—in terms of raising output, sustainability, reducing water consumption, improving soil health, and improving the ecology of farmland. It is regarded as a practical farming method with potential to boost employment and rural development.

NITI Aayog and the Ministry of Agriculture and Farmers Welfare has organized a number of high-level meetings with international experts on organic farming methods. In India, regenerative agriculture is reported, already being used by approximately 2.5 million farmers. It is anticipated that during the next five years, there would be 20 lakh hectares of organic farming in all of its forms, including natural farming, of which 12 lakh hectares are under the BPKP.(https://www.niti.gov.in/natural-farming-niti-initiative).

Organic agriculture and sectors of food and retails are growing stronger amid of the pandemic between 2020-21. Country's organic exports crossed over $ 1 Billion and US being top importer with around 54 per cent of these exports. This pandemic had left an impression for healthy and immunity building foods as an effective measure to cope up with the disease resistance and this created a huge domestic consumption of organic food products grown in the country. Agricultural and Processed Food Products Export Development Authority (APEDA) reported that organic crop production in Marketing year (Apr- Mar) 2020-21 has reached 3.2 Million Metric Tonnes which is an increase of 36 Per cent over 2019-20 Marketing Year. India majors in production of Cereals, Millets, Sugar, Oil seeds and fiber crops organically. In spite of all these huge achievements, India still faces challenges related to organic control system and increased frauds. This impacts the credibility of Organic sector and its exports of the country. India adopts Mixed and Multiple Agriculture i.e., In addition to farming, other allied activities are practiced that give farmers a sizable profit Integrated Farming Models (IFS Models) [7].

What is zero budget natural farming?

Zero Budget Natural Farming (ZBNF) is a farming type that is done chemical-free. In this method total cost incurred on production and harvesting to farmer comes out to be zero. This topic 'Zero Budget Natural Farming,' gained importance when our present Finance Minister Mrs. Nirmala Sitharaman mentioned, in her financial budget speech 2019. She mentioned this as a source to achieve government's mission of "Doubling farmers' income by 2022".

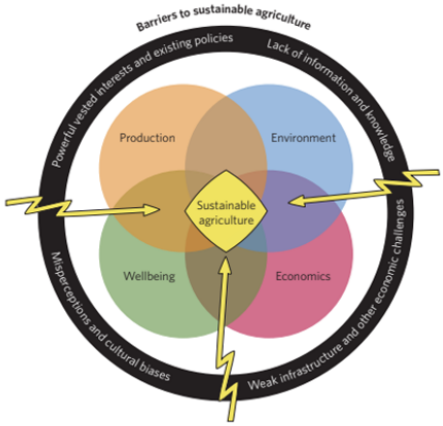
An Indian Agriculturist and Padma Shri recipient Mr. Subash Palekar introduced this concept of Zero Budget Natural Farming in mid 1990s to compensate for the losses brought by Green revolution. Hence he is known as Father of "Zero Budget Natural Farming". He stated following points supporting ZBNF.

- Zero Budget natural farming is adopted by lakhs of farmers in different climatic zones and soil types
- All requirements for growth of a plant is indeed present in nature and hence no supply of chemical fertilizers are required.
- Excreta of Earthworms has seven times more nitrogen than the soil
- Small farmers on a large scale are adapting this ZBNF techniques to be free from never ending debts.
- ZBNF makes farming sustainable and profitable
- ZBNF includes use of naturally available and harm less nutrient supply, pest and weed management methods.

- Jeevamrutha helps in nutrient addition, also acts as catalyst for microbial activities in soils.
- Bijamritha is seed treatment
- Pulp from neem leaves, tobacco and green chilies are mixed and used as an insecticide.
- Acchadana is mulching method
- Whapasa is presence of air and water molecules in soil that reduces irrigation requirement.
- Soil aeration, lesser irrigation, intercropping, bund and top soil mulching are encouraged in ZBNF, while intensive irrigation and deep ploughing are strictly constrained.
- Mr. Palekar mentioned that Europena Red Wiggler earthworms that are commonly used in composting absorb metal and poison in soil. Vermi composting is not used in ZBNF.

Policy instruments to overcome barriers and sustainable eco-friendly agriculture development

Figure 11 illustrates policy tools for removing obstacles to farmers implementing more sustainable farming methods. The findings indicate that the financial success of organic, ZBNF, or Nature agriculture will be compared to one another to decide whether it can continue to expand globally. Crop yields, labour expenses and overall costs, premium prices for their products, and the possibility of lower revenue during the transition phase (usually three years) are the primary determinants of agriculture's profitability from chemical agriculture to ZBNF or Nature farming, possible cost savings from the decreased reliance on purchased commodities and non-renewable resources. To build a climate that is conducive to agricultural innovation, education, and outreach, knowledge-based policy tools are required. Possible cost savings from the decreased reliance on purchased commodities and non-renewable resources. Equal devotion to the production, environment, economics, and social wellbeing sustainability goals does not constrain but rather spurs farmers and researchers to innovate. The task for policymakers is to foster the expansion of organic farming and other cutting-edge farming practices so that we may progress toward production systems that are sustainable. Although it is a difficult endeavor, the implications for the security of the food supply and the environment could not be greater. To do this, it is necessary to utilize effective policymaking, socioeconomic and scientific advancements, farmer innovation, and public involvement [8-21].



Financial instruments	Legal Instruments	Knowledge based Instruments
Increases farmer's access to capital	Measures to ensure open and competitive markets	Public investment in agro-ecological research
Elimination of crop subsidies and biofuel incentives	Reduction of commercial influence in government	Farmers engagement in Research and Development
Use of Agro-environmental incentives	Development of national targets and trade policies for food and ecosystem	Outreach to improve farmer knowledge and Capacity
Increases costs of scarce resources	Enhanced security of land tenure	Enhancement of Women's educational and leadership opportunities
Targeted input subsidies for resource- poor farmers		Increased transparency throughout the food chain
Investment in rural infrastructure		

Figure 11: Policy instruments for overcoming barriers to farmers adopting more sustainable farming systems.

Conclusions

Economics rules the world with intellectual tool. Traditional Farming is gig economy and heterodox economy. Globally, Nature, Natural and Organic farming is a modern and a sustainable form of agriculture that provides consumers fresh natural farm products. This study analyzes the growth, potential, principles of Nature, Natural and Organic Farming's and suggest strategies and policies for Sustainable Eco-Friendly Agriculture development. The study employed meta-analysis, scientific and futuristic approach. The results show that "no fertilizer" farming system and agricultural practices align with "laws of nature" called Nature Farming. In Natural Farming No chemical or organic fertilizers added and in organic farming Organic fertilizers and manures like compost, vermicomposting, cow dung etc. are added.

The results show that in the world 187 countries are involved with organic agriculture with 72.3 million hectares. The share of organic agriculture is 1.5% of total agricultural land. The top 3 countries are Liechtenstein, Austria, Sao Tome and Principe. The

total number of producers are 3.1 million. The organic market for the producers are worth of 106.4 Billion Euros in the world market. The top 3 organic markets countries are USA, Germany, France shows that organic market is increasing as consumer's demand for organic products is increasing. The number of countries with organic regulations are 108 and 719 affiliates with IFOAM organic international.

World Distribution of organic land region wise shows out of world total organic land is 72.3 million Hectares. Oceania has 35.9 million ha, Europe 16.5 million ha and Latin America 8.3 Million ha. The top countries which occupied largest areas of organic agriculture are Australia, Argentina, Spain and USA. Continent wise Growth of the of organic agricultural land during 1999-2019 showed that in Oceania the organic agriculture land increased drastically from 11.4 million Hectares from 2011 to 35.9 million hectares in 2019. Worldwide sales of organic food from 1999 to 2020 showed that the sale of organic food had increased from 15.2 billion U.S. dollars to 120.65 billion U.S. dollars indicating the importance of organic food. It has promising future. Few changes or developments within organic farming can lead to natural framing or ZBNF. By clearly understanding the principles of organic farming, practices have to be defined to its true potential of transformation and hence contributes to sustainable agriculture.

Whether organic or ZBNF or Nature farming, the ability of agriculture to grow globally will be determined by how well it does financially when compared to other methods. Crop yields, labour expenses and overall costs, premium prices for their products, and the possibility of lower revenue during the transition phase (usually three years) are the primary determinants of agriculture's profitability from chemical agriculture to ZBNF or Nature farming, possible cost savings from the decreased reliance on purchased commodities and non-renewable resources. To build a climate that is conducive to agricultural innovation, education, and outreach, knowledge-based policy tools are required. Possible cost savings from the decreased reliance on purchased commodities and non-renewable resources. To build a climate that is conducive to agricultural innovation, education, and outreach, knowledge-based policy tools are required. Equal devotion to the production, environment, economics, and social wellbeing sustainability goals does not constrain but rather spurs farmers and researchers to innovate. The task for policymakers is to foster the expansion of organic farming and other cutting-edge farming practices so that we may progress toward production systems that are sustainable. Although it is a difficult endeavor, the implications for the security of the food supply and the environment could not be greater. To do this, it is necessary to utilize effective policymaking, socioeconomic and scientific advancements, farmer innovation, and public involvement.

Transition from chemical agriculture to nature, ZBNF or organic and initial cost for this transition are greatly worsen the farmer's precarious financial situation. The economic outcomes from these new practices are uncertain. All the changes in factors of production and risk associated on adoption of these technologies together rise the farmers' perception of continuing the previous farming method. Most farmers in India or at global level render towards Due to their fluctuating and precarious resources, which are required to keep their activities running, economic gains are reachable in the short term. Farmers are unable to implement sustainable agricultural techniques because of their perilous financial positions, which will only lead to long-term economic gains. All farmers are impacted by this circumstance due to poor commodity prices. As a result, many farmers are unable to adopt sustainable practices. Hence, the governments at National, International level and think tank institutes together should come up with policies and schemes that facilitate farmers towards these sustainable agriculture methods and reap benefits in long run.

Bibliography

1. Isaacs JR. "Organic farming keeps carbon out of the atmosphere (2012).

2. Funk C and Kennedy B. "The New Food Fights: US Public Divides over Food Science". Washington, DC: Pew Res. Cent (2016).

3. Seufert V., *et al.* "What is this thing called organic? -How organic farming is codified in regulations". *Food Policy* 68 (2017): 10-20.

4. Mercati V. "Organic agriculture as a paradigm of sustainability: Italian food and its progression in the global market". *Agriculture and Agricultural Science Procedia* 8 (2016): 798-802.

5. Earth Observing System.

6. Kimble JM., *et al*. "Soil Carbon Management, Economic, Environmental and Social Benefits". CRC Press, Taylor and Francic Group (2007).

7. MB Dastagiri and L Bhavigna. "Planet Agriculture: Global Commons Natural resources, Climate change, Models and Vision to Feed Hungry Planet". *Global Advanced Research Journal of Agricultural Science* 8.10 (2019): 286-299.

8. Duojiao tan., *et al*. "The effects of environmental degradation on agriculture: Evidence from European countries", Gondwana Research". *Science Direct* 106 (2022): 92-104.

9. GT Patle., *et al*. "An overview of organic agriculture: A potential strategy for climate change mitigation". *Journal of Applied and Natural Science* (2014).

10. Ika Darnhofer., *et al*. "Conventionalisation of organic farming practices: from structural criteria towards an assessment based on organic principles. A review". *Agronomy for Sustainable Development* 30 (2010): 67-81.

11. John P Reganold and Jonathan M Wachter. "Organic agriculture in the twenty-first century". *Nature Plants* 2 (2016): 2016.

12. JMR Baide. "Barriers to Adoption of Sustainable Agriculture Practices in the South: Change Agents Perspectives master". Thesis submitted to the Graduate Faculty of Auburn University (2005): 1-125.

13. MB Dastagiri and PV Naga Sindhuja. "Global agricultural prices and policies during WTO regime: Explorative research to price policy advocacy". *World Food Policy* (2021).

14. MR Anand and HD Shiva Kumar. "Secondary and Micronutrient Management Practices in Organic Farming- An Overview". *Current Agriculture Research Journal* 7.1 (2019).

15. Priya T., *et al*. "Restructuring the agricultural supply chain". *International Journal of Business Innovation and Research* (2016).

16. Willer H and Lernoud J. "The world of organic agriculture. Statistics and emerging trends (2017).

17. https://byjus.com/free-ias-prep/zero-budget-natural-farming/

18. https://www.niti.gov.in/natural-farming-niti-initiative

19. https://www.niti.gov.in/sites/default/files/202202/Annual_Report_2021_2022_%28English%29_22022022.pdf

20. https://ecofriend.com/10-nations-that-are-worlds-leaders-in-organic-farming.html

21. https://www.downtoearth.org.in/blog/agriculture/on-a-tardy-trail-state-of-organic-farming-in-india-73269

Volume 6 Issue 9 September 2022