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ROLE OF ORGANIC FARMING IN SUSTAINABLE DEVELOPMENT

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ABSTRACT

The agricultural system must be able to support the needs of both present and future generations for agriculture to be considered sustainable. Agriculture is already struggling to keep up with the demands of a growing population, urbanization, industrialization, and climate change. Concerns about agriculture's long-term viability have arisen in response to rising food demand, shrinking farmland, dwindling water supplies, shifting weather patterns, and other factors. If there is a crisis in the agricultural sector, emerging countries like India would feel the effects far more acutely than more economically developed nations. India's agricultural sector plays a critical part in the country's overall economy. The agricultural sector is vital to a nation's economy since it produces food, raw materials, and jobs for a large segment of the population, as well as development capital and surpluses. More than half of the population still relies on agriculture for their livelihood. Indian agriculture plays a significant role in international commerce since it is the source of raw materials for India's key industries, such as the cotton, jute, textiles, sugar, vanaspati, and plantation sectors.

INTRODUCTION

Agriculture is essential to the continued existence of the human species. It's crucial to people's survival since it's a source of food, energy, and ecosystem services. Meanwhile, it causes the vast majority of environmental degradation. It lowers freshwater supplies, lowers soil fertility, and pollutes the environment with fertilizers and pesticides, all of which contribute to climate change. The food supply depends on these dwindling and deteriorating natural resources. Maintaining a state of food security over the long term requires not only that all people

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always have access to enough food, but also that it be produced with little waste and damage to the environment. The agricultural system must be able to support the needs of both present and future generations for agriculture to be considered sustainable. Agriculture is already struggling to keep up with the demands of a growing population, urbanization, industrialization, and climate change. Concerns about agriculture's long-term viability have arisen in response to rising food demand, shrinking farmland, dwindling water supplies, shifting weather patterns, and other factors. If there is a crisis in the agricultural sector, emerging countries like India would feel the effects far more acutely than more economically developed nations. India's agricultural sector plays a critical part in the country's overall economy. The agricultural sector is vital to a nation's economy since it produces food, raw materials, and jobs for a large segment of the population, as well as development capital and surpluses. More than half of the population still relies on agriculture for their livelihood. Indian agriculture plays a significant role in international commerce since it is the source of raw materials for India's key industries, such as the cotton, jute, textiles, sugar, vanaspati, and plantation sectors.

Due to agriculture's vital role in India's economy, the government has launched a number of initiatives to foster the sector's sustained growth. Due to a growing population and a series of natural calamities, the nation had severe food shortages, particularly after it gained independence. In order to feed its people, India must import food from all around the globe, but particularly the United States. The Government of India adopted the New Agricultural Policy, often known as the Green Revolution, in the 1960s in an effort to solve this pressing problem and guarantee the country's food supply. High-yielding crops, chemical fertilisers, and chemical pesticides were the only pillars of the new agricultural strategy. With the approach in place, productivity increased considerably. As a consequence of adopting the New Agricultural Policy, India's agricultural output has increased dramatically, allowing the country to become food independent. However, modern agriculture has resulted in ecological and environmental calamities that seem to be irreversible since it disregards the environmental ideals that have been appreciated and practiced for millennia. It has replaced low-yielding traditional seed types with high-yielding kinds that need extensive use of

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chemical fertilizer, herbicides, and irrigation systems. This led to contamination of the environment on all fronts. It has created a serious risk to ecosystems, soil health, heirloom seed stocks, and time-honored farming practices.

This technique, which requires a lot of fertilizers and pesticides and has unfair pricing policies, has been shown to be environmentally unsustainable. The system is now a sign of rising unsustainability since the production and productivity gains were achieved at the price of the environment and ecology. This 'stolen from the west' method of manufacturing has been the subject of heated controversy for its perceived success or failure. The issue raised here is of worldwide significance and not just national. As this kind of farming has many unintended consequences (such as soil erosion, health problems, environmental damage, etc.), it is necessary to find an alternate method. Because of its unique principles and philosophy, as well as its many benefits over conventional farming, organic farming is advocated as a realistic alternative to conventional farming. By definition, organic farming prioritizes both environmental sustainability and social justice. Organic farmers don't use synthetic chemicals like pesticides and herbicides or artificial fertilizers, and they often rotate their crops more regularly. Proposed implementations of this method have been shown to increase species richness in agricultural landscapes by an average of 30% compared to more standard farming methods.

The administration of Bareilly, Uttar Pradesh, has been working on plans to make agriculture more profitable, environmentally friendly, and long-term as part of a larger effort to encourage organic farming on a national and worldwide scale. As a test case, the state of Uttar Pradesh's Bareilly district has been chosen to pilot a comprehensive plan for the expansion of organic agriculture across the state. During the last 20 years, chemical farming and its by-product, the chemical pesticide called "endosulfan," have had a devastating impact on the inhabitants of the Bareilly area, killing an estimated 500 and causing illness and discomfort to tens of thousands more. The State Agricultural Department recognised the need of encouraging organic farming by creating a cell for the promotion of sustainable agriculture and organic farming in 2003-04, a year after taking into consideration the realities on the ground. It has also created two brands, Bareilly uttar pradesh Organic and Bareilly Uttar

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Pradesh Naturals, to promote organic farming practices.

A healthy, pollution-free environment is crucial to the survival of all forms of life on Earth. Despite the fact that technology-enhanced farming is essential for sustaining the world's burgeoning human population, the widespread use of toxic herbicides, insecticides, fungicides, and other agricultural chemicals has wreaked havoc on the planet's ecosystems. Sustainable agriculture can only be achieved by eco-friendly agricultural practises. Gardening is emphasised as a means to restore ecological balance and foster a microclimate conducive to the well-being of soil microorganisms, plants, animals, farm workers, and ultimately the large population that consumes farm food by eliminating or limiting the use of pesticides. Let's have a look at Organic Farming and all its benefits.

MEANING AND DEFINITION OF ORGANIC FARMING

The meaning of Pesticides, fertilisers made in a lab, antibiotics, hormones, and other growth regulators are all banned or severely restricted in organic farming. Crop residues, crop rotations, green manure, pest weeds, off-farm organic wastes, legumes, elements of biological pest management insects, animal manures, etc. are the backbone of a highly adaptable organic farming system. In India, organic agricultural practises have been in use for thousands of years. By using organic wastes and other biological materials, as well as beneficial microbes (bio fertilisers), to release nutrients to crops for increased sustainable production in an eco-friendly pollution-free environment, this farming system aims to keep the soil alive and healthy while also cultivating the land and raising crops.

Several authors have attempted to define organic farming, but Lampkin's (1990) seems to be the most comprehensive and accurately capture all of its important characteristics. Maintaining soil productivity and tilth, supplying plant nutrients, and controlling insects, weeds, and other pests are all dependent on crop rotation, crop residues, animal manures, Legumes, green manures, off-farming, organic wastes, and aspects of biological pest control in an organic farming system. Organic farming, processing, distribution, and consumption all play a part in maintaining and improving ecosystem and organism health, from microscopic soil creatures to humans. The primary difficulty in current environmental sustainability is the exponential rise of pollution across all sectors of society. Throughout the last thousand years,

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organic farming has developed. Crop production in river belts was first begun by ancient farmers who relied on the local environment for their supplies. Several ancient Indian texts, like the Ramayana, Rigveda, Mahabharata, etc., include short references to the use of organic agricultural inputs by those farmers. To fulfil the requirements of the present without jeopardizing the capacity of future generations to do the same is the definition of sustainable agriculture. The goal of organic farming is to provide healthy, wholesome food that may aid in disease prevention. Sustainable agriculture, such the kind fostered by organic farming, contributes to ending the wasteful use of raw materials. Soil fertility, soil productivity, and soil texture are all preserved thanks to organic agricultural practices. Organic Agriculture Movements International: Organic agriculture is defined as a production method that maintains healthy soils, ecosystems, and human populations by the International Federation of Organic Agriculture Movements, which was founded in 1972. Instead of using inputs that might have unfavourable consequences, it makes use of natural processes, local biodiversity, and cycles that are tailored to the region.

Agricultural methods that are well-suited to the local environment and culture are the hallmark of traditional agriculture, which comprises a wide range of management practices. Natural agricultural inputs are used exclusively in traditional farming practices. Several of the requirements for organic agriculture are met by conventional agricultural methods. Organic agriculture promotes safe, chemical-free food and fibre for human and environmental health. The primary goal of organic farming is to produce food that is both highly nutritious and relatively free of potentially dangerous contaminants by limiting inputs to those that have been pre-approved by the government. Organic farming requires farmers to strictly adhere to predetermined standards that restrict the methods they may use. Many other farming methods make use of the same practices used in organic farming, such as intercropping, crop rotation, and mulching. Laws and certification programmes characterize organic farming as distinct from conventional farming in that it forbids the use of synthetic inputs and mandates "soil building" crop rotations.

To boost agricultural output via natural processes rather than external inputs is the goal of organic agriculture. In order to sustain their crops over time, organic farmers practice

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conservation, biodiversity promotion, and ecosystem upkeep. But not always, this approach is often tailored for the organic food industry. Individuals that want to label and market their goods as organic will almost always seek certification, particularly if they aim to export. Nonetheless, many farmers use organic practices without actively pursuing or benefiting from the premium price that certain markets provide for organic goods. These include many of the common approaches used by farmers in developing countries.

WHAT IS ORGANIC FARMING?

To put it simply, organic farming is the practice of growing crops without the use of artificial inputs like chemical fertilizers and pesticides. When we organically garden, we must consider plants in the context of the natural world as a whole. The first step in organic gardening is to improve the soil by working in organic matter using whatever materials are at hand. Organic farming is a production technique that, to the greatest degree possible, does not include the use of synthetically created fertilizers, pesticides, growth regulators, or animal feed additives. The term "organic" describes the methods of farming that are used to create things like food and fibre. Produce, grains, meat, dairy, eggs, fibres like cotton, flowers, and processed foods are all examples of agricultural items that may be grown or raised using organic methods. Biological variety in the field may be used to disturb pest organisms' habitat, and organic farmers will also restore soil fertility on purpose.

Synthetic insecticides, fungicides, and fertilizers are forbidden for use by organic farmers. Essential features of organic systems include the creation and use of a detailed "organic system plan" detailing the methods employed in crop and livestock production, the maintenance of buffer zones to prevent accidental contamination from adjacent conventional fields, and a meticulous record keeping system that tracks all products from the field to the point of sale. The second principle of organic gardening is picking plants that will thrive in the area's soil and climate. These vegetations are naturally robust and fruitful. Maintaining productivity and tilth, supplying plant nutrients, and controlling weeds and other pests are all dependent on the use of various organic farming practises such as crop rotations, crop residues, animal manure, legumes, green manure, off- and on-farm organic wastes, mechanical cultivation, mineral-bearing rocks, and aspects of biological pest control. The

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organic gardening and farming method takes into account the interconnectedness of all living things, as well as the fact that the whole is greater than the sum of its parts, as compared to conventional methods.

Growing organically means conserving the soil and surrounding ecosystem as a valuable resource. Giving the soil's living organisms a healthy diet of composts, manures, and other organic materials so that they may in turn provide a balanced diet to the plants you're growing. By reusing materials instead of disposing of them in landfills or incineration, we can help ensure a cleaner, greener future. Soil fertility may be increased with the use of organic manures such farmyard manures, crop residues, biogas slurry, agricultural wastes, oilcakes, earthworms, and composts. By altering the soil's porosity, aeration, warmth, water-holding capacity, and microflora, these additions have the potential to alter the rhizophere habitat. Nitrogen, phosphorus, potash, sulphur, calcium, magnesium, etc., are all found in these manures and are essential for plant growth. The earthworm's involvement in aeration, soil turnover, and the promotion of microflora necessary for plant development is also crucial. It is possible to find 50,000 to 4,00,000 earthworms in an area of one hectare with organic matter and enough moisture, and these worms may create 25-30 tonnes of castings. A wide variety of soil nutrients, including nitrogen (2.5%), sulphur (2.9%), potash (1.4%), calcium, magnesium, and more, may be found in earthworm castings. In addition to using chemical pesticides, organic soil amendments and worm castings have been shown to be beneficial in reducing disease and nematode populations.

SUSTAINABLE AGRICULTURE

Sustainable agriculture refers to farming practices that reduce negative impacts on the environment and conserve natural resources. It's an approach to farming that considers the long term and takes into account issues of profit, environmental responsibility, equity, health, enterprise, and family. Economic profit, environmental stewardship, and social responsibility are the three pillars upon which it rests. Instead of focusing on one particular crop, sustainable farming practices look at the farm as a whole and how it operates. Instead of focusing solely on financial outcomes, as is done in the conventional approach, a "triple bottom line" takes into account the farm's broader economic, environmental, and social impacts.

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HISTORY ORGANIC FARMING

According to February's World of Organic Agriculture Report, India boasts the most organic farmers anywhere in the world. It is home to more than 30 percent of the world's total number of organic producers (2.7 million) thanks to its population of 835,000 certified organic producers. According to the latest edition of the World of Organic Agriculture report, both the total area of organic agriculture and the market value of organic agricultural products have increased. In this way, organic farming is contributing to a more stable ecosystem. Paramparagat Krishi Vikas Yojana (PKVY) is the Centre's free certification programme me for organic farmers. The International Trade Center, the State of Sustainability Initiative, and the Research Institute of Organic Agriculture (FiBL) compiled the information from 178 countries. A state in northern India called Sikkim completed its transition to organic farming in 2016. Reportedly first used by Australian agricultural scientist Gordon McClymont, the term "sustainable agriculture" has since gained widespread usage. In his 1980 book New Roots for Agriculture, Wes Jackson is credited with coining the phrase. The late 1980s saw the rise in use of this term. Sustainable agriculture is defined as "an integrated system of plant and animal production practises having a site-specific application that will last over the long term," with the goals of providing for human food and fibre needs, protecting the natural resource base on which the agricultural economy depends, optimising the use of finite farm resources, and incorporating biological cycles and controls into agricultural operations.

IMPORTANCE AND METHOD ORGANIC FARMING

Organic farming has the potential to be lucrative because consumers value organic food for its higher ethical and nutritional standards. The benefits of organic farming extend far beyond the financial and moral spheres.

1. Reduced Exposure to Pesticides and Chemicals: According to the Organic Trade Association, we could prevent 500 million pounds of harmful and persistent pesticides from entering the environment annually if all farmers in the United States switched to organic production.

2. Organic Farming Supports Water Conservation: Runoff from non-organic farms, which may contain harmful pesticides, toxic fertilizers, and animal waste, is identified by Indian

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Rivers as a major source of water pollution in rivers. The use of organic farming practices helps to prevent the contamination of water sources. Water conservation is another benefit of organic farming. Mulch and proper soil amendment are two methods commonly used by organic farmers to reduce water usage. High-demand cotton requires extensive irrigation and waste water when grown in the conventional manner. Growing cotton organically, on the other hand, requires much less water for irrigation.

3. Organic Farming Builds Healthy Soil: Maintaining fertile soil is the first step in producing nutritious crops. It's possible that if we use toxic pesticides and chemicals to treat the soil, it will become incapable of supporting life on its own. Chemical soil management is inferior to organic farming practices.

4. Combatting Erosion: According to a comprehensive study that compared organically and chemically treated wheat fields that were located next to one another, the organic field had eight inches more topsoil and experienced erosion loss that was only a third of what the chemically treated field had experienced.

5. Supporting Animal Health and Welfare: Natural pest management is aided by organic agricultural practices since they conserve more habitat areas and attract beneficial predators like birds and other wildlife. Also, the clean, chemical-free grazing provided by organic farms contributes to the animals' innate health and resistance to disease. Organic farmers benefit because healthy, happy animals produce more organic food.

6. Organic Farming Encourages Biodiversity: For the most part, the steadier Strong resistance to climatic extremes, infectious diseases, and pests may be attributed in large part to the amount of biodiversity present on a farm, which is why organic farming practices are so important. A further negative consequence of declining biodiversity is an increase in infectious illnesses, which is bad for both humans and the world.

Method

Traditional farming techniques based on natural biological processes are integrated with scientific understanding of ecology and some contemporary technology to form organic farming systems. The discipline of agro ecology is dedicated to the study of sustainable agriculture practices. In contrast to conventional farmers, who are free to employ synthetic

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pesticides and water-soluble, synthetically refined fertilizers, organic farmers are limited to utilizing only natural pesticides and fertilizers. The pyrethrin in Chrysanthemum flowers is one example of a pesticide that occurs in nature. Crop rotation, green manures and compost, biological pest management, and mechanical cultivation are the cornerstones of organic farming. Planting legumes, which fix nitrogen into the soil, encouraging natural insect predators, rotating crops to confuse pests and regenerate soil, and using natural materials like potassium bicarbonate and mulches to prevent disease and weeds are all examples of these methods. Standard farms have adopted many of the practices originally established for organic farming. The use of synthetic pesticides is often reserved for extreme cases in traditional farming, but integrated pest management is a multidimensional approach that prioritizes the use of organic pest control measures wherever feasible.

Crop Diversity: Organic farming fosters Crop variety. The study of agro ecology has shown the advantages of polyculture, which is widely applied in organic farming. Growing a diversity of vegetable crops encourages a greater assortment of beneficial insects, soil microbes, and other things that add up to overall farm health. Agricultural variety helps habitats flourish and prevents species from becoming extinct.

Soil Management: Organic farming depends primarily on the natural decomposition of organic materials, utilizing processes like green manure and composting, to restore nutrients removed from the soil by previous crops. This biological process, powered by microorganisms such as mycorrhiza, permits the natural creation of nutrients in the soil throughout the growing season, and has been referred to as feeding the soil to feed the plant. Organic farming includes a range of approaches to promote soil fertility, including crop rotation, cover cropping, decreased tillage, and application of compost. By decreasing tillage, soil is not inverted and exposed to air; less carbon is lost to the atmosphere resulting in more soil organic carbon. Organic farmers also utilize animal manure, some industrial fertilizers such as seed meal and other mineral powders such as rock phosphate and green sand, a naturally occurring type of potash that gives potassium. Organic standards mandate rotation of annual crops, meaning that a single crop cannot be planted in the same site without a separate, intervening crop. Organic crop rotations usually incorporate weed suppressive cover crops

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and crops with distinct life cycles to discourage weeds linked with a specific crop. Additional cultural approaches used to promote crop competitiveness and minimize weed pressure include selection of competitive crop types, high-density planting, tight row spacing, and late planting into warm soil to facilitate quick crop germination.

Livestock: Livestock is an organic fertilizer, it may be and must be, treated with medication when they are ill, but pharmaceuticals cannot be used to stimulate growth, their diet must be organic, and they must be pastured. Additionally, horses and cattle were previously a fundamental agricultural component that supplied work, for transporting and ploughing, fertility, via recycling of manure, and fuel, in the form of food for farmers and other animals. Although nowadays, tiny producing operations frequently do not involve livestock, domesticated animals is a desired aspect of the organic farming equation, particularly for real sustainability, the capacity of a farm to operate as a self-renewing unit.

Genetic Modification: Organic Farming is a crucial element of the rejection of genetically altered plants and animals. On 19 October 1998, participants at IFOAM's 12th Scientific Conference released the Mar del Plata Declaration, when more than 600 delegates from over 60 nations agreed unanimously to reject the use of genetically modified organisms in food production and agriculture. Agricultural experts Luis Herrera-Estrella and Ariel Alvarez-Morales continue to support integration of transgenic technology into organic farming as the ideal method to sustainable agriculture, especially in the poor countries.

Sustainable Intensification: Sustainable agriculture has the promise of nourishing higher productivity while also contributing positively to natural and social investment. Sustainable intensification refers to a set of farming practices that aim to boost yields while also reducing their impact on the environment. The farm's goals are met with no additional cultivated land or natural habitat loss, and the system's performance is improved at no net environmental cost. India has recently made sustainable intensification a priority in an effort to forge a connection between farming and the natural environment. As compared to traditional intensification approaches, sustainable intensification prioritizes wider environmental and social consequences.

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Soil Treatment: Instead of using harmful pesticides, you may steam the soil to make it safe to plant in. It is possible to use a variety of techniques to introduce steam into the soil, where it may then kill pests and improve the quality of the soil. The similar concept underlies solarizing, which raises soil warmth to eliminate pests and diseases. Crops like this may be used as natural bio fumigants since they produce substances that discourage pests from flourishing. This effect is most often associated with the brassica family of plants, which includes mustard and radishes.

Economics: There is also some familiarity with the economic and social dimensions of sustainability. Netting's research of smallholder farming systems through time is the gold standard when talking about decentralized agricultural practices. It may also result in unintended consequences including increased manufacturing costs, financial losses, and environmental damage. Many economic analyses of ecosystem services, biodiversity, land degradation, and sustainable land management have factored in these unintended consequences. When calculating agricultural sustainability, it is important to consider how products are exchanged for money. Energy costs for supplies, labor, and delivery vary for food sold at a distant location, such as a farmers' market or a supermarket.

HOW DO ORGANIC FARMERS FERTILIZE CROPS & HOW DO THEY CONTROL PESTS, DISEASES, AND WEEDS?

Organic farmers create fertile soils by feeding the microbes that live there and are responsible for nutrient release, transformation, and transfer. Both the soil's structure and its ability to retain water are improved by the presence of organic matter. Farmers that use organic methods improve soil structure and water-holding capacity by feeding the soil biota. Cover crops, compost, and other biologically based soil amendments are used by organic farmers to feed soil biota and increase soil organic matter. They result in robust vegetation that is more resistant to pests and illnesses. Prevention via proper plant nutrition and management is organic farmers' first line of defence against pests and illnesses. Cover crops and complex crop rotations are used by organic farmers to alter the ecology of the land, making it less favourable to weeds, insects, and disease organisms. Crop rotation, mechanical tillage, and manual weeding, along with cover crops, mulches, and flame weeding, are only some of the

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weed management techniques used. For the most part, organic farmers depend on natural predators like birds and beneficial insects to keep pest populations under control. Insect predators, mating disruption, traps, and barriers are just some of the methods producers employ to restore balance when pest populations spike. Before resorting to the use of a substance for weed, insect, or disease management, farmers must use sanitation and cultural methods, according the National Organic Regulation.

The use of these components in organic agriculture is tightly controlled, monitored, and recorded. Botanical and other non-synthetic insecticides may be used as a last option. However, the negative effects of these chemicals on soil structure, soil microflora, water quality, food quality, fodder quality, and food materials are readily apparent, despite the fact that intensive agriculture with the use of large amounts of agrochemicals has undoubtedly resulted in a manifold increase in the productivity of farm commodities. Most of the ground water in farming areas has been found to include traces of pesticides and nitrates from fertilisers. Nitrates in drinking water are harmful to humans, especially newborns, and may even be lethal at high enough concentrations. Soil, cereals, pulses, vegetable oils, bovine or human milk, butter fat, fish, meat, eggs, vegetables, fruits, animal feed, and drinking water have all tested positive for traces of prohibited DDT and BHC isomers. The World Health Organization (WHO) reports that annually at least 3,000,000 individuals are poisoned by pesticides, and that 20,000 people each year die as a direct result of this. In spite of using just 25% of the world's pesticides, emerging nations are blamed for most pesticide-related fatalities.

WHAT DOES CERTIFIED ORGANIC MEAN?

Products that carry the "Certified Organic" label have been cultivated and processed in accordance with USDA-recognized state or private agencies. The term "organic" must be verified on every item sold. Inspections of farms' fields and processing facilities, as well as submission of an annual organic system plan, are required for certification. Long-term soil management, buffer zones between organic and conventional farms, and thorough record-keeping are just a few of the organic farming techniques that are checked by inspectors. Cleaning and pest control procedures, the storage and transit of ingredients, and the quality of

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documentation and auditing are all aspects of a processing plant that may be scrutinized during an inspection. Natural, or "organic," foods have had as little of their natural state altered as possible throughout production. To be considered "organic," a product must avoid the use of any artificial fertilizers, pesticides, or fungicides, as well as any irradiation or genetic modification.

ORGANIC FOOD MORE NUTRITIOUS THAN CONVENTIONAL FOOD

Due to the complexity of comparing organically produced and conventionally grown food, the final research has yet to be conducted. Some of these factors that may significantly affect nutritional quality include the kind of crop, when it was harvested, how it was handled after harvest, the type of soil, and the climate. According to a study conducted in 2002, conventional food is far more likely to have pesticide residues than organic food. After long-banned persistent pesticides were ruled out of the analysis, just 13% of organic food samples and 71% of conventional produce samples had a pesticide residue.

ORGANIC FOODS IS SAFE

Foods grown using organic methods are just as safe as conventionally grown foods. Produce, like all other types of food, should be washed thoroughly before being consumed. As was previously mentioned, the pesticide residues found in organic food are far lower than those found in conventional produce. Raw manure is often blamed for the potential for E. coli contamination in organic food, yet conventional farms also utilise massive amounts of raw manure with minimal oversight. Manure used in organic agriculture must either be composted beforehand or administered no less than 90 days before harvest to provide for sufficient time for the microbial breakdown of any pathogens.

ORGANIC FOOD REALLY A SIGNIFICANT INDUSTRY

Just around 2% of the food in the United States is produced using organic techniques. Organic product sales have increased by at least 20% annually over the previous decade, making them the fastest-growing segment of the agricultural industry. Natural food shops, conventional supermarkets, CSAs, farmers markets, and other forms of grower-direct marketing all stock organic goods. Organic food is preferred by many chefs because of its higher quality and

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flavour, and this trend can be seen in restaurants around the nation. Markets for organic food in countries like Japan and Germany are expanding as a result of this trend.

Organic Cost More:

Organic food is more expensive than conventional food because its price tag more accurately represents the real cost of cultivating the food, which is to utilize labour and intensive management in place of chemicals, the expenses of which are carried by society in the form of health and environmental costs. Water pollution cleanup and pesticide contamination remediation are two examples of these types of expenses. The prices of organic goods reflect the whole price of production, distribution, and preservation. The price of processed foods includes not only the raw materials, but also their processing and packaging. Organic foods have more stringent requirements for all these processes than conventional foods. Organic agriculture often costs more than conventional production because of the additional administration and effort involved. Growing research suggests that organic food would cost the same as, or be less than conventional food if all the indirect expenses of conventional food production were added into the price of food.

Agriculture's Contribution to Air Pollution & Climate Change:

Public attention is more likely to be drawn to the more evident evidence of agriculture's influence on the environment, despite the fact that the biggest economic consequences are likely to be associated with the less obvious repercussions of air pollution. Methane from rice and livestock production; nitrous oxide from fertilizers and manure; ammonia from manure and urine; and particulate matter and GHGs from land clearance by fire, primarily rangeland and forest and the burning of rice residues, are the four primary ways in which agriculture affects air quality and the atmosphere.

Pollution From Biomass Burning:

Biomasses burning during forest, bush, or rangeland clearing for agriculture releases soots, dusts, and trace gases. Clearing fallow land and dumping of agricultural wastes, especially rice, is a common technique in "slash and burn" tropical farming, as is the fire of Savannah areas by pastor lists to encourage fodder growth. The smoke from these fires may be seen and smelled in tropical areas thousands of miles distant from the actual fire zones, having a

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significant influence on local health. As a consequence of two recent advances, air pollution caused by biomass burning could decrease significantly. Burning is a common method of deforestation, or it is used to clear the land of any residual vegetation after wood has been harvested. Deforestation is expected to decrease, which will reduce the rate of air pollution. While vast grazing systems are expected to continue prevalent, the practice of burning rangeland under such systems will decrease as people move towards more intense livestock production methods.

Organic farming is a method of production management that prioritizes the use of renewable resources and the recuperation of lost soil nutrients via composting and other means. Organic farming prioritizes the health and happiness of animals by providing them with only natural feed and minimizing their exposure to harmful chemicals. Instead of using synthetic pesticides, herbicides, synthetic fertilizers, growth promoters, gene modification, prophylactic antibiotics, and zootechnical hormones, organic farmers rely on the environment's inherent mechanisms for pest and disease management while cultivating crops and raising animals. In return, organic farms use various practices that keep ecosystems healthy and cut down on waste.

THE BENEFITS OF ORGANIC FARMING ON RURAL DEVELOPMENT

Sustainable growth in rural areas is bolstered by organic farming and integrated farming, which both offer promising prospects. The expansion of the organic industry is already creating new job prospects in agriculture, processing, and supporting services. In addition to helping the planet, these agricultural methods may also improve the economic and community harmony in rural regions. Organic farming is a growing industry, and the government's efforts to incentivize farmers to switch to organic farming practices are meant to fuel the industry's expansion and benefit its many supporting enterprises.

THE ROLE OF ORGANIC FARMING IN ENHANCING BIODIVERSITY

Biodiversity is both a tool and an end in itself in organic farming. Above- and below-ground natural ecological balance is essential to its survival. Having a wide variety of plants and animals on a piece of land may help keep pests and diseases at bay, and good soil is essential for growing crops. In spite of organic agriculture's stated goal of preserving and enhancing

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biodiversity, many current methods are only capable of acting as input substitutes. Realizing organic agriculture's full potential for protecting biodiversity calls for a more concerted transition to a systems approach, grounded on deeper knowledge of ecosystem dynamics. The outcomes shown in organic agricultural systems are encouraging but yet sporadic, as described in the presentation below. The soil food web, agricultural food web, and ecological food web are all outlined. Soil biodiversity, agricultural genetic resources, and wildlife biodiversity are all affected by organic farming practices, and their effects must be described.

ORGANIC AGRICULTURE NURTURES SOIL BIODIVERSITY

Organic farming relies fundamentally on restoring soil fertility. By using crop rotations and strip cropping, green manuring and organic fertilizing (animal manure, compost, crop residues), using minimal tillage, and without using harmful chemicals, organic farming techniques improve the health of soil biotic and abiotic resources. Scientific studies conducted in Europe have shown that organic farming practices greatly enhance the density and variety of soil microorganisms, as well as the soil's biological activity. These kinds of ecosystems are better at recycling nutrients and maintaining soil structure.

ORGANIC AGRICULTURE AND NATURE CONSERVATION

Farmers unquestionably play the most crucial role of any group in managing the world's natural resources. Numerous reports show that organic farming is an effective strategy for protecting non-agricultural biodiversity and a practical option in human-activated categories of protected areas. Above all else, the vast amounts of undeveloped land that surround parks and reserves must be managed in a way that doesn't compromise the natural order of things. There is no need to worry about the loss of wildlife or pollution of air, water, and soil if farmers surrounding and linking protected areas use organic practices. When it comes to conserving wildlife in protected regions, these buffer zones are crucial. Organic farming makes it easier for farmers and their communities to prosper without destroying the environment.

Considering that many parks and reserves were originally settled by local villagers, organic farming is a win-win: locals get to keep some of the land they've worked so hard for all these years, biodiversity is protected through sustainable farming practices, and the environment

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benefits from everyone's hard work. On-farm, farm-margin, and ecosystem-wide, organic agriculture has a direct influence. Although the preceding parts focused on biodiversity within individual farms, the next sections will examine how organic farming interacts with the larger environment, specifically with designated wildlife areas and buffer zones.

CONCLUSION

In the 1990s, a movement towards eating healthier, more organically grown foods really took off. For organic goods to reach $50 billion in 2018, it took more than 18 years of sales. After another ten years, in 2018, they hit the $100 billion threshold. The market value of organic food and drink was $112 billion in 2019. There was a 55% rise in sales from 2013 to now (FiBL &IFOAM, 2021). If COVID-19 is influencing how we spend money on eating and shopping, the next increase to $150 billion might occur in the following several years. North America and Europe are losing market share alone and together. In 2000, that number was 97%; in 2019, it's 90%. In the next years, this trend is predicted to continue, and emerging countries like China, India, Brazil, and Indonesia are predicted to grow at a faster pace. When broken down by country, the United States takes up 42% of the retail value of organic items, with France and Germany close behind (11 percent each). The sales value of organic goods is greatest in China (at 8%), followed by Italy, Canada, Switzerland, and the UK (all at 3%).

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