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Sustainable Production and Supply Chain Practices in Organic Food Enterprises.

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Abstract: In recent years, businesses have shifted toward sustainable production and supply chain practices because of environmental concerns and rising demand for organic food. Sustainability is a vital component of modern corporate practices, especially in the organic food sector, where resource conservation and environmental responsibility are key pillars of today's businesses. To reduce their environmental impact and encourage responsible resource use, organic food businesses are increasingly implementing sustainable production and supply chain practices. This paper examines sustainable production methods and supply chain practices in organic food enterprises. This study also focuses on the major challenges organic food enterprises face and aims to identify ways to overcome obstacles to implementing sustainable practices. A structured questionnaire is used to collect primary data from organic food producers and enterprises, and the data is then analyzed using the proper statistical tools. The findings show how eco- friendly production methods, waste reduction and management, energy- saving techniques, and sustainable sourcing and supply chain systems are being adopted. Additionally, the study also identifies the challenges in the adoption of sustainable practices, including a lack of funding support, improper technical expertise, and inefficient supply chain systems. Here, the researcher focuses on aligning with the Sustainable Development Goals to deepen the understanding of sustainable operational practices in organic food enterprises and the role in encouraging ethical production and enhancing environmental sustainability.

Keywords: Sustainable production practices, Supply chain systems, organic food enterprises, Environmental sustainability, Sustainable development goals, and Sustainable business practices.

Introduction

Currently, growing environmental concerns have prompted businesses worldwide to prioritize sustainability in resource use and climate change mitigation. Environmentally responsible production and operational practices that minimize negative environmental impacts while maintaining economic viability are now expected of organizations. In this context, sustainable supply chains and production methods are gaining attention as effective strategies for promoting long-term corporate success and environmental conservation. The organic food industry significantly supports sustainable business and agricultural practices.

The organic food industry is heavily shaped by sustainable business and agricultural farming practices. Organic food companies mainly focus on eco-friendly production methods and avoiding synthetic chemicals, like pesticides and fertilizers, which help support soil health, preserve biodiversity, and ensure food safety. These production methods emphasize energy efficiency, waste reduction, and the responsible use of natural resources. Recently, the demand for organic food products has surged as consumers become more aware of health and environmental issues.

In the sustainable production practices of organic food products, the supply chain is a crucial part in maintaining sustainability. Sustainable supply chain practices include eco-friendly raw material sourcing, effective logistics and transportation, sustainable packaging, and cooperation with suppliers. Organic food businesses can minimize the impact on the environment and increase operational effectiveness and competitiveness in the market by incorporating sustainability in supply chain practices.

Many organic food businesses face numerous challenges while adapting to sustainable production methods and supply chain practices. The obstacles include insufficient funding, lack of technical expertise, poor infrastructure, and difficulties in networking sustainable supply chains. Thus, encouraging sustainable business development requires an understanding of these practices and the challenges faced by organic food businesses. This study focuses on sustainable supply chain strategies used by organic food businesses and sustainable production methods adopted. It also highlights the challenges involved in sustainable business practices.

Statement Of The Problem

Currently, with natural resource depletion, climate change, and growing environmental degradation, environmental sustainability has grown in importance for businesses. As a result, industries are urged to implement sustainable production methods and supply chain practices that minimize the negative effects on the environment and encourage the effective use of resources. Sustainable development and eco- friendly farming methods are used by organic food industries. Moreover, many organic food businesses struggle to adopt sustainable production and supply chain practices, even with rising demand for organic food products. Eco–friendly production techniques, waste reduction, energy conversion, and ethical sourcing and distribution are the major parts of these practices. Small and medium-sized businesses frequently face challenges like insufficient funds, lack of technical expertise, and poor infrastructure facilities. Hence, the researcher focuses on the sustainable production and supply chain practices in organic food enterprises.

Objectives:

- To know about the sustainable production methods of organic food businesses.
- To analyze the sustainable supply chain strategies used by organic food businesses.
- To identify the challenges in implementing sustainable production methods and supply chain strategies in organic food industries.

Literature Review

(Anastacia, 2021) Examined organic farming as a sustainable agricultural practice and highlighted that organic production improves soil fertility, biodiversity, and environmental quality while reducing the harmful effects of synthetic chemicals. The study also pointed out that sustainable farming methods contribute to long-term agricultural productivity and environmental protection.

(Kumar, 2022) explores the thematic analysis, which identified: “Waste management”, “SC sustainability and impact assessment”, “Decision support”, “Operations management and optimization”, “Food quality and safety”, “Sustainable business models”, “Innovation and technological solution”, “SC strategy”, and “Social sustainability” as the key emergent themes. “SC sustainability and impact assessment” is identified as the most dominant theme in SFSC.

(Balcom, 2023) The study shows that local food supply chains contribute to sustainability through reduced transportation, improved farmer-consumer relationships, and environmentally responsible production. Most farm

businesses linked to SFSCs were robust to supply- and demand-side shocks, registered a low number of layoffs and fast recovery of operations, and increased their profits during COVID-19 compared to pre-COVID-19 levels. Yet, several barriers remain, the most important ones being high capital costs and longer payback periods. Other barriers include inconsistent inter-provincial trading restrictions, lack of qualified workers, and shrinking agricultural land base. Shukla, A., & Khare, A. (2024)

(Wani, 2024) Analyzed the role of organic agriculture in promoting environmental sustainability and reported that organic farming reduces environmental pollution, improves soil health, and supports biodiversity conservation. Their study emphasized that organic farming practices help address environmental and socio-economic challenges in agriculture. Divakaran, P., & Chaturvedi, V. M. (2024)

Sustainable production methods and supply chain strategies that enable the organic food industry to operate effectively. In order to achieve sustainability goals, these studies highlight strategies like waste reduction, energy efficiency, eco-friendly sourcing, and sustainable supply chain practices. The actual adoption of sustainable production and supply chain practices by organic food businesses, especially in developing regions, has not been thoroughly studied empirically. The studies that examine supply chain management, sustainable production methods, and the difficulties organic food businesses encounter in putting these methods into practice. Therefore, more research is required to determine the extent to which organic food businesses have embraced sustainable practices and the obstacles that stand in their way.

Methodology

Research Design

This study investigates sustainable production and supply chain practices in organic food businesses using a descriptive research design. Understanding the current procedures and challenges these businesses face is made easier by the design. Both primary and secondary data are used in the study. A structured questionnaire is used to gather primary data from organic food businesses, and books, journals, and reports are used to gather secondary data. Appropriate statistical tools are used to analyze the gathered data. Jadhav, S. P., Ubale, S., & Ubale, D. S. (2024)

Sample Size

A sample of 30 respondents was selected from organic food businesses engaged in supply chain and production activities, making up the study's sample size. Organic food producers and businesses using sustainable production methods are among the respondents. The chosen sample aids in comprehending supply chain procedures, sustainable production methods, and the challenges encountered by organic food businesses.

Tools For Analysis

The collected data are analyzed using simple statistical tools such as percentage analysis and mean analysis**.** Percentage analysis is used to understand the distribution of responses, while mean analysis helps to measure the level of sustainable production and supply chain practices adopted by organic food enterprises.

Table 1: Sustainable Production Practices Adopted by Organic Food Enterprises

Response	Frequency	Percent	Valid percent	Cumulative percent
Strongly Agree	9	30.0	30.0	30.0

Agree	12	40.0	40.0	70.0
Neutral	4	13.3	13.3	83.3
Disagree	3	10.0	10.0	93.3
Strongly Disagree	2	6.7	6.7	100.0
Total	30	100.0	100.0	

Interpretation: The above Table shows that most of the respondents agree that organic food businesses use sustainable production methods. This shows that the respondents are adopting eco–friendly production methods.

Table 2: Sustainable Production Practices in Organic Food Enterprises

Sustainable Production Practices	Mean Score	Rank
Clean and safe Production methods	4.25	1
Reducing waste and recycling	4.17	2
Efficient use of resources	3.97	3
Energy conservation practices	3.95	4
Eco- friendly supply chain practices	3.74	5

Interpretation: Table 2 shows that clean and safe production methods have the highest mean score of 4.25, which is the most widely adopted among organic food enterprises. Reducing waste and recycling is ranked second, followed by efficient use of resources in third place.

Table 3: Sustainable supply chain practices in Organic Food Enterprises

Particulars	N	Mean	Std. Deviation
Eco- friendly source of raw materials	30	4.09	0.81
Green transportation practices	30	3.86	0.91
Sustainable packaging	30	3.94	0.86
Responsible suppliers	30	4.04	0.79

Interpretation: Table 3 shows that eco- friendly raw material sourcing has the highest mean value, indicating a higher level of adoption among organic food enterprises.

Table 4: Challenges in Sustainable Practices in Organic Food Enterprises

Challenges	N	Mean	Std. Deviation
Financial Constrains	30	4.09	0.87
Lack of technical expertise	30	3.83	0.90
Poor infrastructure	30	3.71	0.95
Improper coordination among suppliers	30	3.66	0.99

Interpretation: The above table shows that the biggest challenge to organic food businesses adopting sustainable practices is financial constraints, which have the highest mean score.

Findings

Most organic food businesses use clean and safe production methods, demonstrating a strong dedication to ecologically friendly production methods. Reducing waste and recycling strategies are used to lessen their impact on the environment. The results show that many organic food businesses make effective use of natural resources, including water and raw materials. Organic food companies have been found to adopt eco-friendly supply chain practices, such as sustainable sourcing and packaging. Eco-friendly raw material sourcing is the most popular sustainable supply chain strategy. The challenges in organic food businesses are that adopting sustainable practices is hindered by a lack of funding.

Suggestions

To promote sustainable production methods and reduce their impact on the environment, organic food businesses should implement cutting-edge, eco-friendly production technologies. Organic food businesses should receive financial support and subsidies from the government and associated organizations to help them adopt sustainable supply chains and production methods.

Training programs and workshops should be organized to improve the technical knowledge and skills of organic food producers regarding sustainable practices. Sustainable supply chain management, which includes environmentally friendly sourcing, green transportation, and sustainable packaging, should be strengthened by organic food businesses. To reduce production waste and advance environmental sustainability, waste management and recycling techniques should receive more attention. Organic food businesses ought to concentrate on making effective use of natural resources like raw materials, energy, and water. To create a more effective and long-lasting supply chain system, producers, suppliers, and distributors should work together.

Conclusion

The study focuses on the sustainable supply chain and production methods used by organic food businesses and notes the challenges in putting these methods into practice. The results show that many organic food businesses use eco-friendly production practices like safe and clean production methods, waste reduction, and resource efficiency. The study also shows that organic food companies follow sustainable supply chain practices, such as eco-friendly sourcing and packaging. However, several challenges, including poor infrastructure, a lack of technical expertise, and financial constraints, hinder the successful application of sustainable practices. Therefore, to improve sustainability in organic

food businesses, more government support, better technical training, and increased supply chain cooperation are required. In addition to enhancing environmental performance, encouraging sustainable production and supply chain practices will support global sustainability initiatives like the United Nations' Sustainable Development Goals and encourage ethical business practices.

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