



SUSTAINABLE LOGISTICS PRACTICES AND PERFORMANCE OF THE FOOD PROCESSING SECTOR IN SELECTED DISTRICTS OF TAMILNADU: AN EMPIRICAL STUDY

***A. ANISHA, **Dr. K. CHANDRASEKAR**

*Research Scholar, Alagappa Institute of Management, Alagappa University, Karaikudi-630004, Tamilnadu, India.

** Associate Professor, Alagappa Institute of Management, Alagappa University, Karaikudi-630004, Tamilnadu, India.

ABSTRACT :

This study investigates how Tamil Nadu's food processing industry performs in relation to sustainable logistics techniques. The study intends to determine how sustainable practices affect operational effectiveness, environmental impact, and economic performance with a focus on particular districts. Using a mixed-methods approach that combines quantitative data from surveys and qualitative insights from interviews, The study identifies critical procedures that improve performance and sustainability in the food processing sector. For the purpose of encouraging more environmentally friendly logistics methods, the findings offer policymakers and industry stakeholders concrete advice.

Keywords: Sustainable Logistics, Manufacturing, Food Processing, Performance.

Introduction :

Sustainability is a global concern in today's business world; organizations must be mindful about environmental issues in order to retain a positive image in today's competitive climate.(Gotschol et al.,2014) argued that businesses should give more focus to sustainable logistics for a better environment. Thus it has more challenges for firms to deal with several internal and external changes at the same time. Sustainable logistics is defined as the integration of environmentally friendly initiatives into all aspects of the supply chain, including sourcing, product design and development, manufacturing, transportation, packaging, storage, retrieval, disposal, and post-sales services, including end-of-product life management. (Min & Kim, 2012; Choi *et al.*, 2017).The aim of this Study was to investigate how sustainable logistics practices affect of the food processing sector in selected districts of Tamilnadu. These practice includes optimize transportation routes, renewable energy; reduce emissions, sustainable packaging, Greener transport options.

Food Processing Sector in India

India has made vast progress overtime in providing food security for its people and has become largely self-reliant in agriculture. Accordingly, the policy focus has shifted from attaining self-sufficiency to generating higher and stable income for the farming population. Food processing industry (FPI) is one area which has the potential to add value to farm output, create alternate employment opportunities, improve exports and strengthen the domestic supply chain. India, with about 11.2 per cent of total arable land in the world, is ranked first in the production of milk, pulses and jute, second in fruits and vegetables and third in cereals (Government of India, 2019). It is also the sixth largest food and grocery market in the world. The Government of India has been pushing a range of reforms through its Central Sector and Centrally Sponsored Schemes to encourage sustainable production and enhance farmer's income. With a healthy growth rate of eight percent since 2014, food processing sector is seen as the sunrise sector of the Indian economy and is the fifth-largest industry in terms of production, consumption, exports and potential growth.

Challenges faced by the Food Processing Sector

The growth of Food Processing sector is crucial for greater social and economic development of the country. Some of the important challenges in the Food Processing Sector are:

- There exist gaps in supply chain infrastructure which means inadequate primary processing, storage and distribution facilities.
- Inadequate link between production and processing due to lack of process able varieties.
- Seasonality of operations and low-capacity utilization.
- Institutional gaps in the supply chain, for instance, there is dependence on APMC markets.
- Lack of focus on quality and safety standards, and not having enough of product development and innovation.

Statement of the Problem :

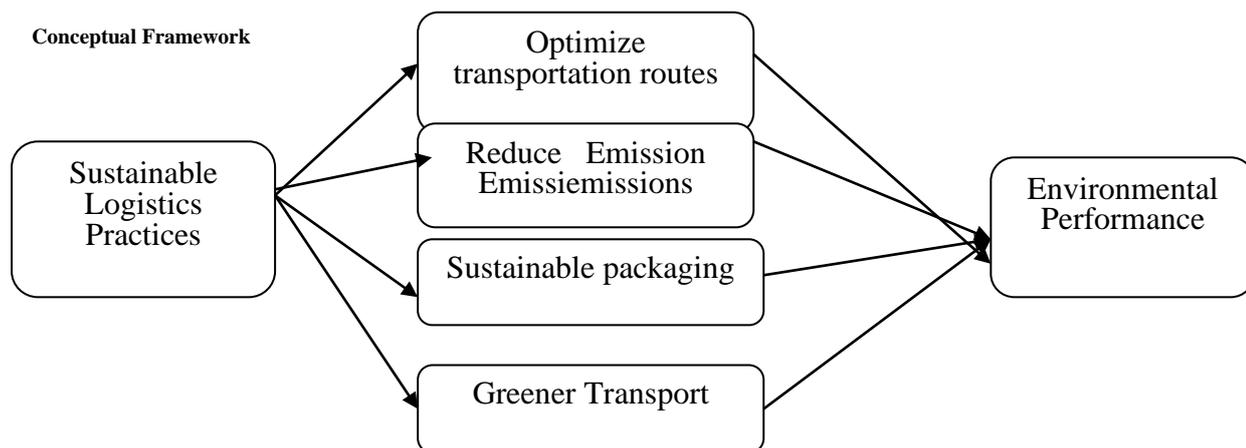
The food industry faces unique challenges in implementing sustainable logistics practices due to the perishable nature of its products, the need for temperature-controlled supply chains, and the complex network of producers, processors, distributors, and retailers (Trivellas et al., 2020). Effective waste management is a critical component of sustainable logistics in the food industry, as minimizing food waste can significantly reduce the environmental impact of the supply chain. Additionally, the timeliness of product delivery is essential to maintaining food quality and safety, which requires careful planning of transportation routes and modes. Sustainable logistics practices in the food business can increase overall sustainability performance (Rahmani et al., 2018).

Objectives of the study :

- To Study the socio- demographic profile of the sustainable practices in the food processing sector.
- To assess the current state of logistics practices in the food processing sector in selected districts of Tamil Nadu.
- To evaluate the impact of sustainable logistics practices on operational efficiency and performance.
- To identify challenges and opportunities for enhancing sustainability in logistics.

Scope of the Study

The study is confined only food processing area located in Madurai, viruthunagar, districts of Tamilnadu. The present study focuses its attention only on various dimensions of sustainable logistics followed in food processing for the selection of suppliers, impact of sustainable practices and implementation barriers in the Logistics of food processing in the select districts of Tamilnadu



Research Methodology :

Research Design

A mixed-methods approach was employed to provide a comprehensive analysis of sustainable logistics practices. The study combined quantitative data from structured surveys and qualitative insights from interviews with key stakeholders.

Data Collection

- **Surveys:** Administered to food processing companies in selected districts to gather data on current logistics practices, sustainability measures, and performance indicators.
- **Interviews:** Conducted with industry experts, logistics managers, and policymakers to gain deeper insights into the challenges and opportunities related to sustainable logistics.

Data Analysis :

Quantitative data was analyzed using statistical techniques to identify correlations between sustainable practices and performance metrics. Qualitative data was analyzed thematically to extract key themes and insights.

*Analysis and Interpretation***Table 1 Demographic Profile of Respondents**

Particulars	Classification	Frequency	%
Gender	Male	68	76.3%
	Female	52	25.2%
Age	20-30	28	23.33%
	30-40	43	36%
	Above 40	49	41%
Educational Qualification	Schooling	17	14.6%
	Under Graduate	63	52.5%
	Post Graduate	40	33.33%
Position	Managing Director	32	27%
	Manager	41	34.1%
	Supervisor	27	22.5%
How often does your company review and update its sustainability practices	Annually	58	48.3%
	Quarterly	46	38.3%
	Monthly	16	13.33%

Source: Primary Data

Table 1 represents that demographic profile of respondents. Out of 120 respondents, majority 76.3% of respondents were male category, followed by 41% of respondents were in the age group of 41%, regarding educational qualification of the respondents, majority 52.5 % under Graduate, followed by 34.1% of respondents are Position of the company, majority 48.3% company review and update its sustainability practices.

Null Hypothesis 1

There is no significant difference between Positions of the company with respect to factors of impact of effective sustainable logistics practices.

Table 2 Positions of the company with respect to factors of impact of effective sustainable logistics practices

Factors	Positions	N	Mean	SD	P-Value
Energy-efficient equipment	Managing Director	32	3.62	1.052	.216
	Manager	41	3.78	1.162	
	Supervisor	27	3.52	1.371	
Waste reduction and recycling	Managing Director	32	3.44	1.086	.563
	Manager	41	3.41	1.235	
	Supervisor	27	3.52	1.340	
Sustainable sourcing of raw materials	Managing Director	32	3.95	1.045	.093
	Manager	41	3.42	1.213	
	Supervisor	27	3.83	1.302	
Use of renewable energy sources	Managing Director	32	3.31	1.185	.865
	Manager	41	3.28	1.762	
	Supervisor	27	3.15	1.219	

Source: Primary Data

The above table highlights that ANOVA test for the positions of the company with respect to factors of impact of effective sustainable logistics practices. The p value of all factors are greater than 0.05. Therefore the null hypothesis accepted at 5% level of significant. Hence it is concluded that there is no significant difference between Positions of the company with respect to factors of impact of effective sustainable logistics practices.

Implications for Policy and Practices :

In order to assist sustainable logistics, policymakers should encourage incentives for adopting sustainable practices and upgrading infrastructure. We urge industry participants to invest in training and technology to overcome challenges and reap the benefits of sustainability.

Conclusion :

The food processing sector plays a crucial role in the global economy, with the industry generating significant revenues and employing millions of people worldwide. However, the industry also faces significant challenges in terms of sustainability, particularly in its logistics and supply chain operations. Sustainable logistics practices have become increasingly important in the food processing sector, as companies strive to minimize their environmental impact and improve the efficiency of their operations. Issues such as visibility and traceability are critical in the food sector, as they ensure product quality and customer satisfaction.

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