

Sustainable Supply Chain Practices in Western Zone of Tamil Nadu: Perceptions and Practices among Eco-Conscious Entrepreneurs

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Abstract: This research explores the sustainable supply chain practices among eco-conscious entrepreneurs in the western zone of Tamil Nadu, concentrating on the acquisition of green, circular and transparent supply chain procedures. On the rise of environmental concerns, business are progressively expected to coordinate sustainable strategies in their supply chain and other operations. This research examines how entrepreneurs in bright and growing industrial hubs such as Coimbatore, Tirupur, Erode, Salem, Namakkal, Dharmapuri, Krishnagiri, and Nilgiris, view and execute practices of sustainable supply chain into their operations, also with the challenges that are faced by them. For this research, data was collected from 52 eco-friendly entrepreneurs covering multiple industries using a structured questionnaire. The findings underscores that although green initiatives like usage of biodegradable materials, energy-efficient operations, and efforts towards recycling is constantly increasing, barriers such as high costs of implementation, limitations of supplier and consumers refusing to buy at premium price, acts as an obstacle for wider execution of sustainable supply chain. The study highlights the requirement for enhanced awareness, accessibility to green technologies and improved policy contribute to encourage sustainable supply chain in the region. By bringing these perceptions and practices into the focus, the study extends insights to foster businesses to achieve bigger environmental responsibility and efficiency of operations.

Keywords: Sustainable Supply Chain, Green Supply Chain Practices, Circular Economy, Transparent Supply Chain, Eco-friendly Entrepreneurs, Ecopreneurs.

I. BACKGROUND OF THE STUDY

Sustainability has become an important part of the modern supply chain management, leading businesses and entrepreneurs to combine the environmental and ethical factors into their business practices. Sustainable Supply Chain is the strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systematic coordination of business processes for improving the long-term the overall performance of businesses. Within the frame of reference of Tamil Nadu's western zone, which includes growing and vibrant industrial hubs such as Coimbatore, Tirupur, Erode, Salem, Namakkal, Dharmapuri, Krishnagiri and Nilgiris, the acquisition of sustainable practices has obtained force, especially among eco-conscious entrepreneurs and manufacturers. Sustainable Supply Chain practices highlights the increasing importance in achieving sustainable development especially in small manufacturing firms (**R. Alamelu, M. Jayanthi, S. Dinesh, R. Nalini, N. Shobhana, and R. Amudha, 2023**). These eco-friendly entrepreneurs are embracing sustainable practices to confront environmental and ethical considerations while keeping up with competitiveness. The environmental concerns can be interconnected with supply chain processes through the implementation of SSCM strategies like Green Supply Chain Management (GSCM), Transparent Supply Chain Management (TSCM) and Circular Supply Chain Management (CSCM) (**Sayam Aroonsrimorakot and Meena Laiphrakpam, 2023**). They play a significant role in the shift from traditional to modern supply chain practices. GSCM pin points on reducing the environmental risks, impacts and enhancing the efficiency of the resources. Where TSCM makes sure of the traceability and responsibility. CSCM practices foreground manufacturing, recycling and minimizing waste. It aims to attain zero waste by integrating and coordinating by using the latest technologies (**Sara Romagnoli, Claudia Tarabu, Behzad Maleki Vishkai and Pietro De Giovanni 2023**). In spite of the advancing awareness, the adoption of SSCM activities stay

uneven across various industries in Tamil Nadu. Entrepreneurs and businesses confront various barriers which includes high cost for implementation, restricted access to technology, and regulatory compliances. These challenges mostly cast down small businesses or startups from completely adopting sustainable practices. Although, entrepreneurs and businesses who do remarkably embrace SSCM strategies constantly experience enhance optimization of resources, improved brand reputation, and stronger stakeholder relationships. This research examines the practices and perceptions of eco-friendly entrepreneurs in Tamil Nadu's western region, assessing the framework of SSCM adoption, the barriers they confront, and the opportunities that are available to them in order to enhance the sustainability practices in the region.

II. STATEMENT OF THE PROBLEM

Sustainable supply chain has been considered as essential and has increasingly gaining importance among various sectors. Yet, the adoption of the same is irregular in the western zone of Tamil Nadu. Eco-friendly entrepreneurs in growing hubs such as Coimbatore, Tirupur and Erode are faced with challenges in implementing green, transparent and circular practices in their supply chain. This could be due to various factors such as the high cost for implementation, uneven access to technology, and low awareness between the suppliers as well as the consumers. Insufficient tracking technologies and mechanisms and minimal transparency of supply chain acts as a challenge which prevents and makes it tough to transfer from traditional to modern supply chain models. This research aims to examine the present level practice of sustainable supply chain in the western region, analyzing the perceptions, practices and challenges of the eco-friendly entrepreneurs.

III. OBJECTIVES OF THE STUDY

1. To assess the adoption of green technologies, circular economy principles, and transparency in their supply chains.
2. To explore eco-conscious manufacturers' perceptions of sustainable supply chain practices in Tamil Nadu's western zones.

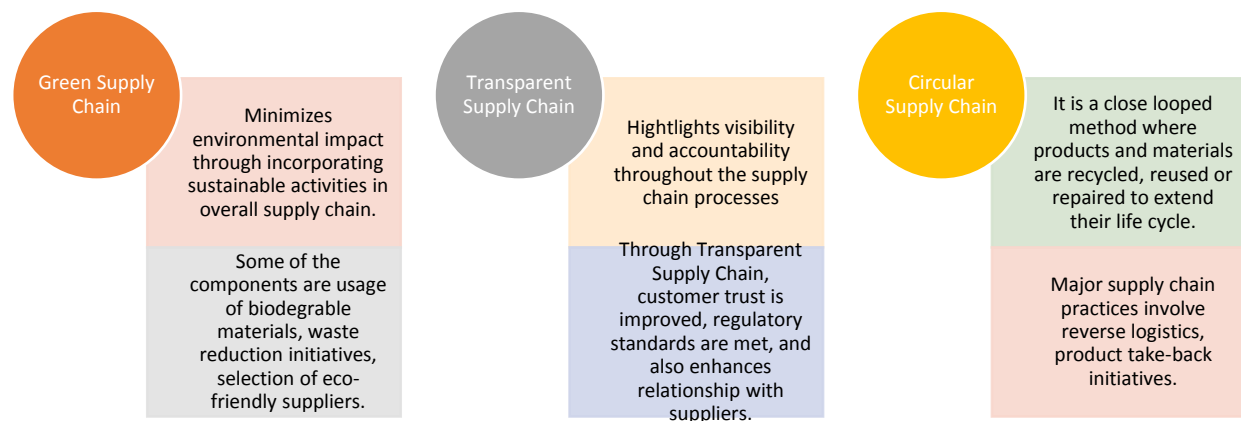
RESEARCH METHODOLOGY

Research Method	Both Exploratory and Descriptive
Sample and Area of the study	Eco-Friendly Entrepreneurs in Western zone of Tamil Nadu
Sampling Method	Snow- Ball Sampling
Sampling size	52
Source	Primary Data
Tools used for collection	Questionnaire
Statistical Tools	Percentage analysis

IV. Theoretical Framework

Sustainable supply chain is the collaboration of concern towards environment, social responsibility and economical practices across all the supply chain procedures, from the procurement of raw materials till delivering it to the final consumers and disposal. It focuses on reducing impact on environment, ensuring ethical concerns and enhances the efficiency of usage of resources while maintaining profitability.

Sustainable Supply Chain Management (SSCM) includes adopting activities such as green procurement, where the business ensure that they are procuring their raw materials from eco-conscious suppliers; energy-efficient production which is involved in order to decrease the negative impact on the environment; and waste reduction initiatives such as recycling and reverse logistics. Transparency also plays an important role in sustainable supply chain, where businesses are required to issue their information regarding sustainable activities to their stakeholders. There are major three components of sustainable supply chain, they are: Green Supply Chain, Transparent Supply Chain and Circular Supply Chain.



Through including sustainability into their supply chain, businesses can decrease costs, improve reputation of brand and meet the regulatory standards. Also, SSCM plays an important role in confronting global environmental issues by encouraging responsible consumption of resources and decreasing impact on environment. At length, a well implemented sustainable supply chain strategy not only enhances the environment but also strengthens long-term business opportunities.

PERSONAL AND BUSINESS PROFILE OF ECO- CONSCIOUS ENTREPRENEURS

Table 1 Percentage analysis on Demographic variables

Age (in years)	No. of respondents	Percent
Under 25 years	8	15.4
26 - 35 years	18	34.6
36 – 45 years	21	40.4
46 and above	5	9.6
Educational Qualification		
No formal education		
School education or diploma	4	7.7
Undergraduate	22	42.3
Postgraduate	14	26.9
Professional degree	12	23.1
Business Sector		
Agriculture	8	15.4
Textile	7	13.5
Engineering	4	7.7
FMCG	7	13.5
Healthcare and Pharmaceuticals	8	15.4
Skincare and Cosmetics	8	15.4
Food and Beverages	6	11.5
Others	4	7.6
Number of years in sustainable business		
Less than 1 year	6	11.5
1 – 3 years	20	38.5
4 – 7 years	14	26.9
8 – 10 years	7	13.5
More than 10 years	5	9.6
Monthly Income		
Less than 10,000	3	5.8
10,000 – 29,999	3	5.8

30,000 – 49,999	12	23.1
50,000 – 74,999	15	28.8
75,000 – 99,999	7	13.5
100,000 and more	12	23.1

Source: Primary Data

Table 1 showcases the demographic analysis. Majority of the respondents come under the age group of 26 - 45 years, which accounts for 75 percent of the total population. This reveals that sustainable supply chain practices are mostly adopted by younger and middle-aged group of entrepreneurs. This indicates their active participation in eco-friendly business operations. As sustainability is a growing concept, entrepreneurs in this age range are probable to have higher awareness and perception of its significance compared to other age groups. With regards of educational qualifications of the respondents, 92.3 percent have at least an undergraduate degree, with 42.3 percent of the respondents being an undergraduate, 26.9 percent of postgraduates and 23.1 percent of the respondents holding a professional degree. This solid educational background of the respondents recommend that they are well-informed and has enhanced understanding on sustainable business operations.

In the context of industrial representation, respondents are scattered across diverse industries, with Agriculture, Healthcare and Pharmaceutical, and Skincare and Cosmetics growing as the prominent industries, where each of the industries accounts for 15.4 percent of the total sample. The increasing awareness of consumers on sustainability and environmental considerations has escalated the demand for products from these lifestyle-oriented industries, which makes them more marketable. The given data also reveals that most respondents have been incorporating sustainable supply chain activities for 1 - 7 year, showing that while sustainability adoption is although recent, it is gradually and steadily gaining momentum. Eventually, the income analysis shows indicates that 28.8 percent of the respondents earn in the range of Rs. 50,000 - Rs. 74,999 which recommends that an important portion of the respondents belong to mid-to-high income groups. This financial capacity enables entrepreneurs to invest in sustainable practices, which encourages the growth of the eco-conscious business initiatives.

PERCEPTIONS AND PRACTICES OF ECO-CONSCIOUS ENTREPRENEURS ON GREEN SUPPLY CHAIN MANAGEMENT

Table 2 : Perception and Practices of respondents on GSCM

Variables	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	No	%	No	%	No	%	No	%	No	%
Our Company incorporates biodegradable products into our supply chain.	29	55.7	14	26.9	4	7.6	1	1.9	4	7.6
Our Company utilizes energy-efficient transportation in our supply chain.	8	15.3	12	23.0	19	36.5	10	19.2	3	5.7
Our Company takes waste reduction initiatives.	18	34.6	19	36.5	12	23.0	0	0	3	5.7
We source materials from eco-friendly suppliers.	12	23.0	10	19.2	20	38.4	6	11.5	4	7.6
We prioritize environmental sustainability in supplier selection.	12	23.0	8	15.3	20	38.4	7	13.4	5	9.6
We adopt green supply chain in response to customer demand.	16	30.7	23	44.2	7	13.4	3	5.7	3	5.7
We adopt a green supply chain as it helps reduce costs and improve efficiency.	11	21.1	21	40.3	12	23.0	5	9.6	3	5.7
Our Company has a green supply chain as part of our commitment to corporate social responsibility.	31	59.6	17	32.6	1	1.9	1	1.9	2	3.8
Our Company adopts a green supply chain	10	19.2	24	46.1	13	25.0	2	3.8	3	5.7

because it provides a competitive advantage.										
Our Company utilized renewable energy.	17	32.6	14	26.9	17	32.6	2	3.8	1	1.9
Our Company is committed to the reduction of hazardous materials.	7	13.4	8	15.3	19	36.5	13	25.0	5	9.6
We incorporate recycling within the manufacturing process.	9	17.3	14	26.9	17	32.6	7	13.4	5	9.6
Our Company focuses on the optimization of energy and resource usage.	14	26.9	23	44.2	10	19.2	3	5.7	2	3.8
Company's level of innovation in green products is high.	15	28.8	21	40.3	8	15.3	5	9.6	3	5.7

Source: Primary Data

Table 2 shows the solid dedication to green practices in key areas, where 59.6 percent of the respondents strongly agreed that their businesses incorporate green supply chain as a part of their corporate social responsibility and 55.7 percent adopt biodegradable materials. Another component which received a significant support is the waste reduction initiatives where the 71.1 percent of entrepreneurs have either agreed or strongly agreed on it. Nevertheless, green activities like the usage of energy-efficient transportation and supplier selection on the basis of environmental concerns have shown mixed responses from the entrepreneurs, with a major proportion of it being neutral. Meanwhile, entrepreneurs adopt green supply chain for its ability to utilize the cost efficiently and also because of the consumer demand, areas such as the usage of renewable energy and recycling in manufacturing requires improvement.

Perceptions And Practices Of Eco-Conscious Entrepreneurs On Transparent Supply Chain Management

Table 3 : Perception and Practices of respondents on TSCM

Variables	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	No	%	No	%	No	%	No	%	No	%
Our Company provides all supply chain information to our stakeholders.	28	53.8	15	28.8	5	9.6	2	3.8	2	3.8
Our Company conducts frequent audits of its supply chain to ensure eco-friendly and ethical compliance.	4	7.6	14	26.9	18	34.6	12	23.0	4	7.6
Our Company generates regular reports on eco-friendly and ethical compliance within the supply chain.	3	5.7	11	21.1	18	34.6	16	30.7	4	7.6
Our Company uses online dashboards or digital tools to provide information on our supply chain.	18	34.6	19	36.5	7	13.4	6	11.5	2	3.8
Our company monitors supply chain transparency through manual tracking methods.	3	5.7	11	21.1	25	48.0	8	15.3	5	9.6
Our Company uses basic digital tools, such as spreadsheets and basic databases, to track supply chain transparency.	2	3.8	3	5.7	13	25.0	27	51.9	7	13.4
Our Company uses advanced digital tools, such as supply chain software and block chain, to ensure supply chain transparency.	4	7.6	1	1.9	8	15.3	12	23.0	27	51.9
Strengthening customer trust is a main goal for achieving greater transparency in our supply chain.	32	61.5	13	25.0	4	7.6	0	0	3	5.7
Our Company's main goal for achieving transparency in the supply chain is to ensure regulatory compliance.	20	38.4	25	48.0	5	9.6	0	0	2	3.8

We ensure transparency in the supply chain to reduce risk.	16	30.7	25	48.0	9	17.3	0	0	2	3.8
Our Company ensures transparency in the supply chain in order to improve our supplier relationship.	17	32.6	21	40.3	8	15.3	2	3.8	4	7.6

Source: Primary Data

Table 3 shows the strong dedication to particular transparency practices in supply chain, with 53.8 percent of the respondents strongly agreeing that their business issue information about their operations and practices to their stakeholders. A major proportion of the respondents, accounting to 61.5 percent, strongly agree that their main target for ensuring transparency is to strengthen the customer trust. Another components which received notable support, with the respondents strongly agreeing to, were ensuring regulatory compliance and reducing risk, which accounts for 38.4 percent and 30.7 percent respectively. Although, transparency activities such as conducting frequent audits and generating reports demonstrated lower involvement, where significant proportion of the respondents either remained neutral or disagreed. Traditional tracking methods are seen common, while the corporation of advanced tools for tracking were minimal, with 51.9 percent strongly disagreeing.

Perceptions And Practices Of Eco-Conscious Entrepreneurs On Circular Supply Chain Management

Table 4 : Perceptions and Practices of respondents on CSCM

Variables	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	No	%	No	%	No	%	No	%	No	%
Our Company incorporates recycled or reused materials into production.	6	11.5	6	11.5	29	55.7	2	3.8	9	17.3
We engage in product take-back programs and reverse logistics.	10	19.2	28	53.8	8	15.3	3	5.7	3	5.7
Our Company disposes of returned products safely to minimize any environmental or operational risks.	14	26.9	20	38.4	10	19.2	4	7.6	4	7.6
We refurbish returned products and resell them as part of a value recovery process.	6	11.5	13	25.0	19	36.5	5	9.6	9	17.3
Our Company recycles materials from returned products to manufacture new items.	3	5.7	10	19.2	14	26.9	15	28.8	10	19.2
We donate or repurpose returned products to support community or sustainability goals.	18	34.6	13	25	11	21.1	5	9.6	5	9.6
We provide incentives to our customers for returning used products.	1	1.9	6	11.5	10	19.2	15	28.8	20	38.4
Our Company has introduced new product designs that incorporate recycled materials to enhance sustainability.	4	7.6	6	11.5	11	21.1	21	40.3	10	19.2
Our Company has implemented advanced recycling or recovery technologies to improve material reuse efficiency.	3	5.7	7	13.4	19	36.5	17	32.6	6	11.5
Digital tools are utilized to enhance transparency and traceability across the supply chain.	4	7.6	11	21.1	13	25	17	32.6	7	13.4
Collaboration platforms have been developed to strengthen partnerships with suppliers and customers in the circular supply chain.	10	19.2	16	30.7	12	23.0	9	17.3	5	9.6

Source: Primary Data

Table 4 shows a mixed involvement in circular supply chain practices amidst respondents. While 53.8 percent of the respondents agree that their business participates in product take-back programs and reverse logistics. 38.4 percent of them either agree or strongly agree that the products returned by their consumers are disposed safely to reduce risks, other circular activities indicate lower adoption. Among the respondents, only 11.5 percent strongly agree that recycled materials are involved into production, and initiatives such as repairing returned products and recycling those materials into new items have minimal support, with the respondents being highly neutral or disagreeing. Particularly, 34.6 percent of the respondents strongly agree that their enterprises either donates or repurposed returned products for community and sustainability goals, which shows a positive dedication in this area. Nevertheless, providing incentives for returned products and advanced recycling technologies indicate weaker adoption, with 38.4 percent and 32.6 percent strongly disagreeing respectively. Limited participation were seen in usage of digital tools for transparency and collaboration platforms for improved partnerships with suppliers and consumers.

V. SUMMARY

The study states that sustainable supply chain practices is a rising concept which is steadily gaining momentum among eco-conscious entrepreneurs in western zone of Tamil Nadu. While green supply chain activities have been generally adopted, these businesses have limited progress in the implementation of transparent and circular supply chain practices. This contrast is mostly because of the challenges such as lack of awareness, technological restrictions and high cost for implementation.

Most importantly, the findings from these analysis shows that sustainable businesses cannot be termed as non-profitable. Most of the respondents had been in the sustainable business for at least more than a year, where their initial profits were low because of higher setup costs. Yet, their businesses gained momentum over the course of years leading to higher profit in the following years. The research also foregrounds that commencing a sustainable business from scratch is often easier and more cost-efficient compared to transforming from a traditional practices. In conclusion, the study reveals that sustainable business have a promising growth opportunity which offers environmental benefits also long-term profitability for dedicated entrepreneurs.

REFERNCES

- [1]. R. Alamelu et al, (2023). Sustainable supply chain and circular economy ingenuities in small manufacturing firms- a stimulus for sustainable development. *Materialstoday: Proceedings* 92(1), 17-23.
- [2]. Sara Romagnoli et al, (2023). The Impact of Digital Technologies and Sustainable Practices on Circular Supply Chain Management. *MDPI*, 7(1), 1.
- [3]. Sayam Aroonsrimorakot et al, (2023). Green Supply Chain Management (GSCM) and Circular Economy (CE): A Rapid Review of their Conceptual Relationships. *Asia Social Issues*, 17(3).