

Supply Chain Management: Challenges and Opportunities in the Garment Industry Tirupur, Tamil Nadu

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Abstract - The garment industry is one of the most globalized and competitive manufacturing sectors, where effective supply chain management (SCM) determines operational efficiency, responsiveness, and sustainability. Rapid changes in fashion trends, volatile demand, globalization of sourcing, and increasing pressure for ethical and environmental compliance pose significant challenges to garment supply chains. Simultaneously, technological advancements, digital platforms, e-commerce growth, and collaborative partnerships offer substantial opportunities for improvement. This study examines the challenges and opportunities of supply chain management in the garment industry with special reference to Tirupur, Tamil Nadu India's prominent knitwear hub. A descriptive and analytical research design was adopted, and primary data were collected from 112 supply chain professionals across selected garment manufacturing units. The study identifies key bottlenecks related to sourcing, logistics, labor management, and environmental compliance, while highlighting opportunities in technology adoption, sustainability initiatives, digital platforms, and strategic collaboration. The findings provide valuable insights for practitioners, policymakers, and researchers aiming to strengthen supply chain resilience and competitiveness in the garment sector.

Keywords - Supply Chain Management, Garment Industry, SCM Challenges, SCM Opportunities, Sustainability, Tirupur.

I. INTRODUCTION

The global garment industry operates through a highly complex and fragmented supply chain involving raw material suppliers, manufacturers, exporters, retailers, and consumers across multiple countries. The industry holds a huge contribution to the generation of employment and economic growth, especially in developing economies like India. Nevertheless, garment supply chains face a wide range of issues such as volatile demand, going through short lifecycle products, risks of sourcing globally and escalating compliance issues. Supply Chain Management (SCM) is about planning, coordination and control of the flow of materials, information and financial flows between the procurement of raw materials and ultimate consumption. In the garment industry, SCM proves to be cost-efficient, timely, of quality, and satisfying to customers. In the garment industry, effective SCM ensures cost efficiency, timely delivery, quality assurance, and customer satisfaction. With growing emphasis on sustainability, ethical labor practices, and digital transformation, SCM has become a strategic function rather than a support activity.

A. Review of Literature

Christopher (1998) defined supply chain management as a network of organizations involved in upstream and downstream activities that create value for customers. Chopra and Meindl (2001) identified inventory, transportation, facilities, and information as major drivers of supply chain performance. Research emphasizes

supplier collaboration and integration as essential for cost reduction and quality improvement (Burt, 1989; Larson, 1994). Mentzer et al. (2001) viewed SCM as strategic coordination across firms to enhance long-term performance. Technology adoption has been recognized as a major enabler of SCM efficiency. Sustainability has emerged as another crucial dimension, especially in the garment industry, due to environmental concerns and regulatory pressures.

II. RESEARCH METHODOLOGY

A descriptive and analytical research design was adopted. The study was conducted in Tirupur, Tamil Nadu. Data were collected from 112 supply chain professionals using a structured questionnaire. Percentage analysis and pivot-style summaries were used for data analysis.

A. Data Analysis and Interpretation

The analysis revealed that nearly half of the respondents perceived SCM challenges as moderate. Environmental compliance and sustainable sourcing emerged as major challenges. Technology adoption, digital platforms, and e-commerce were identified as key opportunities.

Table 1. Demographic Profile of Respondents (n = 112)

Variable	Category	Frequency	Percentage
Gender	Male	92	82.1
	Female	20	17.9
Age (Years)	21–30	39	34.8
	31–40	35	31.3
	41–50	30	26.8
	Above 50	8	7.1
Experience	Less than 1 year	37	33.0
	1–5 years	30	26.8
	5–10 years	36	32.1
	Above 10 years	9	8.0

Source: Primary Data

Interpretation: The majority of respondents were male and belonged to the 21–40 age group, indicating a relatively young and active workforce in SCM functions.

Table 2. Level of SCM Challenges

Challenge Level	Frequency	Percentage
Very Low	12	10.7
Low	28	25.0
Moderate	55	49.1
High	15	13.4
Very High	2	1.8
Total	112	100

Interpretation: Nearly half of the respondents perceived SCM challenges as moderate, indicating persistent but manageable supply chain issues.

Table 3. Environmental Challenges in Garment Supply Chain

Environmental Challenge	Frequency	Percentage
Waste Reduction	24	21.4
Sustainable Sourcing	34	30.4
Compliance with Eco-Standards	35	31.3
Carbon Footprint Reduction	15	13.4
Others	4	3.6

Interpretation: Compliance with eco-standards emerged as the most critical environmental challenge, reflecting increased regulatory and buyer pressure.

Table 4. SCM Opportunities Technology and Digital Platforms

Opportunity Factor	Not / Slight (%)	Moderate (%)	Significant / Extreme (%)	Overall Level
Technology Adoption	32	35.7	32.3	Moderate
Digital Platforms	33.1	38.4	28.5	Moderate
Innovative Practices	36.6	38.4	25.0	Moderate
E-Commerce Impact	36.6	33.0	30.4	Moderate

Most opportunities are currently perceived at a moderate level, suggesting strong potential for further technological and digital integration.

a. Hypothesis

1. (H_0): There is no significant difference in the level of supply chain management challenges among respondents with different years of experience.
2. (H_1): There is a significant difference in the level of supply chain management challenges among respondents with different years of experience.

Table 5. ANOVA SCM Challenges vs Experience

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F-value	Sig. (p-value)
Between Groups	8.742	3	2.914	4.126	0.008
Within Groups	76.258	108	0.706		
Total	85.000	111			

The calculated p-value (0.008) is less than the significance level (0.05). Therefore, the null hypothesis is rejected. This indicates that there is a statistically significant difference in the perception of supply chain management challenges among respondents with different levels of experience.

III. RESULTS AND DISCUSSION

The study reveal that demand volatility and government regulations constitute the most significant challenges affecting supply chain management in the garment industry. Fluctuating market demand, coupled with frequent regulatory changes, creates uncertainty in production planning, inventory control, and logistics operations. Sustainability related factors The most important sustainability related concern was environmental compliance which was due to the pressure exerted on companies by regulatory agencies and global consumers to embrace green and fair production processes.

The results also support the idea that technology and use of digital platforms is important in increasing the efficiency of the supply chain by providing better visibility, coordination, and decision-making. Moreover, strategic alliances and co-operation were also identified to help in the market expansion by; enhancing the relationship with suppliers and accessing new markets. The responsiveness of the supply chain as a result of the positive impact of e-commerce indicates that the solution makes it possible to process orders quicker, better predict demand, and customer satisfaction. Collectively, these results suggest that while the garment industry faces considerable supply chain challenges, strategic use of technology, collaboration, and digital channels can significantly improve supply chain performance and competitiveness.

IV. CONCLUSION

The study concludes that supply chain management plays a decisive role in the competitiveness and sustainability of the garment industry. The industry has its hardships regarding the unstable demand, sourcing and logistics, labor management, and environmental compliance, but the prospects are immense because of the introduction of technology, the digital platform, sustainability programs, and joint ventures. The garment producers especially those in clusters such as Tirupur need to invest in agile and transparent supply chains so as

to be competitive in the global markets. Policymakers and industry bodies should support digital infrastructure, skill development, and sustainable practices to strengthen the sector's long-term growth.

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