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THE NECESSITY FOR SUPPLY CHAIN INTERVENTION AND THE RELATIONSHIP BETWEEN EXPORTS AND THE ENVIRONMENT IN LIGHT OF LEATHER EXPORTS

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ABSTRACT

The Indian government gave the leather industry particular attention due to its strong and promising foreign exchange earnings without sacrificing the creation of jobs. Rich craftsmanship, cost-effective labor, and a wide range of raw materials are the sources of this competitive advantage. As a result, at the turn of the 20th century, the leather industry had grown from exporting raw materials to producing high-value final goods. It is said to have maintained its comparatively strong position in the global markets by compromising under several policy regimes at both the national and international levels. Therefore, there is a need to quantify the green sustainability of the supply chain of India's export-oriented leather manufacturing companies using a particular and validated typology. One such tried-and-true tool for determining the precise state of green sustainability is Green Supply Chain Management (GSCM), which also offers a methodology for firms to implement if they haven't already. Given the body of research on international trade and the environment, it is evident that there are a variety of opinions and disagreements among scholars who believe that trade benefits the environment or ought to benefit it, while others are concerned that trade will have the opposite effect. This chapter ends by demonstrating the increased potential for exporting Indian leather overseas. However, this industry also faces environmental issues, which supports the notion that export liberalization and the environment are negatively correlated. Finding solutions for the entire supply chain while maintaining the export competitive advantage is the sector's challenge..

KEYWORD: Government, Green Supply Chain Management, Leather, Sustainability

1. INTRODUCTION

Since 3000 BC, India's leather industry has been the country's oldest manufacturing sector. Back then, leather was mainly tanned using local methods like rubbing fat, smoking, drying, etc., and it was utilized for a variety of purposes like clothes, tents, shoes, seats, and more. In the 19th century, the British established the first leather boot factory in Kanpur in 1880 after introducing the contemporary techniques of chrome tanning in 1857. As demand grew, about 22 tanneries were established throughout India by 1913.

In 1948, the Central Leather Research Institute (CLRI) was founded in an independent India. India restricted the manufacturing of leather and leather products to the small-scale industry in 1951 by outlawing the export of raw hides and skins. Only completed leather and value-added products were allowed to be exported in 1972, in accordance with recommendations made by the Dr. A. Seetharamiah Committee. In terms of trade liberalization, the 1990s saw significant advancements in international trade, leading to both domestic and international initiatives. Trade liberalization was expected to benefit emerging nations, which have a comparative edge in producing labor-intensive and natural resource-intensive goods. Since then, the Government of India has made leather and leather products a priority for export promotion (Working Group Report GOI, 2011; Foreign Trade Policy 2010-15, published in 2009; Government of India, 5 years plan 2012-17, published in 2011). It has also proven to be a reliable source of foreign exchange earnings for India, placing it in the top ten foreign exchange earners of the nation and ranking among the top employment-generating sectors (Singh, 2004).

2. OBJECTIVES OF THE STUDY

1. Recognize the necessity for supply chain intervention and the relationship between exports and the environment in light of leather exports
2. To gather and assess data on the demands, obstacles, and distinct forces influencing an organization's green supply chain activities.

3. RESEARCH METHODOLOGY

This study's goal was to gather empirical data on the different forces, motivators, and obstacles affecting India's leather industry's green supply chain. For this section of the investigation, a Delphi study was selected. The Delphi technique asks professionals to share their thoughts. Additionally, it makes it possible to compile these answers and identify the fundamentally important elements in an organized way for setting priorities and, ultimately, carrying out a legitimate study or research. Three phases of the study have seen the collection of primary data. Before committing to a full-fledged study or experiment, researchers might perform a preliminary

analysis using a pilot study, a conventional scientific instrument for "soft" research. During the pilot study, the researcher used the draft questionnaire to visit 15 organizations. For this study, all of the information gathered from the organizations was utilized. The primary questionnaire was then revised in light of the interviews, viewpoints, and conversations with subject-matter experts, business owners, managers, and consultants. 100 leather manufacturers and exporters participated in the questionnaire survey. The questionnaire was sent to the respondents by the researcher by email (Google Doc) and physical hand delivery.

Secondary Data

Journals, books, reports, government publications, working papers, research papers, conference proceedings, print and online articles, publicity materials, etc. are the sources of the secondary data gathered for the comprehensive literature survey and content analysis.

Sampling Technique

Since not every organization has an equal probability of being chosen, the survey is non-probabilistic in character. Convenience sampling is another method employed under non-probabilistic sampling, in which samples are chosen based on their easy accessibility and closeness to the researcher.

4. RESULT AND DATA ANALYSIS

TABLE 4.1: MEAN AND SD OF PRESSURE AND ITS DOMAINS SCORES BY TYPE OF OWNERSHIP

Variables	Ownership	Proprietorship	Partnership	Private limited	Total
	N	40	50	10	100
Pressure	Mean	48.10	48.04	52.21	48.52
	SD	5.06	5.11	8.08	5.57
External pressure	Mean	20.00	20.11	20.80	20.13
	SD	3.40	3.06	3.67	3.23
Motivational pressure	Mean	10.71	11.10	12.21	11.07

	SD	1.85	1.72	1.81	1.81
Decision pressure	Mean	17.17	16.60	19.06	17.07
	SD	3.55	3.22	4.35	3.51

Comparison of Means and Standard Deviation (SD) of Barrier & its domains scores by Type of ownership

The Mean and SD of Barriers scores by Type of Ownership are shown in table 4.1. The mean score for all barriers is 34.40±3.64. The proprietorship kind of ownership has the lowest mean Barriers score (34.17±3.88), followed by the partnership type (34.20±3.71) and the private limited company type (36.05±2.03).

TABLE 4.2: MEAN AND SD OF BARRIERS SCORES BY TYPE OF OWNERSHIP

Ownership	Proprietorship	Partnership	Private limited	Total
N	40	50	10	100
Mean	34.17	34.20	36.05	34.40
SD	3.88	3.71	2.03	3.64

Comparison of Means and Standard Deviation (SD) of Driver & its domains scores by Type of ownership

The mean and standard deviation of drivers' scores by ownership type are shown in table 4.2. The average score for all drivers is 25.10±4.68. The partnership type of ownership has the highest mean Drivers score (25.30±5.20), followed by proprietorship (25.12±4.36) and private limited company (24.13±3.17).

TABLE 4.9: MEAN AND SD OF DRIVERS SCORES BY TYPE OF OWNERSHIP

Ownership	Proprietorship	Partnership	Private limited	Total
N	40	50	10	100
Mean	25.12	25.30	24.13	25.10
SD	4.36	5.20	3.17	4.68

Comparison of Means and Standard Deviation (SD) of Organizational GSCM performance & its domains scores by Type of ownership

TABLE 4.3: MEAN AND SD OF GREEN SUPPLY CHAIN MANAGEMENT (GSCM) AND ITS

DOMAINS SCORES BY TYPE OF OWNERSHIP

Variables	Ownership	Proprietorship	Partnership	Private limited	Total
	N	40	50	10	100
Organizational GSCM performance	Mean	105.42	106.02	103.21	105.50
	SD	7.10	8.02	3.12	7.30
Customer coordination	Mean	13.83	14.17	16.70	14.20
	SD	1.50	2.07	3.05	2.08
Eco accounting	Mean	10.76	11.57	11.40	11.07
	SD	1.74	1.83	2.01	1.81
Economic and financial performance	Mean	37.02	39.40	42.00	38.15
	SD	3.85	3.44	1.65	4.00
Operational performance	Mean	20.46	23.77	26.30	22.04
	SD	4.20	2.48	1.85	4.06
Environmental performance	Mean	18.24	21.22	21.50	19.54
	SD	2.86	1.74	1.47	2.82

The mean and standard deviation of organizational GSCM performance and domain scores by ownership type are shown in table 4.3. The overall organizational GSCM performance score is 105.50±7.30 on average. Partnership ownership has the highest mean Organizational GSCM performance score (106.02±8.03), followed by proprietorship (105.42±7.10) and private limited company ownership (103.21±3.12).

Comparison of Means and Standard Deviation (SD) of GSCM & its domains scores by Number of operating plants

TABLE 4.4: MEAN AND SD OF GREEN SUPPLY CHAIN MANAGEMENT (GSCM) AND ITS DOMAINS SCORES BY NUMBER OF OPERATING PLANTS

Variables	Operating	One	Two	Three &	Total

	plants			more	
	N	45	50	5	100
Green supply chain management (GSCM)	Mean	275.62	283.34	291.63	280.43
	SD	11.74	13.03	12.54	13.23
Green process design practice (GPDP)	Mean	21.34	22.44	22.01	22.01
	SD	4.80	3.50	5.05	4.23
Green procurement practices (GPP)	Mean	47.80	48.86	50.13	48.46
	SD	5.26	4.67	6.20	5.06
Green manufacturing practices (GMP)	Mean	64.40	64.51	68.13	64.72
	SD	6.16	8.45	7.58	7.42
Green marketing practices (GM)	Mean	21.26	21.00	23.02	21.22
	SD	3.43	4.10	1.61	3.70
Green logistic and distribution practices (GLDP)	Mean	49.34	51.03	53.01	50.41
	SD	5.32	4.07	6.31	4.88
Occupational safety and health hazards (OSHHP)	Mean	37.54	39.00	36.76	38.16
	SD	3.67	4.01	2.80	3.83
Internal environmental management system practices (IEMP)	Mean	33.26	36.02	38.00	34.85
	SD	5.51	5.42	3.48	5.52

The mean and standard deviation of Green Supply Chain Management (GSCM) and its domain scores by the number of operational plants are displayed in Table 4.4. The average score for GSCM (green supply chain management) is 280.32±13.34. Organizations with three or more operating plants have the highest mean green supply chain management (GSCM) score (291.63±12.54), followed by those with two operating plants (283.34±13.03) and one operational plant (275.62±11.74).

Comparison of Means and Standard Deviation (SD) of Pressure & its domains scores by Number of operating plants

The mean and standard deviation of pressure and its domain scores by the number of operational plants are shown in table 4.5. The overall pressure score average is 48.52±5.57. Organizations with three or more operating

plants had a lower mean pressure score (46.63±4.84), followed by those with two operating plants (47.82±5.05) and one operating plant (49.54 ±6.10).

TABLE 4.5: MEAN AND SD OF PRESSURE AND ITS DOMAINS SCORES BY NUMBER OF OPERATING PLANTS

Variables	Operating plants	One	Two	Three & more	Total
	N	45	50	5	100
Pressure	Mean	49.54	47.82	46.63	48.52
	SD	6.10	5.05	4.84	5.57
External pressure	Mean	20.50	20.00	19.63	20.13
	SD	3.86	2.63	2.60	3.23
Motivational pressure	Mean	11.30	10.87	11.13	11.07
	SD	1.62	2.08	2.04	1.81

Comparison of Means and Standard Deviation (SD) of Barrier & its domains scores by Number of operating plants

TABLE 4.6: MEAN AND SD OF BARRIERS SCORES BY NUMBER OF OPERATING PLANTS

Operating plants	One	Two	Three & more	Total
N	45	50	5	100
Mean	35.72	33.44	32.13	34.40
SD	3.05	4.00	2.27	3.64

The Mean and SD of Barriers scores by Number of Operating Plants are shown in Table 4.6. The overall Barriers score average is 34.40±3.64. Organizations with three or more operating plants had a lower mean Barriers score (32.13±2.38), followed by those with two operating plants (33.44±4.00) and one operating plant (35.72±3.05).

Comparison of Means and Standard Deviation (SD) of Driver & its domains scores by Number of operating plants

The mean and standard deviation of drivers' scores by the number of operational plants are shown in table 4.7. The average score for all drivers is 25.10±4.68. The businesses with three or more operational plants had the highest mean Drivers score (28.76±2.74), followed by those with two running plants (25.57±4.80) and one operating plant (24.02±4.50).

TABLE 4.7: MEAN AND SD OF DRIVERS SCORES BY NUMBER OF OPERATING PLANTS

Operating plants	One	Two	Three & more	Total
N	45	50	5	100
Mean	24.02	25.57	28.76	25.10
SD	4.50	4.80	2.74	4.68

Comparison of Means and Standard Deviation (SD) of Organizational GSCM performance & its domains scores by Number of operating plants

TABLE 4.8: **MEAN AND SD OF ORGANIZATIONAL GSCM PERF BY NUMBER OF OPERATING PLANTS**

Variables	Operating plants	One	Two	Three & more	Total
	N	45	50	5	100
Orgsn GSCM perf	Mean	102.50	107.10	114.00	105.50
	SD	6.12	6.60	9.40	7.30
Customer coordination	Mean	13.85	14.30	16.00	14.21
	SD	1.70	1.82	3.60	2.08
Eco accounting	Mean	11.02	11.13	11.63	11.07
	SD	2.05	1.64	2.14	1.981
Eco and finl perf	Mean	37.44	38.44	40.76	38.15
	SD	4.46	3.20	3.50	4.00
Operational perfmnce	Mean	20.87	22.87	24.14	22.05
	SD	4.31	3.60	3.42	4.05
Env performance	Mean	19.04	20.00	21.01	19.54
	SD	3.18	2.47	1.78	2.82

The mean and standard deviation of organizational GSCM performance and its domain scores by number of running plants are shown in table 4.8. The average GSCM performance score for the entire organization is 105.50±7.30. Organizations with three or more operating plants have the highest mean Organizational GSCM performance score (114.00±9.40), followed by those with two operating plants (107.10±6.60) and one operating plant (102.50±6.12).

5. CONCLUSION

One of the major industries in the past that guaranteed the most amount of foreign exchange, income, and jobs was the leather export industry in India. However, the fact that this industry is a hotbed of pollution still stands. There are significant environmental risks associated with every step of the leather production process, including the use of chemicals, solvents, trash, etc. This was made clear when the industry suffered greatly from two consecutive bans in 1989 and 1994 due to the overabundance of hazardous ingredients in the products. This severity was further increased by the Supreme Court of India's ruling to shut down the tanneries due to environmental regulations. The study was started with the understanding that the domestic environment and export liberalization are strongly correlated. This study has provided sufficient data to demonstrate that there is a trade-off relationship between export and the environment, following a thorough review of the literature on export and the environment in general and leather makers and exporters in particular.In order to support the negative relationship between export and the environment in the leather industry and its export-related activities, this study also conducted in-depth Delphi interviews with academicians, consultants/experts, leather manufacturers, and exporters. This was determined to be factual by the researcher. The Delphi interview sample size was 17. The Delphi study also pinpointed the shortcomings and causes of this industry's poor performance in terms of "green sustainability." This study process yielded research parameters (and sub-parameters) such Pressures, Barriers, and Drivers.

In order to see the facts and reality on the ground, the researcher conducted a force field investigation with ABC Leathers. Every step of the supply chain, from the importation of raw materials to processing to final products and all the way to the end product's delivery to clients, was examined. The field investigation's findings demonstrated that the reality and conditions on the ground were much worse than those portrayed in the literature. Although the sample organizations had environmental measures including certifications, environmental management systems, and ETPs to prevent pollution and environmental damage, these were more in theory than in practice.

India's close rivals, China, Pakistan, Indonesia, and Thailand, were compared based on the following criteria: pollution, water use, waste, animal welfare, natural resources, annoyance, health risks, and worker safety. The results showed that these nations' circumstances are not all that different from one another. Although the legal foundation is in place in every nation, each one's execution efficiency differs. However, it is undeniable that environmental consciousness has increased significantly among sectors in all four nations compared to the past, in part because of domestic rules and in full because of international pressures and regulations.

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