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Sustainability in Supply Chain Management: A Case Study of the Indian Retailing Industry †

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Abstract: This study aims to identify the sustainability programs introduced in their supply chains by the Indian retailing (FMCG and Pharma) sector and the various problems encountered in managing their supply chains. The researchers collected the opinions of 200 companies from the FMCG and pharma sectors after checking the questionnaire's internal consistency and validity using Cronbach's α and Kaiser–Meyer–Olkin (KMO) tests. After data collection, the data were summarized, coded, and controlled using R Studio and Microsoft Excel. The hypotheses were analyzed using the Kruskal–Wallis (K-W) hypothesis technique. Manufacturers emphasized that their supply chains impact toxic waste and pollution, that wholesalers and retailers are highly influenced by poor cost control and management, that there is a difficulty in forecasting demand, and that there are supply related problems.

Keywords: sustainability; supply chain management; environment; economy; society; Indian retailing sector

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1. Introduction

Sustainability, the most trending buzzword in the business map of the world, particularly in the new millennium, has received prominent attention from corporates. In acquiring profits, companies, irrespective of their magnitude and type, concentrate on enhancing profits the one hand and on cost reduction in every bit of operation taken up on the other. Based on the significance and cost involved in supply chain management, most companies consider this function a crucial element for cost reduction. In the erstwhile control regime era, trading was relatively easy, and competition was less, with assured returns. With the introduction of the most influential economic policies in the early 1990s, viz., liberalization, privatization, and globalization, the world markets opened, and competition became more intense; selling is nowadays a more complex task and only possible with the introduction of competitive prices with the market expected degree of quality. To minimize the total cost of production, it is a must for every organization to tighten their complete operations, notably supply chain activities, comprehensively. The corporate world must maintain long-lasting relationships with all the stakeholders in general and suppliers in particular and treat them as partners in the progress of organizations. In the process of the supply chain, i.e., turning raw materials into a final product, the business world must be conscious of the minimization of the environmental harm through carefully managing and controlling all kinds of utilities to keep in mind the waste and pollution control measures to create a positive influence on different stakeholders and future generations. Since the 1990s, sustainable supply chain management has been an issue in academia and the corporate world in other countries.

The COVID-19 outbreak was acknowledged as a public health emergency of global concern on 30th January 2020 and was confirmed as a pandemic on 11th March 2020 by

the World Health Organization [1]. Throughout the globe, the WHO declaration and the scary, life-threatening situation created a situation for the world population to struggle and keep a balance between life and livelihood. In the recent hundred years, the world has never witnessed the destruction created by the COVID-19 pandemic. The unexpected and gigantic destruction is not only related to one or two sectors; all sectors of the world economy, like trade, finance, health and education systems, businesses, and societies, irrespective of the magnitude and type of operations were affected. The entire world has swiftly identified the intensity of the pandemic and introduced extreme measures, such as lockdowns, imperative vaccinations, restrictions on social movement, social distancing, and, more significantly, the closing of borders, restrictions imposed on trade, and other containment procedures that resulted in the disruption of supply chains [2]. Most firms faced many challenges in managing their supply chains, from inbound logistics to services in the value chain, finally leading to a lack of demand [3] and labor shortages [4]. Many companies traditionally emphasize the optimization of the supply chain to minimize costs, reduce inventories, and drive up asset applications (even in their indifferent buffers and suppleness to engage disturbances). Moreover, COVID-19 exemplifies that many firms are not entirely conscious of the susceptibility of their supply chain relationships to universal shocks like COVID-19, trade wars, act of war or terrorism, regulatory change, labor dispute, unexpected hikes in demand, or supplier bankruptcy [5]. Undoubtedly, a black swan event like COVID-19 forced many companies and industries in different parts of the globe to rethink, transform, and introduce digital supply networks (DSNs) instead of conventional linear supply chain models by taking advantage of cutting-edge know-how, such as the Internet of Things, artificial intelligence, robotics, 5G, and DSNs. With this kind of backdrop, the introduction of digital supply networks keeps in mind the sustainability to make a mark on the environment, economy, and society, which concerns supply chain sustainability. Supply chain sustainability refers to a business supply chain's impact on the environment, economy, and society. The highest level of supply chain management achieves sustainability, meaning that it operates within natural and social thresholds [6]. This study examines the sustainability programs introduced in businesses' supply chains by the Indian retailing (FMCG and Pharma) sector and various problems encountered in managing their supply chains.

Supply chains play a paramount role in driving the economy of any country, irrespective of where they are in the world. Since the 1990s, whenever globalization was introduced, the significance of supply chain management has gained momentum, and most companies have concentrated on making their supply chains more resilient, collaborative, and networked. In 2013, academicians [7] revealed that few papers are available that attempt to document and understand the significance of supply chain management within the Indian business context. Supply chain management plays a decisive role in developing a competitive advantage for products and services offered by firms in dynamic global markets [8]. Companies that maintain several product lines with many product mixes serve diversified cultures and geographical boundaries like India and face the intricate task of synchronizing resources and strategies to serve markets profitably. Supply chain management (SCM) involves obtaining and altering input factors into final products and delivering them in time to meet the market's needs, wants, and aspirations. Different suppliers provide various input factors that facilitate the manufacturing of products and services and dispense them to other channel members to reach the hands of the final consumer. Supply chain management addresses these requirements in a synchronized approach to manage materials, information, finances, and their flow from supplier to consumer. As revealed by researchers [9], supply chain management is accountable for frequent flows of information (orders, status, contracts), physical (finished goods and raw materials, etc.), and financial (payment, credits, etc.) goods. These chains of activities and organizations have different terminologies, e.g., process (in operations), logistics channel (in marketing), value chain (emphasis is on the value added), demand chain (customer demands in question), and in the most general terms, supply chain management. Therefore, supply chain management

is 'the management of the interconnection of firms relating to each other through upstream and downstream linkages between the diverse processes that produce value in the form of products and services to the final consumer' [10]. The turf of supply chain management is frequently changing due to the drastic changes in technology and competitive nature throughout the globe, along with man-made and natural calamities identified by the world; keep corporate social responsibility and sustainability in mind. It is, thus, crucial and critical to map these changes from the Indian retailing industry perspective because of the sector's depth and breadth. The Indian Institute of Management, Ahmedabad (IIMA), researchers wrote a scientific paper [11] on the impact of COVID-19 disruptions on the Indian supply chains of different sectors and attempted to bridge the gap between supply chain industry practices and the research work carried out.

Present-day businesses are extensively investing their time in designing and introducing supply chains to optimize value for customers and maintain a competitive edge to generate the expected margins by creating value through the primary and support activities of the companies' value chains. As the world moves toward stability after the pandemic, businesses in India have started analyzing the current landscape of their supply chains and attempted to upgrade their supply chains with the support of technological advancements, growth of e-commerce, globalization, sustainability concerns, and increased competition—which have all played a role in shaping the industry. Most significantly, sustainability issues are going to play a dominant role along with technological upgrades such as global positioning systems (GPS), radio frequency identification (RFID), artificial intelligence (AI), the Internet of Things (IoT), and automation. In the recent twenty years, the Indian logistics and supply chain industry developed from a support sector to a high-impact sector. According to a report, the size of the Indian logistics industry was around USD 100 billion in 2020, up from around USD 40 billion in 2010 to approximately USD 15 billion in 2000, and it is estimated that the sector will grow to about USD 380 billion by 2025 [12]. The Indian industry, in general, and the retailing sector are hectically involved in designing and developing sustainable supply chains within natural and social thresholds with two overarching goals. Goal one is to minimize environmental harm through decreasing water use, energy use, and waste production, and the other is to impact the environment positively and local communities. Many companies are developing a clear strategy to create more sustainable supply chains that depend on technology. These tech-based sustainable supply chains do not begin and end with your place in the supply chain—it involve every single player from end to end, which means that companies have to keep an eye on the sustainable practices of every channel member, including physical distribution firms by offering sufficient training and development programs. Supply chain sustainability, or SCS, refers to meeting the needs of the stakeholders in an organization through business practices that value and protect natural resources, reduce the environmental impact, improve social well-being [13], and confidently help managers to comprehend their own company's supply chain processes to recognize opportunities for development vis à vis both environmental and social sustainability. Sustainability has become apparent from apprehensions about the exhaustion of natural resources for future generations [14]. It has evolved to be considered the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [15]. Researchers like Carter and Rogers [16], Seuring and Müller [17], and Ahi and Searcy [18] have defined SSCM and assembled on the significance of integrating sustainable development initiatives with supply chain management (SCM) for the present and future improvements of organizations. Likewise, rapid changes in customer demand patterns and expectations, growing trends of competition, and pressures from governments and other stakeholder groups have fostered most companies to adopt sustainable practices in supply chains [19]. In 2013, the Council for Supply Chain Management Professionals (CSCMP) introduced revised definitions, providing sustainability as a business effort to comply with sustainable development elements, considering stakeholders' requirements and corporate social responsibility [20]. The review article published in the 'Sustainabil-

ity' journal in 2020 comprehensively reviewed sustainable supply chain management in emerging economies and offers an elaborate discussion of the concept. This research was initiated by considering the idea of sustainability, which is also called the "triple bottom line" (TBL), which consists of the intersection of the three components of the TBL (environment, economic, and social) [21]. Even though companies have a clear and single objective, i.e., profit orientation, the consideration of the environmental and social issues that demand heavy budgets is generally neglected. Even in these circumstances, the performance of the TBL can be sustained by firms' and their suppliers' processes and practices, listening to customers, and meeting market demands [22]. Researchers from France and Saudi Arabia conducted a joint descriptive and critical analysis that revealed eight essential supply chain practices connected to sustainability—purchasing, designing, transporting, sharing information, cooperating, packaging, lean manufacturing, and managing people and operations [23]—with a clear reflection on their meaning. Two concepts of the supply chain are distinguished in the considerations—sustainable supply chain (SSC) and sustainable supply chain management (SSCM) [24]. These are not the same concepts. Even though there are slight differences between these two concepts, the researchers have yet to consider them the same and continue the research.

The researchers have chosen the following list of hypotheses based on the extensive discussion:

H1. *Manufacturers emphasized that their organizations' supply chains significantly impact toxic waste, air, water, and sound pollution.*

H2. *Clearing and forwarding (C&F) agents determine that their supply chains have a more significant influence on lobbying, corruption, red-tapism, and bureaucracy than other economy-related factors.*

H3. *Stockists and super stockists state that their supply chains have an equally significant impact on health, safety, security, environmental issues, and sustain able production, working conditions, and socially responsible actions.*

H4. *Wholesalers and retailers account that their supply chains significantly impact the timely payment of taxes to local, state, and central governments more than any other economy-related problems.*

H5. *Wholesalers and retailers assert that their supply chains significantly impact the poor cost of control and management, difficulty in forecasting demand, and supply-related problems.*

2. Materials and Methods

This research is a descriptive cross-sectional study. A five-part self-administered and well-structured questionnaire was distributed and compiled from 200 respondents from the FMCG and pharma sector companies by using stratified random sampling. This comprehensive five-part questionnaire covered the demographics of the respondents in part one, and the subsequent parts two, three, and four enquired about the targeted subjects or supply chains of companies' influence on environment-, economy-, and society-related issues. Finally, in the fifth part, the researchers attempted to highlight the various problems identified by the Indian retail sector companies in managing their supply chains, keeping sustainability in mind. The Cronbach's α and Kaiser–Meyer–Olkin (KMO) tests were used to check the internal consistency and validity of the total eighteen variables instrument. The collected data were formulated and evaluated statistically, applying the R language in R Studio. Predominantly, by managing the comprehensive collected data with Microsoft Excel, the researchers completed the cleaning process partially before carrying the data into the statistical computing tool, R Studio. The selected five hypotheses were analyzed using the Kruskal–Wallis (K-W) hypothesis technique. Along with the questionnaire, the

researchers conducted brief personal interviews with supply chain managers and other middle-level executives of different FMCG and pharma companies to investigate the problems they face in managing their supply chains.

2.1. Demographic Profile of the Respondents

The following Table 1 shows the demographic variables of the respondents, like the category of industry (FMCG and pharmaceuticals) and the role of the company in the supply chain (manufacturers, C&F agents, stockists, super stockists, wholesalers, and retailers).

Table 1. Demographic profile of the respondents.

Demographic Variable	Manufacturers (15)	C&F Agents (18)	Stockists/ Super Stockists (67)	Wholesalers and Retailers (100)	Percentage (%)
Environmental Effects					
(a) Toxic waste, water, air, and sound pollution	8	2	17	13	20.0
(b) Loss of biodiversity, deforestation, and damage to the ecosystem	1	2	3	3	4.5
(c) Hazardous air emissions and greenhouse gas emissions	2	1	7	7	8.5
(d) Overuse of energy and utilities	4	3	8	14	14.5
Economy-related Effects					
(a) Timely payment of taxes to local, state, and central governments	15	18	67	100	100.00
(b) Infrastructure (power, banks, telecom, all modes of transportation, warehousing and storage-related issues)	8	7	15	25	27.5
(c) Lobbying, corruption, red-tapism, and bureaucracy	0	2	5	5	6.0
(d) Political and legal influence	9	8	12	18	23.5
Social Effects					
(a) Human rights issues like child labor, slavery	2	2	3	7	7.0
(b) Health, safety, security, and environmental issues	15	17	67	92	95.5
(c) Sustainable production and working conditions	15	17	67	96	97.5
(d) Socially responsible actions	15	17	67	90	94.5
(e) Influence on the issues of local cultures and sub-cultures	4	5	11	12	16.0

2.2. Reliability and Validity Tests

The scholars tested the reliability and validity of the questionnaire by administering both Cronbach's α and Kaiser–Meyer–Olkin (KMO) tests by using a sample of 50 companies' supply chain managers and executives who were primarily working in the South Indian states of Andhra Pradesh and Telangana. The chosen two tests are the most prominent and widely used statistical tools to check the validity and reliability of the instruments in diverse contexts and situations. Based on the proven reliability and validity of the questionnaire,

the researchers accumulated the opinions of the remaining 150 companies' supply chain managers from the FMCG and pharma sectors of the Indian retailing industry. Cronbach α is the most applied measure of internal consistency, and the reliability coefficient (α) can range from 0 to 1, with 0 representing a questionnaire that is not reliable and 1 representing a dedicated questionnaire. A reliability coefficient (α) of 0.81 (Table 2) or higher is considered better reliability in R Studio [25].

Table 2. Reliability and validity of the questionnaire.

Number of Variables	Cronbach's Alpha	Kaiser–Meyer–Olkin (KMO)
18	0.81	0.85

The KMO test implemented in this research was used to determine if the data were ready for analysis. As mentioned in Table 2, the result of the KMO test for the overall model consisting of 18 variables was 0.85, which proves that the data are primarily adequate and eligible for implementing the Kruskal–Wallis hypothesis testing technique. The Kaiser–Meyer–Olkin (KMO) test is a statistical measure to govern how suited data are for factor analysis. The test measures the sampling sufficiency of each variable in the model and the complete model. The statistics measure the proportion of variance among variables that might be common variance.

2.3. Testing of Hypotheses

Eventually, the garnered data were prepared to test and determine the driven assumptions by managing this study's K-W hypothesis testing technique. The K-W test is also called a one-way analysis of variance (ANOVA) and tests whether samples are derived from an identical distribution in the data. The scholars administered the K-W assessment to explore the selected five hypotheses signifying the association concerning supported variables. The conclusion is that different supply chain members' sustainability implementation programs and the problems identified in implementing were found. The K-W hypothesis technique was executed to establish whether specific assumptions influence the diverse environment-, economy-, and society-related sustainability programs introduced by the supply chain management programs of manufacturers, C&F agents, stockists and super stockists, wholesalers, and retailers. If the *p*-value, resultant from the K-W technique, is greater than or equal to 0.05, the null hypothesis (H0) is authorized. On the contrary, if the *p*-value is less than 0.05, the alternative hypothesis (H1) is acknowledged [26].

3. Results

The results section of this research highlighted the research context and presented the hypotheses by stating the results in a tabular form.

Research Context: Sustainability Programs and Problems of Supply Chains

This research focuses on the sustainability programs introduced and problems identified in the management of the supply chains of the Indian retailing sector's FMCG and pharma segments. This study has covered only supply chain members, manufacturers, C&F agents, stockists and super stockists, wholesalers, and retailers operating only from the South Indian states of Andhra Pradesh and Telangana. The Indian retailing market witnessed a decline of 80.5% in the financial year 2021, but it recovered in 2022 to reach USD 836 billion with an 81.5% contribution from traditional retail. Astonishingly, shoppers from Tier II and Tier III cities made up over 61 percent of the total market share in the financial year 2022 [27]. After globalization, the Indian retailing sector has appeared as one of the most vigorous and fast-paced businesses due to the entry of several new players. The Indian retail industry is predicted to reach an enormous USD 2 trillion in value by 2032, according to a recent Boston Consulting Group (BCG) analysis. In the retail sector, the selected FMCG and pharma sectors account for approximately 75% of the financial contri-

bution, which was the primary reason for this study, along with the severe environmental, economic, and societal effects that are generated by them [28]. Understanding the various sustainability programs introduced to nullify the impact on the environment, economy, and society is a vital element in this research at large, in addition to identifying the challenges faced by the chosen organizations for this study in managing their supply chains.

The researchers also garnered information about the challenges faced by the different supply chain members in managing their companies' supply chains, as mentioned in Table 3. Almost all supply chain members (manufacturers, C&F agents, stockists, super stockists, wholesalers, and retailers) have identified many challenges related to digital transformation, lack of skilled labor, inadequate infrastructure, meager cost control and management, and product-related problems. Concerning challenges related to digital transformation, 24 percent of respondents were facing issues, and 29 percent expressed their discontent over managing natural disasters, pandemic effects, problems related to data sharing, and cyberattacks. At the same time, Indian retail sector companies identified challenges with a noteworthy 21 percent, 17 percent, and 11 percent of them related to product management, labor, and infrastructure, respectively.

Table 3. Problems in managing supply chains of Indian FMCG and pharma companies.

Problems	Manufacturers (15)	C&F Agents (18)	Stockists and Super Stockists (67)	Wholesalers and Retailers (100)	%
Digital transformation	07	07	14	20	24
Labor and infrastructure	02	02	11	19	17
Cost control and management	01	12	03	06	11
Natural environment	08	09	15	26	29
Product related problems	06	06	15	15	21

This study's five hypotheses were analyzed using the Kruskal–Wallis hypothesis testing technique, as mentioned in Table 4. Concerning Hypothesis 1, manufacturers conclude that the supply chains of their organization have the most significant impact on toxic waste, water, air, and sound pollution, which is valid with the K-W chi-squared value of 0.0086 and p-value of 0.0092. Related to Hypothesis 2, C&F agents determine that the supply chains of their organization do not have the most significant impact on lobbying, corruption, red-tapism, or bureaucracy than any other economy-related factors since the p-value is not statistically significant (>0.05), and since the null hypothesis (H0) failed to be rejected. Associated with Hypothesis 3, stockist and super stockist agents govern that the supply chains of their organization do not have an equally significant impact on health, safety, security, environmental issues, sustainable production, working conditions, and socially responsible actions since the p-value (0.0257) is statistically substantial (<0.05), thus the null hypothesis (H0) is rejected. Thus, stockist and super stockist agents govern that the supply chains of their organization have an equally significant impact on health, safety, security, environmental issues, sustainable production, working conditions, and socially responsible actions. In relation to Hypothesis 4, since the p-value is statistically significant (<0.05), the null hypothesis (H0) is rejected, which means that the alternative hypothesis is accepted with a K-W chi-squared value of 8.4571 and a p-value of 0.0027. Thus, wholesalers and retailers account for the fact that their organization's supply chains significantly impact the timely payment of taxes to local, state, and central governments, more than any other economy-related problem. Related to the final Hypothesis 5, since the p-value is statistically significant (>0.05), the null hypothesis (H0) failed to be rejected. Thus, wholesalers and retailers administer that the supply chains of their organization do

not significantly impact poor cost control and management as well as on the difficulty in forecasting demand problems with a K-W chi-squired value of 6.3465 and a *p*-value of 0.6741.

Table 4. Results of hypotheses testing.

Null and Alternative Hypothesis (H0 and H1)	Interpretation
H0: Manufacturers conclude that their organization's supply chains do not have the most significant impact on toxic waste, water, air, and sound pollution. H1: Manufacturers conclude that their organization's supply chains have the most significant impact on toxic waste, water, air, and sound pollution.	Proportionality Test Result: K–W chi-squared value: 0.0086, *p*-value: 0.0092 Since the *p*-value is not statistically significant (<0.05), the null hypothesis (H0) is rejected. Thus, manufacturers conclude that their organization's supply chains have the most significant impact on toxic waste, water, air, and sound pollution.
H0: C&F agents determine that the supply chains of their organization do not have the most significant impact on lobbying, corruption, red-tapism, or bureaucracy than any other economy-related factors. H1: C&F agents determine that the supply chains of their organization have the most significant impact on lobbying, corruption, red-tapism, and bureaucracy than any other economy-related factors.	Proportionality Test Result: K–W chi-squared value: 0.5871, *p*-value: 0.6813 Since the *p*-value is not statistically significant (>0.05), the null hypothesis (H0) failed to be rejected. Thus, C&F agents determine that the supply chains of their organization do not have the most significant impact on lobbying, corruption, red-tapism, and bureaucracy than any other economic factors.
H0: Stockist and super stockist agents govern that the supply chains of their organization do not have an equally significant impact on health, safety, security, environmental issues, sustainable production, working conditions, and socially responsible actions. H1: Stockist and super stockist agents govern that the supply chains of their organization have an equally significant impact on health, safety, security, environmental issues, sustainable production, working conditions, and socially responsible actions.	Proportionality Test Result: K–W chi-squared value: 3.5471, *p*-value: 0.0257 Since the *p*-value is statistically significant (<0.05), the null hypothesis (H0) is rejected. Thus, stockist and super stockist agents govern that the supply chains of their organization have an equally significant impact on health, safety, security, environmental issues, sustainable production, working conditions, and socially responsible actions.
H0: Wholesalers and retailers account that their organization's supply chains do not significantly impact the timely payment of taxes to local, state, and central governments more than any other economy-related problem. H1: Wholesalers and retailers account for the fact that their organization's supply chains have a significant impact on the timely payment of taxes to local, state, and central governments more than any other economy-related problem.	Proportionality Test Result: K–W chi-squared value: 8.4571, *p*-value: 0.0027 Since the *p*-value is statistically significant (<0.05), the null hypothesis (H0) is rejected. Hence, wholesalers and retailers account for the fact that their organization's supply chains have a significant impact on the timely payment of taxes to local, state, and central governments, more than any other economy-related problem.
H0: Wholesalers and retailers state that the supply chains of their organization do not significantly impact poor cost control and management as well as the difficulty in forecasting demand problems. H1: Wholesalers and retailers state that the supply chains of their organization have a significant impact on poor cost control and management as well as on the difficulty in forecasting demand problems.	Proportionality Test Result: K–W chi-squared value: 6.3465, *p*-value: 0.6741 Since the *p*-value is statistically significant (>0.05), the null hypothesis (H0) failed to be rejected. Thus, wholesalers and retailers ensure that the supply chains of their organization do not significantly impact poor cost control and management as well as the difficulty of forecasting demand problems.

4. Discussion

The perusal of this section of this research article comprehensively discusses various sustainability programs introduced by manufacturers, C&F agents, stockists and super stockists, wholesalers, and retailers related to environmental, economic, and societal issues. This part also emphasizes the challenges they faced in the management of their organizations' supply chains. All the chosen supply chain members have shown immense environmental, economic, and societal effects. Most companies are associated with ecological influences because of manufacturing and supply chain issues. The researchers collected information by using questionnaires and personal interviews from the selected supply chain members concerning environmental issues related to releasing toxic waste,

pollution, biodiversity loss, deforestation, hazardous air, greenhouse gas emissions, and significant overuse of energy and utilities; economic concerns like timely payment of all kinds of taxes to all governments, insufficient infrastructure related to power, banks, telecom, transportation, warehousing, and storage; and societal problems like human rights, child labor, slavery, health, safety, security, sustainable production, working conditions, socially responsible actions. Related to ecological concerns, 20 percent of supply chain members accepted that their organization's supply chains led to releasing toxic waste and pollution. However, executives of the surveyed companies emphasized introducing pollution control equipment to reduce all kinds of pollution. These companies' think tanks strongly stressed their commitment to protecting the environment from all sorts of ailments towards their obligation to corporate social responsibility. Associated with economic issues, 27.5 percent of respondents in the selected sample accepted inefficient and insufficient infrastructure related to power, telecom, the Internet, lack of all-weather roads, availability of sufficient transportation facilities, and inadequate warehousing and storage facilities. Surprisingly, only six percent of respondents from all categories of supply chain management only affected lobbying, corruption, red-tapism, and bureaucracy. Connected with societal problems, more than 90 percent of this study's chosen supply chain members confidently introduced excellent health, safety, and security mechanisms, maintained decent working conditions, and introduced socially responsible actions. Concerning wholesalers and retailers, most of this segment has strongly underlined their influence on the economy and society-related issues more substantially, and the environmental impact is very moderate. All the respondents undoubtedly recognized the significance of establishing sustainable supply chains to safeguard the environment, economy, and society, considering future generations' interests, for which these companies introduced all precautionary measures to minimize the impact and enhance productivity.

All the supply chain members, from manufacturers to wholesalers and retailers, have identified extensive challenges related to digital transformation, infrastructural-related challenges, insufficient and inactive cost control and management, abilities to forecast demand and supply-related issues, natural disasters, pandemic effects, problems in data sharing, and cyberattacks, and significantly product-related challenges like quality, design, features, packaging, ingredients, and branding. Associated with digital transformation challenges, many companies are integrating technology into almost all aspects of their internal and external operations. It is a must situation for businesses to transform digitally, based on the technological innovations that recently hit the world, which are, in the process of using technology to solve business problems with the support of cloud computing, artificial intelligence, machine learning, user experience (UX) design, blockchain, cybersecurity, DevOps, etc., and lack of organizational change management strategy, the continuous evolution of customer needs, internal resistance to change, and budgetary constraints.

5. Conclusions

Finally, in conclusion, the Indian retail sector's most influential wings, viz., FMCG and pharma, which covered almost 75 percent, substantially affected the ecology-, economy-, and society-related sustainable activities and identified diverse challenges related to the digital transformation and development of the present infra-related activities with the support of governments. The chosen FMCG and pharma companies have initiated various sustainable programs to follow the three R's of waste management: reduce, recycle, and reuse. Most supply chain executives emphasized the importance of sustainability and the programs, policies, projects, processes, and budgets that their companies introduced to reduce pollution, take socially responsible actions, maintain sustainable production facilities and working conditions, and much more. At the same time, these respondents reacted differently to the failure of various governments to maintain all-weather roads, sufficient railway wagons, frequent hikes in oil prices, lack of warehousing and storage facilities, and port congestion. All these problems have influenced the product characteristics, viz., quality, design, features, packaging, and other service-related issues. Indian retail compa-

nies persistently increase their plans and budgets to introduce sustainability programs to preserve the environment and business resources and offer consumers ethical shopping options. At the same time, the Indian retail industry and the selected companies of this study realized that supply chain sustainability could improve their business efficiency and productivity while saving money. The bottom line is that sustainability throughout the supply chain is invaluable to preserve the environment and offer consumers exactly what they want, increasing the company's revenue and profitability while enhancing its reputation. This research has commenced with the researchers considering the following crucial limitations. (a) In the vast Indian retail sector, this study garnered the opinions of supply chain executives of only two sectors, viz., FMCG and pharma; (b) even though the Indian retail sector has both organized and unorganized sectors, this study only covered organized retailers who operated with licenses, paid all kinds of taxes, and maintained large supply chains; (c) this study only collected the responses of in-store retail companies (not online retailers) predominantly operating in the South Indian states of Andhra Pradesh and Telangana; (d) the sample selected for this study was very modicum, with just two hundred retail companies from the FMCG and pharma. However, there would be a chance to continue this study by employing a larger sample size, covering the total retail sector, as well as studying other sectors.

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References

1. WHO Director-General's Opening Remarks at the Media Briefing on COVID-19. 11th March 2020. Available online: https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020 (accessed on 8 July 2023).
2. World Health Organization (WHO). Impact of COVID-19 on People's Livelihoods, Their Health, and Our Food System. 2020. Available online: https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people%E2%80%99s-livelihoods-their-health-and-our-food-systems (accessed on 10 July 2023).
3. Kasliwal, R. India's Unaddressed Demand Crisis. Observer Research Foundation (ORF). 2020. Available online: https://www.orfonline.org/expert-speak/indias-unaddressed-demand-crisis/ (accessed on 10 July 2023).
4. Nag, J. Labor Shortage May Break Supply Chain in Coronavirus Lockdown Extension. The Economic Times. 2020. Available online: https://economictimes.indiatimes.com/news/politics-and-nation/labour-shortage-may-break-supply-chain-in-lockdown-extension/articleshow/75073078.cms (accessed on 10 July 2023).
5. COVID-19: Managing Supply Chain Risk and Disruption. Deloitte Touche Tohmatsu India LLP. 2022. Available online: https://www2.deloitte.com/in/en/pages/risk/articles/covid-19-managing-supply-chain-risk-and-disruption.html (accessed on 10 July 2023).
6. Rogers, D. The Importance of Sustainability in Supply Chains. 2023. Available online: https://www.supplychainpartners.co/articles/the-importance-of-sustainability-in-supply-chains (accessed on 4 July 2023).
7. Gurumurthy, A.; Soni, G.; Prakash, S.; Badhotiya, G.K. Review on supply chain management research—An Indian perspective. *IIM Kozhikode Soc. Manag. Rev.* **2013**, *2*, 1–9. [CrossRef]
8. Cuthbertson, R.; Piotrowicz, W. Supply chain best practices—Identification and categorization of measures and benefits. *Int. J. Product. Perform. Manag.* **2008**, *57*, 389–404. [CrossRef]

9. Saxena, A.; Gupta, B.M. Supply chain management research in India: A quantitative & qualitative assessment of publication output during 2006-15. *Int. J. Inf. Dissem. Technol.* **2018**, *8*, 42–49.
10. Chopra, S.; Meindl, P. Supply Chain Management. Strategy, Planning & Operation. In *Das Summa Summarum des Management*; Boersch, C., Elschen, R., Eds.; Gabler: Wiesbaden, Germany, 2007; pp. 265–275.
11. Shrey, A.; Dutt, A.; Roy, D. *Impact of COVID-19 Disruptions on the Supply Chain: Insights from India*; Indian Insitute of Management: Ahmedabad, India, 2022; Research & Publications Working Paper # 2022-06-01.
12. Agarwal, N. Changing landscape of Supply Chain and Logistics in Last Two Decades. The Times of India. 2023. Available online: https://timesofindia.indiatimes.com/blogs/voices/changing-landscape-of-supply-chain-and-logistics-in-last-two-decades/ (accessed on 11 July 2023).
13. Colson, D. Why Is Supply Chain Sustainability (SCS) Important? Available online: https://www.transformationholdings.com/environment/sustainable-supply-chain-management/ (accessed on 12 July 2023).
14. Mani, V.; Gunasekaran, A.; Papadopoulos, T.; Hazen, B.; Dubey, R. Supply chain social sustainability for developing nations: Evidence from India. *Resour. Conserv. Recycl.* **2016**, *111*, 42–52. [CrossRef]
15. Report of the World Commission on Environment and Development: Our Common Future. Available online: http://www.ask-force.org/web/Sustainability/Brundtland-Our-Common-Future-1987-2008.pdf (accessed on 13 July 2023).
16. Carter, C.R.; Rogers, D.S. A sustainable supply chain management framework: Moving toward new theory. *Int. J. Phys. Distrib. Logist. Manag.* **2008**, *38*, 360–387. [CrossRef]
17. Seuring, S.; Müller, M. From a literature review to a conceptual framework for sustainable supply chain management. *J. Clean Prod.* **2008**, *16*, 1699–1710. [CrossRef]
18. Ahi, P.; Searcy, C. A comparative literature analysis of definitions for green and sustainable supply chain management. *J. Clean Prod.* **2013**, *52*, 329–341. [CrossRef]
19. Gopal, P.R.C.; Thakkar, J. Sustainable supply chain practices: An empirical investigation on the Indian automobile industry. *Prod. Plan. Control* **2016**, *27*, 49–64. [CrossRef]
20. Council of Supply Chain Management Professionals. Available online: https://cscmp.org/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.spx?hkey=60879588-f65f-4ab5-8c4b-6878815ef921 (accessed on 13 July 2023).
21. Sánchez-Flores, R.B.; Cruz-Sotelo, S.E.; Ojeda-Benitez, S.; Ramírez-Barreto, M.E. Sustainable supply chain management—A literature review on emerging economies. *Sustainability* **2020**, *12*, 6972. [CrossRef]
22. Thong, K.-C.; Wong, W.P. Pathways for Sustainable Supply Chain Performance—Evidence from a Developing Country, Malaysia. *Sustainability* **2018**, *10*, 2781. [CrossRef]
23. Silva, M.E.; Fritz, M.M.; El-Garaihy, W.H. Practice theories and supply chain sustainability: A systematic literature review and a research agenda. *Mod. Supply Chain. Res. Appl.* **2022**, *4*, 19–38. [CrossRef]
24. Tundys, B. Sustainable supply chain management-past, present, and future. *Pr. Nauk. Uniw. Ekon. We Wrocławiu* **2020**, *64*, 187–207. Available online: https://www.researchgate.net/publication/343668769_Sustainable_supply_chain_management_-past_present_and_future (accessed on 13 July 2023). [CrossRef]
25. Potluri, R.M.; Johnson, S.; Koppalakrishnan, P. An exploratory treatise on the ethnocentric tendencies of Emirati Gen Z consumers. *J. Islam. Mark.* **2022**, *13*, 763–780. [CrossRef]
26. Potluri, R.M.; Koppalakrishnan, P. Risks Associated with the Entrepreneurship Education During the Pandemic: A Perceptual Display of UAE Business Students. *Int. J. Risk Conting. Manag.* **2022**, *11*, 1–12. [CrossRef]
27. Kunil, N. Indian Retail Industry 2023: Growth, Challenges, and Opportunities. Times of India. 2023. Available online: https://timesofindia.indiatimes.com/blogs/voices/indian-retail-industry-2023-growth-challenges-and-opportunities/ (accessed on 22 July 2023).
28. Indian Brand Equity Foundation. Retail Industry in India. 2023. Available online: https://www.ibef.org/industry/retail-india# (accessed on 22 July 2023).