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INNOVATION AND SUSTAINABILITY IN GREEN SUPPLY CHAIN PRACTICES: EXAMINING THE INFLUENCE OF REGULATORY DRIVERS IN PAKISTAN'S MANUFACTURING SECTOR

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ABSTRACT

This study investigates the impact of regulatory drivers on the adoption of green supply chain practices (GSCPs) in manufacturing companies in Pakistan. As global competitiveness rises and environmental concerns intensify, companies face mounting pressure to align their supply chain activities with sustainability principles. A qualitative research design, utilizing semi-structured interviews with managers and key stakeholders across various manufacturing sectors, including textiles, pharmaceuticals, and consumer goods, was employed to gather data. Thematic analysis was applied to identify shared perceptions, challenges, and opportunities related to regulatory influences on GSCP adoption.

The findings reveal that while regulatory drivers are generally recognized as an important catalyst for sustainability strategies, their perceived effectiveness is mixed. Participants highlighted that the lack of enforcement, inconsistent monitoring, and fragmented policy frameworks hinder the potential of regulations to instigate lasting change. Smaller companies often view environmental compliance as a cost burden with limited benefits, whereas larger companies, particularly those engaged in international markets, perceive regulations as a gateway to enhanced global competitiveness. Notably, proactive companies saw regulations as a driver of innovation, energy efficiency, and waste reduction, while reactive companies viewed them as a liability. Furthermore, the study identified a lack of institutional support and incentives, which hinder broader engagement with green practices. The study concludes that to facilitate meaningful green transitions in Pakistan's manufacturing sector, stronger enforcement, clearer guidelines, and the integration of financial and technical assistance mechanisms are essential.

Keywords: *Green Supply Chain, Regulatory Drivers, Manufacturing Firms, Sustainability.*

INTRODUCTION

Background of the Research

Over the past several years, due to increasing global focus on sustainability, there have been significant concerns regarding the integration of green supply chain activities, particularly in emerging economies like Pakistan (Ahmed, Ali, & Mansoor, 2025). The manufacturing firms, which are believed to be the largest contributor to economic growth and environmental degradation, are under pressure to incorporate environmentally friendly operations in their systems. These pressures are not only caused by international obligations to curb climate change but also by the increasing local demands for

pollution, waste management, and resource depletion. The sustainability agenda is becoming more and more urgent in Pakistan, where the manufacturing sector constitutes about 13% of the GDP and provides jobs to millions of people (Xu et al., 2023). Despite its importance to the economy, the sector is under scrutiny due to low energy usage, excessive carbon emissions, and failure to adhere to global environmental regulations. One of the possible ways to reduce environmental degradation and increase competitiveness and resilience in the long term is green supply chain management (GSCM) practices (Ashraf, Arzu, Abrar, & Anwar, 2025). A growing body of literature suggests that the environmental regulatory environment has a role to play in the adoption of organizational GSCM (Rehmat, Hassan, Rumaan, & Abrar, 2025). Regulatory drivers (environmental legislation, government enforcement tools, and international compliance legislation) are considered to be one of the levers that will help to push firms to integrate the use of environmentally sustainable supply chain practices (Khandare, 2024). Regulatory pressures have been effectively converted into corporate environmental responsibility in developed countries. In contrast to the emerging markets like Pakistan, in which institutional enforcement is weak, resources are scarce, and competing managerial interests interfere with compliance (Gui, 2025). The interplay between regulatory drivers and firm-level practices is thus worth exploring further (Ahmed, Urooj, Farheen, & Ishaq, 2025; Zeb, Abrar, Saqib, & Rizvi, 2025; Braun, Clarke, & Hayfield, 2022).

Problem Statement

Although the relevance of GSCM is a popular topic, the role of regulatory drivers in enlightening the adoption of the concept into manufacturing firms in Pakistan is an under-studied area (Akram et al., 2024). Many of the research studies that have been carried out in the context of green supply chain management in Pakistan have been regarding the connection between GSCM practices and the performance implications, including competitiveness, innovation and profitability. There is, however, a lack of empirical data on perceptions of regulatory pressures and the role these perceptions play in influencing intentions and the ability of firms to adopt green practices. In most instances, regulations are poorly implemented or seen as a compliance liability instead of a strategic facilitator of sustainability. As a result, companies can implement superficial compliance strategies and ignore more comprehensive systemic implementation of GSCM practices (Gawusu et al., 2022). The disjuncture is on the subject of knowledge, not just of the formal regulatory space, but also of lived experience and perceptions of managers who operate within these frameworks in their organizational contexts.

Research Questions

The research questions that guide this study are:

1. How do manufacturing firms in Pakistan perceive the role of regulatory drivers in shaping green supply chain practices?
2. What challenges do firms face in aligning regulatory requirements with operational realities in the adoption of green supply chain practices?
3. In what ways do regulatory drivers interact with organizational priorities to influence the effectiveness of green supply chain implementation?

Research Objectives

The research aims to achieve the following objectives:

1. To explore the perceptions of regulatory drivers among managers in manufacturing firms regarding the adoption of green supply chain practices.
2. To examine the challenges and barriers firms encounter in translating regulatory frameworks into operational sustainability measures.
3. To evaluate how regulatory pressures are integrated with organizational strategies to promote sustainable supply chain practices.

Significance of the Study

This study offers a subtle insight into the regulatory environment in the manufacturing industry of Pakistan and how companies understand and react to environmental regulations. Second, it contributes to the general literature on GSCM by offering empirical evidence in an emerging economy, where institutional voids and resource scarcity are

likely to hamper the effectiveness of regulations. Third, the research has practical implications for policymakers who would like to design better regulatory frameworks and for firms who would like to harmonise sustainability objectives with business performance. Through perceptions, this study illuminates compliance behaviours as well as the underlying attitudes that either facilitate or hinder the process of transitioning towards sustainable operations.

The study applied a qualitative research design, which reflects the complexity and richness of managerial perceptions of the regulatory drivers. Semi-structured interviews were held with 15 participants who represented various manufacturing companies in the textile, chemicals and consumer goods sectors. The participants were also picked on the basis of their participation in the decision-making procedures of supply chain and sustainability programs. Interpretation of patterns and extraction of major themes of the interview were done using manual coding and thematic analysis. The results are presented in the context of the available literature and analysed in the framework of a larger institutional and regulatory environment of the manufacturing industry in Pakistan.

Literature Review

Theoretical Framework

The institutional theory forms the basis of the study on the regulatory drivers of green supply chain practices since it addresses the influence of external pressures (regulations, norms and social expectations) on organizational practices (Marculetiu et al., 2023). Institutional pressures in the manufacturing industry in Pakistan are predominantly of a regulatory nature and government guidelines that aim to encourage environmental responsibility. Nazir et al. (2024) state that institutional pressure is a moderator that has a significant impact on how much GSCM practices lead to enhanced environmental performance. Their results indicate that organizations tend to react to the coercive forces of regulators by adjusting internal strategies to the external imperatives (Jia et al., 2025). However, the depth of compliance varies according to managerial perceptions of these pressures as either enablers of competitiveness or just bureaucratic constraints.

The other applicable perspective is the stakeholder theory, which asserts that organizations should be cognizant of the interests of diverse stakeholders such as governments, communities, and customers, by integrating sustainable practices in the operations (Shah & Guild, 2022). The stakeholder influence on the perception of regulatory drivers is even more intense in Pakistan, where regulatory enforcement is not yet regular. Mehmood et al. (2024) point out that the government regulations and the commitment of the top management collaborate to improve the environmental performance. Firms tend to incorporate GSCM as a strategy when they feel that regulatory frameworks are legitimate and that they support the interests of managers.

The implementation of GSCM in emerging economies like Pakistan is also justified using the resource-based theory (Ahmed et al., 2024). It is in this view that firms that adapt effectively to regulatory pressures by establishing green capabilities can create rare and inimitable resources that are ultimately converted into long-term competitive advantage. According to Mahar et al. (2025), sustainability transformation in the industries of Pakistan takes place not only through compliance but also through innovations that reorganize the supply chains. Regulations are the forces that push firms to invest in the production and distribution of goods that are environmentally friendly, which will eventually boost competitiveness in the market (Eiaseb, 2025). Therefore, the study is framed by institutional theory, stakeholder theory and resource-based theory. Collectively, they clarify the interplay of regulatory pressure, managerial perceptions, and the organizational resources to identify the degree and success of GSCM practices in the manufacturing sector in Pakistan.

Regulatory Drivers and Green Supply Chain Adoption

Regulatory frameworks in encouraging the adoption of GSCM have been given attention in recent years (Sheng et al., 2023). It has been empirically demonstrated that the environmental standards and enforcement mechanisms that are introduced by the government tend to be coercive forces that force

the firms to move towards sustainable practices. Qalati et al. (2022) prove that manufacturing companies in Pakistan have begun to acknowledge the relationship between regulatory compliance and corporate performance. Whereas some companies consider regulations as a cost of compliance, other companies consider them as a source of efficiency and innovation. Such duality throws light on the importance of perceptions: regulations are not just neutral instruments but are viewed differently depending on the attitude of managers and the priorities of the organization (Boiral et al., 2025).

Nevertheless, Pakistan is not a simple regulatory environment. There are environmental rules, which are usually weak because of institutional gaps and inefficiencies within the bureaucracies (Altaf & Shabir, 2023). Consequently, companies can opt to do symbolic compliance, which involves superficial measures, like waste separation or energy-saving campaigns, and overlook more fundamental modifications, such as redesigning supply chains or acquiring green technologies. Mehmood et al. (2024) observe that a meaningful change cannot be achieved by using regulations unless they are appropriately enforced and in line with the priorities of the top management. They conclude that firms are more likely to adopt GSCM holistically when they feel that regulations are both legitimate and strategically advantageous (Ahmed, Faisal, Hasan, & Ghazi, 2025).

The other dimension is the international regulatory pressures, e.g., compliance with the export market requirements. The Pakistani textile companies, such as those, are usually subjected to more stringent environmental requirements by European and North American consumers. Saleem et al. (2023) discovered that environmental strategies in the manufacturing sector in Pakistan are influenced by antecedents that are not only influenced by regulations set by the local government but also by those of the global value chain. The export-oriented companies are thus forced to take the regulatory drivers more seriously, and they engage in practices that are above the domestic expectations so as to remain in the market (Rehmat, Hassan, Khan, & Abrar, 2025). These results indicate that the regulatory drivers in Pakistan are multi-layered as they are influenced by the domestic governance structures and the international market dynamics. The way in which firms perceive these regulatory drivers will determine whether green supply chain management (GSCM) is viewed as a strategic necessity or merely a superficial compliance effort (Khan, Butt, Noor, Ishaq, & Siddiqui, 2025; Malik, Parveen, & Hanif, 2026).

Top Management Commitment and Regulatory Perceptions

Regulatory frameworks are not isolated; organizational leadership mediates the impacts of regulatory frameworks (Ahmed et al., 2024). The commitment of the top management comes out as a key determinant when it comes to the interpretation and operationalisation of regulatory drivers. According to Men, Yaqub, Yan, Irfan, and Haider (2023), the top management support contributes to the improvement of sustainable supply chain management through the establishment of a compliance and agile culture. When managers have a positive perception of the regulatory drivers, they can spread their significance throughout the organization so that employees can incorporate sustainability into day-to-day operations. On the other hand, when the top management views regulations as a burden, organizational compliance will be only superficial.

Mehmood et al. (2024) also believe that government regulations can only work when combined with managerial commitment. They show that regulatory frameworks, in conjunction with a proactive culture of management, result in increased uptake of environmentally friendly technologies and practices. This is where perceptions play an important role: managers who see regulatory drivers as an opportunity to innovate and save resources have a greater likelihood of becoming sustainability champions (Alamandi, 2025). Whereas managers who see them as bureaucratic burdens may not be willing to make any significant change.

Therefore, this relationship between top management perceptions and regulatory drivers underlines the need to develop leadership in the sustainability context. Managerial attitudes can be changed via training programs, awareness programs, and policy discourses so that

regulations are not seen as being imposed on managers but as facilitators of strategic competitiveness (Hokmabadi et al., 2024).

Organizational Culture, Employee Engagement, and Regulatory Drivers

Their research has revealed that when a firm faces intense regulatory pressure, it is more likely to invest in green innovations, including renewable energy technologies, waste management technologies, and environmentally friendly products. Mughal et al. (2023) study the attitude of employees towards GSCM and discover that corporate social responsibility and moral attentiveness mediate sustainability results. They indicate that the knowledge of regulatory frameworks and the moral orientation of the employees have a significant impact on the translation of the regulations into practice. When transparency and responsibility are encouraged by the organizational culture, then regulations will be implemented in a meaningful manner (Asif, Jabbar, & Yusaf, 2026).

Likewise, Nazir et al. (2024) state that institutional pressures can be effective only when the internal cultural mechanisms are consistent with the external requirements. A culture that is resistant to change might undermine the value of regulatory drivers, and thus, there will be low uptake of GSCM practices. Conversely, companies that have well-developed CSR-oriented cultures are more likely to accept regulations as an extension of a wider ethical sustainability commitment (Ngwu, 2023). This implies that the regulatory frameworks should be supported by cultural transformation efforts that encourage employee participation and organizational values with the environmental objectives. Therefore, regulatory driver perceptions are not managerial only, but also shared, influenced by organizational culture and the moral systems of the employees. In the absence of such alignment, regulatory pressures cannot deliver desired results (Rehmat, Hassan, Rumaan, & Abrar, 2025; Ahmed, Ali, & Mansoor, 2025; Arzu, Sattar, Sultan, Abrar, & Khuharo, 2025).

Green Innovations and Regulatory Drivers

Recent literature is highlighting the importance of regulatory drivers to stimulate green innovations. Mahar et al. (2025) highlight the need for firms to move beyond compliance and embrace innovation in processes, technologies, and product designs, which is a key aspect of the transformation of sustainability in Pakistan. This involvement is necessary to understand the location of Pakistani firms within global value chains. Apart from improving the performance of the environment, these innovations provide a competitive edge in international markets.

Saleem et al. (2023) corroborate this notion by showing that antecedents of environmental strategies in the form of regulatory frameworks force firms to adopt proactive strategies that are innovation-inclusive. Companies that see regulatory drivers as a source of differentiation and market leadership have a greater opportunity to make fundamental changes in their operations. This indicates that the attitude towards regulations as drivers of innovation, rather than cost increase, can be the driver that can make firms experience sustainability transformation.

Conversely, companies that have a negative attitude towards regulatory drivers can resort to reactive compliance, whereby they take the bare minimum of changes to comply with the regulations (Syed, 2024). Such companies do not have the opportunity to use regulations as a way of innovation and competitiveness. Therefore, the literature alludes to the fact that regulatory drivers may be very strong drivers of innovation, but their success is largely pegged on managerial and organizational perceptions.

Gaps in Existing Research

Although the literature offers useful information on the role of regulatory drivers in influencing GSCM adoption, there are still a number of gaps. The majority of the Pakistani research has quantitatively investigated the connection between GSCM practices and performance outcomes with the help of surveys and structural equation modelling (Nazir et al., 2024; Qalati et al., 2022). Although beneficial, such approaches fail to address the subtle perceptions of managers operating within the regulatory frameworks within complex institutional environments. Qualitative research on the interpretation of regulations by managers and employees and the effects of those

interpretations on organizational strategies is limited (Yusif & Hafeez-Baig, 2024).

Second, the literature tends to believe that the regulations apply uniformly across the industries. Nonetheless, the manufacturing sector of Pakistan is heterogeneous, which includes textiles, chemicals, pharmaceuticals, and consumer goods, each of which has its own supply chain dynamics and regulatory issues (Ahmad et al., 2024). Few studies disaggregate results by sector to know how regulatory drivers are viewed differently based on industry-specific pressures.

Third, little is known about the interaction between domestic and international regulatory drivers. Although the relevance of the needs of the export market is mentioned in some studies (Saleem et al., 2023), not many studies examine how companies balance the competing demands between the local lax rules and the international strict rules. This interplay is necessary to learn how Pakistani companies are positioned in the global value chains.

Finally, the role of perceptions remains underexplored. Although research emphasises the role of managerial commitment and organizational culture (Mughal et al., 2023), it fails to explore in-depth the process of formation, negotiation, and action of perceptions of regulatory drivers in firms. This gap, therefore, needs to be addressed through a qualitative methodology that elucidates the lived experiences of managers.

Methodology

Research Design

This study employed the qualitative research design to investigate perceptions of regulatory drivers of green supply chain practices in the Pakistani manufacturing industry. The qualitative methodology allowed in-depth studies of subtle experiences and meanings that could not have been achieved using a quantitative methodology. The research was about meaning-making and understanding instead of measurement, and about how managers and decision-makers in firms perceived the role of regulatory frameworks in their practices in terms of sustainability. The choice of semi-structured interviews as the primary method of data collection was due to the flexibility of the process, as it gives a chance to probe further into the responses, as well as because it gives the participants additional time to elaborate on their own experiences, interpretations, and organizational realities. Such a design was in line with the objective of the study, which was to reveal the complexity of regulatory perceptions and not to apply pre-decided categories or measures (Byrne, 2022; Abrar et al., 2024).

The study was informed by the interpretivist paradigm as it focuses on subjective realities and the reality that the perceptions of the managers were shaped in the wider social, cultural, and institutional contexts. This epistemological position fitted best in the manufacturing sector in Pakistan, where the institutional enforcement was low and the attitude of the managers varied in their response to the regulation. Regulations were not seen as fixed determinants of behaviour in the research, but were viewed in terms of interpretation, negotiation, and implementation within firms (Khuharo, Ayub, & Ali, 2025; Ahmed, Ali, & Mansoor, 2025).

Sampling Strategy

Purposive sampling was used to design the study and was suitable for identifying the participants who had direct experience of regulatory requirements and decision-making in the area of supply chain management (Bouncken et al., 2025). The sample of interest was managers and senior employees of manufacturing firms that were directly engaged in sustainability planning, supply chain management or compliance operations. To have diversity, the sample has been chosen among various industries such as textile, chemicals, pharmaceutical, and consumer goods, which are the significant departments of the manufacturing sector in Pakistan.

The number of participants chosen was 15. This was enough to evoke a multiplicity of opinions and, simultaneously, of analysis. The sample was sufficient to meet the demands of qualitative research, in which no statistical generalisation is desired, but rather analytical richness. The choice of the participants was made in terms of their positions in order to be capable of intelligently discussing both regulatory pressures and operational realities. The sample was reached out to by the network of contacts in the industry, and each of the participants was

directly contacted and informed about the research and the objective and scope of the study.

Data Collection

The semi-structured interviews were used in data collection. The interview guide was made according to the research objectives that provided consistency and flexibility to ask for new insights. The guide included the perceptions of the participants towards the regulatory framework, their experiences with the implementation of green supply chain practices, the issue of compliance, and the interaction between regulations and organizational strategies.

Interviews were done both face-to-face and through the internet, depending on the availability of the participants and their choice. The interviews took between 45 and 70 minutes, which allowed time to explore in depth. The participants were advised to provide practical examples in their organizations, and clarifying questions were asked to gain more insight. The semi-structured aspect of the interviews ensured that all the main themes had been covered, and the participants were also free to mention any issues that they considered to be the most important. All interviews were recorded with the consent of the participants and were complemented by field notes. The tapes were transcribed word-for-word to maintain accuracy. Systematic analysis was based on transcriptions, which made it possible to code in detail and develop themes.

Data Analysis

The thematic analysis was used to analyse the data and provided a systematic but flexible method of finding patterns in the interviews (Clarke & Braun, 2017). The data were analysed manually to have a close interaction with the data and to achieve interpretive depth. It was done in a number of steps. Initially, transcripts were read several times to ensure that the researcher became familiar with the scope of responses. This immersion helped to find the first thoughts and common points of focus.

Second, the open coding was used on the portions of text. At this point, codes were descriptive and reflected definite phrases or concepts concerning regulatory drivers, challenges, organizational responses and perceptions of enforcement. Third, the codes were put into a larger category, which had underlying meanings. For example, there were codes of "surface-level initiatives", "symbolic compliance", and "low penalties" that were subsumed under a larger category of regulatory enforcement gaps.

Fourth, these categories were narrowed down to major themes that answered the research questions directly. The thematic model represented five key themes related to perceived legitimacy of regulations, enforcement issues, managerial commitment and alignment, cultural and employee factors, and regulatory drivers as sources of innovation. Each theme represented a consistent pattern of meaning among several participants, and also allowed variations in perspective.

Close attention to negative cases or divergent responses was given in the analysis, and this helped in enhancing the insights into how the perceptions differed across industries and organizational settings. As an example, export-oriented companies tended to declare higher compliance levels because of international pressures, whereas domestically oriented companies emphasised resource limitations and lax local enforcement.

Ethical Considerations

The research followed ethical principles of research to safeguard the rights of the research participants and maintain integrity (Zhaksylyk et al., 2023). All the participants were informed and given consent before the start of the interviews. Each participant was given an information sheet describing the purpose of the study, their free participation, and that they had the right to withdraw at any point without penalty. Verbal and written consent were received.

The confidentiality was ensured. The participants were assigned pseudonyms, and no specifics of firms were revealed. The data were kept in a safe place, and transcripts and recordings could only be accessed by the researcher (Rowlands, 2021). The ethical considerations were also applied to the interpretation of findings, whereby the views of the participants were reflected correctly and in a respectable manner. Due to the sensitivity of the

topic of regulatory compliance, the participants were assured that the information would be reported collectively and no individual or firm would be identified. The practice of reflexivity was employed in the process, and the researcher kept a reflective journal where assumptions, decisions and interpretations were recorded. This culture made the culture more accountable and open.

Participant Profiles

The research was done on 15 participants who represented various manufacturing industries. They worked as supply chain managers, sustainability officers, and top executives who worked in compliance and operations. Table 1 gives a summary of the profiles of the participants.

Table 1:
Participant Profiles

Participant	Industry Sector	Role/Position	Years of Experience
P1	Textiles	Supply Chain Manager	12
P2	Textiles	Compliance Officer	8
P3	Chemicals	Senior Operations Manager	15
P4	Chemicals	Sustainability Coordinator	7
P5	Pharmaceuticals	Quality and Compliance Head	14
P6	Pharmaceuticals	Supply Chain Executive	6
P7	Consumer Goods	Procurement Manager	10
P8	Consumer Goods	CSR and Sustainability Officer	9
P9	Textiles	Senior Production Manager	16
P10	Textiles	Environmental Compliance Lead	11
P11	Chemicals	Plant Manager	13
P12	Pharmaceuticals	Logistics Manager	8
P13	Consumer Goods	Senior Procurement Specialist	12
P14	Consumer Goods	Operations Supervisor	5
P15	Textiles	Sustainability Manager	9

The profiles show the variety of the participants regarding industries, roles, and experience levels. The diversification enabled the capture of various perspectives, which made the analysis non-biased to a particular sector or managerial opinion. The fact that the participants had vast experience in their professions also gave credibility to their views, as they were able to use years of experience in navigating regulatory structures and sustainability issues in their industries.

Findings and Discussion

This research was based on semi-structured interviews with 15 participants in the manufacturing industry in Pakistan. The transcripts were analysed to identify five major themes that reflected the perception of the managers on regulatory drivers of green supply chain practices. Although participants did not ignore the importance of government policies, their answers were based on tangled realities of implementation, administrative dedication, culture-fitting, and innovation possibilities.

Theme 1: Perceived Legitimacy of Environmental Regulations

The participants constantly stressed that their perception of the legitimacy and credibility of environmental regulations played a role in

whether the regulations were adopted in a meaningful way. Some managers indicated that regulations were considered as tick box activities, as opposed to being strategic enablers. An example is P2, a compliance officer in the textile industry, who commented: "We are told to obey environmental regulations, but the issue is not the regulations themselves. It is the way they are viewed- at times they are perceived to be out of date or irrelevant to our operating realities".

This observation is consistent with Nazir et al. (2024), who contend that institutional pressures are best realised when the organizations consider them as legitimate and consistent with their operational and strategic objectives. This is not the case in Pakistan, where poor communication between regulators and the industry poses a loophole in the interpretation of regulations. The export-oriented companies recorded higher perceptions of legitimacy because they knew that they had to abide by international standards to remain in the global market. Such a finding is echoed by Saleem et al. (2023), who emphasise the importance of global value chain pressures in the formation of environmental strategies. In the case of domestically oriented firms, however, legitimacy was frequently disputed because of perceived lack of alignment between regulations and business realities, especially in those areas where enforcement was lax.

Perceptions of legitimacy were therefore a major filter that made the difference between strategic integration of regulations and superficial treatment. Companies that viewed regulations as a legitimate and strategic value added were more likely to integrate green supply chain practices within the main operations, whereas those which viewed them as a short-term compliance cost.

Theme 2: Weak Enforcement and Symbolic Compliance

Another issue that kept recurring among participants was the laxity in the implementation of environmental laws in Pakistan. Several managers acknowledged that companies could get away with non-compliance without much penalty, and that is what led to symbolic or cosmetic acceptance of green practices. A plant manager in the chemical industry P11, remarked: "There is no real monitoring. When a company does not follow the rules, there are minimal prospects of a penalty. This promotes symbolic compliance- enough to demonstrate that you are complying with the rules, but not to reform processes".

This fact aligns with Mehmood et al. (2024), who point out that government regulations are not enough without strong enforcement systems and managerial alignment. Low institutional capacity in Pakistan compromises the efficacy of regulations, whereby firms are enabled to undertake superficial programs like recycling drives at the expense of systemic reforms like process redesigns or investments in cleaner technologies.

The issue of symbolic compliance highlights a critical gap between policy and practice. Although there are regulations, their inability to be enforced credibly undermines managerial incentive to implement more comprehensive sustainability actions. Rather, companies participate in low-level activities that meet the reporting standards without actual performance enhancements on the environment. This theme highlights the significance of regulatory credibility not only on the aspect of legitimacy but also on the aspect of enforcement ability. Firms are still unwilling to go beyond token compliance unless there are regular checks, sanctions and rewards.

Theme 3: Managerial Commitment and Alignment with Regulatory Drivers

Strategic alignment and commitment to leadership also played a significant role in managerial perceptions of the regulatory drivers. Some participants pointed out that the top management was very decisive in setting the way the regulations were interpreted and operationalised. P5, a pharmaceutical head of compliance, said: "Even when regulations are not strong, when the top management is convinced of the importance of sustainability, they will drive significant changes. Rules are then taken as a standard and not as a mandate".

This observation is in line with the results of Men et al. (2023), who show that the support of the top management improves the sustainability of the supply chain by promoting a compliance and agile culture. On the same note, Mehmood et al. (2024) state that regulations can only be effective when managerial commitment is

involved, because in this case, compliance can be incorporated into organizational strategies.

The participants pointed out that in companies where the leaders viewed regulations as a chance to be competitive and innovative, the practices of GSCM were actively sought. On the other hand, compliance in companies where managers perceived regulations as bureaucratic burdens was reactive and superficial. P9, a manager of textile production, pointed out this gap: "In my case, rules do not differ, but the attitude of the leadership. Employees follow when leaders view regulations as opportunities. When leaders reject them, there is little compliance". The critical mediating role of managerial perceptions is brought out in this theme. Regulations in themselves cannot lead to sustainability unless the managers tie them to more general organizational objectives and create a culture of environmental responsibility.

Theme 4: Cultural and Employee Influences on Regulatory Adoption

Another important factor that defined the perception of regulatory drivers was the role of the organizational culture and the involvement of the employees. Some of the participants pointed out that companies that had good cultures on CSR had a high chance of accepting the regulations as part of their ethical responsibility. P8 is a CSR officer in a consumer goods company and remarked: "Our culture stresses social responsibility. In our case, regulations are not only rules, but they are reminders that we are supposed to be doing what we are not doing".

This observation can be correlated with Mughal, Nair, Arif, Albejaidi, Thurasamy, Chuadhry, and Malik (2023), who show how organizational values and moral attentiveness influence employees in their perceptions of sustainability. Likewise, Nazir et al. (2024) state that institutional pressures can be converted into outcomes only in case the organizational culture is adjusted to the external requirements.

Regulatory drivers were understated in firms that had resistant or profit-oriented cultures, which resulted in little implementation of GSCM practices. Employees operating in such environments tended to see sustainability as peripheral to their work. This deviation emphasises the role of cultural change in the formation of the perception of regulatory legitimacy and compliance. There is also the suggestion in the theme that employees contribute to the maintenance or erosion of regulatory adoption. Regulations were more likely to be put in place in a meaningful way in firms where employees were engaged. On the contrary, detached workforces were inclined to consider compliance as an extra burden, which further undermined adoption.

Theme 5: Regulatory Drivers as Catalysts for Innovation

Nonetheless, there were participants who viewed regulatory drivers as innovation drivers. These companies did not consider regulations as a set of rules that have to be followed but as a chance to redesign operations, create eco-friendly products, and enter foreign markets. According to P15, a textile sustainability manager, it was observed: "The strain to comply with global environmental requirements has compelled us to be innovative. We have invested in more clean technologies, and it is expensive initially, but it has opened new markets and increased efficiency". This echoes the sentiments of Mahar et al. (2025), who state that the transformation of sustainability in Pakistan needs the firms to be innovative and not confined to compliance. On the same note, Saleem et al. (2023) emphasise that regulatory antecedents may promote proactive strategies resulting in innovations to improve competitiveness.

The businesses that had a favourable perception of regulations were more likely to invest in renewable energy systems, technologies of waste minimisation, and environmentally friendly products. These inventions not only improved the environmental performance, but they also increased the reputational capital and access to the international market. On the other hand, companies that viewed regulations as a liability lost such opportunities, staying responsive and confined. This theme shows that perceptions are the determinants of whether regulatory drivers are a barrier or an enabler of innovation—regulations, when viewed as opportunities, drive firms to change and become competitive in the long term.

Table 2:
Thematic Analysis of Findings

Theme	Sub-theme	Codes	Description
Perceived Legitimacy of Regulations	Alignment with industry needs; International vs. domestic standards	"Tick-box exercise," "Export market compliance," "Outdated rules"	Legitimacy influenced whether regulations were adopted strategically or superficially.
Weak Enforcement and Symbolic Compliance	Minimal monitoring; Cosmetic adoption	"Low penalties," "Symbolic compliance," "Surface-level initiatives"	Weak enforcement encouraged firms to adopt superficial practices rather than systemic changes.
Managerial Commitment and Alignment	Leadership influence; Strategic integration	"Mindset of leadership," "Proactive adoption," "Reactive compliance"	Top management perceptions mediated how regulations were implemented.
Cultural and Employee Influences	CSR orientation; Moral responsibility	"Ethical culture," "Employee engagement," "Profit-driven resistance"	Organizational culture and employee engagement shaped how regulatory drivers were interpreted.
Regulatory Drivers as Catalysts for Innovation	Green technologies; Market access	"Cleaner technologies," "Eco-friendly design," "New markets"	Regulations acted as catalysts for innovation when perceived as opportunities.

Summary of Findings

The findings of this study underscore the central role of perceptions in shaping the impact of regulatory drivers on green supply chain management (GSCM) practices within the manufacturing sector in Pakistan. The results revealed that firms perceive regulatory drivers in diverse ways, influenced by factors such as the legitimacy of regulations, enforcement strength, managerial commitment, organizational culture, and innovation potential. These perceptions are critical in determining whether firms adopt GSCM practices strategically or superficially.

One key finding was the widespread prevalence of symbolic compliance among firms. This occurs when companies, particularly those with limited resources or less managerial commitment, adopt only surface-level green practices to meet regulatory requirements, without making meaningful changes to their operations. This phenomenon is particularly prevalent in firms where enforcement is weak, a pattern echoed in previous studies by Mehmood et al. (2024), who noted that weak regulatory enforcement leads to minimal compliance and superficial sustainability efforts. This finding aligns with Nazir et al. (2024), who argued that institutional pressures can only drive meaningful changes when regulations are perceived as legitimate and aligned with operational goals.

Conversely, companies with strong managerial commitment and organizational cultures aligned with sustainability objectives were more likely to go beyond compliance, integrating GSCM practices into their core operations. This finding reflects the work of Mehmood et al. (2024), who highlighted the importance of managerial support in translating regulatory frameworks into meaningful actions. Additionally, firms with strong CSR orientations and those that encouraged employee participation were more likely to adopt regulations as a part of their ethical responsibility, rather than as a mere compliance burden (Mughal et al., 2023).

Companies that are part of international value chains had a more favorable perception of regulatory drivers, viewing them as gateways to innovation and global competitiveness. This is consistent with Saleem et al. (2023), who found that export-oriented firms in Pakistan are more likely to adopt proactive green strategies to meet the environmental requirements of international markets. This study further

supports the idea that regulatory pressures, when viewed through the lens of innovation, can drive firms to invest in cleaner technologies and improve market access, as highlighted by Mahar et al. (2025).

Ultimately, the study shows that regulatory drivers should not be viewed solely as external pressures. Instead, their effectiveness depends on how they are perceived within the organizational context. As emphasized by Rehmat, Hassan, Rumaan, and Abrar (2025), the interaction between regulatory frameworks and firm-level practices is heavily influenced by managerial perceptions, organizational culture, and external market pressures, which collectively shape the success of GSCM adoption in emerging markets like Pakistan.

Conclusion

This study explored the perceptions of regulatory drivers influencing the adoption of green supply chain practices (GSCPs) in manufacturing firms in Pakistan. It revealed the complex interplay between regulatory pressures, managerial perceptions, organizational culture, and external market factors, offering valuable insights into how firms navigate environmental regulations in an emerging economy. The findings emphasized that regulatory drivers, while recognized as important for promoting sustainability, are not uniformly perceived as enablers of green practices. The mixed perceptions of regulations were largely shaped by enforcement gaps, the legitimacy of the regulations, top management commitment, and the alignment between organizational culture and regulatory expectations.

The study demonstrated that while large firms with exposure to international markets view regulations as opportunities for innovation, smaller firms often consider compliance a costly obligation. A key finding was the prevalence of symbolic compliance in firms where regulations were perceived as either outdated or poorly enforced. These firms engaged in minimal actions to meet regulatory standards without making significant changes to their operations. On the other hand, firms with strong managerial commitment and a proactive corporate culture saw regulatory drivers as strategic tools to innovate, improve efficiency, and gain competitive advantage.

Theoretical Implications

This research contributes to the literature on green supply chain management (GSCM) by integrating multiple theoretical perspectives, namely institutional theory, stakeholder theory, and resource-based theory. Institutional theory helped explain the role of external regulatory pressures on organizational practices, highlighting how firms respond to coercive, normative, and mimetic pressures. The study confirmed that the legitimacy of regulations is crucial for their effective adoption. Firms that perceive regulations as legitimate and aligned with their strategic objectives are more likely to integrate sustainability into their operations. Furthermore, stakeholder theory reinforced the importance of organizational responsiveness to both external pressures from regulators and the expectations of consumers and other stakeholders. Finally, the resource-based theory illuminated how firms that align their operations with regulatory drivers can create valuable, rare, and inimitable resources that provide a competitive edge.

This study also contributes to the understanding of how managerial perceptions and organizational culture mediate the effect of regulatory pressures on GSCM adoption. It underscores the importance of managerial commitment and cultural alignment for the effective implementation of green practices. The findings suggest that managerial attitudes toward sustainability, shaped by top management's commitment to environmental responsibility, play a critical role in how regulations are interpreted and operationalized within firms.

Practical Implications

From a practical standpoint, this study offers several recommendations for both policymakers and firms in Pakistan. For policymakers, the study suggests that stronger enforcement mechanisms and clearer communication with the industry are essential to improve the legitimacy of regulations. Regulatory agencies should ensure that laws are enforced consistently and that firms face appropriate penalties for non-compliance, thereby reducing symbolic compliance and promoting genuine environmental responsibility. Policymakers should also work to align local regulations with

international standards to better support export-oriented companies, who are more likely to adopt green practices to remain competitive in global markets.

For firms, the study emphasizes the need for top management to view regulatory drivers as opportunities for innovation rather than burdens. Firms should invest in leadership development programs that foster a culture of sustainability and innovation. Furthermore, the study highlights the importance of aligning organizational culture with sustainability objectives. Companies that integrate corporate social responsibility (CSR) values into their culture and encourage employee participation are more likely to adopt green practices effectively.

Limitations

While this study provides valuable insights, it has certain limitations. The sample size was relatively small, consisting of only 15 participants from a limited number of industries. This limits the generalizability of the findings to the entire manufacturing sector in Pakistan. Additionally, the study was cross-sectional in nature, offering a snapshot of perceptions at a particular point in time. This does not account for the potential evolution of managerial perceptions or regulatory frameworks. Moreover, the study focused solely on managers and top executives, neglecting the perspectives of lower-level employees who may have different views on regulatory drivers and their impact on operations.

Directions for Future Research

Future research could expand on this study by including a larger and more diverse sample of firms across different industries in Pakistan. This would provide a more comprehensive understanding of how regulatory drivers are perceived across various sectors. Longitudinal studies could also be useful in tracking how perceptions evolve over time, particularly as regulations become stricter or as global market pressures increase. Additionally, comparative studies between countries or regions, especially within South Asia, could offer valuable insights into how firms in similar institutional environments respond to regulatory drivers. Further research could also explore the perceptions of employees at various organizational levels to gain a more holistic understanding of how regulations are interpreted and implemented across firms. Finally, exploring the role of financial and technical assistance in facilitating the adoption of GSCM practices would provide practical insights for both policymakers and industry leaders.

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