

GREEN CULTURE AND GREEN SOCIAL RESPONSIBILITY AS ANTECEDENTS OF GREEN INNOVATION: A CONCEPTUAL FRAMEWORK FOR ENVIRONMENTALLY SENSITIVE INDUSTRIAL ORGANISATIONS

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Abstract: *Green innovation has become an important organisational mechanism for reducing environmental harm, improving resource efficiency, and supporting sustainable industrial development. However, much of the existing literature has examined green innovation either as a technological outcome or as a direct predictor of environmental and organisational performance, while relatively little attention has been paid to the internal organisational antecedents that drive green innovation in environmentally sensitive industrial sectors. This paper develops a conceptual framework that positions green culture and green social responsibility as two major antecedents of green innovation. Drawing on the Natural Resource-Based View and Dynamic Capabilities Theory, the paper argues that green culture provides the internal values, beliefs, and behavioural norms that support environmentally oriented innovation, whereas green social responsibility strengthens organisational commitment to ecological and societal expectations. Together, these two antecedents can create a favourable organisational context for developing green products, processes, and managerial practices. The paper contributes to the environmental management literature by integrating cultural and responsibility-based drivers of green innovation into a single conceptual model. It also provides practical implications for managers in industrial organisations, particularly those operating in environmentally sensitive sectors such as oil refining, petrochemicals, manufacturing, and energy-intensive industries. The paper concludes by proposing testable hypotheses for future empirical research.*

Keywords: *Green culture; Green social responsibility; Green innovation; Environmental management; Natural Resource-Based View; Dynamic Capabilities Theory; Industrial organisations.*

Introduction

Environmental sustainability has become a central concern for industrial organisations because production activities are often linked to emissions, high resource consumption, waste generation, and ecological degradation. In response to these pressures, green innovation has emerged as an important mechanism for firms to reduce environmental impacts while maintaining operational efficiency and long-term competitiveness. Green innovation involves developing or improving products, processes, technologies, and managerial practices that reduce environmental harm and support sustainable organisational performance (Chen et al., 2006; Xie et al., 2019).

Although green innovation has attracted growing scholarly attention, the internal organisational antecedents that drive it remain underexplored in the literature, particularly in environmentally sensitive industrial sectors. Existing studies have often focused on external pressures, technological capabilities, environmental regulation, or market demand, while giving less attention to cultural and responsibility-based conditions within organisations. In this regard, green culture and green social responsibility are important internal factors because they shape environmental values, behavioural norms, ecological commitment, stakeholder responsibility, and environmental accountability.

Accordingly, this paper develops a conceptual framework that explains how green culture and green social responsibility can serve as antecedents to green innovation in environmentally sensitive industrial organisations. The framework is grounded in the Natural Resource-Based View (NRBV) and Dynamic Capabilities Theory (DCT). NRBV explains how environmentally oriented resources and capabilities can support organisational advantage, while DCT explains how firms renew and reconfigure capabilities in response to environmental change. By integrating these perspectives, the paper argues that green culture and green social responsibility provide organisational foundations that enable green innovation.

The novelty of this paper does not lie in proposing isolated links between green culture, green social responsibility, and green innovation. Rather, its contribution lies in integrating these constructs into a focused conceptual framework that explains how internal environmental values and responsibility-based commitments jointly create organisational conditions for green innovation. While prior studies have examined green organisational culture, CSR, green dynamic capabilities, or green innovation separately, less attention has been given to the combined conceptual role of green culture and green social responsibility as complementary antecedents of green innovation in environmentally sensitive industrial organisations. This paper addresses this gap by positioning green culture as the internal normative foundation and green social responsibility as the responsibility-based stakeholder orientation that together support green innovation.

Problem Statement

Although green innovation has been widely examined in relation to environmental regulation, technological capabilities, corporate social responsibility, and organisational performance, the internal organisational conditions that stimulate green innovation remain insufficiently integrated in the literature (Chen et al., 2006; Xie et al., 2019; Kraus et al., 2020). Limited conceptual attention has been given to how green culture and green social responsibility jointly function as antecedents of green innovation in environmentally sensitive industrial organisations.

Green culture and green social responsibility are conceptually related but analytically distinct. Green culture reflects the shared environmental values, norms, and behaviours embedded within the organisation, while green social responsibility reflects the organisation's responsibility-based commitment to environmental protection, stakeholder expectations, and ecological accountability (Gürlek & Tuna, 2018; Suganthi, 2019). However, these constructs are often discussed separately, which limits understanding of how internal environmental values and responsibility-based commitments may work together to support green innovation. Accordingly, the main problem addressed in this paper is not the absence of prior studies on green culture, CSR, dynamic capabilities, or green innovation individually. Rather, the problem is the limited integration of these ideas into a coherent conceptual explanation of how internal environmental values and responsibility-based commitments jointly stimulate green innovation. This paper therefore contributes by developing a focused framework that positions green culture and green social responsibility as complementary internal antecedents of green innovation, and by explaining this relationship through the combined logic of the Natural Resource-Based View and Dynamic Capabilities Theory.

Research Questions

This paper addresses the following research questions:

- RQ1: How does green culture contribute to green innovation within industrial organisations?**
- RQ2: How does green social responsibility contribute to green innovation within industrial organisations?**
- RQ3: How can the Natural Resource-Based View and Dynamic Capabilities Theory explain the relationship between green culture, green social responsibility, and green innovation?**

Research Objectives

This paper aims to achieve the following objectives:

- RO1: To examine the conceptual role of green culture as an antecedent of green innovation.**
- RO2: To examine the conceptual role of green social responsibility as an antecedent of green innovation.**
- RO3: To develop a theoretically grounded framework that links green culture and green social responsibility to green innovation.**
- RO4: To explain the proposed relationships using the Natural Resource-Based View and Dynamic Capabilities Theory.**

Literature Review

This section reviews the three main constructs of the proposed conceptual framework: green culture, green social responsibility, and green innovation. It clarifies each construct and explains its relevance to the development of green innovation in environmentally sensitive industrial organisations. The review also provides the conceptual basis for the hypotheses developed later in the paper.

Green Culture

Green culture comprises the shared environmental values, beliefs, norms, and behaviours that guide how organisational members think and act on environmental issues (Gürlek & Tuna, 2018; Liu et al., 2020). It reflects the extent to which environmental responsibility is embedded in organisational identity, routines, leadership expectations, and employee behaviour, rather than being treated solely as a formal compliance requirement.

A strong green culture can support green innovation by fostering environmental awareness, knowledge sharing, employee participation, and cross-functional cooperation. In industrial organisations, this is especially important because environmental improvement often requires coordinated action across operations, maintenance, engineering, health and safety, and administration. Prior research indicates that a green organisational culture can positively influence green innovation and competitive advantage (Gürlek & Tuna, 2018). Therefore, green culture can be viewed as an internal organisational condition that enables the generation, acceptance, and implementation of green innovation.

Green Social Responsibility

Green social responsibility is an organisation's commitment to environmental protection and ecological welfare as part of its broader responsibility to society and stakeholders (Suganthi, 2019; Yankovskaya et al., 2022). Unlike general corporate social responsibility, which may include economic, social, ethical, and philanthropic activities, green social responsibility focuses specifically on environmental responsibilities, such as ecological conservation, environmental disclosure, compliance, pollution reduction, and public environmental awareness.

Green social responsibility can stimulate green innovation by raising managerial awareness of stakeholder expectations, strengthening environmental accountability, and encouraging organisations to move beyond basic compliance. In environmentally sensitive industries, this responsibility is especially important because organisational activities may directly affect air and water quality, resource use, waste generation, and community well-being. Previous studies suggest that CSR-related and green responsibility practices are associated with green practices, environmental strategy, green innovation, and environmental performance (Kraus et al., 2020; Suganthi, 2019). Thus, green social responsibility can be considered a responsibility-based driver of green innovation.

Green Innovation

Green innovation involves developing and implementing new or improved products, processes, technologies, and managerial practices that reduce environmental impacts (Chen et al., 2006; Xie et al., 2019). It is commonly discussed in terms of green product and process innovation. Green product innovation focuses on reducing environmental harm across the product life cycle, while green process innovation focuses on improving production processes to reduce emissions, waste, energy use, water consumption, and the use of hazardous materials.

Prior studies show that green product and process innovation can contribute to corporate advantage and performance outcomes (Chen et al., 2006; Xie et al., 2019). In industrial organisations, green innovation is essential because environmental improvement requires practical operational changes, such as cleaner production, emissions control, resource efficiency, waste treatment, and environmental monitoring. However, green innovation does not emerge automatically; it requires supportive internal conditions. For this reason, this paper proposes green culture and green social responsibility as key antecedents that can create the organisational foundation for green innovation.

Critical Synthesis of Prior Literature

Although the reviewed literature provides useful support for the relationship between green culture, green social responsibility, and green innovation, several conceptual and methodological gaps remain. First, prior studies do not consistently explain how internal

organisational conditions stimulate green innovation. Some studies emphasise green organisational culture as a direct driver of innovation (Gürlek & Tuna, 2018), while others focus on CSR, environmental strategy, green dynamic capabilities, stakeholder pressure, or environmental regulation as key explanations for green innovation (Chen & Chang, 2013; Kraus et al., 2020; Xie et al., 2019). This variation suggests that the antecedents of green innovation remain conceptually fragmented.

Second, there is some conceptual overlap among the constructs used in previous studies. For example, green culture, green organisational identity, CSR, environmental responsibility, and green social responsibility are sometimes discussed in closely related ways, particularly when they refer to environmental values, ecological commitment, stakeholder accountability, and organisational responsibility. However, these constructs are not identical. Green culture mainly reflects internal environmental values, norms, and behaviours within the organisation, whereas green social responsibility reflects the organisation's responsibility-based commitment to environmental protection and stakeholder expectations (Gürlek & Tuna, 2018; Suganthi, 2019; Yankovskaya et al., 2022). This distinction is important because green innovation may require both an internal cultural foundation and an outward-looking responsibility orientation.

Third, prior literature has often examined green innovation in specific empirical contexts, such as hospitality, manufacturing, or general industrial settings, which may limit the transferability of findings to environmentally sensitive industrial organisations. In sectors such as oil refining, petrochemicals, heavy manufacturing, and energy-intensive industries, green innovation is shaped by higher environmental risk, stronger regulatory attention, operational complexity, and greater stakeholder scrutiny. Therefore, the relationship between green culture, green social responsibility, and green innovation may be stronger or more visible in environmentally sensitive sectors than in less environmentally intensive contexts.

Fourth, many prior studies rely on cross-sectional empirical designs that test direct or mediated relationships among environmental constructs. While such studies are valuable, they may offer limited explanation of the deeper conceptual mechanisms through which internal values and responsibility-based commitments are transformed into innovation capabilities. This creates a need for conceptual work that clarifies how green culture and green social responsibility operate together as antecedents of green innovation.

Therefore, this paper addresses these gaps by developing an integrated conceptual framework that positions green culture and green social responsibility as complementary antecedents of green innovation. Rather than treating these constructs as separate or overlapping predictors, the framework explains how green culture provides the internal normative foundation for environmental innovation, while green social responsibility provides the responsibility-based orientation that connects organisational action to ecological and stakeholder expectations. This critical synthesis strengthens the rationale for integrating the Natural Resource-Based View and Dynamic Capabilities Theory in explaining green innovation in environmentally sensitive industrial organisations.

Methodology of the Conceptual Paper

This paper adopts a structured conceptual literature review approach. This approach is suitable because the purpose of the paper is not to test empirical relationships using primary data, but rather to develop a theoretically grounded conceptual framework that explains how green

culture and green social responsibility function as antecedents of green innovation in environmentally sensitive industrial organisations.

The literature search was conducted between June 2025 and April 2026. The literature coverage period spanned 1995 to 2026. The year 1995 was selected as the starting point because it marks the publication of Hart's Natural Resource-Based View, which provides one of the main theoretical foundations of this paper. The review also included foundational work on Dynamic Capabilities Theory and recent studies related to green culture, green social responsibility, corporate social responsibility, green innovation, green dynamic capabilities, and environmental performance.

The literature search was conducted using open-access academic search platforms, publisher databases, and DOI verification pages. These included Google Scholar, ScienceDirect, SpringerLink, Taylor & Francis Online, Emerald Insight, Wiley Online Library, MDPI, Frontiers, and official publisher websites. Closed indexing databases such as Scopus and Web of Science were not reported because the review was based only on platforms for which the search and verification process could be directly checked during the development of the paper.

The search process used combinations of keywords that directly corresponded to the paper's main constructs and theoretical foundations. The main search strings included: "green organisational culture" and "green innovation"; "green organizational culture" and "green innovation"; "green culture" and "green innovation"; "green social responsibility" and "green innovation"; "environmental CSR" and "green innovation"; "corporate social responsibility" and "green innovation"; "green dynamic capabilities" and "green innovation"; "Natural Resource-Based View" and "green innovation"; "dynamic capabilities theory" and "green innovation"; and "green innovation" and "environmentally sensitive industries".

The selection of literature followed four main inclusion criteria. First, studies were included when they provided relevant theoretical or empirical discussion of green culture, green social responsibility, corporate social responsibility, green innovation, green dynamic capabilities, NRBV, or DCT. Second, studies were included when they helped define the main constructs or explain the conceptual relationships among them. Third, seminal theoretical contributions were retained even when they fell outside the recent publication period, particularly Hart (1995), Teece et al. (1997), and Teece (2007). Fourth, recent peer-reviewed studies were prioritised where they contributed directly to the development of the proposed framework.

Studies were excluded when they were not conceptually aligned with the purpose of the paper. Exclusion reasons included: studies that focused only on general CSR without a clear environmental or green orientation; studies that examined financial performance or competitive advantage without sufficient relevance to green innovation; studies that discussed green dynamic capabilities without linking them to the constructs of this paper; studies located in contexts with limited relevance to environmentally sensitive industrial organisations; duplicate records; and records that did not provide sufficient theoretical, conceptual, or empirical relevance to the proposed framework. To improve transparency, the literature search and selection process is summarised in Table 1.

Table 1: Literature Search and Selection Process

Stage	Description	Number
Records captured from open-access academic platforms, publisher databases, and DOI pages	Initial records identified through the selected search strings	39
Duplicate records removed	Repeated records, duplicate publisher pages, and overlapping search results	7
Unique records screened	Records screened by title, abstract, keywords, and conceptual relevance	32
Records excluded after screening	Records excluded because they were not sufficiently aligned with the constructs or theoretical focus of the paper	14
Full-text or detailed records assessed	Sources assessed for conceptual, theoretical, and empirical relevance	18
Sources finally used in the conceptual paper	Sources retained and used to develop the conceptual framework	18

The final body of literature consisted of 18 sources used in the paper. These sources were selected because they provided the strongest conceptual and theoretical support for the proposed framework. The final selection included foundational theoretical works on NRBV and DCT; empirical and conceptual studies on green culture and green innovation; studies on corporate social responsibility and environmental responsibility; and research on green innovation and environmental performance. Therefore, the final literature base was not selected randomly but through a structured, purposive process based on conceptual relevance, theoretical importance, and direct alignment with the paper's research questions and objectives.

Theoretical Foundation

This paper is grounded in two complementary theoretical perspectives: the Natural Resource-Based View and Dynamic Capabilities Theory. These theories are suitable for explaining how green culture and green social responsibility can contribute to green innovation in industrial organisations. The Natural Resource-Based View explains how environmentally oriented resources and capabilities can become sources of organisational advantage, while Dynamic Capabilities Theory explains how firms adapt, renew, and reconfigure these capabilities in response to changing environmental pressures. Together, these theories provide a coherent foundation for understanding green innovation as an organisational capability shaped by environmental values, responsibility-based commitments, and adaptive learning processes.

Natural Resource-Based View

The Natural Resource-Based View (NRBV) was developed by Hart (1995) as an extension of the resource-based view of the firm. It argues that environmental challenges can shape the development of valuable organisational resources and capabilities. According to NRBV, firms can gain an advantage by developing capabilities in pollution prevention, product stewardship, and sustainable development. Hart and Dowell (2011) later revisited the NRBV and highlighted its ongoing relevance to sustainable enterprise and environmental strategy.

NRBV is suitable for this paper because green culture and green social responsibility can be viewed as intangible organisational resources that support the development of environmental capabilities. A strong green culture fosters shared values and routines that promote

environmentally responsible behaviour. Green social responsibility instils a responsibility-based orientation toward stakeholders and environmental protection. These resources can help firms develop green innovation capabilities by encouraging cleaner processes, better environmental practices, and more sustainable products or services. From an NRBV perspective, green innovation is not merely a technical activity. It is a capability that emerges when firms combine environmental values, knowledge, responsibility, and operational resources. Green culture and green social responsibility can therefore be seen as strategic antecedents that help organisations develop green innovation as an environmentally valuable capability.

Dynamic Capabilities Theory

Dynamic Capabilities Theory explains how organisations adapt, integrate, build, and reconfigure internal and external capabilities in response to changing environments. Teece et al. (1997) define dynamic capabilities as the firm's ability to integrate, build, and reconfigure competencies to address rapidly changing environments. In environmental management, this theory is useful because firms face evolving regulations, stakeholder expectations, technological developments, and sustainability pressures.

Dynamic capabilities are relevant to green innovation because environmental innovation requires firms to sense environmental challenges, seize opportunities for improvement, and transform existing processes and routines. A company may possess environmental values and resources, but these must be continuously renewed and applied to achieve meaningful innovation. This is especially important in industrial sectors where technologies, regulations, and environmental standards evolve over time.

Green culture can support dynamic capabilities by fostering learning, openness to environmental improvement, and employee participation in innovation. Green social responsibility can support dynamic capabilities by motivating the organisation to respond to stakeholder expectations and societal environmental concerns. Together, these antecedents can strengthen the firm's ability to develop and implement green innovation. Thus, while NRBV explains why green culture and green social responsibility are valuable environmental resources, DCT explains how these resources can be transformed into green innovation through adaptation, renewal, and organisational learning.

Based on the preceding literature review and theoretical discussion, Table 1 summarises the key studies that support the proposed conceptual framework. The table brings together the theoretical foundations and empirical evidence related to green culture, green social responsibility, green innovation, and environmental management. It also clarifies how prior studies inform the positioning of green culture and green social responsibility as internal antecedents of green innovation.

Table 2: Summary of Key Literature Supporting the Proposed Conceptual Framework

Author(s)	Focus	Context / Method	Key Contribution to the Present Paper
Hart (1995)	Natural Resource-Based View	Conceptual/strategic management	Establishes NRBV as a theory explaining how environmental resources and capabilities can support competitive advantage.
Hart & Dowell (2011).	NRBV after 15 years	Conceptual review	Reinforces the relevance of NRBV and links environmental capabilities to strategic management and sustainability research.
Teece et al. (1997).	Dynamic Capabilities Theory	Conceptual/strategic management	Explains how firms integrate, build, and reconfigure capabilities in dynamic environments.
Teece (2007).	Micro foundations of dynamic capabilities	Conceptual/strategic management	Explains sensing, seizing, and transforming as mechanisms by which firms renew capabilities.
Porter & van der Linde (1995).	Environmental regulation, innovation, and competitiveness	Conceptual / economics and strategy	Supports the view that environmental pressures can stimulate innovation rather than merely increase costs.
Chen et al. (2006).	Green product and process innovation	Empirical study in Taiwan	Shows that green product and process innovation are positively associated with corporate advantage.
Chang & Chen (2013).	Green organisational identity and green innovation	Empirical/organizational context	Supports the role of green organisational identity in enhancing green innovation performance by strengthening environmental commitment and legitimacy.
Chen & Chang (2013).	Green dynamic capabilities and green product development	Empirical/green product development	Supports the role of green dynamic capabilities in enhancing green product development performance.
Gürlek & Tuna (2018).	Green organisational culture and green innovation	Empirical study in hospitality	Provides evidence that green organisational culture positively influences green innovation and competitive advantage.
Magsi et al. (2018).	Organisational culture and environmental performance	Empirical study in manufacturing	Supports the importance of organisational culture in improving environmental performance.

Wang (2019)	Organisational green culture, green performance, and competitive advantage	Empirical manufacturing-related context	Shows that green innovation mediates the relationship between organisational green culture and green performance or competitive advantage.
Suganthi (2019)	CSR, green practices, and pro-environmental behaviour	Empirical/organizational context	Supports the role of CSR and green practices in sustainable performance and employee pro-environmental behaviour.
Xie et al. (2019)	Green process innovation and green product innovation	Empirical / heavily polluting manufacturing firms	Distinguishes green process innovation and green product innovation and links them to firm performance.
Isensee et al. (2020)	Organisational culture, sustainability, and digitalisation	Systematic literature review	Highlights the need to integrate organisational culture with environmental sustainability research.
Kraus et al. (2020)	CSR, environmental strategy, green innovation, and environmental performance	Empirical study of large manufacturing firms in Malaysia	Supports the role of CSR in stimulating green innovation and environmental strategy, which improves environmental performance.
Rehman et al. (2021)	Green innovation and environmental performance	Empirical/large manufacturing firms	Supports the mediating role of green innovation in improving environmental performance.
Andersén (2021)	Relational NRBV and green innovation	Conceptual/empirical orientation	Extends NRBV by linking relational resources to green innovation and sustainable outcomes.
Wang et al. (2022).	Green innovation strategies and firm performance	Empirical / supply chain risk perspective	Green innovation strategies contribute to performance and are influenced by supply chain risk conditions.

Conceptual Framework and Hypotheses Development

This paper proposes a conceptual framework in which green culture and green social responsibility serve as antecedents of green innovation. The model assumes that organisations are more likely to develop green innovation when they have an internal culture that supports environmental values and demonstrates responsibility toward environmental and societal expectations. The proposed conceptual model is intentionally focused and suitable for a conceptual paper. It does not claim empirical results. Instead, it provides a theoretically grounded framework that can be tested in future quantitative studies.

Green Culture and Green Innovation

Green culture can positively influence green innovation by embedding environmental values into organisational routines, managerial priorities, and employee behaviour. When

environmental values become part of the organisational culture, employees are more likely to recognise environmental problems, share environmental knowledge, and support improvements in products, processes, and managerial practices (Gürlek & Tuna, 2018; Liu et al., 2020).

The logic of this relationship is based on the role of culture in shaping how organisational members interpret problems and respond to change. A strong green culture can create a shared understanding that environmental improvement is not only a compliance requirement, but also an organisational priority. This shared understanding encourages environmental learning, cross-functional cooperation, and employee involvement in identifying cleaner and more efficient ways of working (Gürlek & Tuna, 2018). In environmentally sensitive industrial organisations, such cooperation is particularly important because green innovation often requires coordination among operations, maintenance, engineering, procurement, health and safety, and environmental compliance units.

From the Natural Resource-Based View, green culture can be understood as an intangible organisational resource that supports the development of environmental capabilities (Hart, 1995; Hart & Dowell, 2011). From Dynamic Capabilities Theory, green culture can also support the sensing and transformation of environmental opportunities by encouraging employees and managers to adapt existing routines and adopt cleaner practices (Teece et al., 1997; Teece, 2007). Therefore, organisations with stronger green culture are more likely to develop green innovation capabilities.

H1: Green culture positively impacts green innovation in industrial organisations.

Green Social Responsibility and Green Innovation

Green social responsibility can positively influence green innovation because it creates responsibility-based pressure for organisations to reduce environmental harm and respond to stakeholder expectations. When organisations are committed to environmental responsibility, they are more likely to move beyond symbolic environmental statements and seek practical improvements in products, processes, technologies, and managerial systems (Suganthi, 2019; Kraus et al., 2020).

The relationship between green social responsibility and green innovation can be explained through stakeholder accountability and environmental commitment. Organisations that accept responsibility toward the natural environment, surrounding communities, regulators, and other stakeholders are more likely to search for innovative ways to reduce emissions, conserve resources, control waste, and improve environmental reporting. In this sense, green social responsibility creates both internal motivation and external pressure for innovation-oriented environmental action (Suganthi, 2019; Kraus et al., 2020).

From the Natural Resource-Based View, green social responsibility can be considered an organisational orientation that strengthens environmental capability development by directing attention and resources toward ecological improvement (Hart, 1995; Hart & Dowell, 2011). From Dynamic Capabilities Theory, responsibility-based commitments can encourage organisations to sense stakeholder and regulatory expectations, seize opportunities for environmental improvement, and transform existing practices into greener alternatives (Teece et al., 1997; Teece, 2007). Therefore, green social responsibility can be considered a meaningful antecedent of green innovation in environmentally sensitive industrial organisations.

H2: Green social responsibility positively impacts green innovation in industrial organisations.

Proposed Conceptual Framework

Building on the preceding theoretical discussion and literature synthesis, this paper proposes a conceptual framework linking green culture and green social responsibility to green innovation. The framework positions green culture and green social responsibility as internal organisational antecedents that can stimulate green innovation in environmentally sensitive industrial organisations. Green culture encompasses the internal values, beliefs, and behavioural norms that support environmentally responsible practices, while green social responsibility reflects the organisation's commitment to ecological protection, stakeholder expectations, and environmental accountability. Together, these antecedents are expected to create an organisational environment that encourages green product, process, and managerial innovation. The proposed framework is presented in Figure 1.

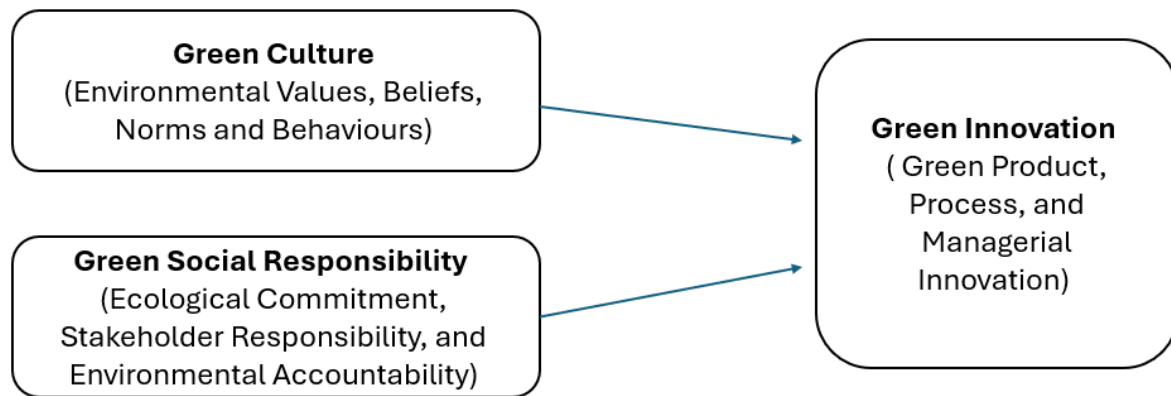


Figure 1: Proposed Conceptual Framework

To summarise the proposed relationships, Table 2 presents the hypotheses developed in this paper. The table also provides the theoretical justification for each relationship, drawing on the Natural Resource-Based View, Dynamic Capabilities Theory, and prior literature on green culture, green social responsibility, and green innovation.

Table 3: Proposed Hypotheses

Hypothesis	Relationship	Theoretical Justification
H1	Green culture positively impacts green innovation.	Green culture instils environmental values, awareness, and behavioural norms that support environmental learning and innovation.
H2	Green social responsibility positively impacts green innovation.	Green social responsibility strengthens ecological commitment and stakeholder-oriented motivation to develop greener products, processes, and practices.

Discussion

This paper argues that green culture and green social responsibility are important antecedents of green innovation. The central argument is that green innovation is not only the result of technology, regulation, or external pressure but also the outcome of internal organisational values and responsibility-based commitments. A firm may invest in environmental

technologies, but if its culture does not support environmental learning and its responsibility orientation is weak, green innovation may remain fragmented or symbolic.

Green culture fosters green innovation by embedding environmental values in organisational behaviour. It encourages employees and managers to view environmental improvement as part of their normal responsibilities rather than an additional burden. In this sense, green culture creates the internal climate needed for innovation. When environmental responsibility is culturally supported, employees are more likely to suggest improvements, accept environmental changes, and cooperate across departments.

Green social responsibility contributes to green innovation by strengthening the organisation's ethical and societal commitment to environmental protection. It aligns internal environmental practices with external stakeholder expectations. This alignment is especially important in industrial sectors where communities, governments, customers, and environmental authorities expect organisations to reduce negative environmental impacts. Green social responsibility, therefore, creates both moral and strategic motivation for innovation.

Integrating green culture and green social responsibility is valuable because these constructs complement each other. Green culture operates primarily within the organisation, shaping values, routines, and employee behaviour. Green social responsibility connects the organisation to broader environmental and societal expectations. When both are present, the organisation is more likely to develop green innovation that is internally supported and externally meaningful.

An additional conceptual implication of the proposed framework is that green culture and green social responsibility may not only operate as separate antecedents of green innovation but also reinforce each other. A strong green culture can enhance the effectiveness of green social responsibility because responsibility-based initiatives are more likely to be accepted, understood, and implemented when supported by shared environmental values and norms. In organisations where green culture is weak, green social responsibility may remain formal, symbolic, or externally driven. However, when green social responsibility is embedded within a supportive green culture, it is more likely to translate into employee involvement, environmental learning, cross-functional cooperation, and practical green innovation. Therefore, green culture may create the internal organisational climate that enables green social responsibility to become more innovation-oriented and operationally meaningful (Gürlek & Tuna, 2018; Suganthi, 2019; Kraus et al., 2020).

From the NRBV perspective, green culture and green social responsibility can be considered intangible environmental resources that help firms build green innovation capabilities (Hart, 1995; Hart & Dowell, 2011). From the DCT perspective, these resources must be continuously renewed and applied to evolving environmental challenges through the processes of sensing, seizing, learning, and transforming (Teece et al., 1997; Teece, 2007). The possible interaction between green culture and green social responsibility further strengthens this theoretical logic, as green culture may provide the internal conditions through which responsibility-based commitments are transformed into practical green innovation. Therefore, the proposed model explains not only why these antecedents matter individually, but also how their combined influence may support innovation in dynamic industrial environments.

Theoretical Contribution

This paper makes three main theoretical contributions. First, it contributes to the green innovation literature by shifting attention from the outcomes of green innovation to its

organisational antecedents. Much of the existing literature has examined whether green innovation improves environmental performance, competitive advantage, or financial performance. In contrast, this paper focuses on the internal organisational conditions that may stimulate green innovation.

Second, the paper contributes by integrating green culture and green social responsibility into a single conceptual framework. Green culture reflects internal environmental values and shared behavioural norms, whereas green social responsibility reflects the organisation's ecological commitment to society and stakeholders. By combining these two constructs, the paper offers a more comprehensive explanation of how organisations can create conditions that support green innovation.

A further theoretical contribution is that the paper clarifies the added value of examining green culture and green social responsibility together rather than as separate predictors of green innovation. Green culture refers to the internal values, norms, and behavioural routines that make environmental innovation acceptable and actionable within the organisation, whereas green social responsibility refers to the organisation's responsibility-based orientation towards ecological protection and stakeholder expectations. Their integration provides a more complete explanation of green innovation by linking the organisation's internal cultural climate to its external environmental responsibility orientation. This combined explanation is particularly relevant in environmentally sensitive industrial organisations, where green innovation requires both internal acceptance and external accountability.

Third, the paper contributes theoretically by integrating the Natural Resource-Based View (NRBV) and Dynamic Capabilities Theory (DCT). NRBV explains how green culture and green social responsibility can serve as valuable environmental resources, while DCT explains how these resources may be transformed into green innovation through learning, adaptation, and capability renewal. This dual-theory approach strengthens the proposed model's conceptual foundation and provides a useful basis for future empirical research.

The expanded framework also addresses calls for greater integration among environmental strategy, organisational culture, and innovation research. By treating green culture and green social responsibility as antecedents of green innovation, the paper links cultural theory, responsibility-based environmental management, and strategic capability perspectives. This integration is especially relevant for environmentally sensitive industrial organisations, which must translate environmental values and responsibility commitments into operationally meaningful innovation. Therefore, the proposed framework offers a theoretical bridge between internal environmental orientation and innovation-driven environmental action.

Practical Contribution

The proposed framework offers practical implications for managers in industrial organisations. First, it suggests that green innovation should not be treated solely as a technological issue. Although clean technologies and process improvements are important, they are unlikely to succeed without a supportive organisational culture. Managers should therefore promote environmental values through leadership behaviour, employee training, internal communication, and recognition of green initiatives.

Second, the framework underscores the role of green social responsibility in driving innovation. Industrial organisations should move beyond general CSR activities and develop specific

environmental commitments, including reducing emissions, improving waste management, supporting ecological initiatives, disclosing environmental impacts, and strengthening environmental compliance.

Third, the model suggests that organisations should align cultural values and social responsibility commitments with innovation activities. For example, environmental awareness programs should be linked to process improvement projects, energy-saving initiatives, waste-reduction programs, and cleaner-production practices. In this way, green culture and green social responsibility can be translated into practical green innovation.

Fourth, the framework is particularly relevant to environmentally sensitive sectors such as oil refining, petrochemicals, manufacturing, and energy-intensive industries. These sectors face significant environmental pressures and, therefore, require internal organisational systems that support continuous environmental improvement.

Limitations and Future Research

The proposed relationships are developed theoretically from prior literature and should be tested in future studies. Future research may use quantitative methods, such as survey design and structural equation modelling, to examine the impact of green culture and green social responsibility on green innovation.

Future studies may also extend the model by treating environmental performance as an outcome of green innovation. This would allow researchers to examine whether green innovation mediates the relationships between green culture, green social responsibility, and environmental performance. In addition, environmental strategy could be included as a moderator to test whether it strengthens the relationship between green innovation and environmental performance.

Another limitation is that the proposed model focuses primarily on internal organisational antecedents. Future research may incorporate external drivers, such as environmental regulation, stakeholder pressure, market demand, technological turbulence, and national sustainability policies. These factors may interact with internal culture and a sense of responsibility to shape green innovation.

Finally, future research may apply the proposed framework across sectors and geographic contexts. Heavy industries, oil refineries, petrochemical companies, manufacturing firms, and energy-intensive organisations offer suitable contexts for testing the model because their environmental challenges are operationally complex and strategically important.

Conclusion

This paper developed a conceptual framework that positions green culture and green social responsibility as antecedents of green innovation in industrial organisations. The paper argued that green culture provides the internal values, norms, and behavioural foundation needed to support environmental innovation, while green social responsibility strengthens the organisation's commitment to ecological and societal expectations. Together, these two factors can create an organisational environment that supports the development of green products, processes, and managerial practices.

The paper contributes to the environmental management literature by integrating green culture and green social responsibility into a single framework and grounding the model in the Natural

Resource-Based View and Dynamic Capabilities Theory. The framework is especially relevant for industrial organisations in environmentally sensitive sectors, where environmental improvement requires both technical innovation and organisational commitment.

Although the paper is conceptual, it provides a foundation for future empirical research. The proposed hypotheses can be tested using survey data and structural equation modelling. Overall, the paper suggests that green innovation should be viewed not only as a technological activity but also as an organisational outcome shaped by culture, responsibility, and the development of dynamic capabilities.

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