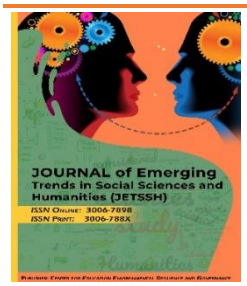
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Environmental Ethics as a Driver of Green Organizational Resilience: Evidence from Manufacturing SMEs of Pakistan

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ABSTRACT

The need for environmental sustainability is a growing priority for small and medium enterprises (SMEs) as they are increasingly subjected to environmental pressures, environmental resource limits, and environmental impacts due to evolving environmental conditions. The effect of Environmental Ethics on green organizational resilience of manufacturing SMEs in Pakistan has been explored in this study. Based on the proposed relationship between these constructs, the study examines if there is a connection between environmentally responsible values/ethical principles and organizations' abilities to anticipate environmental issues, withstand, adapt, and recover from environmental issues, and keep their commitment to sustainability. The positive path coefficients of the structural model show that environmental ethics have a positive influence on the green organizational resilience ($\beta = 0.563$) and that environmental ethics explain 31.7% of the variance in green organizational resilience ($R^2 = 0.317$). The present study, in this regard, adds to the literature on sustainability and organizational resilience by exploring the role of environmental ethics as a potential antecedent of green organizational resilience in the case of manufacturing SMEs in Pakistan. Some of the results might have practical significance for SME managers interested in incorporating environmental responsibility into organizational decision-making and resilience-building initiatives.

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Introduction

As climate change, resource depletion and a strong demand for responsible business conduct have become key concerns in today's complex business landscape, environmental sustainability has emerged as a core priority for organizations. An energy company, in particular, would be vulnerable to these issues since they rely on energy, mining, water usage, production methods, and waste disposal. These activities can place large demands on the environment, and at the same time introduce new regulatory requirements, supply chain disruptions, increased resource costs, and evolving stakeholder expectations for firms. Organizational success therefore needs to be measured not just by financial performance, productivity and competitiveness of the market, but also by the way the organization is handling its environmental responsibilities and is reacting to challenges associated with sustainability. Green organizational resilience has thus become a relevant concept to understand how organizations can keep functioning, adapt to environmental shocks and integrate sustainability into their long-term plans. But achieving that resilience isn't something that's done with technology investments or following the environment rules. It can also be influenced by ethical concepts, managerial values and organizational priorities that are used in decision making about the natural environment. Environmental ethics thus offer a potential basis for the understanding of the way organizations build their abilities to be resilient while acting in an environmentally responsible way.

Environmental ethics are the general moral idea and values that direct human choices and organizational action in relation to the natural environment. In the organizational context, environmental ethics is related to the integration of environmental protection, responsible use of resources, pollution prevention and the consideration of ecological impact into managerial decisions and business activities. Organizations under environmental ethical consideration are more likely to take into consideration the environmental impacts of their operations than those that judge only based on the short-term monetary gain. The sense of responsibility towards the environment is a topic that can be analyzed from various perspectives, which is a departure from the view that it represents an external requirement imposed by regulation or by pressure from stakeholders. Rather, it sees a commitment to the environment as a normative one that can shape organizational priorities, resource allocation, strategic planning and stakeholder relationships. If environmental issues are instilled in the organizational values, managers might be more likely to proactively seek out environmental risks, implement cleaner production, involve employees in environmental initiatives, and establish procedures for dealing with environmental challenges. However, ethical commitments do not necessarily lead to resilient organizational outcomes. They can be effective in helping to achieve the intended results if environmental values are translated into concrete decisions, operational capabilities and organizational practices. Therefore, it is important to study environmental ethics in the context of green organizational resilience to establish whether ethical environmental orientations are linked to the capacity of organizations to react to sustainability-related challenges.

Organizational resilience in the Green dimension can be defined as the ability of an organization to foresee, resist, react to, adapt to and rebound from disruptions and to continue or even improve its environmental sustainability goals. Traditional organizational resiliences focus on continuity, adaptation, recovery and operating under conditions of uncertainty. A green perspective goes beyond this, as it calls for the integration of environmental responsibility into the process of developing and assessing resilience. For instance, a manufacturing company can react to a disruption by changing to different raw materials, increasing energy efficiency, cutting production waste, searching for alternative eco-friendly suppliers or re-engineering processes to diminish environmental impact. These responses may assist the organization with operating issues and implementing their environmental obligations. Importantly, green organizational resilience does not only refer to the capacity to "go back to normal". Reversion to traditional production methods could be to recreate the environmental vulnerabilities that led to the initial issue. Another, more sustainability-minded view of resilience relates to whether organizations adapt, change

practices that impact the environment, and gain knowledge from disruptions so they can operate in a more resourceful manner. This distinction is particularly significant for manufacturing organizations, where the choices made and decisions taken by the business have direct consequences on the use of resources, pollution and environmental performance. It also poses interesting research question: What organizational characteristics foster the building of resilience that is aligned with environmental responsibility, and not merely with short-term operational recovery?

This relationship is especially significant for small and medium-sized enterprises (SMEs), who often do not have the same financial capabilities, access to cutting-edge technologies, management staff, or ability to withstand sudden shifts. Unlike large companies, SMEs may not have the capacity to have a significant amount of financial reserves, commit to continual investment in environmental technologies or build in-depth risk-management strategies. These limitations can expose them to disruptions in raw material availability, energy supply, changes in regulations, environmental issues and variations in production costs. It is found that the resilience of SMEs is linked to the organizational features, resources available to the organization, decision-making and the ability to adapt to the changing circumstances (Koporcic et al. 2026, Damiano & Valenza, 2024).

In this sense, environmental ethics could be seen as an important organizational orientation in that it can affect how managers see environmental issues, prioritize competing issues, and choose to invest in responsible actions even when there is a lack of resources at that moment. Managers might be pushed to think beyond immediate cost cuts and focus on the longer-term impacts of running out of resources and the pollution of the environment, because of their ethical obligations to the environment. However, even if SMEs have an ethical intent, that does not necessarily translate into effectiveness in building resilience when these factors hinder implementation. Thus, there is a need to examine whether environmental ethics is meaningfully related to green OR or not, based on the consideration that environmental awareness or ethical commitment does not automatically lead to resilient outcomes.

Pakistan is relevant here as a context to look at the connection between environmental sustainability and the competitiveness of manufacturing SMEs as one of the managerial concerns. Previous studies on Pakistani SMEs have focused on environmental sustainability, green human resource management, proactive environmental strategies, and green supply chain management. Similarly, Ahmed et al. (2022) analysed manufacturing SMEs of Pakistan and found that the top management support and environmental orientation were found to be positively related to green HRM practices which in turn led to environmental sustainability. In the same way, Ibrahim and Mahmood (2022) studied manufacturing SMEs in Karachi, and explored the relationship between proactive environmental strategies and green mindfulness with environmental performance.

These investigations show the relevance of the environmental orientation and managerial practices in context with sustainability outcomes in the manufacturing sector in Pakistan. But environmental performance and organizational capability aren't synonymous. Environmental performance is related to the degree of desirable environmental results that can be delivered by an organization, while organizational resilience is related to how well an organization can survive, adapt and sustain or rebuild its capacities in the event of disruption, change or environmental change. A crisis may not occur when a firm has the resources and capabilities to continue its environmentally responsible practices. Thus, further study is needed to explore the link between environmental ethics and green organizational resilience to better understand what factors link environmental responsibility to resilience.

While there have been some studies in the past that have examined the link between environmental orientation and environmental sustainability in SMEs in Pakistan, the link between environmental ethics and green organizational resilience is a new field of study. Research into sustainability and SME resilience has now started to link sustainable business strategies/practices to SMEs' coping and adaptation skills. For instance, Damiano and Valenza (2024) reviewed the literature on sustainability of SMEs and resilience, and emphasized that strategies and organizational processes for sustainability can contribute to more resilient business models. Other more recent

studies have also focused on the causes and processes of SME resilience, such as the relationships between the organizational resources, adaptability and crisis reactions.

Yet, these larger viewpoints do not prove that environmental ethics is also contributing to the green organizational resilience. Environmental ethics are normative principles to be considered in decision making, while sustainability practices and resilience capacities are related to the actions and capacities of an organization. It would be wrong to equate these three ideas by assuming that ethical commitments can have different impacts on organizational responses as a function of the firm's context. However, this link between environmental ethics and green organizational resiliency in the context of manufacturing SMEs in Pakistan merits a direct empirical study. The study tackles that research problem by investigating environmental ethics as an explanatory factor which is related to the difference in green organizational resilience.

The challenges faced by Pakistani SMEs are only some of the challenges that must be explored and the ethical and organizational aspects of environmental responsibilities are highlighted. In the qualitative study of Durrani et al. (2024) in Balochistan is the financial constraints, lack of education, poor regulation implementation, and lack of government support were identified as barriers to environmental sustainability. They conclude that organizational conditions, and also the broader institutional context is crucial for the adoption of environmental practices.

This will create a real challenge for SMEs: managers may know about the effects and importance of environmental protection but are also faced with pressures to continue with the production process, satisfy customer needs, ensure business continuity and maintain costs. The principles of environmental ethics can play a role in such a process by providing information for managers to consider in assessing environmental impacts as well as immediate economic considerations. For instance, an ethically motivated company may be less likely to dump toxic waste or think about other, more sustainable options for potentially harmful waste disposal, and reconsider how they produce the product when it is disrupted. These decisions may play a part in forming more sustainable shifts in organizational adaptation. They are, so far, only possibilities and will need empirical analysis to see if they hold true. Environmental ethics may provide motivation and direction, but might also depend on ethical principles being embedded in operational practice, choices and organizational reactions to environmental risk and uncertainty to build resilience.

The key notion of this study is that environmental ethics can contribute to green organizational resilience as it provides a moral foundation for the environmental friendly organizational decisions. Environmental elements incorporate into the managerial decisions may make the firms more sensitive to ecological hazards, more dedicated to their approach towards using resources responsibly, and more inclined to think about the long-term environmental effects of their actions. This orientation may assist in enabling proactive identification of risks, environmental learning and continuous working towards sustainability in uncertain times. Theoretically the relationship can be analysed by resource-based view and natural-resource-based view of the firm. The resource-based view also focuses on the importance of valuable organizational resources and capabilities as enablers of sustained performance and the natural-resource-based view places the focus on the strategic importance of the capabilities linked to pollution prevention, product stewardship, and sustainable development. An environmental ethics predecessor to these organizational skills could be that it might affect priorities for ways by which corporations allocate and allocate resources. Ethical values, however, should not simply be considered as a resilience capability as such. Their theoretical significance is that they could affect the acquisition and utilization of capabilities that allow firms to deal with environmental demands. This paper examines the direct relationship between environmental ethics and green organizational resilience, which is a first step in understanding the potential relationship between the two.

The purpose of this study is to explore the influence of environmental ethics on green organizational resilience of manufacturing SMEs in Pakistan in the context. The study questions the correlation between and causality of the companies with the high level of environmental

ethical orientations and the high green organizational resilience. There are two points where this focus is important. First, it takes the discussion of environmental ethics, which has been confined to environmental responsibility and practices for sustainability, and extends it to an organizational result for adaptation and continuation in challenging times. Secondly, it situates this relationship within manufacturing SMEs within an emerging economy where resources constraints and environmental management concerns may serve as an argument for a particular relevance of resilience. The study does not claim that environmental ethics as a construct can be ensured by resilience; it is assumed that there is a positive association between the two constructs in the proposed structural model. This is because managerial skills, organizational learning, innovation, financial resources, and supply chain relationships and institutional support may be important to resilience as well. So, a link between environmental ethics and green organizational resilience might be the starting point for future research that considers how and when this ethical environmental commitment can be transformed into organizational capacities.

The study may have implications for sustainability and organizational resilience research by fusing two thoughts on two separate but complimentary organizational environmental responsibility issues. Environmental ethics can guide organizational decisions and green organizational resilience is the capacity of the organization to maintain and adapt environmentally sustainable activities to varying environmental conditions. Investigating their relationship among manufacturing SMEs in Pakistan, the study provides context-specific evidence which can guide the researchers and managers to understand if there is any association between ethical environmental orientations and resilience-related outcomes. The study could also emphasize the need for practitioners to consider environmental responsibility as a key action issue for managers, not just as a compliance issue. The study may provide a second source of ideas for policy-makers and SME support institutions related to the organizational values that can be used in addition to financial support, environmental training, technological support and good regulation. Implications should be based on the empirical results, while acknowledging the methodological limitations of this study.

Research Objectives

The main objective of this study is to develop and empirically validate an integrated framework that explains how environmental ethics and green organizational culture foster green organizational resilience.

- To examine the effects of Environmental Ethics (EE) on Green Organizational Resilience (GOR).

Conceptual Framework

This study's conceptual framework considers the relationship between Environmental Ethics (EE) and Green Organizational Resilience (GOR) in the context of manufacturing small and medium-sized enterprises (SMEs) in Pakistan. Environmental Ethics is defined as the independent variable and Green Organizational Resilience is defined as the dependent variable in the framework. It is built on the assumption that an organization's environmental values and ethical standards can impact its capacity to predict environmental issues, react to interruptions, modify its practices and sustain environmental sustainability pledges.

Environmental Ethics is the degree of an organization's integration of moral principles, environmental responsibility and ecological considerations within its managerial decisions and practices. Organizations that focus on environmental ethics might be more likely to take the long-term effects of their operations into account, encourage responsible use of resources, avoid environmental damage, and include environmental issues in their strategic planning. These values can help inform management decisions, especially in a context of conflicting financial, operational and environmental obligations.

Green Organizational Resilience is the ability of an organization to forecast, resist, react, and recover from disruption while at the same time sustaining or enhancing their environmental sustainability goals. This is especially critical for manufacturing SMEs as resource constraints, supply disruptions, environmental risks, and financial pressures can disrupt operations.

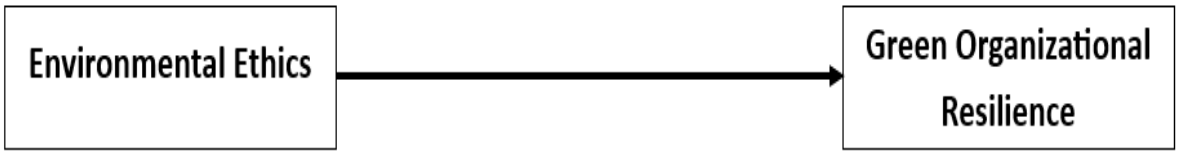
Businesses that incorporate environmental factors into their decision-making process can potentially have a better opportunity to detect environmental vulnerabilities, modify production processes, and continue responsible practices in times of trouble.

According to the framework there is a direct positive relationship between Environmental Ethics and Green Organizational Resilience. The theoretical basis is mainly centered on the Natural-Resource-Based View (Hart, 1995) that underscores how environmental management can be a strategic component and how the organization can build capabilities to be environmentally responsible. The capacity-based approach to organizational resilience (Duchek, 2020) helps to clarify the contribution of organizational capacities to the ability to anticipate, cope, and adapt. These views offer a theoretical framework for suggesting environmental ethics can play a role in the building of an organization's resilience.

The hypothesis which expresses the proposed relationship is:

The relationship between Environmental Ethics and Green Organizational Resilience is positive and significant to manufacturing SMEs in Pakistan.

The conceptual framework does not include any mediating or moderating variable, but one independent variable and one dependent variable. Empirical analysis will investigate the direction, magnitude and statistical significance of the proposed relationship. If this path coefficient (\(\beta = 0.563\)) and the level of variance explained (\(R^2 = 0.317\)) measured in the final statistical output are found to be positive, then the relationship is positive and 31.7% of the variance in Green Organizational Resilience is explained, respectively. The results of the appropriate hypothesis testing are required in order to determine statistical significance.



Literature Review

Introduction

Theories and empirical research that addresses the link between environment ethics and green ORS of manufacturing small and medium sized enterprises (SME) in Pakistan is discussed in this chapter. This chapter aims to lay the conceptual groundwork for both constructs, to outline theories which would explain the assumed relationship between the constructs, to review the results of past studies, and to formulate the research hypothesis. Environmental ethics is the values and moral principles that drive organizational decisions related to the natural environment, while the green organizational resilience is an organization's capacity to foresee environmental problems, deal with disruptions, adjust their operational processes, and keep them environmental sustainability commitments. These ideas span across various aspects of organizational environmental responsibility; they can be related to each other because the values underlying managerial decision making can shape the resources, practices, and capabilities with which organizations respond to problems in the environment.

The organization of the chapter is based on the main constructs of the study, the theoretical framework used to understand their relationship and the empirical evidence relevant to the research context. Special attention is paid to the natural-resource based view of the firm and the capability-based view on organizational resilience. The natural-resource-based view was developed by Hart (1995) to describe how a company's natural environment interactions can impact the natural resources and capabilities used in developing their strategy, specifically through pollution prevention, product stewardship, and sustainable development.

These views can give a theoretical foundation to analyze the positive correlation between environmental ethics and green organizational resilience. The chapter also discusses the specific challenges that are confronting the SMEs from manufacturing sector in Pakistan and elaborates why the present study has developed a specific research question which is different from the existing literature on Environmental Sustainability and Environmental Performance.

Conceptualizing Environmental Ethics

Environmental ethics focus on the "morals" of how human activities relate to the natural environment. It takes into account responsibilities of individual and organizations towards ecosystems, natural resources, biodiversity, pollution prevention and long-term impacts of economic activity. In the context of business management, environmental ethics may be defined as the degree to which an organization integrates environmental responsibility and ecological concerns into its values, managerial decisions and business practices. An ethical approach to environmental protection is not just a legal requirement or a good way of making companies look good, it is a reflection of how companies' activities are planned and implemented that they take environmental responsibility into account. It helps managers to look at the economic impact of their actions, but also the environmental impact, which can impact employees, communities, ecosystems and future generations.

Why environmental ethics matter for organizational decision making is because of the competing economic and environmental priorities that often exist in business activities. Manufacturing companies can be pushed to cut cost of production, fulfill delivery schedules, expand production volume and make profit. Meanwhile, their processes could also produce waste, use large amounts of energy and water, and pollute the environment. Managers might be more likely to wait to invest in the environment because doing so is costly in the short term, rather than investing in the environment to improve the environment. If the only way an environmental decision is judged is on short-term financial returns, the manager might be tempted to delay environmental investments, or make production investments over investments in the environment. Environmental ethics is an alternative decision making orientation that acknowledges that the outcomes of business decisions need to be judged based on principles for environmental responsibility. That doesn't automatically mean that an ethically minded organization has to sacrifice economic results. Rather, the tenets of environmental ethics ask managers if their operating decisions are consistent with good stewardship of resources and the avoidance of unnecessary damage to the environment.

The attitudes and values of environmental ethics also can affect an organization's perspectives on its duties to stakeholders. A firm's environmental choices can have an impact on various groups, such as employees, customers, suppliers, local communities, regulators, and other stakeholders. Ethical environmental management appreciates that the duties of organizations may go beyond the interests of their owners/financial stakeholders. In this frame, waste management, energy use, emissions, material choice, and production processes are not only technical and/or financial issues, but decisions made regarding them are also ethical and judgmental of organizational behavior. If these considerations are incorporated into an organization's values, managers are more likely to set standards for the environment, provide employees with information on environmental expectations, engage employees in improvement initiatives, and think about the long-term effects of their production.

Environmental ethics should, however, be separated from environmental awareness, environmental orientation and environmental performance. Environmental awareness is interpreted as the degree of perception of the decision makers of environmental problems and environmental orientation means more generally the significance which an organization gives to environment problems. Environmental performance, however, is a measure of the environmental impacts of organizational operations. Environmental ethics puts an ethical standpoint on a judgment about what an organization should do with respect to the natural environment. An organization can know the value of pollution prevention, but not always act on it, and it can use an environmental practice simply to meet regulatory requirements instead of to make

pollution prevention part of its values. These differences are relevant to the present study as environmental ethics is not considered as a proxy variable for environmental practices, environmental performance or resilience capabilities.

For a strategic management perspective, ethical issues can be especially significant when the organization is forced to make tough decisions in the face of uncertainty. In the manufacturing SME example, if a manufacturing business has a supply chain problem, it might be necessary to select between a cheaper material that will have a higher environmental impact and a more environmentally responsible material that will have other cost and availability considerations. Likewise, when a company is under pressure in terms of finances, the choice may be made to continue investing in waste reduction, cleaner production, or in resource efficiency. Ethical principles can help to review these decisions and could motivate managers to keep their environmental commitments even though the operational pressures in the short term increase. But ethical concerns do not necessarily resolve resource limitations or ensure that the environment is managed effectively. Partly because they can be interpreted by managers into decisions, procedures and organizational capacity. This distinction serves as the foundation for considering the issue of environmental ethics from the point of view of green organizational resilience.

Green Organizational Resilience

In the business world, uncertainty in the environment, fluctuating market conditions, limited resources, technological advances, and unforeseen disruptions are some of the key features that make organizational resilience an important concept in management research. Resilience isn't just about surviving a challenging event, but also the organization's skills and abilities to get ready for an adverse event, respond appropriately to an adverse event, and learn from it. Duchek (2020) created a conceptualization of organizational resilience that draws on a capability perspective, consisting of three interconnected phases: anticipation, coping and adaptation. The anticipation is to recognize potential hazards and prepare for unforeseen events. The first dimension, coping, is defined as responding to adverse events in an effective manner, while the second dimension, adaptation, is defined as learning and making changes and as finding better ways to operate after the adverse events. This framework is useful for exploring resilience in an organization as a capability, not just an event that happens following a crisis.

Green organizational resilience takes the concept of organizational resilience and focuses on the environmental aspect of organizational continuity and adaptation. It is about how an organization can meet environmental and operational challenges, while continuing to meet or exceed its environmental sustainability requirements. They can be related to resource scarcity, interruption of environmentally preferable materials supplies, environmental requirement changes, pollution incidents, extreme weather events or pressures to minimize the environmental impacts of production. A green organizationally resilient company aims to address these issues but not solely by adopting solutions that only help them to resume immediate production at the cost of the environment. Rather, it does its best to stay viable in operation while adapting practices that remain in line with the goals of environmental protection.

The environmental dimension is relevant as it is not always automatically linked with organizational recovery and environmental sustainability. If a firm is having a disruption it can return to production with less environmental-friendly suppliers or the firm can invest in more environmentally friendly production process, but it may take longer. These could help to maintain a continuity in the short-term but fail to achieve the long-term sustainability goals. The issue of how firms keep environmental commitments during tough times, is therefore relevant to green organizational resilience. It includes the ability to recognize ecological risks, adapt production arrangements, control ecological risks, and learn from disruptions in a way that enables more sustainable operations. The knowledge places green organizational resilience at the crossroad of organizational adaptation and environmental responsibility.

There are multiple interrelated capacities that can be associated with an organization's green organizational resilience. First, environmental risk

anticipation helps a firm become aware of potential environmental risks that relate to resource availability, pollution, use of energy and environmental disruption. Second, adaptive resource management allows the organization to rethink how materials, energy, technology and production capacity are being utilised when things change. Third, organizational learning allows the company to assess the past actions and identify ways to enhance the environmental and operational performance of the company. Fourthly, continuity of environmental commitments relates to the organization's ability to sustain its sustainability agenda when under stress, rather than when it can be deferred simply when needed later. These capacities are conceptually similar, although the exact nature of the dimensions and measurement may vary depending on the instrument that is validated and implemented in the study.

The capability-based literature itself suggests that resilience arises as a result of interactions between organizational resources, leadership, organizational culture, innovation and learning. Resilience is not solely based on an organizational trait but is dependent on having abilities that enable them to anticipate, cope and adapt, as described by Duchek (2020). Furthermore, a review of empirical resilience literature by Vakilzadeh and Haase (2021) confirms that environmental scanning, leadership, organizational culture, innovation, resources, and learning are considered as building blocks of resilience.

The Relationship Between Environmental Ethics and Green Organizational Resilience

Theoretical Foundations of the Study

Although conceptually distinct, environmental ethics and green organizational resilience can be complementary organizational attributes. The concept of environmental ethic provides a normative basis to make managerial decisions about environment; in the other hand, Green organizational resilience is the ability of an organization to maintain and adapt environmentally responsible management in a changing context. The proposed relationship is based on the assumption that ethical values for the environment can shape the way risks are perceived, financial resources allocated, and how decisions are made about what to do in the event of a disruption, as well as what options exist for action. When planning for uncertainty, and unexpected events, managers may be more likely to consider the environmental impact when it is part of the decision making process. These decisions can help develop organizational practices for commitment to the environment and respond to changes.

The idea of a relationship between environmental ethics and resilience is suggested by the "expectation of environmental risk. Ethical evaluation of the impact of their production activities could get managers to consider longer term impact, e.g. depletion of resources, pollution, reliance on sensitive inputs. The focus could spur organizations to identify environmental issues early before they become more significant operational issues. For example, a manufacturing SME that adopts responsible resource use as one of their principles of organization might be more interested in studying the issue of material waste, energy efficiency or use of a single high energy intensive production process. Acknowledging these risks does not imply that a community is, by itself, resilient, but it can help to take steps to address them earlier, and help communities become more resilient in anticipation of future events.

The second potential link is related to how an organization responds to crisis. If a company has to make a choice between competing demands for scarce resources and a choice between competing priorities when they have limited resources, they have to make decisions on how to allocate these resources and which priorities to keep or cut. Environmental ethics may be a starting point in making these decisions because it puts managers to thinking of both the social and economic costs and benefits of alternative responses as well as their environmental costs. A company with a moral compass is more inclined to consider that options are available to make their production process more effective in terms of resource use, and responsible material substitutions or suppliers who prefer an environmental impact. Both these decisions can help shape the sustainability commitments that are made and/or operational adaptation. But the availability of an appropriate alternative, access to finance and the technical skills/capabilities of the business will affect the

chance of the good intention being followed.

The third potential association is to organizational learning and adaptation. When things aren't going, resilient organizations are ready and able to change, and disruptions are a chance to learn and adapt processes. Environmental ethics can help facilitate this by asking managers to consider if there were environmental risks or concerns to the operations that have been unnecessarily caused by practices that could have been done otherwise, or if they are in conflict with their responsibility. This reflection may lead to improved resource management, pollution prevention, pollution reduction and production planning. Pollution prevention, product stewardship, and sustainable development, as strategies to help companies improve their relationships with the natural environment, are recognized by this approach to natural resource-based view, developed by Hart (1995).

H1: There is positive and significant relationship between environmental ethics and green organizational resilience of manufacturing SMEs in Pakistan.

Natural-Resource-Based View of the Firm

The natural-resource-based view (NRBV) as propounded by Hart (1995) is the main theoretical approach that can be used to explain the proposed linkage between environmental ethics and green organizational resilience. The NRBV builds upon the resource-based view of the firm by emphasizing that organizational strategies and capabilities are influenced by the natural surroundings of the organization. It suggests that the strategic implications of pollution prevention, product stewardship and sustainable development are part of the relationship between the firm and the environmental challenges. Pollution Prevention is the process of reducing wastes and pollution by improving an organization's processes. Product stewardship takes a broader view and considers the environment as part of the product development and associated activities, whereas sustainable development considers the environment in the broader context of the long-term relationship between the organization and the environment.

The NRBV is significant because there are ethical issues regarding the environment that can affect the priorities in which a firm designs and implements its environmentally responsible capabilities. Pollution prevention efforts and more efficient use of resources are more likely to be supported and environmental issues incorporated into production decisions if managers perceive environmental protection as an important organizational responsibility. Such practices could mitigate some environmental risks and enable companies to adapt to new operating environments. Such gains in resource efficiency, for instance, might lessen the risk of facing input constraints or energy cost pressures, and pollution-prevention measures might enable firms to detect and address environmental inefficiencies in their production processes. This can contribute to resilience but is contingent on the resilience of the business and its resources, the circumstances of the business, and the nature of the disruption.

Environmental Ethics and Resilience in Manufacturing SMEs

Manufacturing SMEs are an important context in which the connection between environmental ethics and green organizational resilience is explored because they often involve resource utilization, production processes, waste generation, and reliance on supply chains. Meanwhile, smaller companies could have financial and technical restrictions that prevent them from implementing sophisticated environmental management systems or having long contingency plans. In Pakistani SMEs, Durrani et al. (2024) show that the key factors that limit environmental sustainability practices are these: finance, education, government support, and owner / manager attitude.

The conditions indicate careful examination of the relationship between environmental ethics and resilience should be done, rather than just assumed. Environmental ethics can be a force for managers to recognize environmentally problematic processes, rethink resource-intensive operations, and maintain environmental goals in making difficult choices. This orientation can assist in setting priorities that would direct the actions of an organization to address the environment challenges. But in the real world, the positive impact of ethical values can be constrained if the companies don't have the funding, expertise or supplier options to make environmentally responsible improvements. For

instance, if a SME places importance on the responsible use of resources, it may be encouraged to minimize material losses or think of other resources for production if the conventional ones are no longer available. A different company might consider environmental stewardship to be an organizational objective and want to ensure it has proper waste management in place during a financial crisis. These are examples of potential pathways linking environmental ethics with resilience and are not necessarily reported outcomes of the above studies, but illustrations of potential pathways. The effectiveness of such responses would be dependent on the circumstances of the firm and their ability to execute the decisions they feel is appropriate.

Research Methodology

In this chapter, the authors have described the research methodology used to explore the link between environment ethics and green organizational resilience of manufacturing SMEs in Pakistan. It provides explanation of research philosophy, approach to research, research design, target population, sampling technique, data collection procedures, measurement of variables and statistical techniques proposed for the analysis of data. The methodology is designed based on the conceptual framework of the study that is described as an independent variable, environmental ethics and dependent variable, green organizational resilience. The aim is to find out if there is a positive and statistically significant relationship between environmental ethics and green organizational resilience.

The methodological decisions are based on the nature of the research question and the goal of testing a theoretically-supplied association between two constructs. The study is designed with a quantitative approach because the constructs are to be measured based on structured indicators with the aim of assessing the proposed hypothesis statistically. The chapter also clarifies the ethical issues and methodological processes that must be followed to ensure the reliability, validity and transparency of the research results.

Research Philosophy

This research has a positivist research philosophy, which is aimed towards the systematic measurement of indicators that are seen and the empirical testing of theoretically-derived relationships. Positivism is suitable for research that tries to explore the relation of variables by conducting data collection in a structured and statistical manner. The concepts of environmental ethics and green organizational resilience in the present study are conceptual constructs which can be operationalized by means of questionnaire items and analyzed by means of quantitative methods.

From the positivist point of view, the hypothesis production is supported by the theoretical literature, and then tested by empirical data. The study suggests that there is a positive relationship between environmental ethics and green organizational resilience of manufacturing SMEs in Pakistan. This relationship will be assessed based on statistical estimates rather than subjective interpretations or individual experience. However, the results will be analyzed taking into consideration the limitations of the research design adopted, the quality of the measuring instruments used and the nature of the research context.

Research Approach

The study is deductive in research approach. Deductive research is a research process that starts with existing theories and concepts, formulating hypotheses from their theoretical implications and testing the hypotheses with empirical data. This research is based on the natural resource-based view of the firm and capability-based view of organizational resilience to understand the possible relation between environmental ethics and green organizational resilience.

The natural-resource-based view suggests that environmental concerns can affect organizational strategy and capabilities, and the capability-based view is that organizations need to anticipate, respond, and adapt to disruptions. On the basis of these viewpoints the following hypothesis is formulated:

H1: Green organizational resilience positively and significantly impacts HWE among the manufacturing SMEs in Pakistan.

The deductive method allows the researcher to evaluate the relationship observed whether it is consistent with the theory. The hypothesis will be tested using statistical analysis of the data obtained from the questionnaires**.**

Research Design

This study is an explanatory research design with a quantitative approach to examine the relationship of environmental ethics and green organizational resilience. The study is designed to establish if there is a statistically significant relationship between the variation of the independent variable and the variation of the dependent variable. An explanatory design is appropriate in this instance.

The design proposed is a cross-sectional survey design where the data are obtained from the respondents at a given time. The design is suitable for the study of the relationship between organization constructs of a defined population of manufacturing SMEs. It also enables the researcher to gather uniform answers from different organizations in a reasonable amount of time.

The proposed design does not imply as strong of a causal relationship as a longitudinal design or experimental design. The results of a study employing self-reported cross-sectional data should thus be viewed as an evidence of an association or predictive relationship and not as evidence that environmental ethics leads to changes in green organizational resilience.

Target Population

This study is conducted on the target population of Manufacturing small and medium-sized enterprise (SMEs) in Pakistan. Such organizations are of importance for the present research since they are related to the use of resources, production processes, waste management and environmental decision making in manufacturing. Some SMEs in manufacturing industry might also face resource shortages and disruptions that render green organizational resilience as a major concern of the organizations.

The study aims at respondents who have a sufficient knowledge about their organization's environmental policies, managerial decisions and operational practices. The individuals who may be part of these respondents can range from the SME owner, chief executive officer, general manager, operations manager, production manager to the environmental or sustainability manager. They know the environment and have organizational duties, which makes them appropriate participants in terms of the evaluation of environmental ethics and green organizational resilience.

Sampling Technique

The study is based on 370 respondents selected from the total population of manufacturing SMEs in Pakistan. The sampling procedure should document in a manner consistent with the recruitment of respondents. If a complete sampling frame is available, probability based sampling can help ensure representativeness of the sampling frame. A non-probability sampling method should be indicated if the respondents were chosen for accessibility or due to certain eligibility requirements.

The unit of analysis is the manufacturing SME. Thus, given that each of the respondents is an organization, the sample comprises 370 SMEs. When more than one respondent is from the same organization, the study should indicate the number of distinct firms involved and the analysis should take into consideration potential clustering.

Sample Size Determination

The study includes 370 respondents of manufacturing SMEs in Pakistan. This sample is used as a foundation to explore the proposed relationship between environmental ethics and green organizational resilience quantitatively via statistical analysis. The appropriateness of the sample size will vary depending on the analytical technique used, the complexity of the research model, the expected effect size, the statistical power desired, and the quality of the data obtained.

There is one independent variable in the proposed research model, which is 'environmental ethics' and one dependent variable which is 'green organizational resilience'. For this relatively simple structural relationship, a sample of 370 respondents might be sufficient for hypothesis testing, as long as sampling procedures, measure validity, and statistical assumptions are properly considered.

Result and Analysis

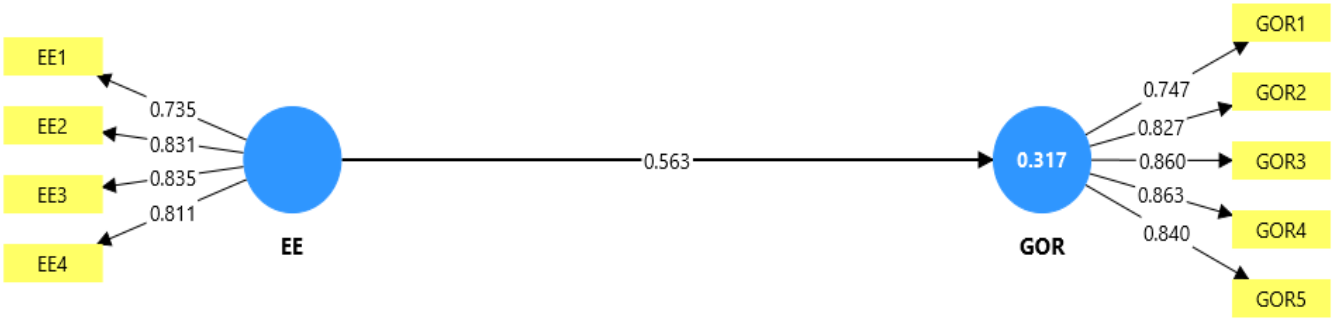
Introduction

Construct reliability and validity

The findings presented in the Table 1 show that both constructs are acceptable in terms of

commonly accepted criteria of internal consistency reliability and convergent validity. The Cronbach's alpha of Environmental Ethics (EE) is 0.816, the composite reliability rho_A is 0.819 and the composite reliability rho_C is 0.879. Likewise, the value for Green Organizational Resilience (GOR) is 0.885, 0.889 and 0.916 for the respective items. The internal consistency of the measurement items is satisfactory, with all reliability coefficients above the recommended level of 0.70, for both constructs. The results indicate that all items of the Environmental Ethics and Green Organizational Resilience instruments consistently measure the constructs.

The average variance extracted (AVE) was used to evaluate convergent validity. The AVE value for Environmental Ethics is 0.646; the AVE value of Green Organizational Resilience is 0.686. The average values for both constructs are above the recommended minimum of 0.50, which means that the constructs account for more than 50% of the variance in their respective indicators, on average. That is, Environmental Ethics explains 64.6% of the indicators' variance while Green Organizational Resilience explains 68.6%. Thus, evidence of satisfactory convergent validity for both constructs is provided in the results.



	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
EE	0.816	0.819	0.879	0.646
GOR	0.885	0.889	0.916	0.686

Outer loadings

All the factor loadings are above the recommended factor loading of 0.70, suggesting that the measurement items have acceptable indicator reliability. For Environmental Ethics (EE), the factor loadings range from 0.735 to 0.835, with EE3 recording the highest loading (0.835), followed by EE2 (0.831), EE4 (0.811), and EE1 (0.735). The results in these items suggest that the construct of Environmental Ethics is well represented by the four items. Likewise, Green Organizational Resilience (GOR) has factor loadings between 0.747 and 0.863. GOR4 has the highest loading (0.863), followed by GOR3 (0.860), GOR5 (0.840), GOR2 (0.827), and GOR1 (0.747). All are within the recommended threshold and thus are suitable to represent Green Organizational Resilience. In general, the factor loadings indicate that the indicators of the two constructs were reliable, and therefore the all the indicators should be retained for further measurement model analyses.

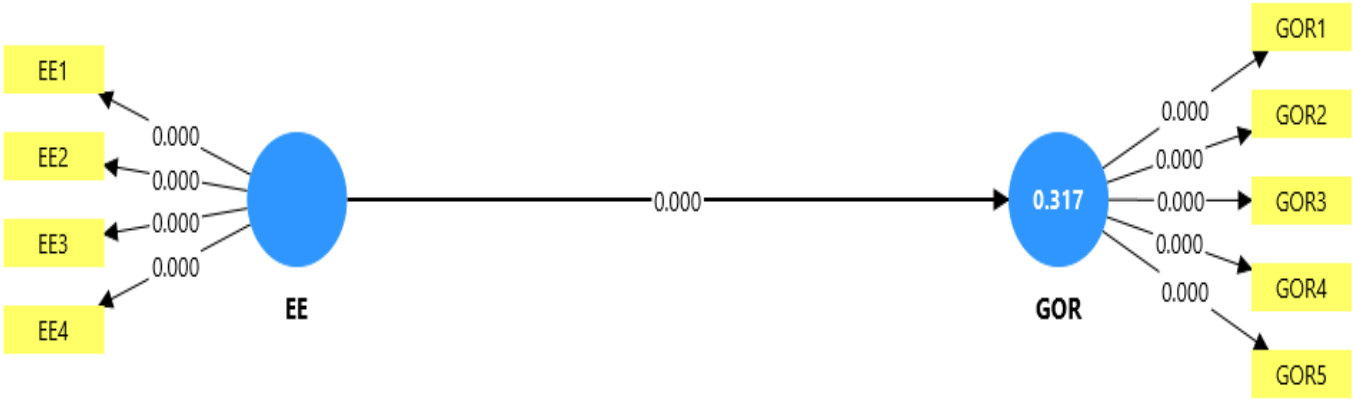
	EE	GOR
EE1	0.735	
EE2	0.831	
EE3	0.835	
EE4	0.811	
GOR1		0.747
GOR2		0.827
GOR3		0.860
GOR4		0.863
GOR5		0.840

Bootstrapping

The bootstrapping results indicate that Environmental Ethics (EE) has a positive and statistically significant relationship with Green Organizational Resilience (GOR), with a sample mean of 0.566, a standard deviation of 0.052, and a T-statistic of 10.908.

	Sample mean	Standard deviation	T statistics	P values
EE -> GOR	0.566	0.052	10.908	0.000

The estimated that relationship is positive indicate that higher levels of environmental ethics are associated between higher levels of green organizational resilience among manufacturing SMEs in the Pakistan. The T-statistic exceeds the commonly used threshold of 1.96, and the reported p-value of 0.000 should be interpreted as $p < 0.001$ rather than an actual probability of zero.



These findings provide strong statistical evidence in support of the proposed relationship. Therefore, hypothesis H1, which states that environmental ethics has a positive and significant influence on green organizational resilience, is supported.

Conclusion

The present study investigated the relationship between environmental ethics and greenness in small and medium sized enterprises (SMEs) of manufacturing sector in Pakistan. The study explored the potential of environmental ethics to support an organization's capacity to sustain and transform environmentally responsible practice in the face of adversity, and examined the similarities and differences between these two views of the firm.The study examined whether

environmental ethics helps to explain and understand the capacity of an organization to sustain and adapt environmentally responsible practice under adverse conditions, and how these two perspectives compare. Environmental ethics was said to be one important organizational orientation that influences managerial decisions related to environmental responsibility, resource use, and preventing environmental damage, while green organizational resilience was defined as the ability to predict challenges, react to disruptions, and adapt, while keeping commitments to environmental sustainability.

Based on the empirical findings, there is a positive and significant relationship between environmental ethics and green organizational resilience. The bootstrapping analysis yielded a sample mean of 0.566, a standard deviation of 0.052, and a T-statistic of 10.908 with a reported p value of 0.000 (which is interpreted as $p < 0.001$). The estimated path coefficient of 0.563 suggests that the environmental ethics has a positive correlation with the green organizational resilience. Moreover, for green organizational resilience, the coefficient of determination ($R^2 = 0.317$) shows that the model explains 31.7% of the variance in the green organizational resilience. The findings of this study are in support of the hypothesis which was set that there is positive and statistically significant relationship between EE and GOR among manufacturing SMEs in Pakistan.

The results point to the potential of environmental responsibility as an organizational value and part of the management decision making process. Resource availability, operational continuity, environmental requirements and financial constraints are some of the challenges faced by manufacturing SMEs. An ethical responsibility for the environment can help to make managers think about consequences that will occur in the future; help them discover environmental risks; help them think about using resources responsibly; help them remember the sustainability targets during uncertain times. Theoretically, the findings fit a theoretical argument about the impact of environmental factors on organizational strategies and capabilities. However, the results do not prove the effect of environmental ethics to resilience, but it provides empirical evidence of a positive relationship in the proposed research model.

For the businessmen and managers of SMEs, it is important to integrate the concept of environmental responsibility in the strategic planning, production decision making, resource management, and organizational policies. Environmental ethics should be expressed not only in words, but in figures, for example, in the reduction of material waste, in the enhancement of the efficiency of resources, in the identification of environmental risks and in the encouragement of the employees to actively engage in programs of environment improvement. Policies and institutional support for SMEs can also promote sustainable management by facilitating the access of SMEs to environmental training and technical assistance, and resources for sustainable production. These can be some of the steps an organization can take in order to carry out its ethical promises in practice and to facilitate both environmental responsibility and organizational adaptability.

The study has several weaknesses, but it has also got some strengths. The study is limited to the manufacturing SMEs in Pakistan and may not be generalizable to other industries and geographical settings. Moreover, if the information has been gathered using a cross-sectional questionnaire, the answer cannot definitely inform the causative relationship or the advancement in time of the relationship. It also accounts for 31.7% of the variance in green organizational resilience, thus indicating that other organizational and contextual factors might influence the result. Research opportunities for future studies could include examining the impact of green innovation, organizational learning, leadership, environmental strategies and availability of resources on the notion of environmental ethics and its relationship with organizational resilience. Longitudinal studies and research in various sectors and countries would be beneficial in elucidating the nature and generality of this relationship.

Finally, this study adds to the body of knowledge about environmental sustainability and organizational resilience by highlighting that environmental ethics is a key positive predictor of green organizational resilience in the model examined. The results highlight that ethical

environmental considerations can be pertinent not only for responsible business practices, but also to the ability of organizations to cope with environmental and operational issues. Incorporating environmental responsibility into managerial decision making and organizational practice can make manufacturing SMEs more likely to engage in a pursuit of resilience, while also being more likely to engage in sustainability objectives.

Recommendations

Organizations, policy makers and sustainability practitioners are provided with several recommendations based on the findings of the study.

- First, it is necessary that the organizations should give attention to the development of environmental ethics through strategic management. Management to incorporate environmental responsibility in the policy, decision making process and corporate values. There is a need to create training programs and awareness programs to improve the understanding of environmental responsibilities and promote sustainable behaviour in different levels of the organization.
- Second, strengthening of Green Organizational Culture is necessary through embedding the principles of sustainability in the organizational identity. Managers should actively promote employee involvement in environmental initiatives, encourage green workplace practices and develop reward mechanisms that will reward employees for their environmental contribution. Good environmental culture can generate group enthusiasm for environmental objectives and increase the adaptability of groups/ organizations.
- Third, organizations must invest in the development of Green Dynamic Capabilities as they are a key route to achieving resilience. Companies need to enhance their environmental change detection, green technology capabilities, process redesigning, and efficient environmental resource management. Organizations need to be empowered to respond to disruptions in the environment by promoting continuous learning, innovation and knowledge development.
- Fourth, policy makers need to create and enact supportive policies that promote sustainable practices by organizations. In addition to compliance requirements, regulations should also enable incentives, technical support, and guidance to be provided to organizations looking to enhance their environmental performance. Enabling policies can foster successful implementation of green capabilities and help achieve sustainable change.
- Fifth, SMEs should build partnerships with government institutions, environmental groups and networks to gain access to knowledge, resources and support for sustainability. These partnerships can enable smaller businesses to get over resource constraints and enhance their capability to implement green strategies.
- Lastly, a holistic strategy for resilience development needs to be taken rather than a single focus on sustainability practices. Environmental ethics, green culture, dynamic capabilities, and regulatory alignment are all interrelated factors that play a role in the resilience of organizations for sustainability.

Future Research Directions

- While this study offered some insight into Green Organizational Resilience, there are some recommendations for further research. First, future studies could build on this research by looking into other organizational and environmental factors which affect the development of resilience like green innovation, leadership style, sustainability orientation, digital transformation, and stakeholder engagement.
- Second, future study can be conducted on the suggested model in various industries, regions, and organizational settings. Comparative studies between different sectors and geographical areas may give insights into the role of sustainability factors for resilience in different environmental and institutional settings, and may this study be the first step towards generating such understanding.
- Third, future studies could use longitudinal research methods to study the process of green

organizational resilience over time. A longitudinal study might give a more detailed understanding of the evolution of environmental capabilities within an organization and how they respond to evolving sustainability problems.

- Fourthly, future research could focus on other methodological strategies, such as qualitative case studies, mixed methods, and comparison. These can offer more comprehensive explanations about how organizations incorporate environmental ethics, build "green" capabilities, and react to regulatory demands.
- Finally, future research might explore the interaction between Regulatory Framework and other factors, such as the nature of regulation, policy context, and institutional forces. Future research can explore why the effects of regulatory moderation are stronger for certain pathways to sustainability than others, as the current study discovered that the moderating effects of regulation vary in different relationships.
- Finally, future research could explore Green Organizational Resilience as a predictor of the broader organizational outcomes such as sustainable performance, competitive advantage, financial performance and long-term survival. These studies would also deepen the understanding of the strategy of green resilience in contemporary organizations.

Conflict of Interest

The author showed no conflict of interest.

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