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Sustainable Leadership Environment: An Empirical Study in Organizational Context

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Abstract

Over the last three decades, the environment has become a hotly discussed topic all over the world. The United Nations has set up seventeen Sustainable Development Goals (SDGs) to achieve a standard of sustainable practices in the world including both developed developing countries. Among these goals, the environment is regarded as a primary concern for all countries. The purpose of this research is to identify potential environmental indicators challenges in organizational settings. This paper specifically investigates the impact of sustainable leadership on the environment, both directly and indirectly, through environmental practices sustainable culture. Using a sample of 306 organizational personnel Partial Least Square (PLS) Structural Equation Model (SEM), the results reveal that Sustainable Leadership (SL) has a significant impact on environmental sustainability. The results also indicate that Environmental Practices (EP) Sustainable Culture (SC) influence Green Performance (GP). Findings of this study reinforce the organization's concern for environmental sustainability and suggest how organizations institutions can improve the environment through sustainable leadership. This is the first research to not only empirically study the interaction of SL GP, but also to throw light on the existing literature by investigating the mediating function of environmental practices sustainable culture the underlying relationship.

Keywords: Sustainable Development Goals (SDGs), Environment, Sustainability, Leadership, Green Practices

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1. INTRODUCTION

Human life has never experienced a cooler-than-average month in their entire life after February 1985 (NOAA, 2014). According to the Global Climate Report (2017), the temperature of the globe is increasing eventually. The temperature has a striking impact on public health, sustainability of life wellbeing of people positively or negatively depending on its intensity (Paraskevis et. al., 2021 and Rocklöv, 2008). As the temperature became a

global concern, environmentalists suggest a number of ways to protect it, for instance, leadership that is focused on sustainability (Al-zawahreh, 2018; Iqbal, 2021), the culture that develops sustainable environment (Rosen, 2013; Zheng, 2021), conservational and environmental practices (Hayes, 2019). Since industrial development is closely linked to the environment, many organizations contribute to environmental degradation, including non-industrial entities that use excessive paper, generate waste, and consume high amounts of electricity.

Institutions and organizations play crucial roles in countries by offering products, services, education, and conducting research for global development. For instance, Higher Education Institutions (HEIs) have a primary responsibility in addressing global environmental challenges in a comprehensive practical manner. For educating future leaders in society also to investigate possible solutions for global environmental and climate change (Mukhuty, 2022) sustainability challenges (Study, 2015). According to Bothun (2016), higher education has a significant positive role in the sustainable development of a country.

Most of the institutions are engaged in integrating institutionalizing sustainability into their products, services, assessment, operations, research, curricula, outreach, evaluation, reporting (Calder Clugston, 2003; Cortese, 2003; Lozano-Ros, 2003). According to Saeed (2019), environmental awareness environmental practices have been increased in the current era to keep environmental sustainability. Multiple stakeholders demanded the higher education institutions lead in a green sustainable environment. (Al-Zawahreh, 2019). Therefore, sustainable leadership has significant importance in organizational context, it can increase profitability by increasing green practices, for instance, benefits that are mainly centered on preserving the natural resources its efficient consumption (Peng Lin, 2008). Moreover, organizations are the only places where sustainable leaders can take initiatives for protecting the environment (Scott, 2012; McIntosh, 2008; Brown, 2010).

As awareness increased about the environment in the current decade, research scholars focused on the sustainable environment are trying to find the mechanism through which organizations can protect the environment. In Pakistan, recently a project has been launched by the Prime Minister named Billion Tree Tsunami in which many of the national organizations have participated voluntarily, the project aimed to plant trees by the help of volunteers called Tiger Force. Al-zawahreh (2019) Freire (2022) highlighted green management practices the effect of sustainable leadership on green management practices. Chang (2019) studied the green identity of an

organization, its shared vision impact on organizational development. Luu (2019) has studied focused on human resource practices that involve environmental practices in an organization and their impact on the organizational behavior citizenship of employees. Demirel (2019) has studied the relationship between eco-innovation capabilities oriented on sustainability. Wang (2019) Abbas (2023) explored the green culture its benefits to the organization its impact on the growth, performance, sustainability. Kim (2018) Go (2023) explored the relationship between sustainable learning and sustainable tourism. Di Fabio (2018) explored the relationship between human capital sustainability and sustainable development.

Research on adopting green practices to improve operations with a focus on environment is limited (Lai, 2011). There is scant knowledge in the field of sustainability, with little empirical research to date (Suparak, 2016) in the developing world. The literature presents a scanty report on the impact of leadership firm sustainable performance (Boadu, 2018). In the literature of green employee behavior at the workplace, inadequate attention has been paid to the leader's support the mechanisms through which it affects employees' behavior concerning environment (Priyankara, 2018) Furthermore, it is demanded that the organizational leadership should incorporate the initiatives of green policies environmental sustainability into its strategic planning (Al-Zawahreh, 2019). Sang (2018) suggested the impact of leader knowledge on green performance projects in future. According to Zhou (2018), organizational culture can not only influence the awareness of leader's employees but may also affect the generating ideas, leadership, employee green values.

There are several gaps in the earlier research studies related to sustainable leadership coupled with impact on the environment green performance. Most of the scholars seem to be focused on human resource practices, employees' behavior awareness of sustainability. Furthermore, by using the Web of Science, no study has been found which explored the empirical relationship between sustainable leadership green performance in the organizational context. In addition, no study has found exploring the mediating relationship of sustainable culture environmental practices between sustainable leadership and green performance. However, there are few studies available on green management practices in institutions; for instance, Al-zawahreh (2019) is focused on human resource green practices. This study aims to validate the association between sustainable leadership and green performance which has not been studied before. Secondly, this study included the mediation of sustainable culture, as Zhou (2018) recommended to include in future studies. Thirdly, this study comprises the mediation of environmental practices, which has not studied before in the context of organizational settings has increased

significantly (Dessart, 2019) either in developed countries or in developing countries in the era of industrial revolution.

This research aims to examine the impact of sustainable leadership, conservational practices, and green culture on green performance. That will ultimately increase the organizational responsibility autonomous motivation for the environment in an integrated model by drawing upon social exchange theory, self-determination theory of normative conduct (Priyankara, 2018). These theories collectively offer a nuanced lens through which to examine the intricate relationships between sustainable leadership, organizational culture, environmental practices, and green performance. Social exchange theory elucidates how the interactions between leader's employees establish a reciprocal environment, contributing to the cultivation of sustainable practices within organizations. Self-determination theory sheds light on the intrinsic motivations that drive individuals to engage in environmentally responsible behavior, while theory of normative conduct examines the role of social norms expectations in influencing such behaviors. By integrating these theories, I construct a comprehensive understanding of how sustainable leadership manifests in the context of organizational culture practices, ultimately impacting green performance. Lastly, the study has significant importance in the promotion of sustainable environment countrywide worldwide through organizational context because, the employees always learn from their institutes either academic or professional (Downes, 2012) use their learning in protecting environment (Cherwitz, 2002) worldwide. The specific objectives are as given below.

- How does sustainable leadership impact green performance within organizational settings?
- To what extent do conservation practices at the organizational level contribute to overall sustainability in the context of modern environmental challenges?
- What are the key drivers that underpin the association between sustainable leadership and green performance, how does this linkage contribute to enhanced environmental sustainability?

The ultimate objective of this study is to contribute to a sustainable environment. The effort of author has been made to explore the knowledge on the mechanism of how institutes organizations can invest their effort to develop a green environment. After reviewing extensive current literature, sustainable leadership has been chosen for impactful contributions to the organizations' green performance, which ultimately increases environmental sustainability in the country. Furthermore, this study includes two mediating mechanisms,

firstly, sustainable culture to check explore the impact of culture on green performance secondly, environmental practices for exploring the impact of practical initiatives or activities on green performance.

Recent studies show that there is minimal knowledge that has developed in the literature on the green outlook of sustainable leadership. Therefore, this study contributes to inimitable discussion in the existing literature. Most significantly, this paper explores the causal impact of sustainable leadership on green performance, it will enhance the literature on both concepts, i.e., sustainable leadership green performance; further, it is the first study that investigates the relationship puts significant knowledge in the relevant literature. Moreover, this paper shows the sights of two robust mechanisms through which sustainable leadership impacts green performance, i.e., sustainable culture environmental practices. Similarly, this study explores contributes to the literature on the association of sustainable leadership with sustainable culture environmental practices. Likewise, this paper answers the question of how environmental practices sustainable culture enhance the green performance followed by sustainable leadership.

The rest of the study includes a literature review on studied variables, shreds of evidence from the literature on the relationship of variables and a brief report on methods including details of scales, tests, and results of the study. Further, it includes a discussion on the study concluding with conclusive paragraph, limitations, future research directions.

2. REVIEW OF LITERATURE

Sustainable leadership has emerged as a vital cornerstone in contemporary organizational contexts, embodying a holistic responsibility encompassing profit generation, environmental stewardship, societal well-being (Kalkavan, 2015; Fernes, 2022). Sustainable leader in this research referred as organization's leader with the responsibility of profit, environment society which include the formulation, implementation, performance of conservational environmental practices on a continuous basis (Liao, 2022). Institutions organizations use consume a lot of paper, electricity water. The unchecked dem for paper amplifies production, adversely impacting tree populations on the environment due to intensified market demands. Non-renewable energy sources, barring solar energy, exact ecological tolls. Solar energy adoption promises dual benefits of cost-efficiency environmental preservation. The protection stability of the environment is one of the most crucial goals from the 17 Sustainable Development Goals given by the United Nations. In Pakistan, there is no waste management system launched by any

organization, even for their own waste. Pakistan's landscape underscores an absence of waste management systems within organizations, fostering a limited environmental focus a general obliviousness to global warming. This dearth of awareness impedes proactive initiatives among employees, officials, students, and management for environmental amelioration. Central to organizational dynamics, leadership emerges as a pivotal catalyst capable of inciting transformative shifts. In light of its multifaceted dimensions encompassing economic, social, environmental concerns, sustainable leadership assumes prominence, further catalyzed by the theoretical framework of change application within organizational contexts (Iqbal, 2020).

Therefore, grounded in theoretical paradigms of transformational ethical leadership (Deng et. al., 2022; Riggio, 2006; Budur, 2022), the relationship between leadership environmental sustainability within organizational contexts is a subject of scholarly interest. Sustainable leadership is recognized for its capacity to integrate environmental considerations into strategic decision-making, fostering a culture of environmental responsibility (Suriyankietkaew et al., 2022; Liao, 2022). Simultaneously, environmental practices, such as waste reduction resource conservation, form a tangible manifestation of organizational commitment to sustainability (Ozbozkurt et al., 2022). Complementing these practices, a sustainable culture, defined by shared values emphasizing environmental responsibility, sustains reinforces environmental initiatives (Masri and Jaaron, 2017). Despite the prominence of these concepts, the empirical validation of mediating mechanisms between sustainable leadership, environmental practices, sustainable culture, green performance has been limited. This research addresses this gap by employing the Partial Least Square (PLS) Structural Equation Model (SEM) to examine the direct impact of sustainable leadership on green performance, while also unveiling the mediating roles of environmental practices sustainable culture. By substantiating these intricate relationships offering practical insights, this study contributes to organizational practice future research endeavors, establishing a foundation for further exploration of the dynamics between sustainable leadership environmental sustainability.

The encompassed literature predominantly explores sustainable leadership's effects across services sector, focusing on the educational institutions ministries. While not extensively delved into, the literature indirectly underscores the role of cultural economic contexts in shaping the influence of sustainable leadership on environmental practices. The reviewed literature, though not directly addressing generalizability, cautions against extending findings to manufacturing or other sectors due to their distinct

operational environmental characteristics. Moreover, acknowledging that the study was conducted within a developing economy primarily centered on the services sector adds pertinent context to these considerations. By recognizing the study's specific focus, the comprehension of the interplay between sustainable leadership, environmental practices, their relevance across varied contexts can be further refined.

3. FRAMEWORK

3.1. Sustainable Leadership Sustainable Performance

Sustainable leadership is a managerial perspective to generate superior more maintainable results (Kalkavan, 2015). Ferdig (2007) demonstrates an increased meaningful interest among those people who have selected themselves to live their lives lead organizations which have ultimately positive impact on health, society, and the global economy. According to McCann (2010), sustainable leadership is also associated with sustainable profits. Gerard (2017) refers to sustainable leadership as the concept calls for organizations to shift focus from the singular, traditional emphasis on investments to a view that the organizations contribute to broader social environmental impacts. Avery (2011) Crews (2010) portray the same concept. Moreover, Sustainable leadership in many industries, institutions organizations is an opportunity to develop a successful strategy for maximum environmental awareness, innovative and longsting success, sustainable development sustainable competitive edge (Jutras 2009; Fable, 2005; Slankis, 2006; Siegel 2009; McCann, 2011; Berchicci, 2012; Miralles, 2017; Al-zawahreh,2019).

Sustainability Goals Organizations around the world have compelled organizations institutions to develop environmentally sustainable skills among the stakeholders so they can become sustainable leaders in the future (Brown, 2010; McIntosh, 2008; Scott, 2012). Higher education institutions are non-profit making in more at cornerstone of eco-friendly sustainability (Leach, 2008). Research development efforts the experience of universities higher education institutions have enabled many professional organizations to develop new process strategies to assimilate the environmental concerns into their business processes to achieve high-performance indicators for environment, society businesses. Therefore, organizations may be instructed to do prepare (Foo, 2013; Shriberg, 2002; Jutras, 2009).

According to Miller Friesen (1983), sustainable leadership is defined as the behavior of managers who aim to support green initiatives innovations to develop an additional competitive edge for the organization. Sustainable leadership involves the practices that create long-lasting value for all

stakeholders, in which future generations and society environment are included (Edge, 2015). Sustainable leadership has many essential characteristics; for example, environmental social impacts (Avery Bergsteiner, 2011; Crews, 2010), society, global economy, earth (Ferdig, 2007), environmental dynamism (McCann, 2010). In the organizational context, sustainable leadership has significant importance to achieve environmental sustainability. Therefore, sustainable leadership in education sectors can be defined as the input in social sustainability or the wellbeing of people.

The new challenge for organizational leaders today is to successfully guide their organizations so that they can sustain achieve sustainability goals eventually (Fable et al., 2005). Slankis (2006) stated that sustainable leadership concepts could allow an organization to gain a competitive advantage and move towards permanent improvement. The real value of sustainable methods lies in the use of sustainability as a driving power that contributes any environmental innovation, technology or the organizational process that seeks to find the best method to run any organizational activity, function, process in an ethically sustainable way. Many stakeholders call on organizations to play a critical role in maintaining protecting the environment from destruction through their research. Sustaining a green environment requires a strong leadership commitment to embed sustainable practices, policies, procedures in their organizations. (Al-zawahreh, 2019). Therefore, it is crucial to study sustainable leadership in an organizational context. In the last few decades, the world has ignored the sustainable environment overall the world. Specifically, the facets of sustainability have also been ignored, for instance, sustainable leadership sustainable culture. However, the study on sustainable leadership has significant importance in the contribution of literature. Institutions have an influential role in the development of the country's environmental growth. Therefore, investigation on sustainable leadership in this area can enhance the environmental performance of institutions itself as well as the country. Slankis (2006) has given the ten items scale to measure sustainable leadership, as far as scholars are concerned with this concept, McCann (2010), (2011), (2014) used these ten items in his research for defining measurement of sustainable leadership. Therefore, we are adopting the same scale to measure sustainable leadership in an organizational context.

3.2. Conservational Practices Sustainability

Conservational issues are becoming increasingly crucial for all organizations industries as leaders' managers face a growing public understanding sensitivity for the environment. The strict regulations of

environment pressure of stakeholder to protect the natural environment are significantly increasing in last decade (Leonidou, 2013; Dinda, S. 2004; Yu, 2017). Organizational culture can develop a management team to guide the goals spread current rules values to protect the environment (Gao, 2017). An efficient effective organization's culture defines a significant efficient way to behave within the organizational operations. An influential sustainable culture has different facets; for instance, it includes the beliefs values that everyone accepts willing to follow. An excellent sustainable culture spreads positivity for society, economy, environment, which ultimately improves employees' behaviors strengthen the communication among all stakeholders. Initially, the scale of sustainable culture was developed by Banerjee in 2002. This scale was used by Mert Gürlek and Muharrem Tuna in 2017, Marshall in 2015 Fraj-re in 2009, which shows that the operationalization usage of the scale is significant.

In the current era, most of the organizations and all governments try to protect the environment, the conservational practices are standard among all countries, organizations, educational institutions. They note that in every part of the world, to start their businesses would have managed some climate-sensitive activities (Gast, 2017; Sari Yanginlar, 2015; Sharma, 2017). Additional aspects, for instance, social responsibility requirements government rules regulations also force organizations to adopt environmentally friendly activities practices (Majid, 2020 Govindan, 2015; Hsu, 2013; Diabat Govindan, 2011). The organizations that have developed rules and regulations for their environmental sustainability have an extra advantage on their competitors because the current world population is more aware of the environment (Rusinko, 2007; Mitra Datta, 2014; Li, 2017). Chen Chang (2012), green innovation environmental practices have become a robust competitive tool, as consumers become more concerned with the environment green products become more marketable. Environmental practices scale is adopted from Seles (2019).

Organizations can use green innovation not only to develop a differential strategy but also to meet a country's environmental needs (Chen 2008; Sheu 2014). Green Performance also delivers crucial evidence on environmental influences, governing compliance, regulatory systems. (Soubihia, 2015), which represents the effectiveness efficiency of organizational environmental work (Henri and Journeault, 2008). Furthermore, Hart (1995) shows, organizational resources have a pivotal role to play in the success of strategical environmental initiatives, a resource which can support the green performance of organizations competitive advantage is green organizational culture (Banerjee, 2002). Green performance has significant importance in environmental social research. Importantly, it has more

significance when researchers discuss the impacts of social variables such as leadership culture on the environmental variables. The green performance scale has adopted from Wang (2019), who has adopted this scale from Yu (2017). It shows that different research studies validated the scale of green/sustainable performance at organizational level, there is no critical question on the scales.

In the growing global literature on employee green behavior at work, little attention has been paid to the influence of the leader's specific support for the environment, the mechanisms by which it affects employees' behavior with the environment (Priyankara, 2018). Psychology is a crucial element of leadership; therefore, Singh (2013) Schaubroeck (2011) illustrated that leadership contributes significantly to individual team performance in the organization. The collective belief of leadership can enhance the organizational level significantly (Frazier et al., 2017). Experimental evidence also suggests an association between psychology employee performance (Carmeli et al., 2010). Contemporary literature identifies that there is a significant positive relation exists in the leadership performance of the organization (Gu et al., 2013) such as green performance.

Furthermore, according to the social exchange theory, performance is an essential outcome of leadership, therefore it is argued that sustainable leadership may have a significant positive role in the green performance of an organization (Singh, 2013; Schaubroeck, 2011). The environmental sustainability pattern revolves around the size value of the natural planets, the environment, how they gradually become more resilient productive in order to meet the needs of human life. Since time immemorial, sustainable leadership relationships with the environment have been relevant. However, the importance sensitivity of environmental sustainability depends on the start of each new day. Challenging context using it for societal economical gains it becomes a fatal dilemma. A number of policy makers and organizations researchers have previously published excellent texts reviews in the field of environmental practices sustainable leadership (Mensah, 2019; Woo, 2020).

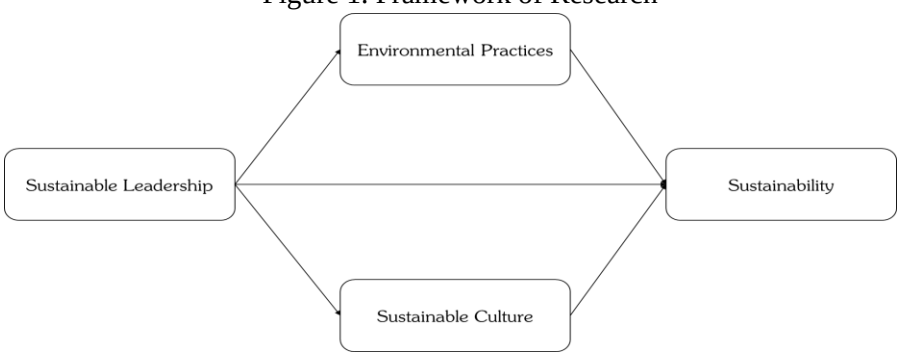
3.3. Green Culture Sustainable Performance

According to Gerard (2017), the concept of sustainable leadership is evidence of a sustainable culture in the organization, especially in institutions. Therefore, it is hypothesized that there is an essential association between sustainable leadership and the culture of the organization. In this study it is hypothesized evaluated that there is a significant relationship between sustainable leadership sustainable or green culture. Moran and Volkwein

(1992) suggest that culture is a critical element which has a significant role in building an organization's attitude, beliefs, values, ideologies. It may be argued that a practical application of sustainable leadership is contingent with an influential sustainable culture, a sustainable culture helps leaders to support maintain sustainable leadership coupled with sustainability.

Furthermore, it has been suggested that "leadership is related to the development of organizational culture" (Bar and Dowding, 2012, p. 65) thus it can be argued that the leadership of an organization can have a profound effect on its culture. The key topic in the development of leader's employees' behaviors towards the environment. If there is no cultural growth coupled with safety inside of the organization, the basis for sustainable leadership is sorely lacking. As identified, literature presents many elements considerations of stable leadership. However, the theoretical framework aims to provide a comprehensive integrated framework that organizations can understand and use.

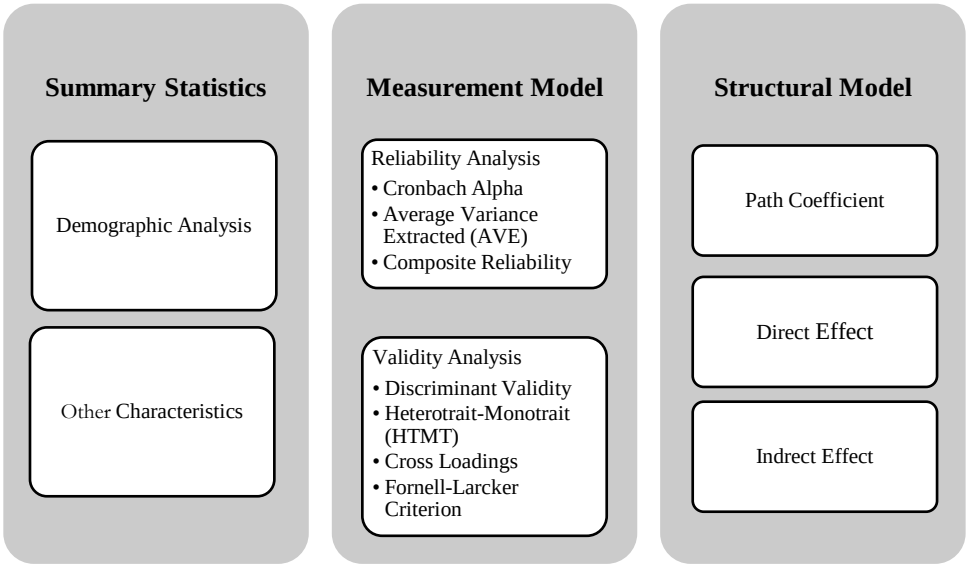
Figure 1. Framework of Research



4. RESEARCH METHODOLOGY AND FINDINGS

The framework of the research method is presented in Figure 2. At first research concept variables have been identified studied. A detailed review of literature has been conducted to develop theoretical framework for this research. However, four variables have been chosen to include test in this study i.e., sustainable leadership, environmental/conservational practices, green/sustainable culture sustainable/green performance. The method followed by the identification finalization of questionnaires to measure the concept to collect to data on it. The data has been collected in the context of organization.

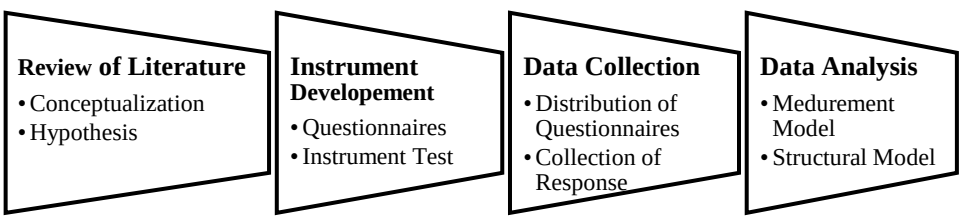
Figure 2. Analysis Included in Study.



Source: Researcher's Own Work.

The proposed research study is quantitative in nature. The data is collected through paper-based questionnaires, in addition to that Google form is also used for data collection. Organizational stakeholders are one of the main contributors' creators of knowledge information which ultimately contributes to the overall performance of an organization (Demirkasımoğlu, 2016). Accordingly, the unit of analysis of this quantitative research is individuals. In this research a cross-sectional approach has been followed for data collection. The data is collected at a single point of time. The following comprehensive method of research is given in Figure 3.

Figure 3. Methodology Followed in Study



Source: Researcher's Own Work.

The target population is individuals working in organizations institutions in the services sector. Data is collected through randomized sampling from the organizational stakeholders in Pakistan analyzed by using

Partial Least Squares (PLS) modeling in Smart PLS 3 Version 2.8. The details of questionnaires used in this study are given in Table 1.

Table 1. Questionnaires Used in Study

Sr.#	Variable	Type of Variable	Scale	Items/ Questions	Adopted from
1.	Sustainable Leadership	Independent Variable	5-Point	10	(Slankis, 2006)
2.	Sustainable Performance	Dependent Variable	5-Point	9	(Wang, 2019)
3.	Green Culture	Mediator	5-Point	7	(Mert, 2017)
4.	Environmental Practices	Mediator	5-Point	9	(Seles, 2019)

4.1. Analysis

To achieve research objectives, answer research questions, evaluate the hypothesis test the proposed causal relationships in the research framework, statistical calculations have been performed using SMART PLS 3.2.7 by Partial Least Square equation modeling technique. This section divides the analsis into three sections i.e. demographc analysis, measurement model, validity analysis, structural model results of the study.

4.2. Demographic Analysis

In the section dedicated to demographic analysis, a comprehensive breakdown of respondent characteristics is presented with corresponding frequencies. This includes pivotal attributes such as age, organizational affiliation, gender, encapsulating the distinct realms to which respondents belong. The objective of this demographic analysis resides in delineating a precise portrait of the respondent profile. Within this endeavor, the analysis endeavors to furnish an elucidative representation of the respondent demographic spectrum. Table 2 duly encapsulates pertinent data concerning Age, Profession, Department type. Initially, the age factor is segmented into discrete quartiles: (20-27, 28-35, 36-42, Above 42), affording a comprehensive evaluation based on age parameters. Additionally, the analysis subdivides the profession category into two discernible cohorts, notably stakeholders' employees, thus furnishing a finer granularity to this vital facet. The educational level for the respondents is above at least bachelor's degree. Lastly, the organizations are divided into four major groups.

Table 2. Demographic Analysis

Demographic Details of Respondents

Variable	Group	Profession	Total
Age	20 – 27	184	306
	28 – 35	72	
	36 – 42	33	
	Above 42	17	
Gender	Female	114	306
	Male	192	
Organization	Information Communication and Technology (ICT)	52	306
	Education Management	63	
	Engineering Environment	145	

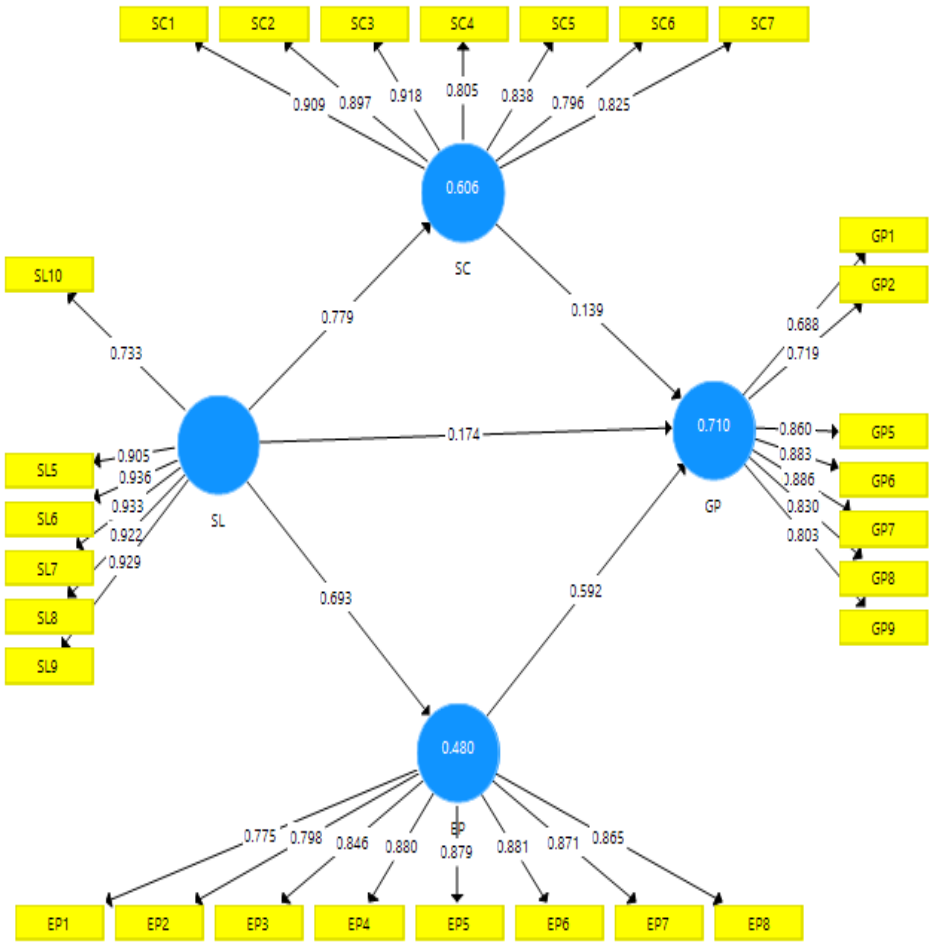
4.2.1. Measurement Model

A measurement model in social sciences research studies is a part of the structural equation model, it refers to the association between the observations having during research theoretical supports of the construct. Mainly it includes reliability validity analysis. Firstly, the Reliability Analysis includes Cronbach Alpha, Average Variance Extracted (AVE), Composite Reliability. Secondly, the Validity Analysis includes Discriminant Validity which is based on Heterotrait - Monotrait Ratio (HTMT), Cross Loadings and Fornell-Larcker Criterion. The measurement model is given below in Figure 4.

Instrument reliability is one of the fundamental components of data analysis. Reliability analysis is concerned with the accuracy precision of a measurement scale. Instrument reliability ensures that the indicators used to measure a construct are correct and valid. According to Creswell (2009), a research instrument is reliable if the scale produces the same results in the same conditions. Another standard for reliability is that all measurements are measuring the same concept represent the ultimate constructs with accuracy. The higher reliability of the scale represents more precision accuracy of the scale.

Moreover, high reliability means the indicators are effectively measuring the relevant construct in the relevant field. Commonly, three indicators are used to measure the reliability of a scale. These three standard measures are Cronbach alpha, Composite Reliability, Outer Loadings. Out of methods as mentioned above, two are construct based criteria's (Cronbach Alpha, Composite Reliability), Outer loading is indicator-based criteria.

Figure 4. Measurement Model



The first criterion to assess the internal reliability consistency of a scale is Cronbach alpha. Cronbach alpha indicates that how many indicators used to measure latent variables are closely related as a group. Cronbach alpha value above 0.60 is the lowest acceptable criterion for the research study in social sciences. Commonly, the rule of thumb is Cronbach alpha value equal to, or more than .70 is required. Cronbach alpha high value does not indicate that latent variable has multi-collinearity or latent variable is unidimensional.

The second criterion used to assess the internal reliability consistency of the scale is composite reliability. Some researchers recommend this criterion as the best alternative to the Cronbach Alpha. Composite reliability is also known as scale reliability. The composite reliability score is computed by dividing the total actual score variance by total scale variance. The minimum threshold set by the researcher for the composite reliability is 0.5.

The third criterion used to measure reliability is outer loading. Outer loading is defined as the relationship between an indicator with its latent variable. Basically, Outer loading defines a contribution by an indicator to its relevant constructs. The outer loading for an indicator more than 0.70 is acceptable. However, if outer loading is less than 0.70, researchers cannot drop that until the composite reliability or AVE can be improved. Therefore, it is imperative to retain or remove some items which have factor loading less than 0.70 in the measurement model to improve the AVE or composite reliability.

To evaluate the internal consistency reliability, the Cronbach alpha of each latent variable is utilized presented in Table 3 below. To establish the internal consistency of constructs, Cronbach alpha's value must be more than .70. In Table 3, all the latent variables have high internal consistency reliability as Cronbach alpha of each latent variable is above .70. The minimum Cronbach alpha in the table below is .913. This means that this variable has covered 91% measurement of asked phenomena.

Composite reliability is another criterion to measure the internal consistency reliability of variables used in the research model. According to (Mantas, 2008), the composite reliability should be above .50 to established internal consistency reliability. In Table 3, all the latent variables have high internal consistency as the composite reliability of each latent variable is above .50.

Outer loadings are used to measure the individual reliability of all indictors of all latent variables. According to (Wong K.K.K, 2013), outer loadings more than .70 are acceptable to established indicator reliability. Indicators have outer loadings less than .70 have been dropped to improve the AVE composite reliability of the data. Therefore, one item from environmental practices (EP9), two items from green performance (GP3 and GP4), four items from sustainable leadership (SL1, SL1, Sl3 and SL4) have been dropped to improve the Composite reliability AVE of the latent constructs. Staying outer loadings are presented in Table 3.

AVE is used to discuss convergent validity in the analysis. The most common measure used to evaluate convergent validity is AVE. In the current study, the AVE for all the variables used in the study is above 0.50. This indicates that convergent validity has been established. The minimum value of AVE in this study is for the variable green performance is 0.661 that exceeds from the minimum threshold of 0.5.

4.2.2. Discriminant Validity Analysis

Validity is defined as the degree to which any instrument measures what it was planned to measure. Another definition of validity prescribed it as the research instrument precision, fitness, relevance efficacy data from collecting it. In SEM (Structural Equation Modelling) validity has two types. One is convergent validity, other is discriminant validity. This study has evaluated both types of the validity of the proposed research framework above. To set up convergent validity, each construct must have an AVE value of more than 0.5 shown in Table 3. To discuss the validity, three criteria are used in this study, Fornell-Lacker Criterion, HTMT Ratio Cross Loadings.

In Smart PLS, Fornell-Lacker Criterion is the first criterion used to assess the discriminant validity. Fornell-Lacker criterion is established by Fornell Larker (1981). This criterion evaluates the discriminant validity in complete detail. In this method, the square root of AVE of each variable must be higher than the correlation of the same variable with others. The results of Fornell-Lacker Criterion are in matrix form. The values on the top of diagonals must be higher than the values below. In Table 4 Panel A, the values on the top of diagonals are higher than the values below, which means that discriminant validity has been established.

HTMT is a new criterion to evaluate discriminant validity in SEM. Smart PLS produces the results of HTMT in the index table. HTMT stands for Heterotrait-Monotrait Ratio. It is a new innovative method alternative of Farnell-Lacker criteria used to evaluate discriminant validity in the PLS-SEM. The average of correlations between all variables in the model has been used to measure HTMT. The milestone for the HTMT ratio is 0.9, which means two variables are correlated, but the correlation is not more than 0.9, it indicates multi-collinearity. In Table 4 Panel B below, the results indicate that the average correlation between variables is less than 0.9 which indicates that discriminant validity has been established.

Table 3. Measurement Model Convergent Validity

Measurement Model

Sign	Question	Loading	AVE	CR	CA
Conservational Practices (practices or initiatives for making environment green healthy) (Seles, 2019)					
CP1	Organization provides/arranges environmental training programs.	0.78			
CP2	Organization does eco-efficiency projects. (energy efficiency, reduce human and environment risks)	0.80			
CP3	Organization reuse, recycle remanufacture products, etc.	0.85			
CP4	Organization installs emission filters. (to increase air quality)	0.88			
CP5	Organization acquires environmental technologies. (wind power, hydro power, solar systems, bioenergy)	0.88	0.72	0.95	0.95
CP6	Organization focuses on innovation related to environmental issues. (to increase environmental health)	0.88			
CP7	Organization behaves positively towards green initiatives (purchase of environment friendly products)	0.87			
CP8	Organization considers environmental criteria in the selection of supplier. (in their purchase)	0.87			
Green Performance (how well your people are engaging with fulfilling your environmental objectives) (Wang, 2019)					
GP1	Organization conforms to requirements of inputs of energy. (rules and regulations related to environment)	0.69			
GP2	Organization conforms to requirements of community relations.	0.72			
GP5	Organization conforms to requirements of outputs of wastewater.	0.86	0.66	0.93	0.91
GP6	Organization conforms to expectations of implementation of environmental policies programs.	0.88			
GP7	Organization has achieved important environment related certifications (e.g. iso 14031).	0.89			

GP8	Organization has regularly achieved targets for energy conservation, recycling, or waste reductions.	0.83			
GP9	Organization has improved its environmental performance over the past years.	0.80			
Sustainable Culture (maintenance of cultural beliefs, cultural practices, culture entity, future existence of culture) (Mert, 2017)					
SC1	Information is provided to understand the importance of social sustainability (wellbeing of people).	0.91			
SC2	The organization promotes social sustainability as a major goal across all departments.	0.90			
SC3	The organization has a clear policy statement urging social sustainability in every area of operations.	0.92	0.73	0.95	0.94
SC4	Social sustainability is a high priority activity in the organization.	0.81			
SC5	Social sustainability holds central value in the organization.	0.84			
SC6	The organization understands that it has a responsibility to be socially sustainable.	0.80			
SC7	The organization works for an image of social sustainability.	0.83			
Sustainable Leadership (values for all stakeholders - investors, environment, species, future generations community) (Slankis, 2006)					
SL10	The leader has energy passion to communicate vision encourage innovation drive.	0.73			
SL5	The leader has shown adaptability (manage, implement change).	0.91			
SL6	The leader has shown patience (commitment to long term).	0.94	0.80	0.96	0.95
SL7	The leader has translational skills (convert thoughts into the idea).	0.93			
SL8	The leader has shown persuasiveness (communication building relationship).	0.92			
SL9	The leader has ability to mentor people for their development.	0.93			

Table 4. Discriminant Validity

Discriminant Validity Tests				
Variable/Construct	Conservational Practices	Green Performance	Sustainable Culture	Sustainable Leadership
Panel A: Fornell-Lacker Criterion				
Conservational Practices	0.85			
Green Performance	0.82	0.81		
Sustainable Culture	0.80	0.75	0.86	
Sustainable Leadership	0.69	0.69	0.78	0.90
Panel B: Heterotrait-Monotrait Ratio				
Conservational Practices				
Green Performance	0.89			
Sustainable Culture	0.84	0.80		
Sustainable Leadership	0.72	0.74	0.81	
Panel C: Cross Loadings				
CP1	0.78	0.66	0.78	0.64
CP2	0.80	0.68	0.78	0.68
CP3	0.85	0.72	0.65	0.56
CP4	0.88	0.68	0.63	0.56
CP5	0.88	0.71	0.65	0.57
CP6	0.88	0.72	0.61	0.54
CP7	0.87	0.71	0.63	0.56
CP8	0.87	0.72	0.67	0.57
GP1	0.63	0.69	0.45	0.44
GP2	0.65	0.72	0.51	0.49
GP5	0.67	0.86	0.61	0.58
GP6	0.70	0.88	0.66	0.61
GP7	0.73	0.89	0.69	0.64
GP8	0.67	0.83	0.66	0.57
GP9	0.64	0.80	0.62	0.58
SC1	0.66	0.65	0.91	0.74
SC2	0.68	0.69	0.90	0.70
SC3	0.67	0.65	0.92	0.72
SC4	0.56	0.57	0.81	0.56
SC5	0.75	0.68	0.84	0.68
SC6	0.71	0.60	0.80	0.59
SC7	0.74	0.63	0.83	0.67
SL10	0.66	0.65	0.86	0.73
SL5	0.55	0.56	0.62	0.91
SL6	0.60	0.61	0.64	0.94
SL7	0.64	0.65	0.71	0.93
SL8	0.60	0.60	0.64	0.92
SL9	0.63	0.62	0.66	0.93

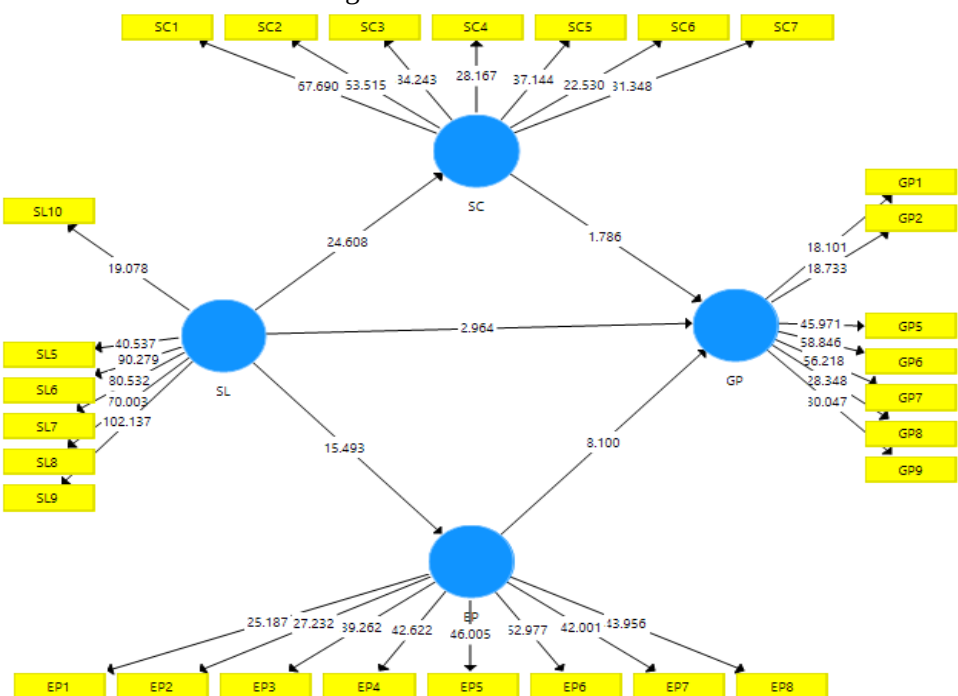
CP = Conservational Practices, GP = Green Performance, SC = Sustainable Culture, SL = Sustainable Leadership

Another method to measure discriminant validity is cross-loadings. In Smart PLS, after Farnell-Lacker Criterion, Cross loadings is the second authenticated way to substantiate discriminant validity. This technique makes sure that cross-loading of each item in its constructs is higher than the other constructs tested in the relevant research theoretical framework shown in Table 4 Panel C. High cross-loading of each item in its construct means that these items are successfully measuring his construct rather than other constructs. In the current study, all the items are presenting their relevant construct rather than other constructs which are not relevant to them. As these items are presenting their constructs with high values others with low values, it means discriminant validity has been established. This also ensures that the multicollinearity between constructs does not exist. The values of all items/indicators which are included in the adjusted measurement model have loaded more than 0.40 have a higher representation of own constructs rather than other constructs.

4.3. Structural Model

The results of using structural equation model are given in Figure 5.

Figure 5. Structural Model



Results of this study show that there is the significant impact of conservational/environmental practices on green/sustainable performance the alternate hypothesis of environmental practices has been accepted with p-value 8.100 p-value 0.000 which shows that there is the significant positive effect of environmental practices on green performance. Secondly, the result shows an insignificant but positive effect of sustainable culture on green performance with t-value 1.786 p-value 0.074, which is slightly insignificant. However, the alternate hypothesis of a significant positive result of sustainable culture on green performance has been rejected. Thirdly, the alternate hypothesis of a significant positive result of sustainable leadership on conservational practices has been accepted with t-value 15.493 p-value 0.000, which shows the there is a highly significant positive result on environmental practices.

Table 5. Path Coefficients, Direct Effect, Indirect Effect

Structural Model

Relationships	Sample	Mean	S. D	T-Stat	P-Value	Decision
Panel A: Path Coefficient						
CP_ -> GP	0.59	0.59	0.07	8.10	0.00	Null Hypothesis Rejected
SC_ -> GP	0.14	0.14	0.08	1.79	0.07	Fail to Reject Null Hypothesis
SL_ -> CP_	0.69	0.69	0.05	15.49	0.00	Null Hypothesis Rejected
SL_ -> GP	0.17	0.17	0.06	2.96	0.00	Null Hypothesis Rejected
SL_ -> SC_	0.78	0.78	0.03	24.61	0.00	Null Hypothesis Rejected
Panel B: Direct Effect						
CP_ -> GP	0.59	0.59	0.07	8.10	0.00	Null Hypothesis Rejected
SC_ -> GP	0.14	0.14	0.08	1.79	0.07	Fail to Reject Null Hypothesis
SL_ -> CP_	0.69	0.69	0.05	15.49	0.00	Null Hypothesis Rejected
SL_ -> GP	0.69	0.69	0.04	15.60	0.00	Null Hypothesis Rejected
SL_ -> SC_	0.78	0.78	0.03	24.61	0.00	Null Hypothesis Rejected
Panel C: Indirect Effect						
SL_ -> GP	0.52	0.52	0.05	10.09	0.00	Null Hypothesis Rejected

CP = Conservational Practices, GP = Green Performance, SC = Sustainable Culture, SL = Sustainable Leadership

Fourthly, the results of this study show there is a significant positive result of sustainable leadership on green/sustainable performance. In this study,

sustainable leadership is the independent variable, green performance is dependent variable at both ends. The hypothesis of sustainable leadership effect on green performance is accepted with t-value 2.964 p-value 0.00. Lastly, the significant positive effect of sustainable leadership on sustainable culture has been evaluated in this study. The hypothesis of sustainable culture on sustainable culture has been accepted with t-value 24.608 p-value 0.000. Path Coefficients of each hypothesis are shown in Table 5 Panel A, Direct Effect in Panel B Indirect Effect in Panel C.

This chapter briefly presented the analysis of data collected from the respondents. Firstly, this chapter provides a brief overview of the demographic profile of respondents in the demographic analysis. Secondly, the measurement model has been presented in detail considering the guidelines provided by Hair et al. (2010). Construct's reliability validity has been discussed in detail. At last, the structural model has been evaluated in which the impact of the latent variable has been observed. Last, the summary of results is presented. Out of five hypotheses proposed above, the total numbers of four hypotheses have been accepted.

5. DISCUSSION

The current paper addresses several gaps identified by global research scholars. Existing literature highlights limitations in research concerning the implementation of green practices for operational improvement with an environmental focus (Lai, 2011). Additionally, the field of sustainability lacks empirical research (Suparak, 2016), including scant attention to the relationship between leadership firm sustainable performance (Boadu, 2018), the mechanisms through which leader support influences employees' environmentally conscious behavior (Priyankara, 2018). Furthermore, scholars emphasize the need for organizational leadership to integrate green policies environmental sustainability into strategic planning (Al-Zawahreh, 2019), along with the potential impact of leader knowledge on future green performance projects (Sang, 2018), the influence of organizational culture on awareness, idea generation, leadership, green employee values (Zhou, 2018). The study's findings affirm a significant positive influence of sustainable leadership on green performance, sustainable culture, environmental practices. The research confirms the positive relationship between environmental practices green performance but indicates an insignificant impact of sustainable culture on green performance, potentially influenced by cultural dynamics in developing countries. This study bridges identified gaps, offering practical

insights for organizations to enhance sustainability through environmental practices, sustainable culture, sustainable leadership. Ultimately, sustainable leadership plays a pivotal role in improving green performance. Future research is suggested across diverse contexts with larger sample sizes. Organizations are advised to adopt environmental practices prioritizing sustainable leadership for enhanced environmental outcomes.

The confirmed positive significant relationship between sustainable leadership and green performance is rooted in social exchange theory, wherein sustainable leadership's alignment with employees' values influences performance. The pivotal role of organizational leadership in decision-making substantiates the strong link between leadership performance. Additionally, the research establishes the significant impact of environmental practices on green performance, with environmental practices acting as mediator enhancer in the sustainable leadership-green performance relationship. The ease of identification sustainable leader emphasis on environmental practices contributes to this result. Furthermore, the study substantiates the positive relationship between sustainable leadership sustainable culture, showcasing how sustainable leadership, encompassing economic, societal, environmental considerations, fosters a holistic organizational culture.

However, the relationship between sustainable culture green performance is found to be insignificant. Possible reasons include the complex long-term nature of culture building. The study posits that sustainable culture's significant role may lie in societal benefits profits rather than immediate green performance. Moreover, the COVID-19 pemic's impact on organizational culture the sample size limitations could contribute to this insignificance. Despite this, environmental practices showcased significant outcomes, possibly due to their continued adoption during lockdowns. Additionally, the pemic's effect on organizational populations might have influenced green performance, while culture's reliance on people could have contributed to the observed insignificance.

5.1. Theoretical Implications

This research expands the knowledge base by offering a comprehensive overview of relevant constructs, employing an established theoretical framework, and empirically validating specific relationships. While the significance of sustainable culture's impact on green performance necessitates further exploration, the confirmed relationships shed light on the mechanisms through which sustainable leadership environmental practices positively influence green performance. This study serves as a steppingstone

for future investigations, encouraging scholars to delve deeper into the intricate dynamics between these constructs, fostering more sustainable organizational practices outcomes. Practical Implication

This research holds practical relevance for organizational management as it offers insights to guide the implementation of novel strategies aimed at enhancing green performance ensuring long-term sustainability. Additionally, the findings can effectively inform the agenda points of organizations, contributing to the formulation of sustainable objectives goals. Moreover, the study serves as a valuable resource by presenting diverse avenues through which organizations can bolster their green performance and elevate their commitment to environmental practices. The identified processes methodologies are transferable across multiple organizational contexts, suggesting their broad applicability.

Furthermore, the research delves into specific environmental practices, including ISO certification, afforestation initiatives, integration of renewable solar energies, and efficient waste management. By shedding light on these actionable practices, the study offers concrete steps that organizations can take to tangibly improve their environmental footprint operational sustainability. The exploration of these practices further enriches the practical implications of the research, providing a comprehensive study for organizations to draw upon in their pursuit of environmentally conscious operations.

6. CONCLUSION

Amid global environmental concerns, linked to human well-being, the United Nations' sustainability goals emphasize environmental importance. Organizational sustainability remains understudied, particularly in green performance. Addressing this gap, the study identifies factors affecting green performance, confirming the positive impact of sustainable leadership environmental practices. It also highlights the mediating roles of sustainable culture environmental practices between sustainable leadership and green performance. However, sustainable culture's insignificant impact on green performance may stem from factors like the pyemic, diverse leadership priorities, varying emphasis on economic, societal, environmental benefits. The study contributes to enhancing green performance by integrating environmental practices sustainable leadership. Limitations Future Research Directions

Several limitations characterize this research. Firstly, the study's scope is restricted to a specific developing economy, the services sector, potentially limiting the generalizability of findings to broader contexts industries.

Secondly, the cross-sectional nature of the research design precludes the establishment of causal relationships among variables, warranting caution in interpreting causality. Additionally, reliance on self-reported data may introduce common method bias subjectivity. The study's focus on a specific set of variables may overlook other relevant factors influencing the relationships investigated. Moreover, the absence of data on respondents' educational backgrounds might influence the comprehensiveness of the findings. Lastly, external environmental factors, including regulatory changes technological advancements, are not deeply examined, potentially impacting the dynamics explored.

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