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Cues Leading Towards the Adoption of Sustainable Green Buildings in Pakistan

by

Maahum Mazhar

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degree of Master of Science

in the

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*I want to dedicate this achievement to my husband, parents, teachers and friends
who always encourage and support me in each and every step of my life.*



CERTIFICATE OF APPROVAL

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Maahum Mazhar

Abstract

Green buildings have been actively spreading as a solution for sustainability challenges in the construction industry for the last decades. Globally, emphasizing the implementation of sustainable green building practices is crucial. This approach represents a fundamental strategy for combating with environmental decline and proactively addressing its extensive impacts. Before conducting this thesis, the existing understanding of the factors driving the adoption of sustainable green buildings in Pakistan was based on limited knowledge. Therefore, the primary aim of this thesis was to investigate the impact of sense of community belonging, government support, and environmental awareness on the adoption of sustainable green buildings, considering green trust as a mediating variable within the context of Pakistan. The research was conducted under the lens of the Stimulus-Organism-Response (SOR) model, enhancing the comprehensive understanding of sustainability adoption within the built environment of Pakistan.

To achieve the thesis objective, we employed a survey questionnaire distribution method. We utilized a simple random stratified sampling technique to collect data from the potential future buyers and tenants of the real estate property in Punjab province. A total of 423 valid, usable survey questionnaires were obtained for our research. The collected data was analyzed using Smart PLS 4.0. The results demonstrated both significant and non-significant relationships, showing that both sense of community belonging and heightened environmental awareness distinctly and positively influenced the establishment of green trust. Subsequently, promoting the adoption of sustainable green buildings. Conversely, government support did not manifest a significant relationship with the establishment of green trust.

Also, it was found that, green trust partially mediated the influence of sense of community belonging and environmental awareness on sustainable green buildings, while no mediation was observed between government support and sustainability adoption. The research's findings will be useful in easing concerns regarding the implementation of green building methods among regulatory bodies, policymakers, and building construction professionals. This thesis aimed to provide valuable

information to stakeholders, including policymakers, construction professionals, and academics. Furthermore, limitation and suggestions for future research were further explained and incorporated in this thesis.

Keywords: Sense of Community Belonging, Environmental Awareness, Government Support, Sustainable Green Buildings, Potential Future Buyers, Real Estate, Sustainable Choices.

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Abbreviations

EA	Environmental Awareness
GDP	Gross Domestic Product
GOVS	Government Support
GT	Green Trust
RO	Research Objectives
RQ	Research Questions
SCB	Sense of Community Belonging
SGB	Sustainable Green Buildings
SOR	Stimulus Organism Response
WHO	World Health Organization

Chapter 1

Introduction

1.1 Theoretical Background

Sustainable green buildings are a subject of global conversation. Existing literature by global scholars for example ([Addy, Adinyira, Dadzoe, & Opoku, 2022](#); [Ahmad, Rosli, & Quoquab, 2022](#); [Agbajor & Mewomo, 2022](#)) signified that, the construction industry consumes 40% of total energy, raw material and natural resources Also, it accounts for 16% of total water. Moreover, the construction industry contributed to 35% of global CO₂ emissions ([Onuoha, Aliagha, & Rahman, 2018](#)). Additionally, the global carbon emissions are expected to reach 42.4 billion tons by 2035 ([Azeem, Naeem, & Waheed, 2020](#)).

On the other hand, the world has witnessed a growth in the demand for buildings due to growing population ([Nguyen, Skitmore, Gray, Zhang, & Olanipekun, 2017](#)). Leading to over-urbanization and putting additional strain on the environment. Severa international countries such as, China, USA, Israel, Malaysia, Ghana, Hongkong, South Africa, Kuwait are particularly concerned about the deteriorating surrounding environment and the pressing energy crises they face ([Li, Long, Chen, Chen, & Wang, 2020](#)). The cumulative impact of these factors has resulted in environmentally detrimental effects ([Jat & Mane, 2018](#)). Furthermore, the building sector has progressively become the most significant contributor to carbon emissions and a main source of natural resource depletion ([Berawi, Miraj, Windrayani, & Berawi, 2019](#)). It is important to realize that both in developed

and emerging parts of the world, the building industry contributes significantly to GDP (Onuoha et al., 2018). Oxford Economics report signified that, the building industry is predicted to be a major factor in the expansion of the world's economy, with an average growth rate of 4.4% till 2025. This growth is expected to surpass the growth rates observed in both manufacturing and services sectors.

Renowned global scholars have directed their efforts towards addressing problems related to the conventional construction practices. The key focus of their discussion has been on enhancing efficiency, reducing resource consumption, and adopting sustainable spatial development practices. To minimize the ecological footprint of construction projects (Bungau, Bungau, Prada, & Prada, 2022).

The Environmental Protection Agency (EPA USA, 2010) described sustainable designs as "The practice of creating structures and using processes that is environmentally responsible and resource-efficient throughout a building's life-cycle from citing to design, construction, operation, maintenance, renovation and de-construction.

Moving towards South East Asia and specifically Pakistan, like many other countries globally, faces significant challenges related to energy crises, overpopulation, and the adverse impacts of natural disasters (Azeem et al., 2020). These circumstances not only lead to public unrest but also have a detrimental effect on the country's economic activity (Khahro, Memon, Memon, Aarsal, & Ali, 2021). Additionally, Pakistan's haphazard and unjustifiable development projects have overlooked developing environmental concerns and have focused merely on meeting the country's growing population's infrastructure needs (Jat & Mane, 2018).

In a similar vein, according to the Pakistan Economic Survey, the Gross Domestic Product (GDP) of Pakistan's construction industry was accounted to be 2.53% and 7.61% of Pakistan's employed work force is employed in this sector. (Pakistan Investment board). Coupled with this, due to Pakistan's rising population, which is expanding by 2.4% annually as of the 2017 census, there is an increasing demand for houses. Despite the numerous benefits that green buildings offer to society; various market barriers hinder their implementation in Pakistan (Farooq & Yaqoob, 2019; Azeem et al., 2020).

Likewise, the strategies and construction practices in Pakistan are not aligned with the Sustainable Development Goals 2030 (Nations, 2015). Additionally, it does not abide by the rules established by the U.S. Environmental Protection Agency (EPA USA, 2023). Moreover, the nation is significantly behind in implementing the LEED (Leadership in Energy and Environmental Design) criteria for environmentally friendly construction methods (Azeem et al., 2020). This lack of alignment and adherence poses significant challenges to the widespread adoption of sustainable construction methods in Pakistan.

A few studies have been conducted on green construction. However, the established literature is directed towards the identification of promotional and restricting aspects of GB. Moreover, It was noted that a number of earlier studies were carried out from a business perspective with little support from the consumer side (Agbajor & Mewomo, 2022; Alnahhal et al., 2021; Berawi et al., 2019).

Therefore, this thesis aimed to investigate the antecedents and understand the cues that motivate potential buyers to adopt eco-friendly buildings. This would help in increasing the demand for green buildings in the market in Pakistan being a developing country.

1.2 Problem Statement

Construction sector consumed massive number of resources, producing large volume of CO₂ emissions and generating large-scale waste (Agbajor & Mewomo, 2022). Top developing countries in the world for example USA, UAE, Indonesia, Israel, China and Malaysia (Alnahhal et al., 2021; Berawi et al., 2019; Du, Jiang, Huang, & Yang, 2023; Darko, Chan, Ameyaw, He, & Olanipekun, 2017; Portnov et al., 2018; Shahron, Abdullah, & Musa, 2020) have identified the fact that the increasing demand for buildings, growing population and over-urbanization had predicted insecurity of energy supply and detrimental negative impacts for the environment.

Moreover, it is worth noting that the adoption of Green Buildings has been slower within developing countries than within developed countries (Darko et al., 2018). In South East Asia, specifically Pakistan. The construction sector is the fastest

growing sector in the country (K. Hussain, He, Ahmad, Iqbal, et al., 2019). However, the unplanned and indefensible construction activities in Pakistan have focused on fulfilling the increasing infrastructure needs of the rising population while ignoring the emerging environmental issues.

In prior studies, numerous researchers had discussed green buildings in different contexts. The majority of them focused on the barriers, awareness and drivers of green buildings around the world (Li et al., 2020) (Avotra, Chenyun, Yongmin, Lijuan, & Nawaz, 2021; Portnov et al., 2018). Nevertheless, findings of earlier studies revealed that the studies on green buildings were organization and firm based. (Agbajor & Mewomo, 2022; AlSanad, 2015; Azeem et al., 2020; Bungau et al., 2022; Ahmad et al., 2022). It was noted that the results were based on the fact of what the entire organization or firm feels about green buildings. On the contrary, researchers were unable to examine consumers awareness or perspectives regarding sustainable green buildings.

However, the factors leading towards sustainable green buildings such as Sense of Community Belonging (Du et al., 2023; Pett, Lackey, & Sullivan, 2003; Wang, Zhang, Su, & Deng, 2019). Environmental Awareness (Agbajor & Mewomo, 2022; Yue, Sheng, She, & Xu, 2020; Sugiarto, Lee, Huruta, Dewi, & Chen, 2022; Sultana, Amin, & Islam, 2022), Government Support (Songling, Ishtiaq, Anwar, & Ahmed, 2018; Azeem et al., 2020; K. Hussain et al., 2019) and green trust (Zhao & Zhang, 2023; Yousaf, Ihsan, & Ellahi, 2016; Warren, Sulaiman, & Jaafar, 2014; Khahro, Memon, et al., 2021) have not been observed under a single study.

We are able to gain a complete understanding of the complex dynamics influencing the adoption of sustainable green buildings by combining all three aspects into a single study. The combined impact of these factors is likely to be greater than the sum of their individual effects (Du et al., 2023). Isolating these factors might fall short of providing an accurate representation of the complex dynamics at work given Pakistan's unique sociocultural and economic backdrop (Agbajor & Mewomo, 2022). A more contextually appropriate analysis is possible when the sense of community belonging, environmental awareness, and government assistance are examined simultaneously. Unfortunately, there were limited studies so far that explained and elucidated the adoption of sustainable green buildings

based on the stimulus organism response model (SOR) (Wu, Yu, Li, & Zhang, 2022; Sugiarto et al., 2022).

Hence, there is a need to explore how sense of community belonging, environmental awareness and government support with the mediation role of green trust perform towards the adoption of sustainable green buildings in the domain of the SOR model.

1.3 Gap Analysis

1.3.1 Theoretical Gap

Majority of the established literature on the adoption of sustainable green buildings has extensively examined the factors influencing the decision-making process. However, minimal attention was paid towards the Stimulus-Organism-Response (SOR) Model in understanding the factors leading to the adoption of sustainable green buildings (Liu et al., 2022; Sugiarto et al., 2022).

Several established SOR studies have been conducted in retail and workplace environments. There is a dearth of research in utilizing the SOR model specifically in the context of sustainable green buildings (Amaya Rivas, Liao, Vu, & Hung, 2022). Therefore, this thesis will contribute by extending the SOR Theory toward consumers' adoption of green buildings in the construction sector.

1.3.2 Contextual Gap

The adoption of sustainable green building practices has gained significant attention worldwide as a means to mitigate environmental impact and promote long-term sustainability. However, in Pakistan, the exploration of cues leading towards sustainable green building adoption remains relatively limited. Majority of the past research on green construction was conducted in the Western world, in nations such as the U.S, the UK, Australia, Canada, and Germany. (Jat & Mane, 2018; Wu et al., 2022; Amaya Rivas et al., 2022). The applicability of these findings is questionable in Pakistan.

Consumer green adoption behavior differs from region to region, and country to country in its cultural, social, economic, and racial makeup. (Hammond, Gajendran, Savage, & Maund, 2021), different studies have stated that most of the existing research was carried out in developed countries with cold climates, stable economies, and different social values. (Khan, Umer, Umer, & Naqvi, 2021). It is not practical to implement their findings in a developing country like Pakistan with different economic and social conditions.

However, some research exists on the environmental benefits of sustainable green building construction in Pakistan, such as reducing energy use and greenhouse gas emissions (Azeem et al., 2020; Azad & Akbar, 2015). (Azeem et al., 2020; Azad & Akbar, 2015). According to a study by (S. Hussain, Xuotong, Maqbool, Hussain, & Shahnawaz, 2022) people who live in green buildings in Pakistan had greater levels of happiness, wellbeing, and productivity than people who live in traditional buildings. However, the study did not explore the underlying factors of these effects or identify specific environmental stimuli that contribute to the observed outcomes.

The lack of research on green construction in Pakistan is concerning as it hampers the development of effective strategies and policies to promote green building practices. Without a clear understanding of the cues leading towards sustainable green building adoption, it becomes challenging to create awareness, provide incentives, and overcome barriers in the Pakistani construction industry.

Thus, this thesis aims to contribute to the existing research by exploring the factors that influence consumers in Pakistan to adopt sustainable green buildings.

1.3.3 Managerial Gap

Green buildings are increasingly preferred by environmentally conscious customers, tenants, and investors, leading to increased demand and competitive advantage. (Alnahhal et al., 2021). However, up until now, research on green buildings has just focused on energy efficiency but it should also be user-oriented. D.-X. Zhao, He, Johnson, and Mou (2015), as a green building projects cannot exist without taking people into account. Moreover, studies on the factors that are driving green

building could increase user satisfaction and productivity in addition to offering investors a scientific bidding and purchasing strategy for growing their construction sector (D.-X. Zhao et al., 2015). Additionally, industry groups help contractor and developer firms exchange helpful Green Building information (Darko et al., 2017). Furthermore, the advancement and adoption of sustainable construction practices will pave the way for the emergence of a new green industry, creating numerous job opportunities (Addy et al., 2022). As more companies and organizations embrace green building projects, there will be a growing demand for skilled professionals specialized in green architecture, sustainable construction, renewable energy, eco-friendly materials, and green technologies. (Avotra et al., 2021). Additionally, the increased utilization of sustainable local materials in construction will stimulate local industries and create employment opportunities within the supply chain. Consequently, the transition towards the utilization of sustainable building techniques will boost the nation's economy and lead to more jobs being created (Alnahhal et al., 2021).

Moreover, in the construction industry, establishing a positive image and reputation is a long-term objective for companies. This pursuit of a favorable image can act as a motivating factor for companies to hurriedly put green building projects into action (Li et al., 2020). However, at present we currently only have a slight understanding of the market for green buildings because they are a relatively new commodity. and there exists a line of vacuum in identifying how managers can effectively implement these factors to ensure sustainable green buildings. Hence, more research is needed to bridge this gap.

The study will also assist in educating contractors and builders in Pakistan's construction industry about their alternatives for pursuing green architecture.

1.4 Research Questions

RQ1: Does sense of community belonging have a significant relationship with green trust?

RQ2: Does environmental awareness have a significant relationship with green trust?

RQ3: Does government support have a significant relationship with green trust?

RQ4: Does green trust have a significant relationship with sustainable green buildings in Pakistan

RQ5: Does green trust mediate the relationship between sense of community belonging and sustainable green buildings in Pakistan.

RQ6: Does green trust mediate the relationship between environmental awareness and sustainable green buildings in Pakistan.

RQ7: Does Green Trust mediate the relationship between government support and sustainable green buildings in Pakistan.

1.5 Research Objectives

RO1: To examine the relationship between sense of community belonging and green trust.

RO2: To examine the relationship between environmental awareness and green trust.

RO3: To examine the relationship between government support and green trust.

RO4: To examine how green trust can impact the adoption of sustainable green buildings.

RO5: To examine how green trust mediates the relationship between sense of community belonging and the adoption of sustainable green buildings.

RO6: To examine how green trust mediates the relationship between environmental awareness and the adoption of sustainable green buildings.

RO7: To examine how green trust mediates the relationship between government support and the adoption of sustainable green buildings.

1.6 Significance of the Study

The construction industry in Pakistan is expanding, which increases the demand for sustainable practices to reduce environmental impact. Undoubtedly, there is a

significant knowledge gap in Pakistan regarding sustainable construction practices as consumers are unaware of sustainable construction practices and what benefits they propose (Azeem et al., 2020).

The thesis would help in educating the general public regarding the environment and importance of sustainable green construction in Pakistan as there is little work done in the domain of creating environmental awareness among Pakistani consumers. Moreover, according to (Addy et al., 2022), the adoption and progress of sustainable construction practices will facilitate the establishment of a new green industry, resulting in the creation of numerous job opportunities. Addressing one of the critical challenges of unemployment in the nation. As the demand for skilled professionals in green architecture, sustainable construction, renewable energy, and other related fields increases, Pakistani individuals will have access to new and rewarding job prospects (Darko et al., 2018).

The research's findings will be useful in easing concerns regarding the implementation of green building methods among regulatory bodies, policymakers, and building construction professionals. This thesis aims to provide valuable information to stakeholders, including policymakers, construction professionals, and academics.

Furthermore, the development of the green industry will boost economic growth. As companies and organizations invest in green building projects and sustainable technologies, there will be an inflow of investments into the country. This will not only stimulate local businesses but also attract foreign investors looking to capitalize on the growing green market.

Moreover, it was established that, minimal evidence was available that the previous studies were conducted in the construction industry especially in the Asian countries. Moreover, most of the studies on Green construction were conducted in different countries like Ghana, Israel, South Africa, China, Malaysia, UAE, Indonesia. (Alnahhal et al., 2021; Berawi et al., 2019; Darko et al., 2018). This constrained the generalization of the findings towards construction industry of Pakistan. Also, it has been observed that minimal studies have been conducted in Pakistan in the light of Stimulus Organism Response Model (SOR). Thus, this study would have significant contribution in the context of Pakistan.

1.7 Study's Scope

The scope of this thesis involves investigating the factors influencing the adoption of sustainable green buildings in the Pakistani context. To achieve this target, we employed behavioral psychographic and demographic segmentation to collect data from the target audience. This approach provided a comprehensive understanding of the audience's values, lifestyle, and purchasing behaviors and purchasing power offering valuable insights into their preferences and motivations related to sustainable building practices. The questionnaire survey was conducted through online platform i.e., Google Docs, to reach individuals with intentions to buy or build a house within the next 5 years.

Examining the effects of three important factors— sense of community belonging (SCB), environmental awareness (EV), and government support (GOVS) on the development of green trust (GT) among consumers which translates in to the adoption of sustainable green buildings (SGB) was the major goal of the study. The research aimed to analyze how these factors influence consumers' decisions to adopt sustainable building practices and explore the potential mediating role of green trust in this context employing the SOR model for a more thorough knowledge of the cues leading towards sustainable green building adoption in Pakistan. This thesis aims to provide valuable information to stakeholders, including policymakers, construction professionals, and academics.

1.8 Underpinning Theory

Numerous researchers worldwide have introduced various theoretical perspectives to underpin the studies of green construction. Some of these studies have employed theories like innovation diffusion theory, consumption value theory, and social exchange theory (Wu et al., 2022; Alnahhal et al., 2021; Tran et al., 2020). However, limited research has been conducted concerning the S-O-R model in the context of sustainable green construction (Amaya Rivas et al., 2022).

In the context of this study, sense of community belonging, environmental awareness and government support acts as external stimuli. These external stimuli have

a significant influence on shaping consumers' attitudes, leading to the establishment of green trust, which is then reflected in the intention to take action which is the adoption of sustainable green buildings. Ultimately, these intentions have a big impact on how someone behaves or acts in certain situations ([Amaya Rivas et al., 2022](#)).

Furthermore, several studies on consumer behavior have employed the S-O-R model. However, it hasn't been frequently used when it comes to adopting green products and addressing environmental concerns ([Amaya Rivas et al., 2022](#)). Although the SOR model has been widely applied to explore various phenomena, this research will advance the model by broadening its scope to include the adoption of sustainable green buildings. For the purpose of understanding the adoption of Sustainable Green Buildings, we frame SOR model by incorporating one mediation variable, namely, green trust. It is also crucial to note that many academics and practitioners see trust as a consumer emotional state variable and have incorporated it in the S-O-R model ([Xia et al., 2019](#)).

This study makes use of the SOR (Stimulus-Organism-Response) model to better understand the dynamics affecting the uptake of sustainable green buildings in Pakistan. The stimuli, which include a sense of belonging to the community, environmental awareness, and government support, have a significant role in influencing people's attitudes ([Zahid et al., 2022](#)). The internal cognitive processes represented by "green trust," which serves as the mediating variable, is influenced by these inputs ([Amaya Rivas et al., 2022](#)). The level of "green trust" reflects people's attitudes and opinions regarding green building techniques ([Chrisjatmiko, 2018](#)). In the end, this trust affects the behavioral reaction, which is the adoption of sustainable green buildings. With the aid of this framework, it is possible to gain a thorough understanding of how these elements affect the adoption of sustainable practices in the special sociocultural and economic environment of Pakistan.

Furthermore, this study expands the applicability of the S-O-R model by investigating its relevance in the environmental domain of the construction industry. In doing so, it contributes to the existing body of knowledge on the adoption of sustainable green buildings. The research provides valuable insights into the underlying motivations driving people's environmentally conscious decisions. It

highlights the crucial role of environmental awareness, sense of community belonging, and government policies in fostering sustainable behaviors and promoting the adoption of green buildings. This insightful viewpoint enriches our understanding of sustainable practices and their implications for the construction sector.

1.9 Structure of the Thesis

This thesis comprises of five chapters:

Chapter 1

This chapter provides the reader with a brief outline on the sustainable green buildings in Pakistan. At first, this chapter established the introduction for this thesis comprising of the theoretical background. Then, problem statement is explained, followed by the Research Gaps leading towards research questions and research objectives for this study. After that, the scope of the thesis and significance in terms of theoretical contribution were presented followed by the underpinning theory at the end of this chapter.

Chapter 2

This chapter sets the scene for reviewing relevant literature, through a stepwise process. At first, the significance of green buildings was established. Thirdly, the literature included a discussion on the hypothesis, seven hypotheses were established each explaining the relationships among our 3 independent (sense of community belonging, Environmental Awareness and Government support) and 1 dependent variable (Sustainable green buildings) followed by a mediating variable (Green trust). Next the chapter includes a conceptual framework. Finally, a summary was established to end this chapter.

Chapter 3

In this chapter, the research paradigm is established initially. Subsequently, the focus shifts to examining the selected population, followed by determining the appropriate sample size for this thesis. A detailed discussion on the measurement model ensues, including the development of scales and comprehensive definitions for each variable. The chapter further elucidates the procedure for data collection

and the chosen research method. Lastly, there is a comprehensive discussion on the utilization of SMART PLS 4.0 for the analysis of both the structural and measurement models.

Chapter 4

This chapter primarily focuses on quantitative analysis, specifically utilizing both the structural and measurement models. The analysis includes conducting various tests such as convergent validity, discriminant validity, and internal consistency. The SMART PLS 4.0 program was used to carry out these testing.

Chapter 5

This chapter encompasses in-depth discussions, robust conclusions, and insightful implications derived from the research findings pertaining to the research questions and hypotheses. The discussions highlight the noteworthy contributions made to the existing theory and shed light on the implications for supervisory practices. Furthermore, the chapter concludes by summarizing the key findings of the research and offering a well-grounded recommendation for future research opportunities.



FIGURE 1.1: Structure of the Thesis

1.10 Introduction Summary

This chapter provides a comprehensive overview of the research background, outlining the identified research problems. In alignment with these research problems, the chapter establishes the research questions and outlines the corresponding research objectives to be investigated. Additionally, the contextual setting of the thesis is thoroughly discussed, providing a clear understanding of the research's situational backdrop. The chapter concludes by presenting the structural details, effectively setting the stage for the subsequent chapters.

Chapter 2

Literature Review

2.1 Introduction

Chapter 2 provided a thorough analysis of the existing literature. It explored the relationship between sense of community belonging, environmental awareness, and government support within the framework of the Stimulus Organism Response (SOR) model. Moreover, this chapter examined the mediating role of green trust between the three independent variables and the adoption of sustainable green buildings. Furthermore, this chapter discussed the established hypotheses in the light of established literature. These derived hypotheses were empirically tested in chapter four, contributing to the overall research findings.

2.2 Sustainable Green Buildings

Environmental degradation we face today is the result of decades of unsustainable consumption patterns, reliance on non-renewable energy sources, and short-term capitalist practices, stemming from industrial human activity (Sio et al., 2022). Green building has emerged as a dominant trend in the construction industry, offering an opportunity to combat global warming and achieve energy efficiency.

The rapid expansion of the industry has led to the encroachment and exploitation of natural habitats, resulting in the destruction of vital ecological resources such as energy reserves and forests (Avotra et al., 2021). While cities initially

co-existed with nature through traditional ways of living, the process of industrialization has inadvertently transformed the environment to its current state. This transformation is a consequence of historical negligence and lack of consideration for sustainable practices (Kamranfar, Azimi, Gheibi, Fathollahi-Fard, & Hajiaghaei-Keshteli, 2022). Consequently, ensuring environmental compatibility and sustainability in human products and activities has become a crucial concern not only for governments but also for academia and researchers.

According to the EPA definition: “Green building is the practice of creating structures and using processes that are environmentally responsible and resource efficient throughout a building’s lifecycle from siting to design, construction, operation, maintenance, renovation and deconstruction (Khahro, Kumar, et al., 2021). By embracing green building practices, structures and operations can become environmentally conscious and resource-efficient from the beginning to the end of a building’s life cycle (Agbajor & Mewomo, 2022). Green buildings are emerging as beacons of sustainable development, gaining widespread acceptance as a viable solution to address the escalating global energy demands exacerbated primarily by anthropogenic climate change (Alnahhal et al., 2021). By effectively using natural resources, decreasing garbage, and assuring the people’ well-being through improved living circumstances, GBs are intended to lessen the burden on environmental resources and limit detrimental impacts on human health (Wang et al., 2019).

In the light of the significance of sustainable green buildings discussed the next heading would elaborate my research hypothesis

2.3 Hypothesis

2.3.1 Sense of Community Belonging

In recent times, there has been growing research on green urban planning focusing on exploring the connection between the sustainable built environment and social and mental aspects, such as the sense of community belonging (SCB). (Du et al., 2023). This interest stems from the significant impacts that the built environment

can have on these constructs. Sense of community belonging (SCB) refers to the extent to which individuals feel a psychological attachment to their community or environment (Chavis, Lee, & Acosta, 2008). Similarly Green trust is often defined as “a willingness to depend on a product or service based on the belief or expectation resulting from its credibility, benevolence, and ability about environmental performance” (Ahmad et al., 2022).

The feeling of belonging and pride associated with a particular place is often referred to as the “sense of community.” This sense of community extends beyond interpersonal connections to include shared norms, social order, and to a lesser extent, civic values within a neighborhood. (Dempsey, Bramley, Power, & Brown, 2011; Kearns & Forrest, 2000). The relationship between the built environment and sense of community belonging (SCB) is often underestimated (Chavis et al., 2008). Due to the diverse methodologies employed, findings from various studies present a mix of positive and negative associations between environmental built elements and SCB. This variability in results underscores the need for more empirical research to gain a comprehensive understanding of these associations (Du et al., 2023). In this study, we explore how the sense of community belonging relates to green trust. Green buildings are becoming more popular due to consumer attitudes toward environmental preservation and social advancement. People are more likely to reduce environmental degradation and work to ensure that society and nature are developing in harmony when they have a strong sense of community (Wang et al., 2019). Moreover, various studies also suggest that individuals who feel connected to their community are more likely to trust their community’s environmental initiatives (McMillan & Chavis, 1986). Specifically, urbanization can lead to the formation of unplanned communities, especially in low-income nations that struggle to control rapid population expansions (Smith & Smith, 2020). Enhancing people’s sense of belonging is the central goals of modern urbanism in the realm of urban planning. A low SCB can lead to feelings of alienation, insignificance, loneliness, and social and cultural isolation, whereas a robust SCB is frequently directly associated to place satisfaction, physical and mental health, and life well-being. Thus, encouraging people to feel more a part of their society would enhance their sense of security, trust, and belonging (Du et al., 2023).

Therefore, initiatives aimed at fostering a stronger connection between residents and their community would enhance their sense of belonging, trust, and security, ultimately improving their physical and mental health (Du et al., 2023). Consumers who feel particularly a part of their community often have a stronger sense of social responsibility (Macke, Sarate, & de Atayde Moschen, 2019). They actively consider and respond to the societal and environmental impacts of construction projects, driven by their loyalty to the environment. This sense of community belonging influences their decision-making regarding the adoption of Green Buildings (GBS). (Wang et al., 2019). Thus, it can be concluded that the adoption of GBs is influenced by consumers' inherent sense of community belonging. This paper explains how consumers' attitudes toward environmental conservation and social development are influenced by their sense of community belonging, hence leading to trust in the procedures (Wang et al., 2019). Trust maximizes value in transactions, reduces the likelihood of opportunistic behavior on the side of trade partners, and boosts purchase likelihood (Chrisjatmiko, 2018). Moreover, those who possess a robust feeling of belonging to a community typically exhibit a heightened sense of social responsibility. They are more inclined to actively assess and address the effects of construction projects on both society and the environment, driven by their commitment to preserving the environment. This, in turn, has a positive influence on their level of trust in environmentally friendly practices and their choices to embrace such practices. (Wang et al., 2019).

Therefore, it is proposed that:

H1: Sense of community belonging has a positive effect on green trust.

2.3.2 Environmental Awareness

Awareness of green construction is closely related to the public awareness of environmental issues (Shi, Zuo, Huang, Huang, & Pullen, 2013). Rapid industrialization is what is driving Pakistan's economic progress (Iqbal, Wang, Ali, Haider, & Amin, 2023) The likelihood of environmental degradation has increased as a result of the rapid growth of buildings in metropolitan areas (Jat & Mane, 2018). Environmental deterioration is likely to worsen if the current trend of economic development and careless consumption behaviors is not stopped (Darko et al., 2017).

Construction activities, an integral part of the Pakistani economy, exert significant impacts on the surrounding environment (Iqbal et al., 2023). Construction-related drawbacks include excessive noise, clogged roads, dust, fumes, water pollution, and inappropriate trash disposal. Unfortunately, Pakistan's development processes have been mostly unplanned and unsustainable, ignoring new environmental concerns in favor of addressing the expanding infrastructural needs of a growing population (Azad & Akbar, 2015).

The primary objectives of environmental awareness are to preserve the natural environment that we share with other living organisms and to safeguard biodiversity. Through environmental awareness, individuals strive to meet their own needs while being mindful of global and local environmental challenges. It is essential for everyone to be conscious of environmental issues and actively fulfill their responsibilities and obligations to create a sustainable environment (Alkaya, Ozturk, & Yaugci, 2020).

All the species that live in that ecosystem are affected by environmental changes, whether directly or indirectly. As a result of environmental consciousness, environmental concerns are becoming more prevalent. It is essential to increase a person's understanding of environmental issues in order to ensure a healthier and safer environment for future generations (Alkaya et al., 2020). The individuals who care about the environment are typically sensitive to environmental issues and frequently engage in green movements on a voluntary basis rather than delegating responsibility for environmental issues to the government and others (Ahmad et al., 2022). Punyatoya (2014) in his study suggests that when consumers possess a heightened ecological awareness, their inclination towards conservation is stronger, and they become more conscious of environmental concerns. When customers possess awareness of the environmental impact of products and develop a more informed attitude towards ecological protection, this awareness influences their purchasing decisions and may guide them towards choosing environmentally friendly products (de Sio, Zamagni, Casu, & Gremigni, 2022). This increased awareness instills confidence in consumers and influences their purchasing decisions, making them more inclined to prioritize environmentally friendly options (Punyatoya, 2014). Studies have indicated that consumers who have a high level of

environmental awareness tend to engage in green purchasing behavior (Kaufmann, Panni, & Orphanidou, 2012). However, while socially conscious customers are expected to prioritize environmental issues in their purchasing decisions, in reality, they may sometimes take these issues for granted (Dempsey et al., 2011).

Additionally, it has been observed that trust plays a significant role in influencing consumers' intention to participate in green movements (Ahmad et al., 2022). Research suggests that trust plays a crucial role in shaping consumers' attitudes towards green products (Sio et al., 2022). When consumers trust the environmental claims made about products, it positively influences their intention to purchase such products. Green trust significantly motivates consumers' purchasing attitudes and intentions towards environmentally friendly products and ultimately helps to drive actual behaviors (Kaufmann et al., 2012). Acquiring environmental awareness can increase trust, ultimately influencing consumer purchase behavior.

Therefore, it is proposed that;

H2: Environmental awareness has a positive relationship with green trust.

2.3.3 Government Support

Governments, whether in developed or developing countries, play a crucial role in creating appropriate policies. These policies aim to align with public opinions and sentiments by establishing mandatory regulations for compliance (S. Hussain et al., 2022). The role of the government in encouraging green buildings (GB) is very crucial, as highlighted by (OECD.org, 2023). This can be achieved through measures such as tax reduction, subsidies, funding communication campaigns, and providing GB education to both consumers and developers. The full realization of the benefits of the green building (GB) market may be hindered by various barriers. In such cases, governmental intervention becomes necessary to facilitate the transition of the housing market from conventional buildings to green buildings (Alnahhal et al., 2021).

Sustainable designs have increased with the launch of Building Research Establishment's Environmental Assessment Method (BREEAM) in 1990, the first green

building rating system in the world (Agbajor & Mewomo, 2022). In the year 2000, the U.S. Green Building Council (USGBC) followed a similar trajectory by developing and introducing criteria aimed at enhancing the environmental performance of buildings through its Leadership in Energy and Environmental Design (LEED) rating system for new construction. Since its inception, LEED has gained significant prominence and has expanded to include rating systems for existing buildings and entire neighborhoods (Berawi et al., 2019). These global initiatives in the field of Green Building serve as a catalyst for structural designers, civil engineers, contractors, and project managers to devise innovative solutions that prioritize occupant comfort while minimizing environmental impacts (Alnahhal et al., 2021).

However, according to the World Resources Institute (WRI at Adaptation Futures 2018: Dialogues for Solutions, 2018), green building initiatives and the implementation of sustainable operations and management are still in their starting phases in Pakistan. The local construction market significantly trails behind due to a lack of sufficient knowledge and understanding of green construction concepts for buildings. The absence of proper government support, and effective management further contributes to the excessive utilization of resources (Majid & Khan, 2021).

According to (K. Hussain et al., 2019) one of the main obstacles to going green and achieving environmental sustainability was a lack of government assistance. Furthermore, research indicates that the government's role is acknowledged as being crucial in advancing the use of green building practices (AlSanad, 2015). In general, the construction of eco-friendly structures often requires more resources, including financial investment, compared to conventional buildings. Therefore, government support plays a vital role in promoting green construction practices, particularly when there is a need for widespread adherence to the established green building policies (Agbajor & Mewomo, 2022).

Studies have found that the majority of the stakeholders think that government commitment is necessary for green development to be encouraged. The government should provide incentives and prizes to the building industry and to customers for creating environmentally friendly structures with affordable energy costs (AlSanad, 2015). Moreover, it has been observed that the increased costs

of GBs would be difficult for stakeholders to bear if they did not obtain adequate government backing, and the predicted economies of scale in GBs would be challenging to realize under the current market system (Darko et al., 2017; Onuoha et al., 2018). Multiple studies have consistently highlighted the significance of specific measures in promoting the adoption of green buildings, including the availability of mandatory green building codes and regulations, as well as financial incentives and penalties provided by the government (such as soft loans and taxes) to encourage sustainable construction practices. These findings hold substantial importance as they provide valuable insights for policymakers, enabling them to gain a better understanding of crucial aspects and emphasizing the need for increased attention towards the promotion of green building practices in Pakistan (Azeem et al., 2020).

The aforementioned studies strongly emphasize the pivotal role of the government in enacting regulations and guidelines that facilitate the full adoption of green buildings (GB) and support their development. These initiatives are aimed at preparing stakeholders in the construction industry to embrace green building practices while also providing necessary financing mechanisms (Agbajor & Mewomo, 2022).

Green trust and government support have been the subject of significant interest in the literature, as policymakers and scholars seek to understand how governments can foster the development of green industries and encourage sustainable practices. According to Azeem et al. (2020) the most effective strategy for promoting green construction practices is required government policy. Governmental and public agencies can play a significant role in defending consumers from information that is deceptive due to labeling, advertising, and poor corporate reporting (Portnov et al., 2018). Moreover, Government policies encourage organizations to adopt eco-friendly practices, leading to a positive perception of these organizations by the public (Ahmad et al., 2022). Excellent goods and services that are trustworthy have a substantial impact on consumers' behavioral intentions and foster trust (Lankton, Wilson, & Mao, 2010). Therefore, the implementation of policies and regulations promoting sustainable GBs can influence green trust positively. In the context of environmental consciousness, research has confirmed the importance

of trust in environmental practices in shaping behavioral intentions, including the intention to make eco-friendly purchases (J. Wang, Wang, Xue, Wang, & Li, 2018).

According to studies, adding green construction norms and bylaws to Pakistan's current planning system will significantly increase consumer trust in the country's green initiatives. Consequently, encouraging green building techniques (Azeem et al., 2020).

Therefore, we propose that:

H3: Government support has a positive influence on green trust.

2.3.4 Sustainable Green Buildings

The green building is the fundamental platform of sustainable development (Liu et al., 2022). The concept of green building has emerged gradually in response to the growing public awareness of environmental protection. This concept encompasses various elements that address environmental sustainability (Alnahhal et al., 2021). The concept of "green building" has been introduced to alleviate the environmental burdens associated with buildings throughout their life cycle. Green buildings are valued higher in the commercial sector due to their perceived advantages, including lower carbon emissions, energy savings, and enhanced economic benefits over the course of their life cycle (Liu et al., 2022). Moreover, the construction industry faces the challenge of identifying greener, more sustainable, and environmentally friendly solutions for future development. As a result, there is an urgent need to explore and establish a sustainable development approach within the construction sector (Zhang et al., 2022). The objective is to transform the current scenario characterized by high environmental pollution and resource consumption (Liu et al., 2022).

Various researches indicate that green trust and sustainable construction are two intertwined concepts that have gained much attention in recent years due to the growing awareness of environmental issues and the need for sustainable development (Avotra et al., 2021). Green trust is defined as "the readiness to be depended on only one thing based on the trust or belief resulting from its reliability, kindness, and capability about eco-friendliness" (Doszhanov & Ahmad, 2015).

Research has shown that individuals who have higher levels of green trust are more likely to engage in environmentally sustainable behaviors (e.g., recycling, energy conservation) (Karimi & Mohammadimehr, 2022). Furthermore, it has been discovered that individuals utilize trust as a risk-reduction strategy, which means that trust plays an essential role in the decision-making process of adopting green building technology (Hammond et al., 2021). Additionally, high levels of public trust in the organizations in charge of green building adoption can also persuade people to use green building solutions and simplify their decision-making processes (Liu et al., 2022). In many cases, individuals lack adequate understanding of scientific and technological concepts, such as green behaviors and other environmentally friendly practices. They might also face limitations in terms of available resources like time and skills for making informed decisions and implementing actions. In such scenarios, the presence of social trust becomes pivotal. Social trust serves as a catalyst, fostering a readiness to embrace the relevant technologies (Hammond et al., 2021). Additionally, social trust is seen to be a reliable indicator of behavioral intention to adopt new technology. Additionally, social trust is seen to be a reliable indicator of behavioral intention to adopt new technologies (Smith & Smith, 2020).

Hence, we propose that:

H4: Green Trust is positively associated with the adoption of sustainable green building construction.

2.3.5 Green Trust Mediates the Relationship between Sense of Community Belonging and Sustainable Green Buildings

Trust, in general, refers to a person's level of confidence in another person or thing (Hart & Saunders, 1997). GT refers to individuals' "willingness to depend on a product or service based on the belief or expectations resulting from its credibility, benevolence and ability about environmental performance" (Ahmad et al., 2022). Within the study of consumers' green purchasing intention and behavior, green trust has been postulated as a mediator between other dimensions

(for example, between green brand equity and green brand image) (Ahmad et al., 2022). However, it has not been studied yet as a mediator between factors motivating consumers towards green construction and intention to sustainable green buildings (de Sio et al., 2022).

Research has indicated that a sense of community belonging fosters a shared identity and common goals among community members, enhancing their trust in one another (Delmas & Pekovic, 2013). This trust, in turn, extends to the community's dedication to sustainable practices, including the adoption of green sustainable buildings. Moreover, individuals who perceive a strong sense of community belonging are more likely to trust that their collective efforts towards sustainability will yield positive outcomes (Ha, Ngan, & Nguyen, 2022). Furthermore, A deep sense of community belonging leads individuals to place trust not just in the community itself but also in its dedication to environmental stewardship and sustainable practices (Du et al., 2023). This trust arises from the shared belief among community members that they are united in pursuing common goals and actively working towards achieving environmental sustainability (D.-X. Zhao et al., 2015).

Furthermore, customers may be more inclined to join green activities if they feel more trusted. Additionally, it has been discovered that one of the key motivators for purchasing eco-friendly goods is trust (Ahmad et al., 2022).

Various studies on Green construction have been conducted in Hong Kong, Australia, Nigeria, U.S.A, U.K, Kuwait , Qatar, Ghana, Taiwan, South Africa, Finland, South Africa, Malaysia, Vietnam & China (AlSanad, 2015; Ahmad et al., 2022; Agbajor & Mewomo, 2022). However, their results empirically exhibited that the adoption of GBs differs from nation to nation. In Pakistan there is little evidence that green trust act as a mediator between Sense of community belonging and Sustainable green buildings Similar to this, it is also widely believed that there may be various reasons influencing the adoption of green buildings in Pakistan.

Therefore, it is proposed that:

H5: Green Trust Mediates the Relation between Sense of Community Belonging and the Adoption of Sustainable Green Buildings.

2.3.6 Green Trust Mediates the Relationship between Environmental Awareness and Sustainable Green Buildings

Environmental awareness and sustainable green buildings have gained significant attention in recent years as society becomes increasingly concerned about the environmental impact of human activities (Ha et al., 2022). Within this context, the concept of green trust has emerged as a critical factor in fostering sustainable behaviors and promoting the adoption of green building practices (de Sio et al., 2022). Consumers' strong emotional connections to environmental protection could aid manufacturers in developing products that are less harmful to the environment (Hameed & Waris, 2018). This literature review aims to explore the mediating effect of green trust on the relationship between environmental awareness and sustainable green buildings. By examining relevant studies, this review highlights the significance of green trust in promoting environmentally conscious behaviors and sustainable building practices. Because it encourages long-term connections and increases loyalty between business owners and their clients or consumers, trust is a crucial component of both commercial and sustainable growth (Karatu & Nik Mat, 2015). Furthermore, it has been discovered that trust is one of the key motivators for purchasing eco-friendly goods (Ahmad et al., 2022).

Yue et al. (2020) emphasized that the absence of trust can negatively impact consumers' inclination towards purchasing green products. It is crucial to establish trust in the minds of consumers, as the failure to do so can potentially undermine the viability of the green market in the future.

Many authors in the past acknowledged that green trust is a strong determinant of purchase intention (Ahmad et al., 2022; Yue et al., 2020; Punyatoya, 2014). Despite the fact that these authors' researches used diverse demographics, methods of analysis, and backgrounds, these writers came up with a good conclusion that suggested a strong association existed between trust and the desire to make green purchases. Sustainable building construction is experiencing rapid global popularity (Alnahhal et al., 2021). However, in Pakistan, there is a lack of awareness and adherence to such practices, especially in the residential sector (Azeem

et al., 2020). Pakistan, with its fifth-largest population, high urbanization rate, and rapid economic growth, is expected to witness a substantial increase in residential building construction in the near future. As the demand for new houses remains high, there exists a significant opportunity to promote the concept of sustainable buildings in Pakistan's residential sector (Khahro, Kumar, et al., 2021). Limited researches examined how consumers purchase intention enables them to adopt green sustainable buildings.

Therefore, it is proposed that:

H6: Green trust mediates the relation between environmental awareness and the adoption of sustainable green buildings.

2.3.7 Green Trust Mediates the Relationship between Government Support and Sustainable Green Buildings

Without the presence of legislative regulations that employ incentives and impose restrictions on activities that pollute or contaminate the environment, it is highly improbable that the escalating challenges posed by climate change and carbon emissions will ever be effectively addressed (Zhao & Zhang, 2023).

Green Trust is essential for sustainable green building principles to be adopted and put into reality. Studies have indicated that individuals with higher levels of trust in green initiatives are more likely to support and invest in sustainable green buildings (Doan et al., 2017). When individuals have a high level of trust in government initiatives, they are more likely to perceive government support as credible and reliable, thereby increasing their intention to engage in sustainable building practices. However, scholars have observed a concerning trend: while environmental pollution continues to worsen, people's awareness of environmental protection is gradually increasing (Punyatoya, 2014). This presents a paradoxical situation. As individuals become more aware of the severity of environmental pollution, their satisfaction with environmental governance diminishes, leading to a further erosion of trust in the government (Ruan, Qiu, Chen, Liu, & Ma, 2022).

Governments from all around the world have implemented a number of policies and programs over the years to improve economic growth, sustainability, and living standards (Songling et al., 2018). In recent years, Pakistan has started to address the growing ecological and environmental challenges (Farooq & Yaqoob, 2019). When examining the link between environmental issues and environmental policies, the government in Pakistan is concerned about the actual implementation of these policies and its effectiveness in practice (K. Hussain et al., 2019). The Pakistan Green Building Council (PGBC) serves as the exclusive representative of the World Green Building Council within Pakistan. The council plays a crucial role in advocating, promoting, and developing region-specific green guidelines, as well as certifying sustainable and green building practices and products in the country (Pakistan Green Building Council, n.d.) but for it is a non-profit organization and its work is voluntary.

The literature has shown significant interest in the topics of green trust and government support, as policymakers and scholars aim to comprehend how governments can effectively promote the growth of green industries and facilitate the adoption of sustainable practices (Khahro, Kumar, et al., 2021). Trust is recognized as a crucial indicator for fostering citizens' participation and establishing a constructive relationship between the government and the public (Khan et al., 2021). The council plays a crucial role in advocating, promoting, and developing region-specific green guidelines, as well as certifying sustainable and green building practices and products in the country (Pakistan Green Building Council, n.d.) but for it is a non-profit organization and its work is voluntary.

Warren et al. (2014) in his study highlighted the importance of institutions taking proactive measures to promote trust among citizens, thereby establishing a participatory and collaborative relationship between the government and the public. Furthermore, trust emerges as a significant challenge for governments in developing countries when it comes to implementing sustainable projects (Khahro, Kumar, et al., 2021).

Therefore, it is proposed that:

H7: Green trust mediates the relation between government support and the adoption of sustainable green buildings.

2.4 Conceptual Framework

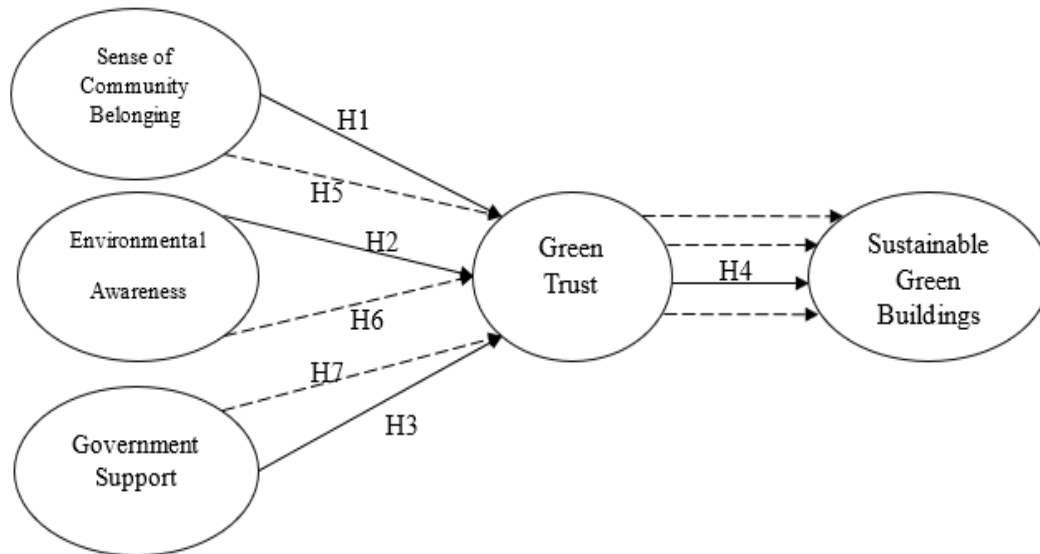


FIGURE 2.1: Conceptual Framework

Source: (Wang et al., 2019; Portnov et al., 2018; Tran et al., 2020; Chrisjatmiko, 2018; do Valle, Guerreiro, & Mendes, 2015).

2.5 Literature Summary

Chapter Two provides an in-depth analysis of the existing literature, serving as the foundation for this study on the adoption of sustainable green buildings in Pakistan. By identifying research gaps, the chapter develops hypotheses and a conceptual framework. Additionally, the literature review delves into various factors that contribute to the adoption of sustainable green buildings, including the sense of community belonging, environmental awareness, and government support. The relationship between these factors and green trust is thoroughly examined, followed by an exploration of the mediating effect of green trust on the three independent variables and their impact on sustainable green buildings.

Chapter 3

Research Methodology

3.1 Introduction

Previous chapters of this thesis have examined the literature on sustainable green buildings, revealing a notable concentration of studies conducted in South Africa, China, Kuwait, the United States, and Indonesia (Berawi et al., 2019; Darko et al., 2017; AlSanad, 2015; Agbajor & Mewomo, 2022; Ahmad et al., 2022). However, there is a scarcity of research conducted in Pakistan on this subject. Consequently, this thesis aimed to fill this research gap by shedding light on the factors influencing the adoption of sustainable green buildings, with a particular focus on the mediating role of green trust. The research methodology section explained the specific approaches employed by the researcher to evaluate the validity of the proposed hypotheses. It is essential for the researcher to provide a clear and comprehensive explanation of the applied methods. This section encompassed various aspects, such as research paradigm, research design, population, sampling technique, unit of analysis, time horizon, instrument development, data collection, and data analysis techniques employed to validate the proposed hypotheses.

3.2 Research Paradigm

A research paradigm encompasses the fundamental philosophical and theoretical framework that directs a researcher's study (Hovorka & Lee, 2010). It establishes

the underlying assumptions, beliefs, and principles that shape the researcher's perspective and impact their selection of research methods and data analysis techniques.

Keeping in view the research setting of this thesis we have adopted the positivism paradigm as it facilitated the acquisition of solid empirical evidence and data. Within this design the deductive reasoning approach was employed, by doing so we strive to achieve objectivity, replicability, and generalizability in our findings.

3.3 Population

In the context of research, a population or universe refers to the particular area or group of interest that the researcher seeks to explore. It is crucial to identify the correct population since an incorrect definition or identification of the population can have a major negative impact on the validity, generalizability, and reliability of the study findings.

Our research aims to uncover the factors influencing the adoption of sustainable green buildings in Pakistan. To achieve this goal, we focused on studying consumers who are potential future buyers or tenants of real estate properties in the country. Given the scale of the task, we chose to narrow our study to internet users in Pakistan, a population estimated to be around 127 million (Pakistan Telecome Authority Indicators, 2023) which is 53.65% of Pakistan's total population i.e., 235,824,862 according to (Bank, 2014). This selection offered advantages in terms of rapid data collection and cost-effectiveness.

Considering the impracticality of surveying the entire population of internet users, we opted to focus our efforts on a specific region: the province with the highest number of internet users. This decision was informed by data from the Pakistan Bureau of Statistics (PBS), which conducted a survey involving 24,809 households across Punjab, Khyber Pakhtunkhwa (KPK), Sindh, Baluchistan, and the Federal Capital Territory. The results of this survey highlighted Punjab as having the most significant proportion of Information and Communication Technology (ICT) skills, along with the highest percentage of internet users (15 per 1000) according to (Shair, Waheed, Kamran, & Kubra, 2022).

Furthermore, data from the Population Welfare Department of the Government of Pakistan (GOP) revealed that Punjab’s urban population stands at approximately 40 million. We meticulously explored the population in question by delving into their behavioral, psychographic, and demographic tendencies concerning green purchasing decisions. This comprehensive approach allows us to better understand the cues that steer individuals towards embracing environmentally sustainable practices within the real estate sector. By focusing on the province with the most substantial internet user base and its urban population, we were able to draw meaningful insights that contributed to our understanding of the factors driving the adoption of sustainable green buildings in Pakistan.

TABLE 3.1: Behavioral, Psychographic and Geographic Characteristics of Respondents

Geographic	
Country	Pakistan
Region	Punjab
Psychographic	
Lifestyle	Eco friendly lifestyle
	Self sufficient
	Minimalistic lifestyle
	Sustainable lifestyle
	Conscious lifestyle
Social Status	Elite Class
	Upper Class
	Middle Class
	Working Class
Behavioral	
Purchase Behavior	Purchase less environmental harmful products
	Purchase harmful but cheaper products
	Purchase environmental friendly products regardless of price
	Purchase products easily available regardless of the consequence

3.4 Sample Size and Sampling Technique

Due to time and resource constraints posed by extensive population data, researchers often select a sample for data collection, enabling generalization to the

larger population. The selected sample aims to mirror the complete population, ideally encompassing all its traits. In social sciences, utilizing sampling techniques is both frequent and advisable due to their efficiency in time and cost compared to a full population survey. Sampling empowers researchers to derive significant insights and extend conclusions about the entire population from a subset of data.

The two fundamental categories into which sampling techniques can be divided into are probability sampling and non-probability sampling. The use of a non-probability sampling technique is advised for data collecting in circumstances when the precise number of the population, such as the potential future buyers or tenants of real estate property in Pakistan, is uncertain. Hence, in order to obtain data for the study, this study used a non-probability sampling strategy, specifically the snowball sampling technique.

Snowball sampling is ideal for our study as it allowed us to access participants who possessed specific characteristics, such as an interest in sustainable green buildings. With careful selection the survey was shared individually to a small group of initial participants through email, who were part of environmental groups, online forums and social media communities related to sustainability and real estate. These participants were then requested to share the survey with others who share similar interests in Punjab and the other participants were requested to do the same. This created a chain reaction that expanded the sample. This approach was particularly employed because of our hard-to-reach population and the absence of a defined sampling frame.

By using snowball sampling and building on referrals, we gathered a varied and suitable sample that truly mirrors people's opinions on sustainable green buildings. In order to ensure that only individuals meeting the desired criteria of potential real estate buyers or tenants are referred, a filter question is included at the start of the questionnaire. "Do you intend to build or buy a house in the next 5 years?" This question acted as a screening mechanism, enhancing data quality by allowing only participants who align with the study's objectives to proceed with the survey. The sample size for the study was determined using the calculations provided by Krejcie and Morgan in their work in 1970, as outlined in **Table 3.2**. [Krejcie and](#)

Morgan (1970) According to these calculations, it was deduced that, for quantitative research methods, a sample size of 384 at a 95% confidence level would be sufficient for a population size of one million or more.

TABLE 3.2: Sample Size Table by Krejcie and Morgan

Population Size	Calculated Size of Sample 95% confidence level
100	80
500	217
1,000	278
5,000	357
10,000	370
50,000	381
1,000,000	384

The primary objective of this study, as indicated in Table 3.2, was to attain a sample size of 384 or more, which can effectively represent the target population. To achieve this goal, the questionnaire was carefully designed to assess participants intentions towards the adoption of sustainable green buildings in Pakistan. .

3.5 Data Analysis Technique

The data used to evaluate this study was obtained through the survey questionnaire technique. A seven-point Likert scale questionnaire is used to conduct the survey within the selected sample from the population. With seven response options, the Likert scale provides a greater level of sensitivity compared to scales with fewer points. This allows respondents to express their opinions and attitudes more accurately and thoughtfully. Seven-point Likert scales seem to possess the sensitivity required to capture a more precise assessment of an interface, all the while maintaining a reasonably concise format. Moreover, these scales seem to match well with the online distribution of usability surveys (Finstad, 2010).

The survey questionnaire was distributed among the target population to gather the necessary data for analyzing the relationship between sense of community belonging, environmental awareness government support, and the mediating role of green trust in translating into the adoption of sustainable green buildings in

Pakistan. The collected data is in numeric format, allowing for analysis using software such as PLS SEM (Partial Least Squares Structural Equation Modeling). According to [Shiyab, Ferguson, Rolls, and Halcomb \(2023\)](#) Online surveys have an average response rate that is 12% lower than surveys delivered in other ways. Hence, 800 survey questionnaires were sent out to online via Google Docs to the targeted population to achieve our desired sample size. .

3.6 Measurement Constructs

Data collection is a critical and complex process, and in this research thesis, questionnaires were employed to gather the required data. These questionnaires were adapted from previous studies conducted by various authors. Table 3.3 presents the three factors affecting the adoption of SGBs in Pakistan i.e., namely sense of community belonging, environmental awareness and government, along with the number of items included. To gather the opinions of the respondents, a Seven-point Likert scale was utilized in this research thesis. This scale was chosen with the aim of providing respondents with more options to express their opinions and ensuring their comfort in answering the questions.

3.7 Scale Adoption

The scale development process was undertaken systematically, starting with the independent variables, followed by the mediator and dependent variables. This approach ensured a comprehensive and well-structured measurement of the constructs involved in the study. By first developing scales for the independent variables, the researcher established a clear foundation for capturing the relevant factors influencing the mediator Green Trust and dependent variable SGBs. Subsequently, the mediator variable was measured, allowing for a thorough assessment of its role in the relationship between the factors affecting the adoption of sustainable green buildings. Finally, scales were developed to capture the constructs of the dependent variable, enabling a comprehensive understanding of its manifestation.

TABLE 3.3: Measurement of Scales

Variable	Source	No of Items	Established Cronbach Alpha
Sense of community belonging	(Wang et al., 2019)	4	0.88
Environmental Awareness	(do Valle et al., 2015)	5	0.727
Government Support	(Tran et al., 2020)	3	0.759
Green Trust	(Chrisjatismiko, 2018)	4	0.902
Sustainable Buildings	(Portnov et al., 2018)	5	-

3.7.1 Exogenous Variables

This research encompasses three independent variables

3.7.1.1 Sense of Community Belonging

A sense of community belonging is defined as “an emotional commitment to a place that resides in and is considered to belong to”

The scales have been adopted from the article “An Empirical Analysis of the Factors Affecting the Adoption and Diffusion of GBTS in the construction market” by (Wang et al., 2019).

3.7.1.2 Environmental Awareness

The term means exactly being conscious of the environment and choosing actions that do not harm the planet.

This scale has been adapted from the article “Environmental awareness of tourists: A fact or a myth? *Tourismos*” by (do Valle et al., 2015).

The original scale consisted of a total of 15 items, which served as the basis for our study. However, in order to meet the specific requirements of our research, we made adaptations to five of these items. This ensured that the scale remained relevant and tailored to the particular context and objectives of our study. By

modifying these specific items, we aimed to enhance the scale's applicability and accuracy in measuring the variables under investigation.

3.7.1.3 Government Support

Key factors that affect government support for green building include a commitment to GB, the availability and enforcement of financial and non-financial incentive policies to encourage green building, and the definition and enforcement of technical rules and legal laws related to green building. This scale has been adopted from the article "Empirical Examination of Factors. The Perspective of Construction Developers in Developing Economies" by (Tran et al., 2020).

3.7.2 Mediator

3.7.2.1 Green Trust

"Green trust" is defined as the tendency to rely on a product, service or brand out of a belief or expectation resulting from its capability with respect to environmental performance. Our study utilized a scale that was derived and adapted from the research article titled "Towards green loyalty: the influences of green perceived risk, green image, green trust, and green satisfaction" authored by (Chrisjatismiko, 2018). This article served as a valuable foundation for our study. In order to ensure the relevance and applicability of the scale to our specific research objectives, we made careful adaptations to align it with the context and variables under investigation. By incorporating insights from Chrisjatismiko's work and tailoring the scale accordingly, we aimed to enhance the measurement accuracy.

3.7.3 Endogenous Variable

3.7.3.1 Sustainable Green Buildings

Sustainable Green Buildings brings together a wide range of procedures and methods to lessen the negative effects of structures on the use of resources, the environment, and human health.

This scale has been adopted from the article “Factors affecting homebuyers’ willingness to pay green building price premium: Evidence from a nationwide survey in Israel” by (Portnov et al., 2018).

Our study drew upon a research article as the foundation for our measurement scale. Specifically, we referred to the original study, which consisted of a comprehensive set of nine items. From this initial pool, we conducted a meticulous selection process to identify and include five items that were particularly relevant to our research objectives. This careful selection was undertaken with the intention of aligning the scale with the specific variables and context under investigation. By focusing on the most pertinent items, we aimed to enhance the precision and accuracy of our measurement tool, thereby ensuring its suitability for our study.

By leveraging the insights and findings from the original research, we not only benefited from a robust starting point but also ensured that our study maintained consistency with previous work in the field. This approach enabled us to build upon existing knowledge while customizing the scale to address our unique research questions.

3.8 Instrument Reliability and Validity

In this research thesis, the reliability of the research instruments was assessed using a widely recognized method known as the Cronbach alpha method. The primary objective of this assessment was to validate the reliability of the data collected for the study. The Cronbach alpha method is a statistical technique that measures the internal consistency of a set of items or scales. It calculates a reliability coefficient, which ranges between 0 and 1, indicating the extent to which the data is reliable for research purposes. To ensure the validity of the data, the Cronbach alpha method requires that the values of the items fall within the range of 0 to 1. Values within this range indicate that the data is reliable and consistent, allowing for confident interpretation and analysis.

The chapter 4 of this research thesis is dedicated to further investigating and discussing the reliability of the collected data. Through this investigation, we aim

to provide a comprehensive assessment of the reliability of the research instruments and establish the trustworthiness of the data used in this study.

3.9 Data Collection Procedures and Methods

We made a dedicated effort to collect data from individuals in Pakistan interested in real estate transactions, especially those planning to buy or build a house within the next five years. To ensure data integrity and accuracy, we carefully filtered out respondents who were not a fit for our study.

To achieve this, we designed a cover letter accompanying the questionnaires. This cover letter served as an introduction to the research objectives and included a discerning filter question. The filter question was pivotal in precisely identifying individuals who aligned with our study's defined target audience—those considering a real estate transaction within the specified timeframe. Additionally, we paid deliberate attention to maintaining a symmetrical design in the cover letter, aiming for a professional and visually appealing layout. This intentional design significantly improved the cover letter's effectiveness in engaging and guiding the respondents, resulting in more meaningful and accurate data.

Participants were assured that their data would be used solely for educational purposes, instilling confidence and trust. The questionnaires were distributed using Google Docs, a convenient and time-saving method, with the intended target audience. The link to the questionnaire was shared online on social media platforms e.g., Facebook and Instagram groups interested in topics like green construction, modern housing options, ecofriendly houses etc., in Pakistan. Questionnaires were also distributed through targeted emails to the desired respondents. Through this approach a total of 654 responses were collected. 94 responses found to be incomplete or inaccurate and 137 responses were filtered out at the beginning as a result a total of 466 questionnaires were evaluated.

By employing a diligent and straightforward approach to data collection, the research aimed to overcome the challenges of gathering information from individuals in Pakistan. The use of clear instructions, a filter question, and a trusted platform like Google Docs helped ensure that the data collected was reliable and relevant.

3.10 Data Analysis

3.10.1 Smart PLS 4.0

The measurement model and the structural model were both estimated in the research thesis using the SMART PLS 4.0 method. Smart PLS 4.0 was selected for its relevance to our study based on several advantages. Firstly, its user-friendly interface accommodates researchers with diverse levels of expertise. Secondly, it effectively manages non-normal data distributions, ensuring precise analysis. Additionally, the software incorporates advanced features in line with contemporary research requirements. Notably, it streamlines mediation analysis by seamlessly integrating it within a unified model, simplifying our investigation into the mediating influence of green trust. These aspects collectively affirm Smart PLS 4.0 as a robust choice for our study. The measurement model was employed to assess the effects and test the hypotheses, while the structural model examined the reliability and validity of the data. Notably, this approach offered advantages such as working with larger sample sizes and not requiring assumptions of data normality due to the implementation of bootstrapping procedures (Koong, Liu, & Liu, 2002). In recent years, PLS-SEM has gained significant popularity across various research disciplines, including marketing and business. This methodological choice not only provided a broader scope for analysis but also ensured greater theoretical parsimony and improved the predictive capabilities of models with intricate relationships

3.11 Summary Research Methodology

This chapter commenced by establishing the research paradigm, providing a solid foundation for the study. Subsequently, an examination of the selected population was conducted, followed by a comprehensive discussion on the determination of the appropriate sample size for this thesis.

The subsequent section focused on outlining the procedural aspects and the methodology employed for data collection. This included a detailed account of the scale

development process and the meticulous setup of variables. Each variable was carefully defined and operationalized to ensure clarity and consistency in measurement. To analyze the collected data, the sophisticated SMART PLS 3.0 software was utilized, which offered advanced capabilities for both the measurement and structural models. This software facilitated a robust data analysis process, enabling the evaluation of relationships and effects within the measurement model, as well as examining the reliability and validity of the data through the structural model.

Chapter 4

Results and Analysis

4.1 Respondents

The survey was conducted using Google Docs amongst the potential future buyers or tenants of any type of real estate properties in Pakistan. (Appendix A, Survey Questionnaire).

The survey Questionnaires were disseminated electronically, through online platform Google Docs. A total of 654 responses were received, out of which 94 were deemed incomplete and inaccurate, and 137 responses were excluded at the beginning of the survey as they did not meet the study's criteria. This resulted in 423 questionnaires being evaluated, which is considered a good representation of our target population.

The response rate was calculated to be 81.75% with a usable response rate of 58.25%. **Table 4.1** shows the response rate for the data collected to analyze.

TABLE 4.1: Response Rate

Questionnaire Returned	Usable Questionnaire	Response Rate%	Usable Response Rate %
654	423	81.75%	52.87%

4.2 Descriptive Analysis

Unlike other statistical tools such as EQS, AMOS, and LISREL, Partial Least Squares (PLS) does not demand a large sample size, as supported by (Aftthanorhan, 2013).

The participants in the main quantitative study were categorized based on their behavioral and psychographic and demographic characteristics. The survey included questions about their lifestyle, purchase behavior, social status, and income level.

4.2.1 Lifestyle

The **Table 4.2** presents lifestyle choices of the respondents. The most popular choice is "Eco-friendly lifestyle," selected by 50.4% of the respondents. "Self-sufficient" and "Minimalistic lifestyle" were chosen by 13.2% and 11.1% of respondents, respectively. "Sustainable lifestyle" was preferred by 17.3%, and "Conscious lifestyle" by 8%. Overall, 92.0% of respondents have adopted environmentally conscious lifestyles, demonstrating a notable interest in sustainable and eco-friendly living choices.

TABLE 4.2: Lifestyle Distribution

		Lifestyle				
		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Eco friendly lifestyle	213	50.4	50.4	50.4	
	Self Sufficient	56	13.2	13.2	63.6	
	Minimalistic Lifestyle	47	11.1	11.1	74.7	
	Sustainable Lifestyle	73	17.3	17.3	92	
	Conscious Lifestyle	34	8	8	100	
	Total	423	100	100		

Figure 4.1 reveals that the highest number of responses is observed in the first category which is ecofriendly lifestyle, indicating a skew in the data towards this group. This suggests that the sample population predominantly consists of individuals with Eco friendly lifestyles.

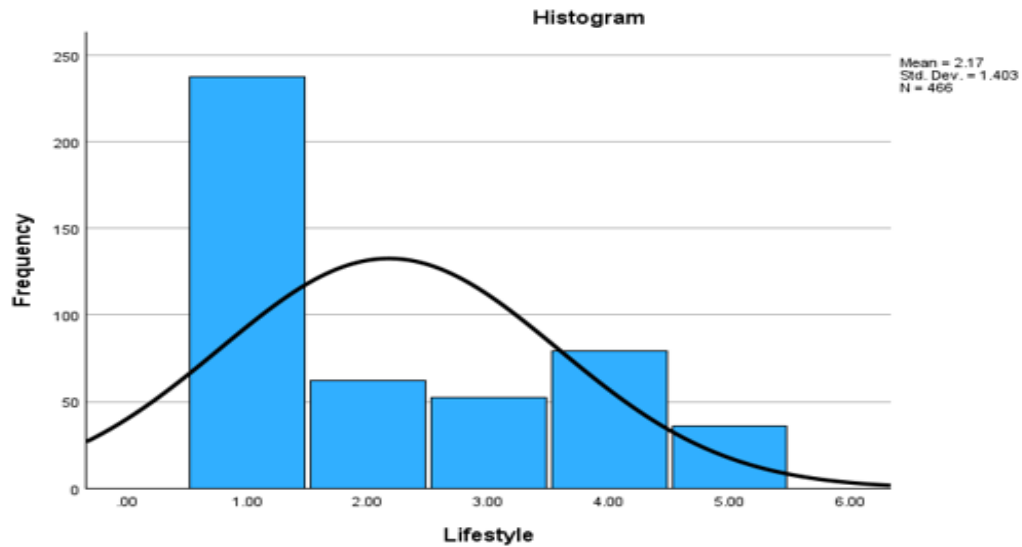


FIGURE 4.1: Lifestyle Histogram

4.2.2 Social Status

The **Table 4.3** displays respondents' social status, with the largest group being the "Middle Class," comprising 41.8% of the total. The "Upper Class" and "Working Class" follow, with 22.5% and 17.5% of respondents, respectively. The "Elite Class" represents 18.2% of respondents. Overall, the "Middle Class" category has the highest cumulative percentage, accounting for 82.5% of the respondents, signifying its prominent presence in the sample.

TABLE 4.3: Social Status Distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Elite Class	77	18.2	18.2	18.2
	Upper Class	95	22.5	22.5	40.7
	Middle Class	177	41.8	41.8	82.5
	Working Class	87	17.5	17.5	100
	Total	423	74	100	

Figure 4.2 reveals that the highest number of responses is observed in the third category which is middle class, indicating a skew in the data towards this group. This suggests that the sample population predominantly consists of individuals belonging to the middle class.

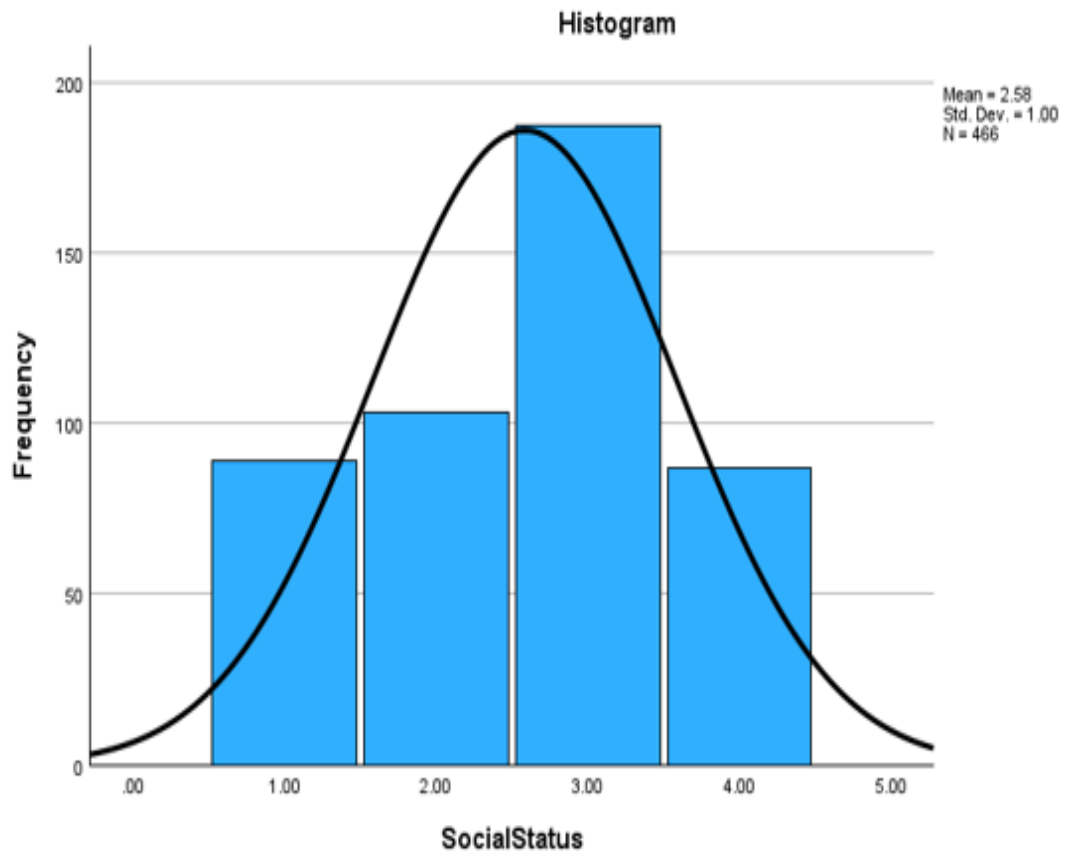


FIGURE 4.2: Social Status Histogram

4.2.3 Purchase Behavior

The **Table 4.4** illustrates respondents' purchase behavior. The largest group was identified by 37.4%. These were the respondents who choose to buy environmentally friendly products, regardless of price. Additionally, 35.9% prefers to purchase less environmentally harmful products. There are also individuals 9.9% who opt for cheaper but potentially harmful products, while 16.8% prioritize convenience over the environmental impact of their purchases. Furthermore, Figure 4.3 shows a normal curve of purchase behavior of the data.

TABLE 4.4: Purchase Behavior Distribution

		Purchase Behavior		Valid	Cumulative
		Frequency	Percent	Percent	Percent
Valid	Purchase less environmental harmful products	152	35.9	35.9	35.9
	Purchase harmful but cheaper products	42	9.9	9.9	45.9
	Purchase environmental friendly products regardless of price	158	37.4	37.4	83.2
	Purchase products easily available regardless of the consequence	71	16.8	16.8	100
	Total	423	100	100	

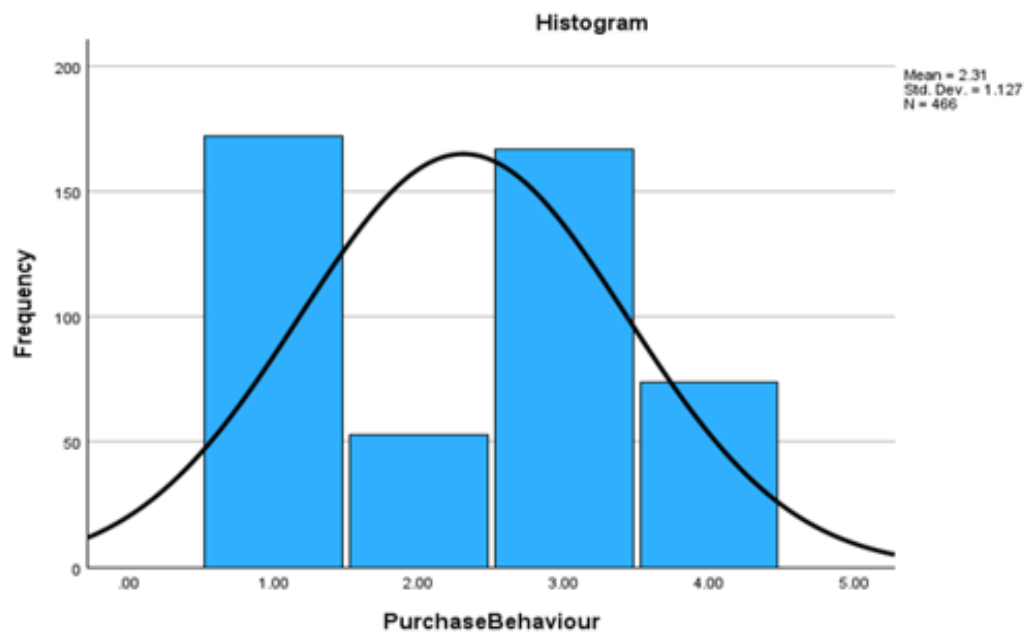


FIGURE 4.3: Purchase Behavior Histogram

The comprehensive summary of the respondents' psychographic and behavioral characteristics is provided in **Table 4.6**.

TABLE 4.5: Behavioral & Psychographic Characteristics of Respondents

Major Segmentation Variables	Category	Frequency	Percentage (%)
<i>Psychographic Segmentation</i>			
Lifestyle	Eco friendly lifestyle	213	50.4
	Self sufficient	56	13.2
	Minimalistic lifestyle	47	11.1
	Sustainable lifestyle	73	17.3
	Conscious lifestyle	34	8
Social Status	Elite Class	77	18.2
	Upper Class	95	22.5
	Middle Class	177	41.8
	Working Class	74	17.5
<i>Behavioral Segmentation</i>			
Purchase Behavior	Purchase less environmental harmful products	152	35.9
	Purchase harmful but cheaper products	42	9.9
	Purchase environmental friendly products regardless of price	158	37.4
	Purchase products easily available regardless of the consequence	71	16.8

4.3 Missing Data

The link to the questionnaire was shared online on social media platforms e.g., Facebook and Instagram and WhatsApp groups interested in real estate and topics e.g., green construction, modern housing options, ecofriendly houses etc., in Pakistan. Questionnaires were also distributed through targeted emails to the desired respondents. Consequently, out of 800 survey questionnaires, 654 survey questionnaires were returned. Out of these 654-survey questionnaire's, 94 had some sort of omission and some were not filled properly so these responses were deleted. At the same time 137 questionnaires were filtered as they were not a part of our survey.

These efforts allowed us to analyze complete data set and was more powerful than analyzing the incomplete data set. A summary showing a comparison of the original and final sample size is presented in **Table 4.7**.

TABLE 4.6: Original and Final Sample Size

Country	Population	Internet Users in Pak	Original Sample	Final Sample
Pakistan	235 million	127 million	384	423

4.4 Model Evaluation (Smart PLS 4.0)

SMART PLS 4.0, a program well known for its ability to effectively handle complex models in Partial Least Squares Structural Equation Modeling (PLS-SEM), was used to analyze the data for this study (Hair, Risher, Sarstedt, & Ringle, 2019).

After building the inner and outer model, the indicators and latent variables were linked together and the model was run in smart pls 4. In the first run the item GT4 had factor loading below 0.5 and were found to have a negative impact on the overall variance extracted, resulting in a lower average. As a solution, this item was removed from the model. Subsequently, when the data was reanalyzed for path model estimation in a second run, it was observed that all items now exhibited factor loadings exceeding 0.5 (Wilden, Gudergan, Nielsen, & Lings, 2013).

4.5 Measuring the Inner and Outer Model

The PLS-SEM model consists of two integral components. The first component is the measurement model, which assesses the reliability and validity of the observed variables used to measure the latent constructs. It helps to ensure the accuracy and robustness of the measurement process. The second component is the structural model, which elucidates the relationships between the latent constructs. This component examines the interconnections and influences among the constructs to understand the underlying patterns and associations in the data. (Aftanorhan, 2013).

4.6 Assessment of Measurement Model

The evaluation of construct quality in the study is determined through the examination of the measurement level. The process of assessing quality begins by reviewing factor loadings, which is then followed by establishing both construct reliability and construct validity.

4.6.1 Factor Loadings

In our study, only GT4 had loading less than the recommended threshold of .50 as suggested by Hair et al. in 2019 and was removed. Factor loading measures the degree to which each item in the coordination metrics is associated with the specific principal component. Factor loadings can vary between -1.02 and positive 1.0, with larger absolute values indicating a stronger correlation between the item and the underlying factor. (Pett et al., 2003). None of the items in the study had factor loading less than the recommended value of .50, (Hair et al., 2019). Hence no items were removed.

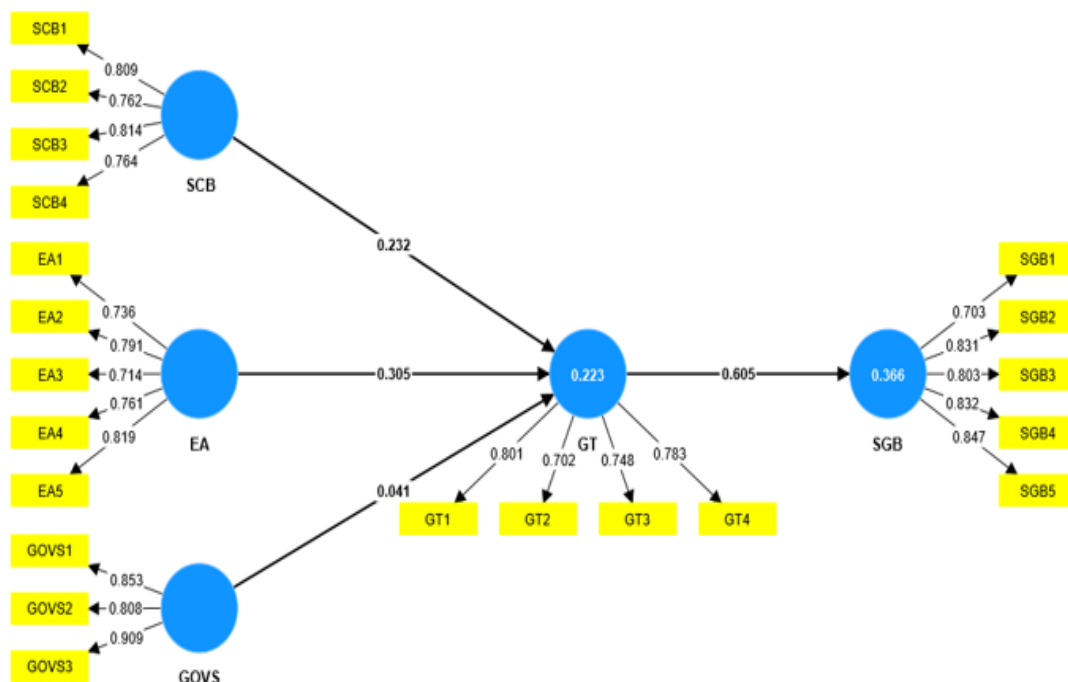


FIGURE 4.4: Structural Model

TABLE 4.7: Factor Outer Loadings

	SCB	EA	GOVS	GT	SGB
SCB1	0.809				
SCB2	0.762				
SCB3	0.814				
SCB4	0.764				
EA1		0.736			
EA2		0.791			
EA3		0.714			
EA4		0.761			
EA5		0.819			
GOVS1			0.853		
GOVS2			0.808		
GOVS3			0.909		
GT1				0.801	
GT2				0.702	
GT3				0.748	
GT4				0.783	
SGB1					0.703
SGB2					0.831
SGB3					0.803
SGB4					0.832
SGB5					0.847

Note: SCB = Sense of Community Belonging, EA = Environmental Awareness, GOVS = Government Support, GT = Green Trust, SGB = Sustainable Green Buildings

4.6.2 Measuring the Internal Consistency

Internal consistency refers to the degree of coherence and similarity among multiple items or questions within a measurement instrument. It evaluates how well these items, designed to measure the same construct, yield consistent and comparable results. In other words, it assesses the extent to which the items in a scale or questionnaire are homogenous and effectively measure the targeted aspect.

The Internal consistency in the measurement model is mainly measured through Cronbach's Alpha and Composite reliability.

4.6.2.1 Cronbach's Alpha

A numerical statistic called Cronbach's alpha was used to evaluate the internal consistency of the measuring scale. It quantifies the average correlation between all possible pairs of items within the scale. Higher values of the alpha coefficient,

which goes from 0 to 1, denote more internal consistency. A Cronbach's alpha value approaching 1 signifies that the items in the scale are highly interrelated, effectively measuring the same underlying construct. **Table 4.9** shows the Cronbach's Alpha values for our study ranging from 0.755 to 0.863 reflecting how well the items within each construct are correlated with each other.

All construct values are above the suggested cutoff point of 0.70, demonstrating the measuring scales' high internal consistency and reliability (Cronbach, 1951).

TABLE 4.8: Cronbach's Alpha

Variables	Cronbach's Alpha Values
EA	0.824
GOVS	0.832
GT	0.755
SCB	0.796
SGB	0.863

Note: SCB = Sense of Community Belonging, EA = Environmental Awareness, GOVS = Government Support, GT = Green Trust, SGB = Sustainable Green Buildings

4.6.2.2 Composite Reliability

The Composite Reliability (ρ_c) results indicate the internal consistency of each construct in the study. Composite Reliability values represent the average inter-item correlation and demonstrate how well the items within a construct are related to each other. According to accepted standards by (Hair et al., 2019), a Composite Reliability value of 0.70 or higher is considered acceptable for reliable measurement. Looking at the results in **Table 4.10**, it is evident that all constructs meet this threshold, suggesting good to high internal consistency. The construct with the highest Composite Reliability is SGB with a value of 0.901, indicating excellent reliability. The other constructs, EA (0.876), GT (0.844), SCB (0.876), and GOVS (0.893), also exhibit good internal consistency. These findings strengthen the reliability and robustness of the measurement scales used in the study.

TABLE 4.9: Composite Reliability

Variables	Composite Reliability
EA	0.876
GOVS	0.893
GT	0.844
SCB	0.867
SGB	0.901

Note: SCB = Sense of Community Belonging, EA = Environmental Awareness, GOVS = Government Support, GT = Green Trust, SGB = Sustainable Green Buildings

4.6.3 Construct Validity

Construct validity is a critical aspect of research that evaluates how well a measurement instrument accurately measures the underlying theoretical construct it intends to assess. It evaluates the extent to which the measurement scale's items accurately capture the idea or construct they are designed to stand for. In other words, it examines whether the scale effectively measures what it claims to measure. To assess construct validity, we will use convergent validity and discriminant validity.

4.6.3.1 Convergent Validity

Convergent validity examines the extent to which different items designed to measure the same construct show high correlations with each other, typically requiring an Average Variance Extracted (AVE) value above 0.50 to establish acceptable convergent validity (Vomberg & Klarmann, 2021).

4.6.3.1.1 Average Variance Extracted (AVE)

AVE evaluates the extent to which the observed indicators of a construct effectively capture its variance, considering the influence of measurement error. AVE provides valuable insights into the proportion of the construct's variance explained by its observable indicators, thus indicating the degree of accuracy with which the items represent the underlying construct (Fornell & Larcker, 1981).

Interpretation

For the construct EA, the AVE value is 0.585, indicating that, on average, The underlying construct accounts for 58.5% of the variance in the observed variables (items). This meets the acceptable threshold for establishing convergent validity (Hair et al., 2019). The construct GOVS exhibits an AVE of 0.736, indicating that, on average, 73.6% of the variance in the observed variables is accounted for by the construct. This demonstrates good convergent validity. The construct GT has an AVE value of 0.576, which indicates that, on average, the construct accounts for 57.6% of the variance in the observed variables. The construct SCB has an AVE of 0.620, indicating that, on average, 62.0% of the variance in the observed variables is captured by the construct and for SGB, the AVE is 0.647, suggesting that, on average, 64.7% of the variance in the observed variables is accounted for by the construct. Similar to the other constructs, this value demonstrates acceptable convergent validity as it exceeds 0.50.

TABLE 4.10: Average Variance Extracted (AVE)

Variable	AVE
EA	0.585
GOVS	0.736
GT	0.576
SCB	0.62
SGB	0.647

Note: SCB = Sense of Community Belonging, EA = Environmental Awareness, GOVS = Government Support, GT = Green Trust, SGB = Sustainable Green Buildings

4.6.4 Discriminant Validity

Discriminant validity holds great significance within construct validity. It assesses the measurement instrument's capability to effectively distinguish between different constructs, thereby preventing any potential confusion or mixing between them. To evaluate discriminant validity, researchers commonly employ diverse

methods, including Fornell-Larcker criterion, Heterotrait - Monotrait (HTMT) ratio, and cross-loadings in Confirmatory Factor Analysis (CFA). Employing a combination of these methodologies enables researchers to rigorously investigate discriminant validity in their studies (Fornell & Larcker, 1981; Henseler, Ringle, & Sarstedt, 2015).

4.6.4.1 Fornell Larcker Criterion

The **Table: 4.12** provided shows the correlation matrix among different constructs: EA, GOVS, GT, SCB, and SGB. The diagonal values indicate the square root of the Average Variance Extracted (AVE) for each construct, while the values off the diagonal depict the relationships between different constructs. To assess discriminant validity using the Fornell-Larcker criterion, we compare the square root of AVE for each construct with the correlations between constructs. For discriminant validity to be established, the square root of the AVE for each construct should be greater than its correlation with other constructs (Fornell & Larcker, 1981).

Interpretation

Based on the Fornell-Larcker criterion, discriminant validity is established among the constructs if the square root of the AVE for each construct is greater than the correlations with other constructs. Looking at the **Table 4.12**, it is affirmed that the square roots of EA, GOVS, GT, SCB and SGB were greater than the other correlation values amongst the variables.

In summary, the Fornell-Larcker criterion confirms that discriminant validity is established among all the constructs in the study.

4.6.4.2 Hetrotrait- Monotrait Ratio (HTMT)

The Heterotrait-Monotrait (HTMT) ratio of correlations is a valuable method employed in PLS-SEM to assess discriminant validity. It offers an alternative approach to evaluate the degree of distinctiveness between constructs.

The HTMT ratio falls within the range of 0 to 1, with lower values indicating stronger discriminant validity. Researchers commonly consider a threshold of 0.85

TABLE 4.11: Fornell-Larker Criterion

	EA	GOVS	GT	SCB	SGB
EA	0.765				
GOVS	0.028	0.858			
GT	0.427	0.055	0.759		
SCB	0.522	0.021	0.392	0.788	
SGB	0.56	0.034	0.605	0.458	0.805

Note: SCB = Sense of Community Belonging, EA = Environmental Awareness, GOVS = Government Support, GT = Green Trust, SGB = Sustainable Green Buildings

or below as an accepted criterion for satisfactory discriminant validity. If the HTMT ratio is below 0.85, it implies that the constructs are clearly distinguishable and exhibit satisfactory levels of discriminant validity (Henseler et al., 2015).

Interpretation

In the **Table 4.13**, the HTMT (Heterotrait-Monotrait) ratios are provided to assess the discriminant validity between pairs of constructs. The outcomes reveal that all HTMT ratios are below the widely accepted threshold of 0.85, which confirms the presence of satisfactory discriminant validity (Kline, 2016). These results demonstrate that each construct is distinct from others and exhibits minimal overlap, indicating their effective differentiation.

TABLE 4.12: HTMT Ratio

	EA	GOVS	GT	SCB	SGB
EA					
GOVS	0.055				
GT	0.522	0.09			
SCB	0.638	0.073	0.501		
SGB	0.654	0.06	0.743	0.55	

Note: SCB = Sense of Community Belonging, EA = Environmental Awareness, GOVS = Government Support, GT = Green Trust, SGB = Sustainable Green Buildings

4.7 Assessment of Structural Model

The structural model helps to understand the relationships between latent constructs by estimating the path coefficients (beta coefficients) that represent the strength and direction of the relationships and coefficients of determination (R^2).

The structural model allows researchers to test hypotheses and understand the causal relationships between different constructs in the study (Hair et al., 2019).

4.7.1 Estimating Path Coefficients

Estimating path coefficients involves using beta values, t-statistics, and p-values to determine the strength and significance of the relationships between variables in a structural equation model (SEM) or path analysis.

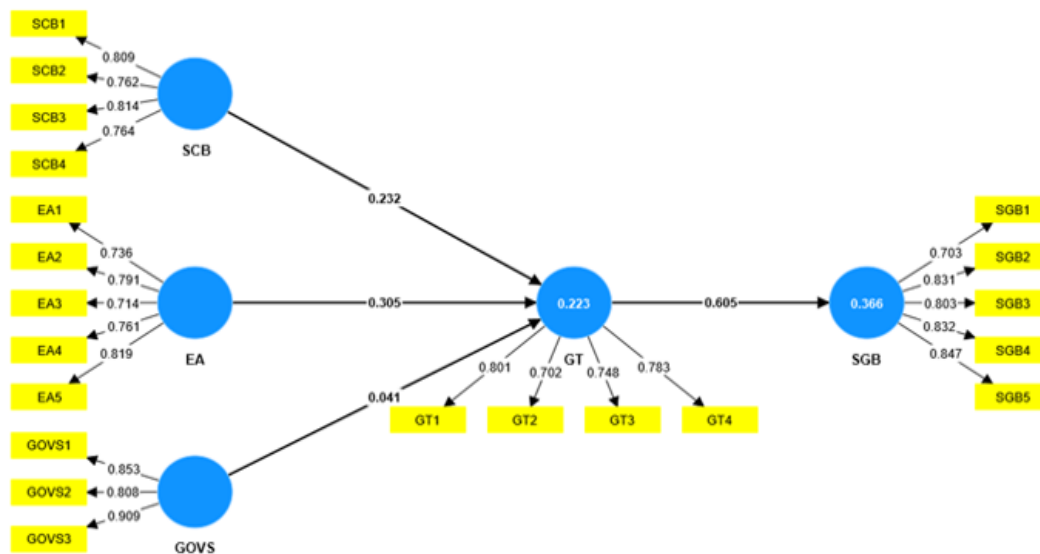


FIGURE 4.5: Estimating Path Coefficients

Interpretation

The presented table provides essential information, including beta coefficients, sample means, standard deviations, t-statistics, and p-values, for various relationships within the structural model. The beta values indicate the direction and strength of the relationships, where larger beta values represent stronger associations. The p-values and t-statistics demonstrate the statistical significance of the relationships. The p-values falling below the commonly accepted threshold of 0.05 tells the significance of the relationships at a 95% confidence level (Kline, 2016).

The analysis of the relationships (EA → GT, GOVS → GT, GT → SGB, and SCB → GT) indicates important findings. The relationship between "EA" and "GT" shows a significant positive association (beta coefficient = 0.305, T statistic = 4.089, P = 0.000). On the other hand, the "GT" → "SGB" relationship exhibits

a strong positive association (beta coefficient = 0.605, T statistic = 12.271, P = 0.000), and similarly, "SCB" → "GT" displays a positive association (beta coefficient = 0.232, T statistic = 3.349, P = 0.001).

However, the GOVS → GT relationship, with a beta coefficient of 0.041, is considered not statistically significant based on the T statistic of 0.788 and a corresponding P value of 0.431. When a relationship is deemed not statistically significant, it means that the observed results are likely to have occurred by chance rather than due to a true underlying relationship between the variables.

TABLE 4.13: Path Coefficient's (Bootstrapping)

	Beta Coefficient	Sample Mean	Std.Dev.	T stat.	P-Value
EA → GT	0.305	0.305	0.075	4.089	0.000
GOVS→GT	0.041	0.049	0.052	0.788	0.431
GT → SGB	0.605	0.607	0.049	12.271	0.000
SCB → GT	0.232	0.234	0.069	3.349	0.001

Note: SCB = Sense of Community Belonging, EA = Environmental Awareness, GOVS = Government Support, GT = Green Trust, SGB = Sustainable Green Buildings

Based on the values provided in **Table 4.15**, the study's results do not support all four hypotheses, there exists a significant and positive relationships between the variables. SCB → GT (T=3.349), EA → GT (T=4.089) and GT → SGB (T=12.271). Whereas, the relationship between GOVS → GT (T=0.788) indicates a non-significant relationship.

TABLE 4.14: Summary of Decision of Research Hypothesis

Hypothesis	Path Relationship	Confidence Intervals		Decision
		2.5\%	97.5\%	
H1	SCB → GT	0.095	0.367	Significant
H2	EA → GT	0.163	0.45	Significant
H3	GOVS → GT	-0.082	0.133	Non-Significant
H4	GT → SGB	0.505	0.697	Significant

Note: SCB = Sense of Community Belonging, EA = Environmental Awareness, GOVS = Government Support, GT = Green Trust, SGB = Sustainable Green Buildings

4.7.2 Coefficients of Determination (R^2)

The R-squared, also known as the Coefficient of Determination, is a statistical measure employed to gauge the extent to which the independent variables can account for the variability observed in the dependent variable (Hair et al., 2019). R-squared values of 0.75, 0.5, and 0.25 are regarded as substantial, moderate, and weak, respectively. These values indicate the level of variance explained by the independent variables in the model, with higher R-squared values representing stronger relationships and better fits to the data.

Interpretation

The table provides R-Square values for "GT" and "SGB," representing the proportion of total variation explained by the independent variable(s) in regression models. "GT" has an R-Square of 0.223, explaining about 22.3% of its variation, while "SGB" has an R-Square of 0.366, explaining around 36.6% of its variation.

TABLE 4.15: Values of Coefficients of Determination (R^2)

	R-Square
GT	0.223
SGB	0.366

Note: GT = Green Trust, SGB = Sustainable Green Buildings

4.7.3 Assessment of Effect Size (f^2)

The f^2 value, as explained by (Hair, Black, Babin, Anderson, & Tatham, 2014), quantifies the contribution of an exogenous construct to the R^2 value when removed from the model, indicating its influence on endogenous constructs. A f^2 value greater than 0.35 signifies a large effect size, suggesting a substantial impact of the exogenous construct on the endogenous ones. If the f^2 value falls within the range of 0.15-0.35, it represents a medium effect size, indicating a moderate influence. Conversely, a small effect size is considered if the f^2 value ranges between 0.02-0.15.

Interpretation

Environmental awareness (EA) and sense of community belonging (SCB) have small effects on green trust (GT), with f^2 values of 0.087 and 0.050, respectively.

Government support (GOVS) shows a negligible effect on GT ($f^2 = 0.002$). This finding implies that in the model, government support does not significantly influence green trust. However, GT has a substantial influence on the adoption of sustainable green buildings (SGB) with an f^2 value of 0.576, highlighting its pivotal role in shaping sustainable behaviors.

TABLE 4.16: Values of Assessment of Effect Size (f^2)

Relationship	f-Square	Decision
H1: SCB \rightarrow GT	0.050	Supported
H2: EA \rightarrow GT	0.087	Supported
H3: GOVS \rightarrow GT	0.002	Not- Supported
H4: SGB \rightarrow GT	0.576	Supported

Note: GT = Green Trust, SGB = Sustainable Green Buildings

4.8 Mediation Analysis using Bootstrapping Approach

In this study, the mediation analysis was performed using the Bootstrapping approach within the framework of Partial Least Squares (PLS). The mediation analysis helps us understand if a third factor can explain the relationship between two other factors. In this study, we've looked closely at how green trust (GT) acts as a middle factor between sense of community belonging (SCB), environmental awareness (EA), government support (GOVS), and the adoption of sustainable green buildings (SGB). The bootstrapping technique gives us a clear picture of how these factors connect. Many researchers prefer bootstrapping over other methods because it's more reliable (Santos, 1999).

4.8.1 Mediation 1: (Hypothesis 5)

H5: Green Trust (GT) mediates the relationship between Sense of Community Belonging (SCB) and Sustainable Green Buildings (SGB).

Interpretation

The mediation analysis examined the relationship between Sense of Community Belonging (SCB) and Sustainable Green Buildings (SGB), considering the mediating role of Green Trust (GT). The analysis revealed several significant findings: Firstly, the indirect effect was observed where SCB influenced SGB through GT ($\beta = 0.196$, $t = 5.402$, $p = 0.000$). The results in table 4.19 revealed a significant indirect relationship; Secondly, we examined the substantial total effect of SCB on SGB ($\beta = 0.461$, $t = 7.312$, $p = 0.000$) which was also significant. Thirdly, the direct effect with the inclusion of the mediator still remained significant ($\beta = 0.265$, $t = 4.525$, $p = 0.000$).

As per the findings by (Hair et al., 2019), they suggest that if the VAF (Variance Accounted For) value is less than 0.20, it means there's no mediation. When the VAF value falls between 0.20 and 0.80, it shows partial mediation. If the VAF value goes beyond 0.80, it indicates full mediation. In our study, the VAF value is 42.51%, which aligns with the idea of partial mediation.

This indicates that GT partially mediates the relationship between SCB and SGB. Hence H5 was supported.

TABLE 4.17: Mediation 1: (Hypothesis 5)

Type of Effect	Effect	Path-Coeff.	T-Stat	P.Value	Remark
Total Effect	SCB→SGB	0.461	7.312	0.000	Sig Total Effect
Indirect Effect	SCB→GT→SGB	0.196	5.402	0.000	Sig Indirect Effect
Direct Effect	SCB→SGB	0.265	4.525	0.000	Sig Direct Effect
VAF	IE/TE	42.51%			
Conclusion	Partial Mediation Exists				

4.8.2 Mediation 2: (Hypothesis 6)

H6: Green Trust (GT) mediates the relationship between Environmental Awareness (EA) and Sustainable Green Buildings (SGB).

Interpretation

The second mediation analysis explored the relationship between an environmental awareness (EA) and Sustainable Green Buildings (SGB), considering Green Trust (GT) as a mediator. The results in table 4.20 highlighted significant findings: Firstly, we examined the indirect pathway, indicating that EA affects SGB through GT ($\beta = 0.190$, $t = 4.969$, $p = 0.000$). Results indicated a significant indirect relationship. Secondly a substantial total effect was uncovered, revealing EA's strong impact on SGB ($\beta = 0.560$, $t = 9.644$, $p = 0.000$) making the relation significant. Thirdly, even with GT in the picture, the direct connection between EA and SGB remained meaningful ($\beta = 0.369$, $t = 6.167$, $p = 0.000$). This suggests that GT partially mediates the EA-SGB relationship. The Variance Accounted For (VAF) indicated that 51.52% of the total effect is mediated. Hence, the conclusion drawn is that there exists a partial mediation and H6 was supported.

TABLE 4.18: Mediation 2: (Hypothesis 6)

Type of Effect	Effect	Path-Coeff.	T-Stat	P-Value	Remark
Total Effect	EA→SGB	0.56	9.644	0	Sig Total Effect
Indirect Effect	EA→GT→SGB	0.19	4.969	0	Sig Indirect Effect
Direct Effect	EA→SGB	0.369	6.167	0	Sig Direct Effect
VAF	IE/TE	51.52%			
Conclusion	Partial Mediation Exists				

4.8.3 Mediation 3:(Hypothesis 7)

H7: Green Trust (GT) mediates the relationship between Government Support (GOVS) and Sustainable Green Buildings (SGB).

TABLE 4.19: Mediation 3:(Hypothesis 7)

Type of Effect	Effect	Path coeff.	T-Stat	P-Value	Remark
Total Effect	GOVS→SGB	0.037	0.593	0.553	Non- Sig Total Effect
Indirect Effect	GOVS→GT→SGB	0.033	0.923	0.356	Non- Sig Indirect Effect
Direct Effect	GOVS→SGB	0.004	0.088	0.930	Non- Sig Direct Effect
VAF	IE/TE	89.10%			

Conclusion

TABLE 4.20: Mediation Analysis Results

Hypothesis	Relationship	Original sample (O)	Sample mean (M)	Std. Dev. (STDEV)	T Statistics (O/STDEV)	P value	Result	Decision
H5	SCB→GT→SGB	0.196	0.197	0.036	5.402	0.000	Partial Mediation	Accepted
H6	EA→GT→SGB	0.19	0.192	0.038	4.969	0.000	Partial Mediation	Accepted
H7	GOVS→GT→SGB	0.033	0.038	0.035	0.923	0.356	No Mediation	Rejected

Note: SCB = Sense of Community Belonging, GT = Green Trust, SGB = Sustainable Green Buildings

Interpretation

The third mediation analysis investigated the link between Government Support (GOVS) and Sustainable Green Buildings (SGB), examining whether Green Trust (GT) plays a mediating role. The findings in **Table 4.21** indicated the following: Firstly, it was observed that no significant indirect effect through GT was present, suggesting that GOVS's influence on SGB via GT isn't established ($\beta = 0.033$, $t = 0.923$, $p = 0.356$). Secondly, the total impact of GOVS on SGB was also not statistically significant ($\beta = 0.037$, $t = 0.593$, $p = 0.553$). Thirdly, the direct effect of GOVS on SGB also lacked significance ($\beta = 0.004$, $t = 0.088$, $p = 0.930$). Notably, the Variance Accounted For (VAF) showed that 89.1% of the overall impact remains unexplained by these pathways. Consequently, no mediation was observed rejecting our Hypothesis 7.

TABLE 4.21: Summary Results of all 7 Hypothesis

Hypothesis	Path Relationship	Confidence Intervals		P-Values	Decision
		2.50%	9.75%		
H1	SCB \rightarrow GT	0.095	0.367	0.001	Accepted
H2	EA \rightarrow GT	0.163	0.45	0	Accepted
H3	GOVS \rightarrow GT	-0.082	0.133	0.431	Rejected
H4	GT \rightarrow SGB	0.505	0.697	0	Accepted
H5	SCB \rightarrow GT \rightarrow SGB	0.128	0.27	0.001	Accepted
H6	EA \rightarrow GT \rightarrow SGB	0.12	0.27	0.001	Accepted
H7	GOVS \rightarrow GT \rightarrow SGB	-0.05	0.093	0.431	Rejected

4.9 Results Summary

Chapter 4 offers a comprehensive view of the analysis results, following a structured approach. The chapter starts by evaluating our model, focusing on the significance of factor loadings after removing less impactful ones. It then progresses to assess the measurement model's quality. To ensure the accuracy of our measurements, we used Cronbach's alpha and composite reliability to assess internal consistency. To establish validity, we used average variance extracted, examining how well our constructs captured the intended concepts. We also looked into discriminant validity, confirming the distinctiveness of our constructs. Once the measurement

model was sound, we moved on to the structural model. Through the bootstrap technique, we tested our hypotheses related to path coefficients, accepting hypothesis 1, 2 and hypothesis 4 and rejecting hypothesis 3. To gauge the impact, we considered R squared and F squared values. Exploring mediation, we found that government support didn't significantly influence sustainable green buildings, even when considering the role of Green Trust. Hence hypothesis 7 faced rejection while hypothesis 5 and 6 were accepted for having partial mediation effects. **Table 4.23** presents summary results of all 7-hypothesis presented in the study.

Chapter 5

Discussion and Conclusion

5.1 Introduction

In the previous chapter, the model's results were discussed, providing valuable insights into the study's outcomes. Chapter five of this thesis serves as a cohesive and comprehensive section, summarizing the research objectives in detail. Additionally, it presents a thorough and in-depth discussion of the findings, drawing meaningful conclusions based on the study's analysis. The theoretical and practical contributions of the research are carefully examined and articulated, acknowledging their significance in advancing the field.

Moreover, the study's limitations are critically addressed, providing a clear understanding of potential constraints and challenges faced during the research process. Finally, the chapter concludes by offering insightful suggestions for future research directions, contributing to the expansion and enhancement of knowledge in the subject area.

5.2 Summary of Research Findings

This research aims to understand how factors like a sense of community belonging, government support, and environmental awareness influence green trust, which acts as a mediating variable, and subsequently, how this green trust impacts individuals' adoption of sustainable green buildings in Pakistan. The study employs

the SOR model as a guiding framework. The findings reveal that a strong sense of community belonging and heightened environmental awareness have significant and positive connections with green trust, contributing significantly to the adoption of sustainable green buildings. However, it is important to note that the relationship between government support and green trust is not statistically significant, indicating that government support might have limited impact on individuals' decisions to embrace sustainable green building practices.

The current section pertains to the through discussion on the proposed hypothesis under the light of existing body of literature.

5.3 Hypothesis Test Results

5.3.1 Sense of Community Belonging with Green Trust

Our Hypothesis 1 relates with our research question (RQ1): Does an individual's sense of community belonging have a significant relationship with green trust?

Based on the data we gathered and analyzed, we found strong evidence supporting our Hypothesis 1, which suggests that a sense of community belonging positively influences consumers' green trust.

Our research establishes a direct link between SCB (stimulus) and green trust (Organism), which supports the first part of the SOR model. The model posits that stimuli influence the internal state of the organism, (Rivas et al., 2022). Our findings demonstrate that a stronger sense of community belonging positively influences individuals' trust in environmentally friendly practices (green trust).

In simple terms, when people feel connected to their community, they are more likely to trust and support environmentally friendly practices. These findings align with previous research in this area. The findings from (Wang et al., 2019; Du et al., 2023) align with our study and provide valuable insights that support the significance of our Hypothesis 1. (Wang et al., 2019) demonstrated that a sense of community belonging influences consumers' attitudes towards environmental protection and social development, leading to greater trust in related procedures.

Similarly, (Du et al., 2023) in his study showed that initiatives fostering a stronger connection between residents and their community enhance their sense of belonging, trust, and security, resulting in improved physical and mental well-being. The collective findings highlight the importance of a sense of community belonging in cultivating trust and positive attitudes towards environmental protection. By establishing this link between sense of community belonging and green trust, our research adds to the growing body of knowledge in this area and highlights the importance of sense of community belonging in promoting sustainable practices and attitudes.

Furthermore, this research makes a significant contribution to the fields of sustainability and environmental psychology. Through empirical evidence, it establishes a direct relationship between sense of community belonging (SCB) and green trust in the context of sustainable green building adoption. By doing so, it provides valuable support and validation for the theoretical assumptions of the SOR model. Additionally, this study sheds light on the psychological mechanisms that influence individuals' decisions to embrace sustainable practices, enhancing our overall understanding in this area. The findings offer practical insights for policymakers and practitioners seeking to promote sustainable behaviors and further advance sustainable development efforts.

5.3.2 Environmental Awareness and Green Trust

Our Hypothesis 2 relates with our research question (RQ2): Does environmental awareness have a significant relationship with green trust? The study's findings shed significant insight on the vital aspect of adoption of sustainable green buildings by examining the relationship between environmental awareness and green trust. The results showed a substantial relationship between EA and GT, showing that people with higher EA are more likely develop trust in environmentally friendly practices. Our research findings, supporting H2, align with previous studies by (Punyatoya, 2014; Ahmad et al., 2022; Kaufmann et al., 2012) and reveal that heightened environmental awareness positively influences green trust. This link instills confidence in consumers, driving them to prioritize environmentally friendly options and participate in voluntary green movements.

Additionally, consumers' views and intentions toward sustainable items are highly motivated by green trust, which ultimately encourages genuine sustainable activities. Our study underlines the significance of green trust as a mediator between environmental awareness and the adoption of sustainable green buildings in Pakistan, offering significant new knowledge to the field of sustainability.

5.3.3 Government Support and Green Trust

Our Hypothesis 3 relates with our research question (RQ3): Does government support have a significant relationship with green trust? Based on the data we gathered and analyzed, we have found insignificant relationship among GOVS and GT. Hence rejecting our Hypothesis 3, which suggests that a government support positively influences consumers' green trust.

Compared to prior researches on sustainable green buildings, our findings present a distinctive viewpoint on the relationship between government support and green trust. While some studies have noted positive connections, for example studies by (Iqbal et al., 2023; Darko et al., 2017; Chrisjatkiko, 2018). Our research offers a more detailed insight by indicating that this link might not be significant in the Pakistani context. This underscores the necessity for localized research to craft tailored strategies for nurturing green trust and sustainable behaviors within Pakistan. By rejecting H3 specific to Pakistan, our study enriches our comprehension of how government support's impact on green trust might contrast with other regions. This challenges the common assumption that government initiatives inherently lead to higher green trust levels among consumers (Chrisjatkiko, 2018).

Furthermore, these findings imply that people in Pakistan might not have a strong trust in their government when it comes to sustainability efforts. This situation underscores the need for the government to step in with initiatives that actively work towards building trust and confidence among Pakistani consumers in relation to sustainability endeavors. This could involve transparent communication, effective implementation of green policies, and visible actions that demonstrate the government's commitment to sustainability. By doing so, the government can

bridge the trust gap and encourage individuals to actively engage in and support sustainable practices. This tailored approach takes into account the specific context of Pakistan, recognizing the significance of trust-building as a catalyst for fostering sustainable behaviors within the population.

5.3.4 Green Trust and Sustainable Green Buildings

Our Hypothesis 4 relates with our research question (RQ4): Does green trust have a significant relationship with sustainable green buildings in Pakistan. Based on the data we gathered and analyzed, we found strong evidence supporting our Hypothesis 4, which suggests that a green trust positively influences consumers' adoption towards sustainable green buildings. The path analysis via boot strap-ping in SMART PLS 4.0 for hypothesis (H4) was supported (H4: $\beta = 0.605$, $t = 12.271$, $p = 0$). Refer to **Table 4.15** for the comprehensive results. Additionally, the acceptance of hypothesis (H2) was also in support with the literature established in the past. [Avotra et al. \(2021\)](#) indicate that green trust and sustainable construction are two intertwined concepts that have gained much attention in recent years due to the growing awareness of environmental issues and the need for sustainable development. ([Karimi & Mohammadimehr, 2022](#)). Additionally, high social trust in the groups in charge of green building adoption can also persuade people to use green buildings and simplify their decision-making processes while doing so ([Zahan, Chuanmin, Fayyaz, & Hafeez, 2020](#)). Moreover, in essence, our research broadens our understanding of the "green trust" and sustainable construction relationship by contextualizing it within Pakistan. By highlighting the potential variation in this relationship, we aim to provide valuable insights that contribute to more effective and culturally sensitive efforts aimed at fostering sustainable behaviors and practices in the country.

5.3.5 Results for Mediating Hypothesis H5, H6 and H7

5.3.5.1 Mediating role of GT between SCB and SGB

The results of the hypothesis (H5) unleashed that green trust plays a partial mediating role between relationship of Sense of community belonging (SCB) and

the adoption of sustainable green buildings. The hypothesis five was related to the research question 5 (RQ5): Does green trust mediate the relationship between sense of community belonging and sustainable green buildings in Pakistan? The SMART PLS 4.0 boot strapped path analysis for hypothesis (H5) which was found to be reliable. for total effect, (H5: $\beta = 0.461$, $t = 7.312^{**}$, $p = 0.000$), total indirect effect (H5: $\beta = 0.196$, $t = 5.402$, $p = 0.000$) was also significant followed by a significant direct effect with the inclusion of the mediator (H5: $\beta = 0.265$, $t = 4.525$, $p = 0.000$). Hence, Results indicated the presence of a partial mediation. Refer to **Table 4.19** for the comprehensive results.

Moreover, by unveiling the role of Green Trust as an intermediary, our study adds depth to the understanding of how individuals' community belonging translates into support for eco-friendly buildings. This contribution aligns with the broader trend of trust driving sustainable behaviors. [Ahmad et al. \(2022\)](#) demonstrates how consumer intentions to participate in green movements are increased by trust. Furthermore, buying green products is proven to be influenced by a number of factors, including trust. According to [de Sio et al. \(2022\)](#) green trust's mediating role has been theorized in diverse contexts, from influencing green product purchase intentions to connecting various constructs such as green brand image and equity. However, it has not been studied yet as a mediator between factors motivating consumers towards green construction and their intention to support sustainable green buildings. By contextualizing and extending prior understandings, our study enhances the understanding of the psychological mechanisms that drive sustainable behaviors in a culturally specific setting.

Most importantly, the S-O-R model aligns well with our study's results. According to this model, when something triggers our feelings (like a sense of belonging), it stirs up emotions and thoughts in people (their reactions). These reactions then influence how they act (their behavior). ([Sugiarto et al., 2022](#)). Our study confirms this by showing that Green Trust plays a crucial role in this process. When people feel a sense of community, it stirs their emotions and thoughts, and Green Trust steps in, to guide their intention to support and adopt sustainable green buildings This connection between our findings and the S-O-R model makes our results even stronger within a theoretical framework.

5.3.5.2 Mediating Role of GT between EA and SGB

The results of the hypothesis (H6) unleashed that green trust plays a partial mediating role between relationship of Environmental Awareness (EA) and the adoption of sustainable green buildings (SGB). The hypothesis six was related to the research question 6 (RQ6): Does green trust mediate the relationship between environmental awareness and sustainable green buildings in Pakistan? The path analysis via boot strapping in SMART PLS 4.0 for hypothesis (H6) was supported for total effect, (H5: $\beta = 0.560$, $t = 9.644$, $p = 0.000$), total indirect effect (H5: $\beta = 0.190$, $t = 4.969$, $p = 0.000$) was also significant followed by a significant direct effect with the inclusion of the mediator (H5: $\beta = 0.369$, $t = 6.167$, $p = 0.000$). Hence, Results indicated the presence of a partial mediation. Refer to Table 4.20 for the comprehensive results.

Furthermore, these findings carry meaningful implications when considered through the lens of Stimulus-Organism-Response (S-O-R) model. In this model, environmental awareness serves as a stimulus, impacting how individuals perceive things, which then guides their actions or behaviors (Rivas et al., 2022) Our finding highlights the importance of "Green trust" as a crucial link. It's like "Green trust" steps in to connect the dots, turning increased environmental awareness into actual adoption of sustainable green buildings. This highlights how trust plays a key role in translating awareness into real actions.

Research by [Sultana et al. \(2022\)](#) illustrates that when individuals possess environmental awareness and trust in eco-friendly initiatives, they are more inclined to opt for green hotels. This observation aligns with Hypothesis 6, which establishes that "Green trust mediates the relationship between environmental awareness and sustainable green buildings." In other words, our findings affirm that the presence of green trust acts as a mediator, facilitating the connection between individuals' environmental awareness and their preference for sustainable options such as green buildings. It's like "Green trust" steps in to connect the dots, turning increased environmental awareness into actual adoption of sustainable green buildings. Previous researches by [Chrisjatmiko \(2018\)](#); [Ha et al. \(2022\)](#); [Zhao and Zhang \(2023\)](#) also indicate the importance of green trust as a mediating variable.

5.3.6 Mediating Role of GT between GOVS and SGB

The results of the hypothesis (H7) unleashed that green trust plays no role between relationship of Government Support (GOVS) and the adoption of sustainable green buildings in Pakistan. The hypothesis five was related to the research question 5 (RQ5): Does Green Trust mediate the relationship between government support and sustainable green buildings in Pakistan? The path analysis via boot strapping in SMART PLS 4.0 for hypothesis (H6) was not supported for total effect, (H5: $\beta = 0.037$, $t = 0.593$, $p = 0.553$), total indirect effect (H5: $\beta = 0.033$, $t = 0.923$, $p = 0.356$) was also not significant followed by a non-significant direct effect with the inclusion of the mediator (H5: $\beta = 0.004$, $t = 0.088$, $p = 0.930$). Hence, Results indicated the presence of no mediation. Refer to Table 4.22 for the comprehensive results.

Our study's results, which revealed the rejection of Hypothesis H7 regarding the mediation of "Green trust" between government support and sustainable green buildings, align with broader trends. Research conducted by (Yousaf et al., 2016) highlights that citizens' trust in government and political organizations has been declining globally, spanning both developing and developed countries. This decrease in trust has notable consequences – it can discourage citizens from investing, following rules and regulations, and can raise transaction costs, ultimately affecting businesses and economic activities within a country. Mansoor (2021) also highlighted the fact that like many other nations, in Pakistan, the sound governance concept is not so popular yet.

Applying this understanding to the situation in Pakistan, our study's findings align closely. In a country like Pakistan, where trust in government and political bodies encounters comparable obstacles, it becomes clearer why the mediation proposed in Hypothesis H7 could be inconclusive. The doubt and reduced trust among the public could potentially disrupt the anticipated link between government support, green trust, and backing for sustainable practices. This connection supports the notion that the diminishing trust among citizens can indeed hold real-world consequences that affect their behaviors, attitudes, and reactions, as we observed in our study. Furthermore, looking these results through the SOR Model it has been

observed that even though the government's support kicks things off but the connection through green trust doesn't lead to the expected support for eco-friendly buildings. This hints that something might be getting in the way or stopping this process from working as anticipated. This points to the possibility that the anticipated process of mediation might face obstacles or interruptions, potentially attributed to distinct contextual elements specific to Pakistan.

While prior literature has generally assumed or suggested the mediation of green trust in similar contexts, our findings challenge this assumption and provide empirical evidence that underscores the need for more refined investigations.

5.4 Theoretical Contribution

The research contributes to the green building literature in the context of Pakistan. The findings shed light on the crucial role of sense of community belonging, environmental awareness, and government support in fostering green trust, which in turn drives the adoption of sustainable green buildings. This insight is valuable for policymakers, urban planners, and developers aiming to promote sustainable practices and address environmental challenges in Pakistan's built environment.

This thesis employs the stimulus-organism-response framework to explore the factors influencing the adoption of sustainable green buildings in Pakistan, with a focus on the mediating role of green trust. This study also critically reviews prior literature, revealing insights from research conducted in various countries using the same framework. Notably, the existing literature primarily originates from countries such as Germany, the U.K., the U.S.A., Australia, Japan, Austria, Brazil, Norway, Finland, Denmark, Canada, Malaysia, Israel, Indonesia, and Singapore, India and China. This highlights the limited research conducted in South Asian countries, particularly Pakistan. Consequently, this thesis holds significance by testing cues for sustainable green buildings, including sense of community belonging, environmental awareness, government support, and the mediating factor of green trust.

The introduction of green trust as a mediator in the SOR model is another crucial theoretical contribution. Green trust represents the level of confidence individuals

have in environmentally friendly practices and initiatives. This research sheds light on the significance of trust as a linking mechanism between the stimuli (sense of community belonging, environmental awareness, and government support) and the ultimate response (sustainable green building adoption). It enhances our understanding of how trust plays a pivotal role in encouraging individuals to embrace sustainable practices. Offering a unique perspective on the underlying psychological mechanisms that drive individuals' eco-friendly choices. Such comprehensive insights are valuable for policymakers and stakeholders in designing effective strategies to encourage sustainable practices in Pakistan.

Moreover, this study's findings align with previous researches on the importance of sense of community belonging and environmental awareness in influencing individuals' pro-environmental behaviors. For instance, studies by (Gifford, 2007; Chavis et al., 2008; Du et al., 2023; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007) highlight how a sense of community and awareness of environmental issues positively impact individuals' engagement in sustainable practices. Additionally, research by (Yue et al., 2020; Agbajor & Mewomo, 2022) emphasizes the role of government support in promoting sustainable development initiatives.

Comparing this research with other studies in the field, it complements existing literature by providing a unique focus on the SOR model applied specifically to sustainable green building adoption. While previous research has explored various factors influencing sustainable behaviors, (Ahmad et al., 2022; Azad & Akbar, 2015; Agbajor & Mewomo, 2022) the incorporation of green trust as a mediating variable within the SOR framework offers a novel perspective. Additionally, the research's application in the context of Pakistan provides region-specific insights into the drivers of sustainable building adoption in a developing country, which may differ from findings in more developed or culturally distinct regions.

5.5 Managerial and Practical Implications

The research highlights that factor like sense of community belonging, environmental awareness, and government support play significant roles in driving the

adoption of sustainable green buildings. Real estate developers and policymakers can use this insight to prioritize these factors in their strategies to promote sustainable building practices.

Secondly it has been suggested that, green trust acts as a mediator in the relationship between the identified factors and the adoption of sustainable green buildings. To enhance green trust among potential buyers and tenants, businesses and policymakers should focus on building transparency, credibility, and reliability in their green initiatives.

Thirdly our research has used behavioral and psychographic segmentation of potential future buyers and tenants interested in real estate. This provides valuable information for tailoring marketing and outreach efforts. Understanding lifestyle, purchase behavior, social status, and income of different segments will allow businesses to create targeted campaigns that resonate with each group's unique preferences and values.

Furthermore, with a growing interest in sustainable living, real estate developers can capitalize on this trend by incorporating green features and practices in their projects. Highlighting the environmental benefits and cost savings associated with sustainable green buildings can attract environmentally conscious customers. Collaboration between real estate developers, environmental organizations, and government agencies can foster the implementation of sustainable practices. Partnerships can lead to shared knowledge, resources, and funding, ultimately accelerating the adoption of sustainable green buildings.

However, to enhance environmental awareness among potential buyers and tenants, educational initiatives can be introduced. Workshops, seminars, and awareness campaigns can inform people about the benefits of green buildings and sustainable living, creating a more informed and receptive market. Furthermore, government support and favorable policies are essential for driving sustainable practices in the real estate sector. Policymakers can incentivize developers to adopt green building practices through tax benefits, grants, or other incentives, encouraging a positive impact on the environment and society enlisting trust among the customers in Pakistani market as results show that consumers do not have trust

in the government which leads to disappointment in trusting sustainable green building adoption.

By taking into consideration these managerial and practical implications, real estate developers, policymakers, and other stakeholders can effectively promote the adoption of sustainable green buildings in Pakistan, creating a greener and more sustainable future for the real estate industry.

5.6 Limitations and Future Research

Firstly, the study used data collected at a single point in time, which has its limitations in establishing cause-and-effect relationships between the factors studied. Performing longitudinal studies that track participants over an extended time-frame would enable a more comprehensive exploration of the dynamic interactions among the factors (sense of community belonging, environmental awareness, and government support), green trust, and the adoption of sustainable green buildings.

Secondly, while in our study green trust was investigated as a mediator, future research endeavors could look into alternative mediators that offer a more comprehensive understanding of the intricate relationships between the identified factors and the adoption of sustainable green buildings. In a similar vein, the study could be enriched by investigating moderating factors as well. Exploring potential moderators like cultural disparities or organizational contexts could provide more detailed insights into the intricate interplay of the identified factors and their impact on sustainable building adoption.

Thirdly, it is important to acknowledge the scope of generalizability. Our research focused on potential future real estate buyers and tenants in Pakistan over a five-year horizon. This specificity may limit the applicability of the findings to broader populations or diverse geographical contexts. To enhance the external validity of the outcomes, forthcoming studies might consider a more diversified sample encompassing different demographics and regions. Furthermore, by contrasting regions or countries with diverse environmental policies, urbanization rates, and community involvement, we can gain valuable cross-cultural perspectives on how these factors impact the adoption of sustainable buildings. This approach can

uncover unique regional influences on green trust, guiding tailored sustainability strategies.

It is also suggested that, collaborating with stakeholders from sectors such as government entities, real estate developers, and environmental organizations can yield more pragmatic and actionable recommendations for advancing sustainable building practices.

By overcoming these limitations and exploring new research paths, we can better understand what motivates people to adopt sustainable green buildings. This, in turn, will contribute to wider endeavors aimed at promoting environmental sustainability in Pakistan and beyond.

5.7 Conclusion

This thesis explored the cues that lead towards the adoption of sustainable green buildings in Pakistan. The study revealed that a profound sense of community belonging plays a pivotal role, exerting a positive and influential effect on the establishment of green trust. Furthermore, this green trust acts as a crucial mediator, channeling its positive impact towards the adoption of sustainable green buildings. This underscores the significance of sense of community belonging to foster a positive environment for sustainable building initiatives. Similarly, the analysis explored the role of environmental awareness as another variable affecting green trust. It was found that environmental awareness exerts a direct and substantial influence on the creation of green trust. However, in contrast to expectations, government support did not yield a significant direct effect on green trust nor did it exhibit a mediating influence through the variables studied. This highlights the need for more comprehensive and targeted strategies to involve governmental bodies in fostering green trust.

In terms of the methodological aspects, the structural analysis validated the constructs used in this study. The sense of community belonging, environmental awareness, and government support were all established as distinct and significant factors through their respective item structures. The green trust construct displayed a satisfactory level of internal consistency except for one item, GT4, which

was removed due to its factor loading falling short of the established threshold of 0.7. Finally, the sustainable green building construct emerged as a robust framework with all its five items exhibiting substantial and noteworthy factor loadings. In essence, this thesis underscores the pivotal role of sense of community belonging and environmental awareness in driving green trust and ultimately, the advancement of sustainable green buildings. While government support might not have demonstrated direct and mediating effects in this context, the findings still underscore the multidimensional nature of factors influencing sustainable buildings. This study contributes to the body of knowledge surrounding sustainable building practices and provides valuable insights for policymakers, practitioners, and researchers aiming to foster a greener and more sustainable built environment in Pakistan.

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Appendix-A

Questionnaire

Dear Respondent

We are carrying out a survey on the cues leading towards sustainable green buildings in Pakistan. In simple terms, the concept of green building looks at ways of building an environmentally responsibly built environment.

We would appreciate your participation by answering all questions related to the research. This question and answer session shall not take more than 10 minutes. Under no circumstances you are obliged to answer any of the questions, however, in doing so will greatly assist me in completing my research and enhancing the understanding of this research focus.

Maahum Mazhar,

MS Research Scholar,

Faculty of Management and Social Sciences,

Capital University Science and Technology, Islamabad.

Section 1: Section 1 (FILTER QUESTION)

Do you intend to build or buy a house in the next 5 years?

1. Yes
2. No

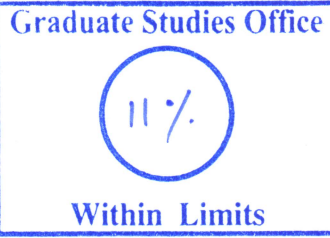
1	I attach great importance to the impact of construction projects on the social environment.	7	6	5	4	3	2	1
2	I often take part in the social activities of nature and environmental protection in the field of architecture.	7	6	5	4	3	2	1
3	I attach great importance to the impact of the construction project on the living environment.	7	6	5	4	3	2	1
4	I think that construction projects should be in harmony with the natural environment, and have a sense of responsibility for it.	7	6	5	4	3	2	1
5	Humans are severely abusing the environment	7	6	5	4	3	2	1
6	If things continue on their present course, we will soon experience a major ecological catastrophe	7	6	5	4	3	2	1
7	We are approaching the limit of the number of people the earth can support	7	6	5	4	3	2	1
8	The earth has plenty of natural resources if we just learn how to develop them	7	6	5	4	3	2	1
9	When humans interfere with nature, it often produces disastrous consequences	7	6	5	4	3	2	1
10	The government and its agencies have a strong commitment to green building and sustainable development in general.	7	6	5	4	3	2	1
11	The government and its agencies provide incentives/support to promote green building and GBTs in both the public and private sectors.	7	6	5	4	3	2	1

12	Codes and regulations/legislation on green building and GBTs are well-defined, sufficient, and available.	7	6	5	4	3	2	1
13	The environmental commitments of green buildings are generally reliable	7	6	5	4	3	2	1
14	The environmental performance of green buildings is generally dependable	7	6	5	4	3	2	1
15	The environmental argument of green buildings is generally trustworthy	7	6	5	4	3	2	1
16	This product is sincere and honest about its environmental protection	7	6	5	4	3	2	1
17	I am familiar with the concept of "green building"	7	6	5	4	3	2	1
18	Green building may lead to savings in maintenance expenses, as a result of reduced energy demand for lighting, heating and air conditioning	7	6	5	4	3	2	1
19	Green building encourages reduction of water use during construction	7	6	5	4	3	2	1
20	Green building encourages reduction of energy consumption during construction	7	6	5	4	3	2	1
21	Green building uses healthy and environment friendly construction materials	7	6	5	4	3	2	1

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