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The Influence of Psychological Capital on Employees' Green Creativity and Green Work Engagement

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TABLE OF CONTENTS

List of Tables **7**

List of Figures **8**

Abbreviations **9**

I. INTRODUCTION **11**

1.1 Problem Statement 18

1.2 Significance of the study 19

1.3 Research Objectives 21

1.4 Research questions 21

1.5 Hypotheses 22

1.5.1 Direct Effects 22

1.5.2 Mediating Effects 22

1.5.3 Moderated Mediation Effects 23

1.5.4 Demographic Factors Moderates Effects 23

II. LITERATURE REVIEW **25**

2.1 Human Capital 25

2.1.1 Psychological Capital (PsyCap) 26

2.1.2 The Dimension of Psychological Capital (PsyCap) 27

2.1.3 The Role of PsyCap in Employee and Small and Medium Enterprise (SME) Performance 30

2.2 Social Capital (SC) 32

2.2.1 The Dimension of Social Capital 33

2.2.2 The Role of Social Capital on employee's and Organizational Performance 35

2.3 Employees' Pro-Environmental Behavior (PEB) 37

2.3.1 The relationship between PsyCap and Pro-Environmental Behavior (PEB) 38

2.3.2 The relationship between SC and Pro-Environmental Behavior (PEB) 39

2.4 Componential Theory of Creativity and Green Creativity 40

2.4.1 Creativity: Understanding Its Role in Sustaining Competitive Advantage and Its Components 40

2.4.2 Green Creativity (GC) 42

2.5 Componential Theory of Work Engagement and Green Work Engagement (GWE) 43

2.6 Componential Theory of Human Resource Management (HRM) and Green Human Resource Management (GHRM) 45

2.6.1 The Aspects of GHRM and its role on Employee's and organizations' Performance and Behaviors 46
2.6.2 Green Performance Management and Appraisal 48
2.7 Small and Medium Enterprises in the Indonesia Context 50
III. MATERIALS AND METHOD 53
3.1 Research Process 53
3.2 Research Design 54
3.3 Research Tool 56
3.3.1 Questionnaire Design and Development 56
3.4 Sampling Method and Sample Size 62
3.5 Data Analysis 62
3.5.1 Data preparation 63
3.5.2 Structural Equation Modelling (SEM) - AMOS 64
3.5.3 Pilot Study 66
IV. RESULTS AND DISCUSSION 69
4.1 Respondent Demographic Profile 69
4.2 Measurement Model Evaluation 70
4.2.1 Kaiser-Meyer-Olkin (KMO) Analysis 70
4.2.2 Reliability Analysis 74
4.2.3 Validity Analysis 76
4.2.4 Discriminant Validity Analysis 78
4.2.5 Fit Indices Analysis 79
4.3 Hypotheses Testing 81
4.3.1 Analysis of Direct Impact 81
4.3.2 Assessment of the Direct Impact of Gender and Educational Attainment on the Study Constructs 82
4.3.3 Mediation Analysis (Indirect Effect) 83
4.3.4 Moderated Mediation (Indirect) Analysis 85
4.3.5 Assessment of Gender as a Moderating factor in the Moderated Mediation relationships. 87
4.3.6 Assessment of the educational attainment as a Moderating factor in the Moderated Mediation relationship. 88
4.4 Discussion 90

V. CONCLUSION AND RECOMMENDATIONS 103
5.1 Conclusion.....103
5.2 Recommendations and Implications 107
5.2.1 Academic Implication.....107
5.2.2 Practical Implications 108
5.3 Limitation and Future Research Directions 110
VI. NEW SCIENTIFIC RESULTS.....115
VII.SUMMARY 117
VIII.APPENDICES.....121
8.1 References.....121
8.2 Appendix 2: Cover Letter for the Questionnaire.....146
8.3 Appendix 3: Questionnaire 147

List of Tables

Table 1. The psychological capital scales 58
Table 2. The social capital scales 59
Table 3. The green human resource management scales 60
Table 4. The green creativity scales 61
Table 5. The green work engagement scales 61
Table 6. Types of questionnaire items and its codes 64
Table 7. Gender Profile of Respondents 69
Table 8. Educational Attainment Profile of Respondents 69
Table 9. KMO Test Result 71
Table 10. Updated KMO Test Result 73
Table 11. Reliability Construct 75
Table 12. Validity Construct 77
Table 13. Discriminant Validity based on Fornell-Larcker criterion analysis 79
Table 14. Analysis of Fit Indices 80
Table 15. Bootstrapping Results on Direct Impact 82
Table 16. Bootstrapping Results on the Direct Impact of Demographic Factors 83
Table 17. Bootstrapping Results on Mediating Impact 85
Table 18. Bootstrapping Results on SC as a Moderator in Indirect (Mediated) Relationships in GC 86
Table 19. Bootstrapping Results on SC as a Moderator in Indirect (Mediated) Relationships in GWE 87
Table 20. Bootstrapping Results on Moderated Mediation Relationships with Gender as a Moderator 88
Table 21. Bootstrapping Results on Moderated Mediation Relationships with Educational Attainment as a Moderator 89
Table 22. The Interrelation of Research Questions, Hypotheses, and Bootstrapping Results in Direct Relationships 105
Table 23. The Interrelation of Research Questions, Hypotheses, and Bootstrapping Results in Indirect relationship 105
Table 24. The Interrelation of Research Questions, Hypotheses, and Bootstrapping Results on SC as a Moderator in Indirect (Mediated) Relationships 106
Table 25. The Interrelation of Research Questions, Hypotheses, and Bootstrapping Results on Demographic Factors as a Moderator in Moderated Indirect (Mediation) Effects 106

List of Figures

Figure 1. Air Quality Condition in Indonesia 15
Figure 2. Urban and Rural population in Indonesia 15
Figure 3. The 6 largest urban Agglomerations in the cities in Indonesia.....16
Figure 4. The Number and Rate of Growth of SMEs in Indonesia.....17
Figure 5. A proposed conceptual framework based on literature and framed hypotheses.....23
Figure 6. Phases of Research Process 53
Figure 7. Research Design 54
Figure 8. Steps followed in SEM AMOS.....65

Abbreviations

AGFI	Adjusted Goodness of Fit Index
AMOS	Analysis of Moment Structures
AVE	Average Variance Extracted
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CITC	Corrected Item-Total Correlation
CMIN/DF	Chi-Square to Degrees of Freedom ratio
CO_2	Carbondioxide
CR	Composite Reliability
CSC	Cognitive Social Capital
EFA	Exploratory Factor Analysis
GC	Green Creativity
GDP	Gross Domestic Product
GFI	Goodness of Fit Index
GHRM	Green Human Resource Management
GPM	Green Performance Management
GR	Green Recruitment
GRW	Green Rewards
GT	Green Training
GWE	Green Work Engagement
HRM	Human Resource Management
IFI	Incremental Fit Index
KMO	Kaiser-Meyer-Olkin
NCDs	Non-Communicable Diseases
NFI	Normed Fit Index
PEB	Pro-Environmental Behavior
Ph.D.	Doctor of Philosophy
PsyCap	Psychological Capital
RMSEA	Root Mean Square Error of Approximation
RSC	Relational Social Capital
SC	Social Capital
SE	Self-Efficacy
SEM	Structural Equation Models
SMEs	Small and Medium-Sized Enterprises
SRMR	Standardized Root Mean Square Residual
SSC	Structural Social Capital
WHO	World Health Organization

I. INTRODUCTION

In today's era of globalization, characterized by rapid and continuous business changes that are volatile, uncertain, complex, and ambiguous, numerous enterprises have emerged offering diverse products and services in the market. This intensifies competition, causing many companies to exit due to their inability to compete and sustain themselves (Alshebami, 2021). Consequently, businesses must continually adapt, learn, and innovate to optimize performance and ensure long-term survival (Alshebami, 2021; Saad *et al.,* 2022). Grant (2009) emphasizes that achieving sustainable competitive advantage through the optimization of internal resources is essential for remaining competitive.

Newbert (2007) argues that human capital, as an internal resource, represents the most valuable and critical strategic asset for sustaining competitive advantage. Thus, understanding the fundamental mechanisms linking human capital to competitive advantage—including their micro-foundations and interdependencies—is crucial for enabling people-based advantages within organizations (Coff & Kryscynski, 2011). Luthans and Youssef (2004) further identify psychological capital (PsyCap) as a key strategic component of human capital capable of providing a competitive edge.

PsyCap refers to a positive psychological mindset that motivates individuals to adapt effectively to their environment, manage stress, enhance overall well-being, and strengthen their competitive advantage. Additionally, PsyCap is recognized as an essential intangible asset, reflecting employees' positive mental energy (Tang, *et al*., 2019; Alshebami, 2021). In positive psychology and its extension into positive organizational behavior, PsyCap is conceptually defined by Luthans *et* al. (2007) as an individual's positive psychological state characterized by four dimensions: hope, self-efficacy, resilience, and optimism. PsyCap significantly impacts employee attitudes in the workplace, including organizational commitment, job satisfaction, and psychological well-being. Additionally, PsyCap is positively correlated with employee behaviors such as organizational citizenship behavior and overall job performance (Avey *et al*., 2008; Larson *et al.*, 2013; Nafei, 2015).

To attain competitive advantage, organizations engage in various human and economic activities aimed at succeeding in market competition. However, these activities often involve practices and materials that are environmentally unsustainable, contributing to environmental issues such as depletion of natural resources, water pollution, and air pollution (Huynh, 2020). Studies examining historical and current environmental conditions indicate that atmospheric carbon

dioxide (CO_2) levels have risen alongside global average temperatures (Jahanger *et al*., 2022). Specifically, atmospheric CO_2 levels have increased by approximately 40% since the mid-nineteenth century, leading to a global warming rate of about 0.2% per decade. In the long term, air pollution can severely degrade atmospheric conditions and trigger environmental crises, including climate change, ozone depletion, ecosystem destruction, deforestation, and biodiversity loss (Cramer *et al.*, 2018; Yang, *et al*., 2021; Ahmad *et al*., 2022; Omarova & Jo, 2022).

According to the World Health Organization (WHO), air pollution remains the leading environmental cause of premature death, with 99% of the global population breathing polluted air as of 2022, posing significant health risks (Xue *et al.*, 2021). Despite air quality monitoring efforts in over 6,000 cities across 117 countries, residents continue to be exposed to harmful levels of fine particulate matter and nitrogen dioxide, with the highest exposures occurring in low- and middle-income countries (World Health Organization, 2022).

Beyond its impact on physical health, air pollution has also been associated with neurological disorders and declining mental well-being. An increasing body of research highlights air pollution's link to various mental illnesses, such as dementia (Carey *et al.*, 2018), psychotic disorders (Oudin *et al.*, 2016; Attademo *et al.*, 2017; Khan *et al.*, 2019; Newbury *et al.*, 2019), schizophrenia (Antonsen *et al.*, 2020), cognitive impairment (Power *et al.*, 2011), anxiety (Power *et al.*, 2015), depression (Kioumourtzoglou *et al.*, 2017), and general mental distress (Bakolis *et al.*, 2021). Thus, air pollution significantly correlates with psychological conditions, which consequently influence overall workplace attitudes and behaviors.

Given these pressing environmental concerns, governments and organizations must implement effective strategies to mitigate air pollution and its adverse effects. Businesses, in particular, play a pivotal role in environmental protection by integrating sustainable practices—such as responsible resource management and eco-friendly initiatives—into their operations (Wassmer, *et al*., 2012). Moreover, organizations should encourage employees to actively participate in environmental protection efforts to ensure the successful adoption of green management practices. However, the effectiveness of these initiatives largely depends on employees' environmental awareness, attitudes, and behaviors, along with the successful implementation of Green Human Resource Management (GHRM) strategies (Omarova & Jo, 2022).

GHRM encompasses HRM practices aimed at reducing an organization's environmental impact and promoting sustainability within workplaces. Research indicates that effective GHRM strategies can improve financial performance while simultaneously addressing environmental concerns (Saeed *et al.*, 2019). Additionally, GHRM significantly fosters employees' pro-

environmental behaviors, particularly green work engagement (GWE) and green creativity (GC) (Kim *et al*., 2019; Aboramadan, 2022; Ahmad *et al*., 2022).

Green work engagement (GWE) refers to the energy, dedication, and absorption employees exhibit in performing environmentally responsible tasks (Aboramadan, 2022). Resources such as GHRM serve as intrinsic and extrinsic motivators, enhancing employees' development and career fulfillment. Consequently, these resources are considered essential in strengthening employees' overall commitment to their work, particularly in fostering GWE (Bakker & Demerouti, 2008). Similarly, green creativity (GC) involves generating innovative and practical green concepts related to sustainable products, services, and business practices. By promoting GC, companies can establish themselves as market leaders in sustainable production, enhance corporate image and market share, and develop eco-friendly products or services to reduce environmental damage (Chen *et al*., 2013; Yong *et al.*, 2019).

In workplace creativity research, previous studies have demonstrated a robust association between the four dimensions of Psychological Capital (PsyCap)—hope, self-efficacy, resilience, and optimism—and employee creative output. Furthermore, PsyCap has been shown to significantly enhance work engagement and positively influence employees' pro-environmental behaviors (Seligman & Csikszentmihalyi, 2000; Donaldson & Ko, 2010; Sweetman *et al.*, 2011; Soni, *et al*., 2015; Thompson *et al*., 2015; Gao *et al.*, 2020). Therefore, it can be inferred that PsyCap plays a crucial role in cultivating employees' GWE and GC, further reinforcing the importance of psychological well-being in promoting sustainable workplace practices.

Furthermore, PsyCap is recognized as a fundamental component of positive organizational behavior, distinguishing it from other constructs such as job satisfaction, workplace well-being, commitment, workplace engagement, and social capital (SC) (Saad *et al*., 2022). While PsyCap focuses on an individual's psychological resources—hope, efficacy, resilience, and optimism—SC emphasizes the value of social relationships and networks in fostering organizational success. The integration of PsyCap and SC has been found to yield significant benefits for both individuals and organizations, enhancing motivation, collaboration, and workplace adaptability (Alkahtani *et al.*, 2021). However, Luthans and Youssef (2004) differentiate PsyCap from SC, arguing that PsyCap serves as a critical form of strategic human capital, offering a competitive advantage through the development of personal psychological strengths, whereas SC pertains to the collective benefits derived from social networks within an organization.

Comparatively, alternative models such as the Job Demands-Resources (JD-R) Model and the Conservation of Resources (COR) Theory provide additional perspectives on workplace well-being and performance. The JD-R model suggests that job resources, including both PsyCap and

SC, mitigate job demands and prevent burnout, emphasizing how these constructs work together rather than separately (Bakker & Demerouti, 2007). Similarly, COR Theory posits that individuals strive to acquire and protect resources such as psychological and social capital, reinforcing the notion that PsyCap and SC act as mutually reinforcing assets that sustain employee engagement and resilience (Hobfoll *et al.*, 2017).

According to Nasser et al. (2022), increased SC within an organization fosters collaboration, reciprocity, and collective workplace well-being, which in turn enhances job performance (Crede *et al.*, 2007; Fisher, 2010), burnout (Amornpipat, 2019), and employee engagement (Sari, 2015). Additionally, empirical studies have linked SC to organizational creativity (Chen *et al.*, 2008; Jang and Shin, 2017), with McFadyen and Canella (2004) emphasizing SC's positive impact on individual creativity. Shi et al. (2022) highlight SC's influence on pro-environmental behavior (PEB), suggesting strong workplace networks promote GC and GWE. Therefore, integrating PsyCap and SC provides a holistic approach to enhancing organizational sustainability, innovation, and workforce resilience, aligning with broader theoretical frameworks like JD-R and COR Theory.

Understanding motivating factors behind pro-environmental behavior (PEB) is crucial for fostering sustainability. Demographic elements, particularly gender, significantly influence PEB (Idalgo-Crespo *et al.*, 2022, Trelohan, 2022). highlight that women typically engage more in green consumption and pro-environmental activities than men (Zhao *et al.*, 2021; Li, *et al*., 2022; Xia & Li, 2023). Thus, gender may substantially influence GC and GWE, with women potentially demonstrating more pronounced involvement. Additionally, educational attainment, especially at higher levels, significantly impacts environmentally friendly attitudes (De Silva & Pownall, 2014; Meyer, 2015; Wang, *et al*., 2022). Consequently, higher education levels, particularly among Ph.D. holders, may significantly shape GC and GWE.

Scholars have also identified correlations between gender, education, and PsyCap. Gender differences may emerge in PsyCap development due to societal norms (Luthans *et al.*, 2007). Additionally, individuals with advanced academic degrees often demonstrate higher levels of PsyCap (James, *et al*., 2009). Similarly, studies suggest gender and education influence SC. Van Emmerik (2006) indicated that gender significantly affects organizational SC, while Lin, (1999) noted education's role in developing community and social engagement.

Amid escalating environmental challenges, countries with higher urbanization and population density face increased vulnerability to environmental issues. Larger populations lead to intensified economic, industrial, and human activities, such as traffic congestion, thereby

exacerbating environmental issues like air pollution (Power *et al.*, 2011, Bakolis *et al.*, 2021; Yang, *et al*., 2021).

Huynh (2020) identified that the world's most polluted cities are predominantly located in developing Asian countries like India, Pakistan, Bangladesh, Thailand, China, and Indonesia. Indonesia ranked 26th among the world's most polluted countries in 2022 (IQAir, 2022). primarily due to forest fires, industrial expansion, economic growth, and rapid urbanization. Figure 1 illustrates Indonesia's air quality conditions in 2022, highlighting Jakarta and Surabaya as the most polluted cities.

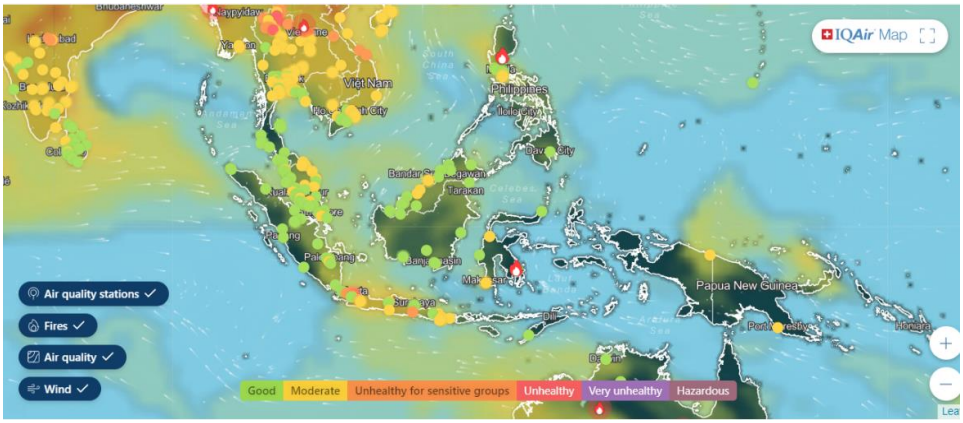

Figure 1. Air Quality Condition in Indonesia
Source: IQAir (2022)

As Lewis (2014) noted, Indonesia also has the highest urban population rate in Asia, with over 50% of the total population residing in urban areas. This trend is expected to persist in the coming decades. The graphical representation in Figure 2 depicts urban and rural population trends in Indonesia over ten decades, from 1950 to 2050.

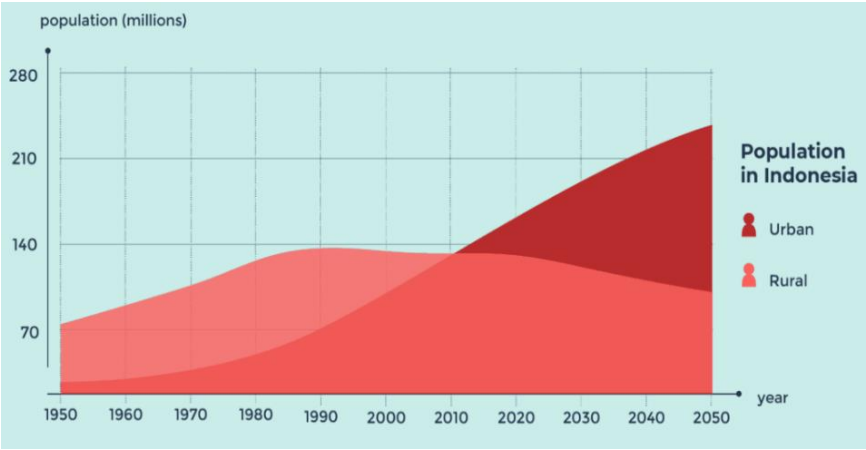

Figure 2. Urban and Rural Population Trends in Indonesia
Source: UN Desa, Population Division (2018)

According to UN Desa (2018), Jakarta has the highest proportion of urban residents among all cities in Indonesia. The rapid urbanization in Jakarta may significantly exacerbate air pollution in the region, as densely populated areas typically experience increased economic and industrial activities, contributing directly to higher pollution levels. Additionally, households, construction activities, road dust, forest fires, and emissions from over one hundred million vehicles have been identified as major sources of Jakarta's elevated air pollution (Badan Pusat Statistik, 2018).

Critically, ongoing severe air pollution in Jakarta has considerably affected the quality of life of its residents, increasing the prevalence of various non-communicable diseases, including cardiovascular diseases, respiratory illnesses, and lung cancer. Air pollution also presents severe health risks for infants, such as low birth weights and premature births, with an estimated 10 million children at risk as of September 2019. Greenstone and Fan (2019) highlighted that the current concentration of particulate matter in Jakarta's air could potentially reduce life expectancy for its residents by two to three years.

Figure 3 illustrates the projected growth trends of the six largest urban agglomerations in Indonesian cities, with Jakarta demonstrating the highest rate of urbanization.

Figure 3. The 6 largest urban Agglomerations in the cities in Indonesia
Source: UN Desa, Population Division (2018)

Beyond its detrimental effects on public health and the environment, air pollution also poses significant economic challenges for Indonesia, impacting productivity, business sustainability, and overall economic growth. Air pollution is estimated to cost Indonesia more than USD 220 billion annually, equivalent to approximately 6.6% of the country's GDP. This underscores the extensive implications of air pollution for the nation's economic development.

Regarding economic growth, small and medium-sized enterprises (SMEs) have played a critical role in the Indonesian economy, particularly during periods of instability, and are viewed as essential contributors to the country's economic progress. SMEs have significantly contributed to

Indonesia's economy, accounting for 61% of GDP and generating approximately 97% of job opportunities since 2016. With over 62 million SMEs nationwide—98.75% (61.5 million) of which are micro-enterprises—transforming these SMEs into larger, more productive entities could become a crucial driver of future economic growth and prosperity (World Economic Forum, 2021). The number and growth rate of SMEs in Indonesia between 1998 and 2017 are presented in Figure 4.

Figure 4. The Number and Rate of Growth of SMEs in Indonesia
Source: Ministry of Cooperatives and SMEs

However, the development of SMEs often involves human and industrial activities that contribute significantly to environmental problems, including the depletion of non-renewable resources, overuse of renewable resources, and pollution. In Indonesia, SMEs are responsible for approximately 70% of environmental issues, largely due to inadequate regulatory frameworks and ineffective management practices. Environmental problems such as waste accumulation, flooding, air and water pollution, marine ecosystem damage, deforestation, coastal erosion, and soil contamination were widely reported in Indonesia as recently as 2018 (Yuliani & Soetjipto, 2019).

Given that SMEs represent nearly 99% of all economic activities in Indonesia, their environmental impact is considerable and likely a major contributor to the country's ecological challenges. Furthermore, the absence of standardized national regulations for air pollution levels exacerbates health risks among Indonesians, negatively affecting public health, employee performance, and overall economic productivity. Consequently, it is critical to enhance environmental awareness and foster pro-environmental behavior (PEB) among individuals and organizations within the SME sector.

1.1 Problem Statement

In the current era of globalization, where market competition is fierce, many companies face challenges in sustaining themselves, and businesses require continuous learning and innovation to optimize their performance and survive. However, companies often overlook the importance of human capital in addition to other essential capital such as financial, physical, and technological capital (Kaplan & Biçkes, 2013). It is identified that human capital is crucial to organizational success and may offer the best return on investment for sustainable competitive advantage (Luthans & Youssef, 2004).

Regarding human capital, PsyCap has been recognized as one of the antecedents of human capital that can foster positive organizational behavior such as creativity and work engagement, which in turn help companies achieve their goals and gain a competitive advantage. However, Luthans et al. (2005) argued there is another capital that can bring benefits to competitiveness namely SC. It is acknowledged that SC also has a significant impact on employees' creativity (Chen *et al*., 2008; Jang & Shin, 2017), and engagement (Sari, 2015). In addition, green human resource management (GHRM) can also help to create PEB at both organizational and individual levels, including fostering GWE (Aboramadan, 2022), and GC (Ahmad *et al*., 2022).

In order to pursue the competitive advantage, individuals and corporations often entails the adoption of practices and materials that are not environmentally sustainable. As a result, this may lead to various environmental issues, including natural resource depletion, water and air pollution (Huynh, 2020). Air pollution, in particular, has emerged as a significant environmental challenge worldwide, especially in developing Asian countries, and can result in severe impacts on both physical and psychological aspects of human health (Oudin *et al*., 2016; Attademo *et al*., 2017; Khan *et al*., 2019; Newbury *et al*., 2019; Antonsen *et al.*, 2020; Bakolis *et al.*, 2021).

Furthermore, it is recognized that the problem of air pollution in Indonesia has worsened due to the increased levels of particulate matter in the atmosphere. This rise can be attributed to the country's growing industrialization, economic development, and urbanization in various regions. Lewis (2014) stated that Indonesia has the highest urban population rate in Asia, with more than half of its total population residing in urban areas. Additionally, the increasing number of motor vehicles on the roads has significantly contributed to the escalating PM levels in the country. The Central Bureau of Statistics Republic of Indonesia (2018) reports that the sales of motor vehicles have reached 146.8 million in the last decade, with an average growth rate of 8.3%.

Moreover, Indonesia's lack of a national standard for air pollution levels exacerbates the risks of air pollution, leading to a reduction in life expectancy for residents, and an increased likelihood of non-communicable diseases (NCDs) such as chronic respiratory diseases, cardiovascular

diseases, and lung cancer. These NCDs have a negative impact on various aspects, including residents' quality of life, city competitiveness, and a country's gross domestic product (GDP) (Syuhada *et al.*, 2023). The annual cost of air pollution in Indonesia is estimated to be more than USD 220 billion, which accounts for 6.6% of the country's GDP (Global Health data Exchange, 2019). This shows that air pollution has a significant impact on the country's economic condition.

Concerning the country's economic condition, SMEs have been recognized as the backbone of its economy. The expansion of SMEs into larger-scale operations can bring benefits to the country's future development. It has been reported that SMEs contributed to 61% of the GDP and filled 97% of job vacancies since 2016. However, the development of SMEs can also result in various environmental issues such as non-renewable resource depletion, overuse of renewable resources, and pollution. In 2018, it was reported that SMEs were accountable for 70% of environmental problems in Indonesia, including rubbish, flooding, air and water pollution, marine ecosystem damage, forest destruction, abrasion, and soil pollution (Yuliani & Soetjipto, 2019). With SMEs making up a significant portion of economic activities (99%), it is crucial to prioritize environmentally, economically, and socially sustainable practices at any levels to address these environmental concerns.

1.2 Significance of the study

In today's volatile business landscape, human capital has emerged as a more critical asset than physical or financial resources. Unlike tangible assets, human capital is difficult for competitors to replicate, as it is deeply embedded within an organization's history, culture, structure, and processes. Recognizing human resources as a capital investment is more important than ever, given its potential to generate sustainable competitive advantage (Luthans & Youssef, 2004). Consequently, organizations must prioritize the development, reinforcement, and strategic management of human capital at all levels. At the individual level, human capital is closely linked to Psychological Capital (PsyCap) (Seligman *et al.*, 2005).

Although previous research has extensively explored the role of PsyCap in fostering positive employee behavior and enhancing performance, there remains a significant gap in understanding its influence on pro-environmental behavior (PEB), particularly in relation to Green Creativity (GC) and Green Work Engagement (GWE). While existing studies acknowledge PsyCap's broader impact on PEB, few have examined its specific relationship with GC and GWE. This study aims to address that gap by being the first to investigate the direct influence of PsyCap on these two key dimensions of PEB, offering valuable insights into how psychological resources contribute to sustainable workplace behavior.

At the organizational level, Green Human Resource Management (GHRM) is widely recognized for its role in promoting employee PEB, including GC and GWE (Kim *et al*., 2019; Opatha *et al.*, 2014; Aboramadan, 2022; Ahmad *et al*., 2022). However, existing research has primarily focused on the direct effects of GHRM on employee behavior. This study adopts a novel approach by examining GHRM as a mediating factor in the relationship between PsyCap and both GC and GWE, thereby providing new insights into the interplay between psychological and organizational factors.

Another critical yet underexplored factor shaping employee behavior is Social Capital (SC). Scholars have highlighted SC's significant impact on various workplace behaviors, including creativity and work engagement (Cannella & McFadyen, 2004; Sari, 2015). While SC has been linked to PEB in prior studies (Shi, Lu & Wei, 2022), no research to date has specifically explored its role in GC and GWE. This study seeks to bridge that gap by investigating SC as a moderating variable in the relationships between PsyCap, GHRM, and both GC and GWE. In addition, it will examine the mediating role of GHRM in the relationship between SC and these dimensions of PEB. These contributions aim to enhance the existing literature by offering a more comprehensive understanding of how SC interacts with psychological and organizational factors to influence pro-environmental behavior.

This study will also consider key demographic factors—specifically gender and educational attainment—due to their potential influence on PEB. Despite their recognized importance, limited research has examined how these variables affect GC and GWE. By focusing on these specific behaviors, the study aims to provide deeper insight into how individual characteristics intersect with psychological and organizational drivers of pro-environmental behavior.

Finally, the research will be conducted in Jakarta, one of the most heavily polluted cities in Indonesia. Notably, the majority of existing studies on PEB originate from Western contexts, leaving a significant research gap in developing Asian countries, particularly Indonesia. Furthermore, few studies have explored the intersection of psychological, organizational, and environmental factors in this region. By addressing these gaps, this interdisciplinary study will contribute meaningfully to the fields of psychology, organizational behavior, and environmental sustainability. By focusing on the SME sector—an essential driver of Indonesia's economy—it will also generate practical insights that can help businesses adopt more sustainable practices while enhancing employee engagement and innovation.

1.3 Research Objectives

The goal of this research is to investigate how psychological, organizational, and environmental factors are interconnected and how they contribute to improving environmental awareness and recognizing the significance of human resources for sustainability in small and medium-sized enterprises (SMEs) in Indonesia's most polluted cities. The study identifies these factors as crucial for promoting sustainability and presents the following objectives:

1. To examine the impact of PsyCap on employees' GC, GWE, and GHRM
2. To examine the impact of GHRM on GC and GWE
3. To examine the impact of SC on GHRM, GC, and GWE
4. To examine the effect of gender (male and female) on the development of PsyCap, SC, GC, and GWE.
5. To examine the impact of educational attainment (bachelor's, master's, and Ph.D.) on the development of PsyCap, SC, GC, and GWE.
6. To analyze the mediating role of GHRM in the relationship between PsyCap and employees' GC`and GWE, as well as in the relationship between SC and employees' GC and GWE.
7. To examine the moderating effect of SC in the relationship between PsyCap and employees' GC and GWE, mediated by GHRM.
8. To examine the moderating impact of gender (male and female), on the moderated mediation relationship between PsyCap, SC, GHRM, and both GC and GWE, as well as to further analyze how different gender categories influence this relationship.
9. To examine the moderating impact of educational attainment (bachelor's, master's, and Ph.D.) on the moderated mediation relationship between PsyCap, SC, GHRM, and both GC and GWE, as well as to further analyze how different educational attainment categories influence this relationship

1.4 Research questions

Based on the study objectives, the following research questions are formulated:

1. How does PsyCap influence employees' GC and GWE, as well as GHRM?
2. What is the impact of GHRM on employees' GC and GWE?
3. What is the impact of SC on GHRM, GC, and GWE?
4. How does gender, including both male and female, influence the development of PsyCap, SC, GC, and GWE?
5. How does educational attainment, including bachelor's, master's, and Ph.D., influence the development of PsyCap, SC, GC, and GWE?
6. How does GHRM mediate the relationship between PsyCap and employees' GC and GWE, as well as the relationship between SC and employees' GC and GWE?
7. How does SC moderate the relationship between PsyCap and employees' GC and GWE, mediated by GHRM?

8. How does gender, including both male and female, moderate the moderated mediation relationship between PsyCap, SC, GHRM, and both GC and GWE? Additionally, how do different gender categories influence this relationship?
9. How does educational attainment, including bachelor's, master's, and Ph.D., moderate the moderated mediation relationship between PsyCap, SC, GHRM, and both GC and GWE? Additionally, how do different educational attainment categories influence this relationship?

1.5 Hypotheses

This study proposes the following hypotheses to examine the direct, mediating, and moderating impacts of variables..

1.5.1 Direct Effects

H1a: PsyCap has a significant impact on employees' GC.

H1b: PsyCap has a significant impact on employees' GWE.

H1c: PsyCap has a significant impact on GHRM.

H2a: GHRM has a significant impact on employees' GC.

H2b: GHRM has a significant impact on employees' GWE.

H3a: SC has a significant impact on GHRM.

H3b: SC has a significant impact on GC.

H3c: SC has a significant impact on GWE.

H4a: Gender significantly influences the development of PsyCap

H4b: Gender significantly influences SC.

H4c: Gender significantly influences the development of GC.

H4d: Gender significantly influences the development of GWE

H5a: The educational attainment significantly influences the development of PsyCap

H5b: The educational attainment significantly influences SC.

H5c: The educational attainment significantly influences the development of GC

H5d: The educational attainment significantly influences the development of GWE.

1.5.2 Mediating Effects

H6a: GHRM significantly mediates the relationship between PsyCap and employees' GC.

H6b: GHRM significantly mediates the relationship between PsyCap and employees' GWE.

H6c: GHRM significantly mediates the relationship between SC and employees' GC.

H6d: GHRM significantly mediates the relationship between SC and employees' GWE.

1.5.3 Moderated Mediation Effects

H7a: SC significantly moderates the relationship between PsyCap and Employees' GC, mediated by GHRM.

H7b: SC significantly moderates the relationship between PsyCap and Employees' GWE, mediated by GHRM.

1.5.4 Demographic Factors Moderates Effects

H8a: Gender significantly moderates the moderated mediation relationship between PsyCap, SC, GHRM and both GC and GWE.

H8b: Women plays a substantial role in moderating the moderated mediation relationship between PsyCap, SC, GHRM and both GC and GWE

H9a: The educational attainment significantly moderates the moderated mediation relationship between PsyCap, SC, GHRM, and both GC and GWE.

H9b: The higher degree (Ph.D.) plays a substantial role in moderating the moderated mediation relationship between PsyCap, SC, GHRM and both GC and GWE

Figure 5 illustrates the proposed conceptual research framework based on the hypotheses presented in this study.

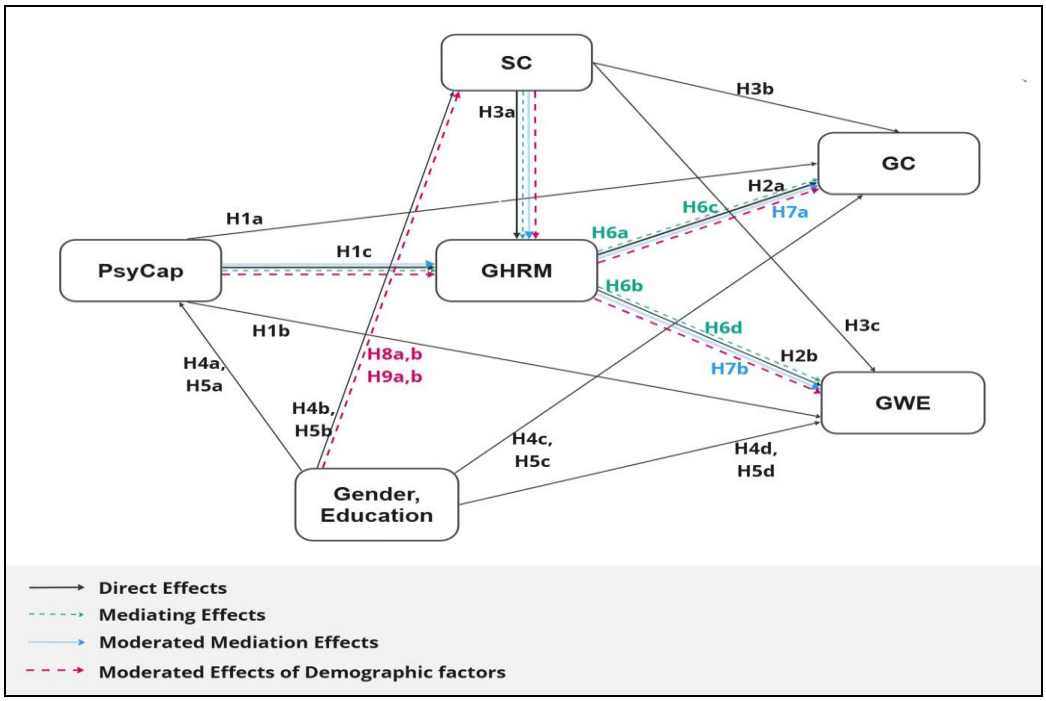

Figure 5. A Proposed Conceptual Framework Based on Literature and Hypotheses
Source: Author's own construction

II. LITERATURE REVIEW

2.1 Human Capital

Increasing global competition and ongoing economic shifts have compelled organizations to implement strategic changes across various operational areas to promote diversification, innovation, productivity, sustainability, and enhanced performance (Alshebami, 2021). As a result, companies must not only optimize the management of their physical and financial capital but also prioritize the strategic development of human capital.

Human capital refers to the inherent productive capacities of individuals (Eide & Showalter, 2010). Scholars describe it as a spectrum of valuable abilities and knowledge accumulated over time. It is generally understood to comprise the personal abilities, expertise, education, skills, experience, and talents that employees bring to an organization (Westhead *et al.*, 2002). These characteristics can be developed through investments in education, on-the-job training, and health-related programs (Eide & Showalter, 2010).

Mayo (2002), classifies human capital into three key categories: capability and potential, motivation and commitment, and innovation and learning. *Capability and potential* encompass qualifications, professional experience, personal values, networks, and the capacity for growth. *Motivation and commitment* reflect the extent to which employees align their personal goals with organizational objectives. *Innovation and learning* capture employees' adaptability and openness to acquiring new skills and knowledge.

Ruzzier et al. (2007) further categorized human capital knowledge into two dimensions: tacit and explicit. While tacit knowledge refers to intuitive, experience-based know-how—such as familiarity with foreign markets—explicit knowledge includes codified skills and concepts that are more easily communicated, like the ability to conduct business in those markets. Both dimensions evolve over time, are often non-transferable, and are considered highly effective.

As an intangible resource, human capital plays a pivotal role in converting information into actionable knowledge that drives organizational performance. Numerous studies have acknowledged its importance in boosting firm success across industries. Human capital can influence business performance directly or indirectly through structural, relational, innovation, or process capital (Mention & Bontis, 2013). Honig and Davidsson (2000) also suggest that investing in human capital creates favorable conditions for innovation. Individuals with higher levels of human capital are more adept at identifying, developing, and capitalizing on new economic opportunities.

In the small and medium enterprises (SMEs) sector, human capital is considered to be a significant determinant of the outcomes of such enterprises. It is widely acknowledged that human capital has a direct impact on entrepreneurial success and the growth of SMEs. Furthermore, the role of human capital in supporting SME internationalization has been highlighted (Unger *et al.*, 2011; El Shoubaki, *et al.*, 2020), with Luthans and Youssef, 2004) emphasizing its contribution to enhancing SME competitiveness and long-term survival.

Given that skilled and knowledgeable human capital is a vital organizational asset, it is essential for enterprises to focus on improving employee behavior and performance at both individual and organizational levels (Fritz *et al*. 2011). To do so effectively, it is important to understand the underlying factors that influence positive employee behavior. In this regard, Psychological Capital (PsyCap) has been identified as a crucial psychological resource that organizations can cultivate to strengthen employee performance and overall organizational success (Luthans *et al.*, 2005).

2.1.1 Psychological Capital (PsyCap)

Recent advancements in business practices have led to the emergence of new resources that offer organizations a competitive edge. As a result, conventional sources of competitive advantage—such as financial, physical, and technological assets—though still essential for sustainability, are increasingly seen as insufficient on their own. In response, a new form of resource, known as Psychological Capital (PsyCap), has gained prominence. Rooted in the domains of positive psychology and positive organizational behavior, PsyCap refers to an individual's positive evaluation of circumstances and their perceived likelihood of success, driven by motivated effort and persistence (Luthans & Youssef, 2004). Additionally, PsyCap has been described as the application of psychological strengths and human resource capabilities oriented toward positivity—attributes that can be measured, developed, and effectively managed to enhance workplace performance (Luthans *et al.*, 2007).

According to several scholars, PsyCap is a *state-like construct*, meaning it is relatively malleable and open to development—unlike fixed traits such as personality (Thompson *et al*., 2015). This adaptability is a critical characteristic, as it allows PsyCap to be enhanced through targeted training and developmental interventions. This practical aspect has been supported by numerous studies. For example, Snyder *et al.,* (2022) demonstrated that hope can be cultivated and introduced the "State Hope Scale" as a validated measure. Bandura developed strategies to increase self-efficacy, while Wagnild and Young (1993) developed a state-like measure of resilience. Masten (2021) presented developmental interventions to improve resilience, and Carver and Scheier (2002), along with Millstein *et al.* (2019), offered methods for developing

and measuring optimism in situational contexts. Seligman's (2005) influential work on optimism further supports the modifiability of PsyCap. Collectively, these studies highlight the practical relevance of PsyCap for individuals, organizations, and broader societal outcomes.

Beyond its theoretical foundations, empirical evidence suggests that PsyCap is influenced by a variety of factors beyond individual predispositions. Research indicates that experiences, personal characteristics, leadership behaviors, job design, and the broader working environment all contribute to the development of PsyCap (Çimen & Özgan, 2018). This suggests that the cultivation of PsyCap is not solely an individual endeavor, but is also shaped by organizational-level dynamics, underscoring its strategic importance in human capital development.

2.1.2 The Dimension of Psychological Capital (PsyCap)

The origin of the concept of PsyCap is widely recognized to have been influenced by positive psychology and positive organizational behavior. According to Luthans et al. (2004), PsyCap is a superior construct that comprises four positive psychological dimensions, namely hope, self-efficacy, resilience, and optimism.

Hope

Hope can be defined as a motivational force that directs an individual towards achieving career-related objectives, and is often characterized by feelings or beliefs about future goals (Lopez, 2009). Scholars conceptualized hope as a positive motivational state that arises from two key components: agency—the goal-directed energy—and pathways—the perceived capacity to plan and generate routes toward those goals. Agency reflects an individual's ability to initiate and maintain actions toward desired outcomes, while pathways represent their perceived capability to identify alternative strategies for achieving specific goals (Snyder *et al.*, 2002; Snyder, 2009).

It is widely acknowledged that employees with higher levels of hope are more likely to set ambitious goals and persist in achieving them, which often results in enhanced performance (Srivastava & Maurya, 2017). Luthans et al. (2007) further demonstrated that hope not only encourages persistence but also enhances adaptability, allowing individuals to modify their strategies in response to changing circumstances.

While the critical role of hope in fostering positive workplace outcomes has been well-documented, research on the individual and organizational factors that influence levels of hope in the workplace remains limited. Therefore, further investigation is necessary to deepen our understanding of the variables that shape and sustain hope in organizational settings.

Self-efficacy

In the field of psychology, beliefs about perceived competence have been identified as a major concern among researchers. Bandura (1978) introduced the concept of *self-efficacy* to better understand perceived competence and its role in human behavior. Self-efficacy refers to an individual's belief in their ability to mobilize motivation, cognitive resources, and appropriate actions to successfully accomplish a specific task within a given context (Stajkovic, 2006). According to Luthans *et al*. (2007), individuals with high levels of self-efficacy are more likely to approach challenging tasks with confidence and to exert the effort required to achieve success.

Grounded in social cognitive theory, self-efficacy represents the belief that one can produce desired outcomes through their own actions. Within the workplace, self-efficacy is defined as an employee's conviction in their ability to effectively harness motivation, cognitive skills, and behavioral strategies to carry out job-related tasks. This construct is shaped by four principal sources: mastery experiences (personal success in past performance), vicarious experiences (observing others succeed), social persuasion (encouragement from others), and physiological and emotional states (such as stress or anxiety). It is emphasized that self-efficacy is a dynamic belief system that influences how confidently individuals perform across a range of situations (Stajkovic & Luthans, 1998).

Resilience

Although resilience originated in the fields of clinical and developmental psychology (Bonanno, 2004; Masten & Reed, 2002), it has increasingly become a central concept in organizational behavior and human resource management. Resilience is commonly defined as the capacity to bounce back from adversity, trauma, or stress, and to adapt positively to significant challenges. In organizational contexts, Luthans (2002a) conceptualized workplace resilience as the ability to recover from adversity, conflict, failure, progress, increased responsibilities, or other disruptive events. This capacity enables employees to withstand pressure, manage change effectively, and maintain performance during times of uncertainty or stress.

Luthans et al. (2007) positioned resilience as one of the four core components of Psychological Capital (PsyCap), emphasizing its importance in enabling employees to persevere through difficulties while maintaining a positive outlook. Unlike fixed personality traits, resilience is a state-like psychological capacity, meaning it can be developed and enhanced through targeted interventions and training.

Resilience is influenced by several individual and contextual factors. Personal characteristics such as optimism, self-efficacy, and emotional regulation contribute to higher resilience (Tugade, *et al*., 2004). At the organizational level, a supportive work environment,

transformational leadership, and a strong organizational culture also foster resilience (Fang *et al.*, 2020). Moreover, access to social support and opportunities for skill development further strengthen an individual's ability to cope with challenges (Pandey, 2019).

Empirical studies have shown that resilience is a strong predictor of various positive work-related outcomes. For example, resilient employees report higher levels of job satisfaction, lower burnout, greater engagement, and improved job performance (King, *et al*., 2016). In high-stress industries such as healthcare, resilience has been found to buffer the negative effects of emotional exhaustion and to promote psychological well-being. Additionally, resilience supports organizational adaptability, helping teams and firms recover more effectively from crises or disruptions. Additionally, resilience supports organizational adaptability, helping teams and firms recover more effectively from crises or disruptions (McAllister & McKinnon, 2009; Caza & Milton, 2012).

In summary, resilience is not only vital for individual well-being and performance but also contributes to organizational sustainability and agility in the face of change. Given its malleable nature, resilience development programs—such as resilience training workshops, mindfulness practices, and leadership coaching—can be powerful tools for building a resilient workforce in today's volatile and complex business environment.

Optimism

Optimism is considered a strength in the field of positive organizational behavior due to its ability to improve individual and organizational outcomes. This is based on the idea that individuals with a positive outlook are more likely to persist in the face of adversity, see opportunities where others see obstacles, and have better mental and physical health outcomes (Seligman, 1998). Optimism contributes to resilience, engagement, and job satisfaction, making it a valuable psychological asset in the workplace. Importantly, optimism is not solely a fixed personality trait; it is also a learned skill that can be developed through interventions such as cognitive-behavioral training, reframing negative events, practicing positive self-talk, and setting achievable goals (Carver & Scheier, 2002). As such, cultivating optimism has been shown to improve overall well-being, motivation, and performance within organizational contexts.

Optimism is typically defined as a generalized expectancy that positive outcomes will occur in the present and future. According to Seligman (1998), optimistic individuals tend to attribute positive events to personal, permanent, and pervasive causes, while attributing negative events to external, temporary, and situation-specific factors. This attributional style fosters a more

adaptive response to setbacks and is associated with increased perseverance and psychological resilience.

Luthans et al. (2007) extends this definition within the PsyCap framework by emphasizing that optimism is not just about positive thinking, but also about maintaining a realistic sense of efficacy and goal-directed motivation. As a component of PsyCap, optimism combines cognitive, emotional, and motivational elements. This multidimensional nature distinguishes it from other PsyCap dimensions such as hope and self-efficacy, which are more cognitively oriented. Optimism enhances motivational intensity and reinforces positive expectancy, thereby improving task engagement, persistence, and performance.

Moreover, research suggests that optimistic employees are more proactive, demonstrate higher levels of organizational citizenship behavior, and adapt more effectively to organizational change. By promoting positive attitudes and reducing the likelihood of burnout, optimism contributes to a healthier, more productive work environment. As such, developing optimism is not only beneficial for individual employees but also for organizational success, especially in dynamic and uncertain business environments (Daswati *et al.*, 2022).

2.1.3 The Role of PsyCap in Employee and Small and Medium Enterprise (SME) Performance

Small and Medium Enterprises (SMEs) have been recognized as a crucial pillar in the global economy, contributing over 20% of GDP and playing a vital role in reducing unemployment, particularly amid intense competition and economic transitions (Alshebami, 2021). While financial and technical assistance are essential for the success of SMEs, other factors—such as employee performance—also play a critical role in determining overall organizational success. In this context, Psychological Capital (PsyCap) has emerged as a powerful tool that can significantly help employees reach optimal organizational performance (Luthans & Youssef, 2004).

Given the growing recognition of PsyCap's role in enhancing both employee and organizational performance, a growing body of research has explored its impact at multiple levels, particularly within the context of small and medium-sized enterprises (SMEs). At the individual level, PsyCap has been found to significantly influence employees' job satisfaction (Ngo, 2021). Satisfying employees' psychological needs is associated with increased job satisfaction, which is directly linked to higher levels of PsyCap (Shah *et al.*, 2019).

In addition, several studies have demonstrated a positive correlation between PsyCap and innovation performance, both individually and within teams. It is observed that PsyCap fosters a

more engaged and psychologically safe learning environment, which encourages innovation across team settings. The relationship between PsyCap and employee engagement has also been well-documented, with PsyCap shown to boost employees' commitment, motivation, and involvement in their work (Tsaur *et al*., 2019; Tran *et al.*, 2021; Chen *et al.*, 2023).

Kahn (1990), foundational work identified a strong connection between positive psychological resources and work engagement, which consists of three core components: *vigor* (energy and mental resilience at work), *dedication* (a sense of significance and enthusiasm), and *absorption* (deep concentration and immersion in tasks). Work engagement has been consistently linked to improved morale, productivity, and intrinsic motivation (Giancaspro *et al*. 2022). Giancaspro, et al. (2022) further noted that personal resources, such as PsyCap, play a key role in strengthening employee engagement while buffering the negative effects of stress and burnout. Employees with high levels of PsyCap tend to be more proactive, adaptable, and resilient, enabling them to thrive in uncertain and dynamic environments—an essential trait in the SME sector (Sujatha & Mukherjee, 2023).

Moreover, research has consistently linked PsyCap to employee creativity. Individuals with strong self-efficacy and hope are more confident in their ability to generate innovative solutions, contributing significantly to their organization's creative output (Rego *et al.*, 2012; Yu *et al.*, 2019). At the organizational level, PsyCap has been shown to positively influence organizational commitment, particularly affective commitment—employees' emotional attachment to and identification with their organization. This fosters a more stable workforce, reduces turnover intentions, and enhances operational effectiveness by enabling deeper relationships with clients, colleagues, and suppliers. Such commitment is especially valuable for SMEs seeking sustainable growth and competitive advantage (Obeng *et al.*, 2021).

Luthans et al. (2005) emphasized that PsyCap contributes to the competitive advantage of SMEs, while Chen and Tao (2021) provided evidence of its positive impact on overall business performance. Numerous studies have demonstrated that PsyCap improves job performance at both individual and team levels (Daraba *et al.*, 2021; Paliga *et al.*, 2022; Giancaspro et al., 2022). High-performing employees are instrumental in helping firms meet strategic objectives and maintain competitive positioning (Sonnentag, 2002). Additionally, PsyCap has been found to positively influence knowledge management, which supports innovation through better knowledge sharing and application. This is particularly crucial in SMEs, where agility and innovation are key survival mechanisms (Zhang *et al.*, 2021; Chang *et al.*, 2022; Ge, 2022).

In times of crisis, PsyCap becomes even more essential, Tanner et al. (2022) identified PsyCap as a crucial resource for fostering organizational resilience, especially in response to external

shocks. Rehman and Mubashar (2017) noted that during crises, the hope and optimism components of PsyCap help business owners and managers maintain confidence in their ability to recover and formulate effective strategies. Similarly, resilience allows leaders to manage stress, maintain emotional balance, and continue operations while navigating recovery paths (Pathak & Joshi, 2020).

These findings align with prior research linking PsyCap to proactive and adaptive behaviors, highlighting its role in helping SMEs survive and grow in uncertain environments. As such, PsyCap is not only a personal resource but a strategic organizational asset, particularly for SMEs operating in volatile, complex, and resource-constrained contexts (McKenny *et al.*, 2013; Madrid *et al.*, 2018).

2.2 Social Capital (SC)

In addition to Psychological Capital, Social Capital (SC) has been increasingly recognized as a critical determinant of employee–organization relationships, particularly in the context of Small and Medium Enterprises (SMEs) (Fang *et al.*, 2020). SC refers to the actual and potential resources embedded within, accessible through, and derived from an individual's or a group's network of relationships. It encompasses both the structure of the network and the assets that can be mobilized through these social ties (Nahapiet & Ghoshal, 2009). From a strategic perspective, SC is considered a form of soft capital that accumulates through social interactions and can be leveraged by individuals or organizations to achieve goals. Membership in specific networks facilitates individual and group actions by providing both direct and indirect connections to other actors (Stephenson, 2004). These network relationships—being complex, socially constructed, and often unique—are difficult to imitate and therefore offer companies a sustained competitive advantage.

SC is also viewed as a valuable resource embedded within interpersonal relationships, encompassing both emotional and instrumental support, along with access to diverse and rich information (Hyde-Peters & Simkiss, 2016). Rather than being a static asset, SC is a dynamic outcome of continuous social processes. It plays a particularly critical role in facilitating the development of other forms of capital, such as Human Capital. Burt (1992) emphasized that SC is accessed through colleagues, friends, and broader social connections that provide opportunities to leverage financial and human resources. Similarly, Portes (1998) defined SC as the ability of individuals to derive benefits from their membership in social networks or structures, categorizing its functions into three areas: (1) social control, (2) family support, and (3) extra-familial network benefits.

Marsden (2021) further argued that SC should be understood in terms of both its *structure*—the configuration of relationships—and its *function*—its capacity to facilitate specific actions within those networks. High-quality SC fosters trust, cooperation, and shared understanding among individuals, not only within organizations but also across communities and entire regions (Wu, 2018). Helliwell (2001) highlighted that interpersonal trust—especially when reinforced by trustworthy behavior—enhances individual well-being and workplace productivity.

Adler and Kwon (2002) proposed that the core principle of SC is that goodwill among individuals is a valuable resource. This goodwill—manifested as trust, sympathy, and forgiveness—enables the exchange of information, influence, and emotional support within networks. Chazon (2009) similarly noted that strong social interactions reinforce relational bonds, creating trust and fostering collaboration.

Portes and Sensenbrenner (1993) defined SC as a set of shared expectations for behavior within a collectivity that shapes goal-directed action, even when those expectations are not strictly economic. Within organizations, SC plays a pivotal role in knowledge integration, helping to reduce perceptions of opportunism and align stakeholder goals (Karahanna & Preston, 2013). Strong SC enables employees to trust, understand, and identify with one another, thereby enhancing team collaboration, communication, and overall organizational effectiveness (Ariani, 2012).

Given its far-reaching influence, it is essential for SMEs to intentionally cultivate SC at both the individual and organizational levels. Doing so not only supports interpersonal coordination and collective learning but also contributes to long-term economic and community development.

2.2.1 The Dimension of Social Capital

Various sociologists have conceptualized Social Capital (SC) as comprising two fundamental aspects: individual social capital and collective social capital (Davis *et al.*, 2005; Dunlap & York, 2008; Pampel & Hunter, 2012). *Individual social capital* refers to how individuals invest in social relationships to access and mobilize resources embedded in their networks. In contrast, *collective social capital* relates to the broader group-level dynamics of trust, participation, and reciprocity, which function as public goods that enhance the overall quality of life within a community or organization. These two forms of SC serve distinct purposes and vary in relevance depending on the social and organizational context. (Bian, 2018; Shi, Lu & Wei, 2022).

Similarly, other researchers have proposed differentiating SC into internal and external social capital. *Internal SC* encompasses trust-based, reciprocal relationships among members within an organization—such as familial or friendship ties among SME owners or managers. In contrast,

external SC is derived from relationships with outside stakeholders, including suppliers, customers, governmental agencies, and other firms. Both internal and external forms of SC provide critical relational infrastructure that supports collaboration and business continuity (Fang *et al.*, 2020; Wang & Lee, 2021).

Milana and Maldaon (2015) introduced another classification of SC into two categories: cognitive social capital (CSC) and structural social capital (SSC). CSC refers to shared norms, trust, and values—essentially the "social glue" that guides behavior and builds mutual expectations. Trust, as a core element of CSC, reflects confidence in others' reliability and the expectation of reciprocal support. SSC, on the other hand, includes the social network structures—both informal (e.g., friends, relatives, colleagues) and formal (e.g., organizational memberships)—through which actors interact. These networks enable access to information and resources by providing communication channels that facilitate interpersonal connections (Kaasa, 2007).

Expanding on this, Nahapiet and Ghoshal (2009) identified three distinct dimensions of social capital: relational, structural, and cognitive.

1. Relational Dimension

   This dimension refers to the nature and quality of personal relationships developed through repeated interactions. It involves elements such as trust, norms of reciprocity, shared obligations, and identification among actors. In business networks, relational SC is critical to fostering mutual respect, behavior alignment, and trust between firms. According to Tomlinson (2012), this dimension aligns with social exchange theory, which posits that individuals are more likely to act helpfully within trusted and mutually beneficial exchanges.

2. Structural Dimension

   The structural dimension pertains to the configuration of relationships—the overall pattern of connections between actors. It emphasizes the position of individuals within a network and the strength, frequency, and pathways of their social ties (Tomlinson, 2012). Karahanna and Preston (2013) suggest that structural SC plays a vital role in enabling access to valuable actors for knowledge exchange, innovation, and collaboration. It represents the social architecture that determines who interacts with whom and how easily information and resources circulate.

3. Cognitive Dimension

   The cognitive dimension involves shared codes, language, interpretations, and collective narratives that help individuals make sense of their relationships and roles. Ariani (2012)

describes this as the foundation for shared goals, values, and behavioral norms within a social system. The presence of shared mental models facilitates coordination, communication, and understanding—key factors in team performance and interdepartmental collaboration. Furthermore, the cognitive dimension includes the distribution and accessibility of socially embedded resources and reflects an individual's ability to evaluate and interpret workplace dynamics.

Despite the richness of these frameworks, scholars note that there is still inconsistency in how SC dimensions are defined and operationalized across disciplines. This variation has led to diverse interpretations and a lack of consensus on the most appropriate way to categorize and measure SC, particularly in applied contexts such as SMEs.

2.2.2 The Role of Social Capital on employee's and Organizational Performance

The concept of SC has gained considerable attention in scholarly discourse, with researchers examining its multifaceted dimensions from diverse perspectives, including sociological, organizational, and management perspectives sociological (Yu & Junshu, 2013, Tanner *et al*., 2022). These perspectives offer critical insights into the complex network of relationships and interactions among individuals and organizations, shedding light on how SC influences human behavior, organizational dynamics, and performance outcomes (Chowdhury *et al.*, 2019).

At the individual level, SC is perceived as a valuable resource that individuals strategically invest in, treating it as part of a utility maximization process—making optimal decisions to derive the greatest personal and professional benefit. Milana and Maldaon (2015) suggested that SC significantly affects job satisfaction, which in turn enhances employee performance. Roberson and Williamson (2012) further found that the structure of SC—particularly the nature of connection ties—mediates its relationship with performance. These ties facilitate information flow and knowledge sharing, ultimately leading to improved employee outcomes.

SC impacts employees across various dimensions, including social norms, mutual obligations, trust, recognition, and shared visions. Trust is particularly crucial, as it encourages employees to share knowledge and offer mutual support (Yu & Junshu, 2013). Shared vision serves as a powerful motivator, integrating diverse knowledge and perspectives to boost team cohesion and performance. SC also fosters creativity by strengthening network ties and enabling access to specialized resources, a key driver of innovation (Rickards, *et al*., 2001; McFadyen & Cannella, 2004). In entrepreneurship, SC plays a pivotal role in shaping behavior and success, especially among younger entrepreneurs, by promoting cooperation and facilitating entrepreneurial performance (Wang & Lee, 2021; Luo *et al*., 2021).

At the organizational level, SC has been shown to enhance overall performance. However, its dimensions can have varying impacts. Yu and Junshu (2013) found that the structural configuration of SC influences employee interactions, enabling leaders to better allocate talent and identify strategic opportunities. SC also reduces opportunistic behavior, lowers the need for costly oversight, and decreases transaction costs—thus improving organizational efficiency. Strong internal and external ties also improve access to valuable information and strategic advice, contributing to better financial outcomes (Oh *et al*., 2004; Tian, *et al*., 2011).

SC enables firms to access critical non-monetary resources through group membership in various networks It facilitates value creation, knowledge integration, and innovation, and supports the generation of new products and services—enhancing competitiveness (Jin & Ma, 2021). Fornoni et al. (2012) argued that different SC dimensions contribute to acquiring resources that are valuable, rare, inimitable, and non-substitutable (VRIN), which can become sources of sustainable competitive advantage, particularly in financing, production, and information management.

Since SC is inherently relational, its structure and effectiveness depend on the characteristics of individuals, groups, or organizations involved. It is not easily transferable or replicable—trust built within one firm cannot simply be replicated in another. This uniqueness reinforces SC as a key strategic asset that contributes to an organization's ability to survive and thrive amidst increasing market volatility (Chowdhury *et al.*, 2019; Hua *et al*., 2021).

Moreover, SC serves as a foundational infrastructure that enables organizational adaptation to internal and external changes. It not only supports collaboration and agility but can also play a role in promoting green innovation, resource efficiency, and pro-environmental behavior (PEB). In response to environmental and social challenges, SC has become increasingly relevant for sustainable organizational development (Chazon, 2009; Hua & Goodman, 2021).

In the context of SMEs, SC has been shown to significantly contribute to organizational resilience, particularly in post-disaster and crisis contexts. SC acts as an information conduit, enhances access to resources, and improves the speed and quality of information diffusion, all while minimizing redundancy (Prasad & Tata, 2015; Chowdhury *et al.*, 2019). *Internal SC (InSC)*—built through strong intra-organizational relationships—enhances trust, perceived support, employee well-being, service quality, and knowledge exchange, thus promoting adaptive resilience. *External SC (ESC)*—built through ties with suppliers, customers, government bodies, and other firms—also plays a vital role in post-crisis recovery and strategic agility for SMEs.

In conclusion, the significance of SC and its various dimensions cannot be overstated. As a critical determinant of individual behavior, organizational performance, resilience, and innovation, SC offers valuable benefits that extend far beyond immediate social interactions. A comprehensive understanding of SC—its forms, functions, and implications—can guide both researchers and practitioners in leveraging it for social, economic, and strategic gains. By recognizing SC's role in fostering collaboration, building trust, accessing resources, and securing long-term competitive advantage, organizations—especially SMEs—can use it as a powerful tool for sustainable growth. Therefore, continued research on SC remains essential for unlocking its full potential and applying it effectively in real-world contexts.

2.3 Employees' Pro-Environmental Behavior (PEB)

It is widely recognized that fostering pro-environmental behavior (PEB) at the individual level can yield numerous benefits for both organizations and society. In response, companies across the globe have increasingly prioritized environmental performance by encouraging voluntary PEB, particularly among employees. Consequently, PEB in the workplace has emerged as a key area of interest for researchers seeking to understand the factors that influence environmentally responsible behaviors among employees (Robertson & Barling, 2017; Tian & Robertson, 2019).

Environmentally responsible behaviors refer to voluntary and discretionary actions undertaken by individuals to support environmental sustainability. In the workplace context, PEB encompasses activities that extend beyond employees' formal job responsibilities and have a positive impact on the work environment. These behaviors may include suggesting eco-friendly initiatives, raising concerns about environmentally harmful policies, and advocating for organizational practices aligned with environmental goals. In essence, PEB represents voluntary, unrewarded, and non-mandatory actions that demonstrate an individual's commitment to environmental stewardship (Paillé *et al.*, 2014; Lamm *et al*., 2015; Tosti-Kharas *et al*., 2017).

Numerous studies underscore the importance of encouraging PEB among employees as a strategy to enhance an organization's environmental performance. These behaviors include reducing energy consumption (Singh *et al.*, 2019), minimizing environmental pollution (Swim *et al.*, 2011), and conserving natural resources (Robertson & Barling, 2017). Cheng and Wu (2015) further emphasized that foundational environmental knowledge and sensitivity are critical for fostering employee engagement in PEB. Prior research has identified several antecedents to environmentally responsible workplace behaviors, including green organizational culture, eco-conscious recruitment practices, sustainable procurement, and strong managerial commitment to environmental initiatives. Given the central role that employees play in driving sustainability, it

is essential to identify those who actively engage in PEB within organizational settings (Suhi *et al.*, 2019, Moktadir *et al.*, 2020).

Three evaluative categories have been proposed to identify and understand PEB among employees. First, engaging in unrewarded and voluntary PEB is seen as an initial step toward establishing green and sustainable organizations (Lülfs & Hahn, 2013). Second, performing environmentally responsible actions, such as reducing waste or conserving energy, can serve as a model for others, encouraging wider participation in eco-friendly practices (Paillé *et al.*, 2014). Third, voluntary acts of conservation, such as minimizing resource use and avoiding environmentally harmful behavior, have been associated with cost savings (Norton *et al*., 2015) and improved financial performance (Albertini, 2013). These insights highlight the critical influence of employees in advancing holistic environmental strategies

Koehler and Hecht (2006) argued that promoting PEB not only supports environmental protection but also contributes to broader societal well-being. Verdugo (2012) emphasized that PEB in the workplace is largely shaped by positive psychological dispositions. Supporting this view, numerous studies have identified Psychological Capital (PsyCap) as a significant predictor of various employee attitudes and behaviors, including PEB. Employees with high levels of PsyCap—characterized by hope, efficacy, resilience, and optimism—are more likely to take initiative, persist in the face of challenges, and adopt positive, voluntary environmental behaviors in the workplace (Luthans *et al.*, 2007; Sweetman *et al.*, 2011).

2.3.1 The relationship between PsyCap and Pro-Environmental Behavior (PEB)

Given the increasing recognition of environmental challenges, it is now evident that economic and human activities play a substantial role in environmental degradation. In response, researchers across work, organizational, and environmental psychology have begun exploring how positive employee behaviors can contribute to environmental sustainability. As a result, several studies have identified correlations between psychological dimensions and employee engagement in pro-environmental behavior (PEB) (Afshar Jahanshahi *et al*., 2021).

Psychological Capital (PsyCap) consists of four core positive psychological resources—hope, self-efficacy, resilience, and optimism—that contribute to the development of constructive behaviors both within and beyond the workplace (Luthans & Youssef, 2004; Zachrisson & Boks, 2012). Individuals with high levels of PsyCap tend to exhibit three defining traits that support PEB:

First, optimism plays a central role. Optimistic individuals are more likely to expect favorable outcomes and take initiative in creating positive change (Karademas, 2006). Sharrock et al.

(1990) found that optimism increases the likelihood of engaging in helpful, voluntary behaviors aimed at benefiting others, suggesting its potential link to environmentally responsible actions.

Second, hope contributes to increased life and job satisfaction, serving as a motivational force that supports sustained engagement in PEB. In contrast, a lack of hope may lead to disengagement, as individuals may feel powerless or demotivated in the face of environmental challenges. Hopeful individuals tend to believe in their capacity to make a difference, which can translate into greater involvement in sustainability-related efforts (Copic *et al.*, 2011).

Third, resilience—particularly in social and workplace contexts—is essential for sustaining voluntary behaviors under stress or adversity. Resilient individuals are better equipped to manage stress, adapt to challenges, and pursue meaningful outcomes (Collins, 2007; Cohn *et al.*, 2009). Reich et al., (2010) found that resilience is a key predictor of sustained voluntary workplace behavior, even in the presence of significant pressures. This highlights resilience as a critical factor in maintaining consistent PEB engagement over time, especially during organizational change or environmental crises.

Together, these PsyCap components create a psychological foundation that supports long-term engagement in behaviors that contribute to environmental well-being. Individuals with high PsyCap are more likely to engage in PEB not only to improve their immediate surroundings but also out of a broader desire to contribute to a sustainable future (Afshar J. *et al*., 2021b).

In addition to its links with PEB, prior studies have demonstrated that PsyCap positively influences employee creativity (Chen *et al.*, 2023) and work engagement (Thompson et al., 2015). This suggests that PsyCap may also have implications for more targeted forms of PEB, including green creativity (GC) and green work engagement (GWE). However, research examining the direct relationship between PsyCap and these specific green behaviors remains limited. Therefore, further investigation is warranted to explore how PsyCap may foster these environmentally focused workplace outcomes.

2.3.2 The relationship between SC and Pro-Environmental Behavior (PEB)

According to Shi, Lu, and Wei (2022), the acquisition of resources for pro-environmental behavior (PEB) through social networks is shaped by three key factors: social network learning, social identity, and social support. Social network learning provides individuals with access to environmental knowledge, which, in turn, informs their behavior in daily life. For instance, individuals may reduce their reliance on private vehicles after learning about the environmental consequences of carbon emissions. This illustrates the role of social network learning as a

foundational mechanism through which individuals acquire the knowledge necessary to make environmentally responsible decisions.

In addition, social support serves as a critical resource, encompassing both material and emotional assistance from family, friends, neighbors, and broader social contacts. Supportive environments encourage individuals to engage in PEB by reinforcing their sense of efficacy and providing reassurance that their actions are valued. Meanwhile, social identity—as a spiritual or psychological resource—emerges from processes of identification, analogy, and comparison. When individuals experience a strong sense of belonging or community pride, they are more likely to adopt behaviors aligned with environmental preservation. For example, those who identify closely with their community are more inclined to participate actively in local environmental initiatives, such as neighborhood greening projects or pollution reduction efforts (Shi, Lu & Wei, 2022).

Moreover, elevated levels of social capital (SC) can significantly enhance individuals' motivation to engage in voluntary behaviors, including PEB (Zhang, 2003). SC plays a central role in promoting cooperation and civic participation, particularly within the environmental domain. Communities with high levels of SC tend to exhibit greater willingness to act collectively for the common good. Pretty and Ward (2001) emphasized that collective action is often driven by social norms, which shape individuals' environmental attitudes and encourage them to adopt PEB. These norms not only foster environmentally responsible behaviors in private settings—guided by legal, cultural, or moral frameworks—but also reinforce public cooperation in shared environmental goals.

In this context, trust becomes a crucial component of SC. The degree of trust that individuals place in their communities and government institutions directly influences their willingness to respond to calls for collective environmental action. When individuals trust that their efforts will be reciprocated and that governing bodies are committed to sustainability, they are more likely to participate in both private and public forms of PEB (Shi, Lu & Wei, 2022).

2.4 Componential Theory of Creativity and Green Creativity

2.4.1 Creativity: Understanding Its Role in Sustaining Competitive Advantage and Its Components

In today's volatile business environment, maintaining a competitive advantage is crucial, particularly for small and medium-sized enterprises (SMEs). According to the resource-based view (RBV) theory, sustainable competitive advantage arises from resources and capabilities that

are rare, valuable, and difficult to imitate (Barney, 1991). RBV is often analyzed through two perspectives: the steady-state perspective, which emphasizes a company's ability to gain and sustain a competitive edge, and the dynamic capabilities perspective, which focuses on an organization's ability to adapt and thrive in a changing environment (Schulze, 1993). The dynamic capabilities framework suggests that firms not only compete by leveraging their existing resources but also by continuously developing and renewing their organizational capabilities to navigate uncertainty (Teece & Pisano, 1994; Teece, 2016).

Within this framework, creativity plays a critical role in helping firms cultivate new resources and capabilities that foster competitive advantage. Unlike innovation, which focuses on the implementation of new ideas, creativity serves as a foundational component of dynamic capabilities, enabling organizations to generate novel solutions (Constantine, 2001). Therefore, attracting and retaining creative employees is essential for organizations seeking to sustain long-term growth and adaptability.

In organizational contexts, creativity refers to the generation of innovative and practical ideas, approaches, and actions by individuals or small groups. These ideas can manifest in various forms, including new products, services, processes, and business practices. Creativity serves as a crucial precursor to innovation, particularly in SMEs, where resource constraints make creative problem-solving essential for business survival and growth (Wyer *et al*. 2010; Amabile *et al.*, 1996; Li *et al.*, 2020).

According to the componential theory of creativity, all individuals with normal cognitive abilities possess the potential to generate creative work, and their work environment significantly influences both the level and frequency of creative behavior (Amabile, 1997). Similarly, Woodman et al. (1993) proposed that creativity in organizational settings is shaped not only by individual traits but also by two additional factors: First, group characteristics - factors such as team norms, cohesion, size, diversity, roles, task complexity, and problem-solving methods influence creative behavior; and second, organizational characteristics - elements including organizational resources, culture, reward systems, strategic focus, structural flexibility, and technological orientation impact creativity at the workplace.

Furthermore, creativity is often conceptualized as a comprehensive model composed of social and psychological components necessary for creative expression. Scholars have categorized these components into four main areas:

1. Domain-Relevant Skills – These include technical expertise, knowledge, and competencies required for specific tasks within a given domain.

2. Creativity-Relevant Processes – These encompass cognitive traits such as divergent thinking, problem-solving skills, risk-taking tendencies, and an openness to new ideas, all of which facilitate creative thought (Amabile, 2012).
3. Intrinsic Task Motivation – This is the internal drive that fuels creative behavior. Research suggests that employees exhibit higher levels of creativity when they find tasks engaging, challenging, and personally meaningful (Amabile, 1997; 2012).
4. Social Environment – This represents the external work environment, including organizational climate and extrinsic motivators, which can either enhance or hinder intrinsic motivation and creativity (Li *et al.*, 2020).

Prior studies have identified various external factors that foster individual creativity, such as leadership style, an innovation-supportive climate, and management encouragement. Employees with advanced knowledge, technical expertise, and domain-specific talent are more likely to engage in creative behavior and contribute meaningfully to organizational success (Wang *et al.*, 2013; Jaiswal and Dhar, 2015; Feng-Cheng, 2016).

2.4.2 Green Creativity (GC)

In recent years, businesses have increasingly recognized the need to minimize the environmental impact of their operations, particularly in terms of industrial waste and pollution from conventional products. This shift has moved beyond merely discussing sustainable business practices to actively integrating green principles into various functional areas, including creativity. As a result, the concept of green creativity (GC) has gained traction in both academic and industrial settings, with growing interest in how creativity can drive environmentally sustainable innovations (Awan, Sroufe & Kraslawski, 2019).

GC refers to the development of original and practical ideas related to green products, sustainable practices, and environmentally friendly services (Jia *et al.*, 2018; Eide et al., 2020). Rooted in the broader concept of creativity—which emphasizes the generation of innovative and valuable ideas - GC has received increasing attention due to the urgent need to mitigate industrial waste and environmental hazards through sustainable practices (Chen & Chang, 2013).

Both individual and organizational factors influence GC, including leadership, organizational attitudes toward environmental concerns, and the promotion of ecological values among employees (Mittal & Dhar, 2016). Additionally, intrinsic and extrinsic motivation related to sustainability play a significant role in fostering GC. By encouraging GC, companies can reduce resource consumption, enhance recycling and conservation efforts, and position themselves as sustainability leaders in their industries (Chen & Chang, 2013; Yong *et al.*, 2019; Chen, 2008).

Previous studies have identified six core dimensions of GC that serve as indicators for measuring green creativity in organizational contexts (Rego *et al.*, 2007; Barczak et al., 2010):

1. Developing innovative approaches to achieve environmental objectives in product development teams;
2. Proposing creative ideas aimed at enhancing environmental performance;
3. Advocating for and promoting new green ideas among colleagues;
4. Structuring actionable plans to implement green initiatives;
5. Refining and improving existing green ideas for practical use;
6. Identifying creative solutions to environmental challenges within team settings.

These dimensions provide a comprehensive framework for assessing GC and designing strategies to foster it within organizations.

Several leading companies have effectively integrated GC into their operations. Tesla, for example, continuously innovates in electric vehicle (EV) technologies and sustainable infrastructure development. Unilever has prioritized sustainable product design by reducing water usage and packaging waste. Interface Inc., through its Mission Zero initiative, exemplifies circular economy thinking by incorporating recycled materials into its supply chain. Meanwhile, Patagonia promotes sustainability by involving employees in programs such as Worn Wear, which encourages product reuse and innovation in sustainable materials.

Despite these advancements, there remains a gap in the literature regarding other pro-environmental workplace behaviors, particularly green work engagement (GWE)—a construct that is still underexplored. Investigating GWE alongside GC could offer deeper insights into how employees engage with sustainability in their roles, and how such engagement can be leveraged to advance organizational innovation and environmental responsibility. A more holistic understanding of these behaviors will be instrumental in helping businesses integrate sustainability into their innovation strategies and contribute meaningfully to a greener, more sustainable future.

2.5 Componential Theory of Work Engagement and Green Work Engagement (GWE)

Scholars and practitioners across various disciplines recognize employees as a critical intangible asset for organizations, given their knowledge, skills, abilities, and personal traits. Their capabilities significantly impact multiple aspects of a business and contribute substantial value to core operations (Giancaspro *et al.*, 2022). Moreover, as environmental awareness grows,

employees play a pivotal role in organizations' sustainability efforts by engaging in environmentally responsible behaviors. Consequently, several studies suggest that companies implement strategies to foster employee engagement in green initiatives (Singh *et al.*, 2020; Chen *et al.*, 2020; Elshaer *et al.*, 2021; Abualigah *et al.*, 2022).

Rooted in positive organizational behavior, the concept of work engagement refers to employees' physical, emotional, and cognitive investment in their roles. It is often characterized as a fulfilling and energetic state where individuals demonstrate mental resilience, enthusiasm, and persistence (Christian *et al*., 2011). Ababneh and Macky (2019) further conceptualized work engagement as a multidimensional psychological construct encompassing emotional activation (e.g., pride and passion), absorption (e.g., attention and alertness), discretionary effort, task performance, and goal identification (e.g., business awareness and strategic orientation).

Work engagement is associated with a wide array of organizational benefits, including enhanced job satisfaction, stronger organizational commitment, increased positive workplace behaviors, and decreased turnover intention and absenteeism (Saks, 2006; Salanova *et al*., 2005; Sonnentag, 2002). Highly engaged employees are proactive, energetic, adaptable, and more likely to contribute to organizational success. Moreover, they tend to experience psychologically fulfilling work-related states that foster a greater sense of meaning and purpose (Chacko & Conway, 2019; Kwon & Kim, 2020).

Several organizational factors have been identified as critical drivers of employee engagement. These include human resource management (HRM) practices (Ababneh & LeFevre, 2019), a positive learning climate (Wollard & Shuck, 2011; Kwon *et al*., 2016), and organizational culture and strategy, such as hierarchical, clan, market, or adhocracy orientations (Reis, *et al*. 2016). Additionally, corporate social responsibility (CSR) initiatives have been shown to positively influence employee engagement (Valentin, *et al*., 2015). At the individual level, traits such as conscientiousness, positive affect, and proactive personality are positively correlated with higher engagement levels (Beltrán-Martín *et al*., 2022).

Extending this concept into the environmental domain, green work engagement (GWE) refers to the energy, dedication, and absorption employees demonstrate in performing tasks aligned with environmental sustainability (Aboramadan, 2022). Employees who are highly engaged in green initiatives contribute to stronger employer-employee relationships and heightened environmental awareness in the workplace (Luu, 2019). Much like traditional work engagement, GWE is positively influenced by organizational factors such as green human resource management (GHRM). Hobfoll (2001) conservation of resources theory suggests that GHRM provides

essential resources that support employee goal attainment, thereby encouraging both in-role and extra-role green behaviors—including green innovation and voluntary PEB.

Recent research has also linked GWE to outcomes such as green team resilience (Çop *et al*., 2021) and organizational citizenship behavior for the environment (Aboramadan, 2022; Luu, 2019). These findings underscore the value of fostering GWE as a pathway to broader organizational sustainability outcomes.

Although prior research has firmly established the connection between individual psychological conditions and general work engagement, the specific relationship between Psychological Capital (PsyCap) and GWE remains underexplored. Given PsyCap's known influence on creativity, performance, and engagement, further investigation into its role in promoting GWE could provide valuable insights into how organizations can cultivate sustainability-driven engagement. Understanding this relationship may enable firms to design more effective interventions that align employee motivation with environmental objectives, ultimately contributing to both individual well-being and organizational resilience.

2.6 Componential Theory of Human Resource Management (HRM) and Green Human Resource Management (GHRM)

The relationship between environmental quality and its impact on human well-being has attracted significant scholarly attention in recent years. As organizations seek to gain competitive advantage and strengthen their corporate image, the adoption of sustainable environmental practices has become increasingly important (Paillé *et al.*, 2014; Tang *et al.*, 2018). The growing emphasis on sustainability—commonly referred to as the green agenda—has influenced a wide array of business functions, including marketing, operations management, accounting, and corporate strategy (Ziegler & Seijas Nogareda, 2009). Among these, Human Resource Management (HRM) plays a particularly crucial role, given that employees are among the most valuable assets in any organization. Consequently, HRM has also evolved to reflect increasing demands for environmental responsibility.

To align with changing corporate strategies and sustainability imperatives, HR managers are increasingly embedding green principles into traditional HRM functions. This strategic shift aims not only to enhance HRM systems but also to cultivate environmentally responsible behaviors among employees. Pham et al. (2019) emphasized that HRM can significantly influence employee attitudes, motivation, and awareness in relation to sustainability. Through the adoption of Green Human Resource Management (GHRM) practices, organizations are able to systematically encourage pro-environmental behavior (PEB) within the workforce.

GHRM is broadly defined as the integration of conventional HRM functions—such as recruitment and selection, training and development, performance appraisal, and reward systems—with an organization's environmental objectives (Haddock-Millar *et al*., 2016). Jabbour (2013) conceptualized GHRM as a strategic alignment between HRM and environmental goals, ensuring an intentional and structured approach to sustainability. In a similar vein, Opatha & Arulrajah (2014) described GHRM as the development and implementation of HR systems aimed at nurturing environmentally conscious employees. By embedding sustainability into HR policies and practices, GHRM empowers employees to become active agents of environmental change, benefiting not only organizational performance but also broader societal and ecological well-being.

It is emphasized that employee environmental awareness is essential for an organization's success. A key aspect of GHRM is empowering employees to actively engage in environmental initiatives (Ren, *et al*., 2018; Ali *et al.*, 2020). By fostering a supportive, eco-conscious workplace culture—alongside recognition and reinforcement of green contributions—GHRM can significantly enhance employee motivation and participation in environmental efforts (Ansari *et al*., 2021; Aboramadan, 2022). Arulrajah et al. (2016) argue that for employees to transform into proactive contributors to sustainability, organizations must cultivate a deep sense of ownership, involvement, and engagement.

To achieve this, GHRM incorporates a range of HR activities designed to develop employees' green competencies. This includes environmentally focused recruitment, selection, training, and performance evaluation. Green recruitment and selection aim to attract individuals with strong environmental values and awareness. Meanwhile, green training programs are designed to reshape employee attitudes and foster an emotional commitment to organizational sustainability objectives. Furthermore, green performance management systems acknowledge and reward employees for their environmentally responsible actions (Tang *et al.*, 2018; Úbeda-García *et al*., 2021). Jabbour et al. (2008) emphasized that improving environmental performance depends on the strategic integration of training, teamwork, environmental goal-setting, non-financial incentives, and a supportive organizational culture.

2.6.1 The Aspects of GHRM and its role on Employee's and organizations' Performance and Behaviors

According to Paillé et al. (2014), Green Human Resource Management (GHRM) practices are designed to support environmental objectives and promote positive work behaviors. Renwick et al. (2013) identified key components of GHRM, including green recruitment, selection, training, and the development of environmental knowledge, all of which provide substantial benefits to

both employees and organizations. For instance, during the recruitment and selection process, organizations can prioritize candidates who demonstrate a commitment to environmental sustainability—an essential tenet of GHRM. Prior studies have categorized green recruitment and selection into three dimensions: candidates' green awareness, green employer branding, and the use of environmental criteria in candidate evaluation (Yusoff & Nejati, 2017).

First, individuals with strong green awareness tend to exhibit personality traits such as environmental consciousness, conscientiousness, and agreeableness. Research suggests that employees who display these characteristics are more likely to develop their environmental knowledge within the workplace, thereby enhancing the organization's environmental performance (Perron, *et al*., 2006). As such, it is crucial for organizations to attract and select candidates who possess these traits by implementing effective assessment tools that identify a genuine interest in sustainability.

Second, green employer branding refers to the perceived environmental reputation of an organization, which can be significantly enhanced through visible GHRM initiatives. Job seekers are more likely to be attracted to organizations with strong environmental reputations, perceiving them as a better cultural fit. As a result, incorporating green values into employer branding efforts can be an effective strategy for attracting and retaining employees who align with the organization's sustainability goals (Jackson *et al.,* 2011).

Third, the incorporation of environmental criteria in candidate evaluation allows organizations to assess applicants not only on qualifications and experience but also on their demonstrated commitment to pro-environmental behavior (PEB). This evaluation may include examining candidates' prior involvement in sustainability initiatives, their environmental knowledge, and their motivation to participate in green practices (Renwick *et al*., 2013). By embedding these criteria into the selection process, organizations can develop a workforce that actively contributes to long-term environmental objectives.

In addition to green hiring practices, green training and development is a vital component of GHRM. This involves structured learning activities aimed at enhancing employees' environmental knowledge, awareness, and skills. Effective green training programs encourage employees to adopt PEB and contribute to corporate sustainability initiatives, ultimately strengthening the organization's environmental performance (Sammalisto & Brorson, 2008). According to Kjaerheim (2005), green training deepens employees' understanding of sustainability practices and motivates proactive involvement in conservation efforts. Similarly, Baumgartner and Winter (2014) emphasized that green training enhances employees' environmental self-efficacy, equipping them with the capabilities to manage environmental

issues and adopt responsible workplace behaviors. It also plays a key role in knowledge management, enabling employees to apply environmental knowledge effectively across various organizational functions.

It is further emphasized that employees who undergo extensive green training gain specialized competencies in areas such as waste management, energy efficiency, and resource conservation. For example, such training may involve teaching employees how to monitor and analyze environmental data, thereby strengthening their ability to make informed, sustainability-driven decisions. Renwick et al. (2013) additionally argued for the integration of green training with performance management systems, asserting that doing so helps to embed sustainability into the organizational culture and reinforces accountability and engagement around environmental issues.

2.6.2 Green Performance Management and Appraisal

Green performance management and appraisal are critical components of GHRM, focusing on evaluating employees' contributions to environmental sustainability. It is argued that green performance management involves establishing measurable performance indicators that assess employees' environmental efforts, such as compliance with sustainability policies, reductions in carbon footprint, and communication of green initiatives. However, concerns have been raised about the effectiveness of standardized green performance measurement methods. Given the diversity of organizational structures, resources, and goals, applying uniform criteria may lead to inconsistencies or subjective assessments (Jasch, 2000; Kuo *et al*.,2012). Therefore, to ensure fair and effective evaluation, organizations must design context-sensitive and customized performance management systems aligned with their operational realities.

Hermann, et al. (2007) emphasized that green appraisals are not only essential for measuring environmental performance but also serve as the basis for effective green reward and compensation systems. Incorporating clear, well-defined environmental indicators into appraisal processes can reinforce employees' responsibility for sustainability outcomes while motivating them to strive for continuous improvement. In addition, Jackson et al. (2011) proposed an alternative performance evaluation approach that focuses on identifying and addressing employee underperformance regarding green objectives. The strategic use of constructive feedback and corrective measures encourages employees to adopt more environmentally responsible behaviors and better align with the organization's sustainability vision. A balanced performance management system—one that recognizes achievements and addresses gaps—can foster a culture of ongoing environmental accountability and engagement.

An equally important aspect of GHRM is green reward and compensation, which encompasses both financial and non-financial incentives designed to attract, motivate, and retain employees who contribute to environmental objectives (Jabbour, 2013). While traditional pay-based incentives remain important, several studies have highlighted the motivational power of non-financial rewards—such as recognition and praise—in promoting pro-environmental behaviors. The combination of both types of incentives has been shown to be most effective in enhancing employee engagement and alignment with green goals (Jabbour & Santos, 2008; Renwick *et al*., 2013).

For instance, green travel benefits, such as rewards for using public transportation or cycling to work, not only reduce employees' environmental footprints but also increase awareness of eco-friendly behavior. Likewise, green tax incentives—which promote the use of bicycles or low-emission vehicles—have been found to positively influence employees' motivation to support environmental protection (Haque, 2017). On the non-financial side, green recognition programs—including public acknowledgments, certificates, or symbolic rewards such as paid leave or gifts—can enhance employee pride and reinforce their commitment to sustainability (Veleva & Ellenbecker, 2001). Integrating green training, appraisal, and reward systems can significantly elevate employees' environmental consciousness and proactive engagement in sustainability initiatives.

Beyond evaluation and incentives, employee involvement in environmental management is a crucial element of GHRM. Renwick et al. (2013) suggested that organizations should provide employees with active opportunities to participate in pollution prevention and sustainability efforts, thereby empowering them to identify areas for improvement. Employee involvement has been linked to tangible environmental benefits, including reduced waste, lower emissions, and improved resource efficiency.

Green involvement can be assessed through multiple dimensions. One key aspect is establishing a green organizational vision that reflects shared values and symbols, inspiring employees to engage with environmental issues. Another is fostering a green learning climate supported by open communication channels that inform and educate employees about environmental practices and expectations. Moreover, encouraging participation in green activities—such as team-based problem-solving groups, environmental newsletters, and green committees—can enhance employees' sense of ownership and commitment to sustainability. Providing opportunities for employee involvement in continuous improvement initiatives related to environmental performance can also foster a proactive green culture (Vallaster, 2017).

According to scholars, GHRM can enhance an organization's employer brand, positively impacting outcomes such as employee work engagement. Defined as the cognitive and emotional connection employees feel toward their work, engagement is strengthened when employees identify with the organization's environmental values. This emotional alignment can increase employees' sense of belonging and motivation to contribute meaningfully to sustainability efforts (Schaufeli *et al.*, 2019; Carmeli *et al.*, 2023). Furthermore, a shared vision of environmental goals, when clearly communicated through GHRM practices, can foster a sense of psychological ownership among employees. This ownership deepens employees' commitment to environmental initiatives and motivates them to invest greater effort toward improving organizational performance—creating a cycle of mutual benefit between employee well-being and corporate sustainability (Chang *et al.*, 2022).

2.7 Small and Medium Enterprises in the Indonesia Context

Indonesia's economy is undergoing rapid expansion, with small and medium-sized enterprises (SMEs) playing a central role in driving this growth. In recent years, the development of SMEs has been particularly significant, making substantial contributions to national economic progress. As of 2021, SMEs accounted for approximately 61% of Indonesia's Gross Domestic Product (GDP) and were responsible for creating 97% of job opportunities since 2016 (World Economic Forum, 2021). Despite their economic importance, the rapid and widespread growth of SMEs has also introduced a series of environmental challenges that warrant serious attention.

The environmental impact of Indonesian SMEs is multifaceted and requires a holistic and strategic approach to address effectively. One of the primary issues is the continued use of outdated technologies and inefficient waste management practices, both of which contribute to considerable environmental degradation. Compounding this issue is the absence of a robust and consistently enforced regulatory framework, making it difficult to hold violators accountable and ensure environmentally responsible operations. The expansion of SMEs has also led to a significant increase in energy consumption, resulting in elevated greenhouse gas emissions and worsening air pollution. Sectors such as textiles and leather are particularly problematic, as SMEs operating in these industries have been identified as major sources of water pollution, especially through the discharge of untreated wastewater (Ministry of Industry of Indonesia, 2016).

In response, the Indonesian government has introduced a number of initiatives aimed at promoting environmental sustainability within the SME sector. A key measure includes technical assistance and capacity-building programs designed to educate SME operators about the

economic and ecological benefits of sustainable practices. For instance, the Ministry of Environment and Forestry has implemented training programs focused on sustainable production and consumption, covering essential areas such as water conservation, energy efficiency, and waste management. Additionally, the government has invested in research and development (R&D) to support the creation and adoption of eco-friendly technologies and green products, which can facilitate the integration of sustainable practices into daily operations.

Furthermore, the government has taken steps to strengthen the regulatory environment by implementing environmental permitting systems through the Ministry of Environment and Forestry. These permits set explicit environmental standards and requirements that SMEs must adhere to in order to minimize their ecological footprint. However, a major challenge remains in the enforcement of these regulations. Weak monitoring mechanisms and limited resources have allowed many SMEs to operate in violation of environmental laws, diminishing the effectiveness of otherwise well-intentioned policies.

In conclusion, while SMEs are vital to Indonesia's economic growth, they also pose serious environmental risks that must be addressed through a combination of policy reform, capacity building, and stricter enforcement mechanisms. The government's initiatives to support sustainable business practices are commendable, yet more comprehensive, integrated, and enforceable frameworks are required. By adopting sustainable practices, SMEs not only contribute to environmental preservation but also enhance their long-term competitiveness and resilience, ultimately supporting a greener and more sustainable Indonesian economy.

III. MATERIALS AND METHOD

The methodology chapter is a crucial component of any research study, as it provides a detailed account of the research design, methods, and procedures used to collect and analyze data. This chapter outlines the step-by-step process followed by the researcher in conducting the study, from the development of research questions to the collection and analysis of data. In this chapter, the research design and methods will be described in detail, including the research approach, research instrument, sampling method and size, data analysis techniques, and research flowchart. This chapter aims to provide a clear and comprehensive explanation of the methodology used in this study, allowing the reader to understand how the research was conducted and how the findings were obtained.

3.1 Research Process

This chapter outlines the research process, which involved a detailed explanation of the materials and methods utilized to achieve the research objectives. The research process consisted of six phases. The first phase involved defining the problem, which entailed gathering information on the field of research by conducting a thorough review of the existing literature. In the second phase, the approach was developed based on the findings of the literature review, and a conceptual model was presented. The third phase involved the formulation of the research design, which tested the validity of the suggested model by developing hypotheses. The fourth phase involved developing a well-structured and closed-ended questionnaire for data collection. The fifth phase involved data analysis using statistical software. Finally, in the sixth phase, the results and discussion were presented, which involved interpreting the data analysis results. Figure 6 demonstrates the phases involved in the research process for this study.

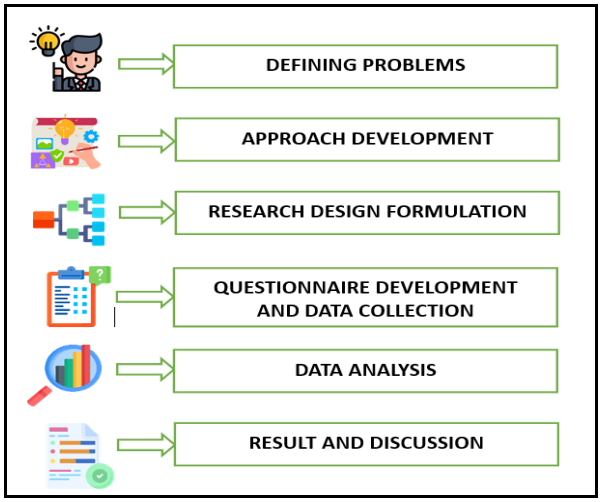

Figure 6. Phases of Research Process
Source: Author's own construction

3.2 Research Design

Crano et al, (2014) define research design as a comprehensive plan that covers all aspects of the research process, from developing hypotheses to analyzing data and drawing conclusions. The research design provides a structure for investigating the research problem and obtaining empirical evidence of the relationship between the variables. It includes decisions about the location of the study and the relevant variables to be considered.

The current study employs a research design consisting of several distinct steps:

a. Defining the study objectives.
b. Designing a correlation study which involves selecting the sample, defining the variables under analysis, and measuring the covariation among variables.
c. Conducting a survey to collect data, including determining the sample size, data collection, data sorting, and data interpretation.
d. Multivariate analysis, which includes selecting sample data, defining the variables under analysis, and determining the adopted multivariate model, such as exploring correlation analysis, comparing groups, and structural equation modeling (SEM).
e. Executing the selected multivariate models
f. Analyzing the resulting data.

Figure 7 depicts the research design utilized in this study.

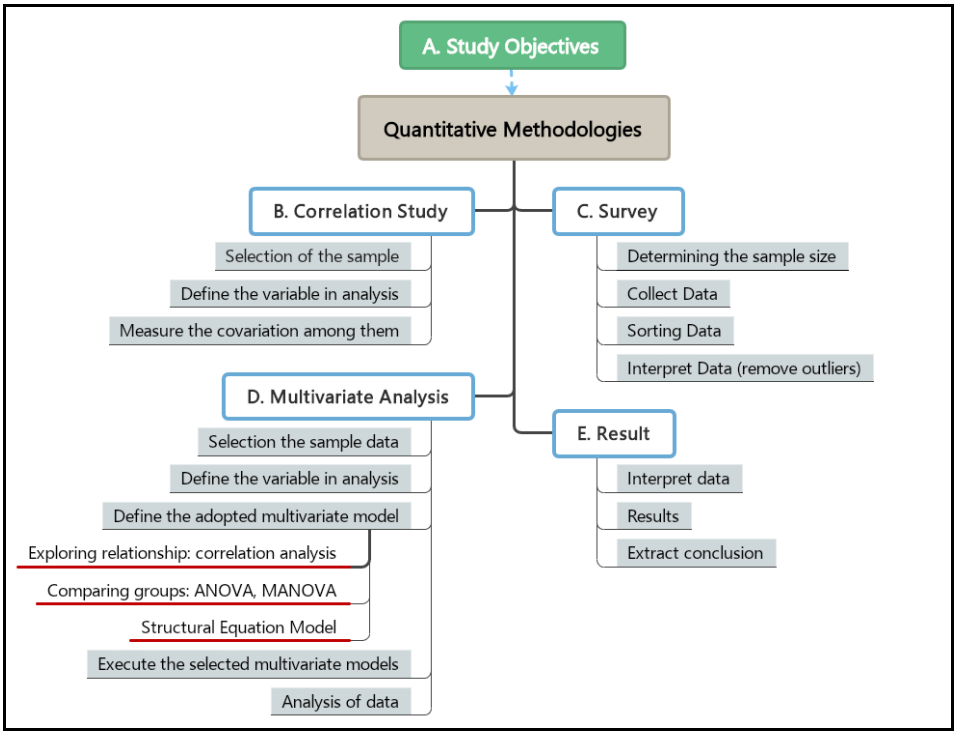

Figure 7. Research Design
Source: Author's own construction

The initial step of the current study involved defining the study objectives by identifying existing literature gaps and linking them to the current situation in the targeted field of study or location. The second step focused on determining the approach, which was a correlation or deductive approach, aimed at establishing relationships between two or more variables. This approach helps researchers to determine whether changes in one variable correspond to changes in another variable and the extent of the relationship. A positive correlation occurs when two variables change in the same direction, while a negative correlation occurs when they change in opposite directions. However, in some cases, two variables may not have any relationship, resulting in a zero correlation (Tan, 2014).

The primary objective of the second phase of this study is to examine the relationships between key psychological, organizational, and behavioral variables. Specifically, this phase aims to investigate the direct effects of Psychological Capital (PsyCap) on both Green Creativity (GC) and Green Work Engagement (GWE). Additionally, the study seeks to explore the mediating role of Green Human Resource Management (GHRM) in the relationships between PsyCap and these two pro-environmental behaviors.

Beyond PsyCap, this phase will also examine the relationship between Social Capital (SC) and both GC and GWE, while simultaneously evaluating whether GHRM mediates these associations. Furthermore, the study will investigate the moderating effect of SC in a moderated-moderated mediation model—analyzing how SC influences the strength of the mediation effect of GHRM between PsyCap and the outcome variables (GC and GWE). This multi-layered analysis will offer deeper insight into the interactions between psychological, social, and organizational factors in shaping employees' pro-environmental behaviors. In addition, the study will assess the influence of demographic factors, particularly gender and educational attainment, within this complex model. These variables will be examined to determine whether they moderate any of the established relationships or influence the strength of indirect effects.

The third phase of the research will involve the empirical testing of the proposed model through survey-based data collection. A sample will be drawn from the target population of SME employees in Jakarta, Indonesia, using the Krejcie and Morgan Table to determine an appropriate sample size. After data collection, the dataset will be cleaned and prepared, including the identification and removal of outliers to ensure data accuracy. Appropriate statistical analyses—including mediation, moderation, and moderated mediation techniques—will then be conducted using tools such as SPSS and PROCESS Macro or AMOS/PLS-SEM, depending on the model requirements.

Adhering to a structured and methodical research plan is critical to ensuring the rigor, reliability, and validity of the findings. By following a well-defined sequence of data collection, cleaning, and analysis, this study aims to produce robust and generalizable insights that contribute to the existing literature on green behavior in SMEs, with practical implications for organizational strategy and sustainability-focused HR practices.

3.3 Research Tool

The research utilized a structured questionnaire with closed-ended questions as the primary tool for data collection. Closed-ended questions offer various benefits, including faster response rates, easier coding and analysis of data, as well as less reliance on communication skills of respondents (Hyman & Sierra, 2016). As a result, this type of questionnaire is suitable for studies with large sample sizes and time constraints. Considering the research objectives and limitations, the use of a well-designed and structured closed-ended questionnaire was deemed appropriate for the current study.

3.3.1 Questionnaire Design and Development

The primary objective of this empirical study is to examine the hypothesized relationships between employees' Psychological Capital (PsyCap) and their engagement in Green Creativity (GC) and Green Work Engagement (GWE). In particular, the study investigates the mediating role of Green Human Resource Management (GHRM) in these relationships.

The study further explores the role of Social Capital (SC), which is examined at multiple levels: (a) as a direct influence on PsyCap, GHRM, GC, and GWE; and (b) as a potential moderator and/or mediator within these relationships. Additionally, this research aims to unpack the moderating effects of key demographic variables, specifically gender and educational attainment, to offer a more nuanced understanding of how individual characteristics influence environmentally responsible behavior in the workplace: (1) psychological capital (PsyCap), (2) social capital (SC), (3) green human resource management (GHRM), (4) green creativity (GC), and (5) green work engagement (GWE), (6) Gender, (7) Educational Attainment.

In the data gathering process, it is important to consider ethics as the responsibility of the researcher. The researcher has the duty to ensure the safety, dignity, rights, and well-being of the participants. The University of Sheffield emphasizes that this is the foremost responsibility of a researcher. Both the researcher and participants have a significant role to play in upholding ethical conduct during the research process. It is imperative to maintain ethical standards to

ensure that the study yields reliable and valid results that can contribute to the existing literature on the topic (The University of Sheffield)

Furthermore, researchers have various obligations during the research process. They must conduct their research with honesty, objectivity, and integrity. They must obtain consent from participants before their participation and respect their culture, religion, values, and economic status. Researchers have an obligation to maintain the confidentiality and personal information of participants as per their choice. They should avoid experiments that may pose a threat to the participants and themselves. Apart from the participant's, researchers also have an obligation towards society, colleagues, other researchers, and funders of the project. On the other hand, participants have the right to provide consent for their participation, withdraw from or refuse to take part in research projects. They have the right to seek confidentiality and prevent personal information or identifiable data from being published or shared. Participants also have the right to seek safety and security. Furthermore, the data should be kept secure, and participants should not be exposed to unnecessary or disproportionate levels of risk whenever required (Parveen & Showkat, 2017).

To facilitate efficient and wide-reaching data collection, the study will utilize an online survey platform, preferably Google Forms. This method offers ease of access for respondents, enabling broader participation from SME employees across Jakarta. The data collection phase is scheduled to run for approximately five months, providing ample time to gather a diverse and representative sample.

The questionnaire will be structured into six distinct sections, aligned with the constructs in the conceptual model. All measurement items will be adapted from validated instruments in existing literature, ensuring the reliability and validity of the scales used. Section 1, Demographic information (e.g., age, gender, education, job role). Section 2, Psychological Capital (PsyCap), comprising 26 items across four sub-dimensions: self-efficacy (six measurement items), optimism (six measurement items), resilience (eight measurement items), and hope (six measurement items). The specific questions used to assess PsyCap are displayed in Table 1.

Table 1. The psychological capital scales

Dimension		Measurement items	Sources
Self-efficacy	SE1	I believe I can solve complicated problems	Gao et al. (2020), (Z. Li *et al.*, 2021)
	SE2	I believe I can perform my job effectively	
	SE3	I believe I can help establish the company's future development goals	
	SE4	I believe that I can set the future development goals for the company	
	SE5	I believe I can contribute to the company's future development goals.	
	SE6	I believe I can provide timely and effective information	
Hope	H7	I can come up with many solutions when I am faces with difficulties at work	
	H8	I can generate multiple solutions when faced with work-related challenges	
	H9	I believe that there are multiple solutions to every problem	
	H10	I believe I can achieve success in my job	
	H11	I am confident in achieving and surpassing my goals	
	H12	I am achieving the work goals I set for myself	
Resilience	R13	I often experience periods of depression and distraction	
	R14	When facing work challenges, I will exhaust all means to find solutions	
	R15	I believe I can accomplish it independently	
	R16	In my work, I give my all, regardless of my emotions	
	R17	I'm making progress toward my goal	
	R18	I remain composed under pressure	
	R19	I have enough experience and believe I can handle any situation	
	R20	I have high energy levels every day	
Optimism	O21	I maintain a positive attitude	
	O22	Despite working hard, I occasionally make mistakes	
	O23	I always focus on the positive aspects of my work	
	O24	I am optimistic about the future progress of my work	
	O25	All the work contradicts my ideas	
	O26	At work, I always believe that 'there's light behind the darkness	

The third section of the questionnaire is designed to assess Social Capital (SC) within the organizational context. This construct is conceptualized through three distinct dimensions based on widely accepted theoretical frameworks: Structural Social Capital (9 items), Relational Social Capital (7 items), Cognitive Social Capital (9 items). These dimensions collectively capture the network structure, trust-based relationships, and shared understandings that facilitate coordination and cooperation among employees. The specific measurement items for each SC dimension are adapted from established instruments and are presented in Table 2.

Table 2. The social capital scales

Dimension		Measurement items	Sources
Structural Social Capital	SSC1	The company encourages the establishment of stable partnership networks	Fandino et al. (2015), Z. Li et al. (2021)
	SSC2	My working relationships facilitate the acquisition of valuable information	
	SSC3	Employees are provided with access to specialists to support their work	
	SSC4	Employees have facilitated access to information sources	
	SSC5	The company's structure promotes employee interaction and the exchange of information	
	SSC6	The interdependence between my colleagues' work and mine facilitates my work life	
	SSC7	The company's leadership encourages information exchange during challenging times to foster mutual support in the work environment	
	SSC8	The company's rules promote teamwork among employees	
	SSC9	The company employs group processes for problem-solving	
Relational Social Capital	RSC10	The company policies empower employees to make decisions and take initiatives	
	RSC11	My daily work involves personal exchanges with colleagues to support my work activities	
	RSC12	I can tell if a colleague doesn't understand something by their facial expression	
	RSC13	My colleagues can understand my viewpoints during our work meetings	
	RSC14	The company's background provides clarity on what is expected from its employees	
	RSC15	We share a common terminology among employees in my daily work, making our tasks easier	
	RSC16	I share my experiences within the company to help explain professional issues to my colleagues	
Cognitive Social Capital	CSC17	Employees of this company share a vision of assisting others in resolving their professional issues	
	CSC18	Employees of this company share the common goal of learning from one another	
	CSC19	Employees of this company share the common value that assisting others is gratifying	
	CSC20	The company policies promote a friendly environment that encourages partnerships and mutual assistance	
	CSC21	I view my professional relationships as a competitive advantage	
	CSC22	I strongly identify with my work team	
	CSC23	I identify with the company's approach and values	
	CSC24	I find my work environment to be inspiring	
	CSC25	The company's communication policy effectively conveys its organizational values to all employees	

The fourth section of the questionnaire focuses on evaluating Green Human Resource Management (GHRM) through its four core dimensions: green rewards (measured by two items),

green training (measured by three items), green performance management (measured by five items), and green recruitment (measured by three items).

These dimensions capture the organization's efforts to integrate sustainability into HR practices by rewarding environmentally friendly behavior, providing sustainability-focused training, incorporating green metrics into performance evaluations, and attracting candidates who align with environmental values. All measurement items for GHRM are adapted from prior validated studies and are detailed in Table 3.

Table 3. The green human resource management scales

Dimension		Measurement items	Sources
Green Rewards	GRW1	Environmental performance is financially rewarded	Kim et al. (2019), Saeed et al.(2019), Alshaabani et al. (2020), Aboramadan (2022)
	GRW2	Environmental performance receives public recognition	
Green Training	GT3	Training programs are available for employees to enhance their environmental awareness, skills, and expertise	
	GT4	In our company, everyone has an equal opportunity to access environmental management training	
	GT5	The company conducts regular environmental training	
Green Performance Management	GPM6	In our company, there are consequences in the performance management system for non-compliance or failing to meet environmental management goals	
	GPM7	Managers' goals for achieving green outcomes are part of the evaluation process	
	GPM8	The company establishes green targets, goals, and responsibilities for both managers and employees	
	GPM9	The company's individual environmental efforts benefit employees	
	GPM10	Environmental performance evaluations are documented.	
Green Recruitment	GR11	Our company prioritizes hiring employees with environmental awareness	
	GR12	The employee selection process takes into account the environmental motivation of candidates	
	GR13	Environmental considerations are integrated into all stages of employee selection	

The fifth section of the questionnaire consists of six items aimed at evaluating employees' levels of Green Creativity (GC). These items are designed to capture the extent to which employees engage in environmentally innovative behaviors, such as: Developing eco-friendly products or services, proposing ideas to reduce environmental waste, or identifying alternative green solutions in the workplace.

The purpose of this section is to assess employees' creative contributions to organizational sustainability efforts, reflecting their capacity to generate and implement novel, practical ideas

that support environmental objectives. The specific items used to measure GC are presented in Table 4, and are adapted from validated instruments used in previous research.

Table 4. The green creativity scales

		Measurement items	Sources
Green Creativity	GC1	I propose innovative methods to attain environmental objectives	Chen et al.(2020), Li et al. (2020)
	GC2	I suggest new eco-friendly ideas to enhance environmental performance	
	GC3	I promote and advocate for new eco-friendly ideas to others	
	GC4	I create well-thought-out plans for implementing new eco-friendly ideas	
	GC5	I would reconsider new eco-friendly ideas	
	GC6	I would discover creative solutions to environmental issues	

The final section of the questionnaire includes six items designed to assess the level of Green Work Engagement (GWE) among employees. These items specifically measure the extent to which employees are physically, cognitively, and emotionally engaged in environmentally sustainable work practices. This includes their dedication to green initiatives, absorption in eco-conscious tasks, and overall enthusiasm for contributing to environmental goals at work.

The measurement items for GWE are adapted from established scales in the literature and are detailed in Table 5.

Table 5. The green work engagement scales

		Measurement items	Sources
Green Work Engagement	GWE1	My tasks related to the environment are inspiring to me	Alshaabani et al. (2020), Aboramadan (2022).
	GWE2	I take pride in the environmental work I engage in	
	GWE3	I am deeply involved in my environmental work	
	GWE4	I am enthusiastic about my environmental responsibilities in my job	
	GWE5	I experience happiness when I am deeply engaged in environmental tasks	
	GWE6	I feel energized when working on environmental tasks at my job	

All constructs in the questionnaire will be measured using a five-point Likert scale, originally developed by Likert (1932) to assess individual attitudes. The Likert scale is widely recognized as a reliable and effective tool for evaluating behavioral intentions, attitudes, and perceptions in both social and behavioral sciences.

Each item in the questionnaire will offer five response options: 1 (Strongly Disagree), 2 (Disagree), 3 (Neutral), 4 (Agree), 5 (Strongly Agree). This format allows respondents to express their opinions along a continuum, offering a nuanced view of their agreement or disagreement with each statement. As noted by Malhotra & Dash (2011), the Likert scale is particularly

suitable for marketing and organizational research due to its ability to capture degrees of belief, attitude, and behavioral intent in a structured and quantifiable manner.

3.4 Sampling Method and Sample Size

Population refers to the entire group or set of units to which the findings of a study are intended to generalize, whereas a sample is a representative subset drawn from that population (Shukla, 2020). This study will be conducted in Jakarta, West Java, the capital of Indonesia, which has the highest concentration of small and medium-sized enterprises (SMEs) and the largest urban population in the country (UN Desa, 2018). As previously noted, the rapid urbanization and high density of SMEs in Jakarta contribute to pressing environmental challenges, particularly in relation to pollution and resource consumption.

Importantly, no prior research has specifically examined the interplay between Psychological Capital (PsyCap), Green Human Resource Management (GHRM), and Social Capital (SC) in relation to Green Creativity (GC) and Green Work Engagement (GWE) within this context. Therefore, the target population for this study will consist of employees working in SMEs located in Jakarta, West Java.

Given the large size of the population, the Krejcie and Morgan Table (KMT) will be used to determine an appropriate sample size. This method is widely employed in social and behavioral sciences and suggests a sample size of 384 for populations exceeding one million (Othman, 2020; Memon *et al.*, 2020). As such, a total of 384 SME employees will be selected to participate in the survey. To facilitate access and maximize participation, a non-probability sampling method, specifically convenience sampling, will be employed. This approach allows inclusion of any willing and eligible SME employee who is able to complete the questionnaire (Shukla, 2020).

In terms of sampling strategy, a non-restrictive approach will be adopted. Participants will be drawn from a variety of departments, industries, and job roles within the SME sector. This broad inclusion aims to capture commonalities across sectors and provide a comprehensive understanding of the psychological, social, and organizational factors influencing pro-environmental behavior (PEB) in diverse work environments.

3.5 Data Analysis

This study will employ a series of analytical techniques to examine the measurement model and test the proposed hypotheses. The analysis will be conducted in sequential stages to ensure the validity and reliability of the constructs and the overall structural model.

First, both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) will be performed to evaluate the dimensionality and reliability of the measurement model, as recommended by Byrne (2016). EFA will be used initially to identify the underlying factor structure of the items, while CFA will be employed to confirm the factor structure and assess the model fit. To assess the internal consistency reliability of each construct, Cronbach's Alpha coefficients will be calculated. Additionally, model fit will be evaluated using key indices such as the Comparative Fit Index (CFI), where values above 0.90 indicate an acceptable fit. Next, the convergent validity of the constructs will be examined using Average Variance Extracted (AVE) and Composite Reliability (CR), following the guidelines by Hair *et al.* (2017). Convergent validity is established when AVE values exceed 0.50 and CR values exceed 0.70 for each construct.

Finally, the proposed hypotheses will be tested using Structural Equation Modelling (SEM) through the AMOS v.24 graphical interface. SEM is an appropriate technique for this study as it allows for simultaneous analysis of both the measurement and structural models and is capable of handling complex relationships such as mediation and moderation effects.

3.5.1 Data preparation

Following the data collection phase, the dataset must be carefully prepared for analysis by addressing potential issues such as missing values, coding, editing, outlier removal, and normality verification, as recommended by Hair (2010). Proper data preparation is essential to ensure the accuracy, consistency, and reliability of the subsequent statistical analysis.

As the primary aim of data analysis is to generate clear and meaningful insights, data summarization represents a critical yet challenging step in the research process. To enhance the quality and integrity of the dataset, all responses were thoroughly reviewed and screened for errors, omissions, and inconsistencies. Responses with readability issues or ambiguous answers were corrected or excluded to maintain the robustness of the final dataset.

Once cleaned, the dataset was formatted for compatibility with statistical software such as SPSS and AMOS. This included the coding of variables using distinct characters and symbols to represent each item within the questionnaire. These codes enable efficient data handling and support the accurate execution of statistical procedures. The specific codes assigned to each questionnaire item—across all constructs—are detailed in Table 6.

Table 6. Types of questionnaire items and its codes

NO.	Questions	Codes
1.	Likert scale-based questions	"Strongly Disagree" – 1 "Disagree" – 2 "Neutral" – 3 "Agree" – 4 "Strongly Agree" - 5
2.	Gender	"Male" – 1 'Female" - 2
3.	Education	"Undergraduate" – 1 "Postgraduate" – 2 "Ph.D" - 3

Source: Author's own illustration

3.5.2 Structural Equation Modelling (SEM) - AMOS

Structural Equation Modelling (SEM) is a powerful multivariate statistical technique that enables researchers to test complex theoretical models involving both direct and indirect relationships among observed and latent variables. SEM adopts a confirmatory approach, meaning it is primarily used for hypothesis testing rather than exploration. At its core, SEM integrates two key elements: (a) a set of structural (regression) equations that represent the hypothesized causal processes, and (b) a pictorial representation of these relationships, which aids in conceptual clarity and theoretical communication (Byrne, 2016).

In SEM, the proposed theoretical model is tested simultaneously as a complete system, allowing researchers to evaluate the goodness-of-fit between the hypothesized model and the actual data. When model fit indices meet acceptable thresholds, the model is considered a plausible representation of the underlying relationships. Conversely, poor fit indices would call into question the validity of the proposed structural pathways.

According to Byrne (2016), several features distinguish SEM from traditional multivariate analysis techniques: First, it prioritizes confirmatory analysis, while still allowing for some exploratory elements. Second, SEM explicitly accounts for and estimates measurement error, thereby enhancing the precision of model estimates. Third, Unlike earlier methods that only use observed variables, SEM accommodates both observed and unobserved (latent) variables. Finally, SEM enables the estimation of direct, indirect, and total effects, making it particularly suitable for mediation and moderation analysis.

To perform SEM, this study will employ Analysis of Moment Structures (AMOS), a user-friendly software tool that facilitates model specification, parameter estimation, and model evaluation through an intuitive graphical interface. AMOS supports the assessment of multiple goodness-of-fit indices, including: Chi-square test statistic (χ^2), Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square

Residual (SRMR). These indices will be used to evaluate how well the hypothesized model aligns with the observed data.

The primary objective of this study is to examine how Psychological Capital (PsyCap) and Social Capital (SC) influence employees' Green Creativity (GC) and Green Work Engagement (GWE), and how these relationships are mediated by Green Human Resource Management (GHRM). Additionally, the study explores the moderating effects of gender and educational attainment in this model.

Given the complexity of the hypothesized relationships, which involve multiple mediators, moderators, and latent constructs, SEM using AMOS is the most appropriate analytical approach. This methodology allows for the simultaneous analysis of the measurement model (via Confirmatory Factor Analysis) and the structural model, ensuring both construct validity and accurate estimation of path relationships.

The process for conducting SEM-AMOS in this study follows the framework proposed by Byrne (2016) and is visually represented in Figure 8.

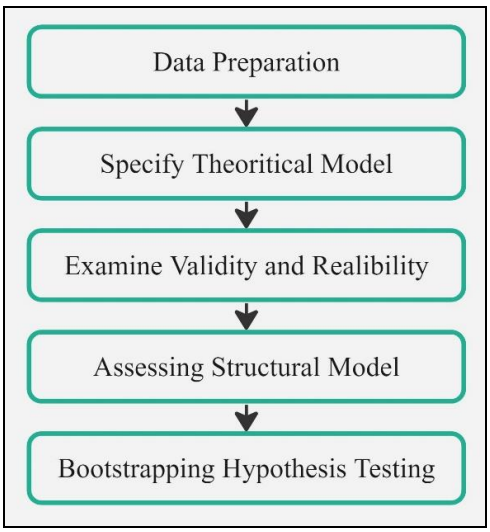

Figure 8. Steps Followed in SEM Using AMOS
Source: Author's own construction

Structural Equation Modeling (SEM) is a powerful statistical technique that enables researchers to examine complex relationships among latent constructs. The use of AMOS, a popular SEM software, involves several crucial steps to ensure robust analysis and meaningful interpretations (Byrne, 2016):

1. **Data Preparation**: The initial step involves meticulous data preparation. This includes cleaning the dataset, handling missing values, and checking for normality assumptions. Data screening helps ensure the reliability of subsequent analyse.

2. **Specify Theoretical Model:** Building on established theories and conceptual frameworks, researchers define the latent constructs and their interrelationships. The development of a well-defined theoretical model serves as the foundation for subsequent analyses.
3. **Examining Validity and Reliability**: Before proceeding, it is crucial to assess the validity and reliability of measurement models. Confirmatory Factor Analysis (CFA) is employed to evaluate how well the observed variables reflect the intended latent constructs. Ensuring high reliability and convergent/discriminant validity is essential.
4. **Assessing the Structural Model:** Once the measurement model is validated, attention turns to the structural model. This step involves testing the hypothesized relationships between latent constructs. Path analysis and model fit indices are used to assess the overall fit of the model to the data and the significance of individual paths.
5. **Bootstrapping Hypothesis Testing:** To enhance the robustness of parameter estimates and assess the stability of relationships, researchers often employ bootstrapping techniques. Bootstrapping generates multiple subsamples from the dataset, enabling the estimation of confidence intervals for parameters and aiding in hypothesis testing.

In summary, the Structural Equation Modelling (SEM) process using AMOS involves a series of structured steps, including rigorous data preparation, development of a theoretical framework, validation of measurement models through Confirmatory Factor Analysis (CFA), and evaluation of the structural model to test hypothesized relationships. Furthermore, the use of bootstrapping techniques enhances the robustness of mediation and moderation analyses, providing more reliable estimates and confidence intervals.

This systematic, step-by-step approach enables researchers to gain a comprehensive and nuanced understanding of complex relationships among multiple constructs within a given research context. As such, SEM-AMOS is particularly well-suited for this study, which aims to examine multi-level relationships involving psychological, social, and organizational variables..

3.5.3 Pilot Study

The pilot study or pretesting phase represents a critical step in the questionnaire development process, aimed at evaluating the instrument's clarity, reliability, and effectiveness prior to its full-scale administration. As emphasized by Reynolds et al. (1993), conducting a pilot test allows researchers to assess the comprehensibility and precision of the questionnaire, especially when applied to context-specific behaviors—such as employees' pro-environmental actions. The primary objective of the pilot study is to ensure that all items are clearly worded, contextually appropriate, and interpreted as intended by respondents. This includes close scrutiny of the

Likert scale structure and response options to verify they are well-calibrated for the constructs being measured.

A sample of approximately 40 to 100 respondents—preferably employees within SMEs in Jakarta, mirroring the target population—will be selected for this phase. This sample size is sufficient to identify issues related to item ambiguity, logical flow, layout, and overall response reliability. Insights gathered from the pilot study will guide necessary refinements to improve the questionnaire's readability, accuracy, and user-friendliness, ultimately ensuring a more robust tool for the main study.

The finalized questionnaire will be systematically structured to align with the study's conceptual framework and research objectives. Standardized measurement scales from validated sources will be adopted to assess: Psychological Capital (PsyCap), Social Capital (SC), Green Human Resource Management (GHRM), Green Creativity (GC), Green Work Engagement (GWE). Each section will focus on specific variables, allowing for a targeted and comprehensive assessment of the individual, social, and organizational factors influencing Pro-Environmental Behavior (PEB) among SME employees.

IV. RESULTS AND DISCUSSION

4.1 Respondent Demographic Profile

This section presents a descriptive analysis of the socio-demographic characteristics of the study participants. At the outset of the questionnaire, respondents were asked to provide key demographic information, specifically regarding their gender and educational attainment. The data collection process was conducted over a period of five months, resulting in a total of 384 responses. After removing 38 duplicate or incomplete entries, 346 valid responses were retained for further analysis. In terms of gender distribution, the sample comprised 146 male respondents (42.2%) and 200 female respondents (57.8%). This indicates a higher female representation in the final sample, which may reflect the demographic composition of the workforce within SMEs in the Jakarta region. A detailed summary of the gender demographics is provided in Table 7.

Table 7. Gender Profile of Respondents

Gender	Frequency	Percent
Male	146	42,2
Female	200	57,8
Total	346	100,0

Source: Author's own construction based on SPSS Descriptive Statistic Test Result

Table 8 presents the distribution of respondents based on their educational qualifications. The analysis reveals that the majority of participants—79.8%—either held or were in the process of completing a bachelor's degree, making this the most represented educational group in the sample. In addition, 16.2% of respondents reported holding a master's degree, while only 4% had attained a doctoral (Ph.D.) qualification. This distribution highlights a strong concentration of individuals with undergraduate-level education, suggesting that employees within Jakarta's SME sector are predominantly bachelor's degree holders.

Table 8. Educational Attainment Profile of Respondents

Educational attainment	Frequency	Percent
Undergraduate	276	79.8
Postgraduate	56	16.2
PhD	14	4.0
Total	346	100.0

Source: Author's own construction based on SPSS Descriptive Statistic Test Result

4.2 Measurement Model Evaluation

This study employed a series of sequential analytical techniques to assess the measurement model and test the proposed hypotheses. Initially, both Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were conducted to evaluate the reliability and construct validity of the measurement model, following the methodological guidance of Byrne, et al. (2016). Reliability was further assessed using Cronbach's Alpha to determine internal consistency, and Comparative Fit Index (CFI) values to evaluate overall model fit. To assess convergent validity, the Average Variance Extracted (AVE) and Composite Reliability (CR) were calculated for all latent variables, in accordance with the criteria established by Hair et al. (2017). These analyses were conducted using SPSS for preliminary diagnostics and AMOS for model testing and validation.

Following the validation of the measurement model, Structural Equation Modeling (SEM) was utilized via the graphical interface of AMOS version 24 to examine the hypothesized relationships among the constructs. SEM was chosen for its capacity to simultaneously evaluate both the measurement and structural models, making it especially appropriate for analyzing complex, multidimensional relationships while accounting for measurement error. This analytical approach enabled a comprehensive understanding of the interactions among PsyCap, SC, GHRM, GC, and GWE, as well as the moderating roles of gender and educational attainment.

4.2.1 Kaiser-Meyer-Olkin (KMO) Test Analysis

The Kaiser-Meyer-Olkin (KMO) test is a crucial diagnostic measure used in Exploratory Factor Analysis (EFA) to evaluate the sampling adequacy of the dataset. It determines whether the correlations among variables are sufficiently strong to justify the application of factor analysis. Specifically, the KMO statistic assesses the proportion of variance among variables that might be common variance, thus indicating the potential for latent factor identification.

KMO values range from 0 to 1, with values above 0.50 generally considered acceptable for EFA. Values closer to 1.0 indicate that the dataset is highly suitable for uncovering underlying factor structures (Kaiser, 1974). In contrast, values below 0.50 suggest that the correlations between variables may be too weak, rendering factor analysis inappropriate. The KMO test and EFA were conducted using SPSS, and the results are summarized in Table 9. These findings provide the foundational evidence for proceeding with the validation of the measurement model through Confirmatory Factor Analysis (CFA).

Table 9. KMO Test Result

Pattern Matrix[a]															
	Factor														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SE1					0,835											
SE2					0,850											
SE3					0,835											
SE4					0,890											
SE5					0,698											
SE6					0,669											
H7						0,529										
H8						0,779										
H9						0,876										
H10						0,892										
H11						0,772										
H12						0,764										
R13																
R14	0,659															
R15	0,791															
R16	0,838															
R17	0,725															
R18	0,725															0,350
R19	0,763															
R20	0,650															0,490
O21										0,900						
O22										0,813						
O23										0,922						
O24										0,667						0,400
O25																
O26																
SSC1																
SSC2							0,843									
SSC3							0,846									
SSC4							0,592									
SSC5							0,618									
SSC6															0,636	
SSC7														0,749		
SSC8														0,653		
SSC9		0,501														
RSC10		0,501													0,342	
RSC11		0,690														
RSC12		0,826														
RSC13		0,852														
RSC14		0,824														
RSC15		0,868														
RSC16		0,642														
CSC17									0,595							
CSC18									0,827							
CSC19									0,886							
CSC20									0,817							
CSC21									0,599							
CSC22											0,450					
CSC23											0,739					
CSC24											0,804					
CSC25											0,834					
GWE1								0,662								
GWE2								0,693								
GWE3								0,774								
GWE4								0,762								
GWE5								0,835								
GWE6								0,599								
GC1				0,807												
GC2				0,762												
GC3				0,778												
GC4				0,877												
GC5				0,833												
GC6				0,734												
GRW1																
GRW2												0,333				
GT3													0,830			
GT4													0,804			
GT5													0,770			
GPM6			0,845													
GPM7			0,825													
GPM8			0,825													
GPM9			0,869													
GPM10			0,672													
GR11												0,671				
GR12												0,707				
GR13												0,834				

Extraction Method: Maximum Likelihood.
Rotation Method: Promax with Kaiser Normalization.[a]
a. Rotation converged in 9 iterations.

Source: SPSS KMO Test Result

As presented in Table 9, the KMO values for all primary constructs exceed the minimum acceptable threshold of 0.50, indicating that the dataset is generally suitable for Exploratory Factor Analysis (EFA). This suggests that the variables exhibit sufficient intercorrelation to justify factor extraction (Kaiser, 1974). However, two items—CSC22 (KMO = 0.450) and GRW2 (KMO = 0.333)—fall below the accepted threshold. According to standard EFA procedures, such low values indicate that these items do not sufficiently correlate with others in the construct and should be considered for removal. Additionally, four items—O25, O26, SSC1, and GRW1—did not return any values during the KMO test. The absence of output suggests issues such as multicollinearity, non-response, or computational error. As these items lack interpretable diagnostic data, they have been excluded from the analysis.

Following the removal of items O25, O26, SSC1, and GRW1, the updated KMO values, as presented in Table 10, indicate that all constructs now exceed the minimum threshold of 0.50, reaffirming the dataset's overall suitability for Exploratory Factor Analysis (EFA). However, two items—SSC9 (KMO = 0.386) and GRW2 (KMO = 0.304)—still fall below the commonly accepted threshold. While these values suggest limited shared variance with other items, it is important to note that there is no universally rigid cutoff point for KMO scores, particularly when dealing with smaller item pools or exploratory phases of scale development.

Given their theoretical relevance and the potential contribution to construct validity, both SSC9 and GRW2 will be retained at this stage for further evaluation during the Confirmatory Factor Analysis (CFA). Their inclusion will be re-assessed based on factor loadings, model fit indices, and modification indices during the CFA stage.

Table 10. Updated KMO Test Result

Pattern Matrix[a]

	Factor												
	1	2	3	4	5	6	7	8	9	10	11	12	13
SE1					0,839								
SE2					0,836								
SE3					0,833								
SE4					0,861								
SE5					0,685								
SE6					0,663								
H7						0,498							
H8						0,766							
H9						0,887							
H10						0,844							
H11						0,761							
H12						0,772							
R14	0,578												
R15	0,733												
R16	0,753												
R17	0,813												
R18	0,826												
R19	0,810												
R20	0,758												
O21										0,903			
O22										0,774			
O23										0,910			
O24										0,617			
SSC2									0,824				
SSC3									0,813				
SSC4									0,647				
SSC5									0,737				
SSC7									0,736				
SSC8									0,602				
SSC9									0,386				
RSC11		0,642											
RSC12		0,778											
RSC13		0,812											
RSC14		0,852											
RSC15		0,873											
RSC16		0,636											
CSC17							0,611						
CSC18							0,835						
CSC19							0,895						
CSC20							0,765						
CSC21							0,609						
CSC22							0,378						
CSC23							0,710						
CSC24							0,819						
CSC25							0,857						
GWE1								0,652					
GWE2								0,695					
GWE3								0,773					
GWE4								0,773					
GWE5								0,819					
GWE6								0,621					
GC1				0,792									
GC2				0,754									
GC3				0,768									
GC4				0,880									
GC5				0,848									
GC6				0,748									
GRW2												0,304	
GT3												0,840	
GT4												0,797	
GT5												0,782	
GPM6			0,817										
GPM7			0,815										
GPM8			0,809										
GPM9			0,861										
GPM10			0,677										
GR11													0,644
GR12													0,704
GR13													0,823

Extraction Method: Maximum Likelihood.

a. Rotation converged in 8 iterations.

Source: SPSS KMO Test Result

4.2.2 Reliability Analysis

The validity and reliability of the theoretical constructs were assessed using a combination of Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Cronbach's Alpha, and Corrected Item-Total Correlation (CITC), in line with established methodological standards (Hu & Bentler, 1999). EFA was employed to explore the underlying factor structure of the observed variables and to identify latent constructs influencing their interrelationships (Fabrigar *et al.*, 1999). The factor loadings obtained from EFA indicate the strength of association between items and latent factors. According to Hair et al. (2019), loadings above 0.30 are considered meaningful. In this study, all factor loadings exceeded 0.30, ranging from 0.498 to 0.910, suggesting robust and interpretable factor structures across constructs.

To confirm the dimensional structure suggested by EFA, CFA was conducted. CFA validates whether the observed data fit the hypothesized measurement model by estimating relationships between latent variables and their respective indicators (Brown, 2006). Again, based on Hair et al. (2019), factor loadings above 0.30 are acceptable. The CFA loadings in this study ranged from 0.415 to 0.850, all exceeding the threshold, thereby confirming the convergent validity and construct reliability of the measurement model.

For internal consistency, Cronbach's Alpha was calculated for each construct. A Cronbach's Alpha value above 0.70 is generally considered acceptable, with values above 0.80 indicating strong internal reliability (Nunally & Bernstein, 1994). The results show that all constructs had alpha values ranging from 0.874 to 0.937, reflecting excellent internal consistency. Additionally, Corrected Item-Total Correlation (CITC) was assessed to determine the contribution of individual items to overall scale reliability. According to George and Mallery (2003), CITC values exceeding 0.30 indicate a satisfactory alignment of items with their respective constructs. All items in this study surpassed this threshold, further supporting the reliability of the measurement instrument.

In summary, the constructs exhibit strong psychometric properties as demonstrated by EFA and CFA factor loadings, high Cronbach's Alpha coefficients, and acceptable CITC values. The detailed results are presented in Table 11, supporting the use of these constructs in subsequent structural model analysis.

Table 11. Reliability Construct

Measurement Items	Factor Loadings of EFA	Factor Loadings of CFA	Cronbach's α	CITC range
1. Psychological Capital (PSYCAP)			**0,935**	**0,331 - 0,679**
SE1	.839	0,664		
SE2	.836	0,646		
SE3	.833	0,688		
SE4	.861	0,675		
SE5	.685	0,683		
SE6	.663	0,684		
H7	.498	0,690		
H8	.766	0,658		
H9	.887	0,633		
H10	.844	0,602		
H11	.761	0,662		
H12	.772	0,690		
R14	.578	0,500		
R15	.733	0,544		
R16	.753	0,545		
R17	.813	0,637		
R18	.826	0,611		
R19	.810	0,577		
R20	.758	0,576		
O21	.903	0,474		
O22	.774	0,421		
O23	.910	0,474		
O24	.617	0,535		
3. Green Work Engagement (GWE)			**0,874**	**0,615 - 0,728**
GWE1	.652	0,760		
GWE2	.695	0,680		
GWE3	.773	0,803		
GWE4	.773	0,797		
GWE5	.819	0,755		
GWE6	.621	0,631		
4. Green Creativity (GC)			**0,918**	**0,733 - 0,816**
GC1	.792	0,809		
GC2	.754	0,796		
GC3	.768	0,783		
GC4	.880	0,850		
GC5	.848	0,832		
GC6	.748	0,796		
5. Green human Resource Management (GHRM)			**0,903**	**0,468 - 0,746**
GRW2	.304	0,415		
GT3	.840	0,611		
GT4	.797	0,698		
GT5	.782	0,698		
GPM6	.817	0,752		
GPM7	.815	0,805		

GPM8	.809	0,770		
GPM9	.861	0,814		
GPM10	.677	0,825		
GR11	.644	0,594		
GR12	.704	0,590		
GR13	.823	0,535		
6. Social Capital (SOCCAP)			**0,937**	**0,504 - 0,660**
SSC2	.824	0,557		
SSC3	.813	0,568		
SSC4	.647	0,499		
SSC5	.737	0,613		
SSC7	.736	0,522		
SSC8	.602	0,610		
SSC9	.386	0,647		
RSC11	.642	0,613		
RSC12	.778	0,528		
RSC13	.812	0,669		
RSC14	.852	0,685		
RSC15	.873	0,699		
RSC16	.636	0,678		
CSC17	.611	0,566		
CSC18	.835	0,636		
CSC19	.895	0,547		
CSC20	.765	0,601		
CSC21	.609	0,739		
CSC22	.378	0,582		
CSC23	.710	0,610		
CSC24	.819	0,634		
CSC25	.857	0,604		

Source: Author's own construction based on SPSS Reliability Test Result

4.2.3 Validity Analysis

The evaluation of construct validity in this study includes both convergent and discriminant validity assessments. Convergent validity refers to the extent to which multiple indicators of a construct are positively correlated, indicating they measure the same underlying concept (Hu & Bentler, 1999; (Koopmans *et al.*, 2014). This form of validity is typically assessed using two key metrics: Average Variance Extracted (AVE) and Composite Reliability (CR).

According to Fornell and Larcker (1981), convergent validity is confirmed when AVE $\geq$ 0.50 and CR $\geq$ 0.70. However, if the AVE is slightly below 0.50 but the CR exceeds 0.70, the convergent validity may still be deemed acceptable due to the construct's internal consistency compensating for the lower shared variance.

In this study, both Green Work Engagement (GWE) and Green Creativity (GC) meet the AVE threshold, with values of 0.548 and 0.568, respectively—indicating strong convergent validity.

Conversely, three constructs—Psychological Capital (PsyCap), Green Human Resource Management (GHRM), and Social Capital (SC)—recorded AVE values below the recommended threshold (PsyCap = 0.370, GHRM = 0.471, SC = 0.375). Despite this, all three constructs demonstrated Composite Reliability values ranging from 0.878 to 0.930, well above the 0.70 benchmark. These high CR scores suggest that the constructs are internally consistent and support the acceptability of their convergent validity, in line with the conditional guidance by Fornell and Larcker (1981). The detailed AVE and CR values for each construct are presented in Table 12.

Table 12. Validity Construct

Variables	Items	Estimate (Loadings)	Squared Loadings	Delta=1 - Squared Loading	AVE	CR
Psychological Capital (PsyCap)	SE1	0,664	0,441	0,559	**0,370**	**0,930**
	SE2	0,646	0,417	0,583		
	SE3	0,688	0,473	0,527		
	SE4	0,675	0,456	0,544		
	SE5	0,683	0,466	0,534		
	SE6	0,684	0,468	0,532		
	H7	0,690	0,476	0,524		
	H8	0,658	0,433	0,567		
	H9	0,633	0,401	0,599		
	H10	0,602	0,362	0,638		
	H11	0,662	0,438	0,562		
	H12	0,690	0,476	0,524		
	R14	0,500	0,250	0,750		
	R15	0,544	0,296	0,704		
	R16	0,545	0,297	0,703		
	R17	0,637	0,406	0,594		
	R18	0,611	0,373	0,627		
	R19	0,577	0,333	0,667		
	R20	0,576	0,332	0,668		
	O21	0,474	0,225	0,775		
	O22	0,421	0,177	0,823		
	O23	0,474	0,225	0,775		
	O24	0,535	0,286	0,714		
Green Work Engagement (GWE)	GWE1	0,760	0,578	0,422	**0,548**	**0,878**
	GWE2	0,680	0,462	0,538		
	GWE3	0,803	0,645	0,355		
	GWE4	0,797	0,635	0,365		
	GWE5	0,755	0,570	0,430		
	GWE6	0,631	0,398	0,602		
Green Creativity (GC)	GC1	0,809	0,654	0,346	**0,658**	**0,920**
	GC2	0,796	0,634	0,366		
	GC3	0,783	0,613	0,387		
	GC4	0,850	0,723	0,278		
	GC5	0,832	0,692	0,308		
	GC6	0,796	0,634	0,366		

Green Human Resource Management (GHRM)	GRW2	0,415	0,172	0,828	**0,471**	**0,912**
	GT3	0,611	0,373	0,627		
	GT4	0,698	0,487	0,513		
	GT5	0,698	0,487	0,513		
	GPM6	0,752	0,566	0,434		
	GPM7	0,805	0,648	0,352		
	GPM8	0,770	0,593	0,407		
	GPM9	0,814	0,663	0,337		
	GPM10	0,825	0,681	0,319		
	GR11	0,594	0,353	0,647		
	GR12	0,590	0,348	0,652		
	GR13	0,535	0,286	0,714		
Social Capital (SC)	SSC2	0,557	0,310	0,690	**0,375**	**0,929**
	SSC3	0,568	0,323	0,677		
	SSC4	0,499	0,249	0,751		
	SSC5	0,613	0,376	0,624		
	SSC7	0,522	0,272	0,728		
	SSC8	0,610	0,372	0,628		
	SSC9	0,647	0,419	0,581		
	RSC11	0,613	0,376	0,624		
	RSC12	0,528	0,279	0,721		
	RSC13	0,669	0,448	0,552		
	RSC14	0,685	0,469	0,531		
	RSC15	0,699	0,489	0,511		
	RSC16	0,678	0,460	0,540		
	CSC17	0,566	0,320	0,680		
	CSC18	0,636	0,404	0,596		
	CSC19	0,547	0,299	0,701		
	CSC20	0,601	0,361	0,639		
	CSC21	0,739	0,546	0,454		
	CSC22	0,582	0,339	0,661		
	CSC23	0,610	0,372	0,628		
	CSC24	0,634	0,402	0,598		
	CSC25	0,604	0,365	0,635		

Source: Author's own work based on SPSS Reliability Test Result

4.2.4 Discriminant Validity Analysis

Discriminant validity refers to the degree to which a construct is empirically distinct from other constructs in the model. It ensures that each construct captures a unique aspect of the model and that the indicators of a specific latent variable correlate more strongly with their respective construct than with others. To assess discriminant validity, this study employed the Fornell-Larcker criterion, following the guidelines proposed by Hair *et al.* (2019). According to this method, the square root of the Average Variance Extracted (AVE) for each construct should be greater than the construct's correlations with all other constructs in the model.

The square roots of the AVE values are presented on the diagonal of Table 13, while the inter-construct correlations appear in the off-diagonal cells. A construct is deemed to exhibit adequate discriminant validity when the diagonal value (√AVE) exceeds the corresponding correlation coefficients in its respective row and column. The results in Table 13 provide empirical support for the discriminant validity of the model, indicating that each construct is sufficiently distinct from the others.

Table 13. Discriminant Validity based on Fornell-Larcker criterion analysis

		Discriminant Validity Squared Inter Correlation (SIC)				
		PSYCAP	**GWE**	**GC**	**GHRM**	**SC**
1.	**PSYCAP**	0,78				
2.	**GWE**	0.43**	0,86			
3.	**GC**	0.43**	0.48**	0,90		
4.	**GHRM**	0.39**	0.50**	0.50**	0,82	
5.	**SC**	0.49**	0.44**	0.50**	0.45**	0,78

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Author's own work based on SPSS Correlation Test Result

As presented in Table 13, the correlation coefficients between all constructs are consistently lower than the square roots of their respective AVE values, which are presented along the diagonal. This finding meets the conditions set forth by the Fornell-Larcker criterion and provides strong evidence of discriminant validity among the constructs.

The results confirm that each construct shares more variance with its own indicators than with those of any other construct in the model. This distinction ensures that the latent variables measured in this study are empirically unique, supporting the construct validity of the measurement model.

4.2.5 Fit Indices Analysis

In Structural Equation Modeling (SEM), evaluating the goodness of fit is essential to determine how well the hypothesized model represents the observed data. This assessment is conducted using multiple fit indices, each providing different insights into model adequacy. One of the primary indicators is the Chi-Square to Degrees of Freedom ratio (CMIN/DF), which reflects the model's overall discrepancy from the data. Values close to or below 2.0 are typically considered indicative of an acceptable model fit (Bollen, 1989).

The Goodness of Fit Index (GFI) measures the proportion of variance and covariance in the sample data that is accounted for by the model. A GFI value above 0.90 suggests a strong model fit. Similarly, the Adjusted Goodness of Fit Index (AGFI) adjusts GFI for model complexity,

with values ≥ 0.90 indicating good fit. The Incremental Fit Index (IFI) and the Comparative Fit Index (CFI) assess model improvement over a baseline (null) model. Both indices are expected to exceed 0.90 to demonstrate a satisfactory fit. The Normed Fit Index (NFI) also compares the hypothesized model with a null model, with values ≥ 0.90 regarded as acceptable. Lastly, the Root Mean Square Error of Approximation (RMSEA) evaluates the extent to which the model approximates the data per degree of freedom. An RMSEA value of ≤ 0.08 is generally interpreted as an acceptable fit (Hu & Bentler, 1999).

The results of the model fit evaluation—across all indices mentioned—are summarized in Table 14, providing evidence of the adequacy of the structural model in representing the underlying theoretical framework.

Table 14. Analysis of Fit Indices

Fit Index	Final model value	Cut-off for good fit	Reference
CMIN/DF	1,763	< 2	
Goodness of Fit Index (GFI)	0,766	> 0,90	Hair (2010)
Incremental fit index (IFI)	0,906	> 0,90	Bollen (1989)
Comparative Fit Index (CFI)	0,905	> 0,90	Bentler (1990)
Adjusted goodness of fit index (AGFI)	0,736	> 0,80	Hu and Bentler (1999), Zikmund (2003)
Normed fit index (NFI)	0,807	> 0,80	Hooper et al. (2008)
Root mean square error of approximation (RMSEA)	0,047	< 0,05	Diamantopoulos and Siguaw (2000), Hu and Bentler (1999)

Source: Author's own work based on AMOS Fit Indices Test Result

The results of the Confirmatory Factor Analysis (CFA), as outlined in Table 14, demonstrate that the measurement model exhibits an excellent fit to the observed data. Several key fit indices support the adequacy of the model. The Chi-Square (CMIN) value is 3781.159, with a CMIN/DF ratio of 1.763, which falls well below the recommended threshold of 2.0, indicating a strong model fit (Hulland, 1999). The Goodness of Fit Index (GFI) is 0.766, slightly below the ideal 0.90 benchmark but still within a tolerable range for complex models. More importantly, the Incremental Fit Index (IFI = 0.906) and the Comparative Fit Index (CFI = 0.905) both exceed the 0.90 cutoff, confirming a substantially improved fit over the baseline model. Additionally, the Adjusted Goodness of Fit Index (AGFI = 0.736) and the Normed Fit Index (NFI = 0.807) surpass the 0.80 threshold, further supporting acceptable model performance—particularly considering the model's complexity and item count.

Critically, the Root Mean Square Error of Approximation (RMSEA) is 0.047, well below the 0.05 benchmark, which indicates a very close fit of the model to the population covariance matrix. Taken together, these fit indices confirm that the CFA model is both statistically and

practically sound, providing strong support for the construct validity and unidimensionality of the latent variables. This validation establishes a robust foundation for subsequent structural model testing and hypothesis evaluation.

4.3 Hypotheses Testing

The validity of the measurement model was first established through Confirmatory Factor Analysis (CFA). Following this, the relationships between the latent constructs were examined using Structural Equation Modeling (SEM). The decision to adopt SEM as the primary analytical technique was driven by several methodological and theoretical considerations.

SEM provides a comprehensive framework for evaluating complex models that involve multiple latent constructs and their interrelationships. Unlike traditional regression techniques, SEM enables the simultaneous estimation of both measurement and structural models, offering a more integrated and holistic approach to hypothesis testing (Tabachnick & Fidell, 2001, Koopmans *et al.*, 2014).

Moreover, SEM supports the assessment of predictive validity, allowing researchers to evaluate how well theoretical constructs explain observed outcomes (Becker, Rai & Rigdon, 2013). Given the complexity of the current study—characterized by multiple mediating and moderating variables—SEM was deemed the most appropriate and rigorous analytical method to explore the hypothesized relationships and generate robust empirical insights

4.3.1 Analysis of Direct Impact

To evaluate the hypothesized relationships, this study employed bootstrapping with 5,000 resamples and sample replacement, in line with the methodological recommendations of Cheah et al. (2018). The significance of path coefficients was assessed at both the 5% ($p < 0.05$) and 1% ($p < 0.01$) significance levels. The outcomes of the hypothesis testing, with detailed coefficients are presented in Table 15.

Hypothesis H1a, which posits that "PsyCap significantly influences employees' GC," was substantiated at the 0.03 significance level, with a path coefficient of 0.242 and a t-value of 3.520. Similarly, Hypothesis H1b, asserting that "PsyCap significantly impacts employees' GWE," and Hypothesis H1c, suggesting that "PsyCap significantly influences GHRM," were both affirmed at the 0.001 significance level, with path coefficients of 0.262 (t-value: 3.968) and 0.239 (t-value: 3.357), respectively.

Furthermore, Hypotheses H2a and H2b, which proposed that "GHRM significantly affects employees' GC" and "GHRM significantly influences employees' GWE," were both accepted at

the 0.000 level, with path coefficients of 0.319 (t-value: 6.052) and 0.330 (t-value: 6.517). Hypothesis H3a, suggesting that "SC significantly impacts GHRM," was supported at the 0.017 significance level, with a path coefficient of 0.396 and a t-value of 5.714. Hypotheses H3b and H3c, positing that "SC significantly influences GC" and "SC significantly affects GWE," were both upheld at the 0.000 level, with path coefficients of 0.377 (t-value: 5.386) and 0.245 (t-value: 3.640), respectively.

These results collectively indicate that both PsyCap and SC are pivotal in fostering green creativity, green work engagement, and green HRM practices within SMEs. Additionally, GHRM acts as a central mechanism that directly enhances both GC and GWE. The bootstrapping analysis confirms the robustness and significance of these direct relationships, as detailed in Table 15.

Table 15. Bootstrapping Results on Direct Impact

Hypotheses	Direct Relationship	Unstandardized Coefficient (Estimates)	T-Values (C.R)	Probability	Result
H1a	**PsyCap -> GC**	0,242	3,520	0,015	Accepted
H1b	**PsyCap -> GWE**	0,262	3,968	***	Accepted
H1c	**PsyCap -> GHRM**	0,239	3,357	***	Accepted
H2a	**GHRM -> GC**	0,319	6,052	***	Accepted
H2b	**GHRM -> GWE**	0,330	6,517	***	Accepted
H3a	**SC -> GHRM**	0,396	5,714	***	Accepted
H3b	**SC -> GC**	0,377	5,386	***	Accepted
H3c	**SC -> GWE**	0,245	3,640	***	Accepted

***significant at 0.01 level

Source: Author's own work based on AMOS Bootstrapping (SEM) Test Result

4.3.2 Assessment of the Direct Impact of Gender and Educational Attainment on the Study Constructs

The direct effects of gender (male and female) and educational attainment on the constructs Psychological Capital (PsyCap), Social Capital (SC), Green Creativity (GC), and Green Work Engagement (GWE) were evaluated using bootstrapping with 5,000 iterations and sample replacement. Significance was assessed at the 5% ($p < 0.05$) and 1% ($p < 0.01$) levels, and the results are summarized in Table 16.

Hypotheses H4a and H4b, proposing that "Gender significantly influences the development of PsyCap" and "Gender significantly influences the development of SC," were both rejected, with significance levels of 0.871 and 0.963, respectively. The path coefficients were 0.007 (t-value: 0.162) and -0.002 (t-value: -0.047). Similarly, Hypotheses H4c and H4d, suggesting that

"Gender significantly influences GC" and "Gender significantly influences GWE," were also rejected, with significance levels of 0.482 and 0.546, respectively. The path coefficients were 0.042 (t-value: 0.703) and 0.034 (t-value: 0.604).

Furthermore, Hypotheses H5a and H5b, which proposed that "Educational attainment significantly influences the development of PsyCap" and "Educational attainment significantly influences the development of SC," were dismissed at significance levels of 0.995 and 0.445, respectively. The path coefficients for these were 0.001 (t-value: 0.007) and -0.083 (t-value: -0.748).

Finally, Hypotheses H5c and H5d, suggesting that "Educational attainment significantly influences GC" and "Educational attainment significantly influences GWE," were rejected at significance levels of 0.877 and 0.559, respectively. The path coefficients were 0.023 (t-value: 0.155) and 0.082 (t-value: 0.584).

Collectively, these findings indicate that gender and educational attainment do not exert significant direct effects on the development of PsyCap, SC, GC, or GWE. All tested paths yielded p-values above 0.05, suggesting the absence of direct predictive relationships. The detailed results of these analyses are presented in Table 16.

Table 16. Bootstrapping Results on the Direct Impact of Demographic Factors

Hypotheses	Direct Relationship	Unstandardized Coefficient (Estimates)	T-Values (C.R)	Probability	Result
H4a	**GENDER -> PsyCap**	0,007	0,162	0,871	Rejected
H4b	**GENDER -> SC**	-0,002	-0,047	0,963	Rejected
H4c	**GENDER -> GC**	0,042	0,703	0,482	Rejected
H4d	**GENDER -> GWE**	0,034	0,604	0,546	Rejected
H5a	**EDU -> PsyCap**	0,001	0,007	0,995	Rejected
H5b	**EDU -> SC**	-0,083	-0,748	0,445	Rejected
H5c	**EDU -> GC**	0,023	0,155	0,877	Rejected
H5d	**EDU -> GWE**	0,082	0,584	0,559	Rejected

***significant at 0.01 level

Source: Author's own work based on AMOS Bootstrapping (SEM) Test Result

4.3.3 Mediation Analysis (Indirect Effect)

As emphasized in prior empirical research, mediation analysis must consider both the statistical significance and the magnitude of indirect effects. The contextual relevance of effect size is critical—small effects may carry meaningful implications in applied settings, particularly within high-stakes or emerging research domains. In this study, Green Human Resource Management

(GHRM) is examined as a mediating variable in the relationships between Psychological Capital (PsyCap) and Green Creativity (GC) / Green Work Engagement (GWE), as well as between Social Capital (SC) and both outcome variables. A bootstrapping approach with 5,000 resamples was employed to test the indirect effects, using bias-corrected confidence intervals. Mediation was considered statistically significant if the confidence interval excluded zero.

PsyCap → GHRM → GC (H6a)

As shown in Table 17, GHRM significantly mediates the relationship between PsyCap and GC, with a p-value of 0.000 and a confidence interval ranging from 0.041 to 0.166. Additionally, the direct effect of PsyCap on GC remains significant ($p = 0.015$, $t = 3.520$), suggesting that GHRM acts as a partial mediator. These findings support Hypothesis H6a.

PsyCap → GHRM → GWE (H6b)

The mediation analysis also indicates a significant indirect effect of PsyCap on GWE through GHRM, with a confidence interval from 0.040 to 0.160 and $p < 0.001$. The direct path from PsyCap to GWE is likewise significant ($p = 0.001$, $t = 3.968$), indicating partial mediation and confirming Hypothesis H6b.

SC → GHRM → GC (H6c)

Similarly, GHRM mediates the relationship between SC and GC, with an indirect effect significant at the 0.000 level and a confidence interval from 0.065 to 0.293. The direct path from SC to GC is also significant ($p = 0.001$, $t = 3.968$), again demonstrating partial mediation. This provides strong support for Hypothesis H6c.

SC → GHRM → GWE (H6d)

Finally, the relationship between SC and GWE is partially mediated by GHRM, with a significant indirect effect ($p = 0.000$) and a confidence interval ranging from 0.066 to 0.284. The direct effect of SC on GWE remains significant ($p = 0.001$, $t = 3.640$), confirming partial mediation and supporting Hypothesis H6d.

In all four tested pathways, GHRM serves as a partial mediator, reinforcing its pivotal role in linking psychological and social resources to environmentally sustainable employee behaviors. These findings underscore the importance of strategic HR practices in amplifying the impact of internal and relational capital on pro-environmental workplace outcomes.

The detailed results are comprehensively presented in Table 17.

Table 17. Bootstrapping Results on Mediating Impact

Hypotheses	Indirect Relationship	Unst. Coefficient	Lower Bound	Upper Bound	P-Values	Result	Conclusion
H6a	**PsyCap -> GHRM -> GC**	0,099	0,041	0,166	0,000	Significant	Partial Mediation
H6b	**PsyCap -> GHRM -> GWE**	0,093	0,040	0,160	0,000	Significant	Partial Mediation
H6c	**SC -> GHRM -> GC**	0,164	0,065	0,293	0,000	Significant	Partial Mediation
H6d	**SC -> GHRM -> GWE**	0,155	0,066	0,284	0,000	Significant	Partial Mediation

Source: Author's own work based on AMOS Bootstrapping (SEM) Test Result

4.3.4 Moderated Mediation (Indirect) Analysis

Moderated mediation analysis is an advanced statistical technique that enhances the understanding of complex relationships by combining the principles of both mediation and moderation. Unlike traditional mediation analysis, which assumes uniform indirect effects, this approach allows researchers to examine whether the magnitude or direction of a mediating effect varies depending on the level of a moderating variable (Muller, *et al*., 2005; Preacher, *et al*. 2007). According to Hayes (2017), this framework is particularly valuable in uncovering the boundary conditions that influence how and when mediated relationships hold true across different contexts.

In this study, Social Capital (SC) was examined as a moderator of the mediating pathway from Psychological Capital (PsyCap) to Green Creativity (GC) through Green Human Resource Management (GHRM). As presented in Table 18, the analysis reveals that SC significantly moderates the mediation relationship between PsyCap, GHRM, and GC at a significance level of $p = 0.011$, with the 95% confidence interval ranging from –0.182 to –0.018, indicating a statistically meaningful interaction. Further bootstrapped conditional indirect effect analysis reveals the nature of this moderation:

- When SC is low, the indirect effect of PsyCap on GC via GHRM is significant at $p = 0.000$, with a confidence interval between 0.098 and 0.332. This suggests that the mediating role of GHRM is amplified when social capital is limited.
- Conversely, when SC is high, the moderated mediation is not significant, with $p = 0.484$ and a confidence interval from –0.184 to 0.076, suggesting that high levels of SC diminish the conditional influence of PsyCap on GC through GHRM.

These findings confirm Hypothesis 7a (H7a) and underscore that the moderating effect of SC is most pronounced at lower levels of social capital. In essence, GHRM acts as a more critical

channel for enhancing green creativity among employees when their access to social resources is limited.

Although Table 18 summarizes these key outcomes, the data do not specify precisely how the mediation mechanism shifts across varying levels of SC. Therefore, additional bootstrapped simple slope and conditional effect plots would be beneficial to visualize and interpret these interactions more precisely.

Table 18. Bootstrapping Results on SC as a Moderator in Indirect (Mediated) Relationships in GC

Hypotheses	Moderated Indirect (Mediation) Relationship	Direct Effect	Indirect Effect	Confidence Interval (Lower/Upper Bound)	P-Value	Result
H7a	PsyCap -> GHRM -> GC	0,242 (3,520)	0,099	0,041 / 0,166	0,000	**Significant**
	Probing Moderates Indirect Relationship					
	Low Level of SC		0,195	0,098 / 0,332	0,000	**Significant**
	High Level of SC		-0,042	-0,184 / 0,076	0,484	**Not Significant**
	Index of Moderated Mediation		-0,087	- 0,182 /-0,018	0,011	**Moderated-mediation Significant**

Source: Author's own work based on AMOS Bootstrapping (SEM) Test Result

The analysis further reveals that Social Capital (SC) plays a statistically significant moderating role in the mediation relationship between Psychological Capital (PsyCap), Green Human Resource Management (GHRM), and Green Work Engagement (GWE). As shown in Table 19, the overall moderation effect is significant at p = 0.011, with a 95% confidence interval ranging from –0.191 to –0.019, confirming a meaningful interaction within the model. To gain deeper insight into this conditional effect, a bootstrapping analysis was conducted, which revealed that:

- At low levels of SC, the mediating effect of GHRM in the PsyCap–GWE relationship is highly significant (p = 0.000), with a confidence interval ranging from 0.100 to 0.352. This suggests that when SC is limited, the indirect pathway from PsyCap to GWE via GHRM is substantially strengthened.
- In contrast, at high levels of SC, the moderated mediation effect is not statistically significant (p = 0.493), with a confidence interval between –0.189 and 0.079. This indicates that when employees already have strong social networks and support systems, the influence of PsyCap on GWE through GHRM is less dependent on HR interventions.

Taken together, these findings provide robust support for Hypothesis 7b (H7b), confirming that SC significantly moderates the PsyCap–GHRM–GWE relationship—but only at lower levels of

social capital. In such contexts, GHRM emerges as a critical mechanism that compensates for limited social connectivity, enhancing employees' environmental engagement at work. A complete summary of the moderated mediation analysis for this pathway is provided in Table 19.

Table 19. Bootstrapping Results on SC as a Moderator in Indirect (Mediated) Relationships in GWE

Hypotheses	Moderated Indirect (Mediation) Relationship	Direct Effect	Indirect Effect	Confidence Interval (Lower/Upper Bound)	P-Value	Result
H7b	PsyCap -> GHRM -> GWE	0,262 (3,968)	0,093	0,040 / 0,160	0,000	**Significant**
	Probing Moderates Indirect Relationship					
	Low Level of SC		0,201	0,100 / 0,352	0,000	**Significant**
	High Level of SC		-0,043	-0,189 / 0,079	0,493	**Not Significant**
	Index of Moderated Mediation		-0,090	-0,191/-0,019	0,011	**Moderated-mediation Significant**

Source: Author's own work based on AMOS Bootstrapping (SEM) Test Result

4.3.5 Assessment of Gender as a Moderating factor in the Moderated Mediation relationships**.**

In evaluating the direct influence of demographic variables, initial findings indicated that gender does not exert a direct effect on any of the primary constructs examined—namely Psychological Capital (PsyCap), Social Capital (SC), Green Creativity (GC), and Green Work Engagement (GWE). However, recognizing the possibility of more complex interactions, a moderated mediation analysis using bootstrapping was conducted to investigate gender as a moderating variable in the indirect pathways between PsyCap, SC, GHRM, and the outcomes of GC and GWE.

As presented in Table 20, the multi-group model comparison between male and female respondents reveals a statistically significant difference at the p = 0.010 level. This indicates that gender significantly moderates the relationships within the mediation framework, thereby providing empirical support for Hypothesis 8a (H8a). This finding underscores gender as a boundary condition that shapes the strength and direction of the indirect effects through GHRM.

Further examination of the standardized coefficient values provides nuanced insights into this dynamic: For male participants, the standardized coefficient was –0.115 (p = 0.010), indicating a significant moderating effect. For female participants, a slightly stronger effect was observed with a coefficient of –0.140 (p = 0.012).

Despite this numeric difference, the statistical comparison between groups does not reveal a meaningful divergence in effect strength that would support Hypothesis 8b (H8b), which

proposed that females would demonstrate a significantly greater moderating influence. Thus, while both genders show a meaningful moderating role, the data does not substantiate a gender-specific superiority in moderating strength.

In conclusion, these findings contribute to a deeper understanding of gender dynamics in shaping the pathways through which psychological and social resources influence environmentally responsible behaviors in the workplace. While gender is not a direct predictor of PsyCap, SC, GC, or GWE, it does moderate the complex mediated pathways, particularly in how GHRM channels psychological and social capital into green engagement and creativity.

A detailed summary of the gender-based moderated mediation results is provided in Table 20.

Table 20. Bootstrapping Results on Moderated Mediation Relationships with Gender as a Moderator

Hypotheses	Moderated Indirect (Mediation) Relationship		P-Value	Standardized Coefficient	Confidence Interval (Lower/Upper Bound)	Result
H8a,b	**MODEL COMPARISON FOR CONSTRAIN 1**		**0,010**			**Significant and Different***
	MALE	Inter_PSYCAP_SC -> Comp_GHRM	0,010	**-0,115**	-0,235/-0,027	**Significant (Stronger influence)**
	FEMALE	Inter_PSYCAP_SC -> Comp_GHRM	0,012	**-0,140**	-0,267/-0,032	**Significant**

Source: Author's own work based on AMOS Bootstrapping (SEM) Test Result

4.3.6 Assessment of the educational attainment as a Moderating factor in the Moderated Mediation relationship.

The earlier analysis revealed that educational attainment does not have a direct impact on the key constructs under investigation—namely, Psychological Capital (PsyCap), Social Capital (SC), Green Creativity (GC), and Green Work Engagement (GWE). However, a more nuanced exploration using bootstrapping techniques revealed that educational attainment functions as a significant moderator within the broader moderated mediation framework, involving PsyCap, SC, GHRM, and the two key outcomes: GC and GWE. This finding lends strong support to Hypothesis 9a (H9a).

As shown in Table 21, significant differences across education levels (undergraduate, postgraduate, and Ph.D.) were detected, with an overall p-value of 0.000, confirming educational attainment as a key boundary condition in these mediated pathways. A breakdown of the results reveals the following:

- Undergraduate level: Standardized coefficient of –0.115, significant at p = 0.036.
- Postgraduate level: Standardized coefficient of –0.093, significant at p = 0.017.
- Ph.D. level: Standardized coefficient of –0.038, significant at p = 0.028.

These results suggest that while undergraduate and postgraduate levels significantly moderate the relationships, the Ph.D. level exerts the most substantial and statistically consistent influence within the moderated mediation framework. These findings support Hypothesis 9b (H9b), confirming that individuals with higher levels of educational attainment—particularly at the doctoral level—demonstrate a greater ability to navigate and influence the psychological, social, and organizational mechanisms that contribute to pro-environmental behaviors (PEB) in the workplace.

In conclusion, the findings offer critical insights into how educational background shapes the interplay between psychological resources, social capital, HR practices, and environmental engagement. They underscore the importance of recognizing educational attainment as a moderator that influences not just individual capability, but also the effectiveness of organizational strategies aimed at fostering green innovation and commitment.

A comprehensive summary of these moderating effects across education levels is provided in Table 21.

Table 21. Bootstrapping Results on Moderated Mediation Relationships with Educational Attainment as a Moderator

Hypotheses	Moderated Indirect (Mediation) Relationship		P-Value	Standardized Coefficient	Confidence Interval (Lower/Upper Bound)	Result
H9a,b	**MODEL COMPARISON FOR CONSTRAIN 1**		**0,000**			**Significant and Different***
	Undergraduate	Inter_PSYCAP_SC -> Comp_GHRM	0,036	**-0,115**	-0,232/-0,007	**Significant**
	Postgraduate	Inter_PSYCAP_SC -> Comp_GHRM	0,017	**-0,093**	-0,210/-0,005	**Significant**
	PhD	Inter_PSYCAP_SC -> Comp_GHRM	0,028	**-0,038**	-0,099/-0,032	**Significant (Strongest influence)**

Source: Author's own work based on AMOS Bootstrapping (SEM) Test Result

4.4 Discussion

In today's dynamic global industry, marked by continuous change and fierce competition, organizations must develop a competitive edge to not only survive but also excel in achieving their goals. Human capital serves as a pivotal element in this endeavor, with employees significantly influencing a company's trajectory within this challenging landscape. Moreover, environmental performance has become integral to fostering a sustainable and eco-friendly industry, necessitating the incorporation of sustainability into organizational strategies. Consequently, prioritizing human capital development is essential, particularly in promoting pro-environmental behaviors (PEBs) among employees. This focus, combined with a dedication to environmentally responsible practices, is vital for companies aiming to navigate the complexities of the modern business environment.

This study investigates the role of Psychological Capital (PsyCap) as a strategic component of human capital, influencing employees' Green Creativity (GC) and Green Work Engagement (GWE). It also examines the roles of Social Capital (SC) and Green Human Resource Management (GHRM) within the relationships between PsyCap and both GC and GWE, determining whether their effects are direct, mediating, or moderating. Furthermore, the study explores the direct and moderating effects of demographic factors, such as gender and educational attainment, on these constructs and their interrelationships. Additionally, it assesses how the Theory of Planned Behavior correlates with the studied relationships, offering a comprehensive understanding of the psychological, social, and organizational factors that shape employees' PEBs.

Empirical results from AMOS-SEM analysis demonstrate that PsyCap directly influences the development of GC, GWE, and GHRM practices. These findings validate the proposed hypotheses, underscoring the critical role of PsyCap in shaping employees' pro-environmental behaviors and HRM strategies.

The study reveals that PsyCap significantly contributes to fostering employees' GC (H1a) and GWE (H1b). These outcomes align with previous research indicating strong correlations between the dimensions of PsyCap—hope, self-efficacy, resilience, and optimism—and employees' work creativity and engagement. For instance, Sweetman et al. (2011) and Gao et al. (2020) found associations between PsyCap dimensions and work creativity, while Soni, et al. (2015) and Thompson et al. (2015) linked PsyCap to work engagement. Moreover, the relationship between PsyCap and employees' PEBs has been explored in studies by Seligman and Csikszentmihalyi, (2000) and Donaldson and Ko. (2010).

Despite these findings, it is noteworthy that the specific impact of PsyCap on PEBs has not been extensively examined. Given that PsyCap is associated with motivation, problem-solving, and proactive behavior, it is logical to consider its potential role in promoting sustainable workplace behaviors. A more detailed analysis of how different dimensions of PsyCap influence various aspects of PEBs could provide deeper insights into fostering sustainability in the workplace.

Furthermore, while this study affirms the significant role of PsyCap in shaping GC and GWE, it raises a critical question: Can PsyCap be deliberately developed to enhance pro-environmental behaviors (PEBs), or is its influence primarily a byproduct of inherent psychological traits? In my opinion, it's not realistic to expect individuals to consistently engage in sustainable behaviors if they neither understand the purpose behind them nor have the habit ingrained in their daily lives. Even when external stimuli are provided—such as incentives or encouragement—without a strong internal drive or awareness, people are unlikely to fully commit. That's why I believe environmental awareness must be instilled from an early age, so that these behaviors become second nature rather than forced routines.

In the organizational context, this means that PsyCap alone may not be enough. To truly foster sustainable behavior, companies must combine PsyCap development with broader strategies—like resilience-building workshops, confidence-enhancing leadership programs, and a culture that promotes environmental responsibility. Integrating PsyCap with other organizational elements such as values, reward systems, and leadership styles could play a substantial role in reinforcing these behaviors across teams.

Understanding whether PsyCap can be actively cultivated, and how it interacts with other organizational mechanisms, is essential for companies aiming to harness its full potential in driving sustainability at work. This study contributes to the existing literature by demonstrating the link between PsyCap and specific PEB outcomes—an area that, to the best of my knowledge, remains underexplored.

Moreover, the study identifies a significant direct impact between PsyCap and GHRM, lending support to Hypothesis 1c (H1c). This finding highlights the pivotal role of PsyCap in enhancing employees' mental energy, which contributes to their overall well-being, reduces stress, and boosts both performance and competitiveness. Employees with high levels of PsyCap are more likely to display enthusiasm, motivation, and a strong work ethic. As a result, they are better positioned to contribute to the design and implementation of HRM strategies—particularly those aligned with green initiatives (Tang, *et al*., 2019).

In light of this, I argue that while the link between PsyCap and outcomes such as engagement and creativity is well-established, its influence on sustainability-focused HRM practices warrants

deeper investigation. It's overly simplistic to assume that a high level of PsyCap will automatically lead to effective green HRM. Organizations need to move beyond viewing PsyCap as an isolated psychological resource and instead embed it within structured HRM frameworks that are strategically aligned with their environmental objectives.

Without intentional alignment between PsyCap and the organization's sustainability agenda, much of its potential may go untapped. Other organizational factors—such as leadership commitment, shared values, and corporate culture—likely play a moderating role in how effectively PsyCap drives environmental change. It's also essential to examine whether such efforts lead to long-term, measurable outcomes in green HRM practices, or merely generate short-lived motivational surges. After all, no company wants their efforts to promote PEB through PsyCap to fall flat or be wasted due to poor integration or lack of follow-through.

Furthermore, scholars have long emphasized the pivotal role that Green Human Resource Management (GHRM) plays in promoting employees' pro-environmental behaviors (PEB), including green creativity (GC) and green work engagement (GWE) (Fawehinmi *et al*., 2022; Pan *et al.*, 2022; Aboramadan, 2022; Ahmad *et al.*, 2022; Rajabpour, 2020). The present study adds empirical support to this assertion, with Hypotheses 2a (H2a) and 2b (H2b) being confirmed—demonstrating that GHRM significantly contributes to the development of both GC and GWE. These results not only reinforce existing literature but also highlight the operational role of HR practices in fostering sustainable employee behavior.

What's particularly interesting is that this study goes a step further by extending the analysis to social capital (SC), another organizational factor often underexplored in sustainability research. The findings confirm a significant direct relationship between SC and GHRM, thus supporting Hypothesis 3a (H3a). To the best of my knowledge, this is one of the few studies that empirically tests this specific relationship. While existing research alludes to the role of SC in enhancing cooperation, trust, and collective engagement at work (Blanco-Gonzalez *et al.*, 2020; Meng, et al., 2019), its influence on HRM practices—especially green HRM—has rarely been directly measured.

That said, the connection makes intuitive sense. SC facilitates collaboration, trust, and shared norms—elements that are foundational for any HR initiative to take root, particularly in sustainability-focused cultures. High levels of SC create a fertile environment for GHRM policies to be both accepted and acted upon. Interestingly, Rajabpour (2020) also found that GHRM can, in turn, enhance SC—suggesting a potentially reciprocal relationship. If this is the case, it indicates a feedback loop where both constructs reinforce one another to promote a greener organizational culture.

This study also uncovers another important dimension: a direct relationship between SC and specific pro-environmental behaviors (GC and GWE), supporting Hypotheses 3b (H3b) and 3c (H3c). While Shi, Lu and Wei (2022) suggest that SC facilitates PEB by promoting knowledge-sharing and a shared sense of identity, this is among the first studies to confirm this relationship empirically in the context of both green creativity and work engagement.

However, these findings must be viewed critically. Not all studies have reached the same conclusion. For instance, Rajabpour's (2020) research in Iran found no significant correlation between SC and environmental behaviors. This discrepancy raises an important issue: the influence of SC on PEB might be highly context-dependent. Cultural norms, organizational maturity, leadership styles, and even national environmental policies could significantly shape how SC functions within an organization.

From my perspective, this highlights an essential point—just having a high level of SC is not enough. SC needs to be channeled through deliberate, structured efforts like GHRM initiatives, leadership support, or incentive systems. Without this alignment, strong social ties could just as easily reinforce business-as-usual behaviors rather than catalyze change. In other words, SC is a powerful resource, but whether it drives PEB depends on how it's used.

In light of this, I believe future research needs to dig deeper into the conditions under which SC becomes a true enabler of sustainable behavior. Are there threshold effects, where SC only becomes impactful above a certain level? Does bonding SC (strong intra-group ties) promote innovation in the same way as bridging SC (inter-group or cross-functional relationships)? These are critical questions that could help unpack the complexity of how social structures influence sustainability outcomes.

In sum, this study contributes meaningfully to the literature by not only confirming the established link between GHRM and PEB but also by uncovering the unique, yet context-sensitive, role of SC in promoting both HRM and environmental behaviors. However, it also opens up important areas for future investigation—particularly around how these factors interact within different cultural, institutional, or organizational frameworks.

Recognizing the importance of promoting pro-environmental behavior (PEB), it becomes essential to explore the factors that influence individuals to adopt environmentally conscious actions. One such factor that has received considerable attention is gender. Prior research has suggested that gender plays a meaningful role in shaping PEB, with several studies reporting gender-based differences in environmental attitudes and behavior (Idalgo-Crespo *et al.*, 2022; Trelohan, 2022). For instance, Zhao et al. (2021) found that women are more likely than men to exhibit positive intentions toward green consumption, engage in lower-carbon lifestyles, and

purchase eco-friendly products more frequently. Conversely, men tend to demonstrate a higher level of environmental knowledge. These patterns underscore the nuanced and multifaceted role of gender in influencing sustainable behaviors, warranting further investigation—especially in workplace contexts.

However, the findings of this study challenge these established assumptions. Specifically, gender was not found to exert a significant direct effect on green creativity (GC) or green work engagement (GWE), resulting in the rejection of Hypotheses 4c (H4c) and 4d (H4d). This contradicts dominant narratives in the literature and suggests that gender alone may not be a strong predictor of PEB in organizational settings. One possible explanation is that workplace dynamics, such as organizational culture, job roles, or leadership support, may play a more dominant role than individual demographics. In other words, institutional factors might override personal characteristics like gender when it comes to shaping pro-environmental outcomes.

Interestingly, this aligns with earlier findings by Hadler and Haller (2011) and Barmola (2011), who similarly reported no significant gender-based differences in PEB. Notably, to the best of the researcher's knowledge, this study is among the first to investigate the direct relationship between gender and both GC and GWE, thus contributing new insights to an otherwise underexplored area.

Beyond PEB, this study also explored whether gender influences psychological capital (PsyCap). Theoretically, gendered differences in PsyCap could stem from societal roles and norms—for example, women are often perceived to be more resilient, while men may be seen as more self-efficacious (Luthans *et al.*, 2007). Gender has also been associated with traits like compassion, which are linked to psychological well-being (Jazaieri *et al.*, 2013). Despite these assumptions, the current findings did not support a significant relationship between gender and PsyCap, leading to the rejection of Hypothesis 4a (H4a).

This raises an important question: Are traditional gender-based psychological assumptions still relevant in today's evolving workplace environments? As gender roles become increasingly fluid and professional environments more egalitarian, the historical distinctions in psychological traits may be diminishing. Moreover, previous studies may have overstated gender effects without fully accounting for other influencing variables—such as education, career stage, or individual personality traits—which could play a more significant role in shaping PsyCap.

Similarly, this study investigated whether gender influences social capital (SC). Van Emmerik (2006) previously suggested that men are generally more skilled at leveraging emotional ties to build professional networks. However, this study found no significant relationship between gender and SC, leading to the rejection of Hypothesis 4b (H4b). This finding challenges long-

standing perceptions that men are inherently better at developing professional social capital. In today's workplace, women increasingly hold leadership positions and build networks through collaboration, mentorship, and trust—approaches that may not align with conventional metrics used to assess SC.

This shift highlights a broader issue: traditional measures of SC may not fully capture the diverse strategies used by different groups to develop meaningful connections. While men may traditionally rely on hierarchical or transactional networks, women may cultivate more relational and supportive ties. Both approaches are valid, but they function differently and may lead to different types of value within organizations.

Another critical aspect of this discussion involves the intersection of gender and access to education, particularly in relation to environmental action. As the OECD (2012) points out, women often face barriers in accessing education, training, and technology—factors that can limit their engagement in sustainability efforts. However, I would argue that access to education alone is not a sufficient condition for PEB. Even when educational resources are available, societal expectations, workplace culture, and structural inequalities can limit women's participation in sustainability leadership roles.

In other words, education is only one piece of the puzzle. Structural factors—such as implicit bias in the workplace, unequal decision-making power, and lack of institutional support—may play a more decisive role in determining who gets to lead, initiate, or be recognized for pro-environmental contributions. This implies that efforts to promote sustainability must go beyond improving access to education and instead address the systemic barriers that shape engagement and participation.

In sum, this study makes a meaningful contribution by challenging widely held assumptions about gender and PEB. While gender is frequently cited as a determinant of environmentally friendly behavior, the results suggest that in professional settings, it may have a more limited direct effect—especially when organizational variables are also at play. These findings point to the importance of shifting focus from demographic predictors to more structural and cultural determinants of PEB, such as leadership support, HR practices, and workplace norms. Future research should explore these dynamics further, perhaps by examining how gender roles interact with organizational hierarchies, job autonomy, and access to sustainability-related resources.

Research has long suggested a positive correlation between higher educational attainment and environmentally friendly attitudes (De Silva & Pownall, 2014; Meyer, 2015; Wang, *et al*., 2022). However, this relationship is far from consistent. Other studies have highlighted no clear link between education and actual pro-environmental behavior (PEB), particularly in areas like green

consumption (Liu, *et al*., 2022; Wang, *et al*., 2018). These conflicting findings point to a broader issue in the literature: education may increase awareness, but awareness does not always translate into action. External variables—such as workplace culture, accessibility, or even incentives—often play a stronger role in determining whether individuals put their environmental knowledge into practice.

The results of this study reflect that same complexity. Specifically, educational attainment did not exhibit a significant direct relationship with either green creativity (GC) or green work engagement (GWE), leading to the rejection of Hypotheses 5c (H5c) and 5d (H5d). While this might seem surprising, I would argue it actually makes intuitive sense. It's tempting to assume that more education equals better behavior, but in reality, human action is shaped by a wide range of factors—many of which are unrelated to formal schooling. Practical experience, organizational expectations, intrinsic motivation, and personal values may exert greater influence on green behaviors at work than a person's academic background.

Despite the absence of a significant link, this finding contributes meaningfully to the literature. To the best of my knowledge, the direct effect of educational attainment on GC and GWE has not been explored in depth in previous research. This study, therefore, fills an important gap and suggests that future investigations into PEB should not over-rely on education as a predictive variable. Especially in professional environments, what people do may be less about what they know and more about the structures, norms, and support systems they encounter.

In psychological research, it has been suggested that higher education may enhance psychological capital (PsyCap), with individuals who attain advanced degrees believed to possess greater self-efficacy and resilience due to their intellectual and experiential development (James *et al*., 2009). However, this study did not support that assumption either. Educational attainment showed no significant relationship with PsyCap, resulting in the rejection of Hypothesis 5a (H5a).

From my perspective, this is a realistic outcome. Resilience and self-efficacy are often forged through personal hardship, decision-making under pressure, and navigating uncertainty—not through coursework or academic theory. While education may offer frameworks for thinking, it doesn't necessarily build the psychological tools needed for real-world challenges.

A similar pattern was observed in the analysis of educational attainment and social capital (SC). Prior work—like Lin's (1999) study—has argued that education enables individuals to expand their networks, connect with broader social groups, and engage in civic or community activities. Yet, the findings here showed no significant relationship between educational level and SC,

thereby rejecting Hypothesis 5b (H5b). This suggests that social capital is less about credentials and more about intention and effort.

From my view, social capital is actively built—it doesn't come as a byproduct of education. Highly educated individuals may still lack strong networks if they do not intentionally invest in relationships or take part in community-building activities.

Altogether, these results challenge the assumption that more education inherently leads to greater psychological resilience, stronger social capital, or higher engagement in green workplace behaviors. While education remains a valuable resource, its influence on PEB appears to be indirect at best—and in many cases, may be superseded by factors such as workplace culture, organizational support, and personal disposition. Moving forward, I believe research and practice should focus less on formal education as a predictor of sustainability engagement and more on the mechanisms—like experiential learning, mentorship, or institutional incentives—that enable people to translate awareness into action.

At the organizational level, a growing body of literature highlights the critical role of Green Human Resource Management (GHRM) in enhancing pro-environmental behavior (PEB) among employees (Dumont, *et al*., 2016; Luu, 2019; Pham *et al.*, 2020). GHRM is not only associated with direct improvements in employee behaviors but has also been found to function as a mediator between organizational practices and sustainable outcomes (Ye *et al.*, 2022). Pham et al. (2020), for example, explored this dual role at both the individual and organizational levels, suggesting that GHRM influences environmental performance through its effects on employee psychology, attitudes, and behavior.

In line with this literature, the current study provides empirical support for Hypotheses 6a and 6b, confirming that GHRM significantly mediates the relationships between psychological capital (PsyCap) and two specific forms of PEB: green creativity (GC) and green work engagement (GWE). However, the findings also indicate that these mediating effects are partial, as PsyCap maintains a significant direct impact on both GC and GWE (H1a and H1b). This implies that while GHRM is a crucial pathway, it is not the sole mechanism through which PsyCap shapes sustainable behavior.

Beyond PsyCap, this study delves into the relationship between social capital (SC) and GHRM, offering novel evidence that SC significantly influences GHRM practices (H3a). This is a noteworthy contribution, as there is a scarcity of empirical research directly linking SC to GHRM. Prior studies have shown that SC fosters collaboration, trust, and shared norms—factors that enhance team efficiency and organizational commitment (Blanco-Gonzalez *et al.*, 2020;

Meng, Borg & Clausen, 2019). These elements are fundamental to effective HRM, especially in sustainability-focused contexts.

Interestingly, the study also confirms the reciprocal relationship previously noted by Rajabpour (2020), who found that GHRM, in turn, can strengthen SC. This mutual reinforcement between GHRM and SC highlights the complex interdependence of social structures and HRM systems in shaping sustainable organizational cultures.

Importantly, SC was also found to directly impact GC and GWE (H3b and H3c), suggesting that its influence on PEB is not solely channeled through GHRM. Thus, the mediating role of GHRM in the SC–PEB relationship (H6c and H6d) is also partial. These findings carry a critical implication: while GHRM can structure and support sustainability behaviors, social capital operates as an independent and powerful influence on how employees engage with green practices.

However, this dual role of SC invites further scrutiny. While SC is often praised for fostering cooperation and mutual support, it can also lead to groupthink—a phenomenon where tight-knit networks suppress dissenting views or innovation. In the context of sustainability, an overly cohesive team may default to familiar routines rather than pushing for disruptive green innovations. Therefore, it is not just the presence of SC that matters, but the type and quality of that social capital.

This distinction leads to an important reflection: not all forms of SC are equally beneficial for sustainability outcomes. Bonding SC, characterized by strong internal ties within close groups, may enhance cohesion but limit exposure to diverse perspectives. Bridging SC, on the other hand, connects individuals across different groups and may be more conducive to spreading novel environmental ideas and practices. Future research should unpack these nuances to understand how different forms of SC interact with GHRM and psychological resources like PsyCap in promoting green outcomes.

Adding to the theoretical richness, the study also explored SC's role as a moderator—a relatively underexplored angle in sustainability research. While past studies have identified SC as a mediator (Rajabpour, 2020) or enhance of HRM effectiveness (Husain, 2017; Diriye *et al.*, 2021), few have examined it in a moderated mediation model involving PsyCap, GHRM, and specific PEBs like GC and GWE.

The findings provide robust support for Hypotheses 7a (H7a) and 7b (H7b), indicating that SC significantly moderates the indirect relationship between PsyCap, GHRM, and both GC and GWE—but only when SC is at a low level. This is a counterintuitive but insightful result. It

suggests that in contexts where SC is weaker, GHRM may compensate by providing the necessary structure and support to facilitate pro-environmental behavior. In contrast, when SC is high, its influence might overshadow or dilute the specific mechanisms of GHRM, rendering its added value less significant.

This low-level moderation effect opens up a new line of questioning: Why might strong SC not amplify the effects of GHRM? One plausible explanation is that in organizations with robust social networks, informal norms and peer influence may already be strong enough to drive green behavior—independent of HR policy. Alternatively, it could reflect a saturation effect, where formal and informal mechanisms compete or overlap, reducing the marginal impact of either.

Regardless, these results suggest that SC should not be viewed as a universally beneficial force. Its role is context-dependent, interacting in complex ways with organizational practices and psychological traits. Future studies should therefore move beyond a binary understanding of SC and examine its interaction with other organizational elements—such as leadership style, incentive structures, or the presence of green champions.

In sum, this study makes a significant contribution by illuminating the dual role of SC—as both a mediator and moderator—in shaping employee sustainability engagement. It challenges simplistic assumptions about the inherent value of SC and underscores the need for a nuanced, context-sensitive approach. By identifying when and how SC influences the PsyCap–GHRM–PEB relationship, this research offers valuable guidance for organizations aiming to cultivate sustainable behavior through integrated social and HR strategies.

When examining moderating factors in greater depth, it becomes essential to explore additional elements that contribute to the development of pro-environmental behavior (PEB) at the individual level. Prior research by Radons *et al*. (2016) has underscored the significant role of gender in moderating the effects of social impact variables on PEB. In line with this perspective, Hypothesis 8a (H8a) in this study posited that gender would significantly moderate the complex relationship between psychological capital (PsyCap), social capital (SC), green human resource management (GHRM), and the outcomes of green creativity (GC) and green work engagement (GWE). The bootstrapping analysis provides strong support for this hypothesis, affirming gender's moderating role.

However, what makes this finding particularly intriguing is that the moderation effect was found to be stronger among men, ultimately leading to the rejection of Hypothesis 8b (H8b), which assumed that women would be more influential in this relationship. This stands in contrast to a substantial body of prior literature, which has consistently shown that women tend to engage more in environmentally responsible behaviors than men (Li, *et al*., 2022, Xia & Li, 2023).

Women are often found to express stronger environmental values, purchase green products more frequently, and exhibit lower carbon-intensive behaviors.

This contradiction raises important questions about the underlying mechanisms of gender's influence on PEB—specifically in organizational contexts. One plausible explanation is that much of the earlier research relied on self-reported attitudes and intentions rather than actual workplace behaviors. In contrast, this study may be capturing more performance-based or role-driven manifestations of PEB, where men's engagement is more visible through leadership in sustainability initiatives, policy development, or organizational decision-making—rather than daily green habits like recycling or energy-saving, which are often associated with women.

Furthermore, the idea that gender roles are socially constructed and culturally variable (Davidson & Freudenburg, 1996) reinforces the need to interpret these results within their sociocultural and professional context. In highly structured workplace environments, traditional gender expectations may be reshaped by organizational dynamics, job roles, and leadership hierarchies. For instance, if men are more frequently positioned in roles with influence over environmental policies or corporate social responsibility, their impact on PEB outcomes may appear more pronounced—even if women remain more committed to personal environmental values. This raises a deeper and more critical question: Is it truly gender that moderates this relationship, or is it the gendered experiences and positions individuals hold within organizational structures that shape these behavioral outcomes? If it's the latter, future research should move beyond binary gender categorizations and instead focus on analyzing job roles, power dynamics, access to green resources, and institutional support for environmental action.

Moreover, this finding opens an opportunity to reframe the conversation around gender and sustainability. Instead of assuming uniform gender-based tendencies, we should be asking how gender intersects with organizational systems to create differing pathways to green engagement. By doing so, we can gain a more nuanced understanding of how to design inclusive and effective sustainability strategies that leverage the strengths and motivations of all employees—regardless of gender identity.

The study also examined the role of educational attainment as a demographic moderator in the relationship between psychological, social, and organizational factors and pro-environmental behavior (PEB). The results offer strong support for Hypothesis 9a (H9a), demonstrating that educational attainment significantly moderates the complex interplay between PsyCap, SC, GHRM, and both green creativity (GC) and green work engagement (GWE). Consistent with prior research (Susanty *et al.*, 2021; Wang *et al*,. 2022), the findings reveal that individuals with

higher educational levels tend to exhibit more pronounced pro-environmental engagement in workplace contexts.

A particularly compelling insight from the data is the differentiated impact across educational tiers. Individuals with Ph.D. qualifications were found to exert the most significant influence in moderating the relationship between PsyCap, SC, GHRM, and both GC and GWE. Consequently, the study confirms Hypothesis 9b (H9b), suggesting that the effect of educational attainment is not homogeneous but varies meaningfully by degree level. This finding adds a nuanced layer to our understanding: education doesn't just enhance environmental awareness—it also appears to shape how individuals apply their knowledge, influence peers, and engage in organizational sustainability efforts.

While these results align with theoretical expectations, I believe we should approach them with some caution. There is a tendency to equate higher education with inherently stronger environmental behavior, but that assumption risks overlooking potential self-selection bias. Individuals already inclined toward sustainability may be more likely to pursue higher degrees in fields that emphasize ecological responsibility.

Moreover, as Meyer (2015) noted, personal attributes such as a sense of responsibility, work ethic, or social conscience could influence both educational attainment and the likelihood of engaging in PEB. In this sense, education may act less as a root cause and more as an amplifier of pre-existing values and motivations. This distinction is important because it invites future research to probe deeper. Specifically, does the type of education matter more than the level? For instance, would a Ph.D. in environmental science result in more PEB than a Ph.D. in engineering or business? If so, it suggests that the content and context of educational experiences—rather than the diploma itself—may be the real catalyst for behavioral change.

Another important consideration is accessibility. If higher education is indeed a significant moderator, how can organizations ensure that employees without advanced degrees are not left behind in sustainability efforts? Overreliance on formal education as a predictor of environmental engagement may unintentionally marginalize a large portion of the workforce. Therefore, it becomes essential for companies to create inclusive sustainability programs that are accessible, practical, and aligned with employees' lived experiences—regardless of their educational background.

Crucially, this study is among the first to empirically explore the moderating roles of both gender and educational attainment in the context of a moderated mediation model involving PsyCap, SC, GHRM, GC, and GWE. By doing so, it addresses a notable gap in the literature and expands

the understanding of how demographic attributes shape the pathways to PEB within organizations.

That said, while these findings are insightful, I see this study as a starting point rather than a definitive conclusion. Demographics alone can only offer a partial explanation. To fully understand the mechanisms driving sustainable behavior at work, future research must investigate deeper psychological and structural variables—such as organizational culture, leadership support, intrinsic motivation, and perceived behavioral control. Without this broader lens, we risk oversimplifying the complex ecosystem that shapes how employees adopt and sustain green behaviors in the workplace.

V. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Indonesia continues to face mounting environmental challenges—ranging from air and water pollution to soil degradation, flooding, and erosion—largely driven by forest fires, industrial expansion, rising motorization, and rapid urbanization. These environmental threats not only jeopardize ecological sustainability but also pose serious risks to public health, productivity, and long-term economic resilience. Given that small and medium-sized enterprises (SMEs) are the backbone of Indonesia's economy, contributing significantly to GDP and employment, fostering pro-environmental behavior (PEB) within this sector is both urgent and essential.

This study provides critical insights into the psychological, social, and organizational drivers of PEB—specifically Green Creativity (GC) and Green Work Engagement (GWE)—among employees in the Indonesian SME sector. One of the most significant findings is the central role of Psychological Capital (PsyCap)—comprising hope, self-efficacy, resilience, and optimism—in promoting both GC and GWE. These findings confirm Hypotheses 1a and 1b. Moreover, PsyCap also positively influences Green Human Resource Management (GHRM) practices, confirming Hypothesis 1c.

GHRM, in turn, plays a crucial role in shaping employees' green behavior. It directly impacts GC and GWE (H2a and H2b) and also partially mediates the relationship between PsyCap and these outcomes (H6a and H6b). These results strongly support the recommendation that organizations should not only recognize PsyCap as a valuable internal resource but also actively invest in developing it through targeted interventions—like leadership coaching, resilience training, and optimism-boosting programs. When integrated with structured HRM practices, PsyCap can significantly amplify the impact of green initiatives.

Beyond individual psychological resources, this study highlights the importance of Social Capital (SC) in organizational contexts. SC directly influences GHRM (H3a), as well as GC and GWE (H3b and H3c), and also plays a partial mediating role in these relationships through GHRM (H6c and H6d). These findings reinforce the notion that fostering trust, collaboration, and shared values within teams is vital for building a culture of environmental responsibility.

Importantly, the study also found that SC moderates the mediation relationship between PsyCap, GHRM, and both GC and GWE, but only at low levels of SC—validating Hypotheses 7a (H7a) and 7b (H7b). This suggests that while SC enhances collaboration and knowledge-sharing, its influence on PEB becomes most critical when social bonds are not yet fully established. In such

contexts, SC acts as a leverage point to strengthen the psychological and HRM mechanisms that drive green behavior.

In terms of demographic factors, this study produced some surprising results. Gender, often considered a key determinant of environmental attitudes and behaviors, showed no direct effect on PsyCap, SC, GC, or GWE (rejecting H4a to H4d). However, gender did significantly moderate the relationship between PsyCap, SC, GHRM, and both GC and GWE (supporting H8a). Interestingly, men appeared to exert a stronger moderating influence than women, leading to the rejection of H8b. This finding challenges previous research that typically portrays women as more environmentally inclined, and suggests the need for a more nuanced, context-specific analysis of gender roles in sustainability efforts.

Regarding educational attainment, the study found no direct relationship with PsyCap, SC, GC, or GWE (rejecting H5a to H5d). This indicates that formal education alone does not necessarily predict environmental engagement in the workplace. However, education did serve as a significant moderator in the PsyCap–SC–GHRM–PEB relationship (supporting H9a), with individuals holding Ph.D. qualifications demonstrating the strongest influence (confirming H9b). This suggests that while education may not directly determine green behavior, it shapes how individuals apply psychological and social resources within organizational contexts to support environmental goals.

The detailed interrelationships between the research questions, proposed hypotheses, and bootstrapping test results are comprehensively summarized in Tables 22, 23, 24 and 25, offering a clear overview of the statistical support underpinning this study’s key findings.

Table 22. The Interrelation of Research Questions, Hypotheses, and Bootstrapping Results in Direct Relationships

Research Questions	Hypotheses	Direct Relationship	Probability	Result
How does PsyCap influence employees' GC and GWE, as well as GHRM?	H1a	PsyCap -> GC	0,015	**Accepted**
	H1b	PsyCap -> GWE	***	**Accepted**
	H1c	PsyCap -> GHRM	***	**Accepted**
What is the impact of GHRM on employees' GC and GWE?	H2a	GHRM -> GC	***	**Accepted**
	H2b	GHRM -> GWE	***	**Accepted**
What is the impact of SC on GHRM, GC, and GWE?	H3a	SC -> GHRM	***	**Accepted**
	H3b	SC -> GC	***	**Accepted**
	H3c	SC -> GWE	***	**Accepted**
To examine the effect of gender (male and female) on the development of PsyCap, SC, GC, and GWE	H4a	GENDER -> PsyCap	0,871	**Rejected**
	H4b	GENDER -> SC	0,963	**Rejected**
	H4c	GENDER -> GC	0,482	**Rejected**
	H4d	GENDER -> GWE	0,546	**Rejected**
To examine the impact of educational attainment (bachelor's, master's, and Ph.D.) on the development of PsyCap, SC, GC, and GWE	H5a	EDU -> PsyCap	0,995	**Rejected**
	H5b	EDU -> SC	0,445	**Rejected**
	H5c	EDU -> GC	0,877	**Rejected**
	H5d	EDU -> GWE	0,559	**Rejected**

Table 23. The Interrelation of Research Questions, Hypotheses, and Bootstrapping Results in Indirect relationship

Research Questions	Hypotheses	Indirect Relationship	Probability	Result	Conclusion
How does GHRM mediate the relationship between PsyCap and employees' GC and GWE, as well as the relationship between SC and employees' GC and GWE?	**H6a**	**PsyCap -> GHRM -> GC**	0,000	Significant	Partial Mediation
	H6b	**PsyCap -> GHRM -> GWE**	0,000	Significant	Partial Mediation
	H6c	**SC -> GHRM -> GC**	0,000	Significant	Partial Mediation
	H6d	**SC -> GHRM -> GWE**	0,000	Significant	Partial Mediation

Table 24. The Interrelation of Research Questions, Hypotheses, and Bootstrapping Results on SC as a Moderator in Indirect (Mediated) Relationships

Research Questions	Hypotheses	Moderated Indirect (Mediation) Relationship	P-Value	Result	Conclusion
How does SC moderate the relationship between PsyCap and employees' GC and GWE, mediated by GHRM?	**H7a**	PsyCap -> GHRM -> GC	0,000	**Significant**	**Accepted**
		Probing Moderates Indirect Relationship			
		Low Level of SC High Level of SC	0,000 0,484	**Significant** **Not Significant**	
		Index of Moderated Mediation	0,011	**Moderated-mediation Significant**	
	H7b	PsyCap -> GHRM -> GWE	0,000	**Significant**	**Accepted**
		Probing Moderates Indirect Relationship			
		Low Level of SC High Level of SC	0,000 0,493	**Significant** **Not Significant**	
		Index of Moderated Mediation	0,011	**Moderated-mediation Significant**	

Table 25. The Interrelation of Research Questions, Hypotheses, and Bootstrapping Results on Demographic Factors as a Moderator in Moderated Indirect (Mediation) Effects

Research Questions	Hypotheses	Moderated Indirect (Mediation) Relationship		P-Value	Result	Conclusion
How does gender, including both male and female, moderate the moderated mediation relationship between PsyCap, SC, GHRM, and both GC and GWE? Additionally, how do different gender categories influence this relationship?	**H8a**	**MODEL COMPARISON FOR CONSTRAIN 1**		**0,010**	**Significant and Different***	**Accepted**
	H8b	**MALE**	Inter_PSYCAP_SC -> Comp_GHRM	0,010	**Significant (Stronger influence)**	**Rejected**
		FEMALE	Inter_PSYCAP_SC -> Comp_GHRM	0,012	**Significant**	
How does educational attainment, including bachelor's, master's, and Ph.D., moderate the moderated mediation relationship between PsyCap, SC, GHRM, and both GC and GWE? Additionally, how do different educational attainment categories influence this relationship?	**H9a**	**MODEL COMPARISON FOR CONSTRAIN 1**		0,000	**Significant and Different***	**Accepted**
	H9b	**Undergraduate**	Inter_PSYCAP_SC -> Comp_GHRM	0,036	**Significant**	
		Postgraduate	Inter_PSYCAP_SC -> Comp_GHRM	0,017	**Significant**	
		PhD	Inter_PSYCAP_SC -> Comp_GHRM	0,028	**Significant (Strongest influence)**	**Accepted**

5.2 Recommendations and Implications

The acknowledged roles of Psychological Capital (PsyCap), Social Capital (SC), and Green Human Resource Management (GHRM)—whether functioning as direct influencers, mediators, or moderators—demonstrate significant contributions to the development of Pro-Environmental Behavior (PEB), particularly in the domains of Green Creativity (GC) and Green Work Engagement (GWE). Unpacking these complex relationships not only adds depth to the academic conversation but also offers practical guidance for organizations aiming to embed sustainability into their workplace culture. By understanding how these psychological, social, and organizational factors interact, we gain a more holistic perspective on the forces shaping environmentally responsible behavior. This comprehensive inquiry serves as a valuable framework for both researchers and practitioners in designing effective strategies that drive sustainable practices across varied organizational and societal contexts.

5.2.1 Academic Implication

The nuanced examination of Psychological Capital (PsyCap), Social Capital (SC), and Green Human Resource Management (GHRM) in the context of both Green Creativity (GC) and Green Work Engagement (GWE) significantly enhances our understanding of how individual traits, social dynamics, and organizational practices collectively shape Pro-Environmental Behavior (PEB). By integrating psychological and social dimensions into the study of PEB, this research offers a multifaceted perspective that expands and enriches existing theoretical frameworks. It underscores the dynamic interplay between human psychology, social networks, and strategic HRM, providing a more holistic view of what drives environmentally responsible behavior in the workplace.

Academically, this study contributes to the growing body of work on green organizational behavior by advancing the conceptual integration between positive organizational psychology (PsyCap), social capital theory, and green HRM frameworks. It offers empirical evidence for the mediating and moderating mechanisms through which these constructs operate, thereby bridging theoretical silos that are often studied independently. The confirmation of GHRM as a partial mediator between PsyCap/SC and PEB provides a theoretical basis for the development of multi-level models that connect micro-level psychological resources with macro-level sustainability outcomes.

Moreover, the investigation of SC as both a mediator and a moderator is especially noteworthy, as prior research has seldom explored its dual role in the context of environmental sustainability. This opens up important academic pathways for future research to explore how bonding vs.

bridging SC, or formal vs. informal networks, may differently influence or interact with green behaviors.

The study also pushes the boundaries of existing theory by critically examining the role of demographic moderators—namely, gender and educational attainment—within the moderated mediation framework. The rejection of several direct effects yet confirmation of significant moderating roles points to the evolving and context-dependent nature of demographic influences. These findings prompt scholars to re-evaluate the assumption of static, linear relationships in sustainability research and instead advocate for more dynamic, interactional models that consider both personal and contextual variability.

From a methodological standpoint, the use of Structural Equation Modeling (SEM) with a large sample and multi-layered moderation-mediation analysis offers a robust statistical contribution to the field. It serves as a methodological blueprint for researchers aiming to study complex behavioral phenomena with multiple latent constructs, especially in underexplored contexts like SMEs in developing economies.

Finally, this study provides a strong foundation for cross-cultural validation and comparative studies. Given the uniqueness of Indonesia's SME landscape and cultural dynamics, future scholars can build on these findings to test the generalizability of PsyCap, SC, and GHRM models in other developing or emerging economies. Doing so would significantly enrich global perspectives on green organizational behavior and sustainable development.

5.2.2 Practical Implications

This study highlights the practical potential for organizations—particularly in developing economies like Indonesia—to foster sustainability by integrating Psychological Capital (PsyCap), Social Capital (SC), and Green Human Resource Management (GHRM) practices. One of the most actionable takeaways is the development of training programs that simultaneously enhance employees' psychological resources and organizational commitment to sustainable practices. Rather than treating these domains separately, an integrated approach—where psychological well-being, supportive HR systems, and collaborative networks are cultivated together—can promote consistent pro-environmental behaviors (PEB), particularly Green Creativity (GC) and Green Work Engagement (GWE).

Human resource professionals should consider tailoring strategies that explicitly support the development of PsyCap's core attributes: hope, self-efficacy, resilience, and optimism. Doing so not only enhances individual capacities but can also improve trust, team dynamics, and alignment with sustainability goals. Importantly, this calls for a strategic balance—organizations

must evaluate the cost-benefit ratio of such interventions to ensure they are sustainable in both intent and execution. Implementing resilience-building workshops or leadership programs without proper alignment to performance metrics or workplace culture could risk short-term enthusiasm without long-term behavioral change.

In parallel, SC can be nurtured through deliberate efforts such as cross-functional projects, open communication channels, and team-building initiatives. These practices strengthen the positive influence of both PsyCap and GHRM on PEB outcomes. Embedding PEB into the organization's core HRM systems—particularly recruitment, training, appraisal, and rewards—ensures these behaviors are not optional extras but embedded within performance and culture.

This study also underlines the importance of inclusive training that addresses differences in gender and educational attainment, especially in culturally diverse settings like Indonesia. For example, organizations should consider environmental literacy workshops that accommodate varying educational backgrounds, ensuring that everyone—from entry-level workers to senior managers—has the knowledge and tools to contribute meaningfully to sustainability initiatives. Leadership development programs should also include modules on gender equity in sustainability, helping leaders understand how to foster inclusive participation and break down barriers that might prevent women or underrepresented groups from fully engaging in green initiatives.

Mentorship programs can also be a practical tool. Pairing employees with lower educational attainment with those who have higher qualifications or more experience in sustainability practices can facilitate knowledge transfer and support behavior modeling. These initiatives create shared ownership of green goals and help democratize sustainability efforts across all organizational levels.

Another important action point is integrating PEB into performance appraisal systems. By aligning recognition and rewards with green behaviors—such as innovation in waste reduction, participation in green programs, or contributions to sustainable processes—organizations reinforce their sustainability values and drive employee engagement. This creates a tangible link between individual effort and organizational success, strengthening intrinsic and extrinsic motivation.

Beyond the private sector, the findings have policy implications as well. The Indonesian government can play a stronger role in advancing sustainability by supporting SME engagement in green practices through targeted incentives, regulations, and public education. For example, policy initiatives could promote recycling, energy conservation, and public transportation use by offering tax relief or recognition programs for environmentally responsible businesses.

At the national level, the Ministry of Education should consider embedding environmental education across all academic levels. By cultivating environmental consciousness from an early age, Indonesia can build a generation that naturally embraces sustainable practices—reducing the need for retroactive workplace training in the future. This long-term strategy can be especially impactful in regions where environmental awareness is low or fragmented across socioeconomic groups.

Lastly, the study's findings offer sector-specific implications. In the automotive industry, for example, PsyCap training can support employees in adapting to green manufacturing methods. In food and beverage, it can enhance engagement in sustainable sourcing and waste reduction. In telecommunications, it may drive innovation in eco-friendly product design. Transportation and logistics firms can use PsyCap and GHRM strategies to promote fuel efficiency and reduce emissions. In the energy sector, it can accelerate the shift to renewables by engaging frontline employees in sustainability missions. And in real estate and construction, PsyCap can foster collaborative, cross-disciplinary teamwork to implement green urban planning and building design.

These industry-specific examples illustrate that the combined application of PsyCap, SC, and GHRM practices is not only flexible but scalable—applicable in a wide range of organizational settings. Ultimately, organizations that invest in these areas are not just contributing to global sustainability—they're also creating more adaptive, motivated, and future-ready workforces.

5.3 Limitation and Future Research Directions

Like any research endeavor, this study is not without limitations. First, the exclusive use of a quantitative approach—while suitable for testing hypotheses and ensuring objectivity—limits the depth of contextual understanding. Although this method allowed for efficient data collection across a large sample and systematic analysis of relationships between PsyCap, SC, GHRM, GC, and GWE, it does not capture the nuanced, lived experiences that qualitative methods such as interviews or focus groups could reveal. Future studies could adopt mixed-methods approaches to gain richer, more holistic insights into the psychological, social, and organizational drivers of pro-environmental behaviors (PEB).

Second, the reliance on self-report measures introduces the possibility of social desirability bias, especially when measuring constructs tied to positive workplace behaviors and sustainability values. Respondents may have overestimated their levels of PsyCap, SC, or engagement in green behaviors to align with perceived social norms. Additionally, common method bias is a concern, given that both independent and dependent variables were collected from the same source. This

may have inflated the observed relationships between variables. Future research should incorporate multi-source data (e.g., peer evaluations, supervisor ratings, or objective behavioral indicators) to enhance the validity of the findings.

Another limitation lies in the study's geographical scope, which was limited to SMEs in West Java (Jakarta). While Jakarta is economically significant, it may not reflect the diversity of other Indonesian provinces in terms of cultural norms, environmental awareness, socio-economic conditions, and regulatory enforcement. Future research should aim for broader geographical representation across Indonesia to improve generalizability and capture regional differences in sustainability engagement.

Similarly, while this study targeted a range of industries, the lack of sector-specific focus presents limitations. Organizational culture, operational priorities, and environmental regulations often vary by industry. Future studies should consider industry-specific analyses to gain more targeted insights into how PsyCap, SC, and GHRM influence PEB in distinct contexts, such as manufacturing, energy, agriculture, or services.

This study also focused predominantly on individual-level psychological factors, particularly PsyCap. However, broader organizational psychology constructs, such as positive organizational behavior, organizational justice, or ethical climate, may also significantly influence PEB. Future studies should expand their scope to integrate organizational-level psychological drivers to develop a more comprehensive model.

Another important consideration is the static treatment of psychological states. PsyCap is dynamic by nature, yet this study did not account for its temporal fluctuations. Longitudinal research could provide insight into how PsyCap evolves over time and whether sustained increases in PsyCap consistently enhance GC and GWE. Additionally, such designs would allow for stronger causal inferences.

While this study confirms that GHRM and PsyCap are significantly associated with GC and GWE, it does not pinpoint which specific GHRM strategies or PsyCap dimensions (e.g., hope, self-efficacy, optimism, or resilience) are most impactful. Future research should disaggregate these constructs to identify the most influential components for cultivating green behavior, which would offer actionable insights for practitioners.

Furthermore, the study revealed mixed results regarding the relationship between SC and PEB, echoing inconsistencies found in prior literature. This suggests the need to explore contextual moderators—such as organizational size, leadership styles, or national culture—that might influence how SC affects sustainable behaviors. Additionally, future studies should differentiate

between bonding, bridging, and linking SC to determine which form most effectively supports PEB. Investigating specific mechanisms within SC—such as team trust, shared norms, communication quality, and collaboration—could further clarify which social processes drive environmental action.

A notable limitation is the study's narrow focus on only two PEB outcomes: green creativity and green work engagement. While these are relevant and meaningful constructs, they do not represent the full spectrum of sustainable behavior. Expanding future studies to include other forms of PEB—such as green advocacy, recycling practices, energy conservation, or environmental citizenship—would yield a broader and more nuanced understanding of sustainability in the workplace.

The role of personal values was also not considered. Future research should explore how values like biospheric (concern for nature), altruistic, egoistic, and hedonic motivations shape employees' PEB. Understanding these value systems could offer insight into the internal drivers that influence sustainability-related choices and help organizations tailor their green HR strategies accordingly.

From a demographic perspective, this study only examined gender and educational attainment. However, other critical demographic variables—such as age, income level, religious beliefs, and cultural background—were not considered. These factors may meaningfully influence how individuals perceive and engage in sustainable behaviors. For instance, religious teachings or cultural norms may shape environmental responsibility in ways that formal education cannot capture.

Regarding gender, this study urges caution against simplistic generalizations. While many studies associate higher PEB with women, factors such as risk perception, altruism, access to resources, and cultural roles likely interact to shape these behaviors. Future studies should adopt a more intersectional approach to understand how gender interacts with other personal and contextual variables to influence PEB.

Similarly, while educational attainment did not directly predict GC and GWE, the possibility of self-reporting bias—especially among highly educated individuals—cannot be overlooked. It is plausible that those with higher education are more inclined to overstate their pro-environmental actions to maintain a positive self-image. Future research should consider additional variables such as personal responsibility, ethical orientation, or exposure to environmental education to assess how education truly influences PEB.

Finally, macro-level factors such as a nation’s economic development stage, legal infrastructure, environmental policies, and public awareness should be factored into future research. For instance, studies could explore how national environmental education curricula, public campaigns, or corporate regulations shape individual behavior and organizational culture. Longitudinal studies would also be valuable in tracking how demographic and organizational factors evolve over time and how they interact with constructs like PsyCap, SC, and GHRM in promoting PEB.

VI. NEW SCIENTIFIC RESULTS

Grounded in the research findings, empirical data, and subsequent discussions, this study offers several novel scientific contributions to the existing body of knowledge on pro-environmental behavior (PEB) in organizational contexts. By adopting a comprehensive analytical framework and integrating multiple constructs—namely Psychological Capital (PsyCap), Social Capital (SC), and Green Human Resource Management (GHRM)—the study expands theoretical boundaries and opens new avenues for future research. The findings not only deepen our understanding of individual and organizational influences on PEB but also offer an evidence-based foundation for scholars and practitioners aiming to foster sustainability in the workplace.

1. Based on my research, I confirmed that Psychological Capital (PsyCap)—which includes hope, self-efficacy, resilience, and optimism—plays a significant role in promoting Green Creativity (GC) and Green Work Engagement (GWE) among employees. Importantly, PsyCap influences these behaviors through both direct and indirect pathways, with Green Human Resource Management (GHRM) acting as a partial mediator. These findings not only provide strong empirical support for the hypothesized relationships but also contribute to theoretical advancement by establishing PsyCap as a foundational psychological resource that drives sustainability-oriented behaviors in the workplace.

   Equally important, this study highlights the multifaceted role of Social Capital (SC). SC not only exerts direct effects on GHRM, GC, and GWE, but also acts as a moderator in the relationship between PsyCap, GHRM, and PEBs. This moderating effect introduces a more complex understanding of how social dynamics within organizations can either strengthen or weaken the influence of psychological and managerial resources on environmental behavior. To the best of the researcher's knowledge, this study is one of the first to explore these relationships in a single integrated model, offering a new conceptual pathway for understanding how PsyCap, SC, and GHRM interact to influence environmentally responsible behaviors in SMEs.

2. Furthermore, my study reveals that gender serves as a significant moderating factor in the complex relationships among PsyCap, Social Capital (SC), Green Human Resource Management (GHRM), and both Green Creativity (GC) and Green Work Engagement (GWE). Although no direct relationships were found between gender and the primary constructs, its moderating effect within the moderated mediation model was statistically significant. This challenges the common assumption that gender differences in pro-environmental behavior (PEB) are solely direct and underscores the importance of

interaction effects. It introduces a new layer of nuance to the ongoing discourse on gender and sustainability, suggesting that gender influences how psychological and social resources translate into environmental engagement—particularly in organizational contexts. As such, this finding represents a critically underexplored advancement in the sustainability and organizational behavior literature.

3. Additionally, my research identifies educational attainment as a significant moderating factor, despite its lack of direct influence on PsyCap, SC, GC, or GWE. While previous studies have largely focused on direct correlations between education level and pro-environmental behavior (PEB), this study reveals that higher education levels—particularly among Ph.D. holders—intensify the strength of the relationships among psychological, social, and HRM constructs and PEB. This finding shifts the lens from viewing education as a simple linear predictor to recognizing it as a contextual moderator. It highlights how educational background shapes employees' responsiveness to psychological and organizational initiatives aimed at promoting sustainability. By doing so, the study contributes a more refined understanding of how individual differences interact with workplace strategies to influence environmental outcomes—an angle that remains underexplored in current literature.

VII. SUMMARY

In summary, in this volatile, uncertain, complex, ambiguous, and highly competitive industrial landscape, companies—particularly Indonesia's Small and Medium-sized Enterprises (SMEs)—are compelled to continuously adapt, innovate, and learn in order to optimize performance and ensure sustainability. However, alongside these industrial developments, Indonesia continues to face a range of environmental challenges such as drought, climate change, natural resource degradation, and water and air pollution. These environmental issues have led to reduced productivity, increased healthcare costs, and a decline in the quality of life for citizens. Over time, this could significantly undermine the nation's economic stability. Jakarta, as the capital city, is widely recognized as a major contributor to these environmental problems.

Therefore, promoting pro-environmental behaviors (PEB) among individuals, particularly within SMEs—the backbone of Indonesia's economy—is vital. In this context, human capital becomes a key factor. Based on the theoretical and empirical framework of PEB, Psychological Capital (PsyCap), Social Capital (SC), and Green Human Resource Management (GHRM) are seen as central to fostering such behaviors, particularly Green Creativity (GC) and Green Work Engagement (GWE). This study thus aimed to analyze the direct, moderating, and mediating roles of PsyCap, SC, and GHRM in influencing GC and GWE. Additionally, it examined the role of demographic factors—specifically gender and educational attainment—in shaping the complex relationships between these constructs, as both have been acknowledged in previous literature as relevant to PEB.

The study was conducted in Jakarta, West Java, involving 384 respondents determined using the Krejcie and Morgan Table (KMT) sampling method. A non-probability sampling technique was used to ensure voluntary participation among SME employees. The sampling approach was intentionally non-restrictive, selecting participants from various departments, industries, and job roles within SMEs, with the goal of capturing generalizable insights across sectors.

Data were collected through a closed-ended questionnaire to allow quicker responses, easier coding and analysis, and minimal reliance on respondents' communication skills. The questionnaire included seven constructs: PsyCap, SC, GHRM, GC, and GWE (measured using a Likert scale), gender (male/female), and educational attainment (undergraduate, postgraduate, and Ph.D.). The survey was distributed exclusively via Google Forms and was completed over a four-month period. A pilot study involving 100 respondents was conducted prior to full-scale distribution.

Following eligibility screening, the data were analyzed using Structural Equation Modeling (SEM) with AMOS version 24. Several statistical techniques were applied to assess the model's goodness-of-fit, including Confirmatory Factor Analysis (CFA), Exploratory Factor Analysis (EFA), Cronbach's Alpha, Comparative Fit Index (CFI), Average Variance Extracted (AVE), Composite Reliability (CR), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Once acceptable fit indices were achieved, hypothesis testing was conducted.

The bootstrap results revealed that both PsyCap and SC have significant direct effects on GHRM, GC, and GWE, while GHRM significantly influences both GC and GWE. Additionally, GHRM was found to partially mediate the relationship between PsyCap and SC with GC and GWE. In terms of moderated mediation, SC significantly moderated the mediation relationship between PsyCap, GHRM, and both GC (at high levels of SC) and GWE (at low levels of SC).

Regarding demographic variables, gender and educational attainment were not directly correlated with PsyCap, SC, GC, or GWE. However, both factors played significant moderating roles. Gender moderated the relationships among PsyCap, SC, GHRM, and both GC and GWE, with male respondents showing a stronger moderating influence. Similarly, educational attainment moderated these relationships, with Ph.D. holders demonstrating the greatest impact.

The established roles of PsyCap, SC, and GHRM—whether direct, mediating, or moderating—significantly contribute to the development of GC and GWE. Accordingly, several implications have been drawn. From an academic standpoint, this study contributes to the literature by integrating psychological and social factors into the domain of PEB, enhancing existing theoretical models. The inclusion of gender and educational attainment provides further insight into the demographic influences shaping sustainable workplace behaviors.

Practically, Indonesian SMEs are encouraged to align their strategies with the pivotal roles of PsyCap, SC, and GHRM in nurturing green creativity and boosting green work engagement. For the Indonesian government—particularly policymakers—this study suggests the need to create more inclusive and effective regulations and incentives to encourage sustainability practices across all levels of society, regardless of gender or education. Meanwhile, the Ministry of Education is urged to embed environmental education at all academic levels to promote PEB from an early age and sustain it into the workforce.

Several limitations were identified. First, the use of a purely quantitative method limited the depth of insight into the contextual and behavioral nuances behind PEB. Incorporating a mixed-method approach in future studies would allow for richer, more triangulated findings. Second, the study was geographically limited to Jakarta, which may not fully represent the broader

Indonesian context, especially given the country's cultural and economic diversity. Third, reliance on self-reported data introduces the possibility of social desirability bias, particularly in responses related to sustainability. Fourth, the study did not focus on specific industries, which limits sector-specific generalization. The relatively short data collection period (four months) may also have restricted participant reach.

Additionally, not all relevant demographic variables—such as age, income, and religious background—were examined. Nor were distinctions made between different types of SC (bonding, bridging, linking) or additional PEB dimensions beyond GC and GWE. These factors should be explored in future research to offer a more holistic picture of PEB determinants. Moreover, while PsyCap was examined as a unitary construct, the specific effects of its sub-dimensions (hope, efficacy, resilience, optimism) on GC and GWE were not independently analyzed—an avenue worth pursuing in future work

This study makes several significant contributions to the literature on pro-environmental behavior (PEB) within organizational contexts, particularly among SMEs in Indonesia. First, it introduces an integrated model combining Psychological Capital (PsyCap), Social Capital (SC), and Green Human Resource Management (GHRM) to explain two key PEB outcomes—Green Creativity (GC) and Green Work Engagement (GWE). PsyCap is shown to influence these behaviors directly and through GHRM as a partial mediator, while SC operates both as a direct driver and a moderator, adding depth to the understanding of how psychological and social resources jointly shape sustainable behaviors.

Second, the study identifies gender as a statistically significant moderator within the PsyCap–SC–GHRM–PEB framework. Although gender shows no direct effect on the primary variables, its moderating role highlights how male and female employees may differently respond to psychological and organizational influences—introducing a nuanced perspective on the role of gender in shaping sustainability outcomes in the workplace.

Third, educational attainment also emerges as a meaningful moderating variable. While not directly related to the key constructs, higher education—particularly at the Ph.D. level—amplifies the interactions between PsyCap, SC, GHRM, and PEBs. This shifts the focus from education as a linear predictor to its role as a contextual enhancer, shaping how individuals engage with organizational sustainability strategies. Collectively, these findings offer an innovative framework for understanding the interplay between individual characteristics, social structures, and HRM practices in fostering environmentally responsible behavior.

APPENDICES

Appendix 1. References

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Appendix 2: Cover Letter for the Questionnaire

Dear Participants,

Warm Greetings!

I am Widhayani Puri Setioningtyas, a third-year PhD student at the Hungarian University of Agriculture and Life Sciences, Hungary. I hope this letter finds you well. I am reaching out to kindly request your participation in a survey aimed at understanding the impact of Psychological Capital on employees' pro-environmental behaviors, encompassing green creativity and green engagement. These behaviors are studied through the mediating role of Green Human Resource Management, with Social Capital acting as a moderating factor.

In essence, green creativity involves the generation of novel and beneficial ideas related to green products, services, and practices. On the other hand, green engagement pertains to the level of energy and effort employees invest in their environmentally conscious work-related tasks.

Participating in this survey will require approximately 15 minutes of your time. I assure you that your responses will be used exclusively for research purposes and will remain completely anonymous. Should you have any questions about the study or wish to receive information on its outcomes, please feel free to contact me at the address provided below.

Thank you sincerely for your valuable support. Wishing you continued health and safety.

Warm regards,

Widhayani Puri Setioningtyas (PhD Candidate)
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Appendix 3: Questionnaire

1. Gender
   - ☐ Male
   - ☐ Female
2. Education
   - ☐ Undergraduate
   - ☐ Postgraduate
   - ☐ Ph.D.

Psychological Capital (Please answer the following question based on your own experience)

Dimension		Measurement items	Strongly Disagree	Disagree	Neutral	Disagree	Strongly Agree
Self-efficacy	SE1	I believe I can solve complicated problems					
	SE2	I believe I can perform my job effectively					
	SE3	I believe I can help establish the company's future development goals					
	SE4	I believe that I can set the future development goals for the company					
	SE5	I believe I can contribute to the company's future development goals.					
	SE6	I believe I can provide timely and effective information					
Hope	H7	I can come up with many solutions when I am faces with difficulties at work					
	H8	I can generate multiple solutions when faced with work-related challenges					
	H9	I believe that there are multiple solutions to every problem					
	H10	I believe I can achieve success in my job					
	H11	I am confident in achieving and surpassing my goals					
	H12	I am achieving the work goals I set for myself					
Resilience	R13	I often experience periods of depression and distraction					
	R14	When facing work challenges, I will exhaust all means to find solutions					
	R15	I believe I can accomplish it independently					
	R16	In my work, I give my all, regardless of my emotions					
	R17	I'm making progress toward my goal					
	R18	I remain composed under pressure					

	R19	I have enough experience and believe I can handle any situation					
	R20	I have high energy levels every day					
Optimism	O21	I maintain a positive attitude					
	O22	Despite working hard, I occasionally make mistakes					
	O23	I always focus on the positive aspects of my work					
	O24	I am optimistic about the future progress of my work					
	O25	All the work contradicts my ideas					
	O26	At work, I always believe that 'there's light behind the darkness					

Social capital (Please answer the following question based on your own experience)

Dimension		**Measurement items**	**Strongly Disagree**	**Disagree**	**Neutral**	**Disagree**	**Strongly Agree**
Structural Social Capital	SSC1	The company encourages the establishment of stable partnership networks					
	SSC2	My working relationships facilitate the acquisition of valuable information					
	SSC3	Employees are provided with access to specialists to support their work					
	SSC4	Employees have facilitated access to information sources					
	SSC5	The company's structure promotes employee interaction and the exchange of information					
	SSC6	The interdependence between my colleagues' work and mine facilitates my work life					
	SSC7	The company's leadership encourages information exchange during challenging times to foster mutual support in the work environment					
	SSC8	The company's rules promote teamwork among employees					
	SSC9	The company employs group processes for problem-solving					

Relational Social Capital	RSC10	The company policies empower employees to make decisions and take initiatives					
	RSC11	My daily work involves personal exchanges with colleagues to support my work activities					
	RSC12	I can tell if a colleague doesn't understand something by their facial expression					
	RSC13	My colleagues can understand my viewpoints during our work meetings					
	RSC14	The company's background provides clarity on what is expected from its employees					
	RSC15	We share a common terminology among employees in my daily work, making our tasks easier					
	RSC16	I share my experiences within the company to help explain professional issues to my colleagues					
Cognitive Social Capital	CSC17	Employees of this company share a vision of assisting others in resolving their professional issues					
	CSC18	Employees of this company share the common goal of learning from one another					
	CSC19	Employees of this company share the common value that assisting others is gratifying					
	CSC20	The company policies promote a friendly environment that encourages partnerships and mutual assistance					
	CSC21	I view my professional relationships as a competitive advantage					
	CSC22	I strongly identify with my work team					
	CSC23	I identify with the company's approach and values					
	CSC24	I find my work environment to be inspiring					

	CSC25	The company's communication policy effectively conveys its organizational values to all employees					

GHRM (Please answer the following question based on your own knowledge)

Dimension		Measurement items	Strongly Disagree	Disagree	Neutral	Disagree	Strongly Agree
Green Rewards	GRW1	Environmental performance is financially rewarded					
	GRW2	Environmental performance receives public recognition					
Green Training	GT3	Training programs are available for employees to enhance their environmental awareness, skills, and expertise					
	GT4	In our company, everyone has an equal opportunity to access environmental management training					
	GT5	The company conducts regular environmental training					
Green Performance Management	GPM6	In our company, there are consequences in the performance management system for non-compliance or failing to meet environmental management goals					
	GPM7	Managers' goals for achieving green outcomes are part of the evaluation process					
	GPM8	The company establishes green targets, goals, and responsibilities for both managers and employees					
	GPM9	The company's individual environmental efforts benefit employees					
	GPM10	Environmental performance evaluations are documented.					

Green Recruitment	GR11	Our company prioritizes hiring employees with environmental awareness					
	GR12	The employee selection process takes into account the environmental motivation of candidates					
	GR13	Environmental considerations are integrated into all stages of employee selection					

Green Creativity (Please answer the following question based on your own experience)

		Measurement items	**Strongly Disagree**	**Disagree**	**Neutral**	**Disagree**	**Strongly Agree**
Green Creativity	GC1	I propose innovative methods to attain environmental objectives					
	GC2	I suggest new eco-friendly ideas to enhance environmental performance					
	GC3	I promote and advocate for new eco-friendly ideas to others					
	GC4	I create well-thought-out plans for implementing new eco-friendly ideas					
	GC5	I would reconsider new eco-friendly ideas					
	GC6	I would discover creative solutions to environmental issues					

Green Work Engagement (Please answer the following question based on your own experience)

		Measurement items	**Strongly Disagree**	**Disagree**	**Neutral**	**Disagree**	**Strongly Agree**
Green Work Engage-ment	GWE1	My tasks related to the environment are inspiring to me					
	GWE2	I take pride in the environmental work I engage in					
	GWE3	I am deeply involved in my environmental work					
	GWE4	I am enthusiastic about my environmental responsibilities in my job					

	GWE5	I experience happiness when I am deeply engaged in environmental tasks					
	GWE6	I feel energized when working on environmental tasks at my job					