International Journal of Sustainable Development and Planning
Vol. 21, No. 9, September, 2026, pp. 4145-4155
Journal homepage: http://iieta.org/journals/ijsdp

Green Attitudes and Climate Change Concern as Drivers of Low-Carbon Behavior: The Moderating Role of Organizational Attachment

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https://doi.org/10.18280/ijsdp.210916

Received: 10 August 2026
Revised: 10 September 2026
Accepted: 18 September 2026
Available online: 30 September 2026

Keywords:
climate change concern, green attitude, low carbon behavior, organizational attachment, Sustainable Development Goals

ABSTRACT

This quantitative study analyzes the influence of green attitude (GA) and climate change concern (CCC) on low carbon behavior (LCB) with organizational attachment (OA) as a moderator. Primary data were collected via online questionnaires from 183 employees across various organizational levels in listed and non-listed companies on the Indonesia Stock Exchange (IDX). Data analysis was conducted using SPSS and Partial Least Squares Structural Equation Modeling (PLS-SEM). The results showed that GA and CCC have a positive influence on LCB. In addition, the study also finds that OA strengthens the relationship between CCC and LCB, but weakens the relationship between GA and LCB. The findings imply that organizations should align environmental policies, work culture, and operational practices with employees' sustainability values to effectively promote LCB. Practical initiatives such as energy-efficiency programs, paper reduction policies, and the adoption of digital technologies can facilitate the development of sustainable workplace habits. This study contributes to the achievement of Sustainable Development Goals (SDGs), particularly SDGs No. 12 (Responsible Consumption and Production) and SDGs No. 13 (Climate Action), by highlighting organizational mechanisms that encourage environmentally responsible behavior and support carbon reduction efforts.

1. INTRODUCTION

The carbon emission crisis has become a global threat which is increasingly serious as the impacts of climate change intensify [1]. In the last several years, global temperatures have hit the highest levels ever recorded [2]. But there are still a lot of human activities which show a tendency not orientated towards low carbon. According to data from PwC [3], sales of petrol vehicles in the United States increased by 10%. This shows that low carbon behavior (LCB) is still low and it affects the increase in carbon emissions. Based on the report published by International Energy Agency (IEA), the electricity consumption was 28,307 Terawatt-hour in 2025, due to the increasing demand in the industry and the use of household appliances [4]. The above situation shows that the consumption behavior is still not geared to LCB in daily life. According to the study [5], global waste production already exceeds 2 billion tonnes per year and is foreseen to reach 3.88 billion tonnes by 2050. Waste contributes to climate change through up to 20% of global methane emissions and about 5% greenhouse gas emissions. This phenomenon shows that the consumption patterns and activities of the society are not yet the LCB, which leads to the increase of emissions and the deterioration of the global environment. Therefore, LCB is an important aspect to be considered in the efforts to mitigate climate change [6].

Based on data from IESR [7] a similar case also occurs in Indonesia, the level of dependence of the public on private vehicles is quite high, especially on the island of Java, the use of motorcycles is 75.98% and the use of cars is 15.53%, while the rest uses public transportation. This phenomenon is a reflection of the still low use of public transport and environmentally friendly modes of transport, thus contributing to the increase of carbon emissions. According to this study [8], only 3% of the vehicles are electric, while the rest are still dominated by petrol vehicles. In addition, Trianto [9] also stated that national electricity consumption continues to increase and the household sector is the largest contributor, which reaches around 133.41 Terawatt-hour in 2025, an increase of around 3.2% compared to the previous year. Thus, the efficiency and low carbon orientation of consumption behavior has been verified not to be yet. Based on data from SIPSN [10], it shows that the composition of waste in Indonesia is still dominated by food waste at 40.82% and plastic at 20.47%. This data shows the high levels of food waste and the use of single-use plastics in daily life. The situation shows that society's behavior still does not fully reflect low carbon principles. The climate change crisis thus shows that society's everyday practices still do not align with low-carbon-oriented practices.

The implementation of LCB has become one of the important strategies to support the effort of climate change

mitigation. This behavior involves a number of activities including energy conservation, reduction of transport emissions, use of renewable energy and adoption of more efficient and environmental work practices [6]. This directly contributes to the Sustainable Development Goals (SDGs) No. 13 (Climate Action) because LCB is designed to reduce carbon emissions by changing the way in which energy is used and daily activities thus contributing to the mitigation of climate change [11]. The implementation of LCB is also relevant to SDGs No. 12 (Responsible Consumption and Production) because it promotes changes in consumption and production patterns that are more efficient and sustainable, and thus capable of reducing the carbon footprint of economic activities [12]. Altın [13] supported the achievement of SDGs No. 7 (Affordable and Clean Energy) through emission reduction by enhancing energy efficiency and SDGs No. 9 (Industry, Innovation and Infrastructure) through the strengthening of innovation and sustainable organizational practices [12]. Therefore, the present study tries to investigate the internal factors that may influence the implementation of LCB such as green attitude (GA) [14], climate change concern (CCC) [11] and organizational attachment (OA) [15].

GA is an individual's evaluation of environmentally friendly products, practices, or behaviors based on values, beliefs, and concern for the environment, and reflects a moral responsibility that encourages engagement in behaviors that minimize environmental impact [16]. Research by Yang et al. [14] shows that GA has a positive influence on LCB, encouraging individuals to make more environmentally friendly decisions such as using public transportation. Then, research by Wang and Lin [17] shows that individuals with a positive low carbon attitude tend to adopt LCB in their daily life. Additionally, research by Waqas et al. [18] shows that GA has a positive influence on LCB, encouraging individuals to take sustainable actions through controlled motivation. However, the research conducted by Shen et al. [19] shows that GA does not have a significant impact on LCB because without strong intention, GA will not manifest in actual behavior.

CCC refers to how seriously individuals perceive the importance of climate change impacts and how much they care about the issue [20]. Research by Shershunovich [11] shows that CCC has a positive influence on LCB because worries about the impacts of climate change, such as extreme weather, can encourage individuals to adopt environmentally friendly behaviors. Additionally, research by Chan et al. [21] shows that CCC has a positive influence on LCB, thereby promoting environmentally friendly behaviors. A positive relationship was also found by Rusyani et al. [22], which showed that individuals with high environmental concern act as strong incentives or motivators to engage in environmentally friendly actions. However, different results were shown by Shen et al. [19], who found that CCC did not have a significant impact on LCB because behavior change requires intention as a mediator. Similar results were also shown by Kamil and Nordin [23], who indicated that CCC did not directly affect LCB, because without strong intention, CCC would not manifest in actual behavior.

OA refers to the extent that employees feel emotionally attached to the organization. This attachment is based on the degree of alignment between the individual's and the organization's values, and the quality of interpersonal relationships that exist within the work environment. Hegde [24] found that sustainability practices in organizations can increase employee commitment to the organization. This indicates that employees with high OA are more likely to endorse the values and practices adopted by the organization, including environmentally friendly behaviors. Moreover, the study by Krchegani and Savari [25] shows the use of the variable place attachment as an independent variable positively influences intentions towards LCBs as it encourages people to have the intention to participate in environmentally friendly behaviors. According to Li et al. [26], organizational commitment as an independent variable has a positive influence on low carbon and pro-environment behavior. The higher the organizational commitment, the higher the probability of company employees engaging in low carbon and pro-environment behavior. However, some previous studies only used OA as an independent variable. The variable of OA plays an important role in moderating the relationship between GA, CCC and LCB. OA can improve the relationship between GA and LCB by strengthening the motivation to support organizational policies and practices. It can also enhance the relationship between CCC and LCB by improving the environmental awareness that is reflected through concrete actions in the workplace.

Considering that previous empirical findings still show inconsistent results, further research is needed to comprehensively understand how GA and CCC affect LCB in the workplace. Additionally, this study aims to see whether the role of OA can moderate the relationship between GA, CCC, and LCB in the workplace. Next, the literature review section will be discussed in Chapter 2, the research methodology in Chapter 3, the research results in Chapter 4, and the conclusion in Chapter 5.

2. LITERATURE REVIEW

2.1 Theory of planned behavior

Theory of planned behavior (TPB) states that individual behavior is driven by the intention to perform a particular action [27]. According to this theory, a person will form an intention to act before the action is taken [28, 29]. This intention becomes the main determinant of whether a behavior will indeed occur or not [30]. LCB is an individual activity that is a direct and indirect way to reduce carbon emissions. LCB is part of pro-environmental behavior to reduce global warming, which is different from the theoretical framework of the TPB [31]. Thus, the TPB provides a theoretical basis to explain LCB as a result of individual intentions, which are influenced by attitude towards the behavior, subjective norm and perceived behavioral control [17, 32]. TPB emphasizes that behavior does not happen spontaneously but is the result of a rational process of weighing up the personal attitudes, social influences and self-efficacy beliefs [33]. If the intention is strong and the person feels capable of doing it then the likelihood of the behavior being carried out will be even higher [12].

2.2 Social identity theory

The social identity theory (SIT) states that an individual's identity is not only formed by personal characteristics but also by membership to social groups which shape the individual's way of thinking, attitudes and behaviors [34]. Therefore, social identity formed by social interaction is a basis for the

facilitation of LCB. The relationship between SIT and LCB explains that when an individual identifies with a group, this encourages the internalization of values and norms that shape behaviors aligned with the group, including LCB [35]. In an organizational context, those who identify with a work environment with pro-environmental values and practices are more likely to show behaviors that are supportive of carbon emission reduction in the process of aligning to the identity of the group [36]. Thus, SIT plays an important role in the motivation of individuals to adopt LCB as an expression of the alignment with the group's values and norms.

2.3 Hypotheses development

2.3.1 Green attitude and low carbon behavior

GA is the attitude of the person towards the things related to the environment. GA in the framework of TPB refers to the degree of concern of an individual for the environment and the evaluation of the benefits and importance of LCB [37]. An individual's attitude towards organizational environmental sustainability policies and actions will affect their intentions and environmental sustainability behaviors [38]. Those with a positive GA are more likely to support and participate in environmentally friendly actions [39]. The TPB [33, 40] suggests that the more positive a person's attitude to being environmentally friendly, the more likely they are to intend to perform pro-environment behaviors. That intention can finally result in the realization of environmentally friendly behavior. Thus, GA is an important factor in explaining one's willingness to perform sustainability-related actions.

Yang et al. [14] revealed that GA has a positive influence on LCB. GA can motivate people to make LCB in their daily life, such as taking public transport. This finding is in accordance with Wang and Lin [17] who found that positive attitude towards environment people are more likely to be consistent in the adoption of LCB in their habits. Moreover, according to Waqas et al. [18] also demonstrated that the effect of GA is also related to intrinsic motivation, where the higher awareness of the environment can increase the motivation of an individual to participate in LCB. It is important in general that a positive outlook and intrinsic motivation of GA promote individuals to adopt LCB. Therefore, the hypothesis can be formulated as follows:

H1: *GA has a positive influence on LCB*.

2.3.2 Climate change concern and low carbon behavior

CCC are defined as the extent to which individuals care about or worry about climate change. In the framework of the TPB, when someone perceives climate change as a serious and widespread issue, that concern will influence how they view the importance of environmentally friendly actions [41, 42]. These concerns motivate people to engage in LCB and result in intentions to act in daily life [43]. Thus, CCC makes individuals more likely to adopt LCB.

Research by Shershunovich [11] indicates that climate change has a positive influence on LCB, since apprehensions about climate change impacts, such as harsh weather, can motivate individuals to engage in environmentally sustainable practices. Furthermore, study by Chan et al. [21] suggests that comprehension of climate change will influence worry regarding it, therefore serving as a catalyst for the development of LCB. Rusyani et al. [22] identified a positive correlation indicating that persons with heightened environmental concern serve as a significant motivator for engaging in ecologically sustainable behaviors, including the acquisition of eco-friendly products and cars. Therefore, the hypothesis can be formulated as follows:

H2: *CCC has a positive influence on LCB*.

2.3.3 Organizational attachment, green attitude and low carbon behavior

The TPB can explain the relationship between GA and LCB, which means that people with a positive attitude towards the environment are more likely to adopt LCB in daily life [37, 38, 40]. The influence of attitudes on behavior is not always consistent in its realization, because it depends on the support of the social context. In the SIT framework, those who are attached to the organization will internalize the values, norms and goals of the organization into their behavior [44]. In an organizational context, employees with high OA are motivated to align their behavior with the organization's values and policies, including the implementation of LCB [35]. This is because people want to be consistent between who they are and how they act. Therefore, high OA may strengthen the relationship between GA and LCB.

Waqas et al. [18] revealed that GA has a positive influence on LCB since eco-friendly attitudes inherently promote low-carbon behavior among individuals. According to Kamil and Nordin's [23] research, a GA does not necessarily reflect in actual behavior without a strong intention. This indicates a difference between concern and behavior (attitude-behavior gap). This condition explains that there are other factors which might affect the relationship between GA and LCB. In addition, Li et al. [26] found a positive association between organizational commitment and the tendency of company employees to adopt low-carbon and eco-friendly behaviors. The findings support the idea that OA is a contingency factor for how individuals respond to the sustainability values and practices of the organization. Therefore, OA can strengthen the positive impact of GA on LCB, because employees who are more attached tend to internalize organizational values and are motivated to act according to their environmental concern [24]. Therefore, the hypothesis can be formulated as follows:

H3: *OA strengthens the relationship between GA and LCB*.

2.3.4 Organizational attachment, climate change concerns and low carbon behavior

The TPB can explain the relationship between CCC and LCB, the more concerned the person is about climate change, the more motivated they are to engage in LCB [41, 43]. The effect of CCC does not always translate into actual behavior [19]. According to SIT framework, individuals with attachment to the organization will internalize the values, norms and goals of the organization into their behavior [44]. Further, in the organizational context, employees with high OA are more motivated to align their behavior with the organization's values and policies such as the implementation of LCB [35]. This suggests that attachment to an organization may be a contingency factor in the expression of individuals' concern for climate change in behavior.

The research by Gökmen Şen and Darıcan [45] found that CCC has a positive influence on LCB by increasing individual awareness of environmental impacts, as well as encouraging rational consideration and a sense of responsibility. Kamil and Nordin [23] found that without strong intent, CCC will not manifest in actual behavior. This indicates a gap between concern and action (concern-behavior gap). This condition suggests that the relationship between CCC and LCB can be

influenced by other factors. Furthermore, Li et al.'s [26] research shows that the higher the OA, the greater the tendency of company employees to adopt low carbon and environmentally friendly behavior. These findings emphasize that without the support of a social context, individuals with a high level of concern tend to stop at the level of awareness without taking action. In this case, OA plays a crucial role in converting that concern into actual behavior. Through attachment to the organization, individuals are encouraged to internalize the values and norms of the environment and act consistently with their social identity. Thus, OA also serves as a mechanism that bridges the gap between concern and action. Therefore, the hypothesis can be formulated as follows:

H4: *OA strengthens the relationship between CCC and LCB*.

3. RESEARCH METHODOLOGY

This study applied a quantitative approach using primary data by distributing questionnaires online to 963 respondents. The questionnaire was distributed using a Google form to each respondent via email, sending direct messages on WhatsApp and LinkedIn. The criteria for the respondents who were sampled were individuals at the organizational level using a minimum level of staff, supervisors, managers, to directors at listed and non-listed companies on the Indonesia Stock Exchange (IDX), and the respondent's education was at least an associate degree until doctoral degree. In this study, a total of 220 respondents (22.85%) had been collected who had filled out the questionnaire. 7 respondents were reduced from the sample because the respondents did not meet the criteria for a limited liability company. Then, the sample was reduced by 24 respondents because they did not meet the criteria for a registered company, and outlier data reduced the sample by 6 respondents. Thus, a total of 183 respondents were collected to be used in this study. The findings should therefore be interpreted as reflecting the perceptions of the surveyed employees rather than being statistically representative of all organizational levels of listed companies. Sampling in this study uses nonprobability sampling with a convenience sampling technique.

Table 1 shows the demographic characteristics of the 183 respondents that took part in this study. The gender distribution is 36.07% male and 63.93% female. Based on the age, the majority of respondents are in the age range of 21-25 years, which is 41.53%. With regard to the level of study, 6.01% are diploma students, 77.05% are undergraduate students and 16.94% are master students. This composition guarantees the presence of the various academic levels of higher education. Positions junior management (supervisor) 8.20%, middle management (manager) 22.95%, senior management (senior manager/director) 4.92% and non-management (staff) 63.93%.

Data analysis in this study used multiple regression analysis, which was obtained using statistical tools such as Smart PLS (Partial Least Square) and SPSS. The questionnaire in this study used a Likert scale of 1 to 6 to examine the respondent's perceptions and determine how strongly they agreed or disagreed with the statements [46]. The measurement of all variables in this study is adapted from the research [15]. LCB is considered the dependent variable in this study, two independent variables namely GA and CCC and moderate variable, namely OA, with each variable is measured using four indicators (Table 2).

Table 1. Demographic profile of respondents

Demography	Description	Count	Percentage
Gender	Man	66	36.07%
	Woman	117	63.93%
Age	17–20 years	1	0.55%
	21–25 years	76	41.53%
	26–30 years	42	22.95%
	31–35 years	24	13.11%
	36–40 years	14	7.65%
	41–45 years	8	4.37%
	>45 years	18	9.84%
Last Education	Associate degree	11	6.01%
	Bachelor degree	141	77.05%
	Master degree	31	16.94%
Position	Junior management (Supervisor)	15	8.20%
	Middle management (Manager)	42	22.95%
	Senior management (Senior manager/Director)	9	4.92%
	Non-management (Staff)	117	63.93%
Business Sector	Energy	9	4.92%
	Raw Materials	4	2.19%
	Industry	23	12.57%
	Primary Consumer Goods	9	4.92%
	Non-Primary Consumer Goods	8	4.37%
	Healthcare	5	2.73%
	Finance	27	14.75%
	Property & Real Estate	17	9.29%
	Technology	9	4.92%
	Infrastructure	6	3.28%
	Transportation & Logistic	18	9.84%
	Others	48	26.23%

Source: Data processed using Excel.

Table 2. Indicators used to construct the indices

Construct	Indicator
Low carbon behavior (LCB)	LCB1. I make sure to turn off the lights and electronic devices every time I leave the workspace.
	LCB2. I prioritize the use of energy-efficient equipment, including LED lights and low-power monitors, in supporting my work activities.
	LCB3. I hold meetings or coordinate through video conferencing applications and other digital devices such as (Zoom, Teams, Google Meet) as a substitute for meetings that require physical travel.
	LCB4. I ensure that the documents that need to be printed have gone through the proper verification and approval process so that resource use remains efficient.
Green attitude (GA)	GA1. I believe that the implementation of low-carbon consumption practices in the workplace will contribute to the improvement of environmental quality.
	GA2. I see that efforts to reduce energy consumption in the workplace are a form of moral obligation that all employees need to adhere to.
	GA3. I believe that the implementation of low-carbon habits in the workplace can support the improvement of employee well-being and have a positive impact on the environment.
	GA4. I believe that the implementation of low-carbon behavior in the workplace reflects a form of care and social responsibility.
Climate change concern (CCC)	CCC1. I believe that uncontrolled energy consumption in the workplace can exacerbate the consequences of climate change.
	CCC2. I realize that climate change is pushing me to evaluate and adopt more sustainable and low-emission work practices.
	CCC3. I believe that without efforts to reduce the carbon footprint in the workplace, climate change will become an increasingly greater threat to our lives.
	CCC4. I assess that the company's lack of seriousness in implementing low-carbon practices has the potential to cause detrimental consequences for the environment and society.
Organizational attachment (OA)	OA1. I feel like I am part of an organization that has a strong commitment to making a positive impact on the environment.
	OA2. I believe that the company's commitment to low-carbon consumption aligns with my personal beliefs.
	OA3. I am proud that the company is implementing various initiatives to reduce its carbon footprint.
	OA4. I feel more connected to my job because of the company's commitment to reducing its carbon footprint.

The instrument was reviewed by one subject-matter expert to ensure contextual relevance. However, no formal pilot testing or back-translation procedure was conducted, which is acknowledged as a methodological limitation. For example, items related to energy-saving behavior were rephrased to emphasize actions such as turning off lights and electronic devices when leaving the workspace, prioritizing the use of energy-efficient equipment, utilizing online meeting platforms to reduce work-related travel, and minimizing unnecessary printing through digital documentation practices. All indicators of this questionnaire will be tested with validity and reliability tests to determine how much a measuring instrument can be trusted in measuring something. Based on this study [47], descriptive statistics were used to describe the study variables using the minimum, maximum, mean, and standard deviation (level of deviation) value. A more detailed discussion is provided in Section 4.

4. RESULT

4.1 Descriptive statistics

As reported in Table 3, the minimum value of the LCB variable is 1.00, which indicates that there are still respondents who strongly disagree with several LCB practices, particularly in activities associated with energy saving and the use of digital technology as a substitute for physical activities. This shows that the application of LCB of respondents is not yet in complete consistency in daily activities. The maximum value of 6.00, on the other hand, indicates that there are respondents who strongly agree with LCB practices, particularly reflected in energy-saving activities, the use of energy-efficient equipment, and the use of digital technology in work activities. This shows a high level of consistency in implementation of LCB in the workplace. The average (mean) value of 5.15 suggests that most of the 183 respondents agree to the implementation of low-carbon behavior in the workplace. This condition is because the respondents are used to switching off the lights and electronic devices when not in use, using energy efficient equipment, using digital technology to reduce physical travel and more efficient in paper usage. In addition, the standard deviation of 0.96 whose mean is smaller than the mean shows that the answers of respondents tend to be homogeneous, so it can be said that the LCB variable has been applied fairly evenly.

Table 3. Descriptive statistics result

Variables	N	Min	Max	Mean	Std. Dev
LCB	183	1.00	6.00	5.15	0.96
GA	183	1.00	6.00	5.21	0.87
CCC	183	2.00	6.00	5.12	0.90
OA	183	1.00	6.00	4.99	0.95

Note: LCB = low carbon behavior; GA = green attitude; CCC = climate change concern; OA = organizational attachment.
Source: Data processed using SPSS.

Then, the GA variable has a minimum value of 1.00, indicating that there are still respondents with a relatively low level of environmental concern because they do not believe that the implementation of low-carbon consumption practices in the workplace will contribute to improving environmental quality. Meanwhile, the maximum value of 6.00 indicates the presence of respondents with very strong beliefs, suggesting that some respondents have internalized environmental values, such as the belief in improving environmental quality, moral obligation, and social responsibility. The average (mean) value of 5.21 indicates that the majority of the 183 respondents have a very positive attitude towards the environment. This condition occurs because respondents believe that low-carbon

behavior can improve environmental quality, is seen as a moral obligation, impacts well-being, and reflects social responsibility. Next, the standard deviation value of 0.87, which is smaller than the mean, indicates that the respondents' answers tend to be homogeneous, so the GA variable can be said to have been applied quite evenly.

The minimum value of the CCC variable is 2.00, indicating the presence of respondents with a relatively low level of concern about climate change, especially in the assessment of the impact of energy consumption in the workplace and the awareness of adopting more sustainable work practices. This suggests that a small group of respondents still have a low level of concern regarding climate change. The maximum value of 6.00 indicates that the respondents have a very high level of concern for climate change issues like assessment of energy impact, awareness of sustainable practices, perception of the threat of climate change and the importance of corporate commitment to climate change. The mean value of 5.12 refers to the fact that most of the 183 respondents are highly concerned about climate change. This condition occurs because respondents realize that uncontrolled energy consumption may worsen climate change, are willing to adopt sustainable practices and see climate change as a serious threat. Then the standard deviation value of 0.90 is smaller than the mean, this shows that the answers of the respondents tend to be homogeneous so that the CCC variable can be said to have been applied fairly evenly.

The variable OA has a minimum value of 1.00, which means that there are respondents with very low attachment, especially in feeling connected to their work due to the company's commitment to reducing its carbon footprint. This suggests that not all respondents have an emotional connection with the organization. Meanwhile the maximum value of 6.00 indicates that there are some respondents with a very strong attachment to the organization. The average value (mean) of 4.99 shows that the majority of the 183 respondents tend to agree that they have an attachment to the organization. This is due to respondents' sense of belonging to an organization that cares about the environment, shares values with the company, is proud of the company's initiatives and feels attached to their work. Furthermore, the standard deviation value of 0.95 which is smaller than the mean indicates that the answers of the respondents tend to be homogeneous, thus the OA variable can be said to have been applied quite uniformly.

4.2 Validity and reliability test

The measurement model, convergent validity, and discriminant validity are evaluated in this study. Convergent validity is assessed using the Average Variance Extracted (AVE) value. Table 4 shows that all variables, namely LCB, GA, CCC, and OA, have AVE values of 0.566, 0.785, 0.716, and 0.723, respectively. All these values are above the recommended minimum threshold of 0.5. Therefore, all variables in this study are declared valid based on convergent validity, and all variables used in this study meet the criteria [47]. Then, for the reliability test, it is evaluated using the composite reliability or Cronbach's alpha value. The test results show that the variables LCB, GA, CCC, and OA have Cronbach's alpha values of 0.745, 0.909, 0.868, and 0.873, respectively. All measurement instruments in this study exceeded the expected Cronbach's alpha value of >0.60. Thus, the reliability results indicate that the questionnaire given to respondents will yield consistent, reliable, and relevant results regarding the variables.

In this study, the discriminant validity was tested with the HTMT approach and Fornell-Larcker criterion. According to Hair Jr et al. [47], an HTMT value of less than 0.9 indicates that discriminant validity has been achieved. Table 5 shows that the HTMT values of all variables, LCB, GA, CCC, OA, and OA x GA are 0.787, 0.859, 0.866, 0.356 and 0.878 respectively. The HTMT values of all constructs are lower than 0.9. Therefore, each construct has a good discriminant ability based on the HTMT criteria. Furthermore, discriminant validity was also tested using the Fornell-Larcker criterion which compares the square root of the AVE with the correlation between constructs. Discriminant validity is achieved if the square root of AVE of each construct exceeds the correlation of other constructs in the model [47]. Discriminant validity is established when the square root of the AVE values for each variable is larger than the correlation values with other variables.

Table 4. Convergent validity result

Construct	Outer Loadings	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
LCB 1	0.746	0.745	0.747	0.839	0.566
LCB 2	0.774				
LCB 3	0.731				
LCB 4	0.758				
GA 1	0.879	0.909	0.911	0.936	0.785
GA 2	0.856				
GA 3	0.907				
GA 4	0.901				
CCC 1	0.850	0.868	0.870	0.910	0.716
CCC 2	0.828				
CCC 3	0.827				
CCC 4	0.878				
OA 1	0.823	0.873	0.888	0.913	0.723
OA 2	0.872				
OA 3	0.854				
OA 4	0.852				

Note: LCB = low carbon behavior; GA = green attitude, CCC = climate change concern; OA = organizational attachment.
Source: Data processed using SmartPLS.

Table 5. Discriminant validity result

Construct	CCC	GA	LCB	OA	OA × GA	OA × CCC
CCC						
GA	0.866					
LCB	0.828	0.859				
OA	0.840	0.712	0.787			
OA x GA	0.472	0.593	0.577	0.356		
OA x CCC	0.532	0.504	0.465	0.442	0.878	

Note: LCB = low carbon behavior; GA = green attitude; CCC = climate change concern; OA = organizational attachment.
Source: Data processed using SmartPLS.

4.3 Collinearity test

To assess the potential impact of common method bias, a full collinearity test was conducted following the procedure proposed by Hair Jr et al. [47]. The variance inflation factor (VIF) values of the inner model were examined as shown in Table 6. The results showed that all construct-level VIF values ranged from 1.000 to 3.250 which are below the recommended of 3.3, indicating that common method bias is not a serious concern in this study [47].

4.4 Structural model

The results of the hypothesis testing using the bootstrapping method by examining the path coefficients, t-values, and p-values. In Model 1, which represents the direct-effect model, GA has a positive influence on LCB (β = 0.482, p = 0.000), while CCC also has a positive influence on LCB (β = 0.298, p = 0.008). F-square, or effect size F-square is the influence of variables at the structural level (low, moderate, or high). Table 7 shows that the F^2 analysis indicates that the effect sizes range from small to medium. Specifically, CCC exhibit a small effect on LCB (F^2 = 0.078), whereas GA demonstrates a medium effect on LCB (F^2 = 0.205). Then, the Adjusted R-Square value in Table 7, which is 0.537 or 53.7% indicates the ability of the independent variables used in this study to explain the dependent variable, with the remaining 46.3% explained by other variables not included in this study.

Model 2 extends the direct-effects model by incorporating OA as an additional predictor and moderating variable. The results show that GA has a positive influence on LCB (β = 0.215, p = 0.012) and CCC has a positive influence on LCB (β = 0.234, p = 0.021). Additionally, the moderating variable OA strengthens the relationship between CCC and LCB (β = 0.256, p = 0.001). However, the moderating variable OA also weakened the relationship between GA and LCB (β = -0.296, p = 0.000). Table 7 shows that the F^2 analysis indicates that all structural paths exceed the 0.02 benchmark but remain below the 0.35 benchmark. Specifically, CCC → LCB (F^2 = 0.041), GA → LCB (F^2 = 0.035), OA → LCB (F^2 = 0.126), OA x CCC → LCB (F^2 = 0.089), and OA x GA → LCB (F^2 = 0.132), indicating that all paths have small effect. Then, the Adjusted R-Square value in Table 7, increased from 0.537 in Model 1 to 0.614 or 61.4% in Model 2, indicates the ability of the independent variables used in this study to explain the dependent variable, with the remaining 38.6% explained by other variables not included in this study.

Table 6. Collinearity result

Construct	VIF
LCB 1	1.387
LCB 2	1.425
LCB 3	1.423
LCB 4	1.465
GA 1	2.884
GA 2	2.213
GA 3	3.250
GA 4	3.019
CCC 1	2.283
CCC 2	1.922
CCC 3	2.070
CCC 4	2.473
OA 1	1.840
OA 2	2.125
OA 3	2.380
OA 4	2.468
OA x CCC	1.000
OA x GA	1.000

Note: LCB = low carbon behavior; GA = green attitude; CCC = climate change concern; OA = organizational attachment; VIF = variance inflation factor.
Source: Data processed using SmartPLS.

Table 7. Structural model result

Regression Path	N	Prediction	β	*t*-Values	*p*-Values	F^2	Remark
Model 1							
CCC → LCB	183	+	0.298	2.637	0.008*	0.078	Accepted
GA → LCB	183	+	0.482	4.440	0.000*	0.205	Accepted
Adjusted R-Square	183		0.537				
Model 2							
CCC → LCB	183	+	0.234	2.042	0.021*	0.041	Accepted
GA → LCB	183	+	0.215	2.276	0.012*	0.035	Accepted
OA → LCB	183	+	0.334	3.438	0.000**	0.126	Significant
OA x CCC → LCB	183	+	0.256	2.479	0.001**	0.089	Accepted
OA x GA → LCB	183	+	-0.296	3.214	0.000**	0.132	Rejected
Adjusted R-Square	183		0.614				

Notes: *p < 0.05; **p < 0.01. LCB = low carbon behavior; GA = green attitude, CCC = climate change concern; OA = organizational attachment.
Source: Data processed using SmartPLS.

4.5 Discussion

The results presented in Table 7 show that GA has a positive influence on LCB and therefore H1 is accepted. Most of the respondents agreed with the statements regarding GA, environmentally friendly practices are important and it is a collective responsibility. These attitudes are then translated into concrete behaviors such as saving energy, turning electronic devices off when not in use, and reducing the use of paper. It means that respondents believe that LCB is the behavior that can help better environmental quality, which is regarded as a moral obligation, influence well-being and demonstrate social responsibility. This view promotes the development of consciously practiced habits in daily life, and this includes promoting the efficient use of resources. Thus, the more positive the attitude of the individual towards environmental issues, the more likely they will be to consistently adopt LCB. These results are in line with the TPB which states that an individual's attitude to a behavior will affect the likelihood of engaging in that behavior [12, 17, 32]. Furthermore, the results of this study are consistent with the findings [14, 17, 18] that GA has a positive influence on LCB, which motivates individuals to engage in LCB in their daily life.

Then, CCC has a positive influence on LCB and therefore H2 is accepted. It suggests that the more concerned they are about climate change, the more likely they are to act in a low carbon way. The majority of the 183 respondents are very concerned about climate change as shown by their awareness that uncontrolled energy consumption can worsen climate change, their readiness to adopt sustainable behavior and their perception of climate change as a serious threat. This consciousness does not only stay limited to the level of understanding, but also affects the manner of the respondents' action. Respondents are more careful in the use of energy, more considerate of the impact of their work activities and begin to get used to choose more environmentally friendly practices. This indicates that CCC generates a feeling of individual accountability that is then expressed in the everyday behavior in the workplace. The indicators of concern used in this study are therefore not only reflecting perceptions but are also influencing real behavior. These findings reinforce the explanation in the TPB that psychological factors such as concern can affect individual behavior [41-43]. In addition, the results of this study are also in line with the research [11, 21, 22], which shows that it has a positive influence on LCB. The concern about the impact of climate change makes individuals more aware and motivated to have LCB in everyday life.

Moreover, the research results show that OA weakened the relationship between GA and LCB and therefore H3 is rejected. This indicates that when OA is high, employees' LCB is less influenced by their personal GAs and may instead be more strongly shaped by organizational policies, norms, and practices. Previous research suggests that organizational factors and social identity can influence employees' pro-environmental behavior, indicating that environmental behavior is shaped not only by individual attitudes but also by the organizational context [48, 49]. This finding can be explained through SIT, which suggests that individuals who strongly identify with a group tend to align their behavior with the norms and values of that group [44, 48]. In this study, strong OA may make the organization a more dominant behavioral reference than employees' personal environmental attitudes, reflecting a process of norm substitution, whereby organizational norms and practices become more influential in guiding behavior than personal environmental attitudes. Thus, when organizational practices do not strongly support environmental sustainability, employees' positive GAs may not be sufficiently translated into LCB. This is consistent with research highlighting the importance of organizational context in shaping employees' environmental behavior [49, 50]. Therefore, the negative moderating effect found in this study indicates that the strengthening effect initially proposed in H3 is not supported. Instead, OA appears to shift employees' behavioral reference from personal environmental attitudes toward organizational norms and practices. This suggests that strong OA does not automatically strengthen the influence of GA on LCB; rather, its effect depends on whether organizational values and practices are aligned with environmental sustainability. This finding is also consistent with Abbas et al. [51], which suggests that employee loyalty or attachment to the organization does not necessarily indicate alignment with environmental sustainability values.

The research results also show that OA strengthens the relationship between CCC and LCB and therefore H4 is accepted. This indicates that when individuals have a strong attachment to the organization, CCC is more consistently reflected in actual behavior. Respondents with high attachment tend to be motivated to contribute and support the values upheld in the organization. In practice, when the organization encourages the implementation of environmentally friendly policies or habits, individuals with high attachment will be more active and consistent in applying them, such as being more careful in energy use and paying more attention to the impact of work activities. Thus, indicators of OA such as a sense of belonging to the organization and connection with the organization also strengthen the individual's drive to translate CCC into real actions. These findings align with SIT, which explains that individuals who feel part of a group will adjust their behavior to match the group's values [44]. Additionally, these results are also in line with the research by Li et al. [26], which states that OA can encourage individuals to act more pro-environmentally, thereby strengthening the relationship between CCC and LCB through increased environmental awareness manifested in concrete actions at the workplace.

5. CONCLUSIONS

The objective of this study is to investigate the impact of GA on LCB, CCC on LCB and the role of OA on the moderating effect of GA, CCC on LCB at workplace. The results of this study indicate that GA and CCC has a positive influence on LCB. The research findings also reveal that OA strengthens the relationship between CCC and LCB but weakened the relationship between GA and LCB. These results suggest that OA plays a dual role in either enhancing or undermining the impact of individual factors on LCB depending on the fit between individual values and organizational practices. The alignment of GA, CCC, and OA will support the implementation of LCB more optimally, thus strengthening the company's contribution towards a low carbon economy and the achievement of SDGs No. 13 (Climate Action) and SDGs No. 12 (Responsible Consumption and Production). This alignment can also be seen when employees are not only concerned about and aware of the environment, but also supported by a work environment that encourages habits of energy conservation and efficient use

of resources. This condition makes LCB part of everyday work activities, thus contributing to emission reduction and improved resource use efficiency.

The contribution of this research can be seen from theoretical and practical perspectives. This research theoretically demonstrates that OA as a moderating variable is not always a factor that strengthens the relationship between GA and LCB, but under certain conditions, it may also weaken the relationship between attitude and behavior. These findings offer a more nuanced understanding of the ways that organizational factors can influence environmentally friendly behavior, especially in the context of LCB. The results of this study have practical implications in terms of the need for organizations to create alignment between individual values and organizational practices in promoting LCB. Organizations cannot depend solely on individual attitude and concern for the environment. They also need to provide tangible support through policy, work culture and facilities that facilitate the implementation of LCB. Examples of LCB are energy efficiency, reduction in paper use and the use of digital technology in work activities. Finally, organizations need to create a work environment which reminds and motivates the employees on a continuous basis to adopt LCB so that it does not end at awareness but becomes a work habit.

This research has several limitations. First, the use of questionnaires in data collection allows for the possibility of subjective bias, as respondents' answers depend on personal perceptions and judgements, which do not always reflect the actual conditions or behaviors. Second, the number of respondents obtained has not fully reached the planned target, which may affect the representativeness of the data. Third, the Adjusted R-Square value of 0.614 indicates that there are still other factors outside the research model that can influence LCB. Therefore, future research is recommended to use mixed methods, such as a combination of quantitative approaches through questionnaires and qualitative approaches through in-depth interviews, to gain a deeper understanding of individual behavior and organizational influence in promoting LCB. Additionally, future research is also recommended to increase the number of respondents and expand the scope of the study to various industrial sectors such as energy, raw materials, infrastructure, technology, and to include various forms of business organizations such as commanditaire vennootschap (CV) and firms, with respondent criteria working at staff to managerial levels to ensure more representative results. The addition of other variables such as environmental knowledge, environmental performance, environmental management accounting, or other factors that may influence LCB, can also be considered to provide a more comprehensive understanding of the factors affecting LCB.

AUTHOR CONTRIBUTIONS

Joelyn Veronica: Methodology, Software, Formal Analysis, Resources, Data Curation, Writing Original Draft, Visualization. Tommy Andrian: Conceptualization, Methodology, Validation, Formal Analysis, Resources, Writing Original Draft, Writing Review & Editing, Visualization, Supervision, Project Administration.

DATA AVAILABILITY

Data supporting this study are openly available from Mendeley Data: DOI: 10.17632/9shc8x28kr.1

INFORMED CONSENT

Prior to data collection, informed consent was obtained from all participants, and they were informed that their responses would be kept confidential and used solely for academic research purposes. Participation in this study was entirely voluntary, and respondents had the right to withdraw at any stage of the research process.

ACKNOWLEDGEMENT

The authors would like to thank all respondents who voluntarily participated in this study.

AI ACKNOWLEDGEMENT

The authors acknowledge the use of ChatGPT to search for literature related to the manuscript. The prompts used were like “please find literature related to studies related to LCB, especially similar to carbon behavior in other countries.” The results of the request were reviewed and edited as needed. While the authors acknowledge the use of AI, they maintain that they are the sole authors of this article and take full responsibility for the content therein.

REFERENCES

[1] Liu, H., Gangji, Z., Wei, Y., Ye, J., Ma, G. (2026). Mathematical modeling of carbon dioxide emissions with GDP linkage: Sensitivity analysis and optimal control strategy. Carbon Balance and Management, 21(1): 5. https://doi.org/10.1186/s13021-025-00359-4

[2] Wu, Y., Martens, P., Krafft, T. (2024). Transitioning to a low-carbon lifestyle? An exploration of millennials’ low-carbon behavior—A case study in China. Smart Cities, 7(4): 2015-2041. https://doi.org/10.3390/smartcities7040080

[3] PwC. (2025). PwC Autofacts Market Update 2025.

[4] IEA. (2025). Electricity Mid-Year Update 2025. International Energy Agency.

[5] World Bank. (2025). Clean Cities, Bright Futures: Accelerating Investment and Reforms in Solid Waste Management in Developing Countries. World Bank Group. https://www.worldbank.org/en/results/2025/04/30/clean-cities-bright-futures-accelerating-investment-and-reforms-in-solid-waste-management-in-developing-countries.

[6] Wei, B., Shaharudin, M.S., Chen, L., Gui, A. (2024). Mapping the path to low-carbon behaviour: A systematic review of trends, gaps, and future directions. Sustainability, 16(21): 9343. https://doi.org/10.3390/su16219343

[7] IESR. (2025). Individual carbon footprint patterns based on demographic profiles in urban, semi-urban, and rural areas on the island of Java. Institute for Essential Services Reform. https://iesr.or.id/pustaka/pola-jejak-karbon-individu-berdasarkan-profil-demografis-di-

kawasan-perkotaan-semi-perkotaan-dan-perdesaan-di-pulau-jawa/.
[8] PwC. (2025). ASEAN-6 eReadiness 2025. https://www.pwc.com/id/en/publications/automotive/pwcid-ereadiness-2025-asean-report.pdf.
[9] Trianto, G.A. (2026). Konsumsi Listrik Nasional Tumbuh, PLN Catat Penjualan 317,69 TWh di 2025 [National Electricity Consumption Grows, PLN Records Sales of 317.69 Terawatt-hour]. https://www.pln.co.id/konsumsi-listrik-nasional-tumbuh-pln-catat-penjualan-31769-twh-di-2025.
[10] SIPSN. (2025). Sistem Informasi Kinerja Pengelolaan Sampah Nasional. https://portal-sipsn.kemenlh.go.id/data/komposisi-sampah.
[11] Shershunovich, Y. (2025). Climate risk perception as a catalyst for pro-environmental behavior. Discover Sustainability, 6(1): 902. https://doi.org/10.1007/s43621-025-01896-1
[12] Thanapongporn, A., Saengchote, K., Gowanit, C. (2023). Factors shaping Thai Millennials' low-carbon behavior: Insights from extended theory of planned behavior. HighTech and Innovation Journal, 4(3): 482-504. https://doi.org/10.28991/HIJ-2023-04-03-02
[13] Altın, H. (2024). The impact of energy efficiency and renewable energy consumption on carbon emissions in G7 countries. International Journal of Sustainable Engineering, 17(1): 134-142. https://doi.org/10.1080/19397038.2024.2319648
[14] Yang, M., Ren, G., Guo, L. (2026). The impact of environmental education on college students' low-carbon behaviour: A chain mediation model moderated by prosocial behaviour. Australian Journal of Environmental Education, 42(3): 723-738. https://doi.org/10.1017/aee.2025.10080
[15] Momenpour, Y., Choobchian, S. (2025). The moderating role of organizational attachment in enhancing low carbon consumption behaviors in the workplace. Results in Engineering, 28: 107767. https://doi.org/10.1016/j.rineng.2025.107767
[16] Hlaba, Z., Shava, H. (2025). Consumer attention, green attitude, and climate change awareness in green purchase behaviour: Insights from an emerging economy. Sustainability, 17(23): 10859. https://doi.org/https://doi.org/10.3390/su172310859
[17] Wang, X., Lin, B. (2024). Information management of low-carbon travel behavior: Based on the extended theory of planned behavior. Journal of Global Information Management, 32(1): 1-26. https://doi.org/10.4018/JGIM.349725
[18] Waqas, M., Rehman, C.A., Rafiq, M. (2021). The role of pro-environmental attitude towards employee green behavior: The mediating and moderating role of motivational states and green work climate perceptions. Review of Applied Management and Social Sciences, 4(3): 715-728. https://doi.org/10.47067/ramss.v4i3.175
[19] Shen, T., Rasdi, I.B., Ezani, N.E.B., San, O.T. (2024). The mediating role of pro-environmental attitude and intention on the translation from climate change health risk perception to pro-environmental behavior. Scientific Reports, 14(1): 9831. https://doi.org/10.1038/s41598-024-60418-7
[20] Weckroth, M., Ala-Mantila, S. (2022). Socioeconomic geography of climate change views in Europe. Global Environmental Change, 72: 102453. https://doi.org/10.1016/j.gloenvcha.2021.102453
[21] Chan, M.Y., Halim, L., Nasri, N.M. (2025). Evaluating the influence of climate change knowledge on intention towards pro-environmental behavior. International Journal of Evaluation and Research in Education, 14(3): 1567-1576. https://doi.org/10.11591/ijere.v14i3.32173
[22] Rusyani, E., Lavuri, R., Gunardi, A. (2021). Purchasing eco-sustainable products: Interrelationship between environmental knowledge, environmental concern, green attitude, and perceived behavior. Sustainability, 13(9): 4601. https://doi.org/10.3390/su13094601
[23] Kamil, N.L.M., Nordin, W.N.A.W.M. (2025). How does ethical climate attract employees' low-carbon behaviour? The role of environmental passion and green mindfulness. Journal of Management & Organization, 31(1): 103-121. https://doi.org/10.1017/jmo.2024.38
[24] Hegde, S. (2025). Influence of sustainability practices on employee commitment in automobile industry. Salud, Ciencia y Tecnología-Serie de Conferencias, 4: 17. https://doi.org/10.56294/sctconf20251258
[25] Krchegani, A.M., Savari, M. (2025). Integrating the protection motivation model with place attachment theory to examine rural residents' intentions toward low-carbon behaviors: Empirical evidence from Iran. Results in Engineering, 28: 107180. https://doi.org/10.1016/j.rineng.2025.107180
[26] Li, X., Cifuentes-Faura, J., Tan, Y. (2023). Analyzing the low carbon and pro-environment behavior of agricultural enterprises based on organizational commitment and role models' guidance. Environmental Science and Pollution Research, 1-13. https://doi.org/10.1007/s11356-023-31302-0
[27] Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2): 179-211. https://doi.org/10.1016/0749-5978(91)90020-T
[28] Chen, Y., Chen, Y. (2025). Influence paths and group differences in residents' low-carbon behaviors in China's pilot cities: A perspective on policy perception and information dissemination. Sustainability, 17(24): 10952. https://doi.org/10.3390/su172410952
[29] Wang, S., Mbanyele, W., Feng, T., Khan, S., Fan, S. (2025). Bridging the knowledge-action divide: Environmental awareness and low-carbon behaviors of Chinese university students. Humanities and Social Sciences Communications, 12(1): 925. https://doi.org/10.1057/s41599-025-04953-2
[30] Li, J., Kim, R.B. (2024). Consumers' green attitude and behavior in China and Singapore: The role of altruistic value and perceived consumer effectiveness, economic motive. Journal of Infrastructure, Policy and Development, 8(13): 9278. https://doi.org/10.24294/jipd9278
[31] Wang, L., Ma, E. (2026). Too much of a good thing? Unlocking the non-linear spillover effects of low-carbon behavior across daily and travel contexts. Tourism Management, 112: 105232. https://doi.org/10.1016/j.tourman.2025.105232
[32] Zhao, S., Duan, W., Zhao, D., Song, Q. (2022). Identifying the influence factors of residents' low-carbon behavior under the background of "Carbon Neutrality": An empirical study of Qingdao city, China. Energy Reports, 8: 6876-6886. https://doi.org/10.1016/j.egyr.2022.05.023

[33] Wang, B., Huang, C., Wang, H., Liao, F. (2022). Impact factors in Chinese construction enterprises' carbon emission-reduction intentions. International Journal of Environmental Research and Public Health, 19(24): 16929. https://doi.org/10.3390/ijerph192416929
[34] Donaldson, J.L., Cruwys, T., Dawel, A., Stevens, M., Chen, J. (2026). Social identities reduce self-focused attention in social anxiety. Behaviour Research and Therapy, 200: 105010. https://doi.org/10.1016/j.brat.2026.105010
[35] Sampene, A.K., Li, C., Agyeman, F.O., Brenya, R. (2024). Employees' behavioural action towards corporate environmental performance: The moderating effect of moral reflectiveness. Heliyon, 10(6): e28075. https://doi.org/10.1016/j.heliyon.2024.e28075
[36] Yang, D., Crawford, J., Daugaard, D., Jia, J. (2026). How finance leaders and organisational culture influence employees' green behaviour: An exploratory study. Business Strategy and the Environment, 35(1): 1199-1218. https://doi.org/10.1002/bse.70217
[37] Ka, L.S., Nguyen, T.K. (2025). What leads households to green consumption behavior: Case of a developing country. Sustainability, 17(10): 4319. https://doi.org/10.3390/su17104319
[38] Liu, H.T. (2021). The influence of public servants' perceived formalism and organizational environmental strategy on green behavior in the workplace. Sustainability, 13(19): 11020. https://doi.org/10.3390/su131911020
[39] Lee, S.J., Lee, S., Kang, S.J. (2025). The impact of green attitudes and environmental perception on electric vehicle purchase willingness in Jeju Island. International Journal of Empirical Economics, 4(2): 2550004. https://doi.org/10.1142/S2810943025500040
[40] Ren, G., Liu, C., Chen, Y. (2024). Motivation and guidance of college students' low-carbon behavior: Evidence from Chinese colleges and universities. Frontiers in Psychology, 15: 1375583. https://doi.org/10.3389/fpsyg.2024.1375583
[41] Hidalgo-Crespo, J., Amaya-Rivas, J.L. (2024). Citizens' pro-environmental behaviors for waste reduction using an extended theory of planned behavior in Guayas province. Cleaner Engineering and Technology, 21: 100765. https://doi.org/10.1016/j.clet.2024.100765
[42] Kerse, Y., Kerse, G. (2025). The effect of eco-anxiety on pro-environmental behaviors and mental well-being: A parallel mediation model. BMC Psychology, 13(1): 1155. https://doi.org/10.1186/s40359-025-03501-6
[43] Laheri, V.K., Lim, W.M., Arya, P.K., Kumar, S. (2024). A multidimensional lens of environmental consciousness: Towards an environmentally conscious theory of planned behavior. Journal of Consumer Marketing, 41(3): 281-297. https://doi.org/10.1108/JCM-03-2023-5875
[44] Guan, M., So, J. (2022). Social identity theory. The International Encyclopedia of Health Communication, 1: 1-5. https://doi.org/10.1002/9781119678816.iehc0667
[45] Gökmen Şen, K., Darıcan, Ş. (2025). The impact of ecological footprint awareness and environmental concern on green purchasing behavior. Discover Sustainability, 7(1): 51. https://doi.org/10.1007/s43621-025-02097-6
[46] Andrian, T., Murwaningsari, E., Sudibyo, Y.A. (2023). Factors influencing carbon management accounting adoption in Indonesia. International Journal of Sustainable Development and Planning, 18(6): 1919-1928. https://doi.org/10.18280/ijsdp.180628
[47] Hair Jr, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., Danks, N.P., Ray, S. (2021). Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook. Springer Nature, p. 197. https://doi.org/10.1007/978-3-030-80519-7
[48] Zhang, J., Ul-Durar, S., Akhtar, M.N., Zhang, Y., Lu, L. (2021). How does responsible leadership affect employees' voluntary workplace green behaviors? A multilevel dual process model of voluntary workplace green behaviors. Journal of Environmental Management, 296: 113205. https://doi.org/10.1016/j.jenvman.2021.113205
[49] Guenthner, L., Kühner, C., Masson, T., Fritsche, I., Zacher, H. (2025). The social identity model of pro-environmental action (SIMPEA) at work: Predicting organizational citizenship behaviour for the environment. European Journal of Work and Organizational Psychology, 34(6): 750-765. https://doi.org/10.1080/1359432X.2025.2536830
[50] Zafar, H., Suseno, Y. (2024). Examining the effects of green human resource management practices, green psychological climate, and organizational pride on employees' voluntary pro-environmental behavior. Organization & Environment, 37(4): 581-609. https://doi.org/10.1177/10860266241241532
[51] Abbas, A., Chengang, Y., Zhuo, S., Manzoor, S., Ullah, I. (2025). Role of responsible leadership for organizational citizenship behavior for the environment in light of psychological ownership and employee environmental commitment: A moderated mediation model. Frontiers in Psychology, 12: 756570. https://doi.org/10.3389/fpsyg.2021.756570