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## Determinants of pro-environmental behaviour within the university community: Insights from Islamic religiosity, risk perception, and environmental attitudes

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### ABSTRACT

Pro-environmental behaviour is a crucial aspect in addressing climate change and environmental degradation, particularly in higher education, which plays a strategic role in shaping ecological awareness. This study examines the contributions of Islamic religiosity, climate change risk perception, and environmental attitudes to pro-environmental behaviour in university communities in Indonesia. Using a quantitative approach, data were collected via an online survey of 435 Muslim respondents, including students, lecturers, and administrative staff. The analysis was conducted using Partial Least Squares Structural Equation Modelling (PLS-SEM) in SmartPLS 4.0. The results show that Islamic religiosity shapes environmental attitudes and directly encourages pro-environmental behaviour. Meanwhile, climate change risk perception does not directly influence pro-environmental behaviour but rather shapes positive environmental attitudes. These findings confirm that environmental attitudes serve as a psychological mechanism linking climate risk awareness and religious values to environmental protection actions. Theoretically, this study strengthens the model of pro-environmental behaviour by integrating Islamic religiosity, climate risk perception, and environmental attitudes. In practice, these findings encourage universities to strengthen environmental education grounded in climate risk literacy and religious values.

### INTRODUCTION

Environmental degradation and climate change are among the most serious and complex threats facing modern humans (Nuta et al., 2025). The challenge of environmental degradation is not only an ecological issue but also affects various aspects of human life, including economic and social problems, which ultimately degrade the quality of life and human welfare. Research by Acheampong & Opoku (2023), using panel data from 140 countries from 1980 to 2021, found that environmental damage can hinder economic

growth. The Intergovernmental Panel on Climate Change (2021) reported that global temperatures during 2011–2020 were approximately 1.1°C higher than during 1850–1900, mainly due to greenhouse gas emissions from human activities. The report also projects that this increase may surpass 1.5°C within the next two decades. In response to this threat, Sakariyahu et al. (2024) emphasize the need for pro-environmental policy initiatives to reduce environmental degradation while improving people's quality of life and welfare.

In the Indonesian context, environmental degradation is also a serious problem. In the past decade, Indonesia has faced serious problems, including pollution, forest fires, and deforestation, which have impacted social, economic, and health stability. For example, by the end of 2025, the island of Sumatra, which includes Aceh, North Sumatra, and West Sumatra, will face an environmental disaster caused not only by heavy rainfall but also by deforestation and extensive illegal gold mining (Walhi, 2025). Given this problem, pro-environmental consumption behaviour and lifestyle are important factors in promoting sustainability and constitute a form of environmental awareness (Setyari et al., 2024; Judijanto & Purike, 2025). Mitigating climate change and environmental damage cannot rely solely on government policy approaches and pro-environmental technological innovations; it also requires awareness of individuals' and communities' collective behavior towards environmentally friendly Behavior.

Previous studies have shown that pro-environmental behaviour is not shaped by a single factor but is influenced by multiple determinants related to efforts to achieve sustainability. One important determinant is climate change risk perception, which refers to how individuals understand and assess the threat climate change poses to human life and environmental sustainability. Shershunovich (2025) found that climate risk perception had a positive, significant effect on pro-environmental behaviour among respondents aged 18–75 in Belarus. The study also emphasised that pro-environmental behaviour plays a strategic role in preventing natural resource degradation and in supporting climate change mitigation. Similarly, Vrselja et al. (2024) demonstrated that an individual's tendency to act pro-environmentally is influenced by cognitive assessments of climate change risks and the level of concern about their impacts. This means that the stronger the perception of climate change as a risk, the greater the concern, which can encourage environmentally friendly behaviour. Using a structural equation modelling (SEM) approach, Shen et al. (2024) also found that perceived health risks from climate change positively affected pro-environmental attitudes and intentions, which, in turn, contributed to pro-environmental behaviour.

However, Kikko & Ishigaki's (2025) findings showed that the relationship between perceived environmental risks and pro-environmental intentions was not entirely consistent. Of the 17 countries studied, only 5 showed a positive, significant relationship, while the other 12 showed no significant effect. Therefore, this study aimed to specifically examine the influence of perceived climate change risks on pro-environmental behaviour in university communities in Indonesia.

In addition, religiosity is considered an important factor that can shape pro-environmental behaviour, as Islam is a complete way of life that affects all aspects of life (Wijaya et al., 2024). One of the important concepts in Islam, and the foundation of pro-environmental behaviour, is *hifz al-bi'ah* (Environmental Protection). This study sought to determine whether a person's religiosity influences pro-environmental behaviour. However, because religiosity is a general construct with general indicators that lack measurement instruments specific to environmental protection, this study treats environmental attitude not only as a direct variable but also as a mediating variable. The reason is, conceptually, that a person with high religiosity ideally exhibits high environmental behaviour, which, in turn, affects pro-environmental behaviour. For example, research by Qoyum et al. (2022) found that companies with Islamic labels exhibit better environmental performance than those without them.

Based on the explanation above, many previous researchers have explored pro-environmental behaviour, but there remain gaps that warrant further study. First, there is still relatively limited research that combines climate change risk perception, Islamic religiosity, and environmental attitudes within a single model. This research is interesting because Islamic religiosity is used as a determining factor. Explicitly, Islam as a religion and a view of life teaches about the prohibition of destroying nature. In addition, Islamic religiousness in the context of Muslims within the university community in Indonesia and its relation to pro-environment behaviour has not been widely researched. This is important because the Islamic context of religiosity across different socio-cultural contexts can influence how individuals interpret climate change risks and engage in environmental behaviour. Lipnicka & Peciakowski (2021) state

that religiosity affects many aspects of a person's life, even in simple decisions such as attending an event or watching a movie. This research focuses on Muslims within the university community in Indonesia, including students, lecturers, and all educational personnel at the University. The choice of the university community as respondents is because they are the agents of change and the intellectual guardians in the present and the future (Juma-Michilena et al. 2023). The University is also considered an institution that has an important role in adopting environmentally friendly practices through the imparting of knowledge and field practice (Sehar et al., 2022).

This study draws on two main theoretical foundations: the Theory of Planned Behaviour and Risk Perception Theory. The Theory of Planned Behaviour (TPB) is among the most widely used theories for explaining and predicting human behaviour (Alghamadi, 2023). This theory was proposed by Ajzen (1991) and Ajzen & Driver (1991) as an extension of the Theory of Reasoned Action previously formulated by Fishbein & Ajzen (1975). From Ajzen's (1991) perspective, individual behaviour is shaped by three main elements: attitudes toward behaviour, subjective norms, and perceived control over behaviour. In general, this theory explains the factors that can shape a person's intentions and behaviour. In the context of this research, as stated by Alzubaidi et al. (2021), a person with a positive attitude toward environmental protection will be encouraged to take concrete actions that are more environmentally friendly, both direct pro-environmental behaviour, such as turning off electronic devices when not in use, reducing vehicle use, reducing the use of plastic bags when shopping, and indirect pro-environmental behaviour, such as joining environmentalist communities and supporting pro-environmental government policies. TPB in this study provides a logical theoretical basis for environmental attitude variables influencing pro-environmental behaviour, both direct variables and variables that bridge Islamic religiosity and climate change risk perception to pro-environmental behaviour.

Furthermore, risk perception theory states that an individual's perception of a threat is determined not only by objective conditions that can be measured in technical terms but also by how the

risk is subjectively perceived (Slovic, 1987; 2016). This means that a person's behaviour is not solely determined by the reality conditions under which the risk is occurring, but also by how he views and perceives the risk. For example, research by Gunarathnej et al. (2020) indicates that low-carbon consumer behaviour is not solely explained by awareness of climate change but is also influenced by social and psychological factors such as low-carbon self-identity, attitudes, and subjective norms. Therefore, in the context of this study, climate change risk perception is also an important variable to measure how individuals respond to a climate change threat. Interestingly, the Islamic factor of religiosity is also an important part that shapes a person's perception of risk, as Islam emphasises protecting the environment. Research by Shahid et al. (2022) found that high religiosity is associated with investing in companies that prioritise environmental protection.

Some previous research on environmental attitude that also focused on the university community, for example, research by Juma-Michilena et al. (2023) that focuses on the university community in Latin America, Sehar et al. (2022), which focuses on faculty members in higher education institutions in Southern Pakistan, Bravo et al. (2025) that focus on respondents in Peruvian higher education institutions, and Qi et al. 2025) which focuses on Beijing, China's respondents. This research offers novelty by integrating Islamic religiosity and climate change risk perception as factors that affect pro-environmental behaviour, thereby providing deeper insights into universities in Indonesia. Furthermore, this study views environmental attitudes as having a dual role: both as predictors and as mediating variables. Placing environmental attitude as a mediating variable is important, especially when examining whether more religious people are more pro-environment. The two-role approach of environmental attitudes can provide a more comprehensive and detailed explanation of the mechanisms underlying its training.

**MATERIALS AND METHODS**

**Conceptual Framework and Hypotheses Development**

*Islamic Religiosity*

In this study, Islamic religiosity is operationalised through 10 indicators representing three main dimensions, namely Iman (Faith), Islam (Islam), and Ihsan (Ihsan), as contained in the concept of Hadith Jibril (Sahih al-Bukhari, Vol. 6, Book 60, Number 300, Hadith 47). These dimensions were then used as the basis for developing a measurement instrument by Mahudin et al. (2016). This instrument was chosen because it is more appropriate to the context of Islamic religiosity, different from several other religiosity instruments that tend to be general, such as the Religious Commitment Inventory (RCI) developed by Worthington et al. (2003) and the Centrality of Religiosity Scale (CRS) developed by Huber & Huber (2012). Based on the dimensions of faith, Islam, and ihsan, religiosity cannot be seen only from the aspect of belief, but also from the practical and consequential aspects of faith itself. One of the consequences of religiosity in this study is to see its role in shaping pro-environmental attitudes. The logical reason is that the concept of religiosity in Islam also teaches humans who are appointed as *Khalifah* by Allah on earth to be prosperers and guardians of the earth. This pro-environmental attitude is certainly part of *Maqasid al-Shariah*, which is specifically referred to in Islam as the term *hifz al-bi'ah* (Protecting the environment). In

addition, the concept of Islamic moral economy which was substantially introduced by Siddiqi (1981), Naqvi (1981), Chapra (1992), Ahmad (1979, 1994), and Sadr (2000), later developed by (Asutay, 2013) It also explains that human activities, especially economic activities, should not only achieve profits, but must also include the concepts of justice, distribution, problems, and protection of the environment. Therefore, this study proposes the following Hypothesis:

H1: Islamic Religiosity has a significant positive impact on pro-environmental behavior

*Climate Change Risk Perception*

Climate change risk perception refers to how individuals understand, assess, and respond to potential threats arising from climate change, both in the near and long term. In this study, this construct was measured using nine indicators sourced from Leiserowitz (2006) and later used by Latif et al. (2024). Conceptually, climate change risk perception comprises two main aspects: a subjective aspect, reflecting an individual's level of concern about climate change impacts, and a cognitive aspect, reflecting an individual's understanding of climate change issues. Based on this explanation, this study formulates the following hypothesis:

H2: Climate change risk perception has a significant positive impact on pro-environmental behavior.

Figure 1 shows the research framework to explain the hypothesis in more detail.

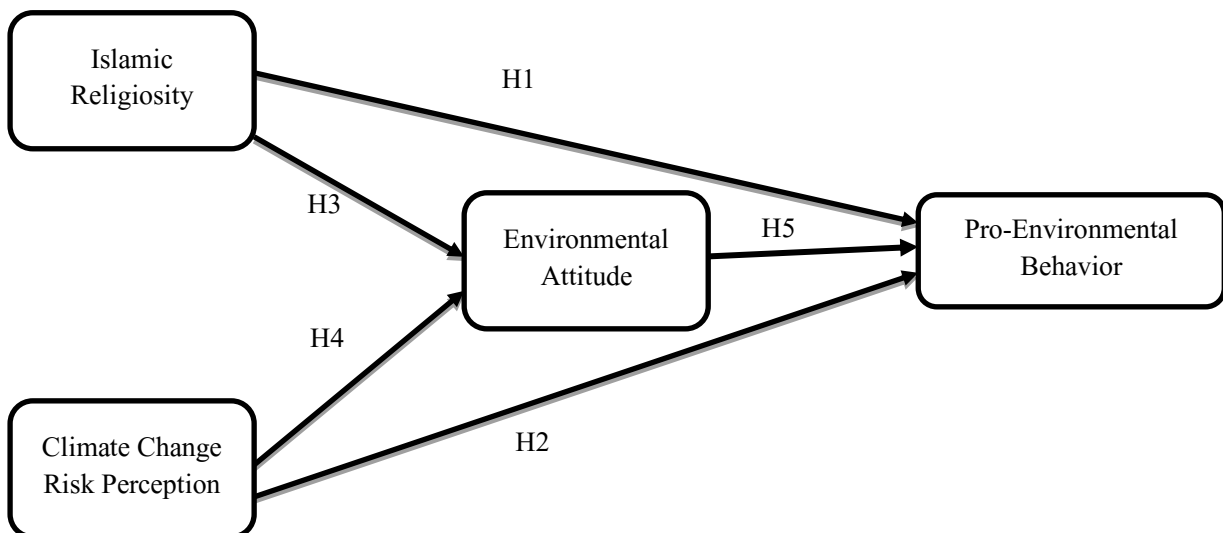


Figure 1. Research Framework

*Environmental Attitude*

The environmental attitude indicators in this study were compiled based on the essence of two main references. First, the article by Uzun et al. (2019) developed the Environmental Attitude Scale, which views environmental attitudes as a multidimensional construct encompassing behavioural, opinion, and emotional dimensions. Second, the article by Hadler & Klosch (2022) explains that environmental attitudes can be understood as concern for environmental issues and encompass affective, cognitive, and conative dimensions, including knowledge, concern, risk assessment, and a tendency to support environmental protection. Based on these two articles, the indicators in this study were not taken directly in the form of original items, but were reformulated to suit the research context, namely respondents' attitudes toward air pollution, hazardous gas emissions, fossil fuel use, renewable energy, energy savings, biodiversity protection, waste management, and water conservation.

H3: Environmental attitudes act as a mediator in the relationship between Islamic religiosity and pro-environmental behaviour.

H4: Environmental Attitudes act as a mediator in the relationship between climate change risk perception and pro-environmental behaviour.

*Pro-Environmental Behaviour*

Pro-environmental behaviour in this study is defined as real actions to protect the environment carried out by individuals stemming from sensitivity to environmental problems (Gazeloglu, 2026). This means that the measurement instrument in this study is not an intention or tendency to take pro-environmental actions, but is an actual action. The pro-environmental behaviour variables in this study used five measurement instruments adopted from Gazeloglu (2026). In this section, the author also wants to answer the fifth hypothesis.

H5: Environmental attitude has a significant positive impact on pro-environmental behavior.

Table 1 explains the item measurements (indicators) of each variable.

Table 1. Items Measurement

Construct	Measure	References
RE1	I strive to balance worldly interests and the afterlife in accordance with the teachings of the Prophet Muhammad (peace be upon him). (Iman)	(Mahudin et al., 2016)
RE2	I avoid actions that I believe will have negative consequences in the afterlife. (Iman)	
RE3	My increasing knowledge should make me more humble (Iman)	
RE4	I teach my family members about the greatness of Allah. (Islam)	
RE5	I feel morally uncomfortable when doing something forbidden, even if others do it too. (Ihsan)	
RE6	I try to prioritize common sense and rational considerations over following my desires. (Iman)	
RE7	I am always grateful for everything I have. (Ihsan)	
RE8	Because of my fear of Allah, I strive always to tell the truth. (Ihsan)	
RE9	I guide my family members to always remember Allah. (Islam)	
RE10	In every phase of my life, I strive to strengthen my relationship with Allah. (Iman)	
RP1	I feel worried about climate change.	(Leiserowitz, 2006); (Latif et al., 2024)
RP2	I am worried that climate change will cause a decline in living standards worldwide.	
RP3	I am worried that water shortages will occur worldwide.	
RP4	I am worried that the number of serious diseases will increase worldwide.	
RP5	I am worried that climate change will affect my standard of living.	

RP6	I am concerned about water shortages in my area.	
RP7	If climate change is not addressed effectively, my risk of experiencing health problems or illness will increase.	
RP8	I view climate change as a serious threat to non-human life, such as animals and plants.	
RP9	I am concerned that the current impacts of climate change are already at a very serious level globally.	
EA1	Actions that cause air pollution contribute to environmental damage.	(Uzun et al., 2019); (Hadler & Klosch, 2022)
EA2	Activities that produce harmful gases further worsen climate change.	
EA3	The use of fossil fuels can hurt the environment.	
EA4	The use of renewable energy sources, such as solar and wind energy, is more conducive to environmental sustainability.	
EA5	Saving energy consumption at home can help reduce negative impacts on nature.	
EA6	Human actions have the potential to damage biodiversity and environmental sustainability.	
EA7	Environmentally friendly waste management, such as recycling, is very important.	
EA8	Excessive water use risks damaging natural resources and reducing the availability of clean water.	
PEB1	I am not willing to change my lifestyle to reduce global warming and climate change. (Reverse)	(Gazeloglu, 2026)
PEB2	I am willing to adopt environmentally friendly practices and encourage others to do the same.	
PEB3	I feel responsible for encouraging my neighbors to adopt measures to address climate change.	
PEB4	I made efforts to adopt measures to address climate change last year.	
PEB5	I will take steps that can reduce the impacts of climate change.	

**Data Collection**

This research was carried out using a quantitative approach by distributing a questionnaire consisting of questions related to the respondent profile, as well as all measuring instruments for the construction of Islamic religiosity, climate change risk perception, environmental attitudes, and their influence on pro-environmental behaviour. The respondents' profiles included questions about age, origin, gender, income, education, and the sources of climate change information they accessed most often. The questionnaire was distributed online via Google Form to the respondents. The data were analysed using the Partial Least Squares (PLS) approach with SmartPLS 4.0. Data were collected from 435

respondents with diverse backgrounds and ages in the university environment, provided they were Muslim and over 17 years old. This study uses a non-probability sampling technique with a purposive-convenience sampling approach, selecting respondents based on certain criteria: individuals over 17 years old in the university environment. Table 2 explains the research details of this research.

This research was conducted among university communities in Indonesia, involving respondents from several universities, including Mulawarman University, UIN Sultan Aji Muhammad Idris Samarinda, Mataram University, SEBI Institute, UIN Sunan Kalijaga Yogyakarta, UIN Mataram, Hamzanwadi University, PTIQ University, Institut

Teknologi Sepuluh Nopember, UIN Raden Mas Said Surakarta, and Jember University. This study used a quantitative, survey-based approach to examine the relationships among Islamic religiosity, climate change risk perception, environmental attitudes, and pro-environmental behavior. The data used were primary data collected through an online questionnaire using Google Forms with a five-point Likert scale. The respondents totaled 435

individuals, consisting of Muslim students, staff, and lecturers aged 17 and over. The sample was selected using a non-probability purposive-convenience sampling technique. The data were then analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 to test the validity, reliability, direct and indirect influences, and the mediation role in the research model.

Table 2. Research Details

Universities	Mulawarman University, East Kalimantan Sultan Aji Muhammad Idris Islamic State University, East Kalimantan Mataram University, West Nusa Tenggara SEBI Institute, West Java Sunan Kalijaga Islamic State University, Yogyakarta Mataram Islamic State University, West Nusa Tenggara Hamzanwadi University, West Nusa Tenggara PTIQ University, Jakarta Sepuluh November Institute of Technology (ITS), East Java UIN Raden Mas Said Surakarta, Central Java Jember University, East Java
Universe	University communities (Students, Lecturers, and Staff)
Sampling Procedures	Non-probability purposive-convenience sampling
Data Collection Method	Online self-administered questionnaire using Google Form with a 5-point Likert scale
Sample Size	435 Respondents (364 College Students, 44 Staff, 27 Lecturers)
Statistical Analysis	SmartPLS 4.0

**Sample Profile**

Table 3 explains the distribution of respondents by gender, age, and education. Based on gender, of the 435 respondents, 159 (36.6%) were male, and 276 (63.4%) were female. There were 297 (68.2%) respondents aged 17-20 years, 130 (29.9%) respondents aged 21-30 years, and 8 (1.9%) respondents aged 31-40 years. If viewed by education level, respondents are: 364 (83.7%) currently studying on campus (college students), 42 (9.6%) who have completed a bachelor's degree (undergraduate), and 29 (6.7%) who have completed a master's degree. In this section, it is clear that from a gender perspective, the majority of respondents are women. Meanwhile, regarding education level, the majority of respondents are university students.

Table 3. Respondents According to Gender, Age, and Level of Education

Respondents	Number	Percent (%)
Gender		
Male	159	36,6
Female	276	63,4
Ages		
17-20	297	68,2
21-30	130	29,9
31-40	8	1,9
Education		
College Student	364	83,7
Undergraduate	42	9,6
Master Degree	29	6,7

**Data Analysis**

This study was analysed using the Partial Least Squares Structural Equation Modelling (PLS-SEM) approach with SmartPLS 4.0 to test the relationships among variables and to expand the research hypothesis. PLS-SEM is used to test predictive research models, including both direct

and indirect relationships. In addition to examining the direct relationship between climate change risk perception and religiosity and pro-environmental behaviour, this study also considers environmental attitude as a mediating variable. All 32 measuring instruments in this study were measured using a Likert scale of 1-5 and then analysed using SmartPLS 4.0. The questionnaire in this study is

limited to the university community throughout Indonesia, including students, staff, and lecturers. To get a more comprehensive picture, the researcher also asked respondents about the climate change information they obtained, allowing them to choose more than one answer. Figure 3 shows the distribution of climate change information sources accessed by respondents.

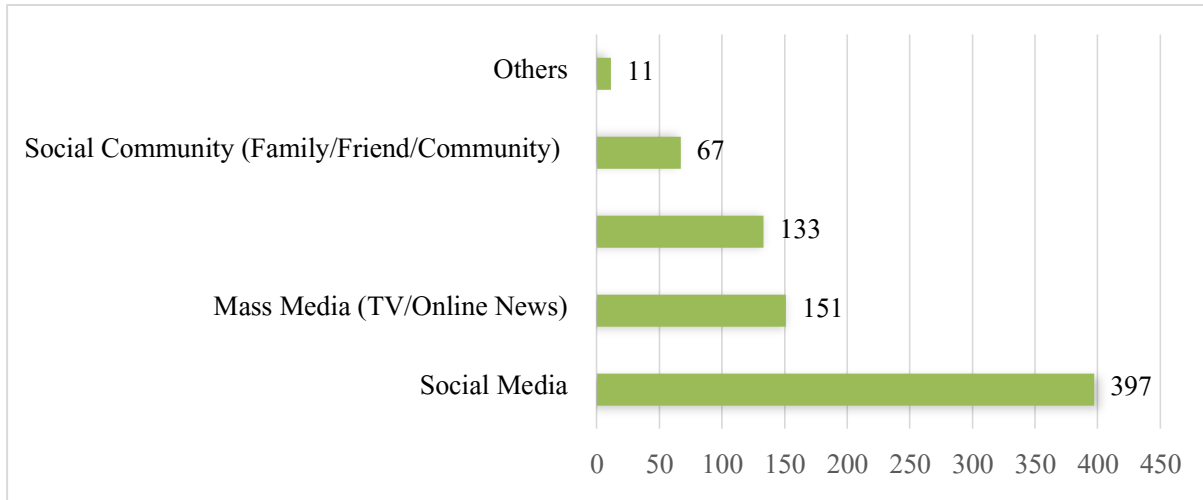


Figure 2. Distribution of Climate Change Information Sources Accessed by Respondents

The initial stage in SEM-PLS analysis is evaluating the measurement model to ensure that each instrument is able to represent the measured construct validly and reliably. This evaluation is carried out by testing the outer loading value, Average Variance Extracted (AVE), Composite Reliability (CR), and Cronbach's Alpha. An indicator is declared valid if its outer loading value is above 0.7. The higher the outer loading value, the stronger the relationship between the measurement indicator and the latent construct it represents. However, in social research, indicators with outer loadings between 0.4 and 0.7 can still be retained if their removal does not substantially increase the AVE and CR values, or does not cause both values to fall below the required limit (Hair et al., 2017).

An indicator is deemed to meet convergent validity if its outer loading and Average Variance Extracted (AVE) values are above the recommended minimum limit. Furthermore, construct reliability is assessed using Composite Reliability (CR) and Cronbach's Alpha to ensure internal consistency between items within each variable. Furthermore, discriminant validity is tested to ensure that each construct has distinct conceptual and empirical relationships with other

constructs in the research model. In addition, the validity of the convergent validity can be seen from an AVE of 0.5 or higher. AVE values below 0.5 should be removed from the analysis to improve data quality (Joe F. Hair et al., 2014). Furthermore, CR and Cronbach's Alpha assess the internal consistency of indicators within each variable (Cronbach & Meehl, 1955). If all constructs are declared valid and reliable, the next stage is to test the research hypothesis, whether each hypothesis is supported or rejected. Testing at this stage is conducted by considering the path coefficient, t-statistic, and p-value obtained through the bootstrapping process in SmartPLS. The relationship between variables is considered to have a positive direction of influence if the path coefficient is positive. Meanwhile, the influence is considered statistically significant if the t-statistic exceeds 1.96 and the p-value is below or equal to 0.05 at the 5% significance level (Hair et al., 2017; Hair et al., 2020).

**RESULTS AND DISCUSSION**

**Assessment of Measurement Model**

Before testing the hypothesis, the researcher first evaluates the measurement model. This stage aims to ensure that the research construct meets validity and reliability standards. Validity in this study includes two types: convergent validity and discriminant validity. Discriminant validity is assessed using the Heterotrait-Monotrait Ratio (HTMT). A further description of the test results is presented in the next section.

*Convergent Validity*

Convergent validity was assessed using outer loadings and AVEs. In the initial stage, the author attempted to explain the external loading for each indicator. An indicator of a variable is said to meet convergent validity if the outer loading value  $\geq 0.7$

(Hair et al., 2017; Hair et al., 2020). According to Hair et al. (2017) and Hair et al. (2020), Indicators with an outer loading value between 0.40 and 0.70 should not be eliminated or can be maintained if their removal does not substantively improve reliability or AVE. Therefore, the authors choose to retain the indicator because, even if eliminated, the construct still meets the criteria for reliability and convergent validity. The most visible thing in this study is the fourth indicator (RP4) of the climate change risk perception variable according to figure 4, where the value is 0.427. Figure 4 shows the results of outer loading from the variables of climate change risk perception (RP), Religiosity (RE), Environmental Attitude (EA), and Pro-Environmental behavior (PEB).

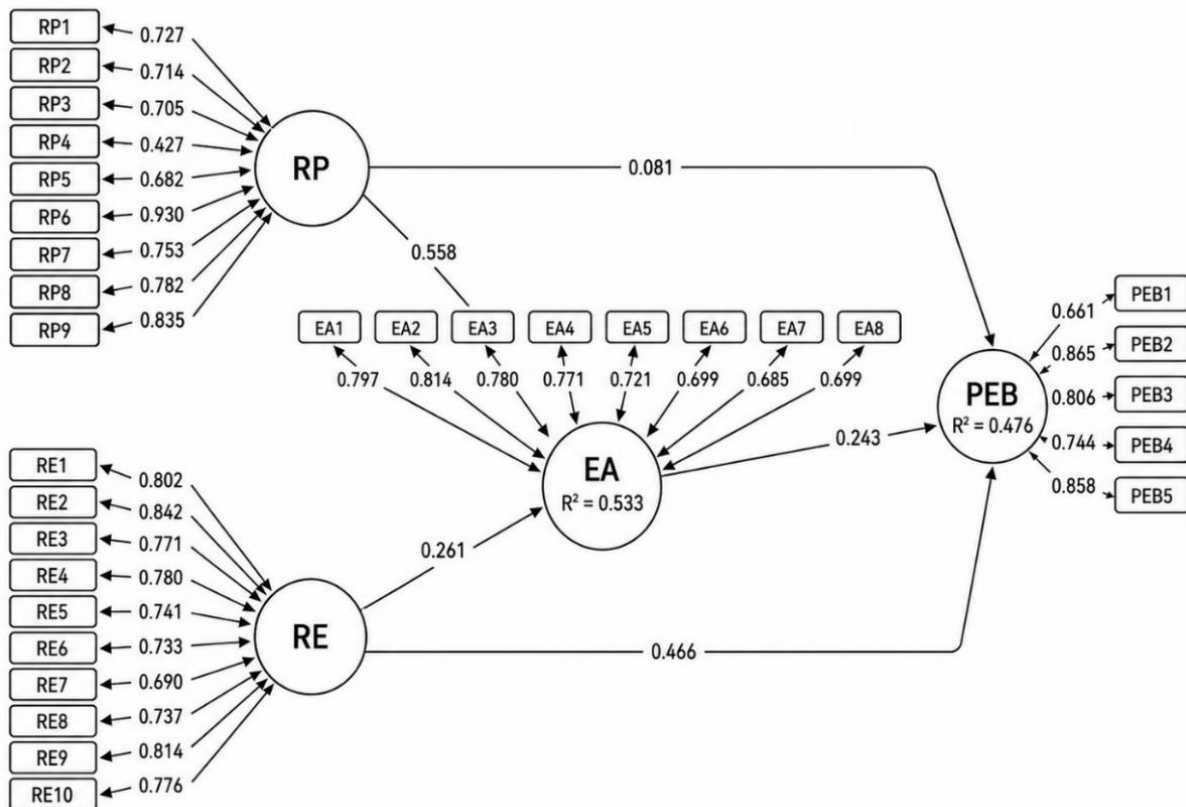


Figure 3. PLS-SEM Measurement Model

Based on this explanation, the authors maintain the RP4 indicator because the AVE and composite reliability remain within safe limits. Without being eliminated, the results of running data in SmartPLS indicate that the AVE for the Risk Perception of climate change variable is 0.547 and the composite reliability is 0.913, which still falls within the range for meeting convergent validity.

After RP4 was deleted, the AVE was 0.595, and the composite reliability was 0.921.

Table 4. Average Variance Extracted (AVE)

Constructs	Average variance extracted (AVE)
EA	0,558
PEB	0,625
RE	0,593
RP	0,547

If we look at all AVE values for the variables in this study, they are all greater than 0.5. Thus, all variables in this study have good convergent validity. In Figure 4, there are two coefficient determinants ( $R^2$ ): Environmental Attitude/EA, a mediation variable with a coefficient of 0.533, and Pro-Environmental Behaviour/PEB, the final dependent variable with a coefficient of 0.476. The  $R^2$  value serves to measure the ability of an independent variable to explain a dependent variable. All  $R^2$  values in this study are included in the moderate category. According to Henseler et al. (2009), Hair et al. (2011), and Hair et al. (2019), an  $R^2$  value of 0.75 is considered substantial, 0.5 is considered moderate, and 0.25 is considered low. In the context of EA variables, the RP and RE variables explain the environmental attitudes variable by 53.3%, and the remaining 46.7% is explained by other variables outside the model in this study.

*Discriminant Validity*

Discriminant validity indicates the degree of difference between a construct and other constructs, as well as the extent to which the indicators can reflect the construct being measured (Hair et al., 2014; 2020). This study uses the Heterotrait-Monotrait Ratio (HTMT) to determine discriminant validity. HTMT is considered valid if the value is below the threshold 0,90 (for conceptually different constructs) or 0,85 (for very similar constructs). If the HTMT value is < 0.90, the discriminant validity is met, indicating that the constructs in this study are unique and do not overlap (Henseler et al., 2015; Hair et al., 2019). The lowest value is found

in the relationship RP ↔ PEB by 0.550, while the highest HTMT value is found in the RP ↔ EA by 0,765. Based on the results of the analysis in this study, all the HTMTs between constructs are below the maximum limit of 0.85, so they meet the criterion of discriminant validity.

Table 5. HTMT Value

No.	Construct Pair	HTMT Value	Remarks
1	PEB ↔ EA	0,626	Accepted
2	RE ↔ EA	0,609	Accepted
3	RE ↔ PEB	0,707	Accepted
4	RP ↔ EA	0,765	Accepted
5	RP ↔ PEB	0,550	Accepted
6	RP ↔ RE	0,565	Accepted

*Reliability Assessment*

In this section, the author explains reliability assessment, including Cronbach's Alpha and composite reliability. Cronbach's Alpha is used to measure how closely the relationship between items within groups (internal consistency) indicates a consistent and reliable variable. The minimum value of Cronbach's Alpha and composite reliability is 0.70; the maximum value is 0.95 to avoid indicator redundancy (Hair et al., 2019). Cronbach's Alpha is the lower bound, and composite reliability is the upper bound for internal consistency reliability. Based on the analysis, this study has a Cronbach's Alpha value and composite reliability of more than 0.7. Table 6 shows the Cronbach's Alpha and composite reliability values of each variable in this study.

Table 5. Cronbach's Alpha and composite reliability value

Construct	Cronbach's Alpha	Composite Reliability	Decision
EA	0.886	0.910	Reliable
PEB	0.849	0.892	Reliable
RE	0.923	0.935	Reliable
RP	0.891	0.913	Reliable

**Hypotheses Testing and Interpretation**

*Hypotheses Testing*

Hypothesis testing aims to assess the relationships between variables in the model, both direct and indirect. The analysis was carried out using the bootstrapping technique in SmartPLS, with reference to the path coefficients, t-statistics, and p-values. A relationship is declared significant if the t-statistic exceeds 1.96 and the p-value is

below 0.05. In this study, the test examines the direct influence of Islamic religiosity (RE), climate change risk perception (RP), environmental attitude (EA), and pro-environmental behaviour (PEB), as well as the indirect influence through environmental attitude as a mediating variable. H1 states that Islamic religiosity positively affects pro-environmental behavior. The results show a  $\beta$  value of 0.466, a t-statistic of 9.659, and a p-value of

<0.001. Thus, H1 is supported. This means that the higher the respondents' Islamic religiosity, the stronger their tendency to behave pro-environmentally. H2 states that climate change risk perception positively affects pro-environmental behavior. The results show a  $\beta$  value of 0.081, a t-statistic of 1.422, and a p-value of 0.155. Because it is not significant, H2 is not supported. This indicates that climate change risk perception is not yet strong enough to drive pro-environmental behavior directly.

H3 stated that environmental attitude mediates the relationship between Islamic religiosity and pro-environmental behavior. The results showed an indirect effect of 0.063, while the direct effect of Islamic religiosity on pro-environmental behavior remained larger, at 0.466. Thus, environmental attitude acts as a partial mediator. H4 stated that environmental attitude mediates the relationship between climate change risk perception and pro-

environmental behavior. The results showed that the indirect effect of 0.136 was greater than the insignificant direct effect of 0.081. Therefore, environmental attitude is a significant mediator in this relationship. H5 stated that environmental attitude has a positive effect on pro-environmental behavior. The results showed a  $\beta$  value of 0.243, a t-statistic of 4.507, and a p-value <0.001. Therefore, H5 was supported. This means that the more positive respondents' attitudes toward the environment, the more likely they are to engage in pro-environmental behavior. In general, the test results indicate that Islamic religiosity has a strong direct influence on pro-environmental behavior, while climate change risk perception plays a larger role through the formation of environmental attitudes. For more details, the results of the direct effect and mediation effect analysis can be seen in Tables 6 and 7.

Table 6. Direct relationship test results

Relationship	Path Coefficient	STDEV	t-statistics	p-values	Decision
RE → PEB	0.466	0.048	9.659	0.001	Supported
RP → PEB	0.081	0.057	1.422	0.155	Not Supported
RE → EA	0.261	0.047	5.610	0.001	Supported
RP → EA	0.558	0.049	11.487	0.001	Supported
EA → PEB	0.243	0.054	4.507	0.001	Supported

Table 7. The mediation effect

Mediation Path	Direct Effect	Indirect Effect	Total Effect	Interpretation
RE → EA → PEB	0.466	0.063	0.529	The direct effect is more dominant than the mediation effect.
RP → EA → PEB	0.081	0.136	0.217	The mediation effect is stronger than the direct effect.

**Interpretation**

The research results indicate that pro-environmental behavior in the university community is influenced not only by awareness of environmental issues but also by Islamic religiosity, attitudes, and risk perceptions. The finding that Islamic religiosity has a positive and significant effect on pro-environmental behavior indicates that religious values can serve as a moral foundation that encourages individuals to act more responsibly towards the environment. In this context, religiosity is understood not only as personal beliefs but also as a value orientation that can shape concern, responsibility, and concrete actions in protecting the

environment. This finding is in line with Muralidharan & Ferle's (2024) findings in the Christian context and research by Karimi et al. (2022) in Iranian rural females. Thus, religiosity not only fosters a positive attitude towards the environment but also directly encourages pro-environmental behaviour. The research results also show that climate change risk perception does not have a significant direct effect on pro-environmental behavior. This finding indicates that awareness or concern about climate change risks does not necessarily automatically translate into pro-environmental action. A person may understand that climate change is a serious threat, but this

understanding alone is not sufficient to drive behavioral change unless it is accompanied by a positive environmental attitude. Thus, risk perception functions more as an initial factor shaping one's perspective on the environment, rather than as a direct driver of behavior. The role of environmental attitude is crucial in this research model. Environmental attitude has been shown to have a positive effect on pro-environmental behavior and also acts as a mediator.

In the relationship between climate change risk perception and pro-environmental behavior, environmental attitude serves as the primary mechanism linking the two. This means that perception of climate change risk must first form a positive attitude toward the environment before ultimately driving pro-environmental behavior. Meanwhile, in the relationship between Islamic religiosity and pro-environmental behavior, environmental attitude serves as a partial mediator, as religiosity still exerts a stronger direct influence on pro-environmental behavior. This study's results demonstrate that strengthening pro-environmental behavior within the university environment requires two approaches. First, increasing understanding and awareness of the risks of climate change to foster more positive environmental attitudes. Second, internalizing religious values that emphasize human responsibility for preserving nature. Therefore, strategies for developing pro-environmental behavior within the university community should not be based solely on environmental information; they should also address attitudes, moral values, and sustainability awareness.

The indirect influence of religiosity on pro-environmental behaviour through environmental attitude was obtained by multiplying the coefficients RE to EA (0.261) and EA to PEB (0.243), yielding an indirect effect of 0.063. At the same time, the direct influence of RE to PEB remained positive and significant at 0.466. These results show that religiosity influences pro-environmental behaviour through two paths: directly and indirectly via environmental attitudes. Thus, the authors found that the role of environmental attitude mediation in the relationship between religiosity and pro-environmental behaviour can be understood as partial. This means that environmental attitudes do explain some of the mechanisms underlying religiosity's influence on

pro-environmental behaviour, but they are not the only path of influence.

Overall, the results of the hypothesis test indicate that environmental attitude plays an important role in the research model. Environmental attitudes not only directly affect pro-environmental behaviour but also serve as a mechanism that bridges the influence of risk perception and religiosity on it. However, the mediation patterns differ across the two paths. In the relationship between risk perception and pro-environmental behaviour, environmental attitudes play a stronger role because the direct influence is not significant. On the other hand, in the relationship between religiosity and pro-environmental behaviour, environmental attitudes serve only as a partial mediator, as religiosity still exerts a strong direct influence on pro-environmental behaviour.

## **CONCLUSION**

This study concludes that pro-environmental behavior in Muslim university communities in Indonesia is influenced by Islamic religiosity, perceptions of climate change risk, and environmental attitudes. The analysis shows that Islamic religiosity positively and significantly influences environmental attitudes and pro-environmental behavior. This finding indicates that religious values not only serve as personal beliefs but also provide a moral foundation that encourages individuals to show concern and responsibility for the environment. Meanwhile, climate change risk perception was found to affect environmental attitudes positively but did not have a significant direct effect on pro-environmental behavior. This suggests that awareness of the threat of climate change does not necessarily lead to pro-environmental actions unless the formation of positive environmental attitudes accompanies it.

This study also emphasizes the importance of environmental attitudes as a mediating mechanism in the research model. In the relationship between climate change risk perception and pro-environmental behavior, environmental attitudes act as the primary pathway bridging the two. This means that individuals who are aware of the risks of climate change are more likely to engage in pro-environmental behavior if that awareness has previously led to a positive attitude toward the environment. On the other hand, in the relationship

between Islamic religiosity and pro-environmental behavior, environmental attitudes act as a partial mediator. This means that Islamic religiosity can encourage pro-environmental behavior both directly and indirectly through environmental attitudes. Thus, environmental attitudes play a central role in explaining how risk perceptions and religious values translate into concrete behaviors that protect the environment.

Theoretically, this study contributes by integrating Islamic religiosity, climate change risk perceptions, environmental attitudes, and pro-environmental behavior into a single empirical model. This study extends the use of the Theory of Planned Behavior and Risk Perception Theory by incorporating Islamic religiosity as a relevant source of moral values to explain pro-environmental behavior. Furthermore, this study strengthens the understanding that environmental attitudes act not only as direct predictors but also as mediating variables, explaining the relationships among cognitive factors, religious values, and pro-environmental behavior. This contribution is important because studies on pro-environmental behavior in Muslim university communities in Indonesia remain relatively limited.

In practice, the results of this study have implications for higher education institutions in designing strategies to strengthen pro-environmental behavior. Efforts to build a sustainable campus are not limited to providing information on climate change; they also need to foster positive environmental attitudes and internalize religious values that emphasize human responsibility for preserving nature. Universities can develop environmental education programs, energy-saving campaigns, waste management initiatives, the use of environmentally friendly energy sources, and religious value-based activities that emphasize environmental protection. Thus, promoting pro-environmental behavior within the university environment can be achieved through a more integrative approach that combines climate risk literacy, environmental attitude-building, and strengthening religious values.

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