EDUCO
Environment Education and Conservation
EDUCO 2(1): 38-57
ISSN 3062-8210

Institute for Advanced Science, Social and Sustainable Future
MORALITY BEFORE KNOWLEDGE

Understanding pro-environmental behavior: A comparative analysis of rural and urban communities for environmental education and conservation

Hafidz Adhitya Himawan[1,*], Naulita Pramanti[1], Ashurzoda Shahboz[1]
[1] *Department of Environmental Science, Graduate School of Sustainable Development, Universitas Indonesia, Central Jakarta, DKI Jakarta 10430, Indonesia.*
*Correspondence: h.adhityahimawan@gmail.com

Received Date: January 15, 2025 Revised Date: February 27, 2025 Accepted Date: February 28, 2025

ABSTRACT

Background: Environmental degradation and climate change have emerged as major global issues, largely driven by human activities such as the intensive exploitation of natural resources. At the same time, humans play a key role in mitigating environmental damage through pro-environmental behavior, defined as actions that reduce negative environmental impacts and improve environmental quality. Pro-environmental behavior is influenced by individuals' emotional attachment to their social groups and living environments. This study explores differences in pro-environmental behavior between urban and rural communities, focusing on the distinct factors shaping such behavior in each setting. **Methods:** This study adopted a literature review approach by analyzing 13 accredited scientific articles addressing pro-environmental behavior in urban and rural communities across Asia, Europe, and America. Relevant studies were obtained from reputable scientific databases, allowing for a systematic synthesis of existing research findings. **Findings:** The findings show that both urban and rural communities engage in pro-environmental behavior, although the driving factors vary. Rural communities tend to exhibit stronger social cohesion and closer relationships with the natural environment, which significantly influence their environmental actions. In contrast, urban communities generally have higher levels of environmental knowledge but often demonstrate skepticism regarding collective environmental responsibility. These differences are shaped by sociodemographic, cultural, and geographical conditions. **Conclusion:** Pro-environmental behavior differs between rural and urban communities due to variations in social, cultural, and geographical contexts. Understanding these differences is crucial for developing targeted strategies and policies to promote environmentally responsible behavior across diverse community settings. **Novelty/Originality of this article:** This study offers a comparative perspective on pro-environmental behavior in rural and urban communities across multiple regions, emphasizing the role of sociodemographic, cultural, and geographical factors in shaping environmental actions. Such a comprehensive comparative approach remains relatively underexplored in existing literature.

KEYWORDS: behavior; pro-environment; community; urban; rural.

1. Introduction

Environmental degradation is a global responsibility shared by all nations. Every country must collaborate and coordinate to protect the environment. Environmental damage can occur on an international scale, affecting multiple regions and leading to severe consequences such as soil, water, and air contamination (Khalatbari & Abbas, 2019). Although environmental degradation and climate change have become global issues, these concepts remain difficult for some individuals to comprehend, as they do not perceive themselves as part of nature (Sörqvist & Langeborg, 2019). This detachment between

Cite This Article:
Himawan, H. A., Pramanti, N., & Shahboz, A. (2025). Understanding pro-environmental behavior: A comparative analysis of rural and urban communities for environmental education and conservation. *Environment Education and Conservation, 2*(1), 38-57. https://doi.org/10.61511/educo.v2i1.2025.1712

humans and nature prevents individuals from fully considering the environmental consequences of their actions.

Humans may become the primary contributors to environmental degradation when the exploitation of natural resources continues unchecked. One prominent example is the decline of mangrove ecosystems, which is largely attributable to human activities such as deforestation and the conversion of land for agricultural and aquaculture uses (Kotijah & Ventyrina, 2019). Land-use changes associated with tourism development, agriculture, livestock production, and industrial activities pose serious risks to ecosystem balance and biodiversity. In addition, environmental pollution resulting from human actions, including oil spills and the release of industrial waste, leads to contamination of soil and water resources. Environmental conservation requires a society that is capable, aware, and responsible in preventing and managing potential environmental damage arising from human activities (Foulon, 2019). Consequently, concrete measures are needed to ensure that environmental considerations are incorporated into all human activities. Human behavior therefore plays a vital role in mitigating environmental degradation and climate change (Bradley et al., 2020). Environmentally responsible behavior is commonly known as pro-environmental behavior (PEB). PEB refers to actions undertaken to reduce or prevent negative impacts on the environment (Li et al., 2019). Another definition describes pro-environmental behavior as a set of actions that support the natural environment, improve environmental quality, and minimize environmental damage as much as possible (Larson et al., 2015).

Pro-environmental behavior plays an essential role in shaping the relationship between humans and the natural environment. Human actions that are oriented toward environmental concerns can reduce ecological degradation and contribute to the conservation of natural resources (Larson et al., 2015). Pro-environmental behavior (PEB) can be categorized according to its impact and underlying purpose (Huang, 2016). From an impact-based perspective, PEB encompasses actions that generate positive effects on resource availability, energy consumption, and ecosystem processes. When viewed from a purpose-oriented perspective, PEB refers to behaviors performed with the intention of influencing environmental conditions from the actor's viewpoint. Impact-based PEB is further classified into public-sphere and private-sphere environmentalism (Huang, 2016). Public-sphere PEB consists of both active and passive forms of participation. Active behaviors involve direct involvement, such as engaging in environmental organizations or participating in environmental protests, while passive behaviors include membership and indirect support of environmental groups. In contrast, private-sphere PEB relates to individual lifestyle practices, including consumption behavior, household appliance use, waste management practices, water and energy conservation, environmentally friendly transportation, and green purchasing decisions (Huang, 2016; Meloni et al., 2019). To date, the majority of research on PEB has concentrated on behaviors within the private sphere.

The determinants of PEB have been widely explored in environmental psychology studies. Identity-related dimensions frequently linked to pro-environmental attitudes and behaviors include social identity, place identity, environmental self-identity, urban identity, and attachment to one's place of residence (Meloni et al., 2019). Other factors influencing environmental behavior include an individual's affiliation with social groups and their perception of sustainability. Affective connections to one's place of residence also play a role in shaping PEB (Song et al., 2019). When individuals perceive a place as valuable and significant, they are more likely to make concerted efforts to protect it. This concept is closely related to the type of settlement in which people reside, whether rural or urban.

According to Dasgupta et al. (2014), rural areas are defined as regions located outside urban centers, characterized by low population density and dispersed settlement patterns. In contrast, urban areas are marked by significantly higher population densities (Food and Agriculture Organization, 2018). Rurality is commonly described through three main dimensions: the distribution of settlements, patterns of land use and land cover, and the geographical distance from urban centers. Rural communities are often more susceptible to environmental degradation and the ineffective implementation of natural resource

management policies (Dasgupta et al., 2014). Environmental pollution in rural areas represents a critical challenge, as the responsibility for managing pollution frequently exceeds local economic capacity and levels of environmental awareness. Rural populations generally exhibit lower levels of awareness regarding pro-environmental behavior (Yang, 2020). Nevertheless, the environmental behavior of rural residents plays an important role in supporting environmental conservation efforts and governance processes (Yang et al., 2022).

The primary difference between urban and rural areas is reflected in variations in settlement density and the concentration of populations (Food and Agriculture Organization, 2018). At present, more than half of the world's population lives in urban regions, and this proportion continues to increase (Revi et al., 2014). Rapid urban growth and ongoing urbanization have introduced new environmental challenges. Large cities increasingly experience environmental crises, which are often accompanied by low levels of public engagement in pro-environmental behavior. This condition may result from insufficient promotion of PEB as well as limited public trust in governmental initiatives to resolve environmental problems, ultimately leading to low compliance with existing environmental regulations (Song et al., 2019).

Urban and rural communities demonstrate distinct ways of perceiving and interacting with the environment, which in turn shape their levels of environmental awareness and the adoption of pro-environmental behavior (PEB). Recognizing these differences is important for conducting comparative analyses of PEB between urban and rural populations. Such comparisons provide valuable insights into the factors that may explain variations in environmental behavior across these contexts. Accordingly, this study aims to investigate pro-environmental behavior among urban populations at a global scale, examine pro-environmental behavior within rural communities worldwide, and analyze the differences in PEB between urban and rural societies.

2. Methods

The materials for this study were collected through a literature review conducted using searches in accredited scientific databases, including Elsevier, Google Scholar, and SAGE Journals. The search process targeted publications related to pro-environmental behavior, pro-environmental behavior in rural settings, and pro-environmental behavior in urban contexts. During the initial phase, three researchers independently extracted relevant information from selected articles to enable cross-validation. The researchers then distributed the workload by focusing on literature from three geographical regions—Europe, Asia, and America. Subsequently, each researcher performed a detailed review of the assigned articles, and the findings were summarized and presented in a tabular format to improve clarity and facilitate understanding.

This article employs a systematic literature review using a descriptive review approach. A systematic review is a form of literature review that applies a structured and repeatable method by collecting and analyzing secondary data, with the data search conducted in a systematic manner (Nunn & Chang, 2020). In addition, a systematic review aims to present a summary through a critical synthesis of available evidence (Purssell & McCrae, 2020), in which research questions are formulated, and relevant data are identified and synthesized in accordance with the objectives of the review (Nunn & Chang, 2020). Within the scope of literature reviews, several types are commonly employed by researchers, including narrative, descriptive, scoping, critical, meta-analysis, qualitative systematic, umbrella, theoretical, and realist reviews (Kosztyán et al., 2021; Paré et al., 2015; Xiao & Watson, 2019).

This study adopts a descriptive review approach, as it enables the identification of empirical studies conducted previously to reveal interpretable patterns over a specific period. This approach involves collecting and analyzing numerical data that represent the frequency of theories, methodological approaches, and research themes reported in the literature (Kosztyán et al., 2021; Paré et al., 2015). Furthermore, this study addresses

several related research questions, namely: how pro-environmental behavior is manifested in rural communities worldwide, how pro-environmental behavior is exhibited in urban communities globally, and how rural and urban communities differ in the implementation of pro-environmental behavior. Accordingly, the use of a descriptive review is considered appropriate, as the search process is conducted in a structured manner and results in a representative and selective sample derived from a global literature search.

The literature review process applied in this article consists of seven stages, namely: formulating the research problem, developing and validating the literature review protocol, searching for relevant references, screening studies based on inclusion criteria, assessing the quality of the selected literature, analyzing the data, and reporting the results (Xiao & Watson, 2019). It is important to note that these stages may be iterative rather than strictly linear. During the review process, unforeseen issues may arise, which can require adjustments or refinements to the previously formulated research questions.

The following section provides a more detailed description of each stage of the literature review process. Stage 1: Problem formulation. At this stage, the outcome of the problem formulation is the development of research questions that guide the entire literature review process. All subsequent stages of the review are directed toward addressing these research questions. In this article, the formulated research questions focus on how pro-environmental behavior is manifested in rural communities worldwide, how pro-environmental behavior is exhibited in urban communities globally, and how rural and urban communities differ in implementing pro-environmental behavior. Stage 2: Development and validation of the literature review protocol. This stage involves the development and validation of the literature review protocol, which is conceptually equivalent to a research design. The protocol is intended to enhance the quality and reliability of the literature review by minimizing potential researcher bias during data selection and analysis, as well as by enabling the use of the same protocol for replication, cross-checking, and verification (Xiao & Watson, 2019). Prior to implementation, the protocol must be validated to improve the accuracy of the literature review results. In this article, a descriptive review is employed; therefore, the literature review protocol is developed in accordance with the characteristics of this review type.

Stage 3: Literature searching. At this stage, the quality of the literature review largely depends on the outcomes of a systematic literature search. Several key aspects must be considered during the search process (Xiao & Watson, 2019), including the sources of literature, which generally consist of three main types: electronic databases, backward searching, and forward searching. In this article, literature sources include Elsevier, SAGE Journals, and Google Scholar. The search keywords are derived from the research questions; in this study, the keywords used are *pro-environmental behavior*, *rural communities*, and *urban communities*. The sampling strategy and search methods are designed in accordance with the objectives of the selected literature review type, allowing the results to be either comprehensive or selective and representative. In this article, a selective and representative strategy is employed. The initial search results are further refined by applying additional criteria, such as publication language, publication period, and source of financial support. Specifically, this study includes English-language publications published between 2012 and 2022, studies conducted in three continents (Asia, America, and Europe), and articles available in full-text format. The stopping rule is applied when repeated searches yield the same references or no new relevant studies, indicating that the literature search process has reached saturation and can be concluded.

Stage 4: Screening based on inclusion criteria. At this stage, the screening process is conducted in two steps to ensure efficiency. The first step involves an initial screening based on a review of abstracts, followed by a preliminary quality assessment through full-text reading. The second step consists of advanced screening, in which articles are evaluated based on their alignment with the research questions to exclude inappropriate studies. In cases of uncertainty regarding article eligibility, the study should be included to maintain an inclusive approach (Xiao & Watson, 2019). In this article, the inclusion criteria require that the literature addresses pro-environmental behavior in rural communities worldwide,

pro-environmental behavior in urban communities globally, or the differences in pro-environmental behavior between rural and urban communities. Stage 5: Literature quality assessment. At this stage, the assessment of literature quality functions as a final filter for the selected full-text articles and represents the last step before data analysis. In this article, the quality assessment is conducted to determine whether the selected literature is relevant to the research topic and suitable for inclusion in the analysis.

Stage 6: Data Analysis. At this stage, the analysis is conducted based on the data extracted from the selected literature. The findings can be presented through tables, graphs, or narrative descriptions. In this study, the results of the data analysis are systematically presented in tabular form to facilitate clarity and comprehension. Stage 7: Reporting Findings. The final stage involves synthesizing and reporting the results of the literature review, transforming them into findings that can inform and guide subsequent research. In this article, the literature review results are structured according to the specific research topic defined by the author and are subsequently presented as a scholarly article in the field of environmental science.

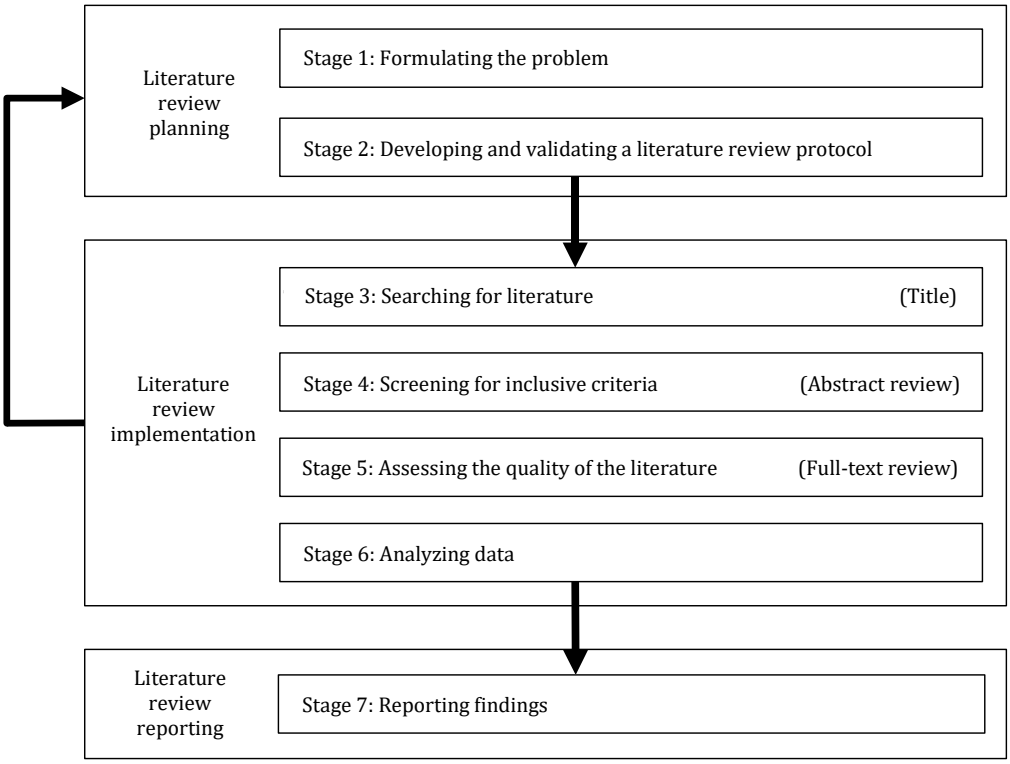

Fig. 1. Stages in literature review
(Xiao & Watson, 2019)

3. Results and Discussion

3.1 Result

The following are the results of a literature review conducted on 13 selected articles related to pro-environmental behavior in rural and urban areas.

Table 1. Results of literature review on pro-environmental behavior in rural and urban areas

No	Title	Writer	Journal (Year)	Location	Objective	Findings/Results	
						Rural community	Urban society
1	Impacts of pecuniary and non-pecuniary information on pro environmental behavior: A household waste collection and disposal program in Surabaya city	Setiawan et al.	Waste Management (2019)	Surabaya City, Indonesia	To examine the effects of monetary and non-monetary information on preferences and willingness to pay (WTP) for enhanced waste collection and disposal programs.	-	The findings indicate that the separation of non-organic waste and the use of recycling as a treatment technology have a significant positive influence on the level of public support. In addition, financial information was found to affect household preferences regarding payments for improved waste collection and disposal programs. Further results show that the provision of financial information increases willingness to pay (WTP) by 20.5%, whereas non-financial information has a negative but statistically insignificant effect on WTP.
2	Evaluating determinants of rural Villagers' engagement in conservation and waste management behaviors based on integrated conceptual framework of Pro environmental behavior	Janmaimool & Denpaiboon	Life Sciences, Society, and Policy (2016)	Nernkhor Sub District, Rayong Province, Thailand	To assess the factors influencing villagers' participation in pro-environmental behavior (PEB), encompassing ecological conservation behavior (ECB) and waste management behavior (WMB).	The results indicate that individual participation in ecological conservation behavior (ECB) and waste management behavior (WMB) can be effectively explained by different sets of predictors. ECB is strongly associated with self-efficacy, place identity, and perceived environmental values, whereas WMB is primarily influenced by community norms, gender, age,	-

						knowledge related to action strategies, and self-efficacy. Examples of ECB include participation in biological activities and ecological conservation efforts, while WMB involves practices such as product use and recycling, as well as waste reduction behaviors. Accordingly, enhancing villagers' engagement in pro-environmental behavior requires the implementation of differentiated environmental strategies tailored to these behavioral domains.	
3	Altruism, environmental concerns, and pro environmental behaviors of urban residents: A case study in a Typical Chinese City	Xu et al.	Frontiers in Psychology (2021)	China	To examine the relationship between altruism, environmental concern, and pro-environmental behavior among the general public beyond self-interested NIMBYism.	-	The findings indicate that a worldview emphasizing human dominance is negatively associated with pro-environmental behavior at both the individual and organizational levels. In contrast, an ecocentric worldview shows a positive relationship with pro-environmental behavior at the individual level. Furthermore, altruistic behavior is positively related to pro-environmental behavior, suggesting that awareness of ecological crises and altruism can encourage the adoption of pro-environmental

							behavior in China. Examples of pro-environmental behavior identified in the study include waste sorting, reducing plastic consumption by using reusable shopping bags, utilizing phosphorus-free detergents, and participating in environmental protection activities.
4	Explaining pro-environmental behavior of farmers: A case of rural Iran	Savari et al.	Current Psychology (2021)	Khuzestan Province, Iran	To identify and examine the factors that determine the implementation of pro-environmental behavior among Iranian farmers.	The findings show that farmers most frequently adopted pro-environmental practices related to the use of new irrigation technologies to reduce water loss, as well as the application of livestock manure and organic fertilizers, compared with other forms of pro-environmental behavior. In contrast, practices such as planting cover crops and retaining crop residues on the soil surface rather than burning them were less commonly implemented than other pro-environmental behaviors.	-
5	Exposure to Urban Nature and Tree Planting Are Related to Pro-Environmental Behavior via Connection to Nature, the Use of Nature for	Whitburn et al.	Environmental Behavior (2019)	Wellington City, New Zealand	To investigate urban residents' involvement in tree-planting programs and their residence in 20 neighborhoods	-	The results found that how important the relationship between urban residents and nature is to PEB. The level of vegetation in the surrounding environment and involvement in planting schemes can explain

	Psychological Restoration, and Environmental Attitudes				with different degrees of greenness, and to evaluate the mediating role of key psychological factors in these relationships.		46% of the variance in PEB and relationships with nature. Then the use of nature for psychological restoration and environmental attitudes can also mediate the relationship. Relationships with nature are stronger related to involvement in PEB than the use of nature for psychological restoration and environmental attitudes.
6	Associations between pro-environmental behavior and neighborhood nature, nature visit frequency, and nature appreciation : Evidence from a nationally representative survey in England	Alcock et al.	Environmental International (2020)	English	To assess how exposure to nature, defined in terms of green space availability, coastal proximity, and recreational nature visits, relates to environmental appreciation and pro-environmental behaviors reported by adults in the United Kingdom.	The findings indicate a positive association between recreational visits to natural environments, nature appreciation, and pro-environmental behavior across different samples and socio-demographic groups. Individuals who engage more frequently in recreational nature visits and demonstrate higher appreciation of nature tend to report higher levels of pro-environmental behavior. The results also show that rural and coastal residents exhibit stronger pro-environmental tendencies on average, as reflected in the positive relationship between pro-environmental behavior, access to green spaces, and proximity to coastal areas across both high- and low-socioeconomic households. Enhancing access to and interaction with natural environments through improved urban planning is therefore identified as a viable strategy for supporting sustainability objectives. Examples of pro-environmental behaviors observed in this study include recycling, purchasing environmentally friendly products and locally produced food, choosing walking or cycling over driving, encouraging others to engage in environmental protection, and participating in environmental volunteering activities.	
7	Rural–Urban Divide: Generation Z and Pro-Environmental Behavior	Dąbrowski et al.	Sustainability (2022)	Poland	To examine the factors influencing pro-environmental behavior among Generation Z from	-	The findings indicate that the type of residential setting influences Generation Z's pro-environmental attitudes as well as the perceived barriers to

					the perspective of a post-socialist European country, namely Poland.		engaging in pro-environmental behavior. Furthermore, the pro-environmental practices commonly adopted by Generation Z include purchasing second-hand goods, sorting waste, reducing plastic consumption, conserving resources, using public transportation, opting for environmentally friendly personal transport, and participating in climate-related protests.
8	Pro-environmental behavior in the European Union countries	Mikuła et al.	Energies (2021)	European Union Countries (Eu-27)	This study aims to evaluate pro-environmental behavior (PEB) across European Union countries by comparing conditions in 2009 and 2019.	-	The findings indicate that the use of renewable energy for heating and cooling has the strongest influence on national pro-environmental behavior, followed by the rate of municipal waste recycling. In contrast, the share of public transport in total passenger transportation shows the least significant contribution in Europe. Furthermore, Northern European countries within the European Union demonstrate a positive benchmark in terms of pro-environmental behavior.
9	Sustainable consumption behavior of Europeans: The influence of environmental	Saari et al.	Ecological Economics (2021)	European Union (EU) and European Free Trade	To examine the ways in which environmental knowledge and risk perception affect individual	-	The findings indicate that sustainable consumption behavior in Europe is closely linked to environmental concern, which is shaped by higher levels of environmental knowledge and

	knowledge and risk perception on environmental concern and behavioral intention			Association (EFTA)	sustainable consumption behavior, mediated by environmental concern and behavioral intention.		perceptions of environmental risk. Examples of such behaviors include purchasing fruits and vegetables free from pesticides, reducing household energy or fuel consumption, and using water more efficiently. These findings are valuable for monitoring potential changes in sustainable consumption patterns among Europeans as they move toward a green economy.
10	Connectedness to Nature and Pro-Environmental Behavior from Adolescence to Adulthood: A Comparison of Urban and Rural Canada	Anderson & Krettenauer	Sustainability (2021)	Canada	This study aims to examine contextual variations in emotional connectedness to nature (ECN) by analyzing its relationship with pro-environmental behavior (PEB) at the national level.	The results indicate that the relationships between age, gender, and emotional connectedness to nature (ECN) do not differ between urban and rural communities, nor between males and females. Age has a significant effect on pro-environmental behavior (PEB), with adolescents exhibiting lower levels of PEB compared to adults. Gender also significantly influences PEB, as women demonstrate higher levels of pro-environmental behavior than men. In addition, individuals living in urban areas show higher levels of PEB than those residing in rural areas. However, the relationships between age and gender with PEB do not vary across urban and rural contexts. ECN is found to significantly mediate the relationship between age and PEB, indicating that older individuals tend to exhibit higher levels of pro-environmental behavior through stronger emotional connectedness to nature. Examples of PEB identified in this study include recycling practices, proper waste disposal, and transportation choices.	
11	Predictors of Pro-Environmental Behavior in Rural American Communities	Takahashi & Selfa	Environment and Behavior (2015)	Iowa and Kansas, Midwestern United States	This study aims to examine the relationships between community attachment factors,	The findings indicate that both community attachment and environmental attitudes significantly influence pro-environmental behavior.	-

					community satisfaction, and environmental attitudes in shaping pro-environmental behavior (PEB) among rural communities with limited facilities.	Residents with longer lengths of residence tend to exhibit stronger attachment to their community. In the study area, community attachment was found to have a significant effect on environmental behavior, whereas community satisfaction showed no significant influence. Examples of pro-environmental behaviors identified in this study include purchasing biodegradable or recyclable products, reducing household waste by choosing products with minimal packaging, avoiding the use of chemicals in home gardening, donating to environmental initiatives, and composting household kitchen waste.	
12	Understanding Attitudes and Pro-Environmental Behaviors in Chilean Communities	Bronfman et al.	Sustainability (2015)	Santiago, Chile	To investigate the environmental behavior of Chilean communities and identify the factors that influence it.	-	The findings indicate that most of the population examined demonstrated a strong inclination toward supporting responsible environmental behavior. Participants showed a high level of concern for environmental issues, reflected in their awareness of the consequences associated with

							inadequate environmental protection. Older individuals tended to exhibit higher levels of pro-environmental behavior. Examples of pro-environmental behaviors identified in this study include conserving electricity and water, engaging in environmentally responsible consumption, protecting biodiversity, using cars more rationally, and practicing environmentally sound waste management.
13	Expectations of others' environmental behavior and its effect on personal pro-environmental behavior	Vanegas-Rico et al.	PsyEcology (2022)	Mexico City	To analyze respondents' expectations of others' behavior in terms of environmental protection or degradation, and to determine whether these expectations are associated with respondents' pro-environmental behavior (PEB).	-	The findings indicate a tendency among respondents to underestimate others' capacity to protect the environment, expecting instead that they would cause environmental harm. In contrast, respondents rated their own families positively in terms of pro-environmental behavior, while neighbors and nearby community members received lower ratings. Overall, the stronger respondents' beliefs that others would engage in environmentally harmful actions, the more likely they were to exhibit pro-environmental behavior themselves.

3.2 Discussion

This discussion is structured into three sections aligned with the research objectives, pro-environmental behavior in rural communities worldwide, pro-environmental behavior in urban communities globally, and the differences in pro-environmental behavior between rural and urban communities. Each section is discussed in detail below.

3.2.1 Pro-environmental behavior in rural communities around the world

Rural communities generally exhibit a strong consideration for environmental aspects in their daily activities, as they recognize that natural resources are closely linked to the sustainability of life on earth. However, with the progression of globalization, rural populations have gradually altered their attitudes and behaviors, which has contributed to environmental degradation. This section focuses on pro-environmental behavior (PEB) that continues to be practiced by rural communities worldwide. Based on the literature review, notable examples of rural PEB are observed in Thailand, Iran, and the United States. In Thailand, according to Janmaimool & Denpaiboon (2016), villagers demonstrate a relatively high level of engagement in pro-environmental activities. These behaviors include ecological conservation behaviors (ECB), such as participation in biological activities and ecological preservation, as well as waste management behaviors (WMB), including the use of minimal packaging products, recycling, and waste reduction. The level of engagement in Thailand is expected to increase further when different environmental strategies are applied to each activity. In Iran, as reported by Savari et al. (2021), rural farmers also exhibit pro-environmental behaviors aimed at promoting sustainable agriculture. These include implementing new irrigation technologies to reduce water loss, using organic fertilizers, planting cover crops, leaving crop residues on the ground, and avoiding open burning. Such practices reflect adherence to pro-environmental behavior in the agricultural context.

In the United States, rural communities also engage in pro-environmental behavior. According to Takahashi & Selfa (2015), villagers' participation in such behaviors is influenced by social ties among residents, the length of residence in the community, and the environmental attitudes exhibited by neighbors. Examples of pro-environmental behaviors include purchasing biodegradable products, recycling, reducing household waste by selecting minimally packaged goods, avoiding chemical use in gardens, composting household waste, and contributing financially to environmental initiatives. Overall, these findings suggest that rural communities worldwide continue to practice pro-environmental behavior extensively. However, awareness of these behaviors remains limited due to restricted access to information through social media, research dissemination, or engagement with communities that are relatively isolated from the outside world.

3.2.2 Pro-environmental behavior in urban societies around the world

In recent years, urban development has increasingly emphasized sustainable practices, requiring cities to integrate environmental considerations. Beyond governmental efforts, urban residents are also expected to engage in environmentally friendly behavior. This section discusses pro-environmental behavior (PEB) practiced by urban communities worldwide. Based on the literature review, studies have examined urban PEB in countries such as Indonesia, China, New Zealand, Poland, the European Union (EU), the European Free Trade Association (EFTA), Chile, and Mexico. In Indonesia, Setiawan et al. (2019) reported that residents of Surabaya City support PEB through improved waste collection and disposal programs. Technologies such as non-organic waste separation and recycling receive positive support, and residents are willing to pay (WTP) for these initiatives.

Although the PEB observed in Surabaya is indirect, it is facilitated through intermediaries involved in waste management. In China, Xu et al. (2021) found that an anthropocentric worldview negatively correlates with PEB at both individual and organizational levels, whereas ecocentric perspectives and altruistic behavior positively influence PEB. This suggests that ecological awareness and altruism can motivate pro-environmental behavior. Examples of urban PEB in China include reducing plastic use while shopping, sorting waste, using phosphorus-free detergents, and participating in environmental protection activities.

In New Zealand, Whitburn et al. (2019) reported that urban communities maintain a strong connection with nature, which supports pro-environmental behavior (PEB). Examples include participation in tree planting programs and living in environments with varying levels of greenery. Residents' involvement in PEB was found to be stronger than their engagement in using nature for psychological restoration or shaping environmental attitudes. In the Americas, urban PEB is also evident in countries such as Chile and Mexico. Bronfman et al. (2015) found that urban residents in Chile generally support PEB and demonstrate high concern for environmental issues, as reflected in their awareness of the consequences of failing to protect the environment. Adults in Chile were found to exhibit higher levels of PEB, with behaviors including conserving electricity and water, protecting biodiversity, environmentally responsible consumption, ecological waste management, and rational car use. In Mexico, Vanegas-Rico et al. (2022) observed that urban residents tend to underestimate others' capacity to protect the environment, expecting them to cause environmental harm. However, they rate their own families positively for engaging in PEB. This suggests that the stronger the belief that others may harm the environment the more likely individuals are to engage in pro-environmental behavior themselves.

In Europe, Dąbrowski et al. (2022) reported that urban residents in Polish cities, particularly Generation Z, tend to engage more in pro-environmental behavior than environmentally harmful actions. Examples of such behaviors include proper waste disposal and segregation, reducing plastic consumption, conserving resources, using public transportation or environmentally friendly personal transport, and participating in climate protests. Similarly, in other European Union (EU) countries, urban communities demonstrate pro-environmental and sustainable behavior, influenced by increased environmental knowledge and heightened perceptions of environmental risks (Mikuła et al., 2021; Saari et al., 2021). Examples of these behaviors include purchasing pesticide-free fruits and vegetables, minimizing energy or fuel consumption at home, and using water efficiently. Overall, urban communities worldwide are increasingly adopting pro-environmental and sustainable practices, driven by growing awareness of the impacts of climate change in cities. Compared to rural areas, information and access to environmental knowledge in urban settings are more abundant and accessible, which further encourages the adoption of pro-environmental behaviors.

3.2.3 Differences in pro-environmental behavior in rural and urban communities

Rural and urban communities exhibit distinct patterns in pro-environmental behavior (PEB). According to Alcock et al. (2020), in the United Kingdom, rural and coastal populations demonstrate higher levels of PEB, as evidenced by a positive association between environmentally responsible behaviors and the availability of green spaces, as well as proximity to the coast, across households with both high and low socio-economic status. Furthermore, engagement in recreational activities in natural settings and the appreciation of nature were found to be positively correlated with PEB, suggesting that increased exposure to and valuation of natural environments enhances pro-environmental actions. Representative PEB practices among rural and urban communities in the UK include recycling rather than discarding items, purchasing environmentally sustainable products, consuming locally sourced food, opting for walking or cycling instead of car use, promoting environmental protection among peers, and participating in voluntary environmental initiatives.

In contrast, in Canada, urban communities exhibit higher levels of pro-environmental behavior (PEB) compared to rural communities, as reported by Anderson and Krettenauer (2021). Age and gender also influence PEB patterns, with adolescents in both rural and urban settings demonstrating lower engagement than adults, while women consistently display higher levels of PEB than men across locations. Common pro-environmental practices among Canadian rural and urban populations include recycling, proper waste disposal, and the use of environmentally friendly transportation. Consequently, although some regions demonstrate higher PEB in rural areas and others in urban areas, the observed differences primarily pertain to the factors influencing behavior rather than the types of pro-environmental activities themselves. The literature review further indicates that the nature of PEB activities is largely consistent across both community types and encompasses actions such as recycling, reducing plastic consumption, favoring walking or cycling for short trips, utilizing environmentally friendly public transport for longer journeys, conserving water and energy, minimizing chemical usage, applying organic fertilizers in agriculture, producing compost from household waste, participating in environmental protection initiatives, and contributing financially to such activities.

The observed differences in pro-environmental behavior (PEB) between rural and urban communities are largely attributable to the distinct factors that shape behavior in each context. In rural areas, interpersonal relationships tend to retain a familial character, facilitating social influence among community members. Rural populations often exhibit a strong dependence on natural resources, which fosters greater environmental stewardship. Additionally, social control within communities is robust, underpinned by high levels of solidarity, adherence to local values and norms, and, in some cases, traditional or religious beliefs that reinforce environmental protection. However, rural communities typically experience lower mobility and less clearly defined labor divisions due to limited specialization. In contrast, urban communities are characterized by higher individualism, with interpersonal relationships often formalized and interactions occurring primarily when necessary. Social control is comparatively weaker, yet urban populations exhibit greater social mobility, a well-defined division of labor based on expertise, openness to change, and a high valuation of time that necessitates careful planning. Consequently, these contrasting social, cultural, and structural characteristics constitute the primary factors influencing PEB in rural and urban settings.

4. Conclusions

Pro-environmental behavior (PEB) in rural communities is predominantly associated with ecological conservation and waste management practices. The strong social cohesion and interpersonal networks characteristic of rural societies facilitate the reinforcement of PEB, while close proximity to natural environments enhances environmental awareness and motivates efforts to preserve ecological resources. In contrast, PEB among urban populations encompasses activities such as waste management, tree planting, energy conservation, and the adoption of environmentally friendly transportation. Urban residents generally exhibit greater knowledge of environmental issues and the potential consequences of environmental degradation, which can encourage engagement in PEB. Nevertheless, urban communities often demonstrate skepticism regarding the capacity of others to uphold environmental responsibilities. Overall, the observed differences in PEB between rural and urban populations are shaped by a combination of socio-demographic, cultural, and geographical factors inherent to their respective living contexts.

Acknowledgements

The authors sincerely thank all researchers whose work contributed to this study, the journal reviewers for their valuable feedback, and our institutions for supporting research on pro-environmental behavior.

Author Contributions
All authors contributed equally to the conceptualization, literature review, analysis, writing, and revision of the manuscript, and approved the final version for submission.

Funding
This research received no external funding.

Ethical Review Board Statement
Not available.

Informed Consent Statement
Not available

Data Availability Statement
Not available.

Conflicts of Interest
The authors declare no conflict of interest.

Open Access

References
Alcock, I., White, M. P., Pahl, S., Duarte-Davidson, R., & Fleming, L. E. (2020). Associations between pro-environmental behaviour and neighbourhood nature, nature visit frequency and nature appreciation: Evidence from a nationally representative survey in England. *Environment International, 136*, 105441. https://doi.org/10.1016/j.envint.2019.105441

Anderson, D. J., & Krettenauer, T. (2021). Connectedness to nature and pro-environmental behaviour from early adolescence to adulthood: A comparison of urban and rural Canada. *Sustainability, 13*(7), 3655–3671. https://doi.org/10.3390/su13073655

Bradley, G. L., Babutsidze, Z., Chai, A., & Reser, J. P. (2020). The role of climate change risk perception, response efficacy, and psychological adaptation in pro-environmental behavior: A two-nation study. *Journal of Environmental Psychology, 68*, 101410. https://doi.org/10.1016/j.jenvp.2020.101410

Bronfman, N. C., Cisternas, P. C., López-Vázquez, E., De la Maza, C., & Oyanedel, J. C. (2015). Understanding attitudes and pro-environmental behaviors in a Chilean community. *Sustainability, 7*(10), 14133–14152. https://doi.org/10.3390/su71014133

Dąbrowski, L. S., Środa-Murawska, S., Smoliński, P., & Biegańska, J. (2022). Rural–urban divide: Generation Z and pro-environmental behaviour. *Sustainability, 14*(23), 16111–16129. https://doi.org/10.3390/su142316111

Dasgupta, P., Morton, J. F., Dodman, D., Karapinar, B., Meza, F., Rivera-Ferre, M. G., Sarr, A. T., Vincent, K. E., Carr, E. R., Raholijao, N., & Broecker, H. (2014). Rural areas. In *Climate change 2014: Impacts, adaptation and vulnerability. Part A: Global and sectoral aspects*

(pp. 613–658). Cambridge University Press. https://doi.org/10.1017/CBO9781107415379.014

Food and Agriculture Organization. (2018). *Guidelines on defining rural areas and compiling indicators for development policy* (pp. 1–75). Food and Agriculture Organization of the United Nations.

Foulon, J. (2019). Recent developments in French environmental law: Recognition and implementation of ecological damage in French tort law. *Environmental Law Review, 21*(4), 309–317. https://doi.org/10.1177/1461452919883441

Huang, H. (2016). Media use, environmental beliefs, self-efficacy, and pro-environmental behavior. *Journal of Business Research, 69*(6), 2206–2212. https://doi.org/10.1016/j.jbusres.2015.12.031

Janmaimool, P., & Denpaiboon, C. (2016). Evaluating determinants of rural villagers' engagement in conservation and waste management behaviors based on integrated conceptual framework of pro-environmental behavior. *Life Sciences, Society and Policy, 12*(12), 1–20. https://doi.org/10.1186/s40504-016-0045-3

Khalatbari, Y., & Abbas, P. (2019). "Environmental damage": Challenges and opportunities in international environmental law. *CIFILE Journal of International Law, 1*(1), 22–28. https://doi.org/10.30489/CIFJ.2019.93906

Kosztyán, Z. T., Csizmadia, T., & Katona, A. I. (2021). SIMILAR—Systematic iterative multilayer literature review method. *Journal of Informetrics, 15*(1), 101111. https://doi.org/10.1016/j.joi.2020.101111

Kotijah, S., & Ventyrina, I. (2019). Preventive regulations to remove environmental damage to mangrove ecosystem at East Kalimantan, Indonesia. *International Journal of Research in Law, Economic and Social Sciences, 1*(1), 9–20. https://doi.org/10.32501/injuriless.v1i1.52

Larson, L. R., Stedman, R. C., Cooper, C. B., & Decker, D. J. (2015). Understanding the multi-dimensional structure of pro-environmental behavior. *Journal of Environmental Psychology, 43*, 112–124. https://doi.org/10.1016/j.jenvp.2015.06.004

Li, D., Zhao, L., Ma, S., Shao, S., & Zhang, L. (2019). What influences an individual's pro-environmental behavior? A literature review. *Resources, Conservation and Recycling, 146*, 28–34. https://doi.org/10.1016/j.resconrec.2019.03.024

Meloni, A., Fornara, F., & Carrus, G. (2019). Predicting pro-environmental behaviors in the urban context: The direct or moderated effect of urban stress, city identity, and worldviews. *Cities, 88*, 83–90. https://doi.org/10.1016/j.cities.2019.01.001

Mikuła, A., Raczkowska, M., & Utzig, M. (2021). Pro-environmental behaviour in the European Union countries. *Energies, 14*(5689), 1–19. https://doi.org/10.3390/en14185689

Nunn, J., & Chang, S. (2020). What are systematic reviews? *WikiJournal of Medicine, 7*(1), 1–11. https://doi.org/10.15347/wjm/2020.005

Paré, G., Trudel, M. C., Jaana, M., & Kitsiou, S. (2015). Synthesizing information systems knowledge: A typology of literature reviews. *Information and Management, 52*(2), 183–199. https://doi.org/10.1016/j.im.2014.08.008

Purssell, E., & McCrae, N. (2020). *How to perform a systematic literature review*. Springer Nature Switzerland. https://doi.org/10.1007/978-3-030-49672-2

Revi, A., Satterthwaite, D. E., Aragón-Durand, F., Corfee-Morlot, J., Kiunsi, R. B., Pelling, M., Roberts, D. C., & Solecki, W. (2014). Urban areas. In *Climate change 2014: Impacts, adaptation and vulnerability. Part A: Global and sectoral aspects* (pp. 535–612). Cambridge University Press. https://doi.org/10.5822/978-1-61091-484-0_13

Saari, U. A., Damberg, S., Frömbling, L., & Ringle, C. M. (2021). Sustainable consumption behavior of Europeans: The influence of environmental knowledge and risk perception on environmental concern and behavioral intention. *Ecological Economics, 189*, 107155. https://doi.org/10.1016/j.ecolecon.2021.107155

Savari, M., Zhoolideh, M., & Khosravipour, B. (2021). Explaining pro-environmental behavior of farmers: A case of rural Iran. *Current Psychology*, 1–19. https://doi.org/10.1007/s12144-021-02093-9

Setiawan, R. P., Kaneko, S., & Kawata, K. (2019). Impacts of pecuniary and non-pecuniary information on pro-environmental behavior: A household waste collection and disposal program in Surabaya city. *Waste Management, 89*, 322–335. https://doi.org/10.1016/j.wasman.2019.04.015

Song, Z., Daryanto, A., & Soopramanien, D. (2019). Place attachment, trust and mobility: Three-way interaction effect on urban residents' environmental citizenship behaviour. *Journal of Business Research, 105*, 168–177. https://doi.org/10.1016/j.jbusres.2019.08.001

Sörqvist, P., & Langeborg, L. (2019). Why people harm the environment although they try to treat it well: An evolutionary-cognitive perspective on climate compensation. *Frontiers in Psychology, 10*, 348. https://doi.org/10.3389/fpsyg.2019.00348

Takahashi, B., & Selfa, T. (2015). Predictors of pro-environmental behavior in rural American communities. *Environment and Behavior, 47*(8), 856–876. https://doi.org/10.1177/0013916514521208

Vanegas-Rico, M. C., Corral-Verdugo, V., Bustos-Aguayo, J. M., & Ortega-Andeane, P. (2022). Expectations of others' environmental behaviour and its effect on personal pro-environmental behaviour. *PsyEcology, 13*(1), 29–49. https://doi.org/10.1080/21711976.2021.1992872

Whitburn, J., Linklater, W. L., & Milfont, T. L. (2019). Exposure to urban nature and tree planting are related to pro-environmental behavior via connection to nature, the use of nature for psychological restoration, and environmental attitudes. *Environment and Behavior, 51*(7), 787–810. https://doi.org/10.1177/0013916517751009

Xiao, Y., & Watson, M. (2019). Guidance on conducting a systematic literature review. *Journal of Planning Education and Research, 39*(1), 93–112. https://doi.org/10.1177/0739456X17723971

Xu, Y., Li, W., & Chi, S. (2021). Altruism, environmental concerns, and pro-environmental behaviors of urban residents: A case study in a typical Chinese city. *Frontiers in Psychology, 12*, 643759. https://doi.org/10.3389/fpsyg.2021.643759

Yang, T. (2020). Association between perceived environmental pollution and health among urban and rural residents: A Chinese national study. *BMC Public Health, 20*(1), 8204. https://doi.org/10.1186/s12889-020-8204-0

Yang, Y., Zhu, Y., Wang, X., & Li, Y. (2022). The perception of environmental information disclosure on rural residents' pro-environmental behavior. *International Journal of Environmental Research and Public Health, 19*(13), 7851. https://doi.org/10.3390/ijerph19137851

Biographies of Authors

Hafidz Adhitya Himawan, Department of Environmental Science, Graduate School of Sustainable Development, Universitas Indonesia, Central Jakarta, DKI Jakarta 10430, Indonesia.

- Email: h.adhityahimawan@gmail.com
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A

Naulita Pramanti, Department of Environmental Science, Graduate School of Sustainable Development, Universitas Indonesia, Central Jakarta, DKI Jakarta 10430, Indonesia.

- Email: npramanti@gmail.com
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A

Ashurzoda Shahboz, Department of Environmental Science, Graduate School of Sustainable Development, Universitas Indonesia, Central Jakarta, DKI Jakarta 10430, Indonesia.

- Email: ashurzodashahboz7@gmail.com
- ORCID: N/A
- Web of Science ResearcherID: N/A
- Scopus Author ID: N/A
- Homepage: N/A