



Research article

Interactive effects of citizen trust and cultural values on pro-environmental behaviors: A time-lag study from Indonesia

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ABSTRACT

Countries that encourage pro-environmental behaviors to safeguard their citizens' health and safety contribute positively towards safeguarding nature and the environment. Therefore, investigating the motivators and triggering factors of people's pro-environmental behaviors is of utmost importance for scholars. Thus, grounded on the bio-spheric value orientation theory, the impact of various cultural values, including collectivism, femininity uncertainty avoidance, and future orientation on the citizens' pro-environmental behavior, has been examined in the current study. Additionally, the moderating role of citizens' trust has also been examined to check the enhanced effect of cultural values on pro-environmental behavior. Surveying 576 citizens of Palangka Raya Central Kalimantan, Indonesia, at two different times with six months gap, results showed that collectivism, femininity uncertainty avoidance, and future orientation positively and significantly influence pro-environmental behavior. Furthermore, citizens' trust moderates these associations while depicting that more citizens' trust results in stronger cultural values associations with pro-environmental behavior. Overall, this study is incremental in exploring the interactive effect of citizens' trust with various cultural values to enhance pro-environmental behavior among citizens of Palangka Raya city, Indonesia. Besides, research brings multiple theoretical, managerial, and future research implications.

1. Introduction

Economies all over the globe are paying attention to environmental protection (Nelson et al., 2021). International organizations and local authorities have been trying hard to reduce the environmental threat due to littering, harmful chemicals, and gases emission into rivers, landfills, and poor waste management (Umrani et al., 2020). Animals, plants, and the geological beauty of the whole planet suffer from environmental pollution affecting land, air, and water (Nam and Hwang, 2019). Therefore, actions and campaigns that can reduce the environmental threats and hazards are being promoted. The current study examines pro-environmental behavior in communities through cultural values and citizens' trust, which has not been previously examined together. Pro-environmental behavior is the direct or indirect behavior of individuals or a society as a whole that does not contaminate the environment (Steg and Vlek, 2009). Multiple factors can impact pro-environmental behaviors (Blok et al., 2015; Juvan and Dolnicar, 2017). Various studies depict the impact of different motivators like sentiments and beliefs (de Miranda Coelho et al., 2016), environmental knowledge (Lin and Niu, 2018), and beliefs about life (Farrow et al.,

2017) on the pro-environmental behavior of the individuals. This study extends the body of literature and examines the impact of certain cultural values such as collectivism, uncertainty avoidance, femininity, and future orientation.

Collectivism is one of Hofstede's cultural dimensions and represents the individual's interaction with others, the priority of group goals, and the perceived importance of unity (Yang et al., 2020). It relates to social collectivity, such as state, nation, or social class, based on unified ideas and perceptions. Individuals that formulate collectivism are more interdependent and group-oriented towards the community (Roy, 2017). Therefore, pro-environmental behavior will be based on the community members' collective efforts to plant trees, clean lakes, and rivers from plastic waste, and maintain the garbage and other waste. It also includes such practices as preferring public transport over personal means of transport, utilizing solar panels and windmills for electricity generation, reduction in the use of pesticides and chemicals (Higuera-Castillo et al., 2019). Community members can encourage each other to exhibit these positive practices to ensure the sustainability of natural resources. Moreover, the impact of femininity on pro-environmental behavior has not been explored previously. Femininity relates to the quality, state, or

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degree of being feminine by exhibiting attributes, behaviors, and roles associated with women (Francis et al., 2017). It is beyond gender differences and can be exhibited by males and females (Hoskin, 2019). It relates to traits such as gentleness, humility, empathy, modesty, cooperativeness, and affection (Paechter, 2018). The individuals exhibiting this personality are kind, helpful, devoted, and sensitive (Muhibbu-Din, 2019). Therefore, studying it for pro-environmental behavior makes a lot of sense related to environmental concern towards protecting others around them, including the animals, plants, and the environment.

Another important cultural value that we will explore in this study is uncertainty avoidance. It refers to how people feel threatened by uncertainty ambiguity and try to avoid these situations (Kim et al., 2018). It requires individuals to have pre-defined rules to avoid various unfortunate acts. It is a society's tolerance for uncertainty and ambiguity, for the level of comfort displayed by the community members in unstructured situations (Sohaib et al., 2019). Human-made development leading to the cutting of trees in forests, illegal trading of animals, and emission of harmful gases into the air are causing unpredictable and hazardous changes to the environment and safety (Watts et al., 2020). Therefore, these individuals require a greater sense of protection and implementation of rules and laws for their safety. Finally, this study explores the cultural value of future orientation and its impact on pro-environmental behavior. It is defined as the degree to which individuals or societies engage in future-oriented behavior such as planning, investing in future research and development, and delaying gratification (Oshri et al., 2018). It relates to foreseeing and anticipating the future to organize resources and future options to maximize profits and reduce unforeseen risks. Future orientation strongly impacts psychological and behavioral characteristics, such as delay in gratification, aggression, depression, and novelty seeking (Thelken and de Jong, 2020). Based on this trait, environmental risks can be reduced by planning for sustainable utilization of resources and implementing policies that can reduce environmental risks. Hence future orientation can highly impact pro-environmental behavior.

This study's most vital contribution is to investigate the unique moderating role of citizens' trust for cultural values and their impact on pro-environmental behavior. Since this study focuses on collective behaviors rather than individual behavior to promote the overall culture and norm of environmentally friendly behavior, the moderating role of citizen's trust will relate to trust based on the social identity of a relationship which is extended to members of a group with a particular social identity (Alzahrani et al., 2017). It relates to sharing a common identity based on ethnicity, social class, or religion (Alzahrani et al., 2018). Governments and policymakers are responsible for safeguarding their people's interests; therefore, citizens' trust is related to the belief that the government will ensure environmental-friendly policies and engage community members in pro-environmental behavior.

Moreover, the current study is conducted in the Palangka Raya capital city of Kalimantan Tengah in Indonesia. It is located near the west bank of Kahayan River, in a south-central region. According to the latest official estimate, as of mid-2019, the population of the region is 281,096, with an average population density of 98.5 per km². A major characteristic of Central Kalimantan is the 11 major rivers and no less than 33 smaller rivers/creeks that run through it (Nasr and Safira, 2021). The amount of rainfall is high during the year; therefore, environmental protection is a high priority by the local government and its people due to many tourists visiting around the year (Rizki and Hadiansah, 2021). Increasing tourism has posed a threat to the environment in terms of water waste and plastic waste, which requires locals to implement actions, ensuring environmental safety and protection policies. According to Hofstede's country ranking of cultural dimension, Indonesia is a highly collectivist society, with high feminism, low uncertainty avoidance, high long-term orientation is, providing an ideal study context necessitating investigation for the impact of cultural values on pro-environmental behaviors. Also, checking the level of citizens' trust in enhancing the pro-environmental behavior of the Palangka Raya citizens while coupled

with cultural values is of utmost importance in this multicultural study context.

Moreover, the framework of the study is based on the bio-spheric value orientation theory. It relates to giving priority to taking care of the environment by engaging individuals in developing pro-environmental behavior (Obeng and Aguilar, 2018). People with a pro-environmental value orientation focus on optimizing others' outcomes, whereas people with a pro-self-value orientation focus on optimizing outcomes for themselves (Martin and Czellar, 2017). Hence this study will explore bio-spheric value orientation based on cultural values that increase citizens' trust to engage in pro-social behavior based on its perceived benefits for the people and their environment. Thus, established on the bio-spheric value orientation theory current study aims to:

- Examine the impact of cultural values, including collectivism, uncertainty avoidance, femininity, and future orientation, on pro-environmental behavior.
- Investigate the moderating role of citizens' trust between cultural values (collectivism, uncertainty avoidance, femininity, and future orientation) and pro-environmental behavior.

2. Literature review

2.1. Theoretical foundation

The current study is established on the bio-spheric value orientation theory, which emphasizes nature's intrinsic value. The biosphere is the part of the earth where life exists, including forests, oceans, and mountain tops (Obeng and Aguilar, 2018). Value Orientation relates to three sources of ethics for natural resource dilemmas related to individual behavior, including homocentric, egocentric, and eco-centric ethics (Vinzenz et al., 2019). An egocentric ethic involves individuals' utilization of natural resources for their own benefit and other community members. Whereas homocentric, or anthropocentric, ethics is grounded in society and implies that the social good should be maximized, and human evil minimized (Neuhofer, 2016). Finally, eco-centric ethics relate to the ecosystem that all things are significant and deserve moral obligation for their preservation (Thelken and de Jong, 2020). The value orientation concerning these three ethics is egoistic, social altruistic, and bio-spheric value orientation. People with a bio-spheric value orientation will mainly base value orientations and beliefs on their decision to act pro-environmentally or not on the perceived costs and benefits for the ecosystem and biosphere (Crick et al., 2020). In this context, individuals will evaluate the costs and benefits associated with pro-environmental behavior based on cultural values and citizens' trust. Thus, providing idea ground for investigating the influence of the cultural values on pro-environmental behavior and how this influence may increase with the changing levels of citizens' trust is an important theoretical research phenomenon.

2.2. Relationship of collectivism, femininity uncertainty avoidance, and future orientation with pro-environmental behavior

Collectivism relates to communism, which puts community benefit above individual goals. It relates to the idea that people prioritize society's welfare over the individual (Roy, 2017). It is linked to cohesiveness and loyalty towards other members (Shulruf et al., 2007). Research indicates that collectivism is a cultural pattern found mostly in traditional societies like Asia, Latin America, and Africa, where societal norms and cultural values strongly bind people to co-exist with each other (Kim and Choi, 2014). Literature has long been studied to review cultural differences and orientations in societies (Hui, 1988; Voronov and Singer, 2002). Moreover, Vicente-Molina et al. (2018) depicted that individuals' environmental considerations, such as bio-spheric values and environmental-self-identity, are linked with pro-environmental behavior. Besides, research suggests that collectivist societies define

themselves as aspects of groups and behave under the influence of roles defined by these groups (Triandis and Gelfand, 2012). Furthermore, literature shows that collective actions supported by rules and laws enforced for environmental protection help to attain better results than individuals trying to practice sustainability within a society (Farrow et al., 2017). Hence, based on the literature, review and above arguments it can be hypothesized that;

H1: Collectivism is positively associated with pro-environmental behavior.

Femininity indicates that individuals are more willing to perform social acts to help others, especially for service-based professions (Lazar, 2006). Literature suggests that femininity is more attributed to care and devotion in society (Francis et al., 2017). Thus, feminist societies prefer sustainability and collaboration with nature, and preserve the environment (Muhibbu-Din, 2019). Research also shows that femininity has been linked with obligation and quality of life based on nurturance towards the environment and its ecosystems (Modleski, 2001). Besides, pro-environmental behavior adoption is based on various internal and external factors, including motivation, environmental concern, and socio-economic conditions such as availability of resources (Ulhasanah and Goto, 2018). It is linked to minimizing the negative impacts of one's actions towards nature and its ecosystem (Jonassen and Rohrer-Murphy, 1999). It has also been linked with gender, as men and women vary for the socially accepted femininity concepts (Vicente-Molina et al., 2018). Moreover, recent research by Umrani et al. (2020) highlights that women, who generally embrace more feminine values on an individual level, have been shown to engage in green purchases more willingly. Thus, based on the above literature and bio-spheric value orientation, which suggests that eco-centric ethic relates to the ecosystem, and all things deserve the best treatment in the social system, it is hypothesized that;

H2: Femininity is positively associated with pro-environmental behavior.

Uncertainty avoidance is a cultural value that relates to the members seeking orderliness, consistency, structure, and formalized procedures for their day-to-day operations (Litvin et al., 2004). Empirical evidence shows that high uncertainty avoidance societies have more strict rules and SOP's (standard operating procedures) to minimize risks (Love et al., 2008). They are likely to imply more conservative measures such as energy and water conservation or product recycling. Moreover, research indicated that high uncertainty avoidance levels are linked to more proneness to rule-following and acting ethically when making consumer decisions (Lim et al., 2004). Previously, it has been linked to higher corporate social performance and green purchase activities (Melewar et al., 2007). People exhibiting this cultural value are more willing to take actions and steps that can reduce natural and man-caused environmental risks and dangers and promote sustainability (Qu and Yang, 2015). At the same time, pro-environmental behaviors require strict rules and regulations to discourage unethical actions leading to misuse of natural resources. It has been linked to prudence towards climate changes, cutting down carbon consumption, quitting or banning smoking in public places, etc. (Byerly et al., 2018). Thus, it can be said that, in higher uncertainty avoidance cultures, there is more tendency for future well-being and environmentally friendly behavior. Moreover, bio-spheric value orientation advocates that individuals and societies try to maximize social goals based on ethical context and avoid uncertain circumstances. Thus, it is hypothesized that;

H3: Uncertainty avoidance is positively associated with pro-environmental behavior.

Pro-environmental behaviors are supported by cautiousness and heedfulness towards the biosphere (De Groot and Steg, 2007). Literature shows that short-term orientation exhibited in societies is related to immediate gratification, utilizing natural resources to fulfill current needs, and focusing on gaining benefits from the animal and marine life trade to gain current profits (Oshri et al., 2018). In contrast, future orientation is related to the degree to which people believe that their current actions influence their future outcomes and hence show a willingness to make sacrifices in the present time for a better tomorrow (Joireman et al., 2001;

Noor et al., 2021). It is linked with conserving behaviors for unforeseen risks and challenges related to our environment in the future. Moreover, Chekima et al. (2019) stated that future-oriented behavior involves tree plantation, sustainable construction material, plastic, and paperless culture, utilizing renewable energy to support environmental protection and preservation. It has also been linked to a strong sense of moral obligation to follow eco-centric value orientation (Thelken and de Jong, 2020). Furthermore, based on the bio-spheric value orientation, people evaluate the costs of their current actions to make sacrifices to earn future benefits by protecting their environment and conserving their natural resources. Hence, following hypothesis is suggested;

H4: Future orientation is positively associated with pro-environmental behavior.

2.3. Moderation

2.3.1. The moderating role of citizen's trust between collectivism, femininity uncertainty avoidance, and future orientation and pro-environmental behavior

Citizen's Trust is related to public and political institutions designated to represent public interests and values, related to social position, caste, or regional and religious affiliation (Alzaharani et al., 2017). It has been linked to the provision of complementary information, transparency, dissemination, and access to government officials regarding policies and practices related to people's rights (Rawlins, 2008). Moreover, Rubel et al. (2018) presented that citizens' trust is related to perceptions of government transparency to safeguard natural resources and the environment. Besides, literature shows that people in collectivistic societies are willing to sacrifice to achieve sustainability, like paying more taxes (Liu et al., 2021). They are more likely to show a positive attitude towards confirming with rules and regulations which support the well-being of others around them (Sadeghi et al., 2018; Umrani et al., 2020). Simultaneously, pro-environmental behavior has been linked to corporate social responsibility performance and exhibiting ethical actions (Chu et al., 2020). Moreover, no study has investigated the interactive effect of trust with collectivism to promote pro-environmental behavior among people. Thus, to bridge this existing gap and establish on bio-spheric value orientation, which advocates the importance of collective efforts taken by individuals, societies, and government bodies to promote environmental-friendly behaviors with the help of trust-building, it can be hypothesized that;

H5: Citizen's trust moderates the association between collectivism and pro-environmental behavior such that in the case of higher values of citizen's trust, the relationship will be stronger.

Research shows that an individual's engagement in pro-environmental behavior is influenced by other behaviors and actions besides personal beliefs (Li et al., 2019; Luczak and Kalbag, 2018). One such factor is femininity related to the corporation, focusing on the quality of life, solidarity, and consensus (Hoskin, 2019). Previous research indicates that people are more likely to trust the message source in the recent era of information overflow to consider them competent and authentic (Rubel et al., 2018). Therefore, governments are trying hard to engage with the public on various platforms to provide information regarding preserving natural resources and their consumption (Rawlins, 2008). Besides, citizens' trust is associated with conservation policies to facilitate collective actions through public participation in environmental protection decisions (Graafland and Bovenberg, 2020). Governments are also found to be running a campaign to educate the masses regarding the benefits of engaging in pro-environmental behaviors such as green consumption, i.e., by banning plastic bags and introducing reusable bags for grocery and shopping, etc. Moreover, in a recent study, Graafland and Bovenberg (2020) revealed that societies exhibiting higher femininity tend to be favorable for pro-environmental action actions and hence place their trust in the government for showcasing sensitivity for environmental protection (Pollock, 2003). Hence, based on this indirect literature support and bio-spheric value orientation, this

study is incremental to suggest that citizen trust can help societies exhibiting a higher level of femininity cultural value to engage actively in pro-environmental behavior. Thus, it is hypothesized that;

H6: *Citizen's trust moderates the association between femininity and pro-environmental behavior such that in the case of higher values of citizen's trust, the relationship will be stronger.*

Citizen trust has been strongly linked to public policy support; therefore, governments consider it vital to smooth the transition towards sustainable and environmental-friendly actions (Hameed and Waris, 2018). Research suggests that governments in recent times have been using social media and other mobile apps to interactively engage with the public and disseminate information to gain citizens' trust (Alzahrani et al., 2018; Sawatsuk et al., 2018). Previous studies show that institutional actors' trust is a strong predictor of biotechnology policy-making for climate change (Harring and Jagers, 2013). As described in the literature, uncertainty avoidance adheres to strict policies governing day-to-day actions to minimize risks associated with unforeseen future events (Litvin et al., 2004). Moreover, studies show that high uncertainty avoidance societies are far more risk-averse and refrain from actions that cause uncertainty (Wennekers et al., 2007). At the same time, research also indicates that people's assessments of global warming risks are related to individuals' levels of trust in the mass media and the experts and scientists familiar with the subject (Sohaib et al., 2019). Although rare literature evidence is available to support the notion that public trust in government institutions play an important role to determine their pro-environmental behaviors. Therefore, based on the indirect reference support, above arguments and bio-spheric value orientation, it has been inferred that uncertainty-avoiders possess a stronger sense of protection and a requirement for a higher level of formalization that can reduce their fears and is induced by the trust in the government for protecting their stakes. Hence, following hypothesis is suggested;

H7: *Citizen's trust moderates the association between uncertainty avoidance and pro-environmental behavior such that in the case of the higher level of citizen's trust, the relationship will be stronger.*

Future orientation has been linked with environmental engagement, which involves actions that provide information and concern for current natural resources, geographical changes, and endangered species of animals, birds, and fishes (Rashideh, 2020). It has also been linked to pro-environmental values, pro-environmental intentions, and green

purchases (Oshri et al., 2018; Yamamori, 2019). Moreover, humans' cognitive ability to predict, foresee and forecast the future has wide implications on all aspects of their lives, whether related to investments, the adaptation of technology, and utilization of resources (Jamal and Budke, 2020; Dalle et al., 2021). This can be explained by their egocentric value orientation of analyzing costs and benefits to evaluate their future decisions. Besides, trust has been indicated to minimize uncertainties and risks associated with future decisions by disseminating information (Nedal and Alcoriza, 2018; Seifert and Kwon, 2019). Moreover, citizen trust has been found to improve green consumption and increase sustainable practices towards the conservation of electricity, water, energy, etc (Umrani et al., 2020). People are even making environmentally friendly lifestyle choices, like opting for electric and solar cars, hydro-power generated appliances, and air fryers to minimize pollution and conserve resources (Chekima et al., 2019). Despite a few literature pieces of evidence regarding the positive association of future orientation and citizens' trust in predicting people's environmentally friendly behaviors in separate studies, none has explored the interactive effect of both to check the inflated effect on citizens' pro-environmental behavior. Thus, to bridge this literature gap and bio-spheric value orientation bases, it can be proposed that government can play a vital role by sharing forecasts for the environment and biosphere to let citizens make informed decisions and engage in pro-environmental behavior. Hence it is hypothesized that,

H8: *Citizen's trust moderates the association between future orientation and pro-environmental behavior such that in the case of the higher level of citizen's trust, the relationship will be stronger.*

2.4. Theoretical framework of the study

Based on problem statement, the theoretical framework of the study are shown below (see Figure 1).

3. Research methods

The current study's prime objective was to investigate the impact of various cultural values, including collectivism, femininity, uncertainty avoidance, and future orientation, on pro-environmental behavior. Moreover, the interactive effect of citizens' trust with these cultural

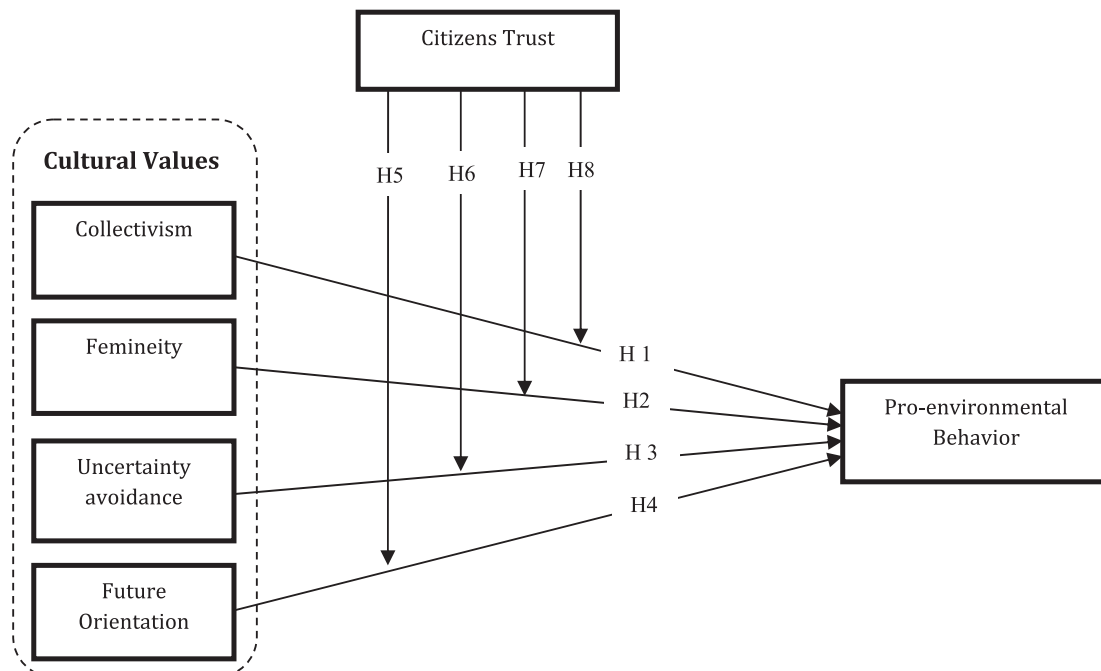


Figure 1. Theoretical framework of the study.

values was examined to check the inflated level of pro-environmental behavior. Before starting a quantitative field survey, it was approved by the ethical committee of the researchers' university, a designated authority for ethical approvals named the University of Palangka Raya Research and Community Service Institute. After approval by the UPRCS committee, it was also ensured that all participants of the survey were briefed about study objectives and were informed in advance to seek their voluntary participation in the survey. The survey was administered to collect primary data from the citizens of Palangka Raya Central Kalimantan, Indonesia. Palangka Raya city is the capital and one of the largest cities of the Indonesian province of Central Kalimantan (Pratomo, 2021). The city is located on the island of Borneo between the Sabangau and the Kahayan rivers. Furthermore, the city's population is 281,096 and divided into 5-administrative units as per the official estimates of 2020.

A multi-stage random sampling technique was applied to collect the data from the citizens of Palangka Raya city. The city comprises five administrative units; all the units were further divided into two communities. Later with the help of "Town and Country Planning's List of Communities," the denser educated class public locations were identified and approached. The authors then started to randomly select the respondents by asking general questions to have some idea about their knowledge regarding sustainability and environmental issues. Furthermore, after the initial screening of respondents' know-how about the study's concept, they were asked about their English proficiency. For this purpose, the authors asked simple questions from the respondents to analyze whether they could understand English well. This English proficiency test was mandatory because the authors used the original scale designed in the English language. Thus, to avoid translation and back translation issues, the authors decided to use the original scale based on the understanding that most Indonesians can understand English as it has been taught in Indonesia since basic educational levels. Hence, those respondents who qualified for the basic English test were further finalized as participants of the study. Moreover, keeping the scenario of COVID-19 into consideration, all the SOPs were followed strictly during the whole data collection procedure. The respondents who agreed to participate in the longitudinal survey were further assured about their response's anonymity right and handed over the survey questionnaire.

The data gathering process started on August 5, 2020. The authors visited 23 different city locations. The authors communicated with the citizens and requested them to participate in the survey and also collected their contact information from them so that they could be contacted in a six-month time-lagged survey. After two months, 970 responses from selected locations were assessed at the end of the Time 01 survey on October 5, 2020. This Time 01 survey includes items related to participants' demographic characteristics and 06 items to measure collectivism, 04 items to measure femininity and 05 items to assess uncertainty avoidance, 04 items to measure future orientation, and 07 items to measure citizens' trust. The authors contacted all the survey one respondents on December 05, 2020, to fill the remaining part of the survey comprising 04 items of pro-environmental behavior. After two months, the authors received 605 questionnaires back. After final scrutiny, it was found that 29 questionnaires were either incomplete or had unengaged responses; hence they were not included in the final analysis. Thus, in total, 576 responses were attained with a final response rate of 59.38%.

3.1. Measures of the study

A four items scale by Goldman, Yavetz, and Pe'er (2006) and Xiao and Hong (2010) was used to measuring pro-environmental behavior. Whereas Hofstede (2001) cultural dimension scale was used to measure collectivism with 4-items, femininity with 6-items, uncertainty avoidance with 5-items, and future orientation with 4-items. Finally, a 7-items scale adopted from Kitt et al. (2021) was used to measure citizens' trust. "All the responses were reported on a five-point Likert scale ranging from 1 = strongly disagree, and 5 = strongly agree".

3.2. Respondents profile

The results show 63.7% of respondents were male, and 37.3 % were females. 55.3% of respondents were married, whereas 44.7% were unmarried. Participants' ages ranged from 19 to 69 years, with a mean of 34.37 years ($SD = 6.79$). Besides, 50.5% of the participants were graduates, 35.5% were undergraduates, and 15% were highly qualified. Moreover, 23.3% were students, 27.2% were employees, 26.7% were self-employed, 18.3% were unemployed, and 6.5% were retired citizens. The statistics reflect a diverse despondence set with different ages and marital statuses. Also, the age ranged from 19 to 69 years old, reflecting the views and environmental concerns of different age groups and an insight into their pro-environmental behaviors. Besides, respondents were also diversified based on their qualification and occupation, reflecting a true representative sample of the city's overall population for me to measure factors impacting their pro-environmental behaviors.

4. Data analysis and results

4.1. Assessing the measurement model

"The Structural Equation Modeling (SEM)" analysis has been performed in SmartPLS 3.3.0 software. During this simulation analysis, respondents' education was found with a significant impact on their dependent variable; hence it was controlled in the further analysis. Moreover, to calculate the reliability of the measures, "Cronbach's α " and "composite reliability (CR)" were assessed (Henseler et al., 2015; Mansoor, 2021; Mansoor and Wijaksana, 2021). The reliability of all constructs is depicted in Table 1. In addition, "factor loadings" of all other indicator variables were within an acceptable range, i.e., ≥ 0.65 . Also, the AVE "Average variance Extracted" of latent constructs was >0.50 for all study variables establishing the "convergent validity" of the constructs (Hair et al., 2010; Noor et al., 2021).

4.1.1. Discriminant validity

The discriminant validity of the study constructs was established and assessed through the "Heterotrait-Monotrait (HTMT) ratio (Mansoor and Paul, 2022). The values of HTMT are depicted in Table 1 and are under the prescribed ranges, i.e., less than 0.9 for all the associations (see Table 2 and Figure 2).

4.2. Assessing the structural model

Before assessing the hypothesized links, the structural model was evaluated for collinearity issues. For that, researchers mostly use the Variance Inflation Factor (VIF) (Hair et al., 2019). Moreover, researchers believe that VIF values less than 3 reflect no issues of collinearity between the formative constructs of the variables (Becker et al., 2015). For Study 1, all the observed VIF were below 2.2 hence deflecting no multicollinearity issues among the constructs' items.

4.2.1. Direct hypothesis

The study results (Table 3) revealed that different cultural values, i.e., *collectivism* ($\beta = 0.172^{**}$, $t = 3.649$), *femininity* ($\beta = 0.215^{***}$, $t = 4.738$), *uncertainty avoidance* ($\beta = 0.239^{***}$, $t = 4.928$), and *future orientation* ($\beta = 0.214^{***}$, $t = 4.677$), were significantly and positively associated with *pro-environmental behavior*. Thus, H1, H2, H3 and H4 are fully supported by the findings of this research.

4.2.2. Moderating hypotheses

To assess the interactive effect of constructs, in PLS-SEM, interaction terms between the moderator (*citizens' trust*), with predictor variables, i.e., *collectivism*, *femininity*, *uncertainty avoidance*, and *future orientation*, were created applying the product indicator approach to investigate their impacts on *pro-environmental behavior* of citizens of the Palangka Raya Central Kalimantan, Indonesia. The results in (Table 3)

Table 1. Reliability and validity results.

Variables/items	Factor Loadings						AVE	CR	Cronbach's α
	1	2	3	4	5	6			
Pro-environmental Behavior							0.553	0.827	0.773
PEB1	0.812								
PEB2	0.791								
PEB34	0.496								
PEB	0.825								
Collectivism							0.581	0.893	0.781
COL1		0.802							
COL2		0.776							
COL3		0.759							
COL4		0.730							
COL5		0.710							
COL6		0.793							
Femininity							0.631	0.872	0.796
EEM1			0.817						
EEM2			0.784						
EEM3			0.826						
EEM4			0.749						
Uncertainty Avoidance							0.594	0.880	0.811
UA1				0.729					
UA2				0.780					
UA3				0.788					
UA4				0.771					
UA5				0.784					
Future Orientation							0.598	0.856	0.801
FO1			0.733						
FO2			0.796						
FO3			0.795						
FO4			0.768						
Citizens' Trust							0.601	0.913	0.826
CT1				0.784					
CT2				0.765					
CT3				0.756					
CT4				0.820					
CT5				0.804					
CT6				0.724					
CT7				0.769					

Note: CR, composite reliability; AVE, average variance extracted.

shows a positive and significant effect of all the interaction term, i.e., *citizens' trust*collectivism*, *citizens' trust*femininity*, *citizens' trust*uncertainty avoidance*, and *citizens' trust*future orientation environmental*. The R^2 for *cultural values'* main effect on *pro-environmental behavior* was ($R^2 = 0.271$), whereas its R^2 with the moderating effect of *citizens' trust* with all cultural values increased to ($R^2 = 0.500$). The R^2 change suggested that the four interaction terms inclusion increased the explanatory power of *pro-environmental behavior* among citizens of Palangka Raya Central Kalimantan, Indonesia, by 23.29%. Furthermore, plotted graph presents these moderating associations as follows;

Figure 3 represents that the line labeled for high citizens' trust has a higher slope than the low citizens' trust for the association of *collectivism* and *pro-environmental behavior*. This depicts that the individuals who believe in a collective society gives more value to the societal norms and behave ethically in all matters of their lives as they are bound with the feelings of concern and liability towards their family, friends, peers, and whole society; thus, they try to avoid any action that can harm the ecosystem. They also display behaviors like switching off unnecessary lights, consuming less fuel and water, planting trees, and

protecting the birds and animals. Thus, hypothesis 5 is proved by this study's results.

Results of moderation, as shown in Figure 4, represent that the line labeled for high citizens' trust has a higher slope than the low citizens' trust for the association of *femininity* and *pro-environmental behavior*, which represents that the individuals with more feminine nature are more caring and protective towards environment displaying higher values of environmental-friendly behaviors. Thus, proving hypothesis 6 as well.

Figure 5 shows that the line labeled for high citizens' trust has a higher slope than the low citizens' trust for the association of *uncertainty avoidance* and *pro-environmental behavior*, representing those individuals who believe in saving resources to avoid any adverse situation more likely to behave pro-environmentally. Thus, hypothesis 7 is also proved.

Figure 6 depicts that the line labeled for high citizens' trust has a higher slope than the low citizens' trust for the association of *future orientation* and *pro-environmental behavior*, which represents that those individuals who care about the future and sacrifice today for betterment in the future are more concern about their environment. These results prove hypothesis 8 (see Figure 7).

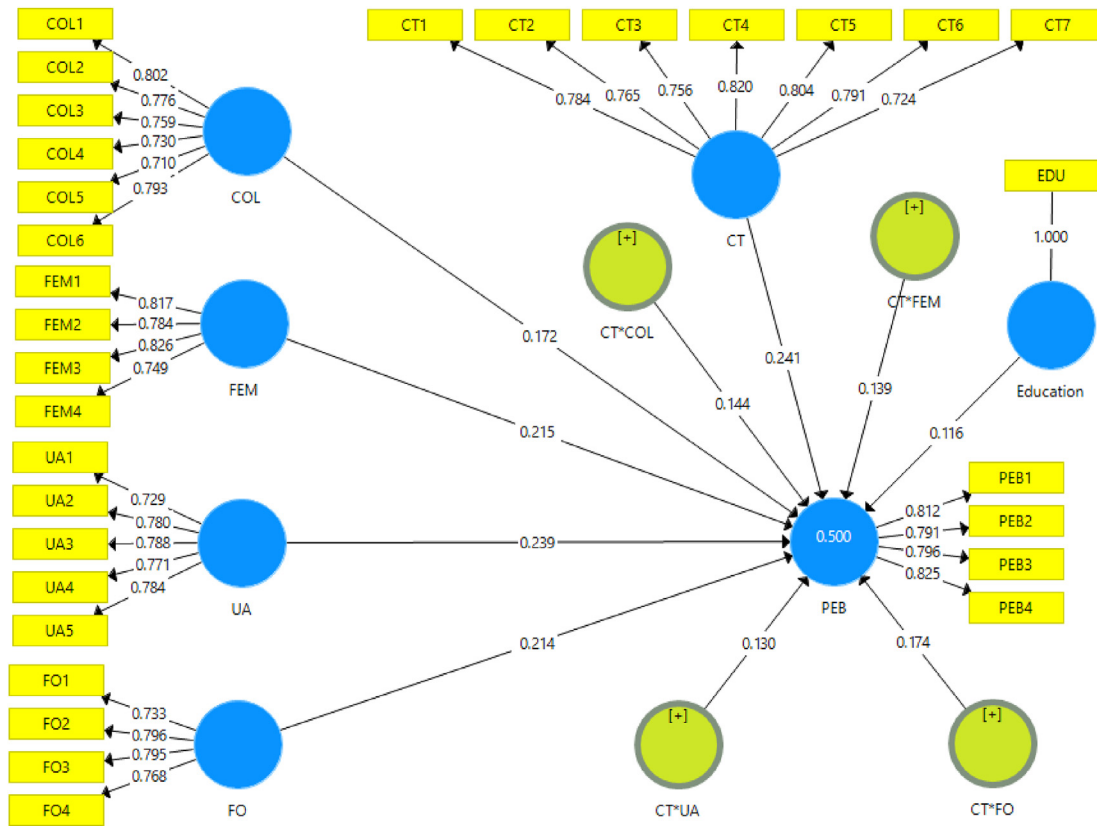


Figure 2. Full measurement model.

Table 2. Heterotrait-monotrait ratio.

Constructs	Mean	STD.	1	2	3	4	5	6
Environmental Knowledge	3.93	0.77	0.743					
collectivism	3.87	0.81	0.441	0.762				
Femininity	4.02	0.57	0.621	0.577	0.794			
Uncertainty Avoidance	3.88	0.83	0.471	0.422	0.461	0.770		
Future Orientation	4.12	0.49	0.389	0.403	0.345	4.46	0.773	
Pro-Environmental Behavior	4.09	0.53	0.498	0.476	0.501	0.521	0.465	0.775

Note: The square roots of AVEs of the constructs are shown in bold in diagonal.

Table 3. Hypothesis testing results.

	Hypotheses	Std. Beta	t-Value	p-values	Supported
H1	COL → PEB	0.172	3.649	0.003	Yes
H2	FEM → PEB	0.215	4.738	0.000	Yes
H3	UA → PEB	0.239	4.928	0.000	Yes
H4	FO → PEB	0.214	4.677	0.000	Yes
H5	CT*COL → PEB	0.144	3.078	0.009	Yes
H6	CT*FEM → PEB	0.139	2.987	0.012	Yes
H7	CT*UA → PEB	0.130	2.466	0.016	Yes
H8	CT*FO → PEB	0.174	3.899	0.002	Yes

Where: COL = Collectivism; FEM = Femininity UA = Uncertainty Avoidance; FO = Future Orientation CT = Citizens' Trust; PEB = Pro-environmental Behavior.

5. Discussion

5.1. Finding

Established on the bio-spheric value orientation theory, the current study aims to investigate the direct and interactive effect of cultural

values like collectivism, femininity, uncertainty avoidance, and future orientation with citizens' trust in pro-environmental behavior. The results show that collectivism is a significant antecedent of pro-environmental behavior. Likewise, (Farrow et al., 2017; Triandis and Gelfand, 2012) advocated that group norms determine collectivist societies' behavior. Thus, the societies that exhibit high values for the environment around them make sure that all the members behave in a way that does not affect the environment to keep it safe for the next generations. Femininity was also found to be positively related to the pro-environmental behavior of the citizens as feminist individuals are more tend to be socially responsible (Lazar, 2006), caring, devoted (Francis et al., 2017), and conscious about the quality of life (Modleski, 2001). Thus, a society with feminist cultural values is more conscious about the environment and the issues and problems faced by natural ecosystems in the modern technological era. Therefore, they depict pro-environmental behavior to minimize their impact on natural resources.

Moreover, results also depicted a positive association of uncertainty avoidance with pro-environmental behavior as uncertainty-avoiders value the prescribed rules and regulations and perform different tasks in a systematic manner (Byerly et al., 2018; Litvin et al., 2004).

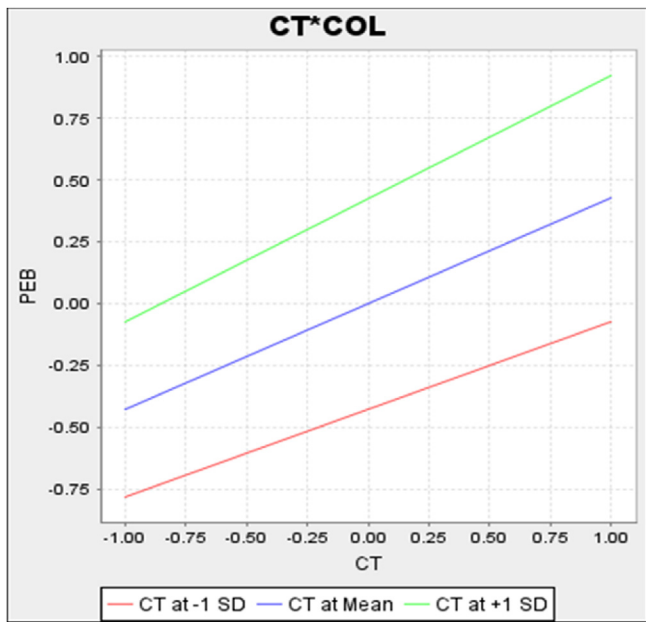


Figure 3. Interaction plots for the interactive effect of citizens' trust and collectivism.

Therefore, it can be said that uncertainty avoiders are risk-averse and try to keep themselves and their society safe from any uncertain situation to their best possible level. Thus, all such individuals act in a sustainable way while conserving energy and resources to keep the environment safe and preserve the resource for a longer time. Simultaneously, the future orientation was also positively associated with the pro-environmental behavior for empirical evidence of the citizens of Palangka Raya, Indonesia. As those who follow the future orientation approach stay conscious of their every action based on its consequences in the future, they are contended to make sacrifices in the present to reap the fruit of their actions in the future (Joireman et al., 2001). Thus, they are happy to plant more trees, and against cutting of trees, they buy organic food products and also conserve energy at their best possible level (Chekima

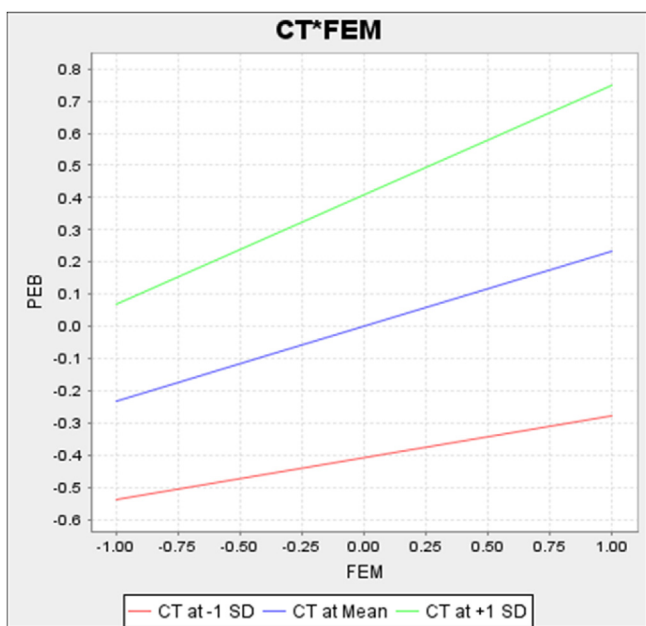


Figure 4. Interaction plots for the interactive effect of citizens' trust and femininity.

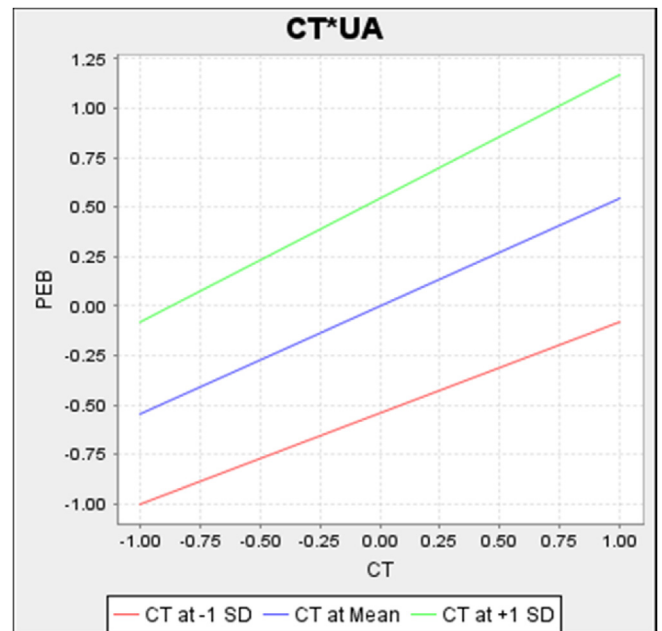


Figure 5. Interaction plots for the interactive effect of citizens' trust and uncertainty avoidance.

et al., 2019). Thus, the study results show that different cultural values have significant positive effects on people's pro-environmental behaviors.

Finally, the results also revealed the moderating role of citizens' trust between the association of cultural values and pro-environmental behavior. Although, there are few studies available in the literature that have examined the direct impact of citizens trust on their pro-environmental behaviors (Harring and Jagers, 2013; Umrani et al., 2020) based on the understanding that citizen trust facilitates green consumption patterns and ignite conservation of energy, electricity, water, etc. for sustainable development. However, to the best of the authors' knowledge, no study has investigated the interactive effect of

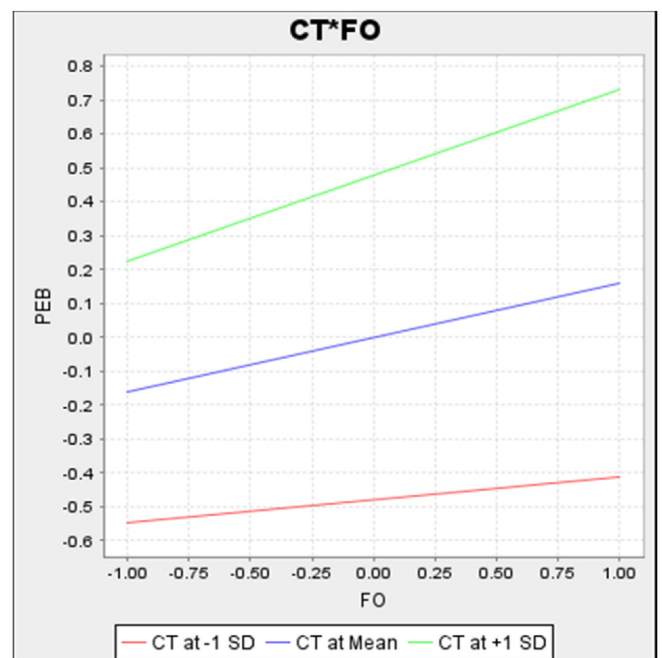


Figure 6. Interaction plots for the interactive effect of citizens' trust and future orientation.

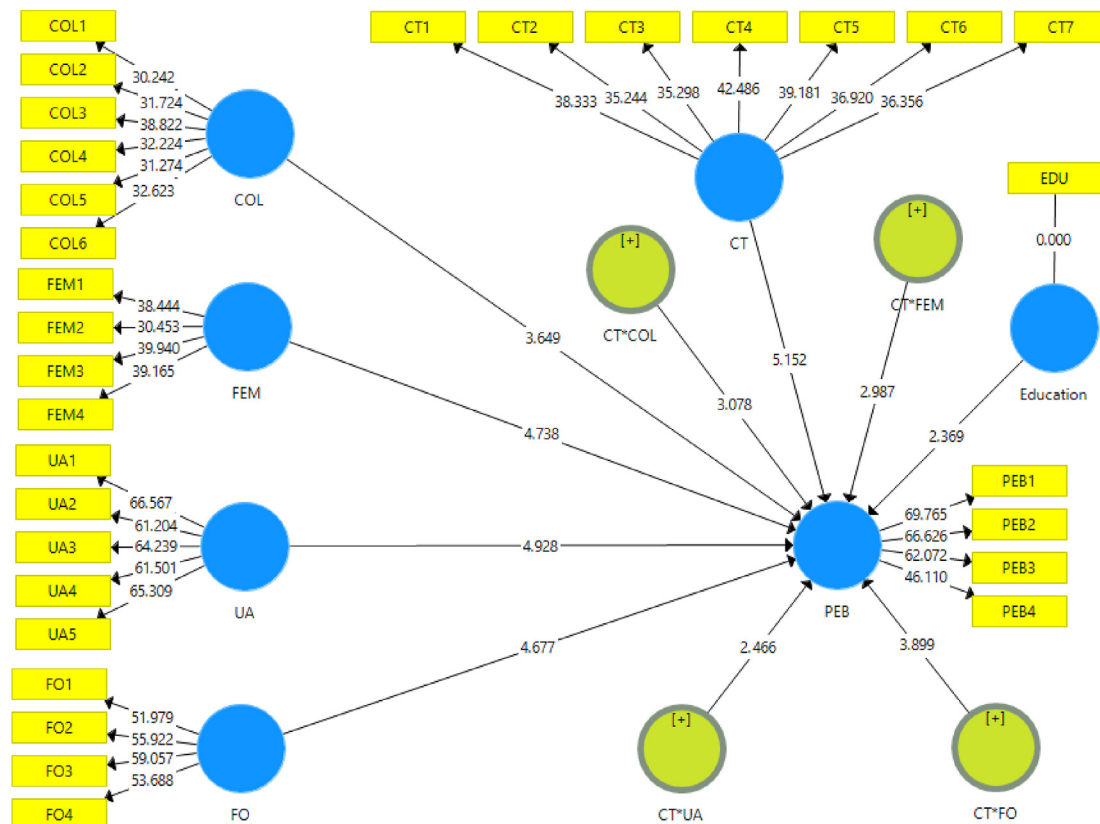


Figure 7. Full structural model.

citizens' trust with cultural values to promote pro-environmental behaviors. Thus, this study is incremental to the body of knowledge, depicting that when citizens trust in government and societies policies interact with various cultural values results in an increased level of pro-environmental behavior. These findings are based on the conceptualization of citizens trust that when public and political institutions and governing bodies prioritize the citizens' needs and take necessary measures to protect the environment for the betterment of society (Alzaharani et al., 2017), then people also care about the surroundings for the betterment of the community as a whole depicting the environmental-friendly behaviors. Thus, the local authorities, governments, and other administrative departments need to work proactively for environmental protection to gain public trust to achieve sustainable development goals in the near future.

5.2. Theoretical implications

The current study offers multiple theoretical implications. For instance, different types of cultural values, including collectivism, femininity uncertainty avoidance, and future orientation, have been studied collectively in a single model to check their impact on pro-environmental behavior, which has not been studied previously in environmental science literature. Thus, depicting the novelty of the theoretical model of the current study. Hence, the study is incremental in the literature on how cultural values, especially femininity and uncertainty avoidance, affect individuals' willingness to behave in an environmental-friendly manner and take actions that protect the environment. Scholars can utilize these findings to mitigate the green gap in recent literature related to cultural values and environmental behaviors. Secondly, the current study is the first of its kind to investigate the moderating role of citizens' trust while interacting with four different cultural values and checking the coupled effect of four interaction terms on pro-environmental behavior. Scholars in the future can benefit from the findings of the

current study to check the interactive effect of citizens trust with other important constructs like altruistic and bio-spheric values that lead to pro-environmental intentions and behaviors.

Thirdly, an important theoretical contribution of the current study is that it is grounded on the bio-spheric value orientation theory that highlights the individual as well as the collective approach of human beings towards devising valuable benefits for the environment; the theory further depicts that those who believe in behaving ethically and care for the society. Collectively do not contaminate the environment and always try to protect the surroundings for future generations. Fourthly, this research is unique in the Indonesian multicultural context, which is affected by environmental imbalance and strives to maintain its position in the global ranking. Thus, providing empirical evidence from such a study context is another important advance made by this research. Overall, this research contributed to bridging the gap between cultural variables and environmental constructs along with individual-level constructs such as citizen trust. Integrating all three key areas into a single comprehensive theoretical framework is one of the major advances of this research. This novel theoretical approach will open further avenues for future exploration about interlinked theories and conceptualizations in related fields.

5.3. Practical implications

The current study offers several practical implications. First, this study is conducted in Palangka Raya city, where every year, a large number of tourists visit the city utilizing the environmental resources of the area. Thus, multiple factors can contaminate the city's environment to become the source of water loss and other resource depletion. The results depicted that those who care for cultural values also care about their environment and exhibit pro-environmental behavior. Thus, the policy-makers need to identify the societal norms that emerge from different cultural values and further affect the individuals' pro-environmental

behaviors. Therefore, the current study suggests that the local administrative bodies can promote cultural norms and values in different societies to make people more responsible for their actions and behaviors.

Another important contribution of the current study is the role of trust in the national government related to the government's policies and procedures to address climate change. The results clearly revealed that citizens' trust, when coupled with various cultural values, including collectivism, femininity, uncertainty avoidance, and future orientation, resulted in a heightened level of pro-environmental behavior. Thus, the local administrations and government bodies should accelerate their actions to amend the policies and procedures regarding climate issues. Also, these initiatives must be made visible to the public so that the citizens can also play their part and join the government drives to keep the environment clean and preserve the natural resources for sustainable development. Moreover, this trust can be communicated to society through different awareness programs, and also special subjects related to the environmental changes and issues related to the environment must be introduced in the curriculum at basic levels so that people may know about the measures taken by the government authorities in favor of environment to protect the citizens' needs and requirements.

Also, discounts can be offered to the people so that they are encouraged to utilize such products that are environmentally safe. Additionally, special government support and subsidies will be offered to the entrepreneurs and businesses engaged in recycling projects and products that benefit the environment and pro-environmental behaviors. Finally, a sense of responsibility must be initiated among the people so that directly or indirectly, they remain conscious about their actions and behaviors towards the environment directly or indirectly. This way, long-term sustainability goals can be achieved at higher levels.

5.4. Limitations and future directions

Although examining the moderating role of citizens' trust in between the association of cultural values and pro-environmental behavior is a valuable contribution of the current study, a few limitations can bring more implications if overcome by future researchers. The current study examined in detail the direct impact of four cultural values, including collectivism, femininity, uncertainty avoidance, on pro-environmental behavior but underlying mechanisms through which these values initiate pro-environmental behaviors are not examined in the current study. In contrast, future studies can check how constructs like perceived responsibility and self-identity interplay between individuals' cultural values and pro-environmental behaviors. Moreover, the current study explored the moderating role of citizens' trust in the association of cultural values and pro-environmental behaviors. In contrast, future studies can explore the interactive effect of knowledge sharing and religiosity with all cultural values to check their augmented effect on environmental-friendly behaviors. Finally, for data collection, only one city resident was approached by the authors due to time and resource constraints, whereas a multi-city and cross-cultural comparison can be conducted in the future to further generalize and validate the current study results. Indonesia is a collectivist society and has a specific ranking in other cultural values, so another country that is exactly opposite is these cultural values should be contextually investigated, and cross-cultural comparisons are encouraged in future studies. Future scholars are encouraged to bridge cultural and environmental factors together in upcoming investigations based on social science theories.

Declarations

Author contribution statement

Irawan, Andrie Elia & Benius: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

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Data availability statement

Data will be made available on request.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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