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Environmental Citizenship: A Holistic Strategy to Realize Pro-Environmental Attitude Sustainability for Coastal Communities

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ABSTRAK

Penelitian ini dilakukan untuk mengembangkan rekomendasi kebijakan dalam mewujudkan kewarganegaraan lingkungan yang mendukung perilaku pro-lingkungan secara berkelanjutan bagi masyarakat pesisir. Lingkup penelitian ini berfokus pada masyarakat pesisir di Provinsi Riau, yang berjumlah 2.907.458 orang yang tersebar di enam kabupaten, yaitu: Kabupaten Indragiri Hilir, Kabupaten Bengkalis, Kabupaten Rokan Hilir, Kabupaten Pelalawan, Kabupaten Kepulauan Meranti, dan Kota Dumai. Merujuk pada the required sample size table dengan tingkat kepercayaan 95% dan margin kesalahan 5%, sampel penelitian yang dibutuhkan adalah 384 orang. Teknik pengambilan sampel acak sederhana digunakan untuk menentukan sampel penelitian. Hasil analisis multi-dimensi menunjukkan bahwa nilai indeks dan status keberlanjutan kewarganegaraan lingkungan masyarakat pesisir di Provinsi Riau berada pada angka 74,17. Nilai ini berada dalam interval 50,01-75,00 dengan kategori yang cukup berkelanjutan. Kondisi ini tentu cukup mengkhawatirkan dalam hal keberlanjutan dan perlu menjadi perhatian khusus bagi para pemangku kepentingan. Analisis prospektif yang dilakukan mengidentifikasi 3 faktor yang memiliki pengaruh sangat besar terhadap keberlanjutan kewarganegaraan lingkungan dalam mewujudkan perilaku pro-lingkungan di masyarakat pesisir di Provinsi Riau. Tiga faktor tersebut terdiri dari satu penentu utama keberhasilan (faktor input) dan dua faktor penghubung/pendukung keberhasilan. (stakes factors). Salah satu faktor utama adalah memilih produk yang ramah lingkungan. Dua faktor penghubungnya adalah (1) pengurangan jejak karbon pribadi; dan (2) pengurangan plastik sekali pakai. Dengan demikian, ketiga faktor ini menjadi dasar untuk penyusunan rekomendasi strategi dalam mewujudkan kewarganegaraan lingkungan dalam mengaktualisasikan perilaku pro-lingkungan masyarakat pesisir di Provinsi Riau. Melalui penilaian ahli, program pendidikan lingkungan hidup dan kampanye terintegrasi ditetapkan sebagai rekomendasi kebijakan yang mendukung SDGs Provinsi Riau.

***Kata kunci*:** Kewarganegaraan Lingkungan; Strategi, Sikap Pro Lingkungan; Berkelanjutan, Masyarakat Pesisir

ABSTRACT

This research was conducted to develop policy recommendations for actualizing environmental citizenship in actualizing pro-environmental behavior in a sustainable manner in coastal communities. The scope of this research focused on the coastal communities of Riau Province, totaling 2,907,458 people spread across six districts, namely: Inderagiri Hilir Regency, Bengkalis Regency, Rokan Hilir Regency, Pelalawan Regency, Meranti Islands Regency, and Dumai City. Referring to the required sample size table with a confidence level of 95% and a margin of error of 5%, the research sample needed is 384 people. Simple random sampling technique was used to determine the research sample. The results of the multi-dimensional analysis show that the index value and sustainability status of environmental citizenship of coastal communities in Riau Province are at 74.17. This value is in the interval 50.01-75.00 with a fairly sustainable category. This condition is certainly quite worrying in terms of sustainability and needs to be a special concern for stakeholders. The prospective analysis conducted identified 3 factors that have a very high influence on the sustainability of environmental citizenship in actualizing pro-environmental behavior in coastal communities in Riau Province. The three factors consist of one main determinant of success (input factors) and two connecting/supporting factors of success (stakes factors). One main determinant is choosing environmentally friendly products. The two connecting factors are (1) reduction of personal carbon footprint; and (2) reduction of single-use plastics. Thus, these three factors are the basis for the preparation of recommendations for strategies to realize environmental citizenship in actualizing pro-environmental behavior of coastal communities in Riau Province. Through expert judgment, an integrated environmental education and campaign program was determined as a policy recommendation that supports Riau Province's SDGs.

***Keywords*:** Environmental Citizenship; Strategy, Pro Environmental; Sustainability, Coastal Comminities

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1. INTRODUCTION

The coasts of many countries are rich in natural resources, but also highly vulnerable to environmental change (Almar et al., 2023; Ozsahin et al., 2023). In the face of this challenge, the concept of environmental citizenship has emerged, which promotes the principle of shared responsibility in protecting and preserving the environment (Mevono, 2023). Comprehensively, environmental citizenship involves individual awareness, knowledge, attitudes, and actions in maintaining and preserving the environment (Oe et al., 2022).

One of the main aspects of environmental citizenship is awareness of the importance of the environment (Navickienė et al., 2023; Hadjichambis et al., 2023). This includes an understanding of the complex interactions between humans and nature and the impact of human activities on the environment (Frankel, 2022; Cooper et al., 2023; Malakar et al., 2023). This awareness paves the way to an appreciation of biodiversity, the importance of natural cycles and the vulnerability of ecosystems to disturbance (Hernandez et al., 2024). Individual attitudes towards the environment are also an important part of environmental citizenship (Yin et al., 2021; Van et al., 2023).

An individual's role in environmental citizenship also includes the ability to collaborate with fellow citizens, government agencies, non-government agencies and the private sector (Berti & Alblas, 2023). Through cross-sector cooperation, individuals can strengthen their influence in influencing policies, mobilizing resources, and generating innovative solutions to environmental challenges (Marin et al., 2022). In addition, environmental citizenship also takes into account social justice and sustainability (Fang et al., 2023).

One of the states of the art from coastal countries is the strategy of environmental education programs integrated in the school curriculum (Pazoto et al., 2023; Ahmad et al., 2024). In the Netherlands, environmental education is an important part of learning at all levels of education (Vlachopoulos et al., 2023). This step encourages awareness and active involvement of the community from an early age in maintaining coastal ecosystems (Mushtaq et al., 2020). In addition, countries such as Canada have taken significant strategies and steps in building the capacity of coastal communities to deal with the threat of climate change (Vogel et al., 2022).

In Indonesia, the diverse cultures, natural landscapes and daily lives of the people create a rich picture of complexity in environmental citizenship. In general, Indonesians show an increasing level of awareness of the importance of protecting the environment, although challenges and differences in local contexts remain (Tao et al., 2024). At the national level, Indonesians have begun to change the way they view the environment (Alam, 2023). Awareness of climate change, environmental degradation and the need for sustainability have become increasingly frequent topics of conversation (Brennan & Madden 2023; Yang et al., 2023).

However, when we turn to Riau Province, we find a particular and complex context. As one of the main producers of oil palm in Indonesia, Riau has unique challenges regarding environmental citizenship (Syahza, 2019). The huge plantation industry has been a major source of income for many communities here, but at the same time, it has also been a source of conflict with environmental conservation (Primahardani et al, 2022).

The characteristics of Riau communities reflect a deep dependence on natural resources, especially tropical forests rich in biodiversity. To address this challenge, a comprehensive and sustainable strategy needs to be designed. Presenting recommendations for strategies to realize environmental citizenship in coastal communities is an urgency that cannot be ignored. Coastal communities are often at the forefront of dealing with the direct impacts of environmental change, such as rising sea levels, habitat destruction and declining seawater quality (Touza et al., 2021; Owusu & Andriesse, 2023; Dixon et al., 2023). Therefore, strengthening environmental citizenship among coastal communities is crucial to improving adaptation and mitigation to environmental challenges.

In this study, there are several limitations that need to be noted to provide a better context for the results obtained. Firstly, this study focused on coastal communities in Riau Province, which consists of six districts. Although the sample covers a wide range of regions, the limited geographical distribution may affect the generalisability of the results, as coastal communities in other regions may have different characteristics and challenges.

Secondly, cultural variations among coastal communities in Riau Province, which consist of various ethnic groups, may influence the pro-environmental attitudes and behaviours studied. Therefore, the results of this study may not fully reflect the views or behaviours of coastal communities in other areas with different cultural backgrounds.

Thirdly, although a simple random sampling technique was used, it is possible that the selected respondents are not fully representative of the entire coastal community population. Some groups may be under-represented, which may affect the validity and reliability of the research results. For example, respondents who are more educated or have better access to environmental information may be more likely to have pro-environmental attitudes compared to those with less exposure.

Lastly, this study was conducted within a limited timeframe and with limited resources, which may affect the depth of analysis and the amount of data that can be collected. Therefore, further research with more time and resources may be needed to gain a more comprehensive understanding of environmental citizenship in coastal communities. By including these limitations, it is hoped that readers

will understand the context behind the research results and consider these factors when interpreting the findings.

However, effective strategies also require a deep understanding of the socio-cultural dynamics in coastal communities. Each community has unique values and traditions, so successful strategies must take these factors into account. For example, in Japan, approaches that respect local wisdom and strengthen intergenerational relationships have proven effective in promoting community involvement in environmental conservation. Therefore, the development of adaptation strategies that involve community participation is urgent. This marks the urgency of this research in developing strategies to actualize pro-environmental behavior among coastal communities.

This study aims to: (1) to analyse whether environmental citizenship contributes to the formation of environmental behaviour of coastal communities; (2) to identify and analyse the index value and sustainability status of environmental citizenship of coastal communities; and (3) to develop recommendations for strategies to realise environmental citizenship in actualising pro-environmental behaviour of coastal communities.

2. MATERIAL AND METHODS

This research was conducted in coastal areas located in Riau Province which includes: Inderagiri Hilir Regency, Bengkalis Regency, Rokan Hilir Regency, Pelalawan Regency, Meranti Islands Regency and Dumai City. The population of this study was all coastal communities in Riau Province, which totaled 2,907,458 people. Referring to the required sample size table with a confidence level of 95% and a margin of error of 5%, the research sample needed in this study was 384 people. Simple Random Sampling Technique was used to determine the sample of this study. For details, the estimated number of Population and Samples can be seen in Table 1.

Data were collected using instruments such as questionnaires, interviews, checklists and prospective analysis sheets. Questionnaires in this study were used to obtain an overview and data on the existing conditions of Environmental Citizenship of coastal communities in Riau Province. Interviews were conducted with experts who researchers considered experts in their fields according to the research study. They were given a series of statements that were considered to explain each attribute for each dimension of the sustainability assessment of the research variables. Researchers used a Checklist Sheet and then identified or checked according to the respondent's answer/opinion to the existing conditions at the research location and then compared it with the criteria or indicators of sustainability. The value given to the response given by the respondent is marked with the numbers 0 (Poor); 1 (Medium), and 2 (Good). Furthermore, the format of the checklist sheet can be seen in Table 2.

In this research, interviews were conducted using 2 (two) approaches, namely structured and semi-structured interviews. Interviews were aimed at key personalities who had more in-depth knowledge of the issues that were used as research topics in accordance with the expertise and authority of the respondents (key personalities). The respondent selection technique was carried out using a nonprobability approach through purposive sampling method. The respondents selected are respondents who know best about the application of pro-environmental attitude. While the questionnaire refers to the indicators that can be seen in Table 3.

To answer the problem formulation, there are several types of data analysis carried out. To analyze the influence between variables in this study, data analysis was carried out through imperential descriptive statistical analysis with the help of the SPSS Version 26 Windows program. This data analysis is to determine whether environmental citizenship affects the pro-environmental attitude of coastal communities in Riau Province.

To analyze the index and sustainability status of environmental citizenship of coastal communities in Riau Province, a Multidimensional Scaling (MDS) analysis approach was used with the help of Rap-Citizenship software (modified Rapfish). According to Primahardani et al (2022) Rapfish stands for Rapid Appraisal for Fisheries is a Non-Parametric Multidimensional Scaling approach. Rap-Pro analysis is carried out through several stages, among others: (1) Determining the sustainable attributes of learning management; (2) Giving an assessment (bad-good) to each attribute on an ordinal scale based on the sustainability criteria of each dimension; (3) Inputting the value/score of the assessment results of each attribute into the Rap-Pro software and running Rap-Pro; (4) Compiling the index and sustainability status. The score results from each attribute are analyzed with multi dimensional to determine one or more points that reflect the sustainability position (unsustainable, less sustainable, moderately sustainable and very sustainable).

Table 1. Population and Sample

No	Population location	Population (Person)	Sample (Person)
1	Inderagiri Hilir Regency	663.248	64
2	Bengkalis Regency	593.390	64
3	Rokan Hilir Regency	669.996	64
4	Pelalawan Regency	422.907	64
5	Kepulauan Meranti Regency	217.607	64
6	Dumai City	340.310	64
	Total	2.907.458	384

** Source: Central Bureau of Statistics Data 2024*

Table 2. Checklist Sheet Format

Indicators	Parameters	Assessment			Scors
		Good (2)	Medium (1)	Poor (0)	
Collective Action	Active citizen engagement				
	Good cooperation with all parties				
	Ongoing environmental programs				
	Understanding the community environment				
	Sustainable economic benefits				
	Protection of natural resources				
Public Sphere	Involvement in decision-making				
	Transparency of environmental policy				
	Education and training about the causes of environmental damage				
	Facilitate access to media and discussion forums				
	Support for citizen initiatives				
	Protection of the rights of coastal communities				
Individual Action	Personal responsibility in protecting the environment				
	Reduction of single-use plastic				
	Preservation of local values				
	Wise use of natural resources				
	Environmental education is integrated into the school curriculum				
Private Sphere	Sharing knowledge between generations				
	Environmentally friendly behavior at home				
	Sustainable food consumption				
	Greenery around the house				
	Personal carbon footprint reduction				
	Choosing eco-friendly products				
	Reuse and recycle				

Table 3. Research Instrument Grid

Variables	Indicators	Parameters
Environmental Citizenship Hadjichambis (2022)	Collective Action	Preventing Environmental Problems
		Solving Environmental Problems
	Public Sphere	Addressing Structural Cause of Environmental Problem
		Achieving Critical & Active Engagement and Civic Paticipation
	Individual Action	Practising Environmental Right & Duties
		Promoting Inter & Intra Generation Justice
	Private Sphere	Developing Healty Relationship With Nature
		Achieving Sustainability
pro-environmental attitude Nkaizirwa et al., (2021)	Energy Saving	Participation in Energy Saving Initiatives
		User Awareness Level of Energy Consumption
		Reduction of Energy Waste
	Mobility and Transportation	Public Transportation Options
		Use of Bicycle or Walking
		Participation in the Transportation Emission Reduction Program
	Waste Prevention	Selection of Environmentally Friendly Products
		Waste Sorting at Home
		Reduced Use of Disposable Products
	Recycling	Participation in Recycling Program
		Selection of Products With Recycled Materials
		Use of Recycled Products
	Behavior that aims to preserve nature	Participation in Nature Conservation Activities
		Biodiversity Awareness
		Maintenance of the Environment at Home

Prospective analysis is used to analyze and develop recommendations for strategies for implementing environmental citizenship in actualizing pro-environmental behavior in a sustainable manner in coastal communities. Prospective analysis is carried out through three stages, namely: the first stage, determining the key factors in the existing condition from the MDS results; the second stage, determining the key factors from the need analysis results from stakeholders; the third stage, determining the key factors from the combined analysis results between the results of the first and second stages or a combination of existing conditions and need analysis. Furthermore, the prospective analysis quadrant is presented in Figure 1.

The resulting strategy is a decision support instrument that can be used by various parties, especially planners and policy makers to determine the right policy priorities in realizing the application of environmental citizenship in actualizing pro-environmental behavior in a sustainable manner in coastal communities. All of this can be realized by combining the results of MDS, Laverage and Prospective analysis. After conducting prospective analysis, expert judgment is needed from experts to determine the strategy for implementing environmental citizenship in actualizing pro-environmental behavior in a sustainable manner in coastal communities. The series of research stages above can be seen in full in Figure 2.

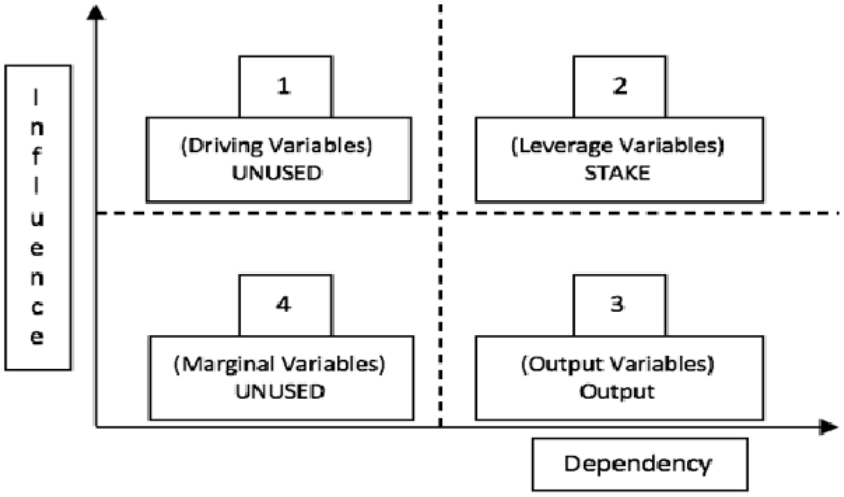

Figure 1. Quadrant Position in Prospective Analysis

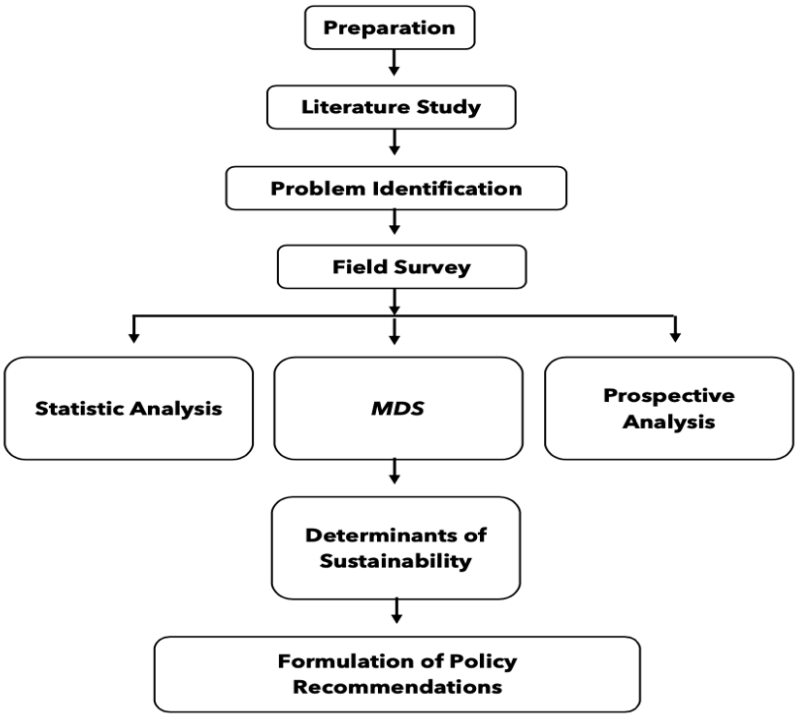

Figure 2. Research Flow Chart

Table 4. Results of the Validity Test of Environmental Citizenship Variable Items

Variables	Description
Environmental Citizenship	Valid
Pro Environmental Attitude	Valid

Source: Primary Data, 2024

3. RESULTS AND DISCUSSION

3.1. Contribution of Environmental Citizenship to the Formation of Environmental Behavior of Coastal Communities

To analyze the influence between variables in this study, data analysis was carried out through descriptive statistical analysis assisted by the SPSS Version 26 Windows program. The following is presented a series of statistical test analysis to determine the influence between variables.

3.2. Validity Test

Validity testing is done to determine whether a questionnaire is valid or not from each variable. The validity test that has been carried out in this study is shown in Table 4.

3.3. Reliability Test

This study must carry out a reliability test to measure whether or not the questionnaire in the

study is consistent in being used to measure the effect of variable X and variable Y. Before reliability testing is carried out, there must be a basis for decision making, namely alpha of 0.60. Variables that are considered reliable if the variable value is greater than> 0.60 if it is smaller than the variable under study cannot be said to be reliable because <0.60. The results of the reliability test on this research variable are in Table 5.

The results of the reliability test on the environmental attitude variable, legal knowledge and environmental education can be seen from the Cronbach's alpha value> 0.60. These results prove that all statements in the questionnaire are declared reliable.

3.4. Normality Test

This normality test uses the Kolmogorof-Smirnov Normality Test because the total number of samples is more than 30, showing significance (p-value <0.05) which can be seen in Table 6.

Based on Table 6, the environmental citizenship variable shows a sig value of 0.000 <0.05, the Pro Environmental Attitude variable shows a sig value of 0.000 <0.05, these results indicate that the data is not normally distributed because it is less than the significant level of 0.05. Furthermore, to find out whether the data used is homogeneous or not, then do the homogeneity test as the results are presented in Table 7.

From the homogeneity test results presented in the table above, it can be explained that the significance value of Based on Mean is 0.00. because the significance value <0.05, it can be concluded that the data is not homogeneous.

The series of statistical test results above, which include reliability, normality, and homogeneity tests, can be seen as reliable and inhomogeneous and the data collected is not normally distributed. Therefore, the statistical test that can be performed is a non-parametric test. So, the Spearman rank test was chosen to see the contribution of Environmental Citizenship to Pro Environmental Attitude of coastal communities in Riau Province. The results of the Spearman Rank test can be seen in Table 8.

From the Spearman Rank test results in Table 8, it is known that the significance value or Sig. (2-tailed) is 0.000. It is known that this value of 0.000 <0.05 means that there is a significant relationship between the two variables, namely the Environmental Citizenship variable and the Pro Environmental Attitude variable. In addition, a correlation coefficient of 0.989 was also obtained where this figure shows the strength of the correlation between the two variables in the range of 0.76 - 0.99 or in the very strong category. So, it can be concluded that Environmental Citizenship has a very strong influence on the formation of Pro Environmental Attitude of the community, especially coastal communities in Riau Province.

Table 5. Variable Reliability Testing Results

Variabels	Cronbach's Alpha
Environmental Citizenship	0.980
ProEnvironmental Attitude	0.980

Source: Primary Data, 2024

Table 6. Normality Test Results

Variables	Sig	Description
Environmental Citizenship	0.000	Data Not Normally Distributed
Pro Environmental Attitude	0.000	Data Not Normally Distributed

Source: Primary Data, 2024

Table 7. Homogeneity Test Results

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Environmental Citizenship & Pro Environmental Attitude	Based on Mean	221.825	1	384	.000
	Based on Median	139.256	1	384	.000
	Based on Median and with adjusted df	139.256	1	525.622	.000
	Based on trimmed mean	201.222	1	384	.000

Source: Primary Data, 2024

Tabel 8. Contribution of Environmental Citizenship to the Formation of Environmental Behavior of Coastal Communities

Correlations				
Spearman's rho			Environmental Citizenship	Pro Environmental Attitude
	Environmental Citizenship	Correlation Coefficient	1.000	.989**
		Sig. (2-tailed)	.	.000
		N	384	384
	Pro Environmental Attitude	Correlation Coefficient	.989**	1.000
		Sig. (2-tailed)	.000	.
		N	384	384

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

3.5. Index and Sustainability Status of Environmental Citizenship of Coastal Communities in Riau Province

To analyze the index value and sustainability status of environmental citizenship, researchers compiled sustainability parameters from each indicator by accommodating stakeholder expectations and needs. The analysis of the index value and sustainability of environmental citizenship of coastal communities in Riau Province was analyzed based on 4 (four) indicators, namely, (1) collective action indicators; (2) public sphere indicators; (3) individual action indicators; and (4) private sphere indicators. The following presents the results of the multidimensional scaling analysis of environmental citizenship. The results of the multidimensional analysis show that the index value and sustainability status of environmental citizenship in coastal communities in Riau Province are at 74.17. This value is in the interval 50.01-75.00 with a fairly sustainable category. This condition is certainly quite worrying in terms of sustainability and needs to be a special concern for stakeholders. Furthermore, the results of the multi-dimensional analysis of the sustainability of environmental citizenship in coastal communities in Riau Province are presented in Figure 3.

Furthermore, the sensitive attributes of each environmental citizenship sustainability indicator obtained from the Rap-Citizenship software-assisted multidimensional scaling analysis are presented in Table 9.

Based on the analysis results in Table 9, the index and sustainability status of each indicator are presented in Table 10.

3.6. Strategy Recommendations for Realizing Environmental Citizenship in Actualizing Pro-Environmental Behavior in Coastal Communities

Based on the results of the scaling analysis, there are 6 (eight) factors that determine the sustainability of environmental citizenship in actualizing pro-environmental behavior in coastal communities in Riau Province. Furthermore, prospective analysis will be carried out to see the most dominant factors which will then formulate the right strategy to actualize it with experts who researchers consider experts in their fields. Further prospective analysis results are presented in Figure 4.

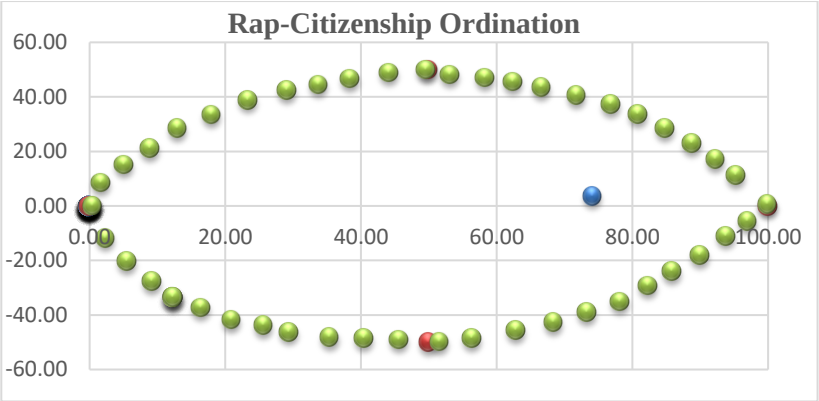

Figure 3. Level of Sustainability of Multidimensional Environmental Citizenship of Coastal Communities in Riau Province

Table 9. Sensitive Attributes Affecting the Sustainability Index in the Actualization of Environmental Citizenship of Coastal Communities in Riau Province.

Indicators	Sensitive Attribute
Collective Action	1. Understanding of the community environment 2. Active citizen engagement
Public Sphere	1. Protection of the rights of coastal communities 2. Involvement in decision-making
Individual Action	1. Environmental education is integrated into the school curriculum 2. Reduction of single-use plastic
Private Sphere	1. Choosing eco-friendly products 2. Personal carbon footprint reduction

Source: Primary Data, 2024

Table 10. Index and Status of Multidimensional Environmental Citizenship Sustainability of Coastal Communities in Riau Province

Indicators	Status
Collective Action	Quite Sustainable
Public Sphere	Quite Sustainable
Individual Action	Quite Sustainable
Private Sphere	Very Sustainable

Source: Primary Data, 2024

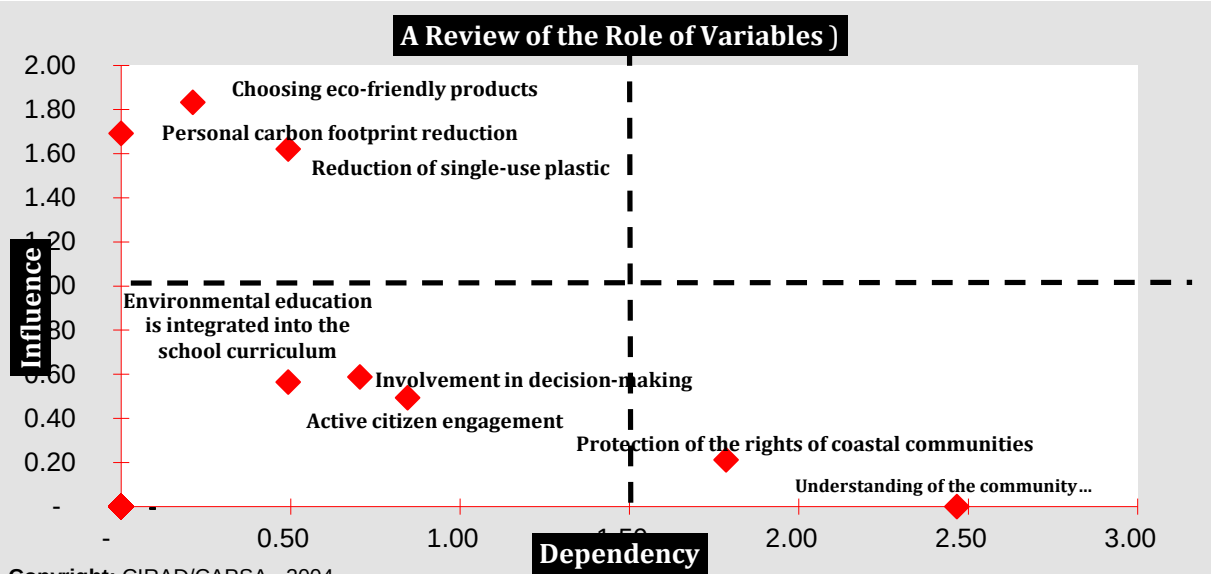

Figure 4. Prospective Analysis Result

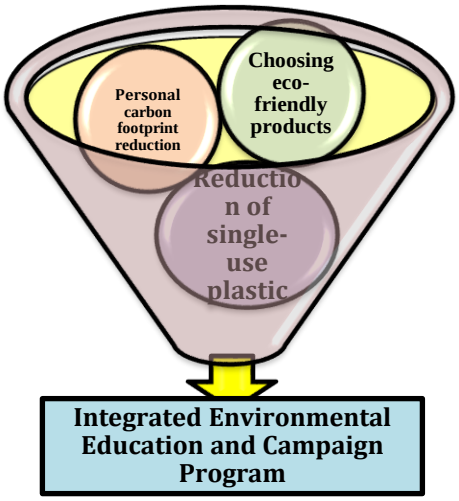

Figure 5. Recommendations for Strategic Policy on Environmental Citizenship in Actualizing Pro-Environmental Attitude in Coastal Communities in Riau Province

Figure 4 illustrates that based on the results of the prospective analysis conducted, three factors have been identified that significantly influence the sustainability of environmental citizenship in actualizing pro-environmental behavior among coastal communities in Riau Province. The three factors consist of one main determining factor for success (input factors) and two connecting/supporting factors for success (stakes factors). The main determining factor is choosing environmentally friendly products. The two connecting factors are: (1) reducing personal carbon footprint; and (2) reducing the use of single-use plastics. Thus, these three factors serve as the basis for formulating recommendations for strategies to realize environmental citizenship in actualizing pro-environmental behavior among coastal communities in Riau Province. Recommendations for strategies refer to the three dominant factors that have been identified. This strategy recommendation is formulated using expert judgment from specialists, as indicated in previous research conducted by Primahardani et al. (2022), which states that strategic policy recommendations can be made through expert judgment after undergoing a series of holistic analyses. Thus, from the three dominant factors above, strategic policy recommendations for environmental citizenship can be formulated to actualize pro-environmental behavior among coastal communities in Riau Province sustainably as follows in Figure 5.

Based on a series of statistical tests conducted earlier, there is a significant relationship between environmental citizenship and pro-environmental attitude, with a significance value of 0.000, which is well below the threshold of 0.05. This indicates that the increase in awareness and community participation in environmental issues (environmental citizenship) significantly contributes to their positive attitudes towards the environment. (Pro Environmental Attitude).

A correlation coefficient of 0.989 indicates that this relationship is very strong, falling within the category of 0.76-00.99. The results of this analysis highlight the importance of education and effective environmental campaigns to raise public awareness, especially in the coastal areas of Riau Province. By understanding that pro-environmental attitudes can be influenced by the level of community involvement in environmental issues, efforts to enhance environmental citizenship can become a key strategy in environmental preservation. This also highlights the need for collaboration between the government, NGOs, and the community to create a more sustainable environment.

Previous research, such as that conducted by Koh et al. (2023) and Zhao & Huangfu (2023), shows that individuals who are more engaged in environmental activities tend to have a more positive attitude towards environmental conservation. This is in line with other research findings that show that increased awareness and community participation in environmental issues significantly contribute to their positive attitudes. (Todaro et al., 2023; Obradovic et al., 2023; Udoh & Willard, 2023). In other words, the higher the level of individual involvement in activities related to the environment, the greater the likelihood that they will develop attitudes that support environmental preservation. (Shah & Asghar, 2024).

In addition, research by Ma et al (2023) emphasizes the importance of environmental education in shaping pro-environmental attitudes. The results of this analysis highlight the need for effective education and environmental campaigns to raise public awareness, especially in the coastal areas of Riau Province. Good environmental education can provide the necessary information to understand environmental issues and encourage individuals to participate in activities that support sustainability. (Zarate et al., 2023; Ramirez et al., 2023; Mohammadi et al., 2023). This indicates that efforts to enhance environmental citizenship can be a key strategy in environmental preservation. (Srisathan et al., 2024).

Furthermore, research by Sockhill et al (2022) identified that pro-environmental attitudes are influenced not only by knowledge but also by social norms and individual values. The results of this analysis indicate that to create a more sustainable environment, synergy among various parties is necessary. (Esposito et al., 2023). The government can play a role in creating policies that support community involvement, while NGOs can assist in the implementation of educational programs and environmental campaigns. (Buijs et al., 2024; Xia, 2024).

In addition, research by Soopramanien et al. (2023) shows that involvement in environmental activities can enhance an individual's sense of responsibility towards the environment. This is in line with the findings in this document, which indicate that an increase in environmental citizenship can influence pro-environmental attitudes. By increasing community engagement, it is hoped that a greater sense of responsibility for environmental preservation will emerge (Aytekin et al., 2023; Patwary, 2023).

Overall, the results of this analysis not only provide empirical evidence of the relationship between environmental citizenship and pro-environmental attitudes but also support the findings of previous research. By understanding that pro-environmental attitudes can be influenced by the level of community involvement in environmental issues, we can formulate more effective strategies to enhance awareness and participation among the public. Therefore, it is important for all parties to work together in creating a more sustainable environment, with a focus on education, environmental campaigns, and collaboration between the government, NGOs, and the community.

The issue of environmental sustainability is becoming increasingly urgent in various parts of the world, including Indonesia, particularly in the coastal areas of Riau Province. Coastal areas play a crucial role in maintaining ecosystem balance and providing essential resources for communities. However, the challenges faced by coastal communities in maintaining the sustainability of their environment are not as easy as one might expect. The results of the multidimensional analysis of environmental citizenship in the coastal communities of Riau Province indicate that the sustainability index value is 74.17. This result places the sustainability status in the "sufficiently sustainable" category, meaning that although efforts have been made to protect the environment, there are still many areas that need improvement.

Understanding the community environment is the main foundation for developing strong environmental citizenship. (Hernandez & Hernandez, 2024; Ryan et al., 2023). Knowledge about the importance of preserving ecosystems, the negative impacts of human activities on the environment, and ways to minimize environmental damage should be instilled from an early age. (Yerokhin et al., 2024). This lack of understanding can lead to indifference towards the environment and destructive behavior. (Chen & McChreary, 2024; Sharma et al., 2023). Therefore, effective environmental education, both formal and informal, needs to be improved. (Cheang et al., 2024; Gray et al., 2023).

Active citizen engagement in environmental issues is an important indicator in measuring the success of environmental citizenship (Bellanca et al., 2023). Community participation in environmental activities, such as beach clean-ups, reforestation, or campaigns to reduce plastic waste, reflects their level of awareness and commitment to the environment (Turnbull et al., 2020). This low level of engagement can be a major barrier in efforts to enhance environmental sustainability (Agyekum et al., 2023; Cao & Solang, 2023). The rights of coastal communities, especially those related to access and use of natural resources, must be protected (Medina,

2023; Teniwut et al., 2023; Gamarra et al., 2023). This protection includes the right to a clean and healthy environment, as well as the right to participate in decision-making related to environmental policies that affect them (Preston, 2024; Al Hammouri et al., 2023). If these rights are not protected, coastal communities could become victims of harmful environmental exploitation. (Faseyi et al., 2023).

The involvement of coastal communities in the decision-making process related to environmental policies is very important (Evans et al., 2023). Active participation in decision-making not only gives them a voice but also ensures that the policies adopted reflect their needs and concerns (Ullibari et al., 2022; Mouter et al., 2021). This involvement can also enhance the sense of ownership towards the environmental programs being implemented, which in turn will increase the effectiveness of those program (Zikargae et al., 2022).

In addition, integrating environmental education into the school curriculum is a strategic step to shape a generation that is more caring towards the environment (Ni et al., 2024; Alkaher & Carmi, 2024). Formal education that focuses on the environment will help students understand the importance of preserving the environment from an early age, such as not littering plastic waste carelessly (Anokye et al., 2024; Nguyen et al., 2023). This will create a generation that has a high environmental awareness and is ready to actively engage in sustainability efforts.

Single-use plastic has become one of the biggest challenges in the effort to maintain environmental sustainability (Liu C & Liu C, 2023; Mathew et al., 2023; Pathak et al., 2023). Plastic waste that is difficult to decompose significantly contributes to marine pollution and the destruction of coastal ecosystems (Dey et al., 2024; Kibria et al., 2023; Kowsari et al., 2023; Gondal et al., 2023). Efforts to reduce the use of single-use plastics should be a primary focus in environmental campaigns (Oludoye et al., 2024; Ahmadi et al., 2024; Abrokwah et al., 2024; Rabiu & Jeager, 2024). Education about the negative impacts of plastic and the promotion of environmentally friendly alternatives, such as the use of reusable shopping bags, are steps that need to be reinforced (Uehara et al., 2023; Muposhi et al., 2022).

Everyday product choices also affect the level of environmental sustainability (Shah et al., 2024; Wollmar et al., 2024; Makowska et al., 2024). The community needs to be encouraged to choose environmentally friendly products that are produced with consideration for their impact on the environment (Yue et al., 2020). Campaigns that encourage consumers to be more critical of their product choices can contribute to the overall reduction of environmental impact, including individual carbon footprints (Sheng et al., 2023; Righi et al., 2023; Hartmann et al., 2023; Liu et al., 2022).

An individual's carbon footprint is the total amount of carbon emissions produced by a person's daily activities (Naderipour et al., 2021). Reducing one's personal carbon footprint, such as by decreasing the use of motor vehicles, saving electricity, or reducing meat consumption, is an important step in sustainability efforts (Lv & Shang, 2023; Ahmed et al., 2023; Ridhosari & Rahman, 2020). Awareness of the importance of reducing carbon footprints must be instilled in every individual as part of their responsibility towards the environment. In facing this concerning sustainability situation, stakeholders need to take more strategic and coordinated actions. The government must strengthen regulations and policies that support environmental sustainability in coastal areas, including the protection of the rights of coastal communities. Educational institutions need to strengthen integrated environmental education programs within the curriculum. Meanwhile, environmental organizations and civil society can play an active role in raising awareness and encouraging community involvement in sustainability efforts.

In addition, collaboration among various parties is needed to strengthen existing programs and develop new, more effective initiatives. Stakeholders also need to conduct regular evaluations to assess the progress that has been made and adjust if necessary. With strong commitment and cooperation, the sustainability conditions in the coastal areas of Riau Province can be improved, allowing the community and the environment to continue to develop harmoniously.

The sustainability of environmental citizenship in the coastal communities of Riau Province, which falls into the sustainable category, indicates significant challenges that must be addressed promptly. By focusing on enhancing environmental understanding, active citizen engagement, protecting the rights of coastal communities, environmental education, and reducing plastic use and carbon footprints, sustainability status can be improved. Therefore, strategic and collaborative measures from all stakeholders are essential to ensure that environmental sustainability in the coastal areas of Riau can be achieved and maintained for a better future.

Figure 5 presents a recommended strategy to improve environmental citizenship and pro-environmental behaviour among coastal communities in Riau Province. The strategy consists of three main components that support each other: green product selection, reduction of personal carbon footprint, and reduction of single-use plastics.

Firstly, green product selection serves as a key determinant in encouraging communities to shift to more sustainable choices. To support this, an integrated environmental education programme can be implemented, which includes workshops and seminars that educate the public on the benefits of products that are not only safe for the environment but also support public health. Education on how to read sustainable product labels and understand the

impact of everyday consumption choices is crucial to raising consumer awareness.

Secondly, the reduction of personal carbon footprints can be achieved through programmes that encourage people to adopt more sustainable lifestyles. This includes the promotion of using public transport, cycling or walking as greener alternatives. The programme can also include training on energy efficiency in households, such as the use of energy-efficient appliances and simple energy-saving practices. By providing the necessary information and tools, people can more easily reduce their energy consumption and carbon emissions.

Third, reducing the use of single-use plastics should be a major focus in this strategy. Campaigns to replace single-use plastics with more environmentally friendly alternatives, such as cloth bags and reusable food containers, can be conducted. In addition, beach clean-up activities and better waste management can also raise awareness of the negative impacts of plastics on marine ecosystems.

This integrated environmental education programme, and campaign is designed to create deep awareness and sustainable behaviour change. The programme will involve various methods, including direct outreach, social media, and collaboration with local schools to reach the younger generation. By involving children in activities such as tree planting and beach clean-ups, they can learn about the importance of protecting the environment from an early age.

Through this integrated and participatory approach, it is hoped that coastal communities in Riau can develop stronger and more sustainable pro-environmental behaviours. By raising awareness and encouraging action, this programme will not only have a positive impact on coastal ecosystems but also improve the overall quality of life for the community.

By emphasizing the importance of community-based approaches in fostering pro-environmental behavior, this article provides new insights into environmental citizenship among coastal communities in Riau Province, Indonesia. This research adds to and expands our knowledge of how social and cultural factors influence environmental awareness and action in current literature.

Research conducted Cvetković et al (2024) shows that individual environmental awareness is often influenced by formal education and available information. However, this study shows that in the context of coastal communities, where local traditions and values are highly influential, a more holistic and participatory approach is needed. By involving communities in decision-making and planning processes, this article highlights that success in promoting pro-environmental behaviour depends not only on knowledge, but also on active engagement and recognition of local values.

Furthermore, the identification of three key factors - green product choice, personal carbon footprint reduction, and single-use plastic reduction - provides a concrete framework for policy intervention. The recommendations for community-based environmental education programmes and integrated campaigns are not only relevant for Riau Province but can also be applied in other regions with similar contexts. This shows that approaches tailored to local needs can increase the effectiveness of environmental programmes.

As such, this article not only adds to the existing literature, but also provides practical guidance for policy makers and practitioners in designing more effective programmes to improve environmental citizenship in coastal communities. This research paves the way for further studies that can explore the relationship between local culture and pro-environmental behaviour in various contexts.

4. CONCLUSION

The sustainability of environmental citizenship for coastal communities, particularly in Riau Province, is still very concerning. This condition is reflected in the sustainability status, which still falls into the category of fairly sustainable, or, in other words, it requires serious attention from stakeholders for the sustainability of the coastal area. The formulation of policy recommendations is necessary to accommodate sustainability parameters in accordance with coastal communities' expectations. Through a holistic analysis approach, reinforced by expert judgment, the policy strategy in the form of an environmental education and campaign program becomes a suitable recommendation to address this issue and, of course, supports the SDGs in the field of environmental conservation.

This research can be strengthened by pointing out further research opportunities on the influence of social and cultural factors on environmental citizenship. These factors include local traditions, social norms, and long-term studies to understand changes in coastal communities' behaviour towards the environment. In addition, there are several concrete actions that can be taken to implement this policy. These include incorporating environmental education into the school curriculum, conducting campaigns to reduce single-use plastics by offering more environmentally friendly alternatives, increasing public participation through workshops and forums, and working with NGOs, the private sector, and the government to support sustainability. It is hoped that these strategies can encourage sustainable pro-environmental attitudes and form the basis of evidence-based future policies.

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