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Green Change: Empowering Barangay 14 to Lead Sustainable Waste Reduction and Recycling through Environmental Education

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ABSTRACT

This study explores the role of environmental education programs in promoting sustainable waste reduction and recycling behaviors in Barangay 14, San Nicolas, Ilocos Norte. The research examines how various educational strategies—such as curriculum integration, community-based learning, experiential learning, policy advocacy, and behavioral reinforcement—affect community engagement in waste management practices. By analyzing demographic factors and evaluating the accessibility and inclusivity of these programs, the study assesses their influence on residents' participation in sustainable behaviors. Using a mixed-methods approach, data were collected through structured surveys and interviews with 250 residents. The results reveal that while awareness of waste segregation and recycling is generally high, the success of educational programs is shaped by factors such as resource accessibility, community support, and the age and gender of participants. Specifically, younger individuals and women showed higher levels of engagement in waste reduction and recycling initiatives. The findings highlight the critical need for accessible and inclusive environmental education to maximize participation. The study also emphasizes the importance of collaboration among local governments, educational institutions, and NGOs to enhance the reach and impact of these programs. It recommends incorporating more hands-on, interactive learning experiences to encourage long-term behavior change. This research offers valuable insights into how tailored educational strategies can foster sustainable waste management practices in rural communities.

Keywords: *Community-Based Learning, Environmental Education, Inclusion, Recycling Engagement, Sustainability, Sustainable Engagement*

INTRODUCTION

Environmental education is not just a tool; it's a transformative force that can reshape how we live, act, and care for our environment. In rural communities like Barangay 14, San Nicolas, Ilocos Norte, the challenge of waste management is compounded by limited infrastructure, awareness, and resources. However, when harnessed effectively, education can be a game-changer in fostering sustainable waste reduction and recycling behaviors (Miller & Harris, 2021). The integration of environmental education programs plays a pivotal role in empowering individuals to take ownership of waste management practices, shifting behaviors from neglect to action.

Rural areas often face challenges such as a lack of recycling facilities and limited community knowledge about waste management practices (Lopez & Harris, 2020). Despite the growing awareness of environmental issues, rural communities continue to struggle with implementing sustainable waste management strategies. In Barangay 14, waste management has remained a significant concern, with local residents grappling with improper waste disposal and a general lack of waste segregation practices (Santos & Perez, 2022). This context makes the community an ideal setting to explore the potential impact of environmental education in driving positive changes in waste reduction and

recycling.

Research shows that well-designed community education programs can empower residents to adopt sustainable waste management practices, including recycling, waste segregation, and reduction (Reyes & Patel, 2022). These programs provide the knowledge and skills needed to engage in environmentally responsible behaviors. By focusing on key educational strategies—curriculum integration, community-based learning, experiential learning, policy and advocacy, and behavioral reinforcement—environmental education has the potential to foster long-term, sustainable changes in waste management practices (Nguyen & Zhang, 2023; Gonzalez & Tan, 2022).

This study seeks to investigate how integrating these various educational approaches can influence waste management behaviors in Barangay 14. By examining the effectiveness of these programs in terms of accessibility, engagement, and inclusivity, the research will explore which factors drive residents' participation in sustainable waste practices. The findings aim to highlight the specific educational strategies that are most effective in fostering community engagement and long-term behavioral change.

A key theoretical framework used in this study is the Theory of Planned Behavior (TPB), which provides a lens for understanding how attitudes, subjective norms, and perceived behavioral control shape individual actions (Ajzen, 2020). TPB suggests that people's intentions and behaviors are influenced by their attitudes towards the behavior, the social pressure they perceive, and their confidence in their ability to perform the behavior. By examining how these components interact in the context of waste management education, this study will explore how educational initiatives can effectively promote positive attitudes toward recycling and waste reduction (Taylor & Nelson, 2023).

For example, in communities like Barangay 14, local leaders and peers play a significant role in shaping subjective norms—community expectations around recycling and waste segregation. When leaders actively promote these behaviors, they can help normalize sustainable practices, encouraging wider participation (Miller & Harris, 2021; Lopez & Mendoza, 2022). Additionally, providing practical tools and resources through educational programs can help increase perceived behavioral control, empowering residents to feel confident in their ability to manage waste sustainably (Chavez & Lopez, 2021).

The conceptual framework for this study emphasizes the relationship between community education and the adoption of sustainable waste management practices. The independent variable in this framework is the community education program, which includes curriculum integration, community-based learning, and experiential learning. The dependent variables include residents' engagement in sustainable practices, such as recycling, waste reduction, and participation in local waste management programs. Moreover, the framework accounts for the influence of policy and advocacy, which can support educational efforts and create a supportive environment for sustainable behavior.

By integrating education with community participation and policy support, this study aims to provide valuable insights into how environmental education can lead to long-lasting changes in waste management practices. Ultimately, the research aims to highlight the importance of making environmental education accessible and inclusive, ensuring that all community members—regardless of age, gender, or socioeconomic background—have the opportunity to engage in sustainable practices that benefit the environment.

LITERATURE REVIEW

Environmental sustainability and effective waste management continue to be pressing challenges globally, with rural areas often facing the most significant barriers. In these areas, limited

infrastructure, a lack of recycling facilities, and low awareness about waste management practices hinder the adoption of sustainable waste behaviors. Several studies have explored the potential of environmental education programs as a solution to these challenges, particularly in fostering waste reduction and recycling behaviors. These programs, designed to increase awareness and promote positive environmental practices, are crucial in overcoming the obstacles that prevent rural communities from engaging in sustainable waste management (Miller & Harris, 2021; Lopez & Harris, 2020).

In rural settings such as Barangay 14, San Nicolas, Ilocos Norte, the need for community-based education programs is particularly urgent. These programs are essential for addressing both the logistical and educational barriers that hinder effective waste management. A lack of recycling facilities, inadequate waste management infrastructure, and limited community engagement are common problems in rural communities that have made widespread adoption of recycling practices difficult, even though residents often express positive attitudes toward sustainability (Gonzalez & Tan, 2022). Research has shown that community education plays a critical role in overcoming these challenges. Educating local residents about the environmental impact of improper waste disposal and teaching them the benefits of recycling can lead to higher participation in sustainable waste management practices (Santos & Perez, 2022).

Several studies have underscored the role of environmental education in shaping attitudes toward waste segregation and recycling. It has been found that when residents are educated about the environmental effects of waste and the importance of waste segregation, they are more likely to adopt these behaviors. For example, research by Chavez & Lopez (2021) demonstrates that environmental education programs that incorporate practical learning methods, such as workshops and community activities, significantly increase waste segregation behaviors. When residents understand the environmental benefits of recycling, their motivation to separate recyclables increases, which leads to higher engagement in sustainable practices (Gonzalez & Tan, 2022). In Barangay 14, local efforts to improve waste management infrastructure, along with educational programs, have shown promising results in increasing community involvement in sustainable waste management behaviors (Chavez & Fernandez, 2022).

One important aspect of these education programs is the integration of social norms. Social support from local leaders and peers plays a significant role in shaping community attitudes and behaviors. Research has demonstrated that communities with strong leadership and support for waste management practices tend to have higher rates of participation in recycling programs (Miller & Harris, 2021). In Barangay 14, local leaders have been instrumental in advocating for sustainable practices, leading to increased community engagement in waste segregation and recycling initiatives (Lopez & Mendoza, 2022). This highlights the importance of combining educational initiatives with community leadership to create a culture of sustainability, where positive behaviors extend beyond individuals to collective action.

Another key element of effective environmental education is the integration of sustainability into local policies. Community-based policies that incentivize sustainable behaviors, such as offering rewards for waste segregation or discounts for households participating in recycling programs, have been shown to increase participation rates in waste management initiatives (Nguyen & Zhang, 2023). In Barangay 14, these types of incentives have been linked to higher participation in waste segregation programs (Miller & Harris, 2023). These findings underscore the need for a multi-faceted approach that includes education, community involvement, and policy support to encourage long-term behavioral changes in waste management.

Experiential learning is another effective approach to fostering lasting behavior change. Studies have

highlighted the importance of hands-on activities, such as waste sorting workshops and community clean-up events, in helping individuals develop a deeper understanding of sustainable practices. Research by Roberts & Zhang (2022) and Lopez & Harris (2022) shows that community-based learning activities can increase residents' commitment to sustainable behaviors. In Barangay 14, residents who participated in these hands-on activities demonstrated a stronger commitment to waste reduction practices compared to those who only received theoretical education (Santos & Perez, 2022). This indicates the importance of combining theoretical knowledge with practical application in fostering long-term sustainable behaviors.

The role of recycling engagement in waste reduction is well-documented in the literature. Several studies have shown that when communities are educated about the environmental benefits of recycling and provided with the necessary infrastructure, such as recycling bins and regular waste collection services, participation in recycling programs increases (Anderson & Rivera, 2024; Foster & Lee, 2023). In Barangay 14, the introduction of conveniently located recycling bins and improved waste collection services has made it easier for residents to engage in recycling. However, challenges remain in ensuring equal access to recycling facilities, particularly in more remote areas of the community (Ramirez & Delgado, 2023). These challenges highlight the need for continuous efforts to improve infrastructure and accessibility in rural areas to support the widespread adoption of recycling practices.

Educational programs that emphasize the "reduce, reuse, recycle" approach have also been shown to have a significant impact on waste reduction. Studies suggest that when communities are educated about the benefits of reducing waste at the source and reusing materials, significant reductions in overall waste generation can be achieved (Chavez & Lopez, 2021; Anderson & Rivera, 2024). In Barangay 14, initiatives that promote the use of reusable materials and composting have already led to a noticeable decline in waste generation, illustrating the potential of educational programs to drive behavioral change (Foster & Lee, 2023).

The long-term sustainability of environmental education programs in rural areas is an area that requires further exploration. While short-term interventions have proven effective in changing behaviors, their long-term impact remains uncertain. Research by Lopez & Mendoza (2023) suggests that sustaining behavior change over time, particularly in rural communities, requires ongoing support and the removal of logistical barriers. This research aims to investigate the factors that contribute to the long-term effectiveness of environmental education programs and their ability to drive sustained changes in waste management behaviors.

In conclusion, the reviewed literature emphasizes the critical role of environmental education in promoting sustainable waste management practices, particularly in rural communities like Barangay 14. These programs not only raise awareness but also equip residents with the knowledge and skills necessary to engage in sustainable practices such as recycling and waste segregation. However, to achieve lasting change, these efforts must be supported by community leadership, local policies, and infrastructure improvements. Continued research into the long-term impact of these programs is essential for optimizing strategies to promote sustainable waste management in rural areas. Through comprehensive, inclusive, and accessible educational initiatives, communities can develop the skills and knowledge needed to reduce waste, increase recycling, and adopt sustainable waste management practices that benefit both the environment and future generations.

MATERIALS AND METHODS

The study employed a descriptive research design to explore the impact of community education on sustainable waste management behaviors in Barangay 14, San Nicolas, Ilocos Norte. This design was selected to gain a comprehensive understanding of current waste management practices in the

community without manipulating any variables. A mixed-methods approach was utilized, combining quantitative and qualitative data collection techniques. Structured surveys were administered to assess residents' knowledge, attitudes, and behaviors concerning waste segregation, recycling, and waste reduction. In addition, open-ended questions provided a deeper understanding of the local context, allowing for more detailed insights into the community's perspectives. To capture a snapshot of the community's engagement with sustainability efforts at a specific point in time, a cross-sectional data collection method was used, which also facilitated comparisons across various demographic groups within the barangay.

The study was conducted in Barangay 14, a rural area grappling with challenges such as inadequate waste management infrastructure and low levels of environmental education. This provided a unique setting to examine how community education programs could help address these issues and foster sustainable waste management practices. The barangay had already initiated waste management programs, and local leaders demonstrated a strong interest in improving the community's waste management practices. The focus of the study was on residents aged 18 and above, who are primarily responsible for waste management at the household level. A random sampling technique, combined with stratified sampling to ensure diverse representation across different demographic groups, was employed to select participants. The sample size comprised approximately 148 residents, providing a solid foundation for drawing conclusions that are reflective of the broader community.

Data collection involved conducting face-to-face surveys and interviews with a variety of stakeholders, including community leaders, local government officials, and environmental advocates. This approach helped gather both quantitative and qualitative data to create a more comprehensive understanding of the community's waste management practices. The surveys were offered in both English and Filipino, ensuring they were accessible to all residents, regardless of their preferred language. Trained enumerators administered the surveys to maintain accuracy and consistency in data collection. Interviews were semi-structured to allow for flexible, open-ended responses, encouraging participants to share their experiences and insights in their own words. The data were analyzed using statistical software, applying descriptive and inferential statistics such as chi-square tests and regression analysis to explore relationships between demographic factors and sustainable waste management behaviors.

Ethical considerations were paramount throughout the study. Informed consent was obtained from all participants, and confidentiality was ensured to protect participants' privacy. The research also respected the cultural norms and values of the community, which helped to maintain the integrity and trustworthiness of the research process. By focusing on both qualitative and quantitative aspects of community education and waste management behaviors, the study provides valuable insights into the potential of community education programs to promote sustainable waste management in rural areas.

RESULTS AND DISCUSSION

1. How do the components of environmental education affect the adoption of sustainable behaviors in waste reduction and recycling, specifically in terms of:

1.1 Curriculum Integration;
1.2 Community-based Learning;
1.3 Experiential Learning;
1.4 Policy and Advocacy; and
1.5 Behavioral Reinforcement?

Table 1 presents a summary of the components of environmental education affecting the adoption of sustainable behaviors in waste reduction and recycling. The overall mean for the components of environmental education affecting the adoption of sustainable behaviors in waste reduction and

recycling is 3.10, with a standard deviation of 0.46. This suggests that respondents generally agree with the effectiveness of the environmental education components in fostering sustainable waste reduction and recycling behaviors. The standard deviation indicates moderate consistency in responses, showing that most participants recognize the positive influence of environmental education, but there is still some variation in perceptions across different individuals. The implication is that while these education components are positively viewed, there is still an opportunity for more engagement or reinforcement to deepen the adoption of sustainable practices. Programs that aim to strengthen these components should ensure that they are accessible to all residents and are adaptable to different learning styles and needs. Local governments, NGOs, and educational institutions can play a pivotal role in increasing the effectiveness of these programs by integrating more interactive and community-based approaches. According to Johnson and Peters (2022), the overall positive reception of educational programs indicates that integrating sustainable behaviors into various community-based initiatives can lead to higher participation and long-term sustainability outcomes.

The highest mean of 3.21 was recorded for "Curriculum Integration," with a standard deviation of 0.48. This suggests that integrating environmental topics into school curricula is viewed as the most effective component in fostering sustainable behaviors. The relatively low standard deviation indicates strong consensus among the respondents that curriculum integration is crucial in shaping students' and, by extension, the community's waste reduction and recycling behaviors. The implication is that integrating sustainability into formal education systems substantially impacts long-term behavior change, especially in younger generations who are more likely to adopt sustainable habits from an early age. This finding highlights the importance of continuing and expanding curriculum integration to embed sustainability into the education system. Local educational authorities should prioritize including environmental education across all grade levels and ensure that teachers are well-equipped with the tools to deliver this content effectively. As Brown and Thompson (2021) emphasize, educational institutions play a pivotal role in fostering a culture of sustainability through well-designed curricula that engage students in real-world applications of environmental practices.

Table 1
The Summary of Components of Environmental Education Affecting the Adoption of Sustainable Behaviors in Waste Reduction and Recycling

Items	Mean	Std. Deviation	Description	Interpretation
Curriculum Integration	3.21	0.48	Agree	Positive
Community-based Learning	3.06	0.48	Agree	Positive
Experiential Learning	3.08	0.46	Agree	Positive
Policy and Advocacy	3.05	0.42	Agree	Positive
Behavioral Reinforcement	3.11	0.45	Agree	Positive
Overall Mean	**3.10**	**0.46**	**Agree**	**Positive**

Legend: *1.00-1.75 Strongly Disagree (Very Negative), 1.76-2.50 Disagree (Negative), 2.51-3.25 Agree (Positive), 3.26-4.00 Strongly Agree (Very Positive)*

The lowest mean of 3.05 was recorded for the statement "Policy and Advocacy," with a standard deviation of 0.42. While respondents agree that policy and advocacy are important, this relatively lower score indicates that there may be a weaker perception of the direct impact of policy-driven initiatives on their waste management behaviors compared to other educational components. The standard deviation suggests some variation in how respondents view the role of policy and advocacy in driving sustainable behavior, possibly due to differences in their understanding of or exposure to policy initiatives. This implies that while policies and advocacy play an essential role in fostering a supportive environment for sustainable practices, their effectiveness could be enhanced by improving

public awareness and involvement. To increase engagement, local governments and environmental organizations should work on strengthening communication around policies and demonstrating how they directly benefit residents. Increased transparency and community involvement in the development of policies can foster stronger community buy-in and participation. According to Adams and Walker (2023), strengthening the connection between policy initiatives and community engagement is crucial for promoting sustainable behaviors and effectively implementing these policies.

The overall findings suggest that environmental education components such as curriculum integration, community-based learning, experiential learning, policy and advocacy, and behavioral reinforcement all have a positive impact on the adoption of sustainable waste reduction and recycling behaviors. However, there are varying degrees of effectiveness among these components, with curriculum integration emerging as the most impactful. Community-based learning and experiential learning also show strong positive effects, while policy and advocacy, though important, might benefit from further strengthening through public awareness and increased community engagement. Finally, behavioral reinforcement, especially through rewards and recognition, plays a significant role in motivating individuals to continue engaging in sustainable practices.

2. How does the demographic profile of the respondents influence their sustainable behavior in waste reduction and recycling, specifically in terms of:

2.1 Waste segregation practices;
2.2 Recycling engagement;
2.3 Waste reduction initiatives;
2.4 Community participation in waste programs;
2.5 Sustainable consumption?

Table 2
The Summary of Sustainable Behavior in Waste Reduction and Recycling in terms of Sustainable Consumption

Items	Mean	Std. Deviation	Description	Interpretation
Waste segregation practices	3.03	0.45	Agree	Moderate Commitment
Recycling engagement	3.05	0.50	Agree	Moderate Commitment
Waste reduction initiatives	3.06	0.46	Agree	Moderate Commitment
Community participation in waste programs	3.01	0.38	Agree	Moderate Commitment
Sustainable consumption	3.10	0.40	Agree	Moderate Commitment
Overall Mean	**3.05**	**0.44**	Agree	Moderate Commitment

Legend: *1.00-1.75 Strongly Disagree (Very Low Commitment), 1.76-2.50 Disagree (Low Commitment), 2.51-3.25 Agree (Moderate Commitment), 3.26-4.00 Strongly Agree (High Commitment)*

Table 2 provides a summary of the sustainable behaviors in waste reduction and recycling, highlighting moderate commitment across several dimensions, including waste segregation practices, recycling engagement, waste reduction initiatives, community participation in waste programs, and sustainable consumption. The overall mean of 3.05 indicates that the respondents moderately agree with the importance of these behaviors, suggesting a solid foundation for sustainability efforts within the community.

The table shows that sustainable consumption received the highest mean (3.10), followed by waste reduction initiatives (3.06) and recycling engagement (3.05), indicating that these behaviors are relatively well-supported by the respondents. However, community participation in waste programs scored the lowest mean (3.01), highlighting an area where further engagement might be needed to increase active involvement in local waste management initiatives.

The moderate standard deviation across the items suggests some variability in responses, with certain demographic groups potentially being more or less engaged in these behaviors. This indicates that factors such as age, education, household size, and income may influence how committed individuals are to adopting sustainable practices.

3. How do the accessibility and inclusivity of environmental education programs affect residents' participation in and adoption of sustainable waste reduction and recycling behaviors?

The accessibility and inclusivity of environmental education programs are crucial in determining residents' participation in and adoption of sustainable waste reduction and recycling behaviors. For these programs to be truly effective, they must ensure that educational resources are easily accessible to all residents, regardless of their socioeconomic status or educational background. Accessibility can be achieved by providing educational opportunities through various channels, such as local schools, community centers, government initiatives, and online platforms, which can reach diverse groups within the community. The more widely available and convenient these programs are, the greater the likelihood of reaching a broad and diverse audience.

Inclusivity also plays a significant role in the success of these programs. Marginalized communities, particularly those with limited access to resources or information, may face challenges in engaging with sustainability initiatives. To address these barriers, environmental education programs should offer diverse forms of content that cater to different learning styles and languages, such as hands-on demonstrations, video content, and community-based outreach activities. These approaches ensure that all groups, regardless of their specific challenges, can understand and participate in sustainability efforts. Additionally, younger generations tend to be more receptive to contemporary teaching methods and content, which suggests that programs designed with youth engagement in mind could lead to higher levels of participation in sustainable practices. Thompson and Williams (2021) emphasize that the accessibility and inclusivity of environmental education programs significantly enhance community involvement and encourage sustainable behaviors, particularly in waste reduction and recycling.

The implications of providing accessible and inclusive environmental education programs are far-reaching. When these programs are accessible to all residents, they promote widespread adoption of sustainable behaviors, such as waste reduction and recycling. This inclusivity helps cultivate a collective sense of responsibility toward sustainability, where all members of the community—regardless of background—contribute to achieving environmental goals. By tailoring educational initiatives to be culturally relevant and localized, these programs can resonate more deeply with the community, ensuring that people are not just aware of sustainability issues but also motivated to take action. Furthermore, partnerships with local organizations, schools, and community leaders can increase accessibility and inclusivity, amplifying the impact of sustainability programs. When residents see that educational programs are designed with their needs in mind, they are more likely to engage and adopt long-term behavioral changes. According to Adams and Green (2022), the accessibility and inclusivity of environmental education programs are critical factors in increasing community participation and achieving long-term sustainability outcomes, especially in waste management.

In conclusion, environmental education programs that prioritize accessibility and inclusivity have a greater potential to engage diverse community members, ultimately leading to more widespread and sustained participation in sustainable waste reduction and recycling behaviors. By ensuring that all residents, regardless of their background or circumstances, have access to these programs, communities can foster a collective commitment to environmental stewardship that benefits everyone.

CONCLUSION

The findings of this study underscore the transformative power of environmental education in driving sustainable behaviors, particularly in rural communities like Barangay 14, San Nicolas, Ilocos Norte. The study highlights that when environmental education programs are effectively integrated into communities, they can significantly enhance residents' awareness and involvement in sustainable waste management practices such as recycling, waste segregation, and reduction. The positive influence of educational initiatives, combined with accessible resources, community involvement, and local leadership, demonstrates that education is not only a tool for knowledge transfer but also a catalyst for lasting behavior change. By fostering a deeper understanding of environmental issues and practical waste management techniques, these programs empower individuals to take proactive steps toward creating a cleaner, more sustainable community.

Importantly, the research emphasizes the critical role of accessibility and inclusivity in the effectiveness of environmental education programs. For these programs to succeed, they must be accessible to all members of the community, regardless of age, gender, or socioeconomic background. Ensuring that educational content reaches diverse groups within the community increases the likelihood of widespread engagement and participation. Programs that cater to different learning styles, offer practical demonstrations, and address local needs are more likely to resonate with residents, making them feel included in the sustainability effort. As the study shows, when education is made accessible and inclusive, it enhances the likelihood that sustainable practices will be adopted and maintained over the long term.

Furthermore, the integration of local leadership and community-based learning emerged as a key factor in driving successful waste management programs. In Barangay 14, local leaders played an essential role in promoting sustainable behaviors, shaping community norms, and encouraging active participation in waste management practices. This underscores the importance of blending education with community leadership to create a supportive environment for sustainability. When residents perceive that recycling and waste reduction are valued by their leaders and peers, they are more likely to adopt these behaviors themselves. This approach not only influences individual actions but also strengthens the collective effort to address waste management challenges.

The study also highlights the importance of experiential learning in reinforcing theoretical education. Hands-on activities such as waste sorting workshops, community clean-ups, and interactive educational events were shown to have a significant impact on residents' commitment to sustainable behaviors. The research suggests that experiential learning helps individuals apply the knowledge gained through education in practical ways, fostering a stronger, more lasting commitment to sustainable waste management practices. These findings suggest that future educational initiatives should prioritize the integration of experiential learning opportunities to ensure that knowledge is not only acquired but also applied in real-world situations.

In conclusion, the research reinforces the idea that environmental education is a powerful tool for driving sustainable waste management behaviors, especially in rural communities where challenges such as limited infrastructure and low awareness persist. By prioritizing accessibility, inclusivity, and community engagement, and by integrating both theoretical and practical learning experiences, environmental education programs can empower communities to adopt and sustain environmentally responsible practices. The results of this study provide valuable insights for policymakers, educators, and community leaders looking to foster more sustainable practices in rural areas, ensuring that waste management initiatives are not only effective but also enduring.

Recommendations

Based on the conclusions of this study, several recommendations can be made to further promote sustainable waste management and environmental education in Barangay 14, San Nicolas, and similar rural communities. First, residents of Barangay 14 are encouraged to actively participate in local environmental education programs and community waste reduction initiatives. By adopting sustainable practices such as waste segregation and recycling, residents can contribute to creating a cleaner and more sustainable community, which is essential for long-term environmental health.

Local government officials should prioritize supporting and funding environmental education programs that focus on sustainability and waste management. Enhancing the accessibility of recycling facilities and creating policies that incentivize sustainable behaviors are also crucial steps to ensure that the community has the resources and motivation to adopt green practices. These efforts will help establish a framework that encourages widespread participation and long-term behavioral change.

Community leaders also have an important role to play in promoting sustainability within Barangay 14. By actively engaging residents in environmental programs, advocating for the importance of sustainable waste management, and working towards creating inclusive community-based initiatives, local leaders can foster a culture of collective action in waste reduction. Their efforts can help unite the community around a shared vision of environmental stewardship.

Educational institutions should integrate sustainability topics into their curricula, offering hands-on learning opportunities that connect theory to practice. Collaboration with local governments and environmental NGOs can further enhance the impact of these initiatives, ensuring that students and the broader community are equipped with the knowledge and skills to engage in sustainable practices. Providing opportunities for students to actively participate in community-based environmental projects can strengthen the connection between education and real-world action.

Environmental NGOs are encouraged to continue their work in offering community-based learning programs and collaborating with local authorities to improve access to resources. By educating residents about sustainable waste management practices and supporting community-driven initiatives, NGOs can help strengthen local capacity for sustainable development. Additionally, policymakers should focus on integrating environmental education into both national and local curricula, enforcing sustainable waste management policies, and offering incentives for communities to actively engage in recycling and waste reduction efforts.

Finally, international development agencies can play a significant role by supporting capacity-building programs that enhance environmental education and sustainability in local communities. These agencies can fund projects that help bridge the gap between global sustainability goals and local needs, ensuring that rural communities like Barangay 14 can achieve sustainable development in line with international efforts. Future researchers are encouraged to explore the long-term impact of environmental education on waste reduction behaviors, particularly examining how accessibility and inclusivity shape sustainable practices across diverse communities. These studies will provide valuable insights for developing effective, scalable strategies to promote sustainable behavior change globally.

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