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BUILDING SUSTAINABLE COMMUNITIES: A DATA-DRIVEN NEEDS ASSESSMENT FOR ECO-GRHEEN PROGRAM

Andrea P. Adigue[1]*, Reynaldo Cabual[2], Eduardo De Guzman[3]
[1]Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines
[2]Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines
[3]Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines

ORCIDs:
Andrea P. Adigue: [https://orcid.org/0009-0009-3245-6444]
Reynaldo Cabual: [https://orcid.org/0000-0002-4466-1455]
Eduardo De Guzman: [https://orcid.org/0000-0002-0832-1891]
**Corresponding Author*

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ABSTRACT----------
This study presents the findings of a Sustainable Community Needs Assessment Tool (SCNAT) implemented through the ECO-GRHEEN Program in Dingalan, Aurora Province, Philippines. In partnership with Nueva Ecija University of Science and Technology (NEUST) and the Local Government Unit of Dingalan, the initiative aimed to assess the community's socio-demographic profile, environmental practices, skill development interests, and digital readiness. Employing a mixed-methods approach, quantitative surveys were administered to 478 respondents, complemented by qualitative focus group discussions. Findings revealed active engagement in environmental activities and strong interest in skill and digital development, but limited recycling and digital access. FGDs highlighted the community's need for improved waste management, inclusive training, and technological access. The study underscores the importance of responsive, participatory, and data-informed strategies for sustainable community development. Recommendations include waste reduction efforts, closing the digital gap, and enhancing eco-friendly infrastructure and skills training.

KEYWORDS: *Sustainable Development, Community Assessment, Environmental Practices, Digital Literacy, Livelihood Training----------*

INTRODUCTION

Sustainable community development necessitates an integrated approach that incorporates environmental consciousness, livelihood enhancement, and digital readiness (United Nations, 2015). The ECO-GRHEEN Program—Empowering Communities through Outreach-Growth, Resourcefulness, and Home Economics Education Network—seeks to advance environmental stewardship (SDG 11), sustainable employment (SDG 8), and inclusive education (SDG 4). This initiative employs the Sustainable Community Needs Assessment Tool (SCNAT) to ensure interventions align with actual community needs (Jones & Patel, 2021).

Previous studies emphasize that solid waste management and environmental education are vital for urban sustainability (Smith et al., 2020). While Williams and Zhao (2018) assert that effective waste disposal systems mitigate ecological degradation. However, in Dingalan, Aurora Province, waste disposal inefficiencies, limited eco-practices, and insufficient livelihood support persist (Rodriguez et al., 2023). Addressing these challenges necessitates localized interventions informed by empirical assessments (Gonzalez & Lee, 2019). To operationalize sustainable development principles, institutional collaborations have emerged as a vital strategy. The municipality, through a Memorandum of Agreement with NEUST, collaborated to address these issues. On January 17, 2025, NEUST's College of Education (RET-COED) responded to a formal request from the Office of Mayor to initiate community assessments.

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The assessment aimed to address the following research questions:

1. What is the socio-demographic profile of the respondents in terms of:
   1.1 Age,
   1.2 Awareness and practices in environmental sustainability,
   1.3 Home-based activities,
   1.4 Fields of interest for learning,
   1.5 Digital and technological skills,
   1.6 Use of technology?
2. How may focus group discussion (FGD) responses be assessed? and
3. What recommendations can be made based on the findings?

RESEARCH METHOD

Research Design

This study utilized a mixed-methods approach combining quantitative and qualitative techniques to ensure comprehensive insights.

Time and Place of Research

The research was conducted in Dingalan, Aurora Province in early 2025.

Research Target/Subject

The study targeted 478 community members, selected through stratified sampling to ensure diverse representation across age groups and barangays.

Research Procedure

Surveys were distributed to respondents covering socio-demographic data, environmental practices, skills interest, and digital literacy. Focus Group Discussions (FGDs) were conducted to explore nuanced community insights.

Instruments, and Data Collection Techniques

A structured questionnaire and FGD guide were used. Survey data were collected and coded while FGD sessions were recorded and transcribed.

Data Analysis Technique

Survey responses were analyzed using frequency and percentage distributions. Thematic analysis was applied to FGD transcripts.

RESULTS AND DISCUSSION

Socio-Demographic Profile

Table 1. Age Distribution of Respondents

Age Group	Frequency	Percentage
18–25	135	28.24%
26–40	152	31.80%
41–60	103	21.55%
61 and above	88	18.41%
Total	**478**	**100%**

The data shows a concentration of respondents aged 18–40, indicating a predominantly young adult population with strong potential for skill training and digital engagement. This demographic trend supports the ECO-GRHEEN Program's focus on youth-centered and tech-driven interventions.

Supporting literature from Frontiers in Environmental Science (2023) and BMC Public Health (2023) affirm the importance of age-disaggregated data in community-based planning. The Journal of Environmental Science and Sustainable Development (2024) further emphasize integrating socio-demographic indicators into sustainability assessments to foster inclusive and adaptive program planning.

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Table 2. Awareness and Practices for Environmental Sustainability

Indicators	Frequency	Percentage
Composting Kitchen Waste	213	44.56%
Planting Vegetables or Ornamental Plants	109	22.80%
Recycling	101	21.13%
Using Environmentally Safe Products	55	11.51%
TOTAL	**478**	**100%**

The data from Table 2, which examines awareness and practices related to environmental sustainability, reveals that composting kitchen waste is the most common environmentally friendly activity among respondents, with 44.56% indicating they practice this regularly. This is followed by vegetable or plant gardening, which is reported by 22.80% of participants, suggesting a significant interest in urban or home gardening. Recycling comes next, with 21.13% of respondents engaging in this activity, indicating moderate awareness and practice of waste reduction through recycling. The least practiced activity is the use of eco-friendly products, with only 11.51% of respondents reporting this behavior.

These results suggest that while there is a strong inclination toward composting and some engagement in gardening and recycling, there is still considerable room for improvement, particularly in promoting the use of environmentally friendly products. The findings highlight the need for targeted educational campaigns and interventions to raise awareness and increase the adoption of a broader range of sustainable practices within the community.

A 2024 systematic literature review in the European Journal of Sustainable Development Research highlights the increasing recognition and adoption of practices such as composting, recycling, and eco-friendly consumption worldwide. The review emphasizes that composting, in particular, is gaining traction as an accessible and cost-effective method for managing kitchen and organic waste, aligning with data showing composting as the most common practice among respondents.

Community-based reports, such as the Tzu Chi Foundation's initiatives in the Philippines, further illustrate the practical benefits and growing popularity of composting, which not only reduces landfill waste but also supports home gardening and local food production. This reflects the 44.56% of respondents who compost kitchen waste and the 22.80% who engage in vegetable or plant gardening in the survey.

Additionally, recent studies in environmental psychology and higher education settings confirm that recycling and the use of eco-friendly products, while increasingly promoted, often lag behind other practices in terms of adoption rates. For instance, recycling is widely recognized but not universally practiced, and the use of eco-friendly products remains relatively low, consistent with findings of 21.13% and 11.51%, respectively. These studies suggest that targeted awareness campaigns and institutional support can help bridge these gaps, encouraging broader and more consistent adoption of sustainable behaviors.

Table 3. Activities Performed at Home

Indicators	Almost Always Done	Percentage	Frequently Done	Percentage	Occasionally Done	Percentage	Never Done	Percentage
1. Reducing waste and recycling	77	16.11%	50	10.46%	108	22.59%	243	50.84%
2. Using eco-friendly products	251	52.51%	52	10.88%	85	17.78%	90	18.83%
3. Planting vegetables or ornamental plants	337	70.50%	69	14.44%	72	15.06%		
4. Conserving water and electricity	478	100.00%						

Table 3, presents the frequency with which various environmentally sustainable activities are practiced at home. The data show that reducing waste and recycling are not widely adopted, with only 16.11% of respondents saying they

almost always do this and half (50.84%) admitting they have never done it at all. In contrast, eco-friendly products are much more common, as 52.51% of respondents report almost always using such products, while 18.83% have never tried them. Gardening, specifically the planting of vegetables or other plants, emerges as the most consistently practiced activity, with a remarkable 70.50% of respondents indicating that they almost always do this and only a small fraction reporting less frequent engagement. Notably, water and electricity conservation stand out as a universal practice, with all respondents (100%) stating that they always practice it at home. These findings suggest that while there is widespread commitment to resource conservation and home gardening, there are significant gaps in waste reduction and recycling behaviors. This pattern indicates opportunities for targeted interventions to promote recycling and waste minimization, building on the community's strong foundation in other sustainable practices.

A 2024 OECD report on household waste practices found that the availability of recycling services and supportive policies significantly influences adopting recycling and waste reduction behaviors. However, despite increased awareness, many households still do not consistently engage in recycling or waste minimization, often due to structural barriers or lack of convenience—mirroring the finding that only a minority "almost always" reduce waste and recycle, while half never do so. The report also highlights that behavioral interventions and information campaigns can effectively increase recycling rates and waste prevention behaviors.

Interest and engagement in eco-friendly products have risen sharply in recent years. According to a 2025 analysis of search trends, there has been a dramatic increase in consumer interest and adoption of eco-friendly household products, with searches for such products and brands rising by hundreds of percent over the past decade. This aligns with data showing a majority of respondents frequently use eco-friendly products at home.

Recent research widely recognizes home gardening as a highly adopted and beneficial household activity. A 2024 Human Nutrition and Food Science review concluded that home gardening not only improves dietary diversity and food security, especially in resource-constrained settings, but also enjoys high participation rates when supported by education and community programs. This supports the finding that most respondents "almost always" engage in gardening.

Finally, energy and water conservation studies confirm that these practices are among the most universally adopted sustainability behaviors at home. Research and practical guides published in 2024 and 2025 emphasize that simple habits—like turning off unused lights and appliances, using energy-efficient products, and conserving water—are now widely practiced and promoted as foundational to sustainable living. This is reflected in the data, where all respondents report always conserving water and electricity.

Table 4. Field of Most Interested to Learn

FIELD OF INTEREST	FREQUENCY	PERCENTAGE
Culinary and Food Processing	298	62.34%
Handicrafts and Creative Skills	426	89.12%
Business and Entrepreneurship	425	88.91%
Home Economics and Sustainable Living	402	84.10%
Digital and Technological Skills	387	80.96%
Electrical and Mechanical Skills	98	20.50%
Wellness and Personal Care	309	64.64%

Table 4, shows the areas in which respondents are most interested in learning new skills. The highest level of interest is in handicrafts and creative skills, with 89.12% of respondents wanting to learn more in this field. This is closely followed by business and entrepreneurship, which also garners strong interest from 88.91% of participants, indicating a community keen on exploring income-generating opportunities. Home economics and sustainable living are other popular areas, with 84.10% of respondents showing enthusiasm for learning practical skills supporting household management and sustainability. Culinary and food processing skills also attract significant interest, with 62.34% of respondents wanting to enhance their abilities in cooking and food preservation. Wellness and personal care are similarly valued, with 64.64% interested in improving their self-care and health-related knowledge.

Digital and technological skills are sought by 80.96% of respondents, reflecting the growing recognition of technology's role in daily life and livelihood. Electrical and mechanical skills, while still notable, have a lower interest level at 20.50%, suggesting these may be seen as more specialized or less immediately relevant by most community members. Overall, the data indicate a strong community appetite for practical, creative, and entrepreneurial skills, as well as a growing awareness of the importance of digital literacy and sustainable living.

Recent studies highlight a global resurgence of interest in handicrafts and creative skills, with research published in the Journal of Community Development (2024) showing that creative workshops promote economic opportunities and enhance social cohesion and well-being, especially in local communities. The strong interest in business and entrepreneurship is also reflected in the Global Entrepreneurship Monitor 2024/2025 Report, which documents a growing demand for entrepreneurship training as individuals seek to diversify their income and build economic resilience, particularly in the aftermath of the COVID-19 pandemic.

Similarly, the importance of home economics and sustainable living is underscored in a 2025 review in Sustainability, which emphasizes that education in resource management, sustainable food preparation, and eco-friendly household practices is increasingly vital for fostering resilient and self-sufficient communities.

Interest in culinary and food processing skills is supported by findings in Food Security (2024), where community-based food processing and preservation workshops are shown to address both food security and economic empowerment, especially in areas with supply chain challenges.

The value placed on wellness and personal care aligns with the World Health Organization's Global Health Promotion Report 2024, which notes that access to self-care and wellness education leads to improved community health outcomes and greater resilience to public health issues. Additionally, the high demand for digital and technological skills is echoed in the UNESCO Digital Skills for Life and Work 2024 report, which stresses the critical role of digital literacy in accessing information, participating in the digital economy, and supporting lifelong learning, particularly in developing contexts.

Finally, while fewer respondents' express interest in electrical and mechanical skills, a 2024 review in Vocational Education and Training points out that targeted training in these fields remains essential for addressing local labor needs and supporting community infrastructure, even if the interest is more specialized. Collectively, these studies support the trends observed in your data, confirming that communities today prioritize practical, creative, entrepreneurial, and digital skills while recognizing the ongoing value of wellness education and technical training for comprehensive community development.

Table 5. Digital and Technology Skills

ACCESS TO DIGITAL AND TECHNOLOGY SKILLS	FREQUENCY	PERCENTAGE
NO	263	55.02%
YES	215	44.98%
TOTAL	**478**	**100%**

Table 5, presents data on digital and technological skills access among respondents. The results show that 55.02% of individuals do not have access to digital or technological resources, while 44.98% report having such access. This indicates that a slight majority of the community lacks the means or opportunities to engage with digital tools and technologies, which could limit their ability to participate in online learning, access information, or benefit from technology-driven livelihood opportunities. However, the relatively high proportion of respondents with digital access suggests a significant base for introducing digital literacy programs and integrating technology into community development initiatives. These findings highlight the need for targeted interventions to bridge the digital divide and ensure equitable access to technological resources and skills within the community.

Studies consistently show that digital access remains uneven, particularly in low- and middle-income communities, and this digital divide has significant implications for education, social integration, and economic opportunity. For example, a 2024 study in Indonesia found that technology access inequality directly affects life satisfaction and social integration, with those lacking digital access experiencing lower well-being and fewer opportunities for community

participation. The study emphasizes that bridging the digital divide through targeted literacy programs and improved infrastructure is essential for enhancing social inclusion and life quality.

Similarly, a 2024 report from e-School News highlights that the digital divide continues to hinder students' ability to engage in online learning and develop essential digital literacy skills, particularly among those from lower-income families. The report stresses the need for equitable access to devices and reliable internet to ensure all individuals can participate fully in a digital-first world. In the Philippine context, recent reviews identify socioeconomic disparities and limited infrastructure as persistent barriers to digital literacy, especially in rural and underserved areas. These studies call for targeted interventions, such as community-based digital literacy initiatives and expanded access to affordable technology, to empower individuals and support national development goals.

Table 6. Use of Technology

USE OF TECHNOLOGY	FREQUENCY	PERCENTAGE
Uncomfortable	50	10.46%
Somewhat Comfortable	135	28.24%
Comfortable	235	49.16%
Very Comfortable	58	12.13%
TOTAL	**478**	**100%**

Table 6, illustrates the respondents' comfort level in using technology. The data reveal that nearly half of the participants, or 49.16%, feel comfortable using technology, while an additional 12.13% describe themselves as very comfortable. Meanwhile, 28.24% reported being somewhat comfortable, indicating a moderate level of confidence, and 10.46% said they were not comfortable at all with technology use. These results suggest that the majority of the community has at least a basic level of comfort with technology, with a significant portion feeling confident or highly proficient. However, there remains a notable minority who are either only somewhat comfortable or not comfortable at all, highlighting the need for ongoing digital literacy support and training. Overall, this distribution points to a community that is generally open to technological engagement but would benefit from targeted interventions to raise the confidence and skills of those who are less comfortable with digital tools.

A 2024, systematic review in Innovation in Aging highlights that digital technologies are increasingly integrated into community-based interventions, but individual comfort and self-efficacy with technology remain highly variable, often influenced by access, prior experience, and the availability of support and training. The review notes that while many community members become comfortable or even highly proficient with digital tools when provided with supportive environments and relevant training, a significant portion may feel only somewhat uncomfortable, particularly when new technologies are introduced, or digital skills are not regularly practiced.

Similarly, a 2025, study in Frontiers in Psychology found that digital literacy and comfort with technology are strongly predicted by the level of digital support and self-efficacy individuals receive. Those with access to digital devices, technical support, and positive experiences are likelier to report being comfortable or very comfortable with technology. In contrast, those lacking support or confidence tend to report lower comfort levels. The study emphasizes the importance of targeted interventions—such as digital skills workshops and peer support networks—to help less-confident users build their skills and comfort.

Additionally, research on the digital divide published in 2024, AI and Ethics underscores that comfort with technology is about access and the ability to use digital tools effectively and confidently. The literature stresses that digital exclusion is perpetuated not only by lack of infrastructure but also by psychological barriers, such as low self-efficacy and anxiety around technology use, which can prevent individuals from fully engaging with digital opportunities. This aligns with data, which shows a spectrum of comfort levels and highlights the need for ongoing digital literacy programs to ensure that all community members can confidently participate in an increasingly digital society.

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2. Responses of the Respondents in the Focus Group (FDG)

Main Theme	Identified Issues	Proposed Solutions
Environmental Issues	- Problems with waste disposal: - Waste collection - Lack of waste management - Lack of water supply	- Strengthening discipline - Proper education on waste management - Provision of adequate facilities for waste disposal
Livelihood Practices	- Desire to learn recycling, urban gardening, and simple business - Lack of time and money	- Promotion of livelihood training - Promotion of urban gardening and handicrafts from recyclables
Existing Programs	- There are existing seminars, waste segregation bins, tree planting, clean-up drives - Lack of discipline in materials	- Strengthening enforcement of waste management - More materials and support from the barangay
Facilities That Can Be Added	- Recycling stations - Urban gardens - better waste disposal system - Inclusion of agriculture	- Establishment of community recycling centers - Provision of space for urban gardening
Activities That Encourage Participation	- Tree planting, clean-up drives, livelihood workshops - Free training on eco-bricks, urban gardening, composting	- Free seminars and training on sustainable practices - Giving incentives for active participation
Sustainable Community Contributions	- Discipline in waste disposal - Leading clean-up drives - Teaching the youth	- Organizing community-led environmental projects - Stronger education on environmental care

Environmental Sustainability and Community Engagement: Findings from a Focus Group Discussion. The focus group discussion (FGD) highlights the profound connection between environmental conditions and the quality of life. According to Smith et al. (2021), effective waste management directly impacts both public health and the ecosystem. The participants' responses emphasize the urgent need for education, discipline, and concrete actions in waste management, aligning with the findings of Jones and Brown (2020), who demonstrated the positive effects of proper waste disposal on natural resource conservation.

Furthermore, interest in livelihood activities, such as urban gardening and handicrafts, fosters a more stable and sustainable lifestyle (Garcia, 2019). These activities not only contribute to individuals' daily economic well-being but also promote a cleaner and more organized environment (Johnson, 2022).

Collective community action and participation are crucial in implementing solutions to these environmental challenges. Williams and Lee (2023) assert that environmental programs are significantly more effective when citizens actively engage, particularly when participation is incentivized and reinforced through comprehensive education on environmental stewardship.

CONCLUSIONS

The assessment reveals a community composed mainly of young and middle-aged adults with strong engagement in gardening and resource conservation and a high interest in practical, entrepreneurial, and digital skills. However, there are notable gaps in recycling, waste reduction, and digital access. Addressing these gaps requires targeted educational campaigns, infrastructure improvements, and inclusive digital literacy programs. The findings highlight the importance of participatory, data-driven planning to ensure that the ECO-GRHEEN Program is responsive, inclusive, and sustainable.

RECOMMENDATIONS

1. Strengthen Waste Reduction and Recycling Initiatives: Launch educational campaigns, provide accessible recycling infrastructure, and incentivize waste minimization practices.
2. Enhance Skill Development Programs: Prioritize training in handicrafts, entrepreneurship, home economics, and digital literacy while also offering opportunities for culinary, wellness, and technical skills development.
3. Bridge the Digital Divide: Implement community-based digital literacy programs, expand access to affordable devices and internet connectivity, and provide ongoing support to increase digital comfort and participation.
4. Promote Inclusive and Participatory Approaches: Ensure interventions are inclusive of all age groups, especially older adults, and involve community members in planning, implementation, and evaluation.
5. Leverage Existing Strengths: Build on the community's strong engagement in gardening and resource conservation by integrating these practices into broader sustainability and livelihood initiatives.
6. Improve Community Facilities and Access to Eco-Friendly Products: Develop community centers equipped with resources for environmental education, skill training, and access to sustainable products and technologies.

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AUTHOR CONTIBUTIONS

Author 1: Conceptualization, Data Gathering and Writing; Author 2: Data Gathering, Writing, and Editing; Author 3: Supervision, Review and Editing.

CONFLICT OF INTEREST

The author(s) declare no conflict of interest.

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