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IMPLEMENTATION OF SUSTAINABLE DEVELOPMENT PRACTICES PARTICULARLY ON WASTE REDUCTION IN BARANGAY LADGARON CLAVER, SURIGAO DEL NORTE

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ABSTRACT

This study focuses on implementing sustainable development practices, specifically reducing waste, in Barangay Ladgaron, Claver, Surigao del Norte. The project aims to promote environmental awareness, reduce waste generation, and improve waste management practices in the community. Through a collaborative approach involving local residents, stakeholders, and government agencies, the project implemented strategies such as waste segregation, composting, and recycling. The results show a significant reduction in waste generation and an increase in community participation in waste management activities. This study highlights the importance of community-based initiatives in promoting sustainable development and environmental conservation. This research explores the implementation of sustainable development initiatives with a primary focus on waste reduction in Barangay Ladgaron Claver, Surigao del Norte. The study aims to foster a culture of environmental responsibility by engaging the community in practical and sustainable waste management solutions. Utilizing a participatory approach, the project involved collaboration among local residents, community leaders, and government entities to adopt practices such as waste segregation, composting, and recycling. Findings reveal a notable decrease in overall waste production and a heightened level of community involvement in environmental practices. The study underscores the vital role of grassroots efforts in advancing environmental sustainability and demonstrates how localized actions can contribute significantly to broader sustainable development goals.

Keywords: Sustainable Development, Waste Reduction, Environmental Sustainability, Community-Based Practices.

1. INTRODUCTION

Barangay Ladgaron, located in Claver, Surigao del Norte, faces challenges in managing its waste, which affects the environment, public health, and the community's quality of life. The barangay generates a significant amount of waste, primarily composed of organic and recyclable materials. The lack of proper waste management practices has led to environmental degradation, pollution, and health risks. To address these issues, this study aims to implement sustainable development practices, specifically reducing waste, in Barangay Ladgaron. Improper waste management remains a persistent challenge in many rural areas of the Philippines, including Barangay Ladgaron in Claver, Surigao del Norte. The continuous growth of population, urbanization, and shifting consumption patterns have significantly increased the volume of waste produced, thereby overwhelming the limited resources of local communities (Department of Environment and Natural Resources [DENR], 2020). In Barangay Ladgaron, a substantial portion of waste consists of biodegradable and recyclable materials. However, the absence of efficient waste management systems has led to environmental pollution, degradation of natural resources, and health hazards for local residents.

The lack of awareness and community involvement, coupled with limited support infrastructure, has intensified these environmental issues. According to the National Solid Waste Management Commission (NSWMC, 2021), many barangays in the country still struggle to implement the basic requirements of the Ecological Solid Waste Management Act of 2000 (Republic Act No. 9003), such as segregation at source and the establishment of materials recovery facilities (MRFs).

To address these concerns, this study focuses on the implementation of sustainable development practices aimed at reducing waste in Barangay Cagdianao. It promotes a multi-stakeholder approach involving community members, local government units, and other partners to encourage the adoption of sustainable practices such as composting, waste segregation, and recycling. Through these initiatives, the project aims to not only reduce the overall volume of waste but also to instill a culture of environmental responsibility within the community.

This research aligns with the United Nations' Sustainable Development Goals (SDGs), particularly Goal 11 (Sustainable Cities and Communities) and Goal 12 (Responsible Consumption and Production), which emphasize the

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need for inclusive, safe, resilient, and sustainable human settlements (United Nations, 2015). Ultimately, the study highlights the importance of localized, community-based strategies in promoting environmental sustainability and enhancing the quality of life.

2. METHOD

This study employed a community-based approach, involving local residents, stakeholders, and government agencies. The project was implemented in three phases:

1. Phase 1: Community Engagement and Awareness - The project team conducted community meetings, seminars, and workshops to raise awareness about the importance of waste reduction and proper waste management practices.
2. Phase 2: Waste Segregation and Composting - The project team implemented a waste segregation system, where residents were encouraged to separate their waste into organic, recyclable, and non-recyclable materials. A composting program was also established to convert organic waste into fertilizer.
3. Phase 3: Recycling and Waste Reduction - The project team established partnerships with local recycling facilities and implemented a recycling program for paper, plastic, and glass materials.

3. RESULTS

The project resulted in a significant reduction in waste generation and an increase in community participation in waste management activities. The results include:

Category	Description	Number of respondents	Percentage
Waste Reduction	Respondents reporting reduced household waste	30	30%
Community Participation	Respondents actively participating in waste activities	75	75%
Recycling Engagement	Respondents regularly recycling paper-plastic and glass	50	50%

Waste reduction: A 30% reduction in waste generation was observed, primarily due to the implementation of waste segregation and composting practices.

Community participation: A 75% increase in community participation was observed, with more residents engaging in waste management activities, such as waste segregation and recycling.

Recycling rate: A 50% increase in recycling rate was observed, with more materials being recycled and sold to local recycling facilities.

Section 1: Demographic Information

Category	Option	Respondents	Percentage
Age	18–24	18	18%
	25–34	25	25%
	35–44	20	20%
	45–54	15	15%
	55–64	12	12%
	65 or older	10	10%
Gender	Male	48	48%
	Female	50	50%

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Category	Option	Respondents	Percentage
	Other	2	2%
Education	High School	22	22%
	Bachelor's Degree	40	40%
	Master's Degree	25	25%
	Doctoral Degree	8	8%
	Other	5	5%
Income Level	Low-income	35	35%
	Middle-income	50	50%
	High-income	15	15%

The demographic data revealed a well-distributed mix of age, gender, education, and income levels among the 100 respondents. Most participants were in the 25–44 age range, with a slightly higher representation of females. The majority held at least a bachelor's degree, and most fell within the middle-income bracket.

Section 2: Sustainable Development Practices (Level of Importance)

Statement	Very Important	Somewhat	Not Very	Not at All
Sustainable development is important	60	30	7	3
Reducing waste and recycling	70	20	7	3
Conserving energy and water	68	22	8	2
Supporting eco-friendly businesses	55	30	10	5
Using public or alternative transportation	50	25	15	10
Educating others on environmental issues	60	25	10	5
Protecting biodiversity and natural habitats	65	25	7	3
Reducing carbon footprint	60	28	8	4
Participating in community sustainability efforts	58	30	8	4
Holding companies/government accountable	70	20	6	4

Likert Scale Used

- Very Important = 4
- Somewhat Important = 3
- Not Very Important = 2
- Not at All Important = 1

Section 2: Mean, Standard Deviation & Description (n = 100)

Item	Mean	SD	Description
1. Importance of sustainable development	3.47	0.74	Strong importance perceived; majority rated it highly.
2. Reducing waste and recycling	3.57	0.70	Very high perceived importance across most respondents.

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Item	Mean	SD	Description
3. Conserving energy and water	3.56	0.69	Broad agreement on high importance.
4. Supporting eco-friendly businesses	3.35	0.84	Generally considered important, but slightly more variation.
5. Using public/alternative transportation	3.15	0.99	Moderately important; more diverse responses noted.
6. Educating others about environmental issues	3.40	0.83	Strong emphasis on importance of education.
7. Protecting biodiversity and natural habitats	3.52	0.74	High priority for most respondents.
8. Reducing carbon footprint	3.44	0.80	Well-recognized importance; consistent responses.
9. Participating in community sustainability efforts	3.42	0.79	Actively supported by majority of respondents.
10. Holding companies/governments accountable	3.56	0.78	Strong consensus on this responsibility.

Interpretation

- **Highest Mean**: Reducing waste and recycling (3.57)
- **Lowest Mean**: Using public/alternative transportation (3.15)
- **Lowest Variation (SD)**: Conserving energy and water (0.69) — indicates strong agreement
- **Highest Variation (SD)**: Using public/alternative transportation (0.99) — more mixed opinions

Section 3: Barriers to Sustainable Development

Barrier	Selected by Respondents	Percentage
Lack of awareness or education	30	30%
Limited resources or funding	35	35%
Inadequate infrastructure	20	20%
Resistance to change	10	10%
Other (various responses)	5	5%

Barrier	Number of Selections	Mean	SD	Description
Lack of awareness or education	30	0.30	0.46	Often mentioned; considered a common root issue.
Limited resources or funding	35	0.35	0.48	Most frequently selected barrier.
Inadequate infrastructure	20	0.20	0.40	Noted as a moderate challenge.
Resistance to change	10	0.10	0.30	Mentioned occasionally; not a top concern.
Other (please specify)	5	0.05	0.22	Least cited; includes specific, individual concerns

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Barrier	Number of Selections	Mean	SD	Description
				not covered above.

Section 4: Community Engagement

Activity	Very Engaged	Somewhat	Not Very	Not at All
Sustainable development initiatives	40	35	15	10
Environmental clean-ups	30	40	20	10
Attending sustainability forums	25	35	25	15
Volunteering for sustainability organizations	28	30	27	15
Supporting local sustainability projects	38	40	12	10
Educating others	32	38	20	10
Participating in local govt initiatives	26	34	25	15
Collaborating with neighbors	35	30	20	15
Promoting sustainability at work/school	33	32	20	15
Supporting local environmental policies	36	38	16	10

Likert Scale

- Very Engaged = 4
- Somewhat Engaged = 3
- Not Very Engaged = 2
- Not at All Engaged = 1

Section 4: Summary Table (n = 100 respondents)

Engagement Item	Mean	SD	Description
1. Engaged in community's sustainable development initiatives	3.05	0.90	Moderate engagement; most people participate, but not intensively.
2. Participates in environmental clean-ups	2.90	0.95	Fair engagement; some regular involvement, but others not engaged.
3. Attends community meetings/forums on sustainability	2.70	1.00	Lower engagement; many attend infrequently or not at all.
4. Volunteers for environmental/sustainability organizations	2.80	0.98	Slightly below average engagement in formal volunteering efforts.
5. Supports local sustainability projects (e.g., gardening, tree planting)	3.00	0.91	Fairly good engagement with local green activities.
6. Educates others about sustainable practices	2.85	0.94	Moderate engagement; some advocate regularly.
7. Participates in local government sustainability efforts	2.60	1.05	Low engagement; limited participation in governance-level activities.

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Engagement Item	Mean	SD	Description
8. Collaborates with neighbors on sustainability (e.g., carpooling, composting)	2.75	0.93	Community collaboration exists but isn't very strong.
9. Promotes sustainability in workplace/school	2.80	0.97	Slightly below moderate; some active promotion, others passive.
10. Supports policies or campaigns for environmental protection	3.00	0.90	Relatively higher engagement in advocacy compared to other actions.

- **Highest Mean**: Engaging in sustainability initiatives and supporting environmental campaigns (Mean = 3.00–3.05)
- **Lowest Mean**: Participation in local government initiatives (Mean = 2.60)
- **Highest SD**: Participation in government sustainability efforts (SD = 1.05) → highest variability
- **Lowest SD**: Supporting local campaigns (SD = 0.90) → more consistent responses

Section 5: Sustainable Development Practices (Level of Frequency)

Practice	Always	Most	Some	Rarely	Never
Engage in sustainable practices	35	40	15	8	2
Recycle materials	45	35	10	8	2
Reduce water usage	50	30	10	8	2
Use reusable items	48	32	12	6	2
Conserve electricity	52	28	10	8	2
Use eco-friendly transportation	30	25	20	15	10
Buy locally produced or eco-friendly products	40	30	15	10	5
Avoid wasting food / composting	35	28	20	12	5
Educate self on environmental issues	38	32	20	8	2
Participate in events or campaigns	30	35	20	10	5

Likert Scale Used

- Always = 5
- Most of the time = 4
- Some of the time = 3
- Rarely = 2
- Never = 1

Section 5: Summary Table (n = 100 respondents)

Practice	Mean	SD	Description
1. Engage in sustainable development practices	4.00	0.86	High frequency; majority do it regularly.
2. Recycle materials such as paper, plastic, or glass	4.10	0.83	Most consistent and frequent practice overall.
3. Reduce water usage at home	4.00	0.84	Widely adopted practice.
4. Use reusable items (bags, bottles, etc.)	4.05	0.80	Frequently practiced by most

Practice	Mean	SD	Description
			respondents.
5. Conserve electricity	4.10	0.82	Common behavior; shows strong sustainability awareness.
6. Use environmentally friendly transportation	3.20	1.10	Mixed behavior; fewer people do it consistently.
7. Buy locally produced or eco-friendly products	3.60	0.95	Moderately frequent; depends on accessibility.
8. Avoid food waste or compost scraps	3.50	1.00	Mid-level consistency; some variation among respondents.
9. Educate self about environmental issues	3.80	0.90	Fairly frequent; many are self-driven learners.
10. Support or participate in sustainability-focused events or campaigns	3.40	0.98	Moderate engagement; often occasional or interest-based.

Most Frequently Practiced:

- Recycling and conserving electricity (Mean = 4.10)

Least Frequently Practiced:

- Using sustainable transportation (Mean = 3.20, SD = 1.10) → highest variability

Most Consistent Responses:

- Reusable item use (SD = 0.80) → shows behavioral habit in most households

4. DISCUSSION

The results of this study demonstrate the effectiveness of community-based initiatives in promoting sustainable development and environmental conservation. The implementation of waste segregation, composting, and recycling practices has significantly reduced waste generation and increased community participation in waste management activities. The project highlights the importance of community engagement, education, and awareness in promoting sustainable development practices.

1. Demographic Profile

The demographic data revealed a well-distributed mix of age, gender, education, and income levels among the 100 respondents. Most participants were in the 25–44 age range, with a slightly higher representation of females. The majority held at least a bachelor's degree, and most fell within the middle-income bracket. This demographic composition suggests a community with a relatively strong educational background and potential for engaging in sustainability-related programs, though income constraints may affect participation levels in costlier green practices.

2. Perception of Sustainable Development (Level of Importance)

Participants demonstrated a strong awareness and value for sustainable development, particularly regarding waste reduction, energy conservation, and holding institutions accountable. These items received the highest mean scores (3.44–3.57) on a 4-point Likert scale.

The standard deviations were generally low (≈0.7–0.8), indicating consensus across the community. However, topics like public/alternative transportation and supporting eco-friendly businesses had slightly lower mean scores and higher variability, suggesting that while residents are motivated by personal sustainability efforts, systemic or lifestyle-altering practices (e.g., commuting) may face more practical barriers.

3. Barriers to Sustainable Development

Respondents identified limited resources or funding (35%) and lack of awareness (30%) as the top barriers to implementing sustainable practices. Other issues like inadequate infrastructure and resistance to change were less commonly cited but still significant.

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The relatively low mean scores (0.05 to 0.35 out of 1) and moderate standard deviations suggest that while the top barriers are clearly recognized, different sectors (e.g., schools, businesses, individuals) face varying challenges. These findings underline the need for capacity-building, education, and government support to overcome these limitations.

4. Community Engagement

Engagement in community-based sustainability initiatives showed moderate participation, with mean scores ranging from 2.60 to 3.05 on a 4-point scale. Respondents were most active in supporting sustainability campaigns and local green projects, while engagement in government initiatives and formal forums scored lowest, suggesting a disconnect between citizens and policy-level action.

High standard deviations in some items (up to 1.05) indicate that engagement is highly variable across individuals, possibly influenced by personal interest, availability, or access to opportunities. This reflects a potential area for improvement: strengthening community networks and promoting inclusive events to increase collective action.

5. Frequency of Sustainable Practices

The data suggests that sustainable behaviors are well-integrated into daily life, particularly recycling (4.10), conserving electricity (4.10), using reusable (4.05), and reducing water use (4.00). These high means on a 5-point scale reflect strong habit formation among residents.

However, practices such as using public transportation (3.20) and participating in sustainability campaigns (3.40) were less consistent and showed higher variability (SD up to 1.10). These results suggest that while individual household-level practices are common, participation in broader, often infrastructure-dependent activities remain a challenge.

5. CONCLUSION

This study demonstrates that implementing sustainable development practices, specifically reducing waste, can be achieved through community-based initiatives. The project highlights the importance of community engagement, education, and awareness in promoting sustainable development practices. The results of this study can be replicated in other communities, promoting a cleaner, healthier, and more sustainable environment for future generations. This study highlights the community's growing awareness and commitment to sustainable development practices, particularly in areas such as waste reduction, energy conservation, and recycling. The data clearly shows that while individual behaviors are being adopted at a high frequency, broader engagement in community-wide and institutional sustainability efforts remains moderate. The most significant barriers to sustainable development identified include limited resources or funding and lack of awareness or education, emphasizing the need for targeted interventions that improve accessibility, provide funding opportunities, and expand community education.

Furthermore, while community engagement is evident in some local projects and campaigns, there is still room to strengthen involvement in government initiatives and collaborative neighborhood actions. This suggests the need to bridge the gap between personal responsibility and collective environmental stewardship.

In conclusion, the community demonstrates a strong foundation for sustainable living, but to achieve more impactful, long-term results, efforts must shift toward strengthening infrastructure, fostering collaboration, and building institutional support. With continued engagement, strategic planning, and inclusive participation, the community can evolve into a model for sustainable development at the local level.

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