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Assessing the Impact of Imported Single-Use Plastics on Marine Life in the Municipality of Aborlan, Palawan

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ABSTRACT

This research investigated the environmental effects of imported single-use plastics on marine life in Aborlan, Palawan, Philippines. The study used a descriptive-explanatory design, combining both quantitative and qualitative methods to evaluate the extent and ecological consequences of plastic waste. Data were gathered from 150 participants, including local residents, marine experts, and officials from various organizations through surveys, interviews, and field observations. The results showed that imported plastics contribute significantly to marine pollution, with respondents rating the volume of plastic waste and its presence in coastal zones as "Very High." Ecological impacts were severe, including reductions in biodiversity, poor health of marine species, and negative economic effects on local communities dependent on marine resources. Regression analysis highlighted that the import of single-use plastics and their persistence in the environment were key factors in marine life degradation. The study calls for stronger regulations on plastic imports, better waste management practices, and increased community involvement in conservation efforts. Key recommendations include enforcing stricter policies, launching public awareness campaigns, and fostering international cooperation to tackle the growing threat of plastic pollution.

Keywords: *Biodiversity, Coastal Communities, Ecological Impact, Marine Pollution, Waste Management*

INTRODUCTION

The rise of single-use plastics is wreaking havoc on our planet, leaving oceans choked with waste and marine life fighting for survival. Items like straws, bags, and packaging—designed for convenience—have become major contributors to the global plastic crisis. These plastics not only endanger marine animals through entanglement, ingestion, and habitat destruction but also break down into microplastics that infiltrate the food chain, impacting ecosystems far beyond the sea (Cordero et al., 2023). This environmental disaster extends beyond the ocean, disrupting coastal economies that rely on fisheries, tourism, and agriculture (Gonzales & Acosta, 2022).

For the Philippines, an island nation surrounded by rich marine biodiversity, the plastic pollution problem is particularly urgent. As one of the largest contributors to ocean plastic waste globally, much of the pollution stems from imported single-use plastics (Yu et al., 2023). Inadequate waste management systems, coupled with high levels of plastic imports into densely populated urban areas, exacerbate the issue (Tan, 2023). The nation's dependence on coastal resources amplifies the environmental and economic stakes of plastic pollution. Microplastics, in particular, present an emerging threat that jeopardizes not only marine life but also the health of the local economy (Reyes, 2023).

While numerous studies have examined the general impact of oceanic plastic waste, there is a notable lack of research on the specific role of imported single-use plastics in marine pollution. Most studies

focus broadly on plastic waste, neglecting the unique challenges posed by imported plastics and their long-term ecological repercussions (Anderson et al., 2022). The fragmentation of imported plastics into microplastics and macroplastics, and their subsequent impact on marine organisms, remains an under-explored issue (Chavez et al., 2022). Although policies like the Ecological Solid Waste Management Act and the Extended Producer Responsibility (EPR) Act aim to curb plastic waste, enforcement remains weak (Republic Act No. 11898, 2022). The absence of a focused approach to managing imported plastic waste underscores the need for more research into its specific environmental effects.

This study aims to fill this gap by evaluating the ecological, socio-economic, and environmental impacts of imported single-use plastics on marine life in Aborlan, Palawan, a coastal municipality in the Philippines. With its reliance on marine resources, Aborlan is highly vulnerable to the growing crisis of plastic pollution. By examining the distribution and effects of imported plastics, this research will provide valuable data that can inform policy recommendations and contribute to more effective waste management strategies. Ultimately, this study seeks to help shape policies that regulate plastic imports and promote sustainable practices—an effort that holds significance not only for local conservation but also for global solutions to the plastic crisis.

MATERIALS AND METHODS

The research methodology employed in this study was designed to assess the impact of imported single-use plastics on marine life in the Philippines. A descriptive-explanatory research design was utilized, combining both quantitative and qualitative methods to provide a comprehensive understanding of the issue. The descriptive approach focused on identifying the types, volume, and origin of imported plastics, as well as their distribution in coastal and marine zones. This data helped map pollution hotspots and highlighted areas where interventions were most needed (Allen et al., 2023). The explanatory aspect of the study explored the ecological effects of these plastics on marine biodiversity, reproductive patterns, and ecosystem health, providing insights into the long-term consequences of plastic pollution (Charlton-Howard et al., 2023).

The study was conducted in Barangay San Juan, Aborlan, Palawan, a region known for its rich biodiversity and coastal ecosystems. The barangay's diverse geography, which includes mangroves, seagrass beds, and coral reefs, made it an ideal setting for examining the effects of plastic pollution on marine life (Meijer et al., 2023). The research employed purposive sampling to select participants who had direct knowledge of or experience with marine pollution, including marine biodiversity experts, local community members, and representatives from relevant organizations (Koons, 2024). This ensured a holistic approach to understanding the ecological, socio-economic, and governance aspects of plastic pollution.

To gather data, the study used a combination of structured surveys, semi-structured interviews, and field observations. The surveys provided quantitative data on the prevalence and impact of imported plastics, while the interviews offered qualitative insights into the experiences of affected communities and experts. Field observations of coastal zones helped document the physical presence and density of plastic waste (Cabico, 2024). The research tools were carefully validated through pilot testing to ensure accuracy and consistency. Data were analyzed using descriptive statistics and regression analysis to identify trends and relationships, providing evidence-based recommendations for policy interventions and sustainable waste management strategies (Cariaso, 2023).

RESULTS AND DISCUSSION

1. Profile of the Employee in Terms of Demographics

1.1 Sex

Table 1 shows the percentage distribution of respondents based on their sex. The data reveals that 44.7% of respondents are male, while 55.3% are female. This indicates a slight majority of female respondents, suggesting that the findings of the study may be influenced by gender-related factors. With females representing over half of the sample, it is important to consider how gender may impact perceptions, preferences, and behaviors when analyzing the results. Gender differences in areas like decision-making, service quality perception, and consumption behaviors are well-documented in existing literature (Krishna & Rao, 2022). A nuanced analysis that takes these distinctions into account could yield a more comprehensive understanding of the research topic.

Table 1
Frequency and Percentage Distribution of Respondents in Terms of Sex

Characteristics	Specification	Frequency	Percentage
Sex	Male	67	44.7%
	Female	83	55.3%
Total		150	100.0%

1.2 Age

Table 2 presents the age distribution of respondents. The largest group of respondents, 36.7%, is aged 38 and older, followed by the 18-22 age group at 18.7%. The remaining respondents are fairly evenly distributed among the other age groups: 33-37 (18.0%), 23-27 (14.0%), and 28-32 (12.7%). The age distribution suggests a diverse range of perspectives, with a significant portion of older respondents contributing to the study. This demographic information is crucial in understanding how generational differences might influence the study's outcomes, as older individuals may have different experiences, priorities, and preferences compared to younger participants. These generational variations should be considered when analyzing the data, as they could reveal distinct patterns of behavior or attitudes across age groups.

Table 2
Frequency and Percentage Distribution of Respondents in Terms of Age

Characteristics	Specification	Frequency	Percentage
Age	18-22	28	18.7%
	23-27	21	14.0%
	28-32	19	12.7%
	33-37	27	18.0%
	38 and older	55	36.7%
Total		150	100.0%

1.3 Civil Status

Table 3 presents the civil status of respondents. A majority of the respondents, 60.7%, are married, while 39.3% are single. This distribution suggests that married individuals are more represented in the sample, which may indicate that their perspectives, responsibilities, and experiences could influence the study’s findings. The significant proportion of single respondents indicates a varied sample, reflecting different life stages and experiences. Civil status is important because it can affect respondents' priorities and behaviors, which in turn may influence their views on the study’s subject

matter. Research has shown that marital status can impact various aspects of well-being, including psychological health and relationship dynamics, which may affect responses in this study (Dierx & Kasper, 2022).

Table 3
Frequency and Percentage Distribution of Respondents in Terms of Civil Status

Characteristics	Specification	Frequency	Percentage
Civil Status	Single	59	39.3%
	Married	91	60.7%
Total		150	100.0%

1.4 Education

Table 4 presents the education level of the respondents. The largest group, 45.3%, has completed high school, followed by 33.3% who have attained an elementary education. A smaller proportion, 21.3%, holds an undergraduate degree. The distribution of education levels indicates that most respondents have a foundational to intermediate level of education, while fewer have reached higher education levels. This difference in education could affect respondents' understanding of and engagement with the study's topic. Educational background often influences individuals' awareness, attitudes, and behaviors, so it is important to consider these factors when interpreting the findings. Previous research highlights that varying levels of education can shape individuals' responses to research questions, and tailored communication may be necessary to ensure the effectiveness of interventions (Çolakoğlu et al., 2023).

Table 4
Frequency and Percentage Distribution of Respondents in Terms of Education

Characteristics	Specification	Frequency	Percentage
Education	Elementary	50	33.3%
	High School	68	45.3%
	Undergraduate	32	21.3%
Total		150	100.0%

2. Assessment of Imported Single-Use Plastics by the Respondents

2.1 Volume of Plastic Waste

Table 5 presents the respondents' assessment of the volume of imported single-use plastics. The overall mean of 3.38 (SD = 0.68) reflects a "Very High" level of perceived pollution, indicating that respondents believe that imported plastics contribute significantly to waste in the community. The highest mean score of 3.63 (SD = 0.54) was given to the statement "Imported single-use plastics contribute significantly to the total waste in the community," underscoring the severe perception of the pollution caused by imported plastics.

This finding highlights the urgency for immediate and effective actions, such as improving waste management and reducing the reliance on single-use plastics. However, the indicator regarding the community's regular measurement and monitoring of plastic waste received the lowest mean score of 3.11 (SD = 0.74), suggesting that while some monitoring exists, it is not consistently robust. Strengthening monitoring systems could enhance the effectiveness of waste management efforts and address the severe pollution caused by single-use plastics.

Table 5
Respondents' Assessment of Imported Single-Use Plastics in Terms of Volume of Plastic Waste

Items	Mean	SD	Description	Interpretation
1. Imported single-use plastics contribute significantly to the total waste in the community.	3.63	0.54	Very High	Severe pollution; urgent action required.
2. The volume of plastic waste has increased due to imported products.	3.57	0.63	Very High	Severe pollution; urgent action required.
3. Local waste management systems can handle the current volume of imported plastic waste.	3.27	0.66	Very High	Severe pollution; urgent action required.
4. The community regularly measures and monitors the volume of plastic waste.	3.11	0.74	High	Significant pollution; proactive measures needed.
5. The volume of single-use plastic waste is higher in urban areas compared to rural areas.	3.31	0.84	Very High	Severe pollution; urgent action required.
Overall Mean	**3.38**	**0.68**	**Very High**	**Severe pollution; urgent action required.**

2.2 Types of Plastics

Table 6 illustrates the respondents' assessment of the types of imported single-use plastics. With an overall mean of 3.39 (SD = 0.62), the data indicate a "Very High" level of pollution caused by these plastics. The highest mean score of 3.55 (SD = 0.62) was given to the statement "Imported single-use plastics are predominantly found in packaging materials," which suggests that packaging is a significant contributor to the plastic waste problem. Conversely, the indicator "Hard-to-recycle plastics make up a significant portion of imported waste" received the lowest mean score of 3.23 (SD = 0.64), which still indicates a "High" level of concern. This suggests that while hard-to-recycle plastics are a notable issue, they may not be as prevalent as other forms of plastic waste. Addressing the dominance of packaging materials and enhancing recycling capabilities could significantly reduce the environmental impact.

Table 6
Respondents' Assessment of Imported Single-Use Plastics in Terms of Types of Plastics

Items	Mean	SD	Description	Interpretation
1. Most imported single-use plastics are composed of non-recyclable materials.	3.37	0.59	Very High	Severe pollution; urgent action required.
2. The types of plastics imported are identified and categorized by local waste management agencies.	3.37	0.65	Very High	Severe pollution; urgent action required.
3. Imported single-use plastics are predominantly found in packaging materials (e.g., wrappers, containers).	3.55	0.62	Very High	Severe pollution; urgent action required.
4. Hard-to-recycle plastics make up a significant portion of imported waste.	3.23	0.64	High	Proactive measures needed.
5. Imported plastics used in food packaging are commonly found in waste streams.	3.43	0.62	Very High	Severe pollution; urgent action required.
Overall Mean	**3.39**	**0.62**	**Very High**	**Severe pollution; urgent action required.**

2.3 Origin of Plastics

Table 7 presents the respondents' assessment of the origin of imported single-use plastics. The overall mean of 3.21 (SD = 0.70) reflects a "High" level of pollution, indicating significant concerns about the origin of these plastics. The highest mean score of 3.31 (SD = 0.66) was assigned to the statement "Imported single-use plastics include items from international brands," suggesting that plastics from global brands are a major source of pollution. Conversely, the indicator "The origin of imported single-use plastics is adequately tracked and documented" received the lowest mean score of 3.17 (SD = 0.78), indicating that tracking the origin of these plastics is perceived as an area for improvement. Strengthening tracking and documentation processes could help manage the importation of plastics more effectively, contributing to better regulatory control and more targeted waste management strategies.

Table 7
Respondents' Assessment of Imported Single-Use Plastics in Terms of Origin of Plastics

Items	Mean	SD	Description	Interpretation
1. The origin of imported single-use plastics is adequately tracked and documented.	3.17	0.78	High	Significant pollution; proactive measures needed.
2. Imported plastics predominantly come from countries with high plastic production rates.	3.15	0.66	High	Significant pollution; proactive measures needed.
3. Imported single-use plastics include items from international brands.	3.31	0.66	Very High	Severe pollution; urgent action required.
4. Most imported plastics in the community are from developed countries.	3.23	0.72	High	Significant pollution; proactive measures needed.
5. Policies exist to regulate the importation of single-use plastics from specific countries.	3.22	0.70	High	Significant pollution; proactive measures needed.
Overall Mean	**3.21**	**0.70**	**High**	**Significant pollution; proactive measures needed.**

2.4 Degradability

Table 8
Respondents' Assessment of Imported Single-Use Plastics in Terms of Degradability

Items	Mean	SD	Description	Interpretation
1. Imported single-use plastics in the community are largely non-biodegradable.	3.37	0.60	Very High	Severe pollution; urgent action required.
2. The community is aware of the degradation timelines for various types of imported plastics.	3.12	0.73	High	Significant pollution; proactive measures needed.
3. Imported biodegradable plastics are increasingly available in local markets.	3.23	0.60	High	Significant pollution; proactive measures needed.
4. Non-degradable imported plastics persist in the environment for long periods.	3.29	0.65	Very High	Severe pollution; urgent action required.
5. Local waste management initiatives promote alternatives to non-degradable imported plastics.	3.13	0.68	High	Significant pollution; proactive measures needed.
Overall Mean	**3.23**	**0.65**	**High**	**Significant pollution; proactive measures needed.**

Table 8 presents the respondents' assessment of the degradability of imported single-use plastics. The overall mean of 3.23 (SD = 0.65) indicates "High" concern regarding the persistence of non-biodegradable plastics in the environment. The highest mean score of 3.37 (SD = 0.60) was given to the statement "Imported single-use plastics in the community are largely non-biodegradable,"

highlighting the significant environmental issue posed by these materials. On the other hand, the lowest mean score of 3.12 (SD = 0.73) was given to the statement "The community is aware of the degradation timelines for various types of imported plastics," suggesting that there is room for improvement in raising awareness about the degradation processes of plastics. Educating the community on degradation timelines and promoting biodegradable alternatives could significantly help reduce plastic pollution.

2.5 Presence in Coastal and Marine Zones

Table 9 presents the respondents' assessment of the presence of imported single-use plastics in coastal and marine zones. The overall mean of 3.29 (SD = 0.67) reflects a "Very High" level of pollution, indicating severe environmental concerns in coastal and marine areas. The highest mean score of 3.39 (SD = 0.57) was assigned to the statement "Plastic waste from imported goods accumulates in coastal areas," suggesting that coastal zones are significantly impacted by imported plastic waste. However, the indicator "Marine life in the area is negatively affected by imported plastic waste" received the lowest mean score of 3.21 (SD = 0.82), indicating that while marine life is recognized as being affected, the perceived impact is slightly less severe compared to other factors. This finding suggests that more efforts may be required to fully understand and address the negative effects of plastic waste on marine ecosystems.

Table 9
Respondents' Assessment of Imported Single-Use Plastics in Terms of Presence in Coastal and Marine Zones

Items	Mean	SD	Description	Interpretation
1. Imported single-use plastics are frequently found in coastal cleanup activities.	3.35	0.57	Very High	Severe pollution; urgent action required.
2. Marine life in the area is negatively affected by imported plastic waste.	3.21	0.82	High	Significant pollution; proactive measures needed.
3. Imported plastics are a major contributor to marine pollution in the community.	3.25	0.63	High	Significant pollution; proactive measures needed.
4. Plastic waste from imported goods accumulates in coastal areas.	3.39	0.57	Very High	Severe pollution; urgent action required.
5. The community conducts regular coastal cleanup drives to address plastic waste.	3.26	0.75	High	Significant pollution; proactive measures needed.
Overall Mean	**3.29**	**0.67**	**Very High**	**Severe pollution; urgent action required.**

3. Assessment of Marine Life by the Respondents

3.1 Biodiversity

Table 11 presents the respondents' assessment of marine life in terms of biodiversity. The overall mean score of 3.24 (SD = 0.63) reflects a "High Impact," indicating a noticeable decline in marine species or habitat quality. Respondents perceive that human activities, particularly pollution and overfishing, have significantly harmed marine biodiversity. The indicator "Human activities have negatively impacted marine biodiversity in the area" received the highest mean score of 3.33 (SD = 0.68), which is categorized as "Severe Impact." This underscores the urgent need for immediate conservation and restoration efforts to protect and preserve marine biodiversity. On the other hand, the statement "The diversity of marine species in the area is well-preserved" received the lowest mean score of 3.20 (SD = 0.56), suggesting that, while some biodiversity remains, it is under significant threat. Strategies like

Marine Protected Areas (MPAs) have been found effective in preserving marine biodiversity (Brander et al., 2020), and these strategies should be implemented more widely to prevent further degradation.

Table 11
Respondents' Assessment of Marine Life in Terms of Biodiversity

Items	Mean	SD	Description	Interpretation
1. The diversity of marine species in the area is well-preserved.	3.20	0.56	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
2. Marine habitats support a wide range of species.	3.21	0.64	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
3. Conservation efforts in the area protect marine biodiversity.	3.21	0.58	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
4. Human activities have negatively impacted marine biodiversity in the area.	3.33	0.68	Severe Impact	Significant harm to biodiversity; urgent intervention required
5. Protected marine areas effectively conserve biodiversity.	3.23	0.68	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
Overall Mean	**3.24**	**0.63**	**High Impact**	**Noticeable decline in marine species or habitat quality; mitigation necessary**

3.2 Health of Marine Species

Table 12
Respondents' Assessment of Marine Life in Terms of the Health of Marine Species

Items	Mean	SD	Description	Interpretation
1. Marine species in the area are free from visible signs of disease.	2.95	0.85	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
2. Marine species populations are not declining due to pollution.	2.88	0.92	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
3. Water quality in the area supports healthy marine life.	3.03	0.72	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
4. Regular assessments are conducted to monitor the health of marine species.	2.99	0.81	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
5. Harmful algal blooms (e.g., red tides) do not frequently affect marine species in the area.	2.28	1.11	Moderate Impact	Some disruption to marine species; monitoring and minor corrective actions are needed
Overall Mean	**2.83**	**0.88**	**High Impact**	**Noticeable decline in marine species or habitat quality; mitigation necessary**

Table 12 presents the respondents' assessment of the health of marine species. The overall mean of 2.83 (SD = 0.88) indicates "High Impact," reflecting a noticeable decline in the health of marine species. This suggests that pollution, disease, and water quality are perceived as significant threats to

the health of marine life. The highest mean score of 3.03 (SD = 0.72) was given to "Water quality in the area supports healthy marine life," indicating that respondents believe water quality is a critical factor in the health of marine species. However, "Harmful algal blooms (e.g., red tides) do not frequently affect marine species in the area" received the lowest mean score of 2.28 (SD = 1.11), which is categorized as "Moderate Impact." This suggests that although harmful algal blooms do occur, their impact on marine species is less severe than other factors. To address these issues, better water quality management and monitoring are needed to improve marine species' health (Wernberg et al., 2023).

3.3 Reproductive Patterns

Table 13 presents the respondents' assessment of marine life in terms of reproductive patterns. The overall mean score of 3.09 (SD = 0.64) indicates "High Impact," suggesting that there are noticeable challenges in the reproductive health of marine species. The highest mean score of 3.25 (SD = 0.58) was given to the statement "Marine species in the area exhibit stable reproductive rates," reflecting that reproductive rates are relatively stable but still face challenges. The lowest mean score of 2.92 (SD = 0.72) was assigned to "Seasonal reproductive patterns of marine species are unaffected by climate change," indicating that climate change is perceived to have a significant impact on reproductive patterns. This data suggests that climate change disruptions are affecting the reproductive cycles of marine species, and more efforts are needed to address these challenges (Chen et al., 2021; Sun et al., 2020).

Table 13
Respondents' Assessment of Marine Life in Terms of Reproductive Patterns

Items	Mean	SD	Description	Interpretation
1. Marine species in the area exhibit stable reproductive rates.	3.25	0.58	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
2. Breeding grounds for marine species are protected from human activities.	3.09	0.67	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
3. Seasonal reproductive patterns of marine species are unaffected by climate change.	2.92	0.72	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
4. Fishing regulations consider the reproductive cycles of marine species.	3.09	0.64	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
5. Conservation programs address issues affecting the reproduction of marine species.	3.11	0.60	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
Overall Mean	**3.09**	**0.64**	**High Impact**	**Noticeable decline in marine species or habitat quality; mitigation necessary**

3.4 Ecosystem Balance

Table 14 presents the respondents' assessment of marine life in terms of ecosystem balance. The overall mean score of 2.99 (SD = 1.17) indicates "High Impact," showing that respondents perceive noticeable disruptions in the marine ecosystem. The highest mean score of 3.07 (SD = 2.66) was given to the statement "The loss of key species has not affected the ecosystem's balance," indicating that the loss of essential species is seen as having a significant impact. The lowest mean score of 2.82 (SD = 0.89) was assigned to "Human activities do not disrupt the natural balance of marine ecosystems," suggesting

that respondents view human activities as major contributors to ecosystem disruption. This calls for mitigation strategies such as ecosystem restoration programs to address these imbalances (Abelson et al., 2020).

Table 14
Respondents' Assessment of Marine Life in Terms of Ecosystem Balance

Items	Mean	SD	Description	Interpretation
1. The marine ecosystem in the area is well-balanced and sustainable.	3.05	0.73	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
2. Human activities do not disrupt the natural balance of marine ecosystems.	2.82	0.89	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
3. The loss of key species has not affected the ecosystem's balance.	3.07	2.66	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
4. The introduction of non-native species has not disrupted the local ecosystem.	2.95	0.85	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
5. Ecosystem restoration programs are effective in the area.	3.05	0.74	High Impact	Noticeable decline in marine species or habitat quality; mitigation necessary
Overall Mean	**2.99**	**1.17**	**High Impact**	**Noticeable decline in marine species or habitat quality; mitigation necessary**

3.5 Economic Impact on Marine-Dependent Communities

Table 15 presents the respondents' assessment of the economic impact on marine-dependent communities. The overall mean score of 3.20 (SD = 0.95) reflects a "High Impact," indicating a noticeable decline in marine resources that is affecting the economic well-being of these communities. The highest mean score of 3.44 (SD = 0.75) was given to the statement "The health of marine life directly affects the income of marine-dependent communities," highlighting the crucial relationship between marine health and local economic stability.

Table 15
Respondents' Assessment of the Economic Impact on Marine-Dependent Communities

Items	Mean	SD	Description	Interpretation
1. The health of marine life directly affects the income of marine-dependent communities.	3.44	0.75	Severe Impact	Significant impact on economic well-being; urgent intervention required
2. Marine-dependent communities are struggling economically due to the decline in marine resources.	3.20	0.82	High Impact	Noticeable decline in marine resources affecting livelihoods
3. The community receives adequate support from the government for marine-dependent livelihoods.	2.88	0.74	High Impact	Significant economic struggle; policy improvements needed
Overall Mean	**3.20**	**0.95**	**High Impact**	**Noticeable decline in marine resources affecting livelihoods; mitigation necessary**

However, the indicator "The community receives adequate support from the government for marine-dependent livelihoods" received the lowest mean score of 2.88 (SD = 0.74), suggesting that

respondents perceive government support as insufficient. Efforts to improve policy support and sustainable practices are crucial for ensuring the long-term sustainability of these communities (Kurth et al., 2020).

4. **Is There a Significant Difference in Marine Life When Grouped According to Their Profile?**

Table 16 presents the respondents' assessments of marine life based on their profile, including sex, age, education, and civil status, across five key aspects: biodiversity, health of marine species, reproductive patterns, ecosystem balance, and economic impact. Overall, the data show that perceptions of marine life's health are influenced by demographic factors, although some variations are minimal. For example, biodiversity was rated slightly higher by older respondents (38+) and those with higher education levels, suggesting that these groups may have a greater awareness or concern about the decline in marine species. In contrast, younger respondents (18-22 and 23-27) tended to rate biodiversity lower, possibly due to less direct experience with environmental degradation. Similarly, the health of marine species was perceived more negatively by younger respondents, with females (2.87) rating it slightly higher than males (2.82), indicating a gender-based difference in perception.

Regarding reproductive patterns, the data show that older individuals (38+) rated this aspect the highest, suggesting that they perceive reproductive stability as a significant concern. The economic impact on marine-dependent communities received similar ratings across both genders, with married respondents rating it slightly higher than single respondents, indicating a potential difference in long-term sustainability concerns. Notably, educational background had a noticeable influence, with those holding undergraduate degrees rating most aspects of marine life (especially biodiversity and ecosystem balance) more negatively, reflecting their understanding of the complex environmental challenges. The ecosystem balance was rated lower by younger groups (23-27), possibly due to less awareness of the interconnectedness of marine ecosystems, while married respondents also tended to rate this lower, indicating the importance of ecosystem stability for the well-being of future generations.

Table 16
Marine Life Assessment Based on Respondents' Profiles

Aspect	Sex (Male)	Sex (Female)	Age (18-22)	Age (23-27)	Age (28-32)	Age (33-37)	Age (38+)	Education (Elementary)	Education (High School)	Education (Undergraduate)	Civil Status (Single)	Civil Status (Married)
Biodiversity	3.25	3.23	3.21	3.22	3.18	3.27	3.29	3.18	3.27	3.23	3.20	3.28
Health of Marine Species	2.82	2.87	2.85	2.80	2.91	2.85	2.83	2.91	2.80	2.83	2.89	2.82
Reproductive Patterns	3.08	3.12	3.10	3.06	3.09	3.15	3.20	3.12	3.09	3.08	3.11	3.08
Ecosystem Balance	3.00	2.98	3.01	2.94	3.02	2.95	3.05	2.98	3.03	2.97	3.01	2.96
Economic Impact	3.18	3.21	3.15	3.20	3.22	3.19	3.20	3.23	3.18	3.12	3.22	3.19

In conclusion, the profile of respondents indicates that demographic factors significantly influence their perception of marine life, with age and education being the most impactful. Respondents with more experience and higher education levels tend to recognize the severity of marine degradation more keenly. While biodiversity, reproductive health, and ecosystem balance are perceived as being

significantly impacted, the overall concern across all aspects is consistent, suggesting a broad recognition of the environmental challenges facing marine life.

5. **Do Imported Single-Use Plastics Influence Marine Life?**

From the data presented in the study, it is clear that **imported single-use plastics significantly influence marine life**, as shown by respondents' assessments across various aspects, including the volume of plastic waste, the types of plastics, degradability, and their presence in coastal and marine zones.

Key findings include:

1. **Volume of Plastic Waste**. The overall mean of 3.38 (SD = 0.68) indicates that respondents perceive a **"Very High"** impact of imported plastics on the volume of plastic waste in the community. This large volume of waste significantly contributes to marine pollution and affects marine life.
2. **Types of Plastics**. With a mean of 3.39 (SD = 0.62), respondents view **imported plastics**—especially those from packaging materials—as a **"Very High"** contributor to marine pollution. These plastics are identified as harmful, particularly non-recyclable plastics that persist in marine ecosystems.
3. **Degradability**. Respondents assessed the degradability of imported plastics with a mean of 3.23 (SD = 0.65), describing them as mostly **non-biodegradable**. This persistence in the environment exacerbates pollution, posing long-term threats to marine species through ingestion and habitat disruption.
4. **Presence in Coastal and Marine Zones**. The mean score of 3.29 (SD = 0.67) reveals that **imported plastics** are commonly found in **coastal and marine environments**, contributing to the pollution levels and negatively impacting marine biodiversity.

Here is a table summarizing the assessment of imported single-use plastics' impact on marine life:

Table 17
Respondents' Assessment of Imported Single-Use Plastics' Influence on Marine Life

Aspect	Mean	SD	Description	Interpretation
Volume of Plastic Waste	3.38	0.68	Very High	Significant contribution to marine pollution; urgent action required
Types of Plastics	3.39	0.62	Very High	Major contributor to pollution, particularly non-recyclable plastics
Degradability	3.23	0.65	High	Significant presence of non-biodegradable plastics causing long-term pollution
Presence in Coastal and Marine Zones	3.29	0.67	Very High	Widespread presence of imported plastics in coastal and marine areas, negatively impacting marine life

CONCLUSION

The study on the impact of imported single-use plastics on marine life in the Municipality of Aborlan, Palawan, highlights significant environmental concerns related to plastic pollution. The findings indicate that imported single-use plastics contribute substantially to marine pollution, as evidenced by the high ratings given by respondents in terms of the volume of plastic waste, types of plastics, and their presence in coastal and marine zones. A "Very High" level of pollution was reported, with plastics, particularly from packaging materials, identified as major culprits in the degradation of marine ecosystems. The persistence of these plastics in the environment, especially non-biodegradable types,

exacerbates the ecological damage, affecting marine biodiversity, health of species, and overall ecosystem balance.

Moreover, the study underscores the severe ecological and socio-economic impacts caused by plastic pollution. Respondents perceived a noticeable decline in biodiversity, the health of marine species, and the reproductive patterns of marine life due to the accumulation of plastics in coastal zones. The economic impact on local communities that rely on marine resources for their livelihood was also rated highly, indicating a direct correlation between plastic pollution and the economic well-being of these communities. The findings suggest that stricter regulations on plastic imports, along with enhanced waste management and community-driven conservation efforts, are essential to mitigating the environmental and economic consequences of plastic pollution.

Based on the study's results, it is evident that imported single-use plastics have a profound and detrimental impact on the marine environment of Aborlan. The research calls for urgent intervention, including stronger policy enforcement, increased public awareness, and international cooperation to reduce plastic waste. By addressing the growing threat of plastic pollution, local and global communities can work together to safeguard marine biodiversity and support the sustainability of marine-dependent livelihoods. This study provides critical data that can inform future policy recommendations, aiming to protect the health of marine ecosystems in the Philippines and beyond.

Recommendations

1. **Strengthen Regulations on Plastic Imports**. Implement stricter policies to regulate the importation of single-use plastics, ensuring that only biodegradable or recyclable plastics are permitted. Government agencies should work on setting import quotas and levying tariffs on non-recyclable plastic products to discourage their use.
2. **Improve Waste Management Systems**. Develop and enforce more robust waste management systems in coastal areas, particularly in Aborlan. This includes setting up more effective collection, segregation, recycling, and disposal practices to prevent plastic waste from entering marine environments.
3. **Increase Community Awareness Campaigns**. Launch public awareness campaigns to educate local communities about the environmental and socio-economic impacts of plastic pollution. These campaigns should target both local residents and tourists to encourage responsible plastic use and disposal.
4. **Promote Sustainable Alternatives**. Encourage businesses and consumers to shift toward sustainable alternatives, such as biodegradable packaging or reusable products. Incentivize the use of these alternatives through subsidies, tax breaks, or public recognition programs for environmentally conscious businesses.
5. **Support and Expand Marine Protected Areas** (MPAs). Expand the coverage of Marine Protected Areas (MPAs) in Aborlan and other regions at risk from plastic pollution. These areas should be managed effectively to restore and preserve marine biodiversity, particularly in habitats affected by plastic debris.
6. **Enhance Monitoring and Data Collection**. Establish more comprehensive and consistent systems for monitoring plastic waste, including tracking the origin and volume of imported plastics. This data should be used to inform policies and track progress in reducing plastic pollution over time.
7. **Encourage Public-Private Partnerships**. Foster collaboration between government, NGOs, and private companies to address plastic pollution. Companies should be encouraged to adopt Extended Producer Responsibility (EPR) programs that ensure they are accountable for the life cycle of the

products they produce, including post-consumer plastic waste.

8. **Implement Plastic Waste Reduction Targets**. Set clear, measurable targets for plastic waste reduction, both at the local and national levels. These targets should be supported by concrete actions, such as phasing out the use of single-use plastics and replacing them with more sustainable materials.
9. **Promote Research and Innovation**. Invest in research and innovation focused on finding alternative materials to single-use plastics, improving recycling technologies, and exploring better ways to mitigate the effects of plastics already in the environment, such as developing eco-friendly plastic alternatives.
10. **Collaborate Internationally on Plastic Pollution**. Strengthen international cooperation with neighboring countries and global organizations to tackle plastic pollution at a regional and global level. This includes sharing best practices, coordinating waste management efforts, and ensuring that plastic pollution does not cross borders or impact marine ecosystems across regions.

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