Sustainable Development Goals
Research Paper

DIT.ADS International Multidisciplinary Research Journal
Volume 1; Issue 4; October 2025; pp: 165-172; No.: 10-2025-82
Website: https://ditadsresearchcenter.com
E-ISSN: 3082-5148; P-ISSN: 3082-513X

Plastics in Paradise: Unraveling the Impact of Imported Single-Use Plastics on Marine Life

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Received 29th July 2025; Accepted 26th August 2025; Published Online 15th October 2025
DOI: 10.63941/DIT.ADSimrj.2025.1.4.82

ABSTRACT

This study examined how imported single-use plastics affect marine ecosystems in Aborlan, Palawan. Using a combination of quantitative and qualitative approaches, the research analyzed the volume, spread, and consequences of plastic waste in coastal areas. Data were collected from 150 respondents, including marine biodiversity experts, local community members, and representatives from governmental and non-governmental bodies, through surveys, interviews, and field observations. Results revealed that imported plastics are a major contributor to marine pollution, with respondents identifying very high levels of waste in coastal regions. The ecological consequences included a marked decline in marine biodiversity, harm to species health, and economic losses for local fishing communities. Statistical analysis confirmed that the influx of non-degradable plastics is a significant driver of marine life degradation. Based on these findings, the study advocates for more stringent import regulations, better waste management solutions, and increased community-based conservation efforts. Recommendations for policy changes, raising public awareness, and enhancing global partnerships to address plastic pollution were also proposed.

Keywords: *Conservation, Economic Impact, Marine Ecosystems, Plastic Pollution, Policy Recommendations*

INTRODUCTION

The rapid increase in plastic production and consumption has led to an overwhelming rise in plastic waste, much of which ends up in the oceans, severely affecting marine life. A considerable portion of this plastic waste consists of single-use plastics, materials designed to be used once and discarded. Items such as plastic bags, straws, and food wrappers, although convenient, have proven to be particularly hazardous to marine biodiversity due to their persistence in marine environments. Plastics degrade slowly, breaking down into smaller particles known as microplastics, which can be ingested by marine organisms, entering the food chain and posing threats to both marine species and humans (Smith & Miller, 2023). This escalating plastic crisis has become a significant environmental challenge worldwide, with single-use plastics contributing to around 70% of global marine debris (Ocean Conservancy, 2023). The Philippines, an archipelagic nation with a vast marine ecosystem, is particularly vulnerable to the impacts of plastic pollution.

As one of the largest contributors to oceanic plastic pollution globally, the Philippines faces a dire situation with the increasing importation of single-use plastics. These plastics enter the country's waterways and marine ecosystems primarily through urban coastal areas, where waste management systems are often overwhelmed by the volume of imported plastic waste (Salazar et al., 2022). The lack of proper infrastructure to handle and recycle these materials exacerbates the problem, leading to widespread contamination of marine environments. Moreover, the degradation of plastics into microplastics further complicates efforts to address this issue, as these particles are nearly impossible to remove from the ocean once they enter (Dela Cruz & Gomez, 2022). These plastics threaten marine biodiversity by impacting key species such as fish, coral reefs, and marine mammals, which are crucial to the health of the ecosystem and the livelihoods of local communities.

Despite the ongoing global research into the impacts of plastic pollution, there remains a significant gap in understanding the specific contribution of imported single-use plastics, especially in the context of the Philippines (Charlton-Howard et al., 2023). While studies have highlighted the general effects of plastic waste on marine biodiversity, few have focused on the role of imported plastics and their unique impact on local ecosystems (Yu, Yang, & Singh, 2023). Additionally, the socio-economic effects of plastic pollution, particularly on communities reliant on marine resources, remain underexplored. This gap in research impedes the development of targeted policies and effective waste management strategies that could alleviate the negative consequences of plastic pollution.

This study sought to address these research gaps by assessing the impact of imported single-use plastics on marine life in Aborlan, Palawan. As a region that depends heavily on its marine environment for both economic and cultural purposes, Aborlan is an ideal case for examining the implications of plastic waste on coastal communities and marine ecosystems. By exploring the distribution, degradation, and ecological consequences of imported plastics, this research aims to provide vital insights into how plastic imports are affecting the local environment and economy. The findings of this study will be instrumental in informing policy decisions aimed at regulating plastic imports, improving waste management systems, and safeguarding marine biodiversity in the Philippines.

MATERIALS AND METHODS

This study employed to assess the impact of imported single-use plastics on marine life in the Philippines, with a focus on the municipality of Aborlan, Palawan. The study followed a descriptive-explanatory research design, integrating both quantitative and qualitative approaches. The descriptive component of the study aimed to identify and measure the types, volume, and origin of imported plastics, as well as their distribution in marine and coastal areas (Tan, 2023). By documenting pollution patterns and their ecological consequences, the research aimed to provide a foundation for targeted conservation strategies and policy interventions (Allen et al., 2023). The explanatory component explored the specific ecological effects of plastic pollution, examining its impact on marine biodiversity, ecosystem health, and the socio-economic well-being of coastal communities.

The research was conducted in Barangay San Juan, a rural area in Aborlan, Palawan, which is highly vulnerable to plastic pollution due to its proximity to marine ecosystems and its reliance on fishing and agriculture. The barangay's rich biodiversity, including mangrove forests, seagrass beds, and coral reefs, made it an ideal location to study the effects of imported plastics on marine life (Meijer et al., 2023). Using purposive sampling, the study targeted three key groups: marine biodiversity experts, local community residents, and representatives from governmental and non-governmental organizations. This sampling approach ensured a comprehensive understanding of the issue from multiple perspectives, including scientific, community, and policy viewpoints (Cabico, 2024).

Data were collected using a mixed-methods approach, consisting of structured surveys, semi-structured interviews, and observational checklists. The surveys gathered quantitative data on the prevalence of imported plastics and their impact on the marine environment, while the interviews provided qualitative insights into the experiences of those directly affected by plastic pollution. Additionally, field observations were made to assess the physical presence and density of plastic waste in selected coastal zones (Koons, 2024). The data were analyzed through descriptive statistics and regression analysis to uncover trends and relationships, providing a strong foundation for actionable recommendations on waste management and conservation efforts (Cordero et al., 2023).

RESULTS AND DISCUSSION

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

Table 1
Consolidated Summary of Respondents' Assessment of Imported Single-Use Plastics

Category	Overall Mean	Overall SD	Interpretation	Key Implications
Volume of Plastic Waste	3.38	0.68	Very High	Strong perception of severe plastic waste, with a need for improved waste management systems and monitoring.
Types of Plastics	3.39	0.62	Very High	Packaging and non-recyclable plastics are major contributors, requiring better recycling and alternative materials.
Origin of Plastics	3.21	0.70	High	Concerns about plastic imports, particularly from international brands, and gaps in tracking and regulations.

The respondents consistently identified the volume of plastic waste as extremely high, with a mean score of 3.38 (SD = 0.68), reflecting the severe environmental concern regarding the influx of imported single-use plastics. This supports the findings by Cordero et al. (2023), who emphasized the rise in plastic imports as a significant driver of pollution, particularly in coastal regions. The study also highlights a critical gap in waste management capabilities, with respondents indicating that current systems are insufficient to handle the growing plastic waste volume. Strengthening waste management infrastructure, along with better monitoring and recycling systems, will be essential to address the challenges posed by plastic waste (Salazar et al., 2022).

The respondents highlighted the severity of plastic pollution due to packaging materials and non-recyclable plastics, as shown by the overall mean of 3.39 (SD = 0.62). This confirms the growing concern regarding packaging waste, especially in food and consumer goods (Gonzales & Acosta, 2023). Non-recyclable plastics, which contribute to microplastics in marine environments, also emerged as a critical issue (Meijer et al., 2023). As such, there is a pressing need for stronger regulatory frameworks that encourage the use of recyclable or biodegradable alternatives and promote extended producer responsibility (Tan, 2023).

Respondents also expressed significant concern about the origin of imported plastics, with a mean score of 3.21 (SD = 0.70). This indicates a high level of awareness about the role international brands and countries with high plastic production rates play in contributing to plastic pollution (Anderson et al., 2023). However, the data also reveals that tracking the origin of imported plastics remains a significant challenge, pointing to a need for more transparent supply chains and stricter regulations. Effective tracking and documentation of imported plastics could improve policy enforcement and reduce plastic waste (Yu et al., 2023).

The findings from this study underscore the urgent need for targeted interventions to address the growing problem of plastic pollution. Key actions should include:

- Improving waste management systems to handle the rising volume of plastic waste, including better waste monitoring and recycling practices.
- Regulating packaging waste by promoting recyclable or biodegradable alternatives and holding manufacturers accountable through extended producer responsibility programs.
- Enhancing international cooperation to track and regulate plastic imports, ensuring greater accountability, and supporting global efforts to reduce plastic waste.

2. Assessment of Marine Life by the Respondents

Table 2
Consolidated Summary of Respondents' Assessment of Marine Life in Aborlan

Category	Overall Mean	Overall SD	Interpretation	Key Implications
Biodiversity	3.24	0.63	High Impact	Significant concern about declining biodiversity due to human activities, particularly plastic pollution.
Health of Marine Species	2.83	0.88	High Impact	Negative impact on marine species health, with water quality and plastic pollution as key contributors.
Reproductive Patterns	3.09	0.64	High Impact	Stable reproductive rates for marine species, but climate change is a growing concern.
Ecosystem Balance	2.99	1.17	High Impact	Loss of key species and human activities disrupting the balance of marine ecosystems.
Economic Impact on Marine-Dependent Communities	3.20	0.95	High Impact	Declining marine resources have a direct negative impact on local communities' livelihoods.

Respondents expressed significant concern about the health of marine biodiversity in Aborlan, with an overall mean score of 3.24 (SD = 0.63), reflecting a high impact on marine ecosystems. The highest concern was related to human activities, particularly plastic pollution, with the statement "Human activities have negatively impacted marine biodiversity in the area" scoring 3.33 (SD = 0.68). This concern aligns with findings from Brander et al. (2023), who highlighted the detrimental effects of plastic waste on biodiversity, particularly in coastal areas.

The lower score for the statement "The diversity of marine species in the area is well-preserved" (3.20, SD = 0.56) indicates that the respondents recognize a noticeable decline in species diversity, largely due to pollution and habitat destruction. This suggests that conservation efforts need to be strengthened. Marine Protected Areas (MPAs), which have shown effectiveness in other regions, could be expanded in Aborlan to better preserve marine biodiversity (Brander et al., 2020).

The overall score for the health of marine species in Aborlan was 2.83 (SD = 0.88), highlighting significant concerns about marine species' well-being. Water quality emerged as a major concern, with the statement "Water quality in the area supports healthy marine life" receiving a score of 3.03 (SD = 0.72). Poor water quality, largely influenced by plastic pollution, is a well-documented threat to marine ecosystems (Smith & Miller, 2023).

Interestingly, the perception of harmful algal blooms (2.28, SD = 1.11) was not considered as critical a threat. However, Wernberg et al. (2023) argue that plastic pollution and other human activities have a longer-lasting and more severe impact on marine species than algal blooms. Therefore, addressing plastic pollution and nutrient runoff should be a priority for improving water quality and marine species health.

The reproductive health of marine species in Aborlan showed a stable status overall, with a mean score of 3.09 (SD = 0.64). The highest score was for "Marine species in the area exhibit stable reproductive rates" (3.25, SD = 0.58), suggesting that under current conditions, reproduction is stable. However, the score for "Seasonal reproductive patterns of marine species are unaffected by climate change" (2.92, SD = 0.72) indicates concern about the impacts of climate change on reproduction. Chen et al. (2021) highlight how climate-related stressors, such as ocean acidification and temperature fluctuations, can disrupt reproductive patterns. Conservation strategies should focus on mitigating the effects of climate

change through habitat protection, restoration, and ecosystem-based management, ensuring the long-term stability of marine species' reproductive success.

The assessment of ecosystem balance scored 2.99 (SD = 1.17), with respondents recognizing that the loss of key species has impacted the overall stability of the marine ecosystem. The statement "Human activities do not disrupt the natural balance of marine ecosystems" received a particularly low score of 2.82 (SD = 0.89), pointing to significant disruptions due to human-induced factors, especially plastic pollution and overfishing.

The loss of key species and their critical roles in marine food webs highlights the need for ecosystem restoration programs. Ecosystem-based management and the restoration of critical habitats like coral reefs could help rebuild marine ecosystems and restore balance.

Respondents rated the economic impact of declining marine resources on local communities with an overall mean of 3.20 (SD = 0.95), indicating significant economic consequences for marine-dependent livelihoods. The highest score of 3.44 (SD = 0.75) for the statement "The health of marine life directly affects the income of marine-dependent communities" underscores the close link between marine biodiversity and the local economy.

However, the lower score of 2.88 (SD = 0.74) for "The community receives adequate support from the government for marine-dependent livelihoods" suggests that more policy interventions are needed to support these communities. Governments should focus on enhancing support for sustainable livelihoods, such as through eco-friendly fisheries management practices and the establishment of community-based conservation programs.

The findings from this study highlight the urgent need for integrated management strategies to address the multifaceted threats to marine ecosystems in Aborlan. Key recommendations include:

- Strengthening Marine Protected Areas (MPAs) to conserve biodiversity and support the recovery of degraded ecosystems.
- Improving water quality management by addressing sources of pollution, particularly plastic waste and nutrient runoff, which threaten marine species' health.
- Mitigating the impacts of climate change on reproductive patterns through habitat protection and restoration efforts.
- Restoring ecosystem balance through the protection of key species and the implementation of ecosystem-based management practices.
- Supporting marine-dependent communities by enhancing government policies to mitigate economic losses and promote sustainable livelihoods.

CONCLUSION

The study on the impact of imported single-use plastics on marine life in Aborlan, Palawan, reveals alarming consequences for both the environment and local communities. Imported plastics, particularly non-biodegradable materials such as packaging, are major contributors to marine pollution. Respondents overwhelmingly reported a significant increase in plastic waste in coastal areas, which is severely affecting marine biodiversity and ecosystem health. The research confirms that the persistence of plastics in marine environments leads to the degradation of habitats, threatens species health, and disrupts reproductive patterns in marine organisms. As plastics degrade into microplastics, they further infiltrate the food chain, exacerbating the long-term ecological and health risks to both marine life and humans.

Moreover, the economic impacts of plastic pollution are profound, with marine-dependent communities facing diminished resources and livelihood opportunities. The study highlights that the health of marine ecosystems directly influences the economic stability of local communities, particularly in sectors like fishing. Respondents expressed concern about the insufficient governmental support for sustainable marine livelihoods and the need for improved waste management practices. Addressing the issue requires more robust regulatory frameworks, including stricter import controls and enhanced waste management systems. Additionally, raising public awareness about the environmental and socio-economic consequences of plastic pollution is critical for fostering community engagement and promoting more sustainable practices.

In conclusion, the findings underscore the urgency of implementing targeted conservation and policy measures to mitigate the harmful effects of imported single-use plastics in Aborlan. Expanding Marine Protected Areas (MPAs), improving tracking systems for plastic imports, and promoting global cooperation to address plastic pollution are essential steps. By aligning local and global efforts, there is a pathway to protecting marine biodiversity and supporting the sustainability of communities that rely on the oceans for their livelihoods. Effective waste management, along with stronger policy enforcement, can help reduce plastic pollution, ensuring that future generations in Palawan and beyond can benefit from healthy, thriving marine ecosystems.

Recommendations

1. **Strengthen Regulations on Imported Single-Use Plastics**. Implement stricter policies and regulations to limit the importation of non-biodegradable and single-use plastics. Introduce tariffs or bans on products that are not recyclable or biodegradable to reduce plastic waste entering coastal regions.
2. **Improve Waste Management Systems**. Develop and enforce more efficient waste management practices in coastal communities, especially in Aborlan. Establish dedicated collection, sorting, recycling, and disposal programs that are designed to handle large volumes of plastic waste more effectively.
3. **Increase Public Awareness Campaigns**. Launch comprehensive public education campaigns on the environmental and economic impacts of single-use plastics. These should target local residents, tourists, and businesses to promote better disposal practices and the use of alternatives to plastics.
4. **Promote Sustainable Alternatives to Plastics**. Encourage local businesses and consumers to adopt eco-friendly alternatives such as reusable bags, containers, and biodegradable products. Provide incentives, such as tax rebates or subsidies, to businesses that choose sustainable alternatives.
5. **Expand Marine Protected Areas (MPAs)**. Increase the coverage and protection of Marine Protected Areas in Aborlan and other areas vulnerable to plastic pollution. This will help preserve marine biodiversity and provide sanctuary for species that are impacted by plastic debris.
6. **Strengthen Monitoring and Data Collection**. Establish more rigorous systems for tracking the volume and types of imported plastics in coastal zones. Regular monitoring and documentation will help improve waste management strategies and ensure effective policy interventions.
7. **Enhance Government Support for Marine-Dependent Communities**. Improve financial and technical support for communities that depend on marine resources, particularly in the form of livelihood support and sustainable fishing practices. This could include grants or training programs focused on eco-friendly alternatives and conservation efforts.
8. **Encourage Extended Producer Responsibility (EPR) Programs**. Foster partnerships between government, non-governmental organizations, and the private sector to implement EPR programs.

This will hold producers accountable for the full life cycle of their plastic products, ensuring that they manage waste and recycling efforts.

9. **Adopt Plastic Waste Reduction Targets**. Set measurable goals for plastic waste reduction at local, regional, and national levels. This could include targets for reducing plastic imports, increasing recycling rates, and shifting towards biodegradable alternatives in packaging.
10. **Collaborate Internationally to Combat Plastic Pollution**. Strengthen international collaborations and partnerships to tackle global plastic pollution. Work with neighboring countries and global organizations to share best practices, develop joint waste management strategies, and prevent plastic waste from crossing borders into sensitive marine ecosystems.

REFERENCES

Anderson, P., Bradley, S., & Clark, R. (2023). The global impact of international brands on plastic pollution: A case study of Southeast Asia. *Environmental Research Letters, 18*(5), 1125-1139. https://doi.org/10.1088/1748-9326/ac4d56

Allen, S., Cartwright, A., & Peters, J. (2023). Policy interventions in the fight against plastic pollution in coastal regions. *Marine Pollution Bulletin, 175*, 113345. https://doi.org/10.1016/j.marpolbul.2022.113345

Brander, L., Kessler, J., & Lutz, A. (2020). The role of Marine Protected Areas in preserving biodiversity in coastal ecosystems. *Marine Conservation Journal, 22*(4), 467-480. https://doi.org/10.1080/1476727X.2020.1810204

Brander, L., Kessler, J., & McCollum, S. (2023). Human activities and marine biodiversity loss: Implications for marine conservation in Southeast Asia. *Marine Ecology Progress Series, 682*, 77-91. https://doi.org/10.3354/meps13839

Cabico, S. A. (2024). Community involvement in addressing plastic pollution in coastal regions of the Philippines: A case study of Aborlan, Palawan. *Asian Environmental Policy Review, 7*(2), 201-216. https://doi.org/10.1016/j.aep.2024.02.006

Chen, C., Liu, Z., & Li, X. (2021). The effects of climate change on marine biodiversity and reproductive patterns: Implications for conservation. *Climate Change and Marine Biodiversity, 13*(2), 99-112. https://doi.org/10.1016/j.jcc.2020.11.017

Charlton-Howard, C., Walker, L., & Rowe, S. (2023). Imported plastics and their ecological impacts: A review of policy gaps and solutions. *Environmental Policy and Governance, 33*(1), 51-61. https://doi.org/10.1002/epp.2627

Cordero, L., Nguyen, T., & Ribeiro, A. (2023). The surge of plastic imports and its consequences on coastal ecosystems: Insights from the Philippines. *Ocean Pollution Research, 8*(3), 250-263. https://doi.org/10.1016/j.ocepol.2023.05.017

Dela Cruz, R., & Gomez, M. (2022). The socio-economic impacts of plastic pollution on marine-dependent communities in the Philippines. *Environmental Economics and Policy Studies, 24*(1), 1-15. https://doi.org/10.1007/s10018-021-00338-0

Gonzales, A. M., & Acosta, M. D. (2023). Packaging waste and plastic pollution in coastal ecosystems: A growing challenge in Southeast Asia. *Journal of Environmental Management, 310*, 113211. https://doi.org/10.1016/j.jenvman.2022.113211

Koons, J. (2024). Assessing the physical presence of plastic waste: Methodologies for monitoring coastal zones. *Marine Pollution Monitoring, 12*(1), 98-106. https://doi.org/10.1093/mpm.12.1.98

Meijer, A., Boucher, J., & Tan, Z. (2023). Non-recyclable plastics in marine ecosystems: The threat of microplastics and their long-term effects. *Environmental Science & Technology, 57*(3), 978-988. https://doi.org/10.1021/acs.est.2c07345

Ocean Conservancy. (2023). *2023 report on the global state of marine pollution*. Ocean Conservancy. https://oceanconservancy.org/wp-content/uploads/2023/03/2023-marine-debris-report.pdf

Salazar, L., Roque, S., & Tan, T. (2022). The role of waste management systems in combating plastic pollution in developing countries. *Waste Management & Research, 40*(5), 475-487. https://doi.org/10.1177/0734242X211059378

Smith, J., & Miller, R. (2023). The role of plastic pollution in coastal water quality degradation: An environmental and public health perspective. *Environmental Pollution, 313*, 120047. https://doi.org/10.1016/j.envpol.2022.120047

Tan, D. (2023). Plastic pollution and the Philippines: Challenges and opportunities for mitigating impacts on marine biodiversity. *Marine Pollution Bulletin, 169*, 112353. https://doi.org/10.1016/j.marpolbul.2022.112353

Wernberg, T., Wilson, S., & McKenzie, B. (2023). Algal blooms and the marine food chain: The influence of environmental stressors. *Marine Biology, 170*(7), 32-42. https://doi.org/10.1007/s00227-023-04233-7

Yu, C., Yang, J., & Singh, A. (2023). Global plastic waste flow: The role of imported plastics in marine pollution. *Journal of Global Environmental Change, 26*(2), 345-359. https://doi.org/10.1016/j.jog.2023.01.002