

Capacity and Training Needs Assessment of the Microplastic Research in the Philippines

Presented by: Ezra Osorio

Adaptation and Water Area

Institute for Global Environmental Strategies (IGES)

Email address: osorio@iges.or.jp

Highest Ocean Plastic Waste Polluters

(annual estimation in metric ton)



Reference: Meijer et al. (2021);
Visualized by Wicaksono (2023)

Spotlight

Philippines contributes to over one-third of world's ocean plastic waste - study

Job Manahan, ABS-CBN News

Published Jun 10, 2021 09:38 PM PHT



7 of top 10 rivers contributing to global plastic problem in oceans are in PH

According to study by Meijer et al. (2021), Southeast Asian countries particularly the Philippines rank **among the highest ocean plastic waste polluters.**

TOP 10 RIVERS CONTRIBUTING TO GLOBAL PLASTIC PROBLEM IN OCEANS

River	Country	Share of global ocean plastic pollution
1. Pasig	Philippines	6.43%
2. Klang	Malaysia	1.33%
3. Ulhas	India	1.33%
4. Tullahan	Philippines	1.33%
5. Meycauayan	Philippines	1.23%
6. Pampanga	Philippines	0.95%
7. Libmanan	Philippines	0.72%
8. Ganges	India	0.63%
9. Rio Grande de Mindanao	Philippines	0.54%
10. Agno	Philippines	0.47%

Sources: Our World in Data

ABS CBN
NEWS

ABS CBN NEWS
NEWS.ABS-CBN.COM

Spotlight

Philippines contributes to over one-third of world's ocean plastic waste - study

Job Manahan, ABS-CBN News

Published Jun 10, 2021 09:38 PM PHT



7 of top 10 rivers contributing to global plastic problem in oceans are in PH

According to study by Meijer et al. (2021), Southeast Asian countries particularly the Philippines rank **among the highest ocean plastic waste polluters.**

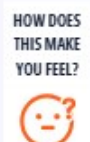
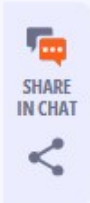
How athleisure, fast fashion are contributing to microplastic pollution

JUL 7, 2022 4:11 PM PHT

PIA RANADA

[UPGRADE TO LISTEN](#) POWERED BY [SPEECHIFY](#)

Already have Rappler+? [Sign in](#) to listen to groundbreaking journalism.



SCITECH

Filtered by: Scitech

Microplastics are already present in Metro Manila air, study confirms

By LOU ALBANO, GMA Integrated News

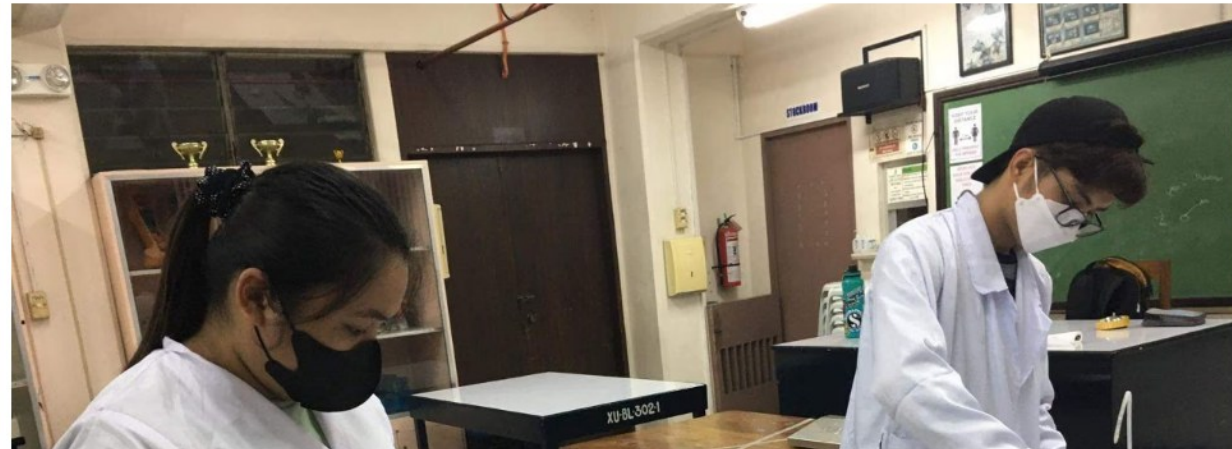
Published April 27, 2023 2:25pm

Health & Science

Invisible threat: How microplastics are polluting our cities and bodies

Raphael Bosano, ABS-CBN News

Published Feb 13, 2025 08:50 AM PHT





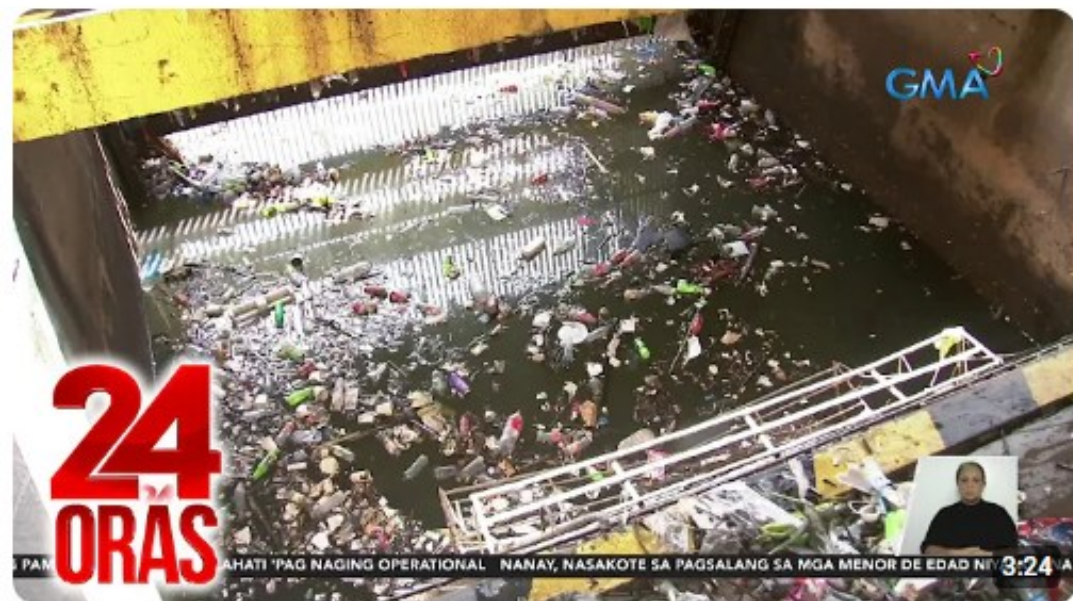
Hangin sa Metro Manila, kontaminado ng microplastics na masama sa kalusugan — MSU-IIT study | SONA

2K views • 1 year ago



GMA Integrated News ✓

Posibleng nakakalanghap na raw ng sobrang liliit na plastic ang mga taga- metro manila dahil kontaminado na raw ng ...



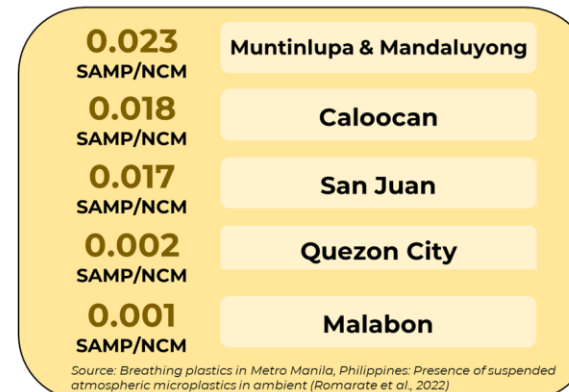
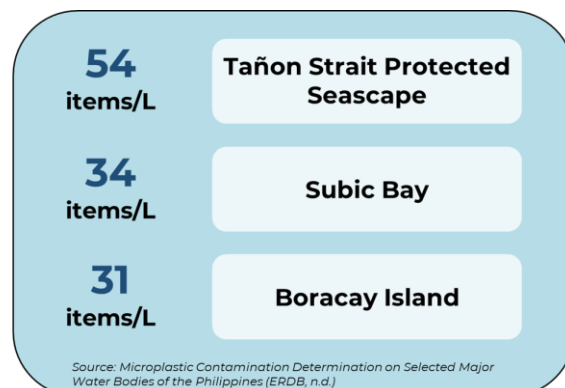
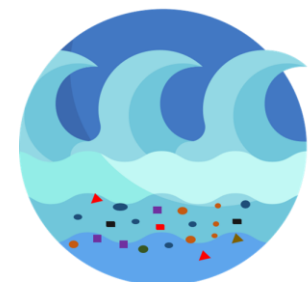
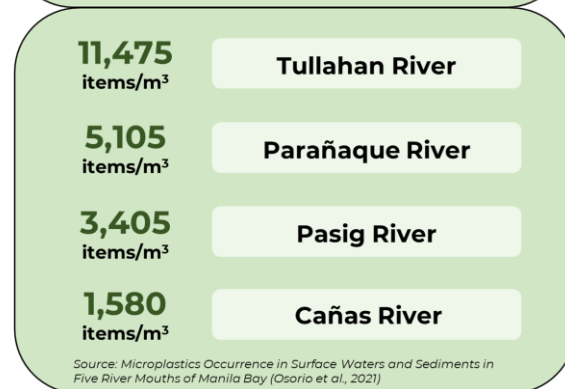
Pilipinas, kabilang sa mga bansang may pinakamaraming microplastic ingestion | 24 Oras

12K views • 8 months ago

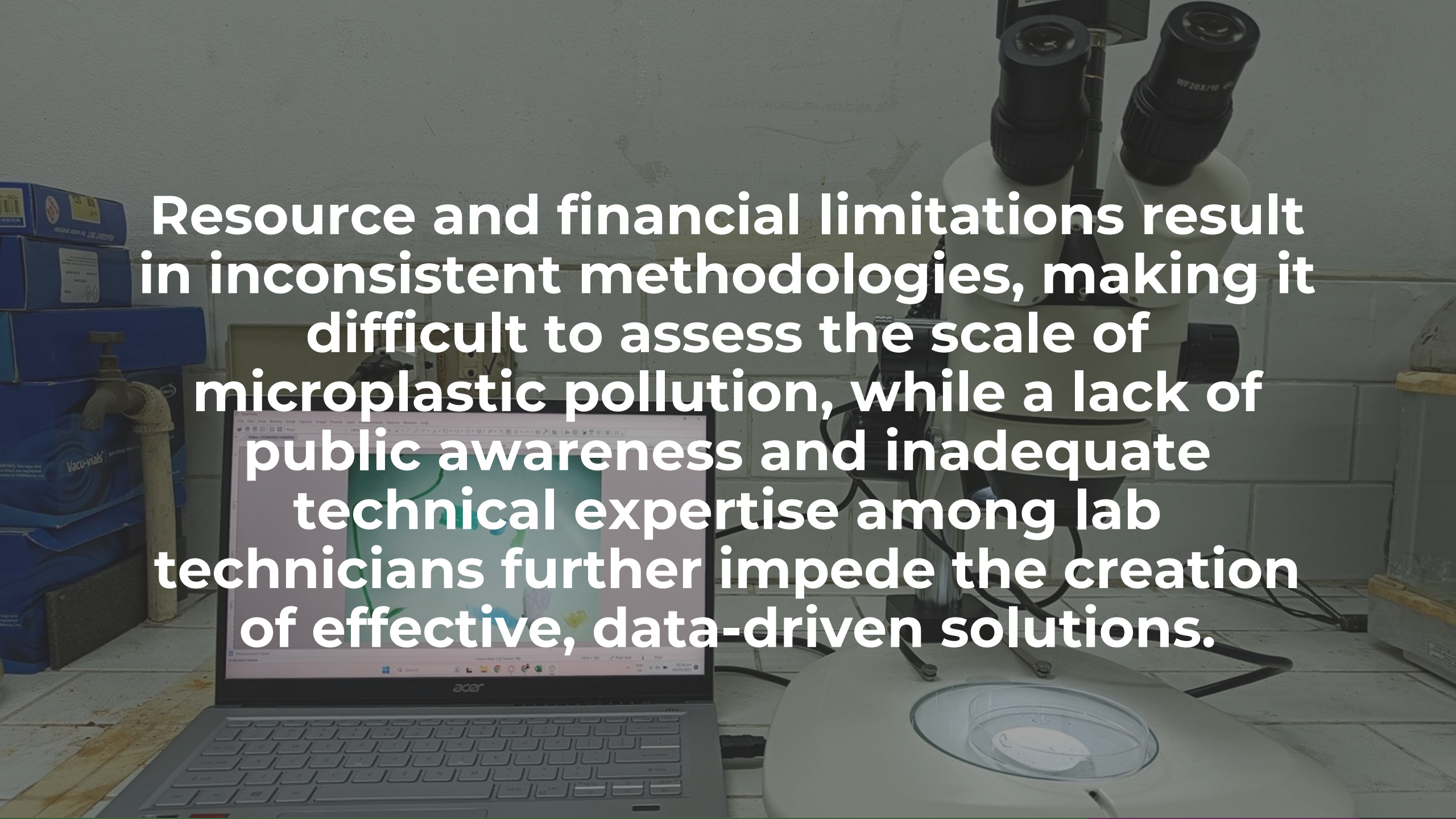


GMA Integrated News ✓

Kabilang ang Pilipinas sa mga bansang may pinaka-maraming insidente ng microplastic ingestion o pagpasok sa katawan ng ...



Selected Microplastic Studies in the Philippines

The background image shows a laboratory or workshop environment. On the right, a large white microscope with two eyepieces is visible. In the foreground, an Acer laptop is open, displaying a software interface with a green and blue graphic. To the left of the laptop, there is a blue water filtration system with a white faucet. The text is overlaid in the center of the image.

Resource and financial limitations result in inconsistent methodologies, making it difficult to assess the scale of microplastic pollution, while a lack of public awareness and inadequate technical expertise among lab technicians further impede the creation of effective, data-driven solutions.

Capacity and Training Needs Assessment



Evaluate the **public's awareness of plastic pollution**, specifically focusing on microplastics and nanoplastics



Assess the **facilities available for monitoring microplastics pollution** in the Philippines

Providing a better understanding of capacity training needs for microplastics sampling, quantification, and analysis in the Philippines

Capacity and Training Needs Assessment

- The results of this work provide valuable data for formulating mitigation programs and capacity-building activities aimed at improving research on microplastic pollution.
- Previous TNA studies were conducted in Sri Lanka and Vietnam.



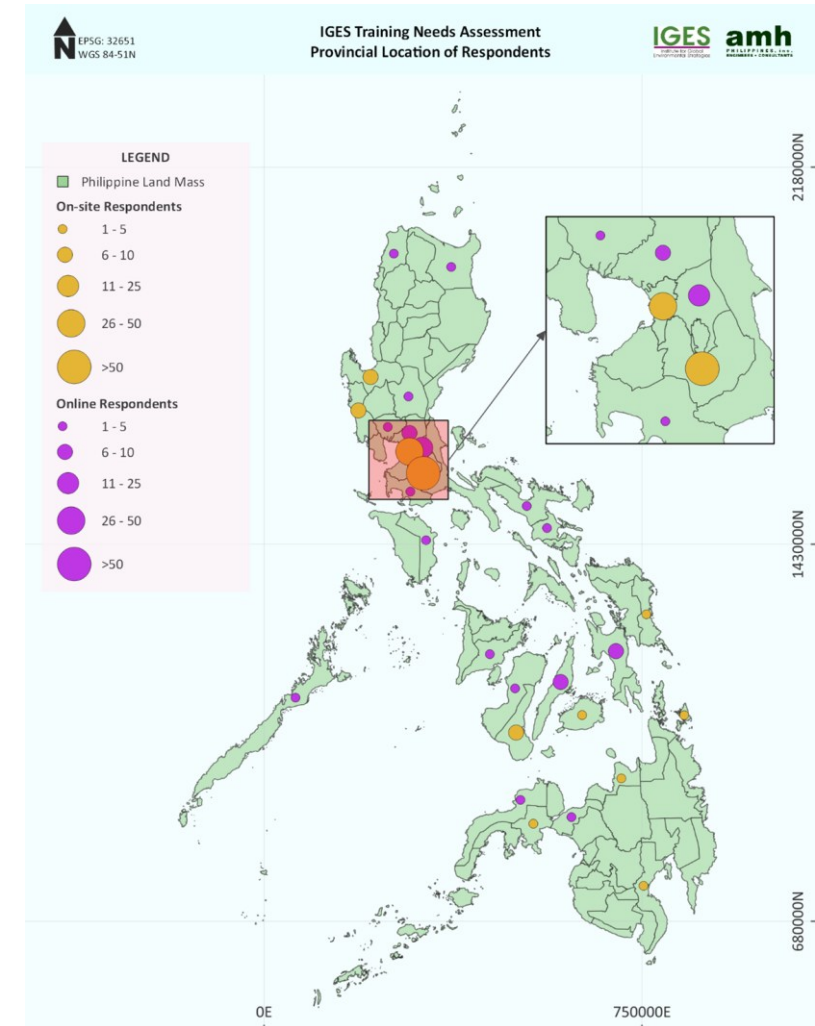
**Sri Lanka
(2022)**



**Vietnam
(2022)**

Methodology

- **200 respondents** were obtained from the all three island groups of the Philippines.
- Respondents from **26 cities and provinces** of spread throughout the Philippines
- Respondents were targeted **where microplastic studies have been already conducted**.



Methodology

Public Survey Questionnaire

- Respondent Background
- Perception of Plastic Pollution
- Opinion on Microplastics and Nanoplastics
- Recommendations

Survey Questionnaire on Micro- and Nano-plastic-related Pollution and its Impacts on Ecosystems and Human Health

Plastics have spread throughout every aspect of our daily lives. However, the widespread use of plastics poses a significant risk to the environment, owing to the high demand and slow degradation rate of plastics. The reliance of humans on plastics must therefore be addressed. The purpose of this questionnaire is to gather the insight of Filipinos on plastic waste and its resulting issue – microplastics and nanoplastics. The responses from this survey will help the researchers understand Filipinos' level of awareness, identify concerns, and guide educational efforts and policies on microplastic-related pollution.

A. Respondent Background

1. Name: _____
2. Age: _____
3. Gender: _____
4. Occupation: _____
5. Barangay and City: _____
6. Highest education attainment: _____
7. Province: _____
8. Contact details (if applicable): _____

B. Perception of Plastic Pollution

1. Do you think plastics are important in our daily lives?
☐ Yes
For what reason/s? (MA)
☐ Plastics are cheap.
☐ Plastics are easily accessible.
☐ Plastics are durable.
☐ Plastics are useful.
☐ Other: _____
☐ No
For what reason/s? (MA)
☐ Plastics break easily.
☐ Plastics are not environmentally friendly.
☐ Plastics are hazardous when burnt.
☐ Plastics can contaminate food and beverages.
☐ Other: _____

Methodology

- **Laboratories that have conducted microplastics studies** and potential laboratories interested in microplastics were interviewed.
- **Representatives or laboratory managers** were asked on the research activities, inventory of equipment, and standards of quality control and assurance.
- **Interviews were completed in 7 laboratories** from the contacted 12 laboratories. In addition, **5 microplastic researchers** were also interviewed.



Methodology

Laboratories and Researchers' Interview Questionnaire

- Organization Background
- Microplastic Research Background
- Research Activities
- Laboratory Activities
- Quality Assurance and Quality Control
- Laboratory Inventory
- Observation of Microplastics
- Nature of Microplastics
- Challenges and Recommendations

Survey Questionnaire on Micro and Nanoplastic-related Pollution and its Impacts on Ecosystems and Human Health

Microplastics are plastic debris that measures less than 5 millimeters in any dimension, while nanoplastics measure less than 1000 nm. Micro- and nanoplastics have emerged as an environmental pollutant and publications around the world have proven their significant negative impacts on both the marine and terrestrial ecosystem. Effective countermeasures for mitigating their effects, monitoring, and scientific-based policies are necessary to avoid further consequences. Therefore, facilities such as sampling devices, analytical equipment, and skilled technical staff are required.

This questionnaire intends to collect the present situation of various potential stakeholders in government, academia, private and other organizations in the context of microplastic sampling and analysis related facilities and skills and identify the facility and training-related capacity needs, the available resources, and potentials of contributing to future capacity-building activities and national strategic plans of monitoring and science-based policy-making process.

Please be assured that all responses from this survey will be treated as confidential and will only be used for research purposes. Your data will be stored securely and retained only for as long as necessary for our research.

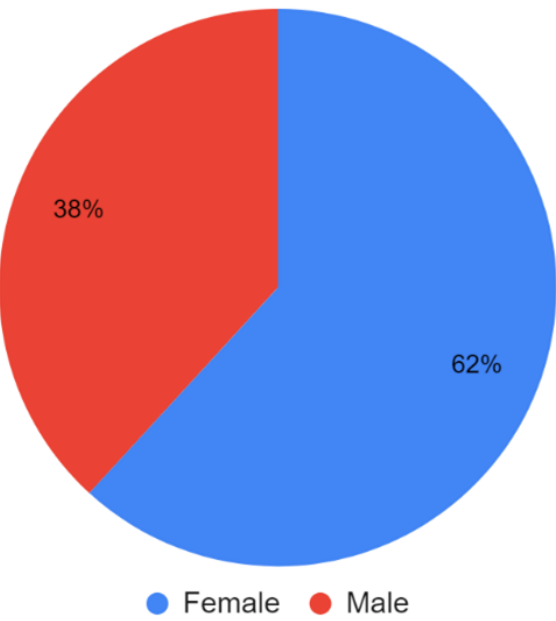
A. Organization Background

1. Name of Organization: _____
2. Address: _____
3. Province: _____
4. Name and position of the respondent: _____
5. Age: _____
6. Gender: _____
7. Email: _____
8. Phone number: _____
9. Your organization is a
 - ☐ Government institute
 - ☐ University or similar educational institute
 - ☐ Private laboratory
 - ☐ Other (please describe) _____
10. The organization's work scope is on or related to (please answer especially if you are under the government sector). Please select one or more relevant answers.
 - ☐ Drinking water (public water supply)
 - ☐ Freshwater (river, lake, etc.)
 - ☐ Marine and coastal environments
 - ☐ Wastewater and sludge
 - ☐ Industrial pollution
 - ☐ Agriculture (Soil/Fertilizer/Irrigation water)
 - ☐ Food and beverages quality
 - ☐ Other (please describe) _____
11. Does your organization involve quality assurance/monitoring or policymaking? (Please answer especially if you are under the government sector). Please select one or more answers.
 - ☐ Quality Assurance
 - ☐ Monitoring
 - ☐ Policymaking

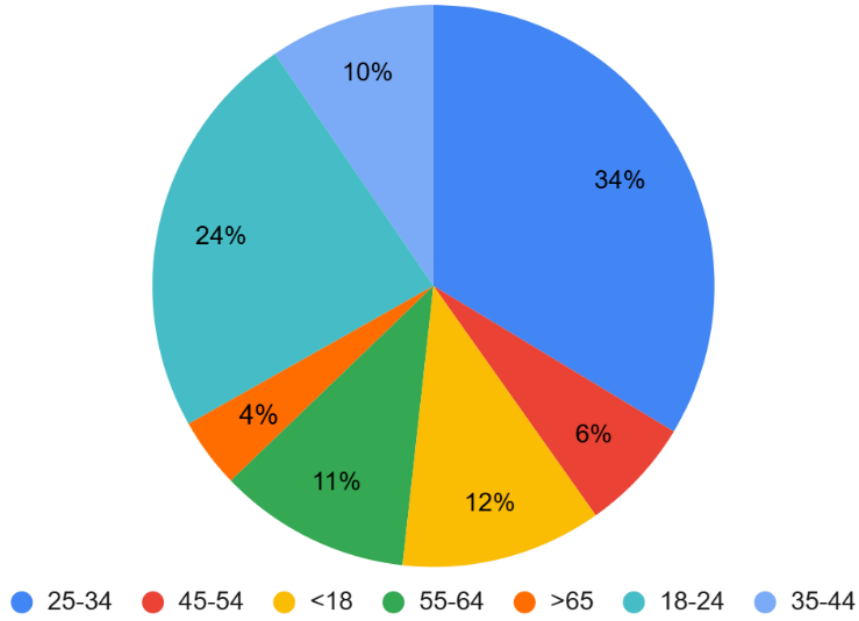
B. Research Activities



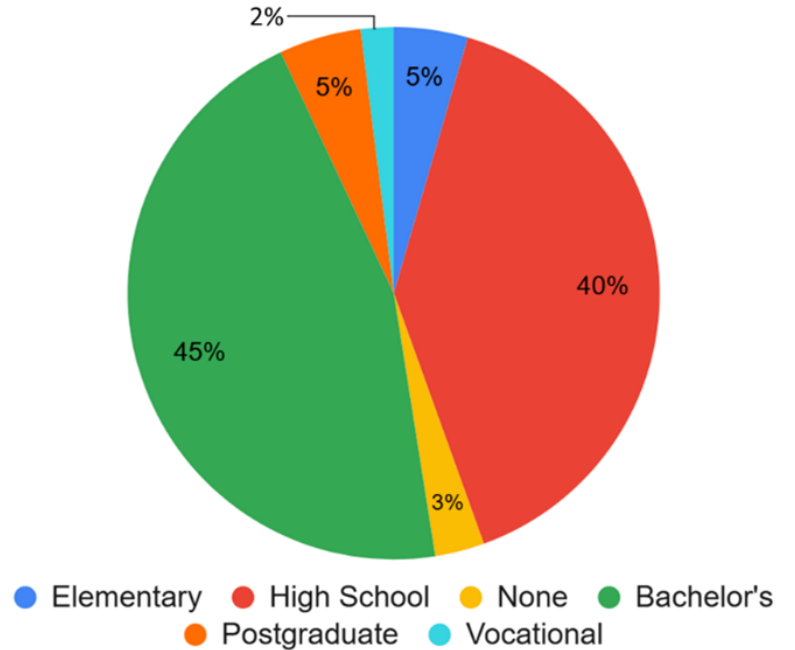
Background Information on the Respondents (General Public) for Awareness Survey



Sex

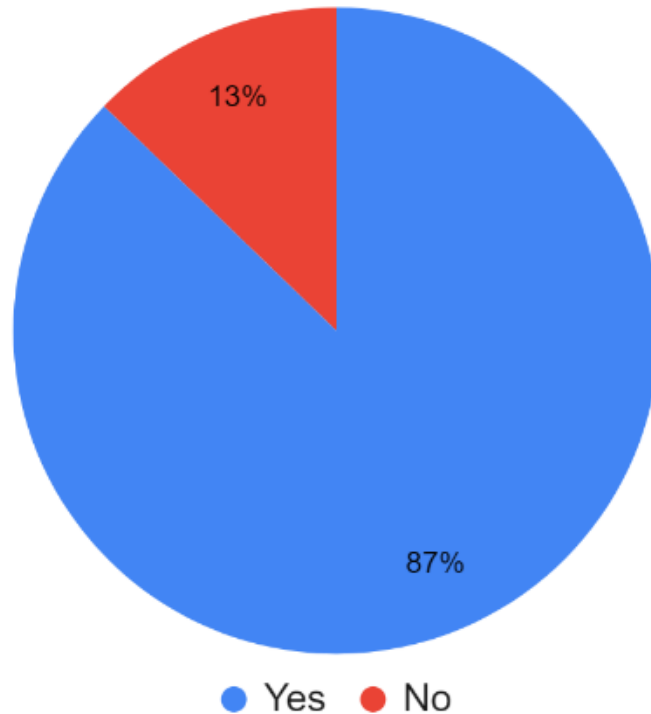


Age Group

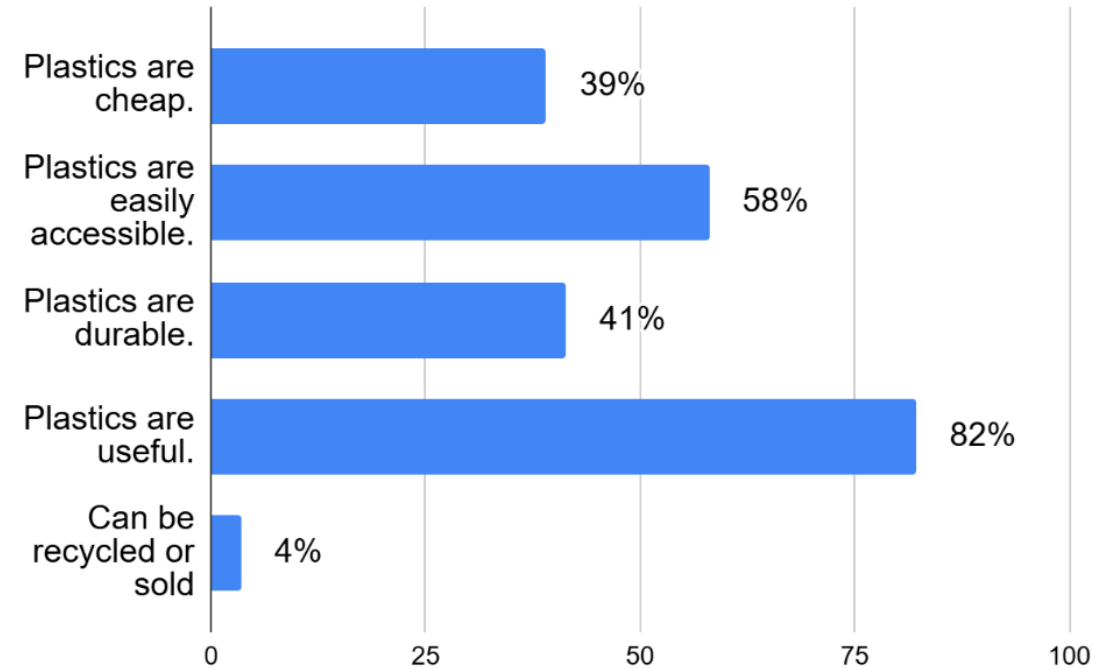


Highest Educational Attainment

Importance of the Plastics in Daily Life

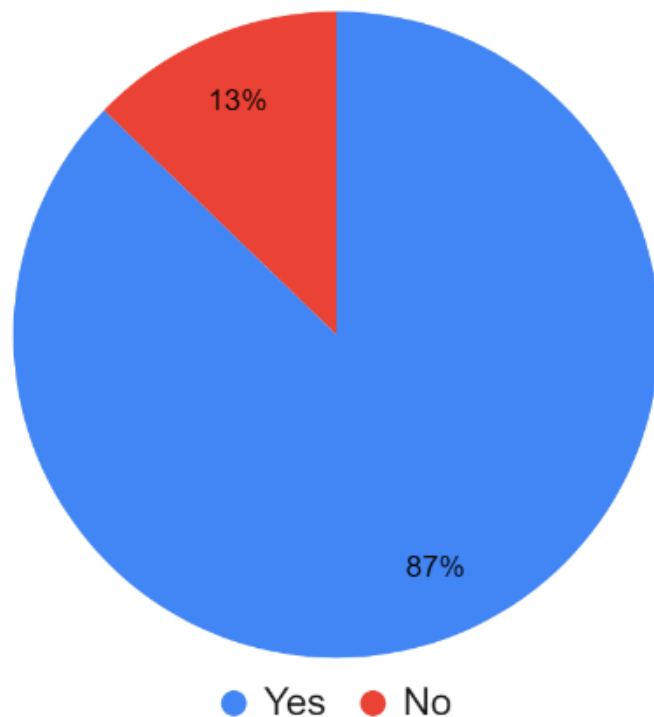


87% of respondents agreed that plastics are important in daily life

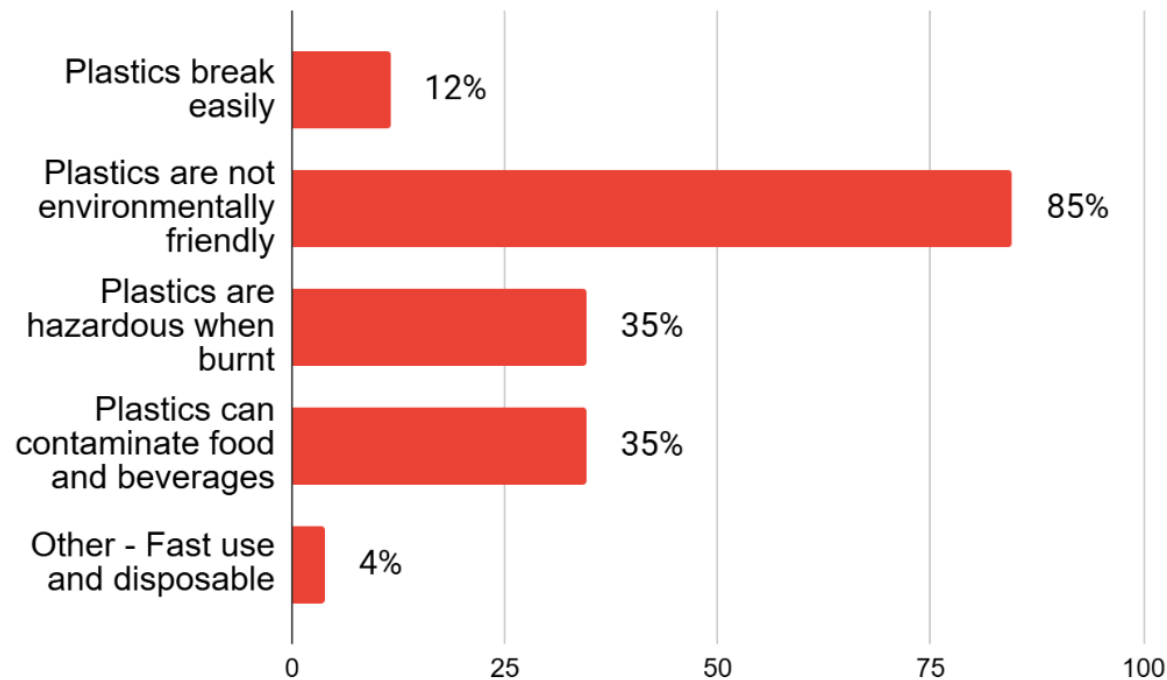


Among those who agreed that plastics are important, the most common reason was because **plastics are useful**

Importance of the Plastics in Daily Life

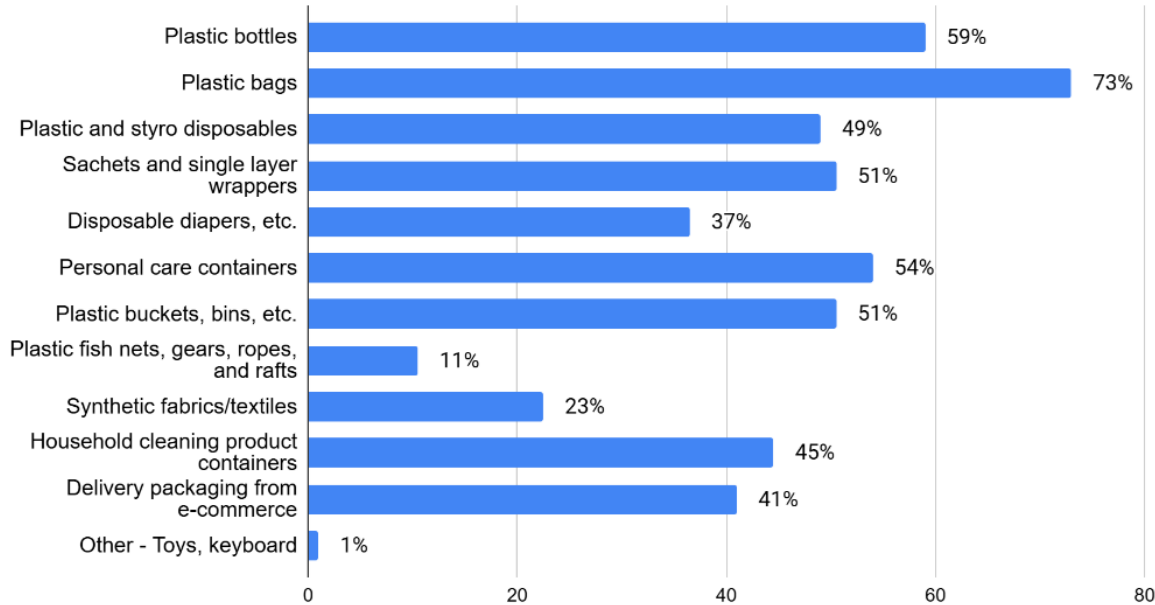


13% of respondents do not agree that plastics are important in daily life

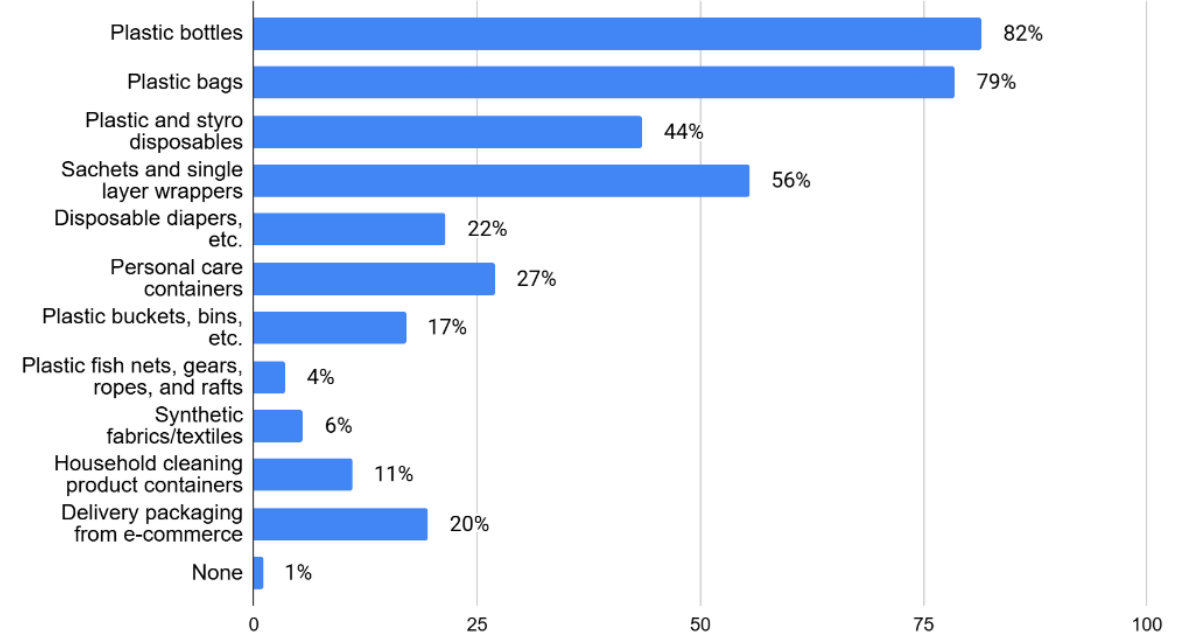


Among those who replied that plastics are not useful, the most common reason was because they are **not environmentally friendly**

Types of Plastics Frequently Used and Observed

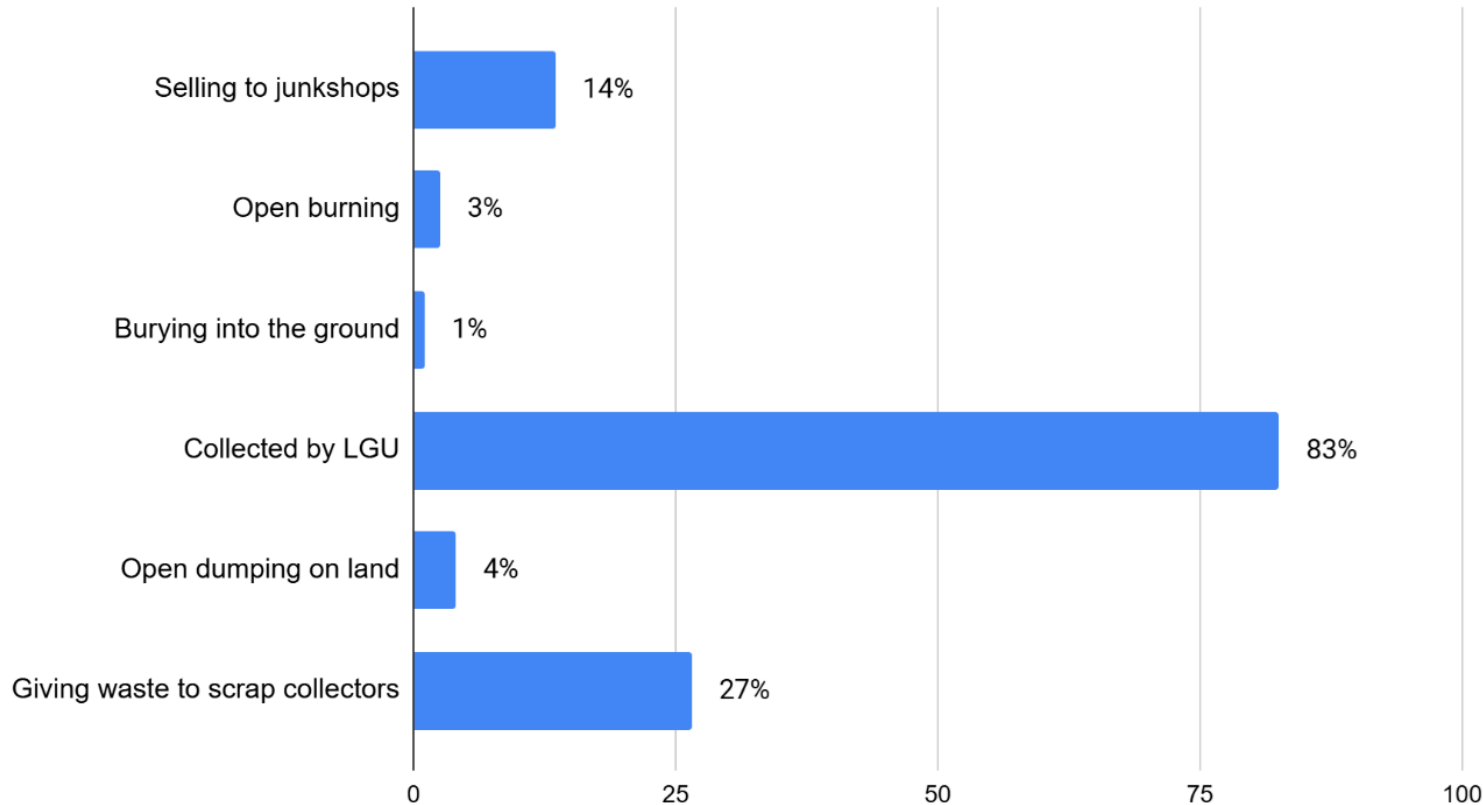


The three types of plastics frequently used are **plastic bags, plastic bottles, and plastic care containers.**



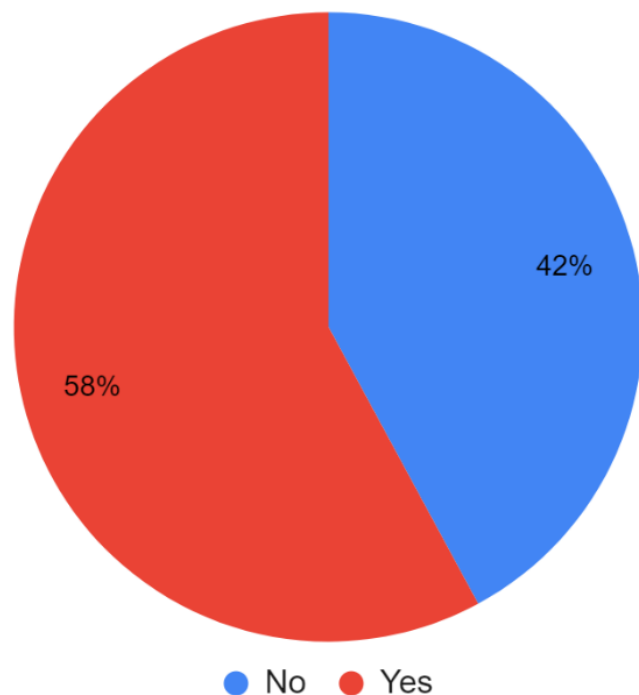
The three types of leaked plastics frequently observed near areas of residence are **plastic bottles, plastic bags, and sachets and single-layer wrappers.**

Type of Disposal Method

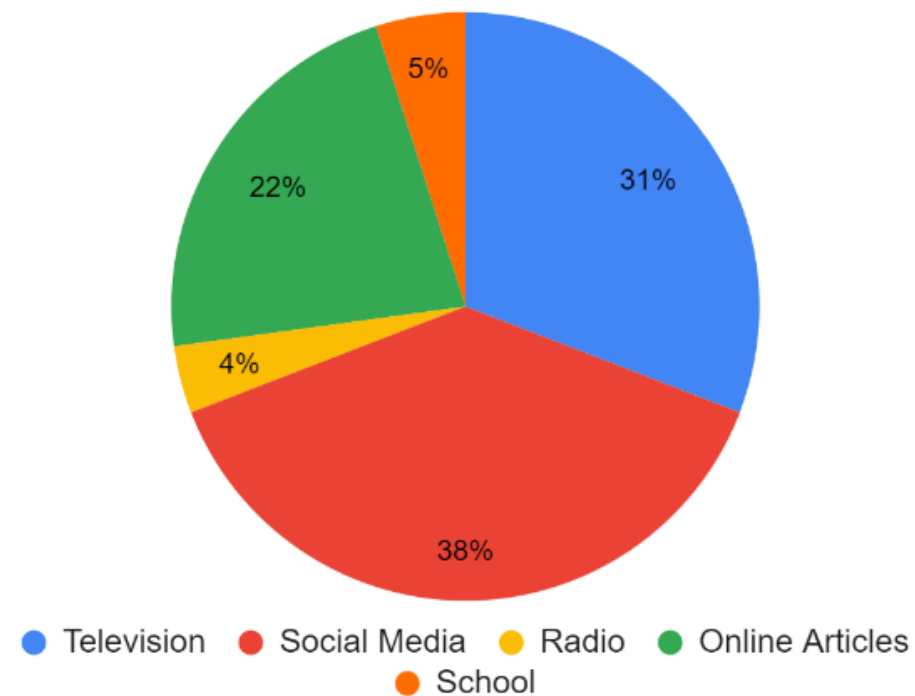


- The most mentioned method of waste disposal is through the **collection of waste by local government units (LGUs)**
- There are also some who **sell waste to junk shops and to scrap collectors**
- There are a **few who burn, bury and dump waste** on dumpsites

Awareness on Plastic Pollution in the Philippines

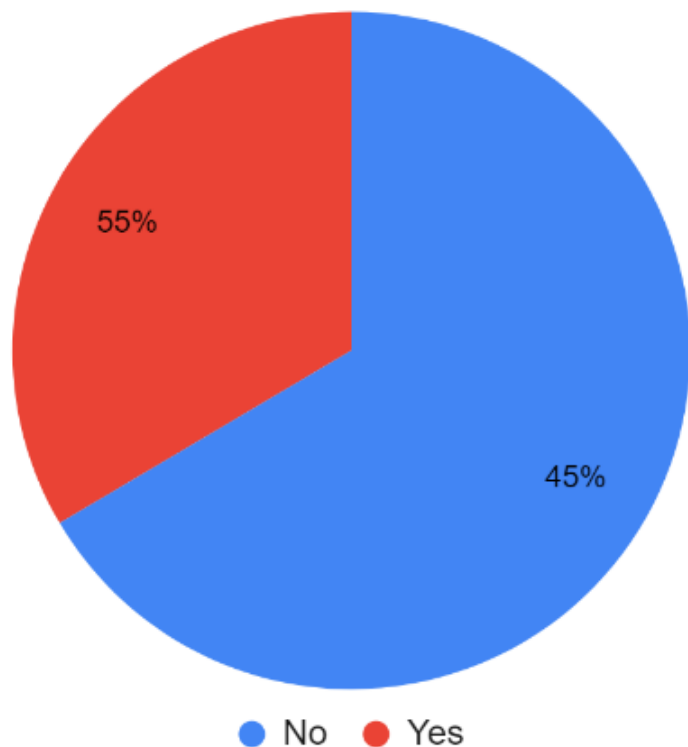


58% of the respondents are aware that the Philippines is the top contributor to global ocean plastic pollution

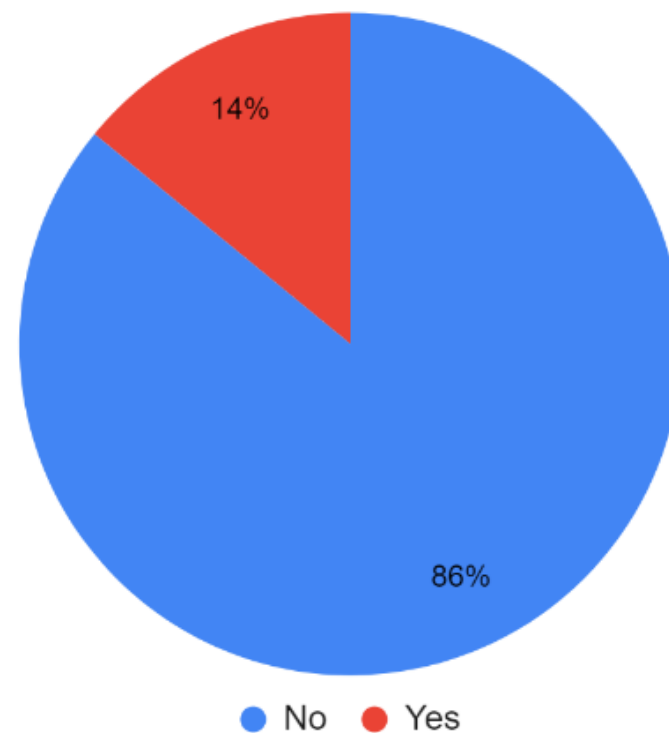


Most have heard of the news through social media.

Awareness on Plastic Pollution in the Philippines

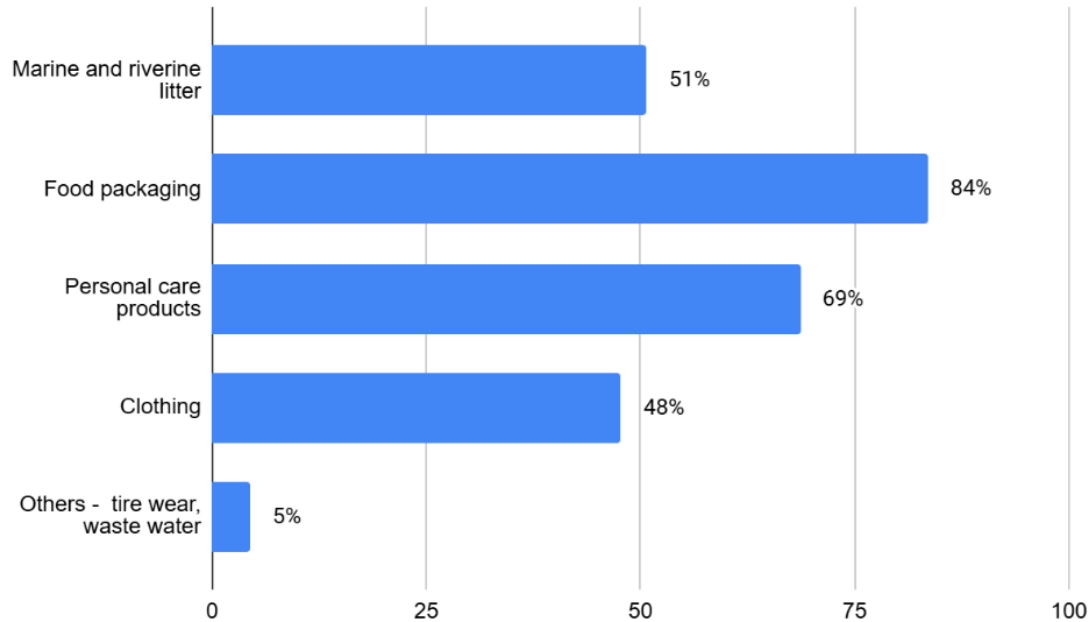


45% of the respondents are aware of microplastics

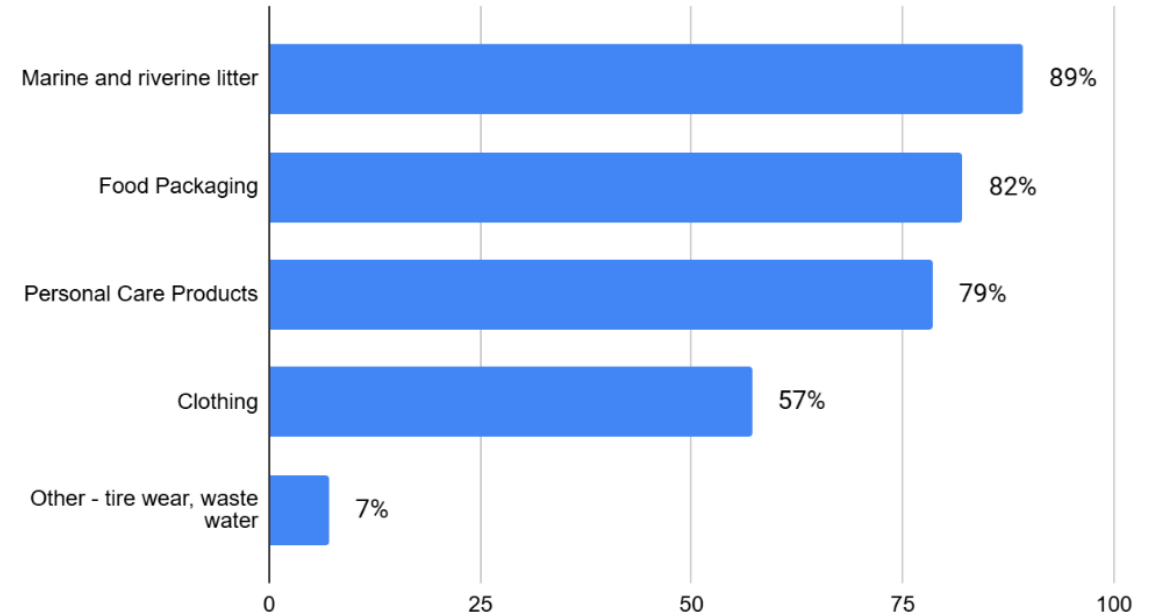


Only **14%** of the respondents are aware of nanoplastics

Perceived Source of Microplastics and Nanoplastics



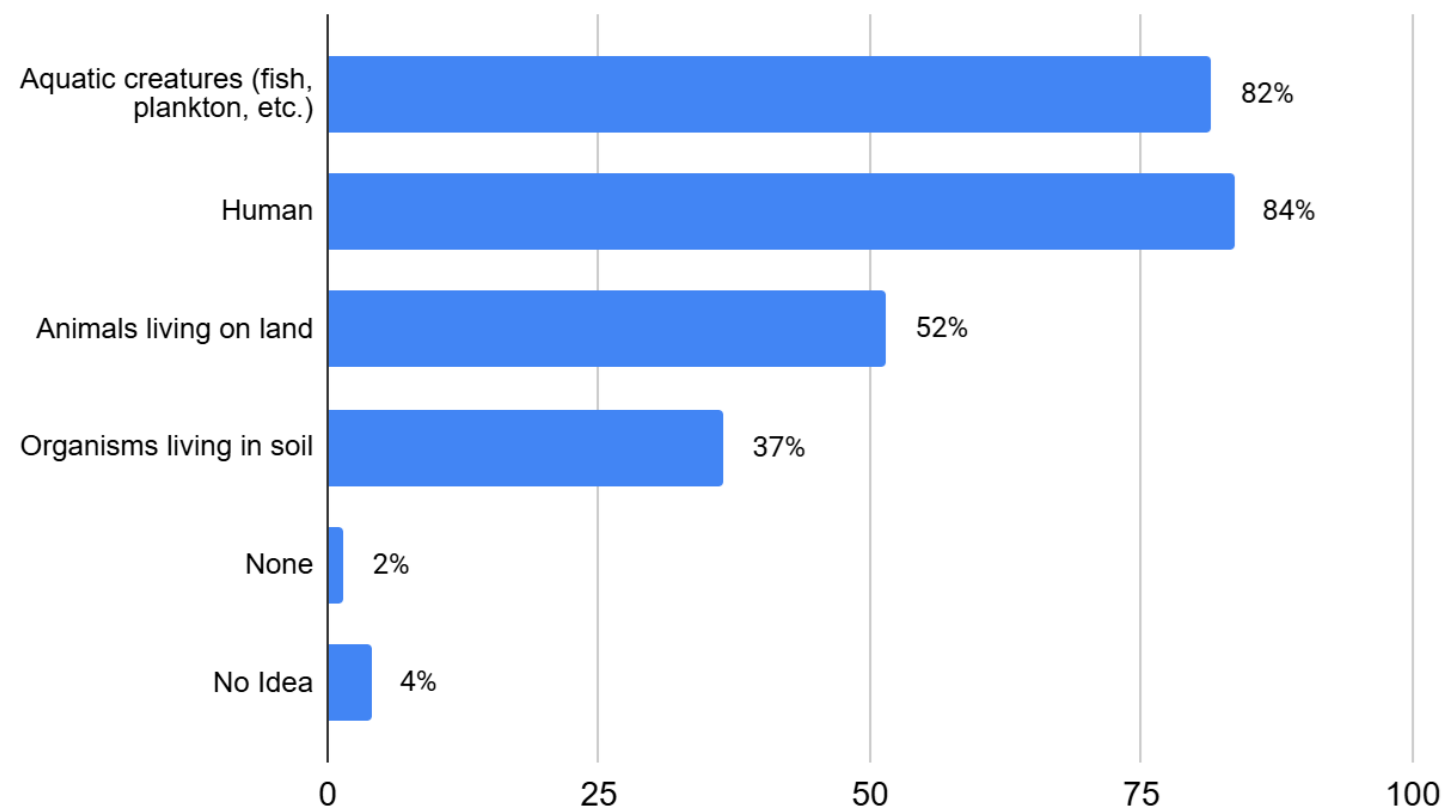
The most commonly perceived source of microplastics is from **food packaging**.



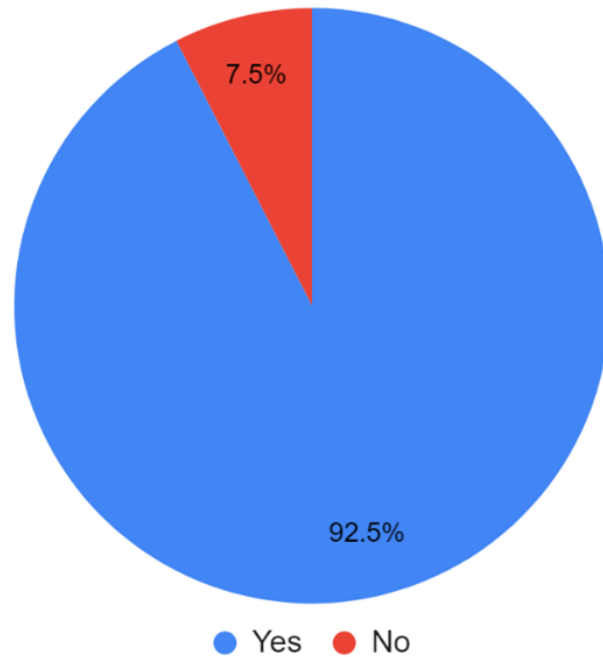
The most commonly perceived source of nanoplastics is **marine and riverine litter**.

Impact of Microplastics

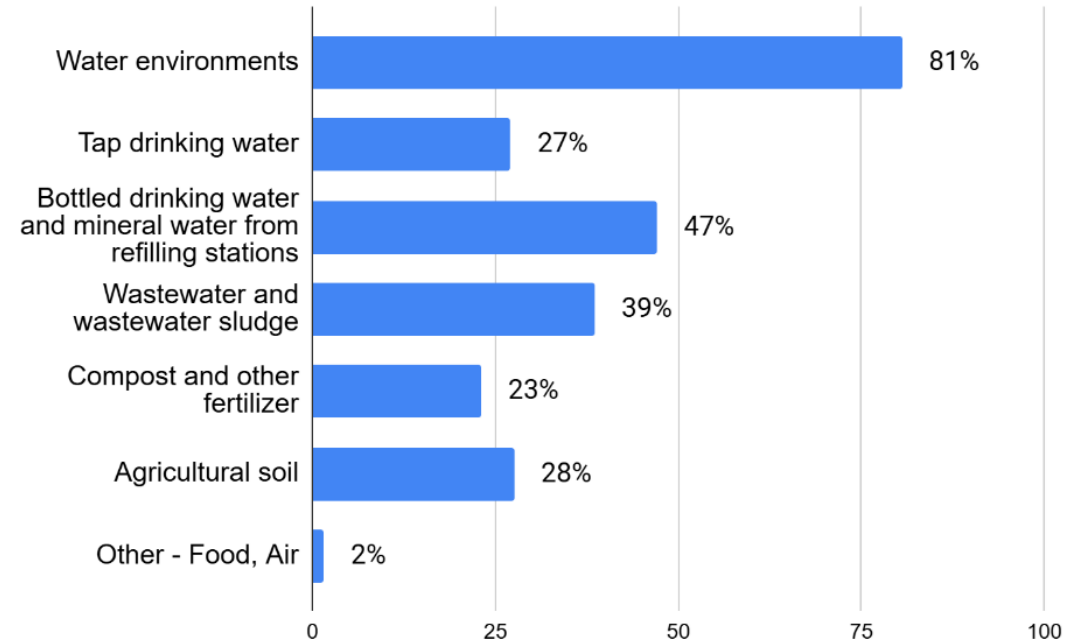
- The commonly perceived organisms affected by microplastics are **humans and aquatic organisms**



Monitoring of Microplastics

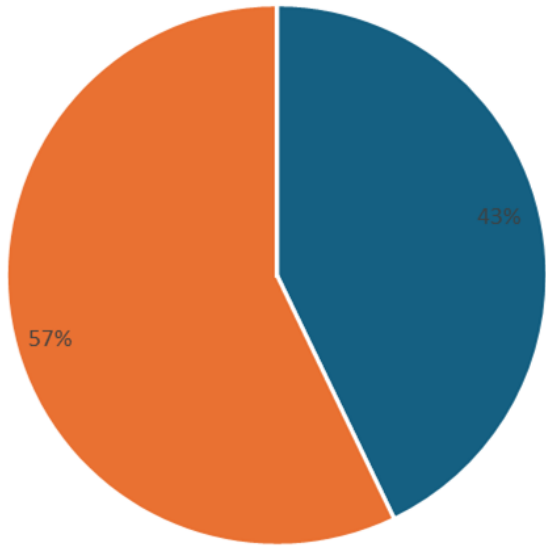


92.5% of respondents believe that **microplastics should be monitored** in the environment



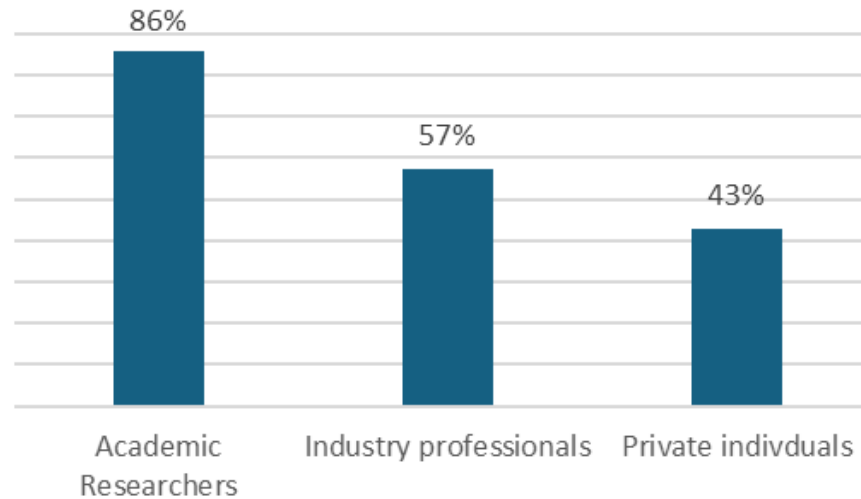
Most respondents believe that **water environments should be monitored** for microplastics

Background Information on the Laboratories

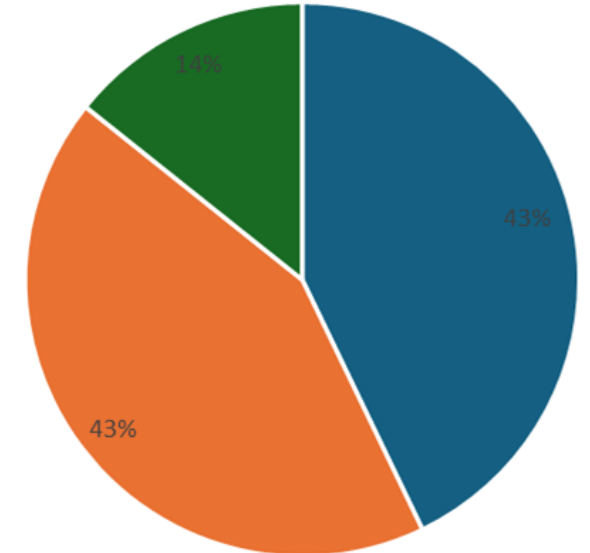


■ Government insitute ■ University or similar educational institute

57% of laboratories are managed by academic institutions



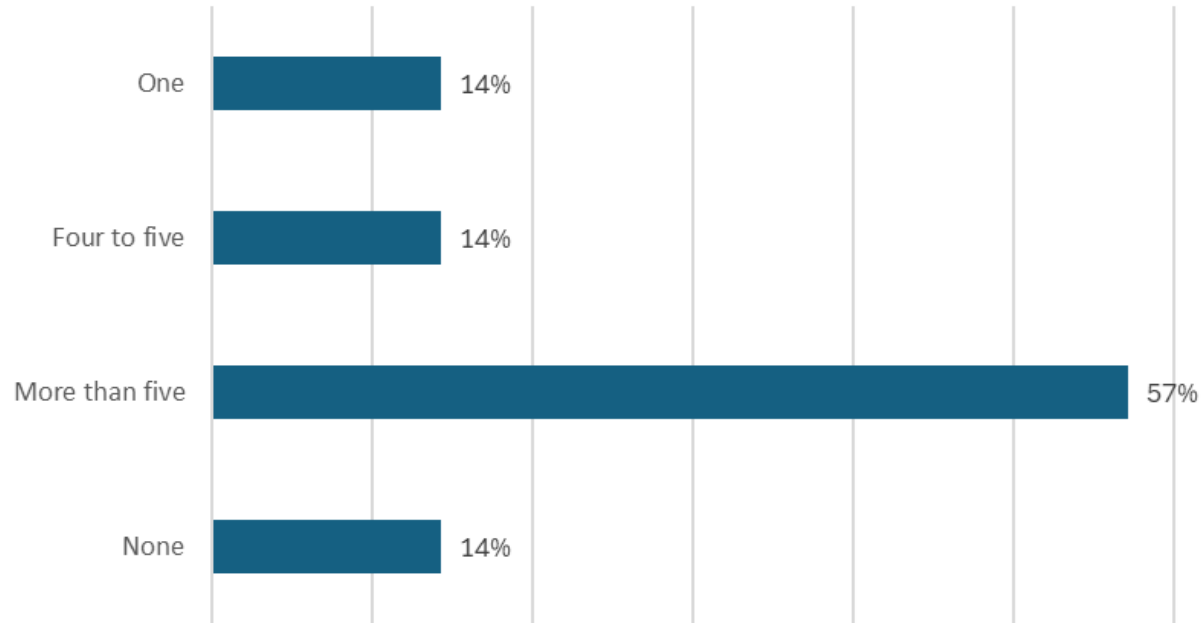
86% of the laboratories are open to academic researchers



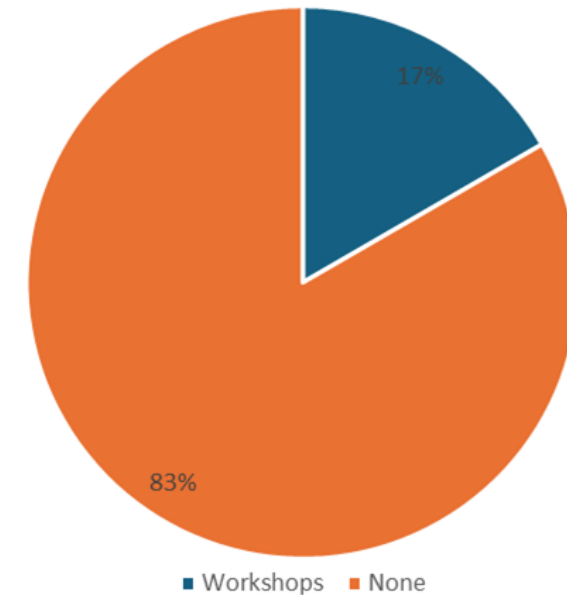
■ 1 - 3 years ■ 3 - 6 years ■ Not applicable

43% of laboratories have started conducting microplastics studies between 3 to 6 years ago

Background Information on the Laboratories

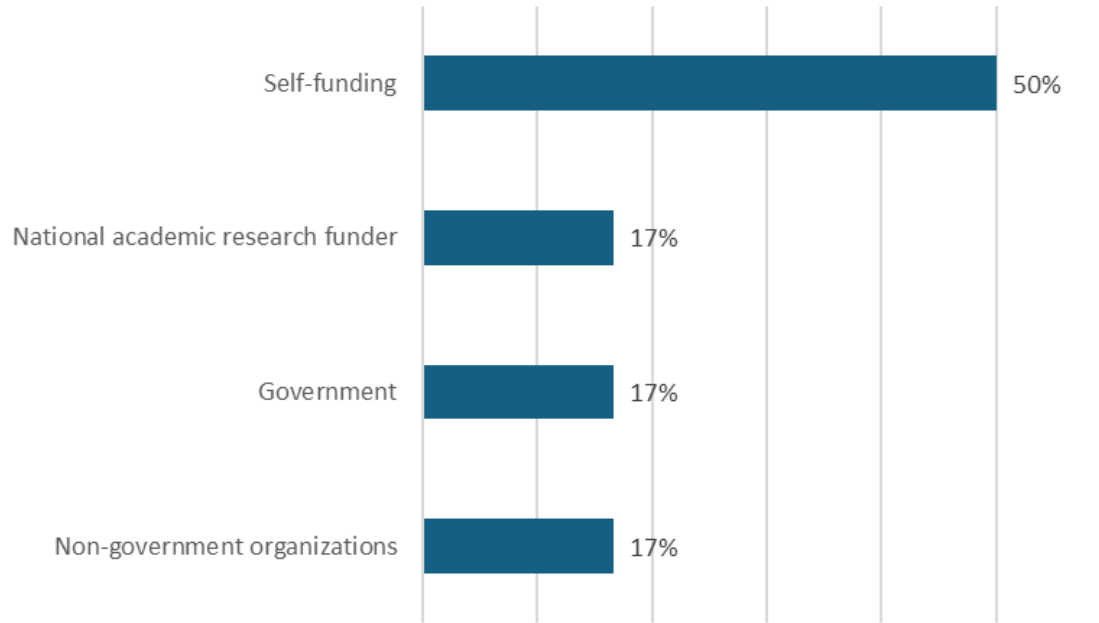


57% of laboratories have conducted **more than 5 microplastics studies**

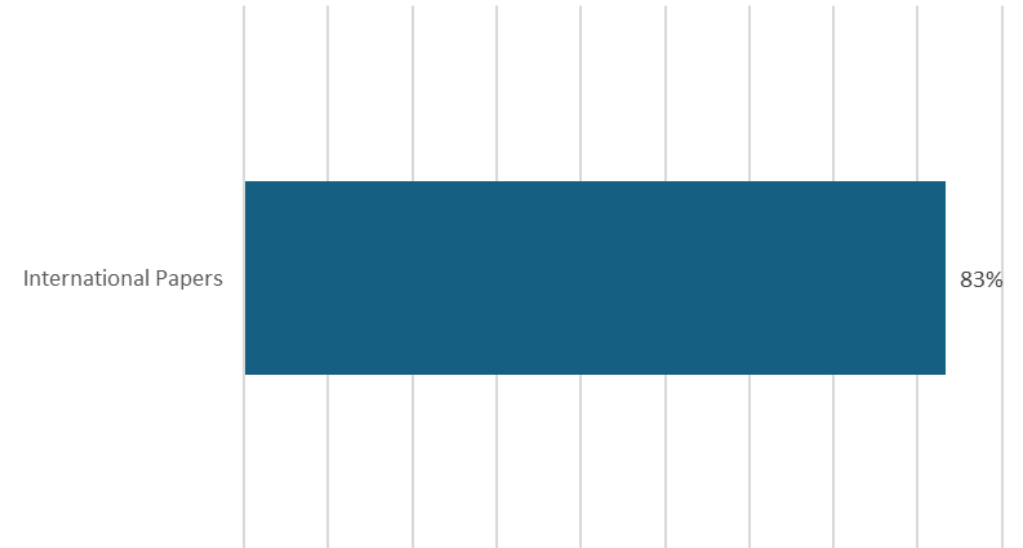


83% of facilities have **not received any training** in conducting microplastics studies

Background Information on the Researchers

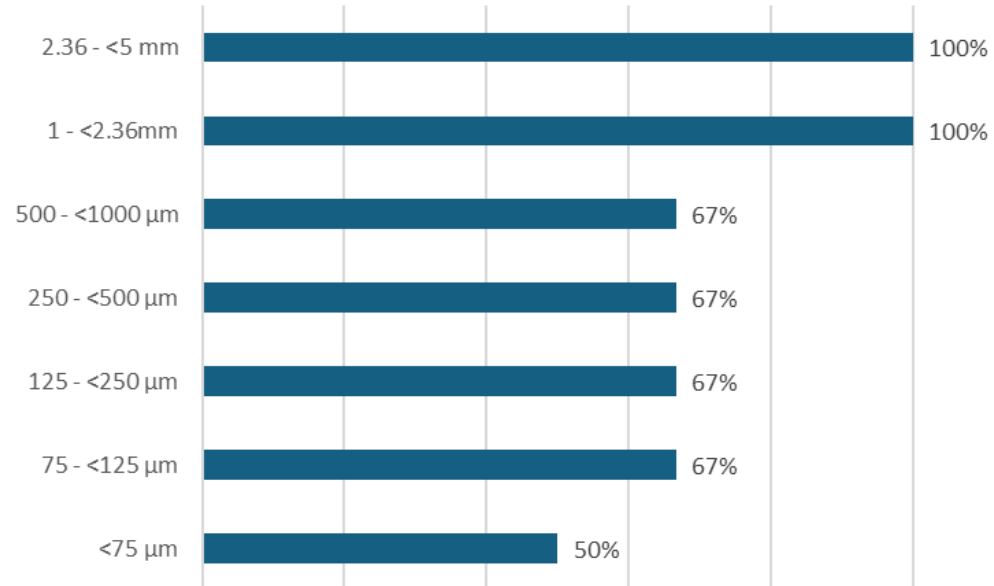


Most of the **microplastics studies** by the researchers are **self funded**.

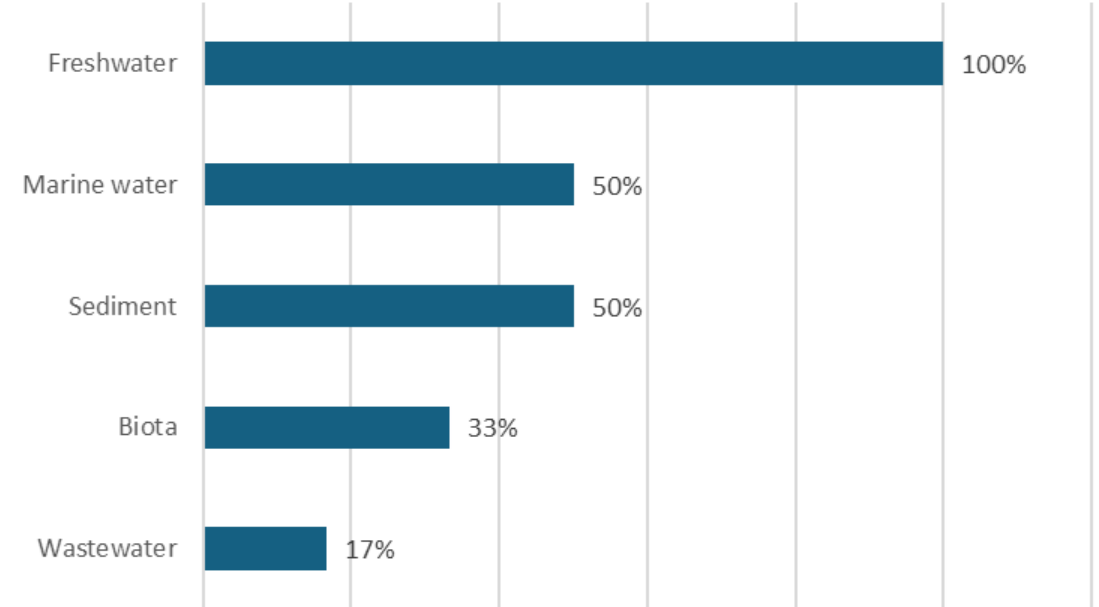


87% of researchers have published their microplastic studies in **international journals and conference proceedings**.

Scope of Microplastic Research

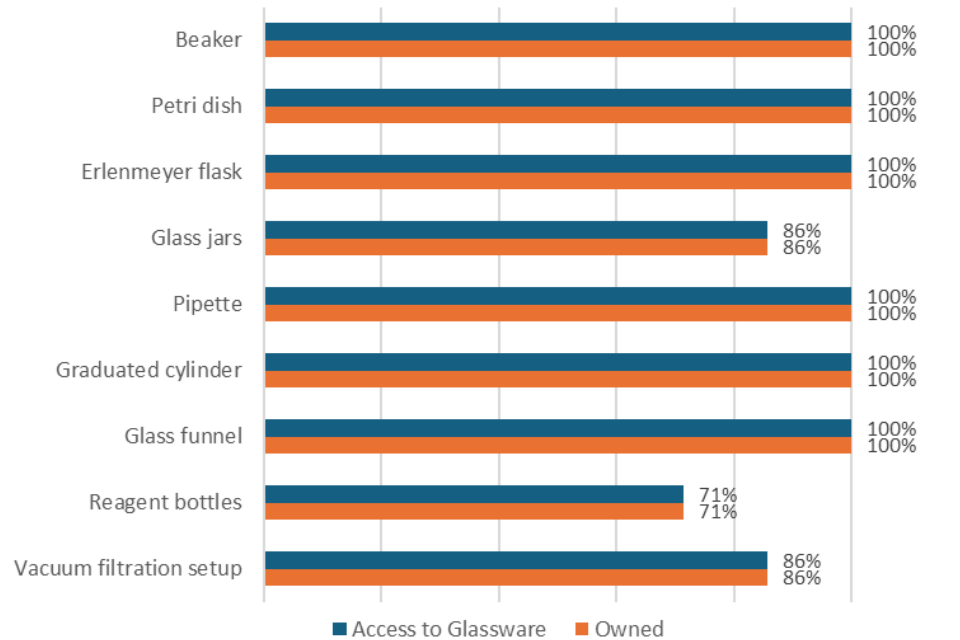


50% of researchers were able to extract and characterize **microplastics less than 75 μ m in size.**

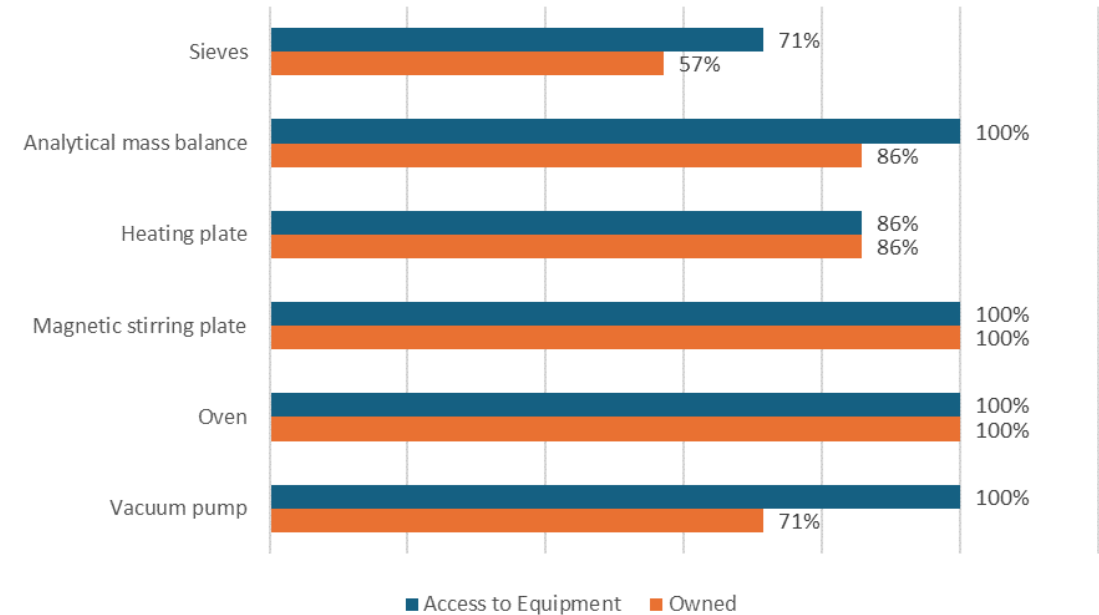


All researchers have conducted microplastics research activities on **freshwater bodies.**

Materials and Equipment

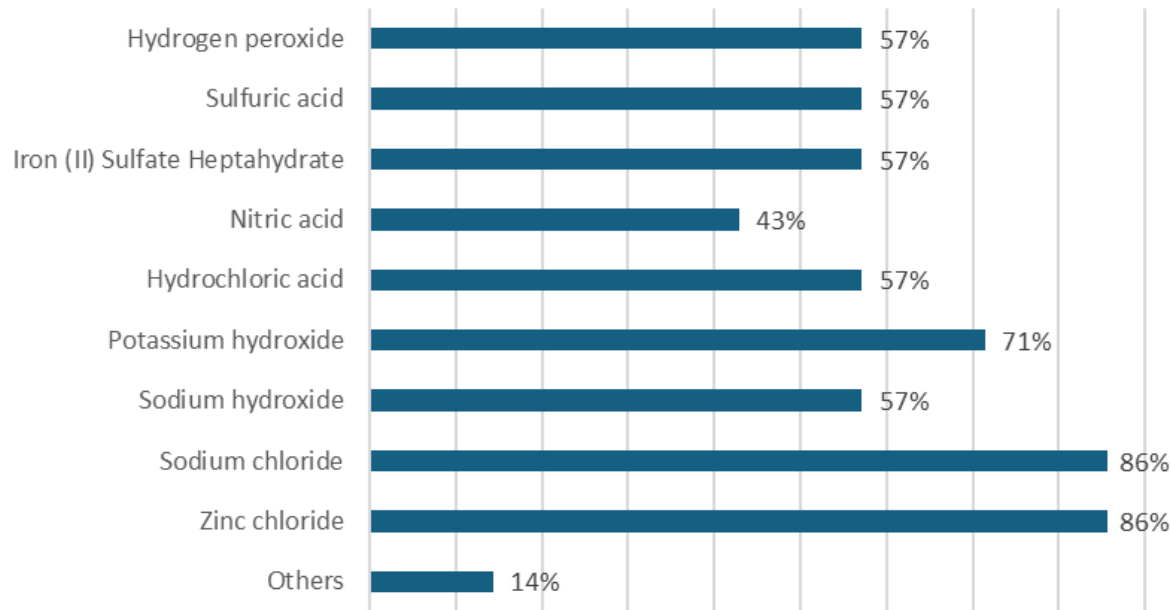


All facilities own the laboratory glassware available for microplastics analysis

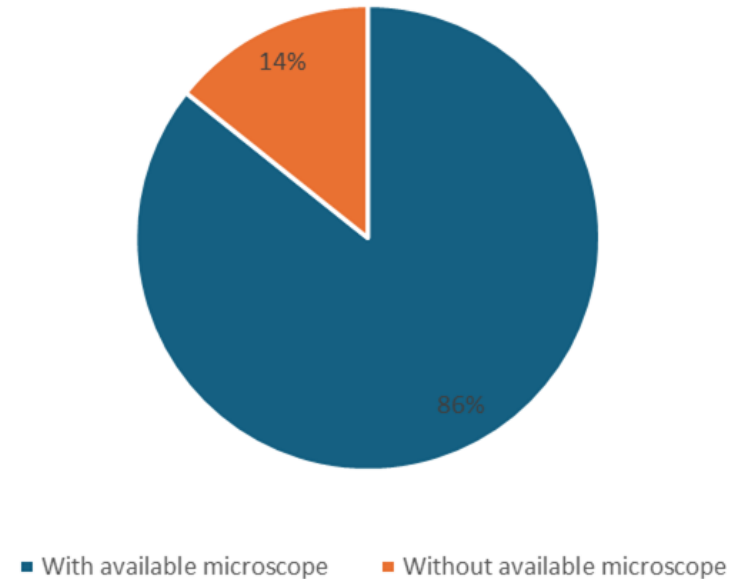


Not all facilities with access to sieves, analytical mass balances, and vacuum pumps **own the equipment itself**

Materials and Equipment

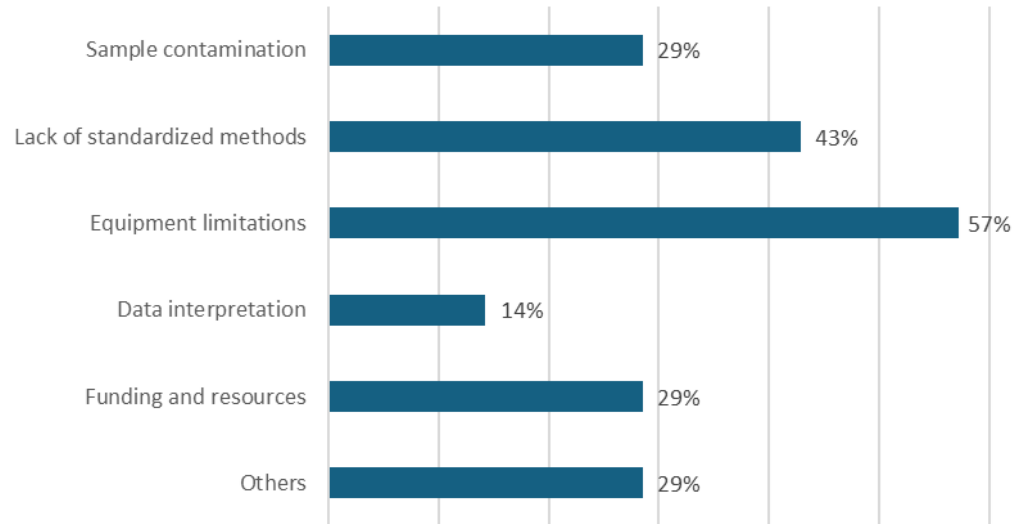


Most facilities have conducted density separation and utilized **sodium chloride** and/or **zinc chloride** in the process.

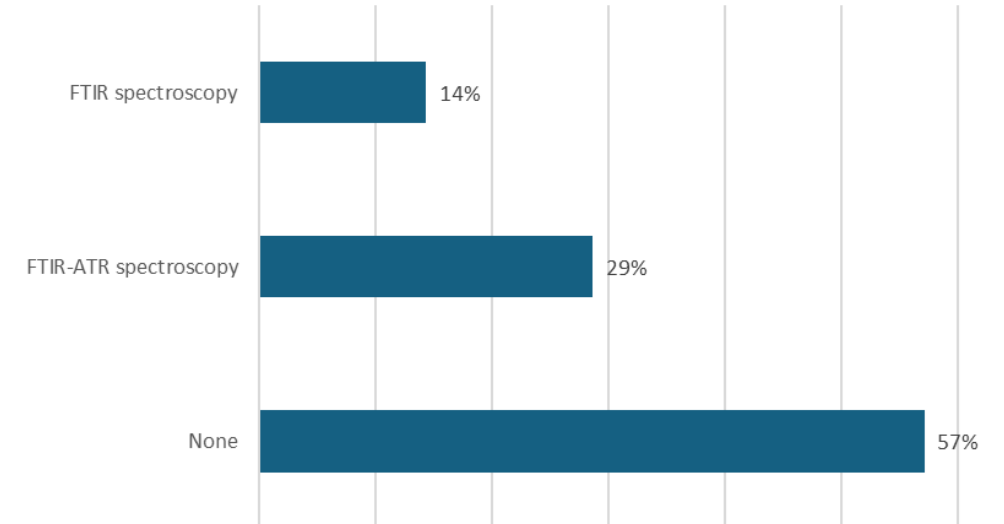


14% of the facilities **do not have access to microscopes** for microplastic analysis

Challenges Encountered of the Laboratories



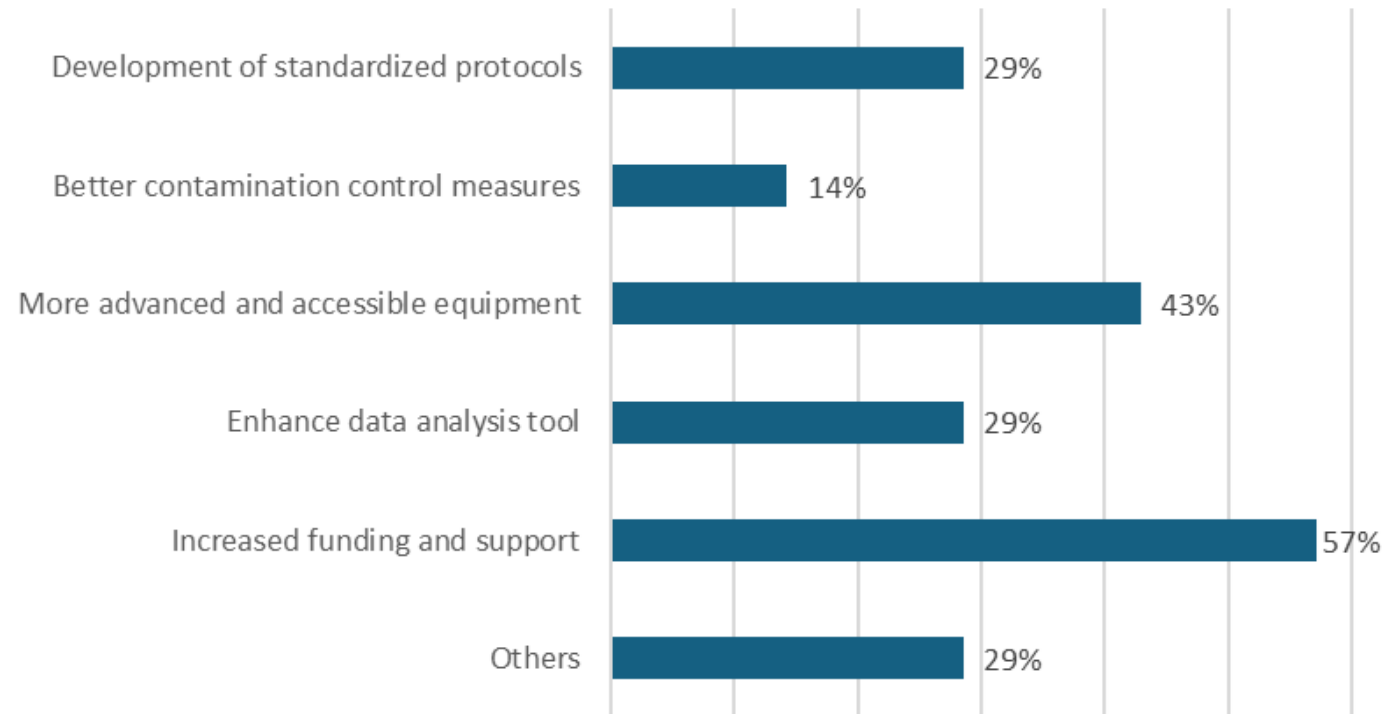
57% of laboratories mentioned that their facility has significant **equipment limitations**



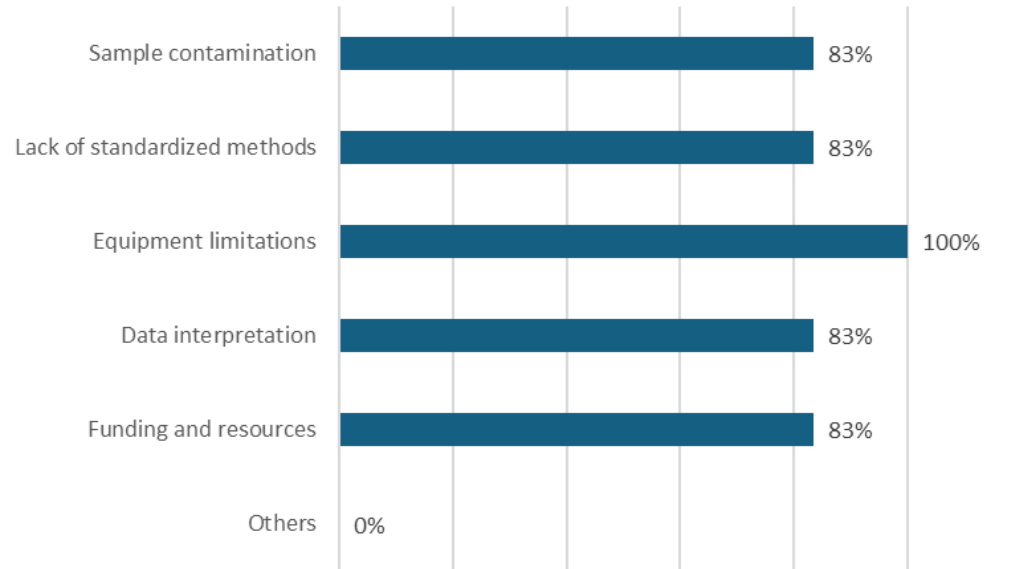
57% of laboratories do not have access to **spectrometers for microplastics polymer types identification**

Suggested Improvements and Support

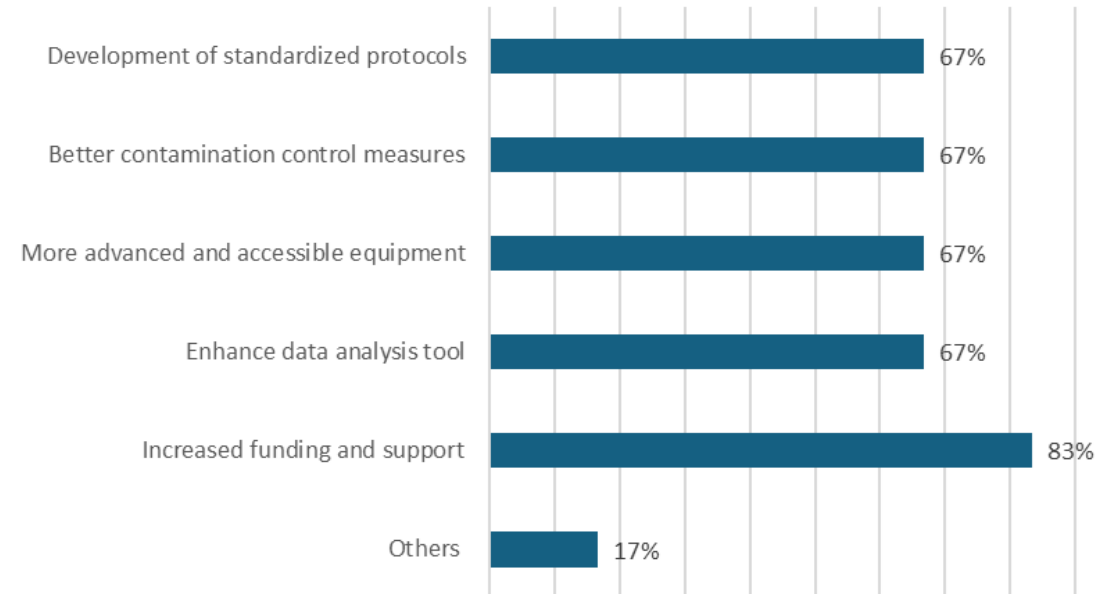
- 57% of laboratory mentioned that their facility **requires increased funding and support** for microplastics studies



Challenges and Suggestions of the Researchers



All of the researchers mentioned that their facility has significant **equipment limitations**



Most of the researchers mentioned **increased funding and support** would help them.

Other Significant Results

Actions they are Willing to do to Combat Negative Impacts of Microplastics

- Control plastic use.
- Avoid using personal care products containing microbeads.
- Avoid purchasing clothing made from synthetic fabrics.
- Spreading awareness about microplastics.
- Practicing responsible consumption.

Proposed Measures to Mitigate Microplastic Pollution

- Invest in systematic waste management systems
- Implement effective waste management strategies
- Minimize or eradicate the use of plastics

Future Outcomes of Inaction

- Human health and safety risks
- Clogged drains and increased flooding
- Increased climate change and environmental disasters

Strategies for Increasing Awareness on Microplastics

- Utilize social media for outreach
- Simplify terminology to make the topic more accessible
- Involve important government officials in awareness campaigns

Gaps Identified

Resources

Lack of Equipment
Lack of Funding
Lack of Specialized Lab Personnel

Training

Lack of Training for Practitioners
Lack of Standard Methodology

Identified Gaps

Policy

Lack of Monitoring Guidelines
Lack of Inventory of Microplastic Facilities

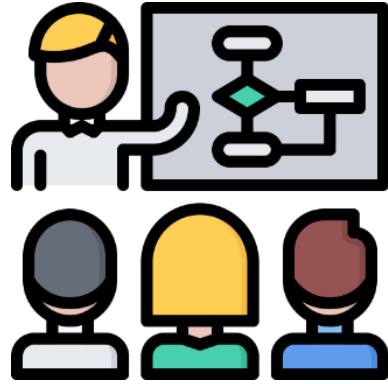
Social-Behavioral Change Communications

Lack of Awareness of MP and NP and its Impacts

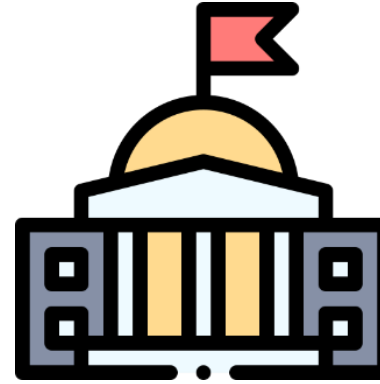
Recommendations



Resources



Training



Policies



**Socio-behavioral
Change
Communications**

Priority Issues

Resources

Lack of Equipment
Lack of Funding
Lack of Specialized Lab Personnel

Training

Lack of Training for Practitioners
Lack of Standard Methodology

Identified Gaps

Policy

Lack of Monitoring Guidelines
Lack of Inventory of Microplastic Facilities

Social-Behavioral Change Communications

Lack of Awareness of MP and NP and its Impacts

Recommendations

- **Formulation of standardized methodology** for sampling, analysis, and monitoring of microplastics in different environmental compartments (i.e., waterbodies, wastewater, drinking water) in ASEAN

Resources



Formulation of Standardized Methodology



Lab Space and Equipment



Software and Data Analysis Tools



Lab Personnel and Specialists



Centralized Data Management System



Sources of Funding

Table 6. NPOA-ML Programmatic Cluster of Strategies and Actions

	ACTIONS	EXPECTED OUTCOMES	TIMELINE	LEAD AND COOPERATING AGENCIES / SOURCES OF FUNDING	RESOURCE REQUIREMENTS
1	Establish science- and evidence-based baseline information on marine litter				
1.1	Develop the National Research Framework and Program for the Monitoring and Assessment of Marine Litter	National program on monitoring and assessment of marine litter and micro-plastics	2021-2022	DENR-EMB/ERDB; DOST Research Councils; SUCs and other R&D institutes; Development cooperation agencies	Technical experts; Researchers; Funding for calls for proposals
1.2	Standardize methodology and appropriate data collection system for marine litter information in the Philippines	Nationally standardized methodology and information system for the baselining of marine litter leakage and accumulation from all	2021-2022	DENR-EMB/BMB; NSWMC; DICT; DOST; DILG; MBCC; LLDA, SUCs/HEIs, DA-BFAR, DENR-FASPS; Development cooperation agencies	Technical and administrative coordinator
	1.2.1 Create an inventory of all known methodologies for collecting baseline data on marine litter, e.g., material balance, remote sensing, etc. 1.2.2 Coordinate with global and international bodies, (e.g. UNEA Ad Hoc Experts Group (AHEG) on Marine Litter and Microplastics, UN Environment/COBSEA, International Maritime Organization (IMO), UNESCO Intergovernmental Oceanographic Commission (IOC) for the tools/methods (e.g. Japan Osaka Blue, et al.) 1.2.3 Develop, validate and adopt a standardized methodology for baseline data gathering				
1.3	Carry out a national baseline assessment on waste leakage and accumulation of litter in the marine environment including, but not limited to:	National definitive marine litter baseline assessed, compiled and published	2021-2022	DENR-EMB/BMB/ERDB; DOST Research Councils; NSWMC; DOST; DILG; LGUs; BOC; LLDA; NAMRIA; DICT; DTI; SUCs/HEIs; Development cooperation agencies	Technical experts; Research; I.T.-based data management system; Proposal funding; Information provided by NGOs/CSOs/private sector

Harmonized Protocol for Microplastics Sampling, Analysis and Monitoring

RECOMMENDED HARMONIZED PROTOCOL FOR SAMPLING, ANALYSIS, AND MONITORING OF MICROPLASTICS IN SEWAGE TREATMENT PLANTS AND RIVERINE ENVIRONMENTS IN ASEAN

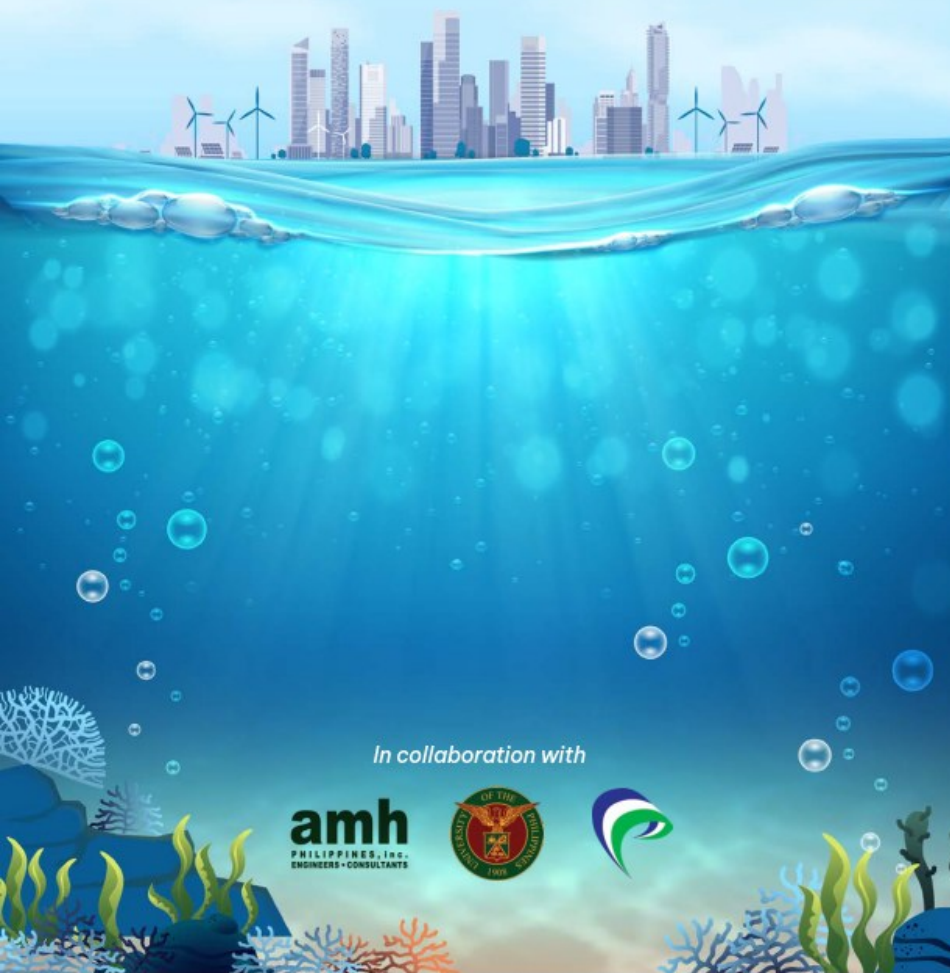


TABLE 2. Guidelines for Monitoring and Assessment of MPs

Document	Publisher/Author	Year Published	Type of Samples	Quantification Units	Collection	Organic Removal	Inorganic Removal	Characterization
Monitoring Plastics in Rivers and Lakes: Guidelines for the Harmonization of Methodologies	UN Environment Programme (UNEP)	2021	Wastewater, drinking water, freshwater biota, surface water, water column, and sediments	Particles per volume in International System of Units (SI) Mass per volume in SI units	Use of a pump, grab samples, or surface skimming device for wastewater sampling Use of a net, pump, or series of filters of decreasing mesh sizes for sampling the water surface and water column Use of a grab sampler or corers to collect the top 15 cm of sediment or use of metal spoons for collecting shore samples	Employment of enzymatic treatments to extract MPs from samples	Addition of dense salt solutions such as sodium chloride (NaCl), sodium iodide (NaI), and zinc chloride (ZnCl ₂) to separate MPs from the samples	Performing a visual/microscopic inspection Touching the particles with a heated dissecting needle or staining the solution with dyes, such as Nile Red, in combination with fluorescence microscopy Use of mass-based analytical methods, such as thermoextraction, or particle-based analytical methods, such as FTIR and Raman spectroscopy
EPA's Microplastic Beach Protocol	United States' Environmental Protection Agency (EPA)	2021	Sand on the beaches or shorelines of oceans and bays, lakes, and rivers	Number of MP particles (pieces)	Scraping the surface of the sand using a metal cup or flat dustpan	Removal of any large pieces of natural debris and litter using a brush or placing the sample into a 1-mm sieve and performing the "sink test" and "squish test"	Removal of any large pieces of natural debris and litter using a brush or placing the sample into a 1-mm sieve and rinsing it with water	Use of a magnifying glass to visually identify MPs

3.1. Wastewater at Sewage Treatment Plant

MATERIALS

- a. A metal or hard plastic bucket/container with a known volume, tied with a long rope
- b. Wooden stake or stick
- c. Sieves with mesh sizes of less than 5 mm
- d. Data sheet
- e. Marker and labels
- f. Flow meter
- g. Wash bottles
- h. Glass jars
- i. Steel tweezers
- j. Steel brush
- k. Ruler
- l. Mobile with camera and GPS
- m. Personal protective equipment (i.e., safety shoes, vest, gloves)
- n. Large storage container

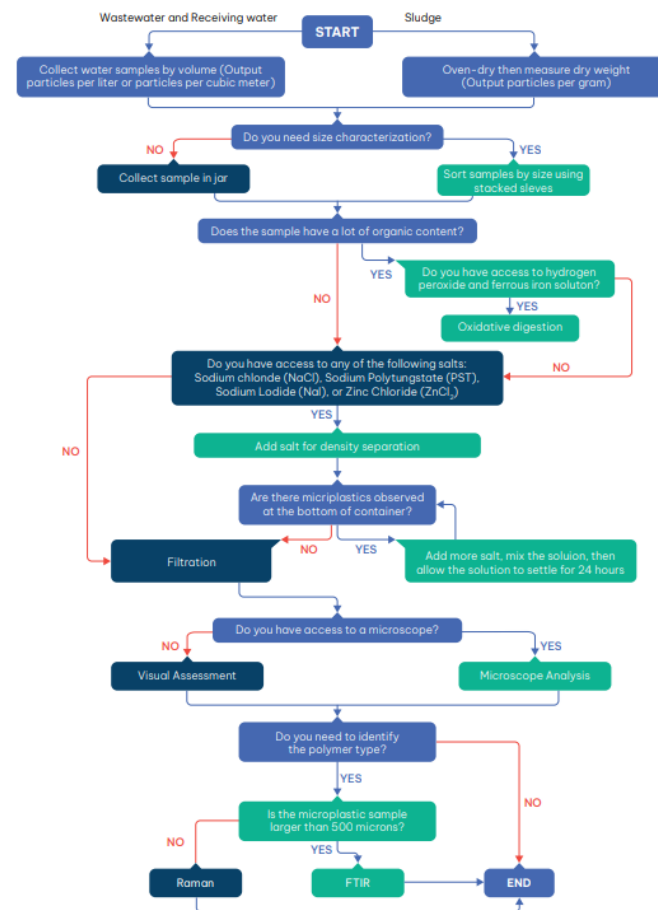
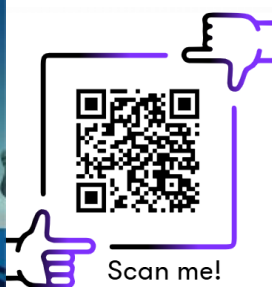


Figure 2. Flowchart of MP Sampling and Analysis at STPs



Recommendations

- Development of **training modules and programs on microplastics and nanoplastics**

Foundation Course

Module Title	Foundation course on microplastic monitoring and evidence-based policy measures
Duration	5 hours (300 minutes excluding breaks)
Lecture	120 minutes
Group Exercise and Discussion	180 minutes
Objectives	1. To provide background and a basic understanding of micro- and nanoplastics, which include their sources, fate, and transport 2. To understand the impacts of micro- and nanoplastic pollution and the corresponding mitigation measures and strategies
Learning Outcomes	1. Identify the different sources of micro- and nanoplastics 2. Discuss the fate and transport of micro- and nanoplastics 3. Determine and assess the impacts of micro- and nanoplastics on human health and environments 4. Propose and explain potential mitigation measures along with strategies for effective implementation
Outline of Sessions	1. Background on microplastics including description, sources, fate, and transportation 2. Discussion on health and environmental impacts and mitigation measures 3. Group activities using case studies and group presentations 4. Discussion, Q&A, and way forward

Fundamentals of the plastic and microplastic pollution issue

Advanced Course

Module Title	Advanced course on microplastic monitoring and evidence-based policy measures	2. Discussion on Sample Pre-treatment a. Sieving b. Oven drying c. Organic matter removal d. Inorganic matter removal e. Filtration f. Storage of samples g. Quality control measures 3. Discussion on Microscopy a. Characterization according to size b. Characterization according to shape c. Characterization according to color d. Quantification of micro- and nanoplastic e. Quality control measures 4. Discussion on Spectroscopy a. Different spectroscopy techniques b. Quality control measures 5. Data reporting and communication 6. Journal Writing 7. Laboratory experiments and presentation of results 8. Discussion, Q&A, and way forward
Duration	Two and a half days (1290 minutes excluding breaks)	
Lecture	330 minutes	
Group Exercise and Discussion	960 minutes	
Objectives	1. To provide necessary information on the different processes in conducting micro- and nanoplastic studies 2. To equip researchers with the necessary skills for analyzing micro- and nanoplastics, including implementation of quality control measures 3. To gain insights into proper data reporting and communication related to monitoring micro- and nanoplastics	
Learning Outcomes	1. Describe the different procedures and methods in analyzing micro- and nanoplastic samples, including materials and equipment 2. Properly conduct sampling and laboratory analysis of micro- and nanoplastic samples 3. Characterize and quantify micro- and nanoplastic samples 4. Present microplastic data and discuss the significance of the results	
Outline of Sessions	1. Discussion on Sampling a. Identification of study area and sampling points b. Collection of samples per type of samples c. Storage of samples d. Transportation to the laboratory for analysis e. Quality control measures	

Focused on microplastic sampling, analysis, and report writing

Training



Microplastics and Nanoplastics 101



Microplastic Sampling



Microplastic Laboratory Analysis



Sample Pretreatment



Characterization

Foundation Course

Module Title	Foundation course on microplastic monitoring and evidence-based policy measures
Duration	5 hours (300 minutes excluding breaks)
Lecture	120 minutes
Group Exercise and Discussion	180 minutes
Objectives	1. To provide background and a basic understanding of micro- and nanoplastics, which include their sources, fate, and transport 2. To understand the impacts of micro- and nanoplastic pollution and the corresponding mitigation measures and strategies
Learning Outcomes	1. Identify the different sources of micro- and nanoplastics 2. Discuss the fate and transport of micro- and nanoplastics 3. Determine and assess the impacts of micro- and nanoplastics on human health and environments 4. Propose and explain potential mitigation measures along with strategies for effective implementation
Outline of Sessions	1. Background on microplastics including description, sources, fate, and transportation 2. Discussion on health and environmental impacts and mitigation measures 3. Group activities using case studies and group presentations 4. Discussion, Q&A, and way forward

Advanced Course

Module Title	Advanced course on microplastic monitoring and evidence-based policy measures
Duration	Two and a half days (1290 minutes excluding breaks)
Lecture	330 minutes
Group Exercise and Discussion	960 minutes
Objectives	1. To provide necessary information on the different processes in conducting micro- and nanoplastic studies 2. To equip researchers with the necessary skills for analyzing micro- and nanoplastics, including implementation of quality control measures 3. To gain insights into proper data reporting and communication related to monitoring micro- and nanoplastics
Learning Outcomes	1. Describe the different procedures and methods in analyzing micro- and nanoplastic samples, including materials and equipment 2. Properly conduct sampling and laboratory analysis of micro- and nanoplastic samples 3. Characterize and quantify micro- and nanoplastic samples 4. Present microplastic data and discuss the significance of the results
Outline of Sessions	1. Discussion on Sampling a. Identification of study area and sampling points b. Collection of samples per type of samples c. Storage of samples d. Transportation to the laboratory for analysis e. Quality control measures

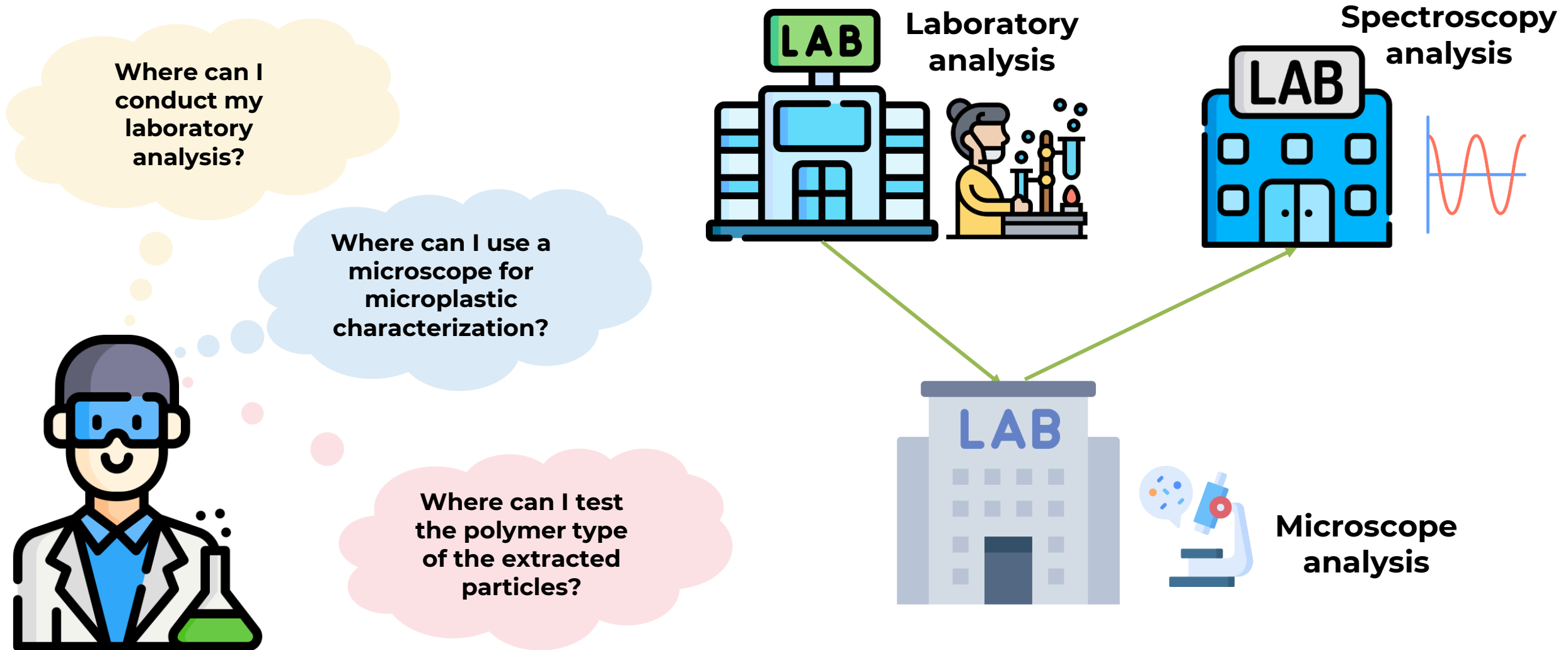
	2. Discussion on Sample Pre-treatment a. Sieving b. Oven drying c. Organic matter removal d. Inorganic matter removal e. Filtration f. Storage of samples g. Quality control measures
	3. Discussion on Microscopy a. Characterization according to size b. Characterization according to shape c. Characterization according to color d. Quantification of micro- and nanoplastic e. Quality control measures
	4. Discussion on Spectroscopy a. Different spectroscopy techniques b. Quality control measures
	5. Data reporting and communication
	6. Journal Writing
	7. Laboratory experiments and presentation of results
	8. Discussion, Q&A, and way forward

Recommendations



- Adoption of **guidelines on microplastics (and nanoplastics) sampling and monitoring through the Administrative Order** that can be issued by DENR
- Similar to the laboratory accreditation for water pollutants being monitored in the environment by the DENR, **inventory and/or accreditation of laboratories for microplastic and nanoplastic studies may be done.**
- Formulation of guidelines for **creating a centralized data management system and standard data reporting** to the DENR for microplastic and nanoplastic-related studies.

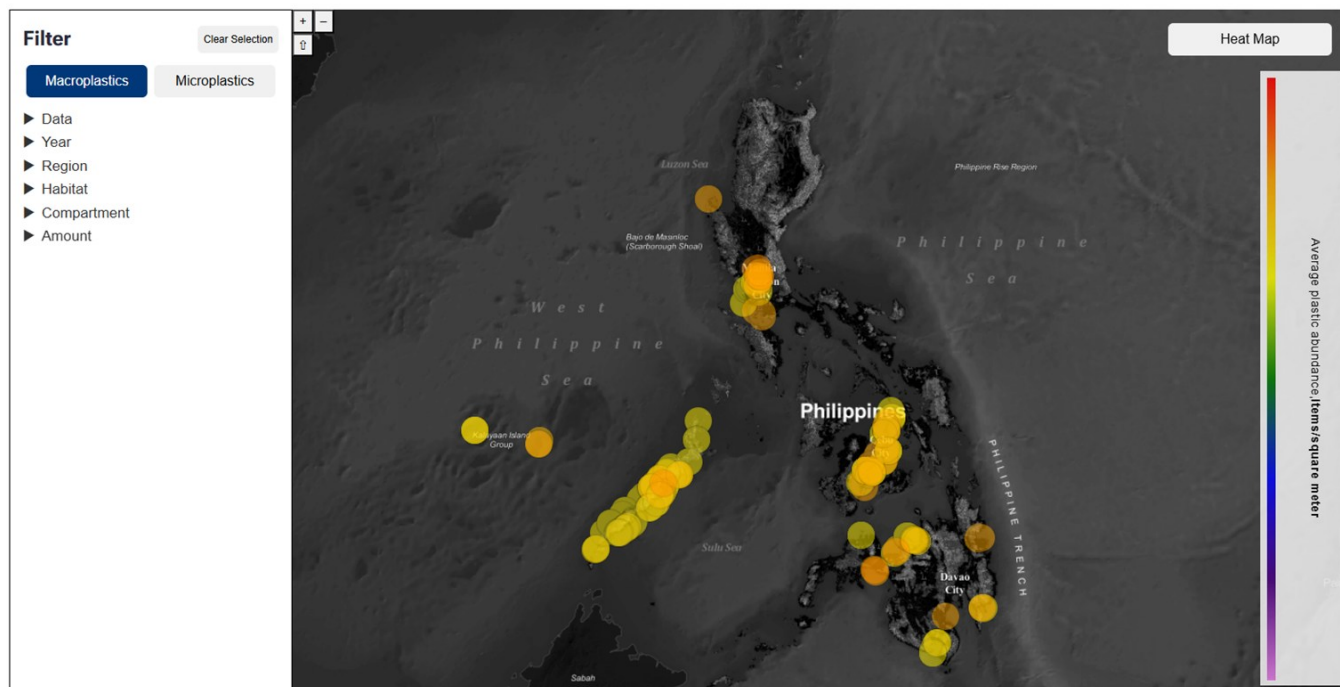
Inventory of Laboratories



PlastiCount Pilipinas

Philippine Plastics Monitoring Map

DISCLAIMER: The information on this map has been lifted from several sources. This map aims to summarize plastics data currently available in the Philippines. If you want to contribute to this map, please contact us using the page provided in this website. No violations of intellectual property were intended.

[SUBMIT ABSTRACT](#)[VOLUNTEER](#)[PLASTICS TRACKER](#)[HOME](#)[ABOUT](#)[RESOURCES](#)[BULLETIN](#)[EVENTS](#)[PARTNERS](#)[CONTACT](#)

Publications

DISCLAIMER: This page contains a list of micro and macro-plastics pollution articles from different authors. We are merely collating these researches to allow ease of access to research articles on plastics wastes in the Philippines. We are not claiming ownership on any of the publications cited below.

[2022 Publications](#)[2021 Publications](#)

Scan me!

Recommendations

Resources



Formulation of
Standardized
Methodology



Lab Space and
Equipment



Software and
Data Analysis
Tools



Lab Personnel
and Specialists



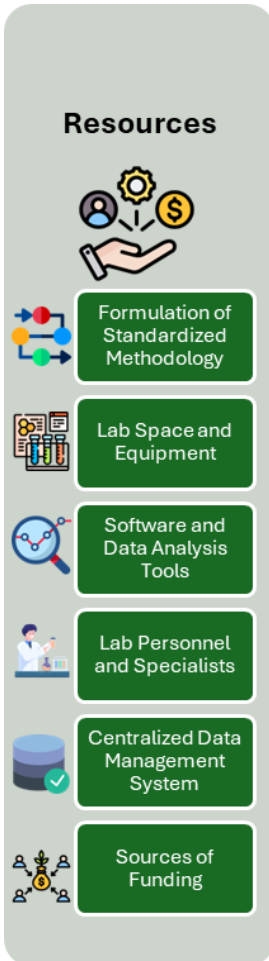
Centralized Data
Management
System



Sources of
Funding

- **Room should have space for glassware, lab equipment, and materials.** It is estimated that a 35 to 50m² room is enough space to conduct microplastics studies exclusively.
- Procurement of equipment such as **spectroscopy (i.e., FTIR, Raman) for polymer make up identification** is highly recommended.
- **The use of additional software and data analysis tools** in quantifying and identifying microplastics would reduce the time required

Recommendations



- **Specialized laboratory personnel dedicated to microplastics processing and analysis** would be highly beneficial for the laboratory. This initiative would require comprehensive training and capacity building.
- An **accessible centralized data management system and data repository** for all microplastics studies in the Philippines would greatly aid researchers and decision-makers.
- **Sourcing funding for microplastics studies is crucial**, as it is currently only available to selected researchers and institutions. Ensuring stable funding for publishing microplastics studies in national and international journals is equally important.

Recommendations



- Through the students, **public awareness campaigns through schools and the academe** can help improve the awareness of the public on the health and environmental risks of microplastics and nanoplastics
- **Targeted social media campaigns and local TV news with easy-to-understand information** will also help improve public awareness on micro- and nanoplastics.
- Encouraging **households to adopt sustainable habits such as reducing plastic consumption** may help reduce microplastic pollution



**"Effective policies and comprehensive training
are essential to tackle plastic pollution.
By equipping communities and researchers
with the knowledge and tools they need, we
can create sustainable solutions and protect
our planet for future generations."**

Thank you for listening!

For any questions or queries, please contact
the following email addresses:

osorio@iges.or.jp

ngoc-bao@iges.or.jp