




DRIVING CIRCULARITY from SEA to CITIES

Christine Bellen
Project Manager, Circular Explorer

DRAFT

Made possible by  **HOLCIM**

In Partnership with  **oeo**
one earth-one ocean

Endorsed by



 **HOLCIM**

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Our approach to sustainability

Our sustainability pillars are embedded across our operations, and focus on climate, circularity, nature and people.



CLIMATE

We are taking a science-driven approach to becoming a net-zero company.



CIRCULARITY

Holcim is driving circular construction at scale across key metropolitan areas.



NATURE

We are restoring and preserving biodiversity and freshwater, and bringing nature into cities.



PEOPLE

Our 63,448 Holcim people worldwide are driven to make a positive difference.



We only have one planet but are living like we have two. A circular global economy could fulfill people's needs while reducing the materials we extract and use

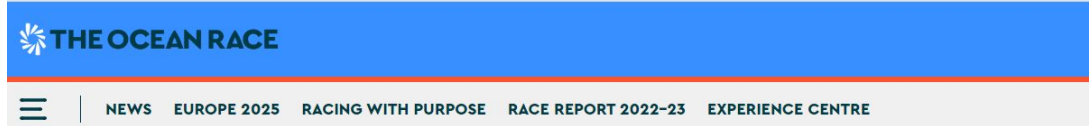
At Holcim, circularity is at the core of everything we do, facilitating our net-zero journey. We are driving circularity by raising awareness and taking local action:



- **Team Holcim-PRB** is racing the seas and oceans to raise awareness about the importance of circular building and living, and with a call to action to accelerate this transition

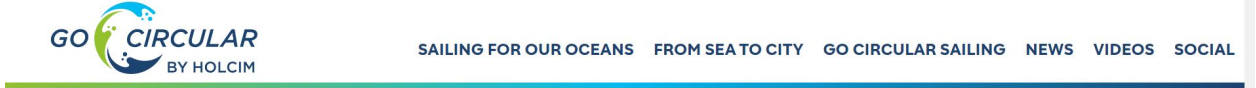
- **The Circular Explorer**, a solar-powered catamaran, is taking local action by collecting and recycling marine litter and empowering local communities to become changemakers through science and education.

Go Circular | The Ocean Race at the 2024 Ocean Decade Conference in Spain



The Ocean Race and IOC/UNESCO: contributing towards the science we need for the ocean we want

Rosalin Kuiper, the skipper of Team Holcim-PRB. “Being out on the ocean and changing the water filters every day yourself, it also changes you and makes you realise how important this work is. I’m very motivated to continue this work with Team Holcim-PRB to make a difference in ocean preservation.”



COLLECTING DATA TO HELP SCIENCE

The data that Team Holcim-PRB collects provides the world’s leading science organizations with valuable information, in real-time, to paint a more accurate picture of what is happening to the ocean and the important role it plays in maintaining a healthy planet. This vital data is helping scientists get more information that is currently lacking on two of the biggest threats to the health of the seas: the impact of climate change and plastic pollution.

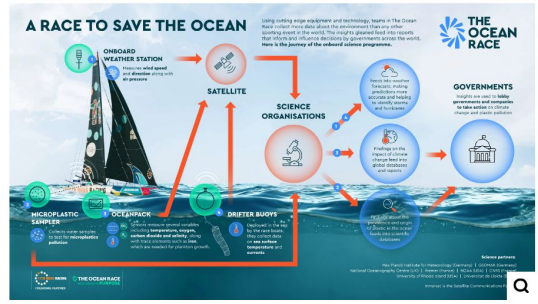


HOW THE DATA IS USED

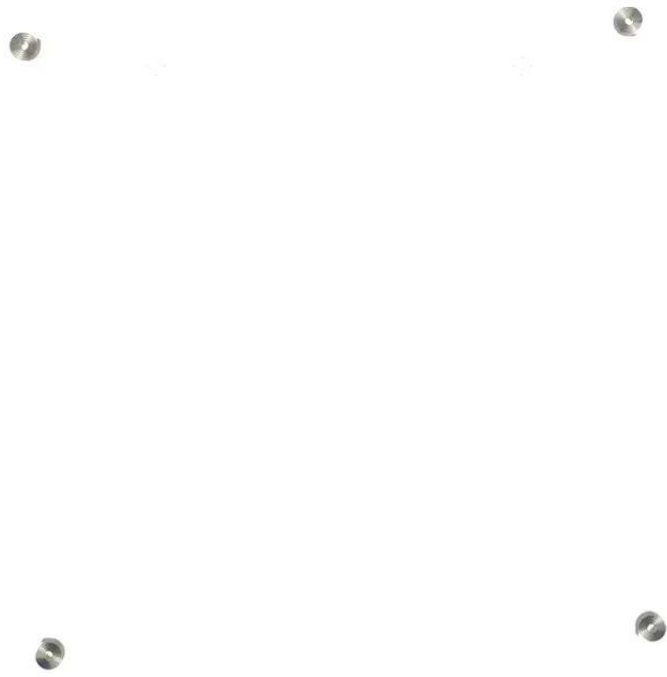
The collected data is open-source and shared with The Ocean Race’s science partners – organizations that are examining the impact of human activity on the ocean.

They use it in reports that inform and influence governments across the world. This includes reports from the [Intergovernmental Panel on Climate Change \(IPCC\)](#) along with databases such as the [Surface Ocean Carbon Dioxide Atlas](#), which provides data for the [Global Carbon Budget](#), a yearly assessment of carbon dioxide that informs targets and predictions for carbon reduction.

Part of the data gathering also supports efforts by international organizations who work together as part of the [Global Ocean Observing System](#), a network aimed at improving understanding of our one ocean.



Credit: The Ocean Race



Project Overview: Three main streams

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RECYCLING

- Recover marine litter and partner with existing recyclers / upcyclers

If recovered plastics are recyclable >> recycling partner;

If residual >> Geocycle

- Co-processing / alternative fuels and raw materials for end of life waste

EDUCATION

- Develop and implement educational toolkits
- Workshops with local schools and communities. Holcim employees as volunteers.
- “Welcome Aboard” sessions to raise awareness on circularity.

SCIENCE

- Collect and analyze data from the installed microplastic sampler and environmental sensors to track key trends.
- Collaborate with research institutes and government agencies for a science-based approach to gain new insights and recommend actions to policy makers.

COMMUNICATIONS

- Dial up impact and outreach through continuous communications activities (local and global): Multimedia content production / PR campaigns / Welcome aboard sessions for key stakeholders (government authorities, media, other private companies, etc.)



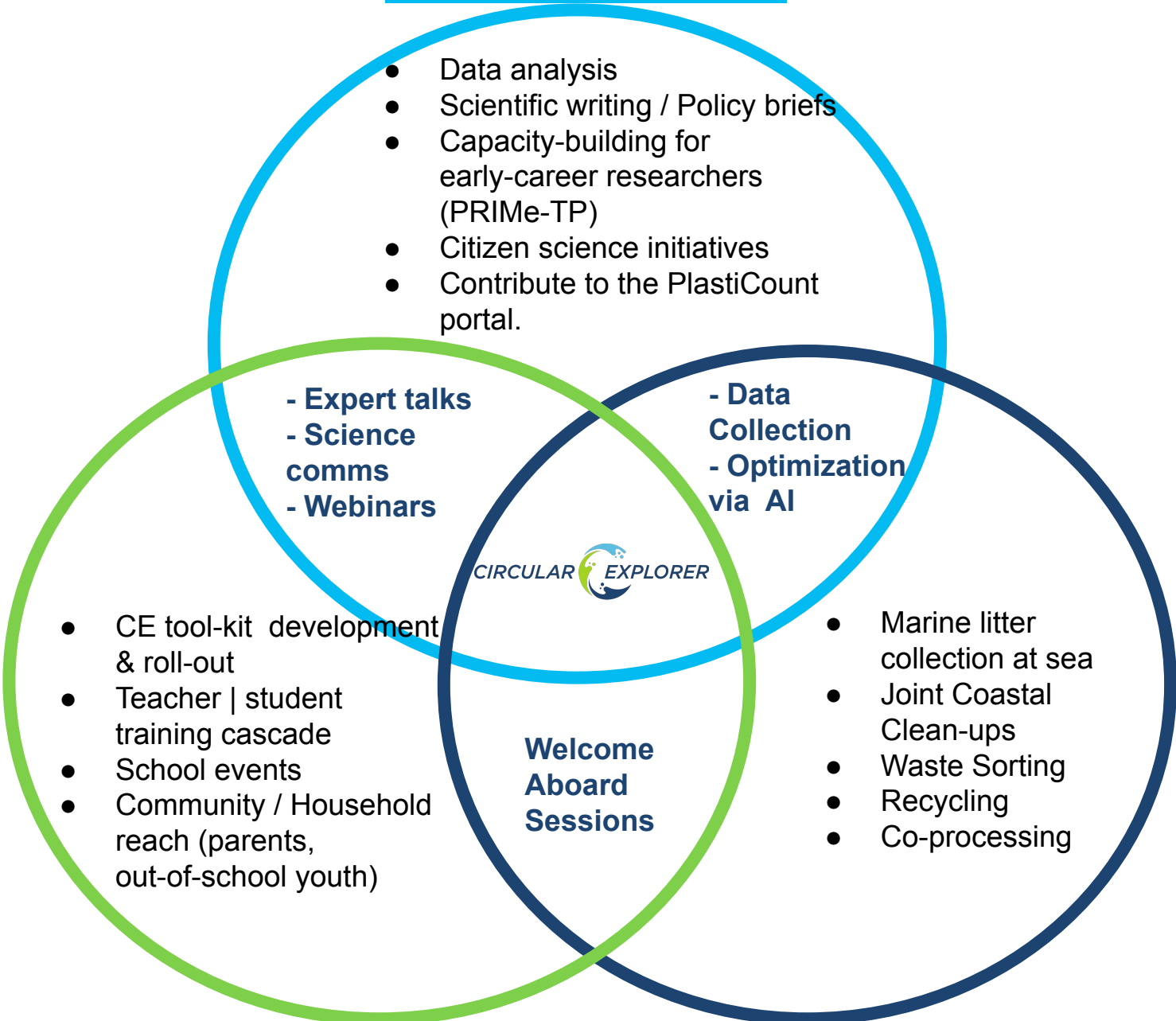
University of the Philippines
Marine Science
Institute



SCIENCE

EDUCATION

RECYCLING



CIRCULAR  *EXPLORER*

CIRCULAR EXPLORER - MAKING AN IMPACT

FAST FACTS

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Marine Litter Recovery & Recycling

66,000 kg
Total marine litter collected (i.e., plastics, wood, glass, textile etc.)
Plastics comprise about **30%** of this mix

450 volunteers have joined Circular Explorer-organized coastal cleanups



Advancing Marine Science

100 Early-career researchers & educators from

50 different universities and gov't agencies intensively trained across the country

350 unique microplastic samples by end of 2024.

5 Technical papers featuring research enabled by the Circular Explorer



Education: Raising Awareness

3,700 external attendees at Circular Explorer-related events

Tailored **educational toolkit to > 10 of the country's public schools** to include government-endorsed Circular Explorer toolkit in their curriculum.



PARTNERING ACROSS VARIOUS SECTORS TO DRIVE CIRCULARITY

CE as a platform to gain shares of voices in important roundtable discussions.



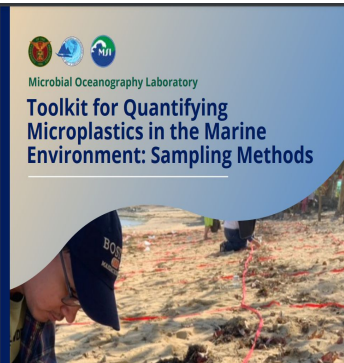
SCIENTISTS & ENGINEERS

Gather new insights from our oceans through the oceanographic sensors and microplastic sampler in the Circular Explorer. Scale-up the training of early-career researchers in the field of plastic pollution. Leverage on existing platforms and materials



PLASTICS TRACKER HOME ABOUT RESOURCES BULLETIN EVENTS PARTNERS CONTACT

SUBMIT DATA



Philippine Plastics Monitoring Map



Plastics Litter Imaging Protocol as Data Gathering for AI-based Counting

Latest Update: September 16, 2022



Circular Explorer x PRIME-TP*

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CE fully supports the capacity-building of early career researchers and educators across the country

Pilot Batch | Oct. 2022

Mindanao Leg | Sept. 2023

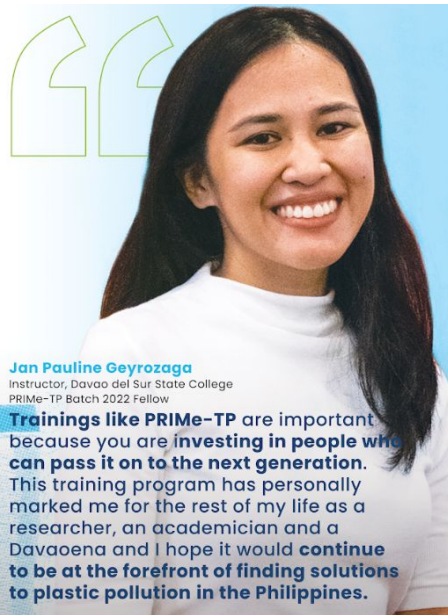
Visayas Leg | Mar. 2024

Luzon Leg | Sept. 2024



*Plastics Research Intensive Methods - Training Program

- Research methods and skills (e.g., various substrates [water, sediment, biota]; use of FTIR, AI)
- Science communication
- Coastal community & school roadshows



Jan Pauline Geyrozaga
Instructor, Davao del Sur State College
PRIME-TP Batch 2022 Fellow

Trainings like PRIME-TP are important because you are investing in people who can pass it on to the next generation. This training program has personally marked me for the rest of my life as a researcher, an academician and a Davaoena and I hope it would continue to be at the forefront of finding solutions to plastic pollution in the Philippines.

HOLCIM CIRCULAR EXPLORER OEOE PRIM:TP



Edcyl Lee Salac
Assistant Professor, University of the Philippines Visayas
PRIME-TP Visayas Fellow

Through the Holcim Masterclass, we learned about Circular Economy and we were taught to identify if materials are actual waste or not. I became more conscious of reusing things I would otherwise throw out.

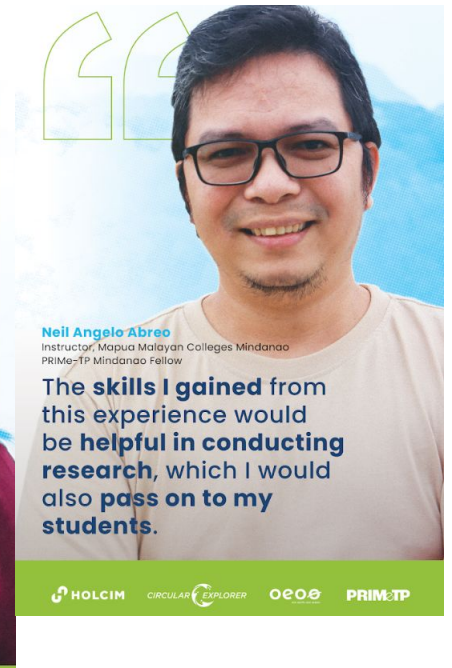
HOLCIM CIRCULAR EXPLORER OEOE PRIM:TP



Ma. Theresa Salamida
Instructor, Eastern Visayas State University Carigara Campus
PRIME-TP Visayas Fellow

The PRIME-TP Roadshow made me realize that we should teach children at an early age that they can contribute in their own little way, and that we can share with them our research in a way that they can understand and appreciate.

HOLCIM CIRCULAR EXPLORER OEOE PRIM:TP



Neil Angelo Abreo
Instructor, Mapua Malayan Colleges Mindanao
PRIME-TP Mindanao Fellow

The skills I gained from this experience would be helpful in conducting research, which I would also pass on to my students.

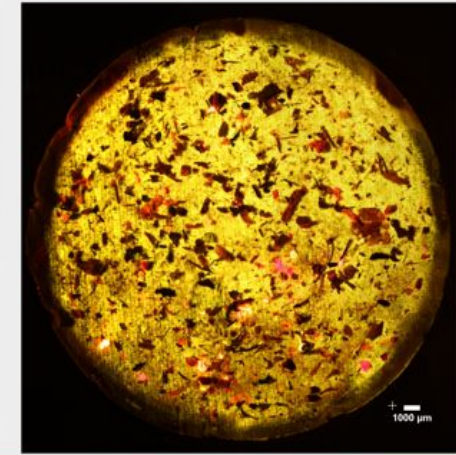
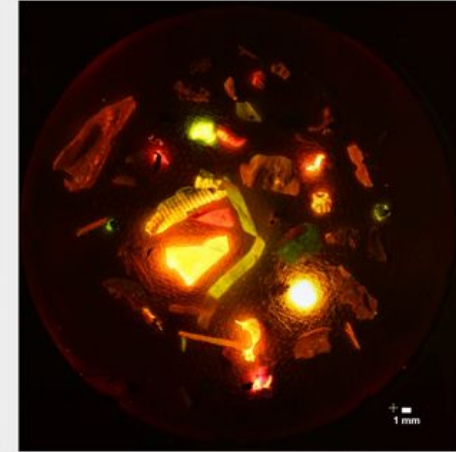
HOLCIM CIRCULAR EXPLORER OEOE PRIM:TP



MICROPLASTICS in Manila Bay

under PLAIN WHITE LIGHT

under BLUE LIGHT



Top row: Large microplastics (1mm to 5mm), n=22 (26.5%, N=83)

Bottom row: Small microplastics (<1mm), n=61 (73.5%, N=83)



University of the Philippines
Marine Science
Institute



An AI-model developed by the team from the University of the Philippines, thru the PlastiCount project* is now being optimized using the marine litter data collected by the Circular Explorer.

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AWAITING the approval from the proponents (Dr. Onda and Dr. Ignacio) if it is okay to show the sample video of said model at this stage.

PARTNERING ACROSS VARIOUS SECTORS TO DRIVE CIRCULARITY

CE as a platform to gain shares of voices in important roundtable discussions. DRAFT



From left, DENR Undersecretary for Integrated Environmental Science Carlos Primo David, Holcim Philippines Chief Sustainability Officer Zoe Sibala, DENR Secretary Maria Antonia Yulo-Loyza, Holcim Philippines President and CEO Horia Adrian, and Holcim Group Circular Explorer Project Manager Christine Bellen



Holcim Philippines decarbonized its operations and reduced carbon emissions per ton of cement by 7%.

In partnership with the DENR, it will be deploying a 100% solar powered catamaran, the Circular Explorer, operated by One Earth One Ocean, to clean up coastal areas from plastic waste in Manila Bay. There is a new project in Northern Mindanao to support coral and coastal ecosystems via a 'marine bio-active concrete'.

PUBLIC AUTHORITIES

Drive enabling regulatory environment.



The EAS is composed of the following countries: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Vietnam, Australia, China, Japan, India, New Zealand, Republic of Korea, Russia, and the United States. END



Delegates and speakers of the EAS Workshop on Maritime Cooperation join Undersecretary Ma. Theresa Lazaro for a group photo during the Opening Ceremony. (DFA-OPCD Philip Fernandez photo)



PARTNERING ACROSS VARIOUS SECTORS TO DRIVE CIRCULARITY

CE as a platform to gain shares of voices in important roundtable discussions.

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CITIZENS

Raise public awareness on the importance of our marine environment.
Inspire future change makers to advocate for sustainable production and consumption and promote circular economy.



PROMOTING CIRCULAR ECONOMY: A TEACHER'S MANUAL ON SUSTAINABLE PLASTIC WASTE MANAGEMENT



LESSON 1: WHAT IS WASTE?

OVERVIEW

Plastic is a lightweight, hygienic, and resistant material which can be moulded in a variety of ways and utilized for a wide range of applications. Raw resources like crude oil or natural gas from the oceans or from rock formations are extracted to produce plastics.

In 1906, French researcher Maurice Lemaignere discovered biodegradable plastic from his study on bacterium *Bacillus pasteurii*. The first bioplastics were made of poly(hydroxybutyrate (PHB). Despite its biodegradable component, both can still harm our environment as they emit carbon dioxide during degradation.

According to a study by Meher et al. (2021), plastics are more likely to wash into the water in countries with smaller land masses, larger coastlines, frequent rainfall, and weak waste management systems.

In 2018, 369 million tons (ME) of plastic were produced worldwide with more than half (51%) coming from Asia. An estimated 52% of the plastic that enters the ocean comes from the Philippines, an archipelago of more than 7,000 islands with a 36,289-kilometre coastline and 4,820 rivers. Following Philippines are India and Malaysia.

Types of plastics

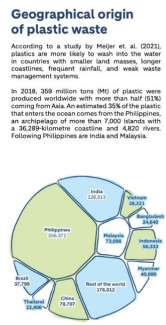
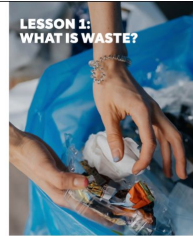
There are four categories of plastic based on size namely: macroplastics, microplastics, mesoplastics, and nanoplastics. The discussion will focus on macroplastics and microplastics.

MACROPLASTICS

Macroplastics are large (>20 mm) plastic debris or discarded waste that is visible to the naked eye and can still be handled. Some examples of this are plastic bottles and packaging.

MICROPLASTICS

Microplastics, on the other hand, are small plastic fragments, typically less than 5mm that are derived from the breakdown of macroplastics. These are no longer visible to the naked eye.



CIRCULAR EXPLORER

The Circular Explorer High School Workbook

A Workbook on Circular Economy for High School Students

ABOUT THE WORKBOOK

The issue of waste management is one of the most pressing environmental challenges of our time, with negative impacts on the health of our people, high economic impacts due to global waste in addition to the air quality and the soil and water contamination and the plastic waste pollution of our oceans.

The Circular Explorer High School Workbook consists of 17 fun and interactive games, activities, and practical activities that will help students understand the global and regional waste problem and its local-level context. The workbook begins with how waste management will address certain Sustainable Development Goals (SDG) presented in the introduction to SDG 12 followed by an introduction to the workbook's key practices and how plastic waste and the environment are related.

After understanding plastics as a waste issue present in our lives, the workbook will discuss the types of plastics, especially macroplastics, and mesoplastics, and the circular economy on the local level to provide the needed information for students on the role of the business or the government in creating plastic products and their disposal. Each chapter contains fun and interactive activities that will help students learn about the importance of plastic waste and its impact on the environment.

ACTIVITY 03

Sustainable Waste Management Scavenger Hunt

OBJECTIVE

By the end of this activity, you will be able to identify and understand the importance of sustainable waste management practices through a scavenger hunt and analyzing different waste management approaches and determining an understanding of the correct behavior towards waste management and achieving the Sustainable Development Goals.

MATERIALS

- Pen and paper for each participant
- List of Sustainable Development Goals related to waste management
- List of items to search for in the scavenger hunt
- Clipboard

LESSON 01

Introduction: The Sustainable Development Goals and Its Relation to Waste Management

The Sustainable Development Goals (SDG) have been developed for addressing the issues that the international community has been confronting.

The 17 Sustainable Development Goals are presented in the following table:

Goal	Description
1	No Poverty
2	Zero Hunger
3	Good Health and Well-being
4	Quality Education
5	Gender Equality
6	Clean Water and Sanitation
7	Affordable and Clean Energy
8	Decent Work and Economic Growth
9	Industry, Innovation and Infrastructure
10	Reduced Inequalities
11	Sustainable Cities and Communities
12	Responsible Consumption and Production
13	Climate Action
14	Life Below Water
15	Life on Land
16	Peace, Justice and Strong Institutions
17	Partnerships for the Goals

Circular Explorer helps to tell the story of the plastic pollution problem in the country and inspire the public and government leaders to take action



How Circular Explorer project fuses sustainable economy into PH education system

By Bianca Ysabel Abrencillo - August 23, 2024 - 3:03 PM



Ang Plastic Mo! – The Philippine Plastic Problem | DigiDokyu

GMA Integrated News 14.7M subscribers

CHRISTINE BELLEN | PROJECT MANAGER, HOLCIM PH'S CIRCULAR EXPLORER

BELLEN: WE HOPE THE RESEARCH WE GET FROM HOLCIM PH'S CIRCULAR EXPLORER TRANSLATES INTO POLICY

WATCH: Holcim PH on efforts to clean Manila Bay, push boundaries of marine science | ANC

YouTube

"Circular Explorer," solar-powered sea vessel na nangongolekta ng basura sa Manila Bay | 24 Oras

364 likes

27K views 1 day ago #GMAIntegratedNews #KapusoStream

Circular Explorer's Link to the UN SDGs

THE SUSTAINABLE DEVELOPMENT GOALS



Image source: <https://www.un.org/sustainabledevelopment/>



CONSERVE AND SUSTAINABLY USE THE OCEANS, SEA AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

PLASTIC/MARINE POLLUTION



PLASTIC POLLUTION IS CHOKING THE OCEAN

17+ MILLION METRIC TONS OF PLASTIC ENTERED THE OCEAN IN 2021

PROJECTED TO DOUBLE OR TRIPLE BY 2040



Image source: <https://www.un.org/sustainabledevelopment/>

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS

UNSUSTAINABLE PATTERNS

OF CONSUMPTION AND PRODUCTION ARE ROOT CAUSE OF

TRIPLE PLANETARY CRISES



CLIMATE CHANGE



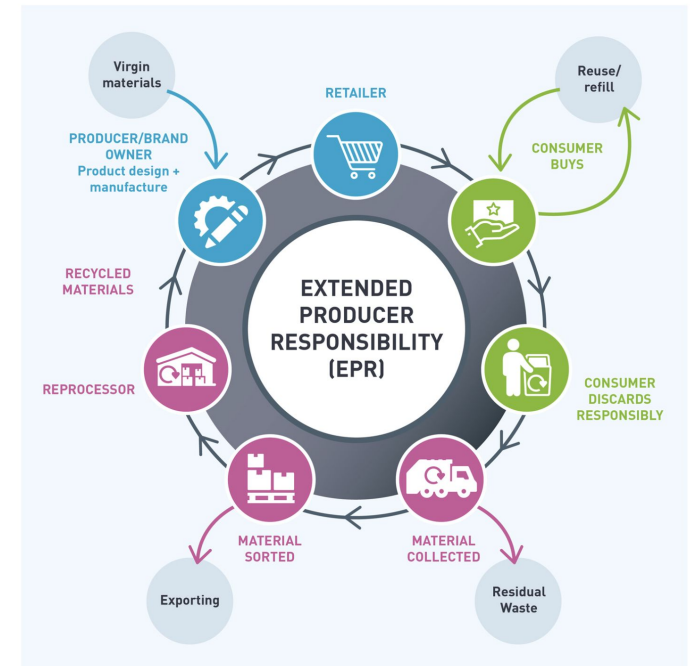
BIODIVERSITY LOSS



POLLUTION

OUR RELIANCE ON NATURAL RESOURCES IS INCREASING

RISING OVER 65% GLOBALLY FROM 2000 TO 2019



EPR Image from: <https://www.zerowastescotland.org.uk/our-work/extended-producer-responsibility>

Image source: <https://www.un.org/sustainabledevelopment/>



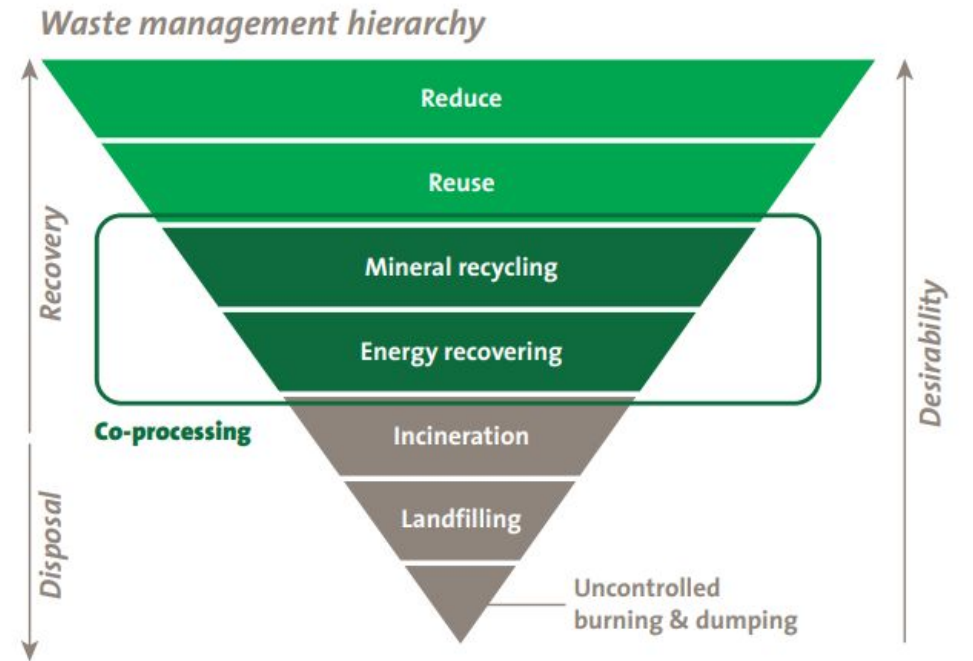
MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE



AS CITIES GROW, MUNICIPAL SOLID WASTE PROBLEMS MOUNT



Image source: <https://www.un.org/sustainabledevelopment/>



According to EU Waste Framework Directive, “recycling includes any operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes”.



TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS

- With a climate cataclysm looming, the pace and scale of current climate action plans are wholly insufficient to effectively tackle climate change. Increasingly frequent and intense extreme weather events are already impacting every region on Earth. Rising temperatures will escalate these hazards further, posing grave risks.

“...regions vulnerable to flooding often coincide with high plastic mobilisation potential during floods. Consequently, clean-up, mitigation measures and flood risk management are inherently interdependent and need to be managed holistically” (Roebroek et al, 2021)



Metro Manila (CNN Philippines, August 11) — Manila Bay overflowed due to heavy downpour Saturday morning, leaving the stretch of Roxas Boulevard flooded and full of garbage.

<https://www.cnnphilippines.com/news/2018/08/11/Manila-Bay-overflows-floods-garbage.html>

17 PARTNERSHIPS FOR THE GOALS



STRENGTHEN THE MEANS OF IMPLEMENTATION AND REVITALIZE THE GLOBAL PARTNERSHIP FOR SUSTAINABLE DEVELOPMENT



© UN Photo / Isaac Billy

17 PARTNERSHIPS FOR THE GOALS



Strong international cooperation

PARTNERSHIPS: WHY THEY MATTER

Invest In Our Planet

EARTH DAY 2023

PLANET VS. PLASTICS: GLOBAL THEME FOR EARTH DAY 2024

