

Marine Debris Pollution and Mitigation Strategies

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Co-funded by the
Erasmus+ Programme
of the European Union

Introduction

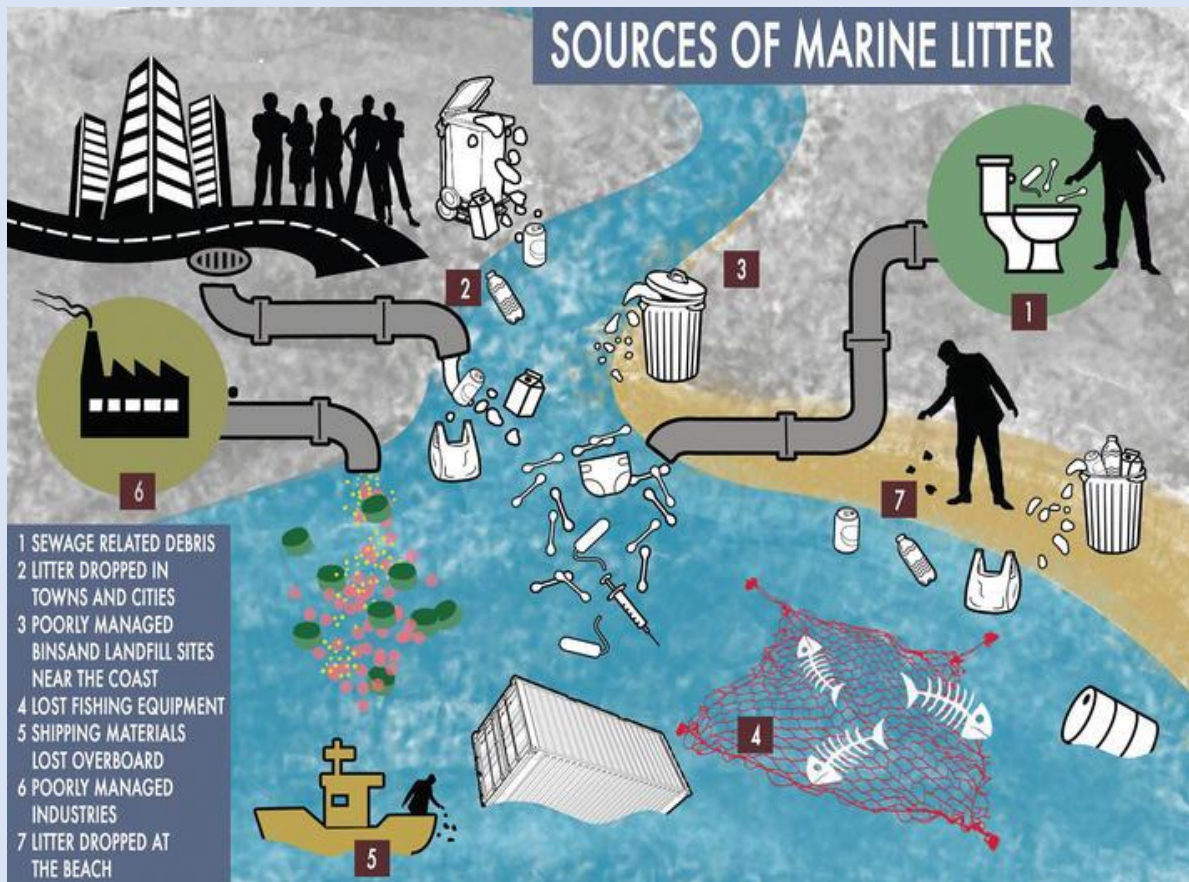
For policy makers, industries and scientists, recognising and controlling marine debris is an extremely significant environmental priority. Marine debris is characterised as any permanent solid material that is produced or processed and disposed of or abandoned in the marine environment, directly or indirectly, intentionally or unintentionally.

Negligence is the primary source of this waste. In fact, 80 per cent of marine litter is estimated to come from shore. This contamination comes mostly from domestic waste, which is improperly recycled, discarded or left in the wild in landfills. There is no place on Earth today which is immune to this problem. Storm drains and sewers, as well as shoreline and outdoor events such as picnicking and beach going, account for the bulk of the garbage and debris lining our beaches. There is also a major problem with abandoned or discarded fishing gear because this garbage can entangle, kill, maim, and drown marine wildlife and harm property.



The decomposition times of marine debris.

Sources : Zephyrschord (2018).



Sources of Marine Litters into the ocean.

Sources : Daniela Berto et al (2018)

Types and source of marine debris

There are a few types of marine debris that we can see through our beaches and oceans. Usually the most thing we can see is anything man-made such as food and drink beverage, plastic bag and fishing gear. Other than that, the common materials that make up marine debris are plastics, glass, metal, paper, cloth, rubber and wood. There is an example of marine debris found around our beaches.



Nylon nets thrown by fishermen in the sea.

Source : 'Geng Plastik Ija' club.



Condition of Pantai Batu Buruk after the flood.

From that, we can justify that most of these problems occur due to the irresponsible attitude of some individuals. Sometimes, people leave garbage on beaches or throw it from vessels or offshore installations, such as oil rigs, into the sea. Occasionally, garbage finds its way from land into the water. This irresponsible attitude can lead to species extinction and destruction of environmental beauty.



Left by irresponsible people at Pantai Cakar Hutan, Kerteh Terengganu.

The Impact on Marine Organisms

Marine debris are often ingested by animals that either mistake it for food or accidentally consume it along with their meal. This can cause a variety of issues, ranging from mild discomfort to a hazardous blockage. Debris can fill the stomachs, causing an animal to feel full while depriving it of the healthy food it needs. In these instances, with full stomach, animal can starve.

In marine debris, animals can become tangled up and unable to free themselves. This can have a range of effects on the animal, ranging from slight discomfort to severely affecting the ability of the animals to survive. Entangled animals may get abrasions from the debris, leading to a dangerous infection. If movement is limited, animals may not be able to feed and if entangled underwater, air-breathing fauna may drown



The contents of the bird's stomach show marine debris can block up an animal's system.

Source : National Oceanic and Atmospheric Administration (NOAA) Marine Debris Program



Animal entangled in net.

Source : Eastcott & Momatiuk, 2017

In addition to recreation and tourism, marine debris may have a detrimental impact on the economy due to economic damages incurred by commercial fishing and shipping. Tourism is also affected by marine debris, as the coastline and beaches are less attractive. Thus, activities like sport fishing, whale watching and diving are also dependent on healthy ecosystems. Marine debris also can spoil the beauty of the sea and the coastal zone.



Tourism may be negatively effected by marine debris.



Some of marine debris around Pantai Gong Balai

How to reduce the marine debris pollution

Marine debris pollution has been highlighted as factor that badly effect our environment especially sea and beaches. Many studies found that most of the plastic materials that have be found at the beach and in the sea are plastic bags, bottles, packaging straps and fishing lines. These proved that we should take firm action to avoid further destruction to our ocean. Marine studies will lead us to find solutions on how to decrease the marine debris pollution.

Tips on how to decrease macro plastic pollution

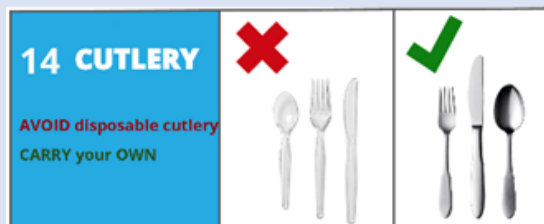
1. Purchasing products using non-plastic material that eco-friendly



2. Drink water in re-usable bottle that makes of stainless steel or glass



3. Trying to avoid disposable plastic utensils



4. Do bulk buying for item like toiletries, cereal and paper products at supermarket or mall to reduce plastic bags usage



5. Demonstrate publicly to create awareness by holding beach cleaning program or talks on how to live with less plastic usage



Bibliography

- Camps, M. (2020). The impact of marine debris on nature. Retrieved 29 December 2020, from <https://allyouneedisbiology.wordpress.com/2017/06/11/impact-marine-debris/>
- Daniela B. (2018). Elemental Analyzer/Isotope Ratio Mass Spectrometry (EA/IRMS) as a Tool to Characterize Plastic Polymers in a Marine Environment. From <https://www.intechopen.com/books/plastics-in-the-environment/elemental-analyzer-isotope-ratio-mass-spectrometry-ea-irms-as-a-tool-to-characterize-plastic-polymer>
- European Environment Agency. (2019) Marine Litter Watch. Retrieve from <https://www.eea.europa.eu/themes/water/europes-seas-and-coasts/assessments/marine-litterwatch>
- Elliott and Elliott, 2018 T. Elliott, L. Elliott A plastic future: plastic consumption and waste management Wwf (2018), pp. 533-536
- M.C. Blettler, E. Abrial, F.R. Khan, N. Sivri, L.A.(2018) Espinola Freshwater plastic pollution: recognizing research biases and identifying knowledge gaps. 143, 416-424
- M.C.B. Araújo, M.F.(2019). A critical review of the issue of cigarette butt pollution in coastal environments. Enviromental research.
- Zephyrschord (March, 2018). Mitigation process for Marine Debris, Wikipedia. https://en.wikipedia.org/wiki/Marine_debris

Special Thanks

Universiti Malaysia Terengganu

- Institute of Oceanography and Environment, INOS

- Faculty of Science and Marine Environment, FSSM

MARE (Marine Coastal and Delta Sustainability for Southeast Asia)

European Union Erasmus+

The project by first year students

Bachelor of Science (Marine Science), Year 2020

Course Fundamental of Marine Science (MMS3009)



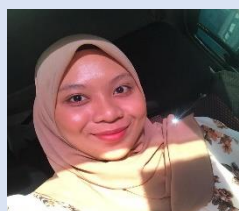
-Ahmad Syahmi Bin Abdullah-

"Be an ocean- Beautiful, mysterious, wild, and free."



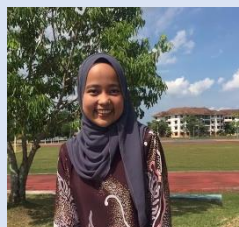
-Muhammad Haris Mursyidi bin Khairol-

"Dalam hidup perlu sentiasa jujur dan ikhlas, nanti langit pasti cerah untuk kita"



-Nur Ashikin binti Wan Alias-

"Life is like the ocean. It can be calm or still, and rough or rigid, but in the end, it is always beautiful"



-Nur Azira binti Abdullah-

"Save the sea to see the future"



-Wan Nor Suziana binti Wan Zaki-

"Rivers and the sea are not landfills but a habitat shelters"