Water and Environment Support
in the ENI Southern Neighbourhood region

Activity: WES N-E-MO-2

Training on marine litter monitoring

Marine litter in the Mediterranean: an overview of research and policy advances related to monitoring

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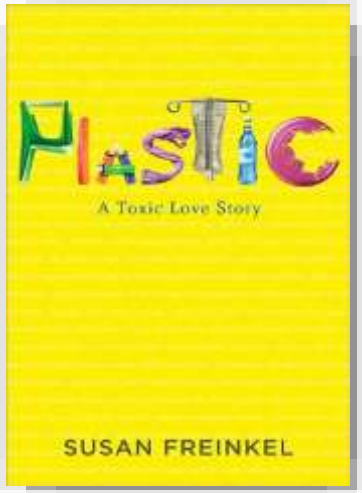
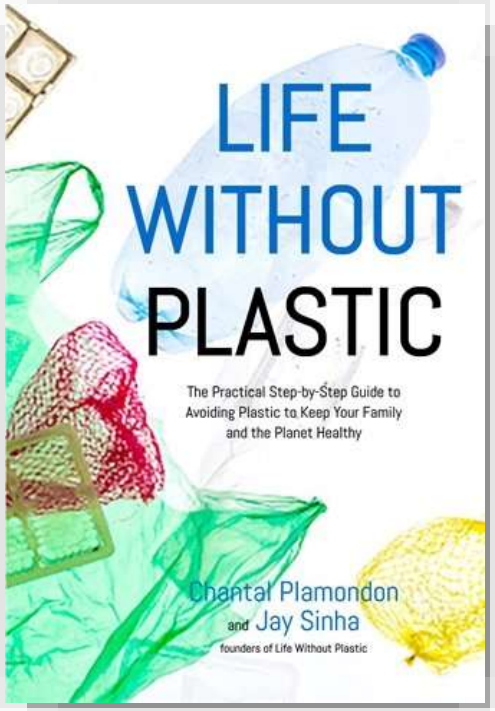
Member of the UNEP/MAP CORMON Group
WP Leader of Plastic Busters MPAs & Plastic Busters CAP

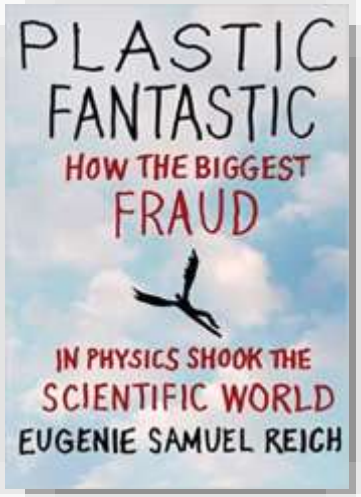
LDK Consultants Global EEIG

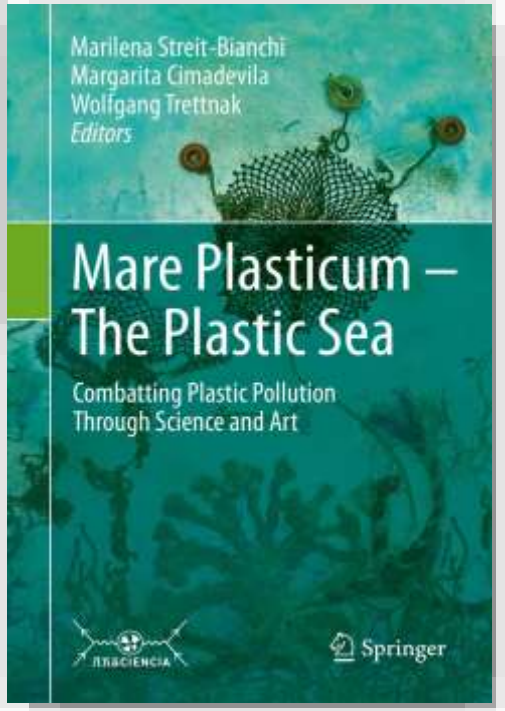
This Project is funded by the European Union

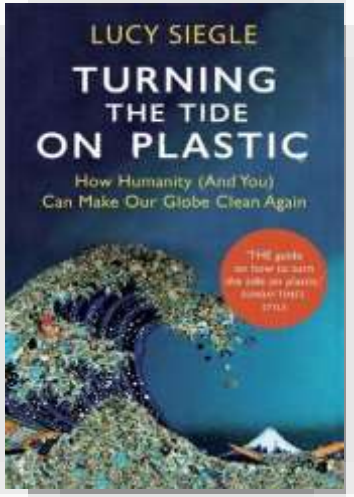
FROM THE ANTHROPOCENE TO THE PLASTOCENE…

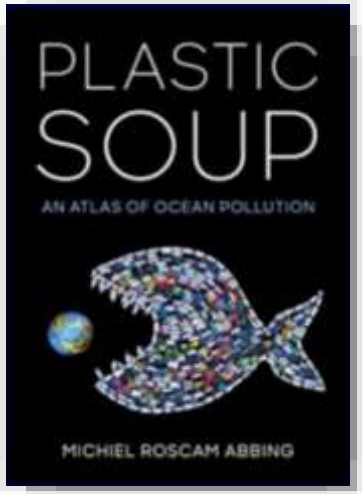


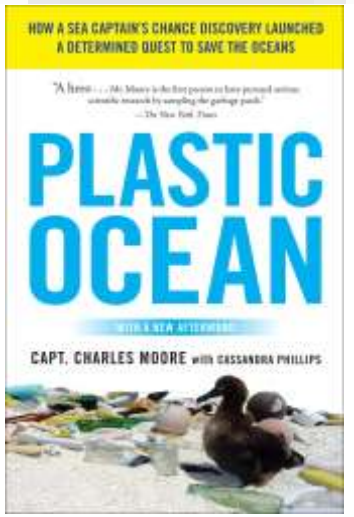




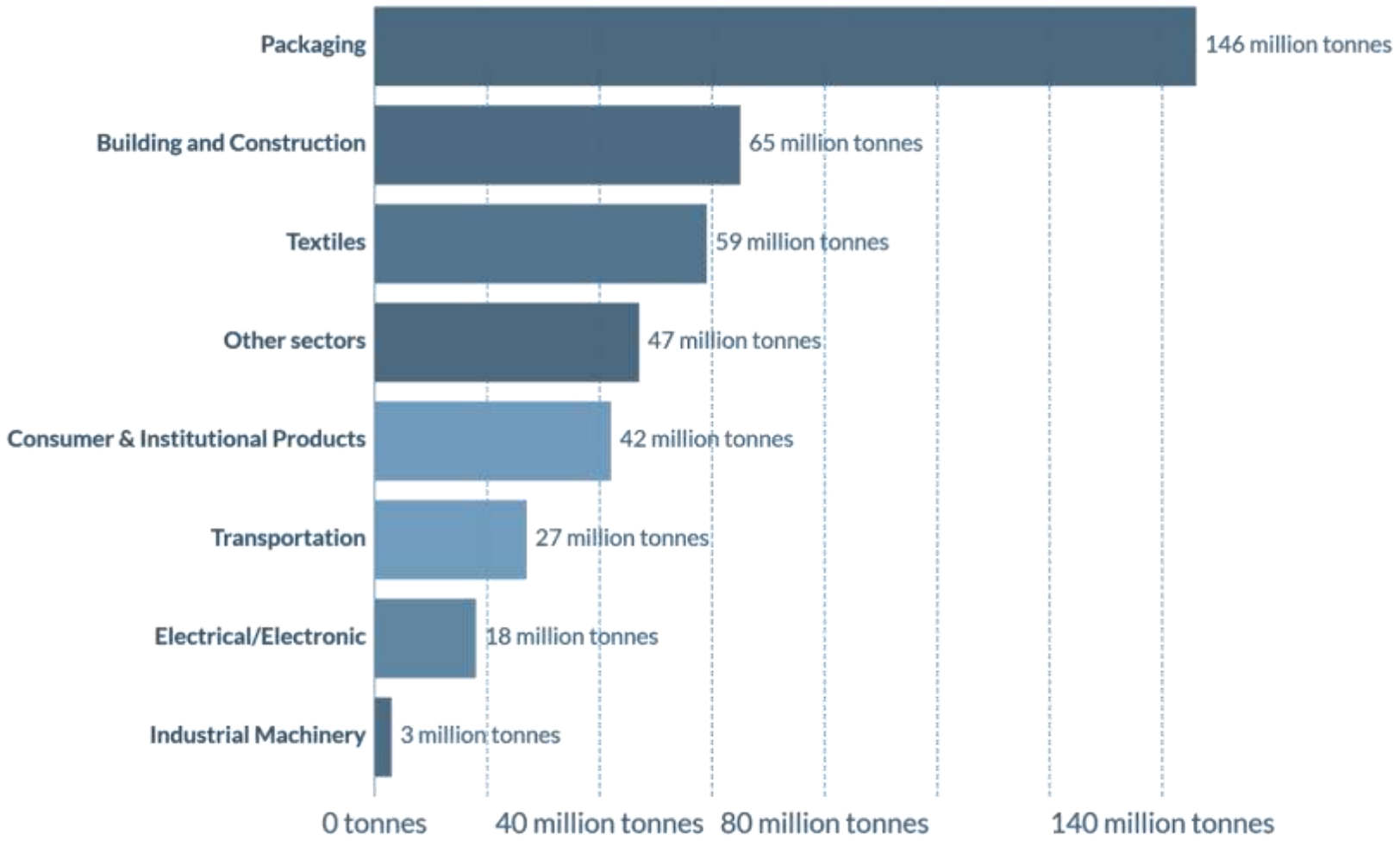








GLOBAL PLASTIC PRODUCTION BY INDUSTRIAL SECTOR



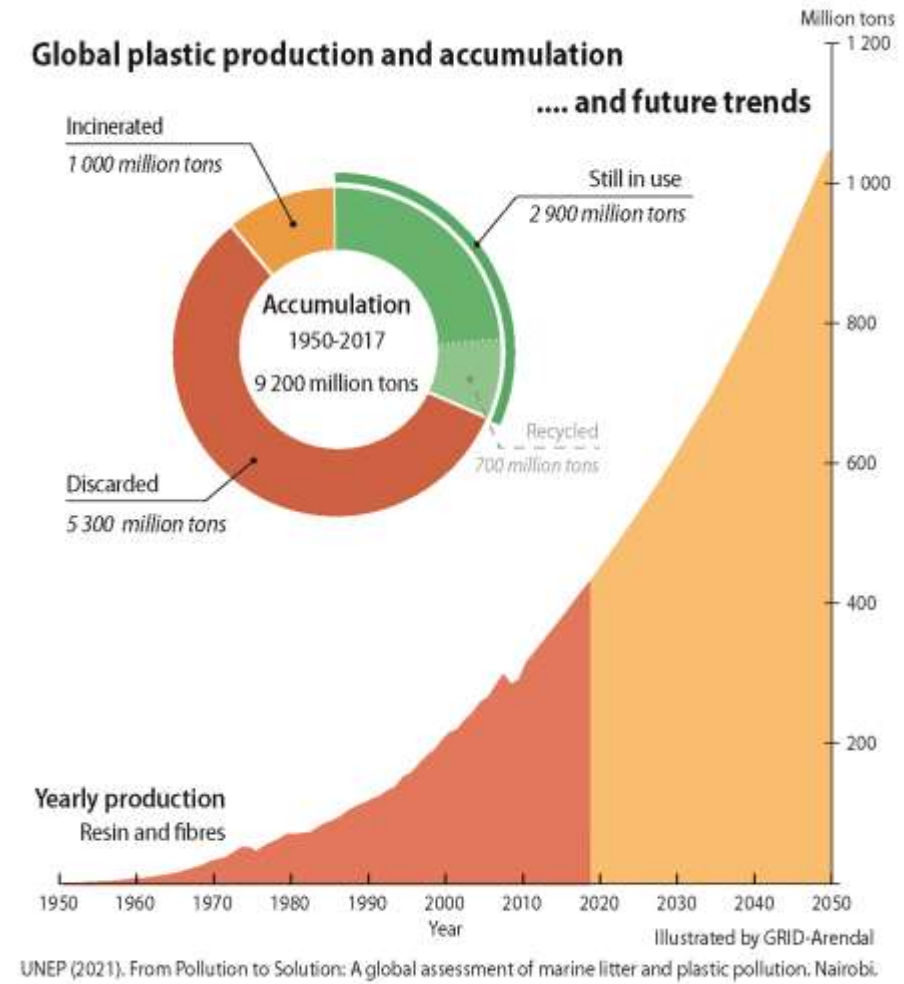
The world produces more than

400 million tons

of plastics every year

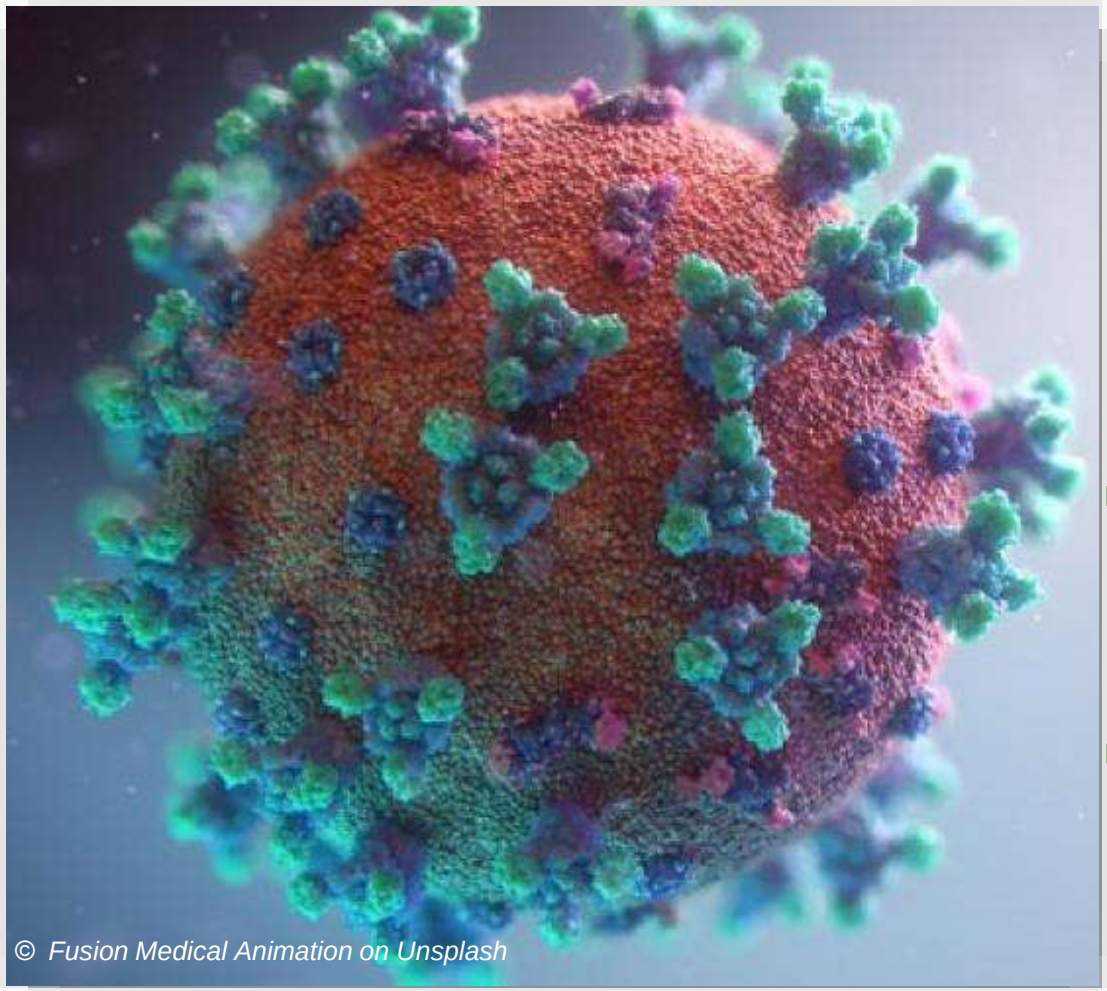
Source: Geyer, R., Jambeck, J. R., Law, K. L., 2017. Production, use, and fate of all plastics ever made. Science Advances, 3(7), e1700782.

GLOBAL PLASTIC PRODUCTION & FUTURE TRENDS



UNEP (2021). From Pollution to Solution: A global assessment of marine litter and plastic pollution. Nairobi.

IMPLICATIONS OF COVID-19 ON PLASTIC WASTE GENERATION



Plastic medical waste

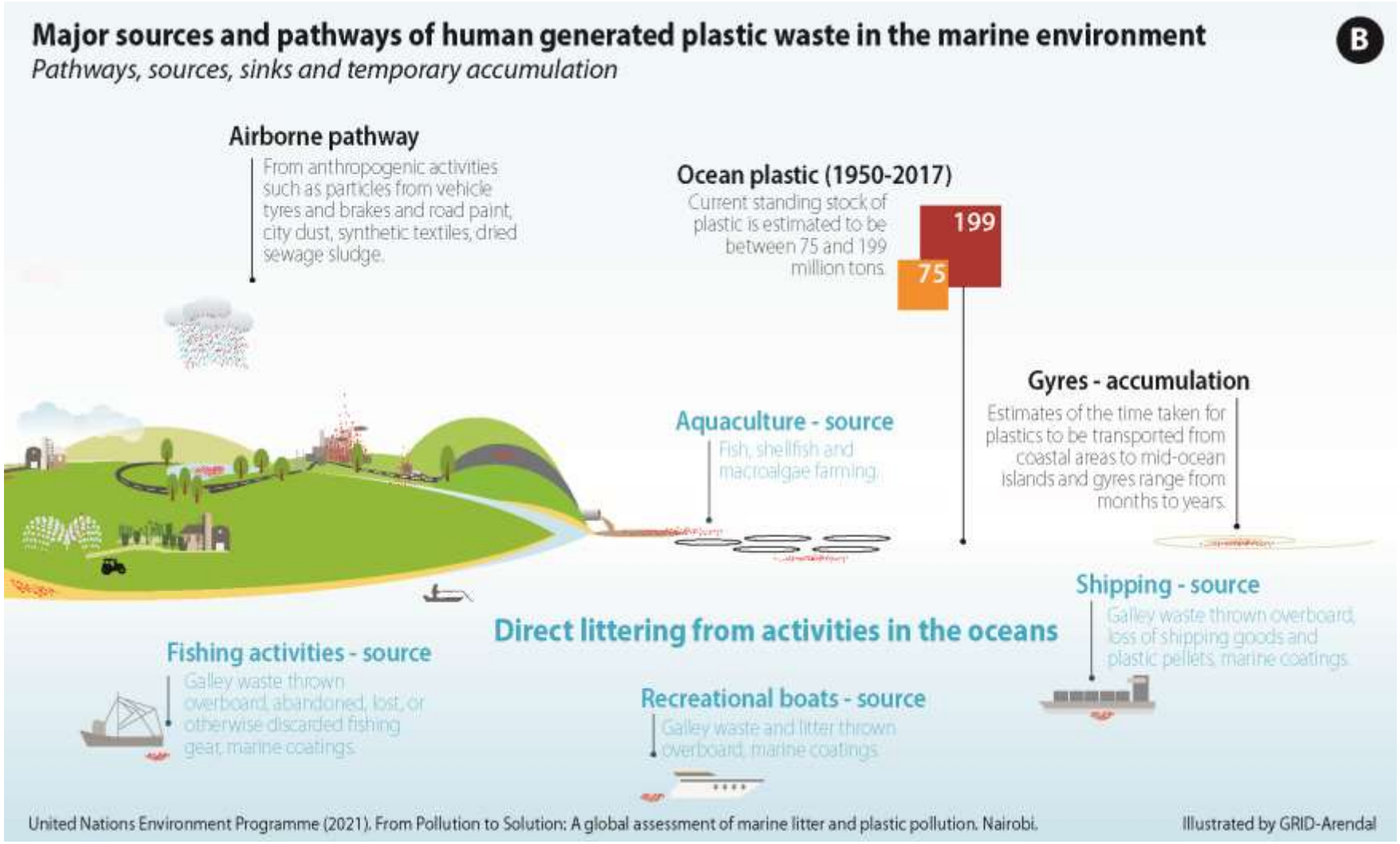
Plastic personal protection equipment (PPE)

Single-use plastics (SUPs)

COVID-19 induced plastic waste generation

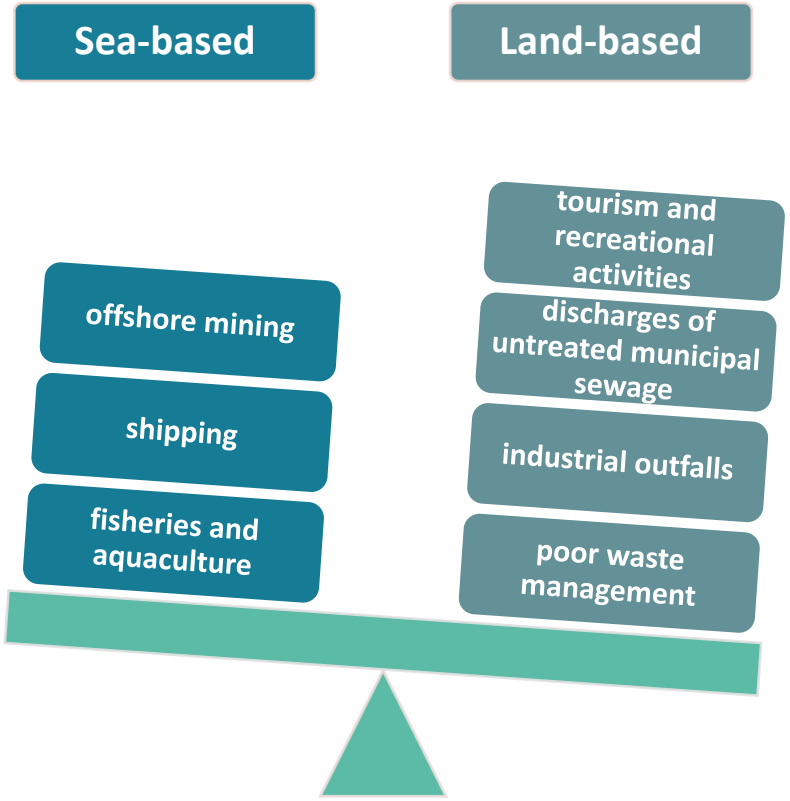
HOW PLASTIC ENDS UP IN THE ENVIRONMENT FROM LAND-BASED SOURCES

HOW PLASTIC ENDS UP IN THE ENVIRONMENT FROM SEA-BASED SOURCES



LAND-BASED VS SEA-BASED SOURCES OF THE MARINE LITTER IN THE MEDITERRANEAN

SEA-BASED SOURCES ARE OF PARAMOUNT IMPORTANCE IN MANY AREAS OF THE MEDITERRANEAN, INCLUDING MPAs!



THE GROWING THREAT OF PLASTIC POLLUTION

Air

Water (freshwater & marine)

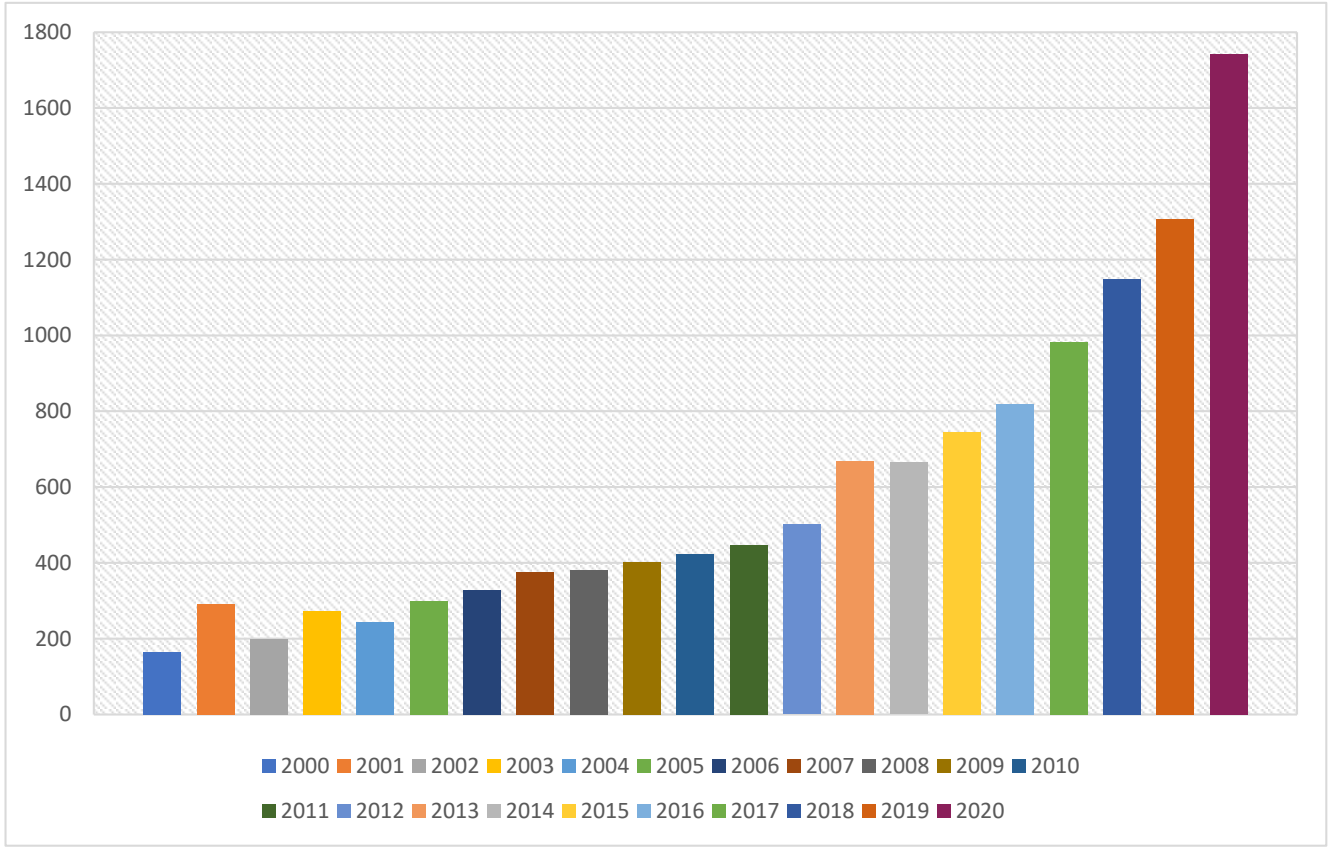
Land

Biota

Plastics ‘leak’ into all environmental compartments from different entry points and in various size fractions inducing wide-ranging effects

MARINE LITTER & MARINE PLASTIC POLLUTION| AN INDISPUTABLE GLOBAL THREAT THAT IS GROWING

Some 12,400 research articles have been published in the last 20 years documenting the marine litter and marine plastic pollution threat



LATEST MARINE LITTER RESEARCH TOPICS – INDICATIVE EXAMPLES

- Artisanal trawl fisheries as a sentinel of marine litter pollution
- Public perceptions, knowledge, responsibilities, and behavior intentions on marine litter: Identifying profiles of small oceanic islands inhabitants
- Linking marine litter accumulation and beach user perceptions on pocket beaches of Northern Sardinia (Italy)
- Relationships between marine litter and type of coastal area, in Northeast Atlantic sandy beaches
- Assessing the potential for the introduction and spread of alien species with marine litter
- Exploring governance policy of marine fishery litter in China: Evolution, challenges and prospects
- Marine litter in the Red Sea: Status and policy implications
- The drift lighter project — Estimation of drifting range and source of North Pacific marine litter using disposable lighters washed up on coasts
- Understanding the interactions between cephalopods and marine litter: A research evaluation with identification of gaps and future perspectives
- Understanding the factors affecting the quantity and composition of street litter: Implication for management practices

KEY MEDITERRANEAN PROJECTS COMBATING MARINE PLASTIC POLLUTION

MARINE LITTER MED, IMAP/MPA, ECAP

SEIS

WES

SWIM-H2020 SM

ACT4LITER

AMARE

MELTEMI

INDICIT I & II

IPA-ADRIATIC DEFISHGEAR

LIFE+

SMILE, AMMOS, GHOST ,DEBAG, MERMAIDS

MED SEALITTER

PLASTIC BUSTERS MPAS

COMMON

FP7 CLEANSEA

FP7 MARLISCO

FP7 PERSEUS

HORIZON 2020 SOS-ZEROPOL 2030

MED BLUEISLANDS

marGnet

HORIZON 2020 BLUEMED COORDINATION AND SUPPORT ACTION

Mediterranean Sea basin lighthouse - actions to prevent, minimise and remediate litter and plastic pollution

BLUEMED

PLASTIC BUSTERS CAP

THE UfM LABELLED PLASTIC BUSTERS INITIATIVE

HARMONIZED MONITORING

SETTING UP A JOINT GOVERNANCE PLAN

DIAGNOSING THE IMPACTS

BUILDING CAPACITIES AND TRANSFERRING KNOWLEDGE

IDENTIFYING MARINE LITTER HOTSPOTS

SHOWCASING PREVENTION & MITIGATION MEASURES

Union for the Mediterranean
Union pour la Méditerranée
الاتحاد من أجل المتوسط

Interreg Mediterranean
EUROPEAN UNION
PLASTIC BUSTERS MPAs

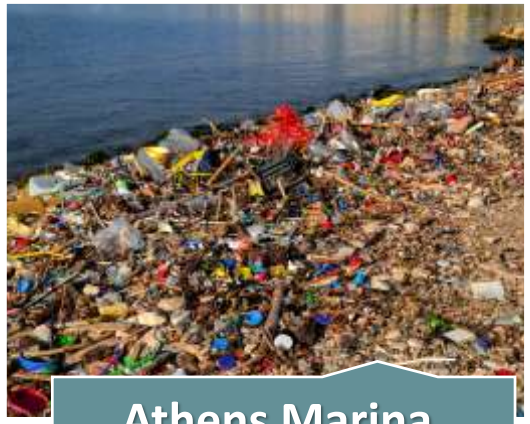
ENI CBCMED
Cooperating across borders in the Mediterranean
Project funded by the EUROPEAN UNION
REGIONE AUTÒNOMA DE SARDIGNA
REGIONE AUTONOMA DELLA SARDEGNA
Plastic Busters CAP

MARINE LITTER & MARINE PLASTIC POLLUTION IN THE MEDITERRANEAN

The Mediterranean Sea is one of the most affected areas by marine litter worldwide!

Port of Izmir, Turkey

Archipelago of Lavezzi, France



Athens Marina, Greece

Tangier, Morocco

Milazzo, Italy

MACROLITTER DENSITIES ON MEDITERRANEAN BEACHES

Reference	Study area	Number of beaches	Years	Litter density (items/100 m)	Plastic (%)
Vlachogianni et al., 2018	Greece	24	2014-2016	156	92
Vlachogianni et al., 2018	Bosnia & Herzegovina	4	2014-2016	176	80
Vlachogianni et al., 2019	Cyprus	3	2018	177	90
Vlachogianni et al., 2018	Italy	26	2014-2016	186	90
Vlachogianni et al., 2018	Albania	12	2014-2016	201	54
Prevenios et al., 2017	Greece	1	2014-2015	244	90
Vlachogianni et al., 2018	Greece	1	2014-2016	244	90
Vlachogianni et al., 2018	Montenegro	8	2014-2016	271	78
Vlachogianni et al., 2018	Croatia	16	2014-2016	303	96
Gjyli et al., 2020	Albania	5	2018	333	65
Nachite et al., 2019	Morocco	12	2015-2017	369	83
Vlachogianni et al., 2019	Greece	8	2018	419	90
Vlachogianni et al., 2018	Slovenia	18	2014-2016	424	76
Vlachogianni et al., 2019	Morocco	5	2018	436	82
Fortibuoni et al., 2021	Italy	64	2015-2018	477	74
Maziane et al., 2018	Morocco	12	2015	494	71
Vlachogianni et al., 2019	France	5	2018	505	90
Papachristopoulou et al., 2019	Greece	62	2017-2018	619	88
Vlachogianni et al., 2019	Italy	3	2018	636	90
Vlachogianni et al., 2019	Algeria	17	2018	**872**	75
Vlachogianni et al., 2019	Croatia	3	2018	2681	90

ENVIRONMENTAL IMPACTS OF PLASTIC POLLUTION

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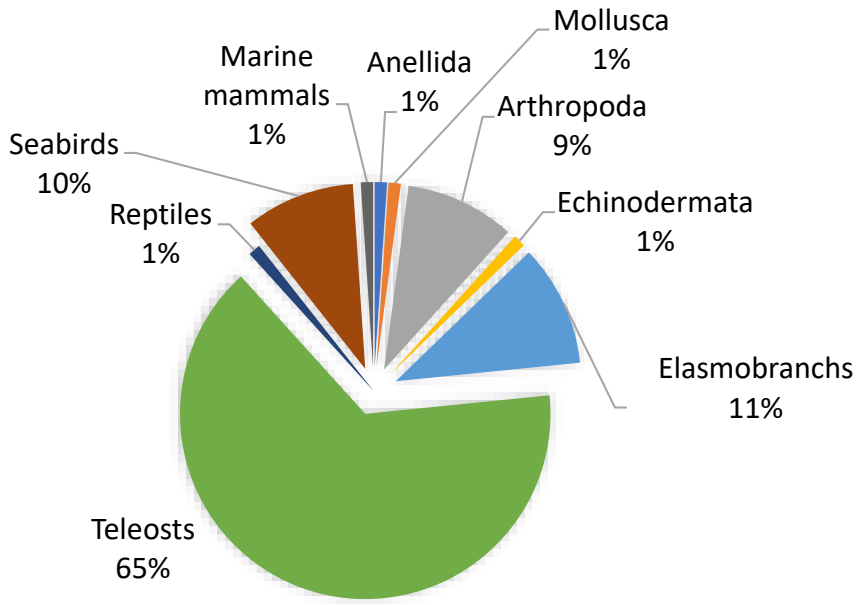
Plastic pollution pose a threat to wildlife and ecosystems with impacts varying from **entanglement** and **ingestion**, to **bio-accumulation** and **bio-magnification** of toxics either released from plastic items or adsorbed and accumulated on plastic particles; facilitation of **introduction of invasive alien species**; **damages to benthic habitats** and communities (e.g. through abrasion of coral reefs from fishing gear, disruption of colonies, reduced oxygenation or 'smothering' of communities)

PERCENTAGE OF SPECIES INVESTIGATED AMONG DIFFERENT TAXA FOR MARINE LITTER INGESTION IN THE MEDITERRANEAN SEA



Source: Vlachogianni, et al., 2018. State-of-the-art methods to monitor marine litter and its impacts on biodiversity. Interreg Med Plastic Busters MPAs project.

HUMAN HEALTH IMPACTS OF PLASTICS

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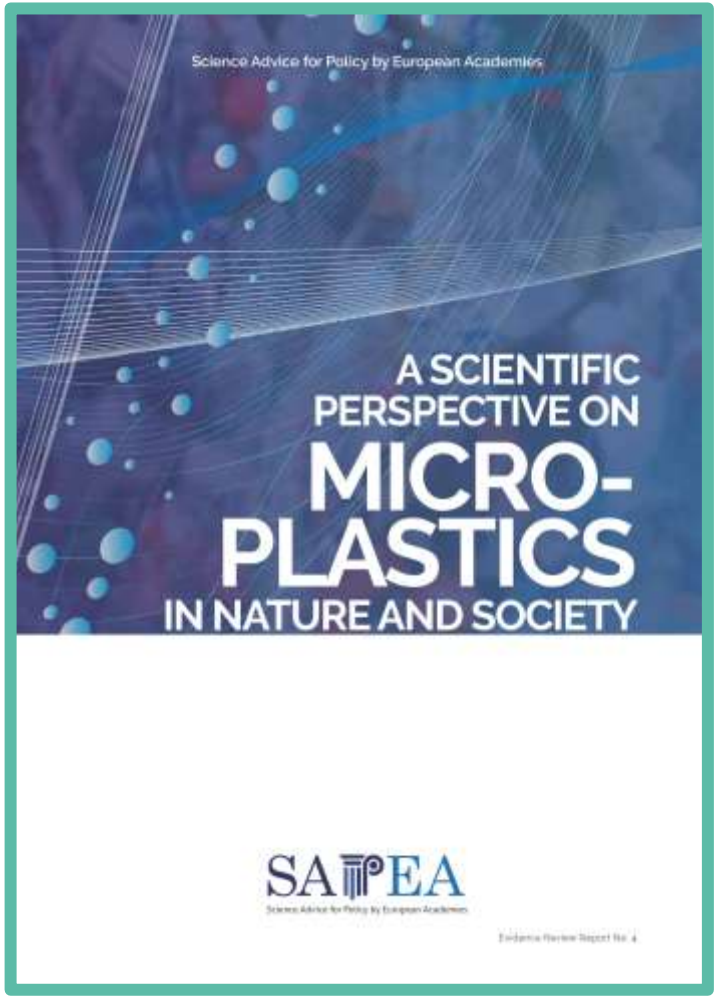
in the ENI Southern Neighbourhood region

Humans are exposed to a large variety plastics (micro, nano) through inhalation, ingestion, and direct skin contact, all along the plastic lifecycle

Basic toxicological data on the consumption of microplastics and nanoplastics by humans for a food risk safety assessment are lacking

MICROPLASTICS – WHAT DO WE KNOW?

- A lot is already known about microplastics, and more knowledge is being acquired, but some of the evidence remains uncertain and it is by its nature, complex (for instance, differences in size, shape, chemical additives, concentrations, measurements, fates, unknowns, human factors, actions).
- There is a fair knowledge of microplastics concentrations for freshwaters and the ocean surface, but little is known about concentrations and implications of microparticles below the ocean surface.
- Most microplastics go in and out of most organisms, and as with many chemicals, 'the poison is in the dose'. Most effect studies are performed using concentrations that are much higher than those currently reported in the environment, or using very small microplastics for which limited exposure data exists, or using spherical ones which are not representative of real-world types of particles, or using relatively short exposure times. Currently, it is not known to what extent these conditions apply to the natural environment. This limits the reliability of the risk assessments.



PLASTICS & CLIMATE CHANGE

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- Plastic contributes to greenhouse gas emissions at every stage of its lifecycle, from its production to its refining and the way it is managed as a waste product.
- According to the 2019 CIEL report "Plastic & Climate: The Hidden Costs of a Plastic Planet" by 2050, the greenhouse gas emissions from plastic could reach over 56 gigatons—10-13 percent of the entire remaining carbon budget.

KEY LEGISLATIVE FRAMEWORKS RELATED TO MARINE PLASTIC POLLUTION

KEY LEGISLATIVE FRAMEWORKS

EU	Barcelona Convention
Marine Strategy Framework Directive	Ecosystem Approach
Plastics Strategy	Regional Plan for Marine Litter Management in the Mediterranean
Single-Use Plastics Directive	

BARCELONA CONVENTION: POLICY ADVANCES FOR MARINE LITTER

COP22 Antalya Ministerial Declaration: Leaving a Pollution and Litter-free Legacy

Updated Regional Action Plan on Marine Litter Management in the Mediterranean

Mediterranean priority list of SUPs per group of items

List of Chemical Additives of Concern Used in Plastic Production

2021 Baseline Values and Threshold Values for IMAP Common Indicator 22

MEDITERRANEAN PRIORITY LIST OF SUPS

Group of items	Items
Packaging	Bags
Smoking-related	Cigarette filters
Food and beverage packaging	Drink bottles, caps and lids, crisp packets and sweet wrappers
On-the-go food and beverage packaging	Cutlery, plates and trays, straws and stirrers, drinks cups and cup lids, food containers including fast food packaging
WC flushed items	Sanitary applications, including cotton buds, wet wipes and sanitary towels
Personal protective equipment	Masks and gloves

THRESHOLD VALUE FOR IMAP COMMON INDICATOR 22

Threshold value means a value or range of values that allows for an assessment of the quality level achieved for a particular criterion, thereby contributing to the assessment of the extent to which good environmental status is achieve.

130 items/100m

THE EUROPEAN THRESHOLD VALUE FOR BEACH MACROLITTER

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A beach litter threshold value has been adopted at EU level

< 20 litter items for every 100 metres of coastline

Good Environmental Status

MSFD GES TECHNICAL GROUP ON MARINE LITTER

MARINE LITTER IN THE MEDITERRANEAN: KEY FIGURES

Mediterranean-wide 659 items/ 100m beach

UNEP/MAP IMAP

Beach macrolitter threshold = 130 items/100 m beach

5x exceeded

EU MSFD

Beach macrolitter threshold = 20 items/ 100m beach

33x exceeded

Mediterranean coastal & marine protected areas

EU MSFD

Beach macrolitter threshold = 20 items/ 100m beach

7 – 147x exceeded

UNEP/MAP, 2021. Updated Baseline Values and Proposal for Threshold Values for IMAP Common Indicator 22. UNEP/MED WG.509/11

Fossi et al., 2022. Report on the results and findings of the piloted harmonized marine litter monitoring approach in Mediterranean MPAs. Interreg Med Plastic Busters MPAs project.

MARINE LITTER IN THE MEDITERRANEAN: KEY FIGURES

40-50%

of all litter collected, is generated on land (mainly from tourism/recreation and poor waste management)

Fisheries & aquaculture related litter on beaches

15%

of all litter collected on European **beaches**

Fisheries & aquaculture related litter on seafloor

of all litter collected from the **seafloor** in the Adriatic and Ionian seas (trawl surveys)

17%

High impact plastic contamination

96%

of bioindicator species (turtles, fish, cetaceans, invertebrates, etc.) ingested marine litter (incl. microplastics)

Based on 1280 samples of 46 bioindicator species

References:
UNEP/MAP, 2015. Marine Litter Assessment in the Mediterranean.
Addamo, a., Laroche, P., Hanke, G., 2017. Top Marine Beach Litter Items in Europe, EUR 29249 EN, Publications Office of the European Union, Luxembourg.
Vlachogianni, Th., Anastasopoulou, K., Fortibuoni, T., Ronchi, F., Zeri, C., 2017. IPA-Adriatic DeFishGear Project, MIO-ECSDE, HCMR and ISPRA.
Fossi et al., 2022. Report on the results and findings of the piloted marine litter monitoring approach to assess the impacts of marine litter on biota. Interreg Med Plastic Busters MPAs.

THE JOINT LIST OF LITTER CATEGORIES

Water and
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Thank you for your attention!

www. wes-med.eu