

Marine Plastics Abatement

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Foreword

Since 2015, the importance of marine ecosystems has been highlighted in Sustainable Development Goal (SDGs) No. 14, which emphasizes the need to ‘Conserve and sustainably use the oceans, seas and marine resources for sustainable development.’ A constant stream of alarming facts demonstrates that the sustainability of our oceans is under severe threat from acidification, ocean warming, eutrophication, fisheries collapses and, most notably, marine plastic pollution while over 3 billion people, or 42% of the global population, rely on oceans for their livelihoods. Marine plastic litter has become a serious global issue due to the fact that about 10 million metric tons of plastic waste generated on land enters the marine environment annually, contaminating major river basins and oceans. Plastics are also difficult to biodegrade and some types are non-degradable, resulting in accumulation rather than decomposition of plastics in the environment. One estimate predicts that by 2050, the weight of plastic waste in the ocean will be greater than the weight of fish. For this reason, in March 2022, the United Nations Environment Assembly adopted a resolution entitled, ‘End Plastic Pollution’ related to the marine environment, and negotiations for an internationally legally binding instrument will begin from the second half of 2022 onward.

In the last decade, several global/regional programs to develop innovative and practical solutions have been initiated by both the public and private sectors to tackle mismanaged plastic pollution. Among these initiatives, the ‘Osaka Blue Ocean Vision’ (OBOV) with the overarching aim of reducing additional pollution by marine plastic litter to zero by 2050 was shared at the G20 Osaka Summit in 2019, and the Government of Japan has launched the **MARINE Initiative** in order to realize OBOV. Japan’s MARINE Initiative aims to advance effective actions to combat marine plastic litter on a global scale focusing on (1) management of waste, (2) recovery of marine litter, (3) innovation, and (4) empowerment.

One of the crucial factors in translating the initiative into action is to empower all stakeholders who play a significant role in marine plastic abatement, whether governmental offices, private companies, non-governmental organizations,

reuse/recycling enterprises or small-scale waste pickers. The Ministry of Foreign Affairs (MOFA), Japan has thus supported the Asian Institute of Technology (AIT), Thailand in establishing and implementing an intensive empowerment program with an emphasis on marine plastic pollution. This initiative led to the very first one-year Master's in 'Marine Plastics Abatement (MPA)' program in the region, officially inaugurated in August 2020.

This unique program has recruited almost 100 young environmental leaders from more than 30 countries in Asia, Africa, and Latin America for training through comprehensive coursework and innovative research which will contribute immensely to realizing SDG14: Life Below Water and others such as SDG11: Sustainable Cities and Communities; SDG12: Responsible Consumption and Production; and SDG17: Partnerships for the Goals. The curriculum of the MPA program has drawn widely from up-to-date research findings, process innovations, technological advancement as well as social interventions/campaigns by experts and professionals from AIT and its partner institutions. To increase awareness and widen empowerment on this subject, it is essential to consolidate new areas of knowledge and expertise into a book which is accessible to other audiences from different sectors.

I am certain that readers of this book will come to understand not only the root causes and negative impacts on human and environmental health of the marine plastics issue, but also various means to reduce mismanaged plastics through innovative technology. They will also learn about the application of the circular economy and become familiar with innovative business models and lessons learnt from regional case studies around the world. I, therefore wish to acknowledge the authors and editors led by AIT and their respective partner universities, i.e., Thammasat University, Ramkhamhaeng University, Chulalongkorn University, Thailand for coordinating the edition and publication of this reference book. As the community of professionals grows, my personal expectation is for this book to be regularly updated to capture new evidence and scientific findings for new generations who might face and be affected by even more serious marine pollution.

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