

Outline for the progress report of UN Ocean Decade (UN22. Stem the tide of Asia's riverine plastic emission into the ocean)

1. Introduction

Background and why this programme/project is needed for the UN Ocean Decade

Marine plastic pollution has become a pressing environmental issue of global concern. Previous model-based studies estimated that most of marine plastic waste comes from Asia's rivers. Asian countries have been concerned about this widespread pollution and committed to combatting plastic pollution. The international negotiation about a global legally binding framework for addressing marine plastic pollution revealed the urgent need to improve our understanding, generate knowledge, and ultimately find a solution to this issue in the next decade.

To assist countries in developing science-based management measures and taking effective actions on riverine plastic waste, this Action will develop a better understanding of the sources, pathways, fluxes, leakage and accumulation hotspots of river plastic and microplastics via in-situ sampling, analyzing and modelling, and further inform effective waste management, support technology innovations for plastic recycling and capturing in the river, and contribute to arresting marine plastic pollution in the region.

This Action will build on the past achievement that the IOC Sub-Commission for the Western Pacific has made over the past five years in marine microplastic research and monitoring, capitalizing on the well-established regional research and monitoring network of institutions, the enhanced national and regional capacity for plastic research and monitoring, and the ever-increasing commitment of Member State to combating marine plastic pollution.

The Action will adapt sampling and analyzing methodologies to local river conditions, carry out in-situ sampling data collection, and conduct model validation, in major rivers in Asia, including Yangtze River, Zhujiang River, Mekong River, Tapi River, Brantas River, Klang River, and Kelani River. Meanwhile, the Action planned to conduct a comparative study between Asia' river and Nile River.

Based on the data, we will also identify key sources, leakage and accumulation hotspots of plastics in studied rivers and make predictions about their changes based on different management scenarios. The Action will promote local stakeholder engagement in combatting marine plastic pollution. In close consultations with partners, their institutions and NGOs, we will conduct local stakeholder engagement workshop in several hotspot areas in different countries, sharing scientific data and findings, enhancing public awareness, exploring and promote good local practices in reducing marine plastic pollution.

The Action will also support technology innovations to improve plastic waste management, recycling and capture of the plastic waste in rivers.

Capacity development will serve as integral part of the program development and implementation. This Action will further improve research capacity of countries in Asia for plastics and microplastics. To this end, citizen science, training classes/summer schools, international workshops, and exchange of scholars will be conducted throughout the project implementation. The Sub-Commission has already established a Regional Training and Research Center (RTRC) on Plastic Marine Debris and Microplastics at East China Normal University, a reputed university for coastal and estuarine environment study. This RTRC will provide training and research opportunities to serve the needs of Member States for marine plastic research. In addition, the Action will keep exploring with other stakeholder groups, in particular business sector, about any capacity building opportunity related to marine plastic pollution.

2. Timeframe and objectives

*Specific, Measurable, Achievable, Relevant, and Time bound)
What was expected to achieve over the project timeframe?*

Timeframe: 2022.06–2028.12

Overall objectives:

- (1) Develop a better understanding of the sources, pathways, fluxes, leakage and accumulation hotspots of river plastic and microplastics via co-designed field samplings, site visits, analysis, and modeling.
- (2) Catalyze management, infrastructure, technological and behavioral solutions to reduce riverine plastic waste, via the conduct of joint research, capturing and sharing of lessons learned and best practices, technology innovation, and engagement of local authorities, NGOs, business and private sectors, and other stakeholders if relevant.
- (3) Develop research capacity of young scientists and students in developing countries for marine plastic and microplastic research and monitoring.

Achievable outputs/outcomes (Time Frame):

- (1) By June 2023, a set of standardized methodology developed for riverine plastic and microplastic monitoring and flux estimate.
- (2) Starting from 2023.07, baseline studies on the status of riverine plastic pollution and countermeasures (waste management), research capacity and engagement. Pilot rivers in China, Thailand, and Vietnam.
- (3) 2023.07-2024.12, assessments on distribution and leakage hotspots, major sources, transport, fluxes of plastics and microplastics in pilot rivers.
- (4) 2023.12-2025.12, policy briefs/recommendations co-developed with local partners on combating riverine plastic pollution
- (5) By 2025.12, an Asia riverine plastic data portal (project data+ research data)
- (6) By June 2023, a training manual developed;
- (7) By 2024.12, at least 100 young scientists and students in Asia countries trained to do riverine plastic and microplastic related research.

3. Activities and progress made from 2022 to April 2023

The activities and progresses made since it was registered till April 2023

The Action was registered in April 2022. Due to the challenges posed by the COVID-19 pandemic in 2022, some elements of the work under this project have been adapted to virtual formats through online meetings. The project has progressed thanks to the effective coordination and support of the project leader and all partner organizations.

On 20 May 2022, a virtual meeting of the Ocean Decade partners was held, following the approval of the project. During the meeting, partners engaged in brainstorming and constructive discussions, and agreed on the initial priorities for the project. Subsequently, each partner thoroughly screened priority rivers in their respective countries.

A series of virtual meetings were held between 9 August and 15 October 2022 between East China Normal University and IOC-WESTPAC, to further detail the project and define clear objectives for each stage of the research. These discussions resulted in the development of a project framework document.

On December 2, 2022, we invited our partners from Thailand and Vietnam held an online discussion on river plastic and microplastic monitoring and estimation of oceanic influx. The participants shared their currently used sampling equipment and analysis methods for river plastic and microplastic observations and discussed the advantages and disadvantages of each approach, leading to a consensus on developing a unified observation method for the Decade Action.

In terms of capacity-building, the project leader is currently supporting the training of one doctoral student each from Vietnam and Thailand, and one postdoctoral researcher from Pakistan.

4. Objectives to be achieved, if applicable, over the next intersessional period (May 2023-April 2025)

- (1) By June 2023, a set of standardized methodology developed for riverine plastic and microplastic monitoring and flux estimate.
- (2) Starting from 2023.07, baseline studies on the status of riverine plastic pollution and countermeasures (waste management), research capacity and engagement. Pilot rivers in China, Thailand, and Vietnam.
- (3) 2023.07-2024.12, assessments on distribution and leakage hotspots, major sources, transport, fluxes of plastics and microplastics in pilot rivers.
- (4) By 2024.12, at least 100 young scientists and students in Asia countries trained to do riverine plastic and microplastic related research.

5.Planned activities for May 2023- April 2025

- (1) In April 2023, hold an international workshop (Online or in person), discussing the harmonized methodology for riverine plastic and microplastic monitoring as well as pilot monitoring sites.
- (2) In June 2023, first monitoring training for the riverine plastic and microplastic sampling, sample process and analyzing.
- (3) In July 2023, Dec 2023, conduct field sampling in at least three pilot rivers and finish the sample analyze and data process by Dec 12, 2024.
- (4) In May 2024, hold an international workshops to share experiment and discuss the progresses made.
- (5) In October 2024, hold another training workshop on the transport of plastic and MPs in rivers.
- (6) In April 2025, hold a workshop to share and discuss the progresses the Action has made.

[provide, in tabular form, the action items that should be included in the work plan and budget]

Program					Funding Required		Remark
	Activities	Objectives	Expected outputs/outcomes	Date and place	IOC	Other sources (i.e., from national or international)	
	1. International workshop on harmonizing methodology for riverine plastic and microplastic monitoring	Develop standardized methodology for riverine plastic and microplastic monitoring and flux estimate.	A set of standardized methodology developed for riverine plastic and microplastic monitoring and flux estimate.	April 20 th , 2023 Online	0	20,000 RMB From East China Normal University	
	2. Training workshops for the riverine plastic and microplastic sampling,	Based on the methodology established, train young scientists and students in the Asia-Pacific region on the using of the methodology	At least 50 young scientists and students will be trained.	June 26-28 th , 2023 Sanya, Hainan, China	0	50,000 RMB From East China Normal University	
	3. Filed sampling in pilot rivers	Collect <i>in situ</i> riverine plastic and microplastic data in pilot rivers	At least three pilot rivers will be sampled and the data will be obtained.	July 2023, Dec 2023, Selected pilot rivers	0	100,000 RMB From East China Normal University	
	4. International workshop	Share experiences and discuss the project progresses; Make plan for the future.	A project progress report	May 2024 Sanya, Hainan, China	Depends on IOC's budget	50,000 RMB From East China Normal University	
	5. Training workshop on the transport of plastic and MPs in rivers.	Train young scientists and students in the Asia-Pacific region on the modeling the transport of plastic and microplastic in rivers.	At least 50 young scientists and students will be trained.	Oct 16-18 th , 2024 Sanya, Hainan, China	0	50,000 RMB From East China Normal University	

Program					Funding Required		Remark
	Activities	Objectives	Expected outputs/outcomes	Date and place	IOC	Other sources (i.e., from national or international)	
	6.International workshop	Share data, experiences and discuss the project outcomes	Project Tire 1 report	May 2024 Sanya, Hainan, China	Depends on IOC's budget	50,000 RMB From East China Normal University	