

# Partnerships for plastic pollution control in the Yangtze River

Strengthening coordination using the River Chief System

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## Publication brief

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### About this publication:

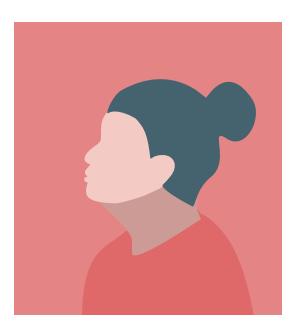
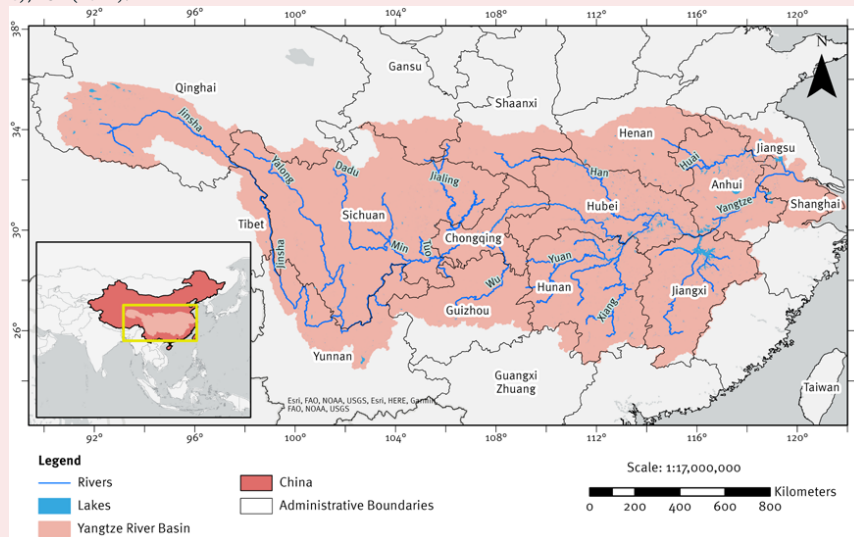
This paper explores the untapped potential of the River Chief System (RCS) as a multi-stakeholder partnership mechanism to enhance the coordination of plastic and microplastic pollution control and monitoring in the Yangtze River.

### Plastic pollution in the Yangtze

Currently, 5.25 trillion plastic particles weighing 260,000 tonnes are floating at sea, the majority of which come from rivers (Cohen et al., 2019). The Yangtze River is one of the world's biggest basins, with a very high amount of mismanaged plastic waste generation (Meijer et al., 2021). The Yangtze River Economic Belt accounts for over 40 percent of China's population, and represents 37 percent of China's output of primary plastics (National Bureau of

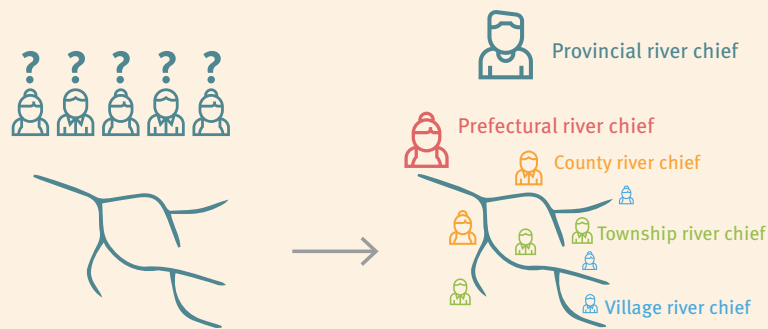
Statistics of China, 2020). An estimated 540–910 tonnes of microplastic flow through the surface layer of the Yangtze estuary into the ocean each year (Zhao et al., 2019). The plastic waste discharged in the Yangtze is transported via several environmental media, including surface runoff, agricultural activities, and effluents from industrial and domestic wastewater.

**Figure 1.** Map of the Yangtze River Basin. **Source:** Lehner and Grill (2013); United Nations Office for the Coordination of Humanitarian Affairs (OCHA) (2020); Esri (2022).



## Applying the River Chief System for enhancing plastic pollution control

**Figure 2.** The River Chief System mechanism. **Source:** Xu (2017).



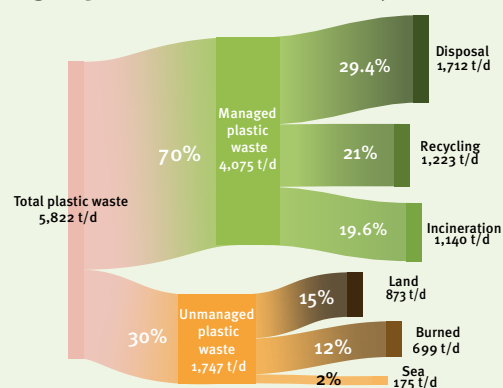
The RCS is an organisational structure that was introduced in the early 2000s as an experiment to support the protection and environmental management of rivers and lakes in China. The RCS relies on a five-level organisational structure of river chiefs: provincial, municipal, county, township, and village. River chiefs at different levels are assigned to take responsibilities for the management and protection of rivers and lakes in their jurisdictions. The river chiefs act as coordinators between different departments for

issues related to water resource protection, river and lake shoreline management and protection, water pollution prevention, water environment governance, water ecology restoration, and law enforcement and supervision. The RCS was initially piloted and successfully implemented to support the rejuvenation of Lake Taihu and the Chishui River in the early 2000s. In 2016, it was promoted by the central Government to be implemented across the country. By the end of 2018, China accounted for more than 1.23 million river chiefs.

## Material flow analysis

To obtain a good technical understanding of the problem, we first conducted a material flow analysis (MFA) in Anhui Province in the lower catchment of the Yangtze Basin. The MFA helped us to obtain a detailed understanding of the main consumption, disposal, and management patterns of plastics in a typical segment of the Yangtze. Our findings confirm that a large proportion of plastics are still unmanaged, ending up in the Yangtze, and ultimately in the ocean. Our model suggests that a total production of plastic waste from Anhui Province alone is 5,822 tonnes/day, of which 2 percent (175 tonnes/day) ends up in the ocean.

**Figure 3.** Plastics material flow analysis result.



## Institutional analysis

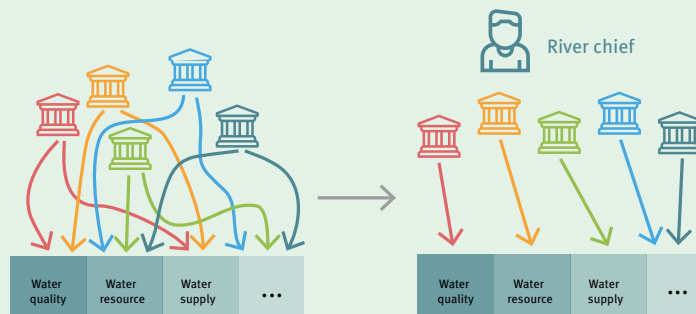
In parallel with the MFA, we conducted an institutional analysis to understand the governance and regulatory gaps in controlling plastic pollution. The analysis points to a need for the following:

- **Legal coherence**, given that some laws and regulations are overly wide and punitive actions are unclear, and the legislation is not stringent enough to regulate plastic pollution.
- **Regulatory enforcement**, as the prevention and control of plastic focuses on reducing production and consumption, but regulations insufficiently take into account other middle stages of the life cycle.
- **Departmental cooperation**, as multiple management units have responsibility with unclear and overlapping obligations, which leads to buck-passing and waste of public resources.
- **Regional coordination**, given that fragmentation between different provinces causes a dynamic whereby upstream pollution needs to be treated downstream.
- **Monitoring and assessment**, since inadequate monitoring and lack of technical specifications at the national or watershed level hampers efforts to control plastic waste and microplastics.
- **Corporate engagement and public participation**, as there is currently insufficient cooperation between the government, the private sector, and/or civil society in the fight against plastic pollution.

### Key recommendations to apply the RCS to enhance plastic pollution control.

An in-depth analysis of the RCS was conducted to examine its potential to enhance plastic pollution monitoring and control. The analysis revealed that the RCS can contribute to multi-level coordination, cross-sectoral collaboration, and enhancing participation from enterprises. The RCS was additionally proven to be context-dependent, results-oriented, and characterised by adaptive management, which all reinforced its position as a suitable mechanism for ensuring coordination in relation to plastic pollution monitoring and control.

**Figure 4.** The river chief as a coordinator of different departments. **Source:** Xu (2017).



Recommendations put forth to guide the improvement of multi-stakeholder coordination under the RCS for better plastic pollution control in the Yangtze River include:

- Strengthening interdepartmental cooperation for strict control of plastic pollution throughout the whole process
- Establishing a special coordination mechanism for the control of plastic pollution
- Establishing a monitoring, evaluation, and information-sharing mechanism for plastic pollution in the basin
- Building an improved enforcement and regulatory mechanism to strengthen the joint inspection and regulation of plastic pollution
- Integrating plastic pollution monitoring and control into existing environmental management systems and introducing a plastic pollution fee.

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