



Plastic Pollution and Its Management Strategies in Yangtze River Basin

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Contents

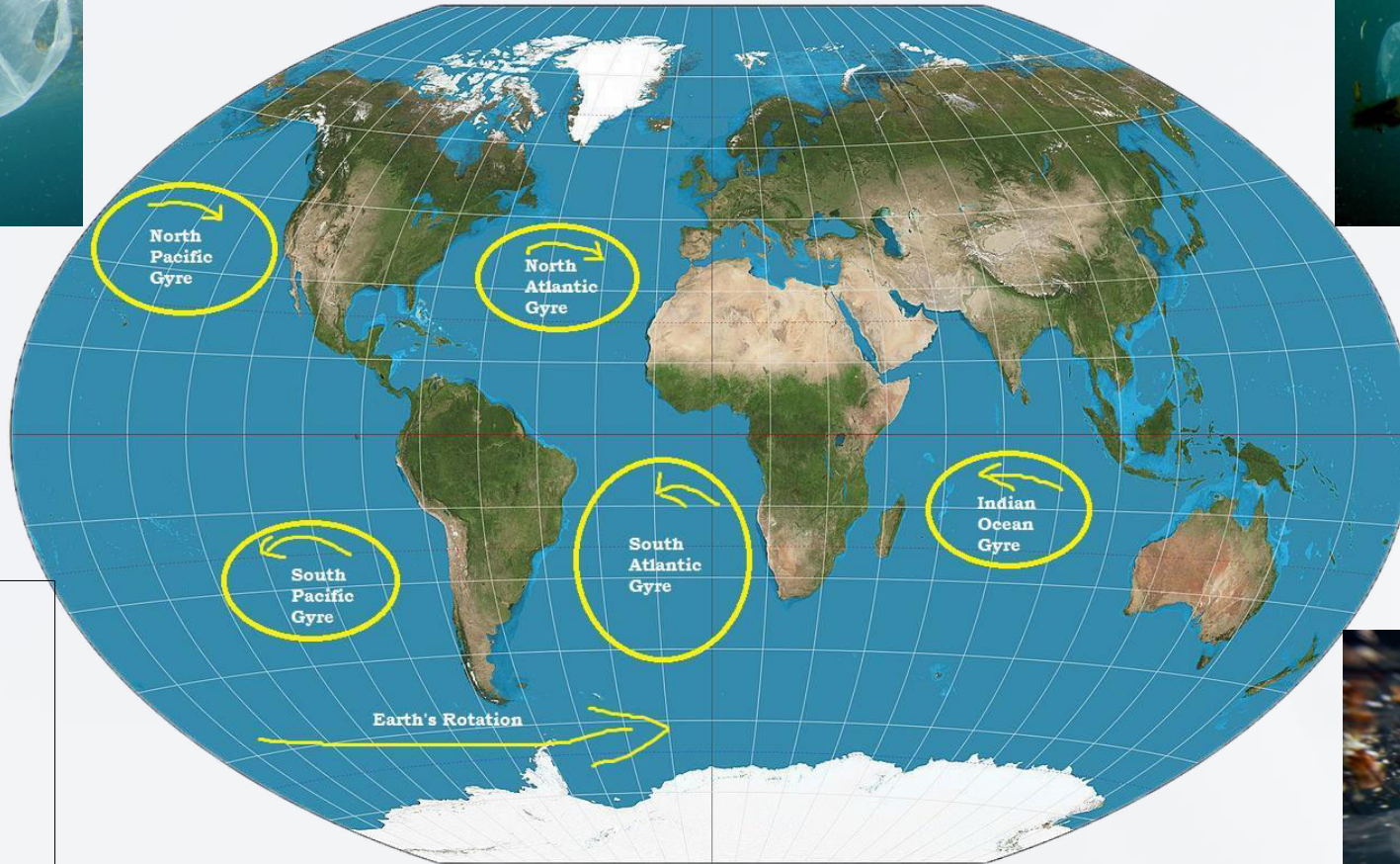
- Plastic pollution in Yangtze River
- Actions to Control Plastic Pollution ...
- Next work to Address Plastic Pollution ..



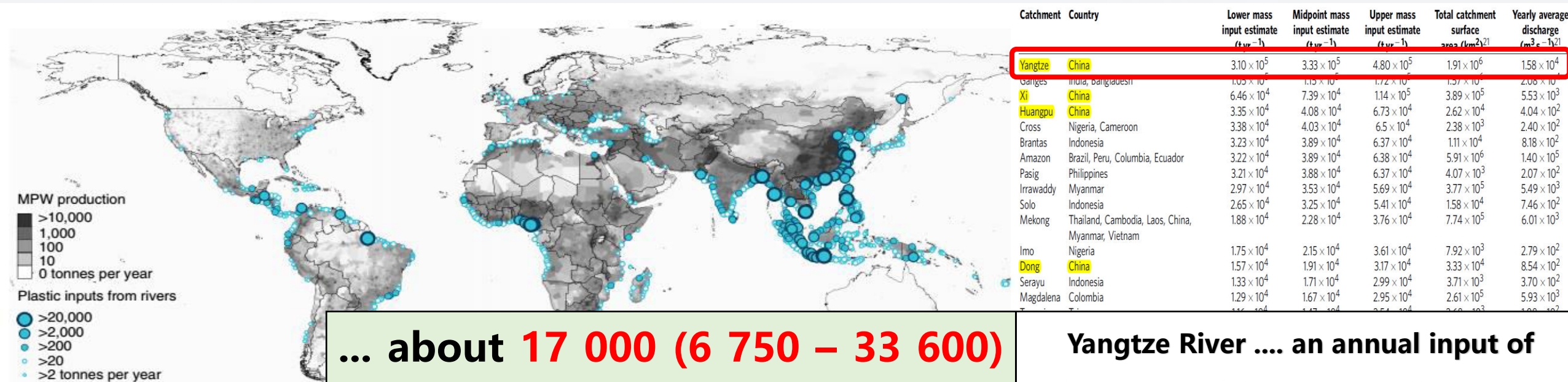
I. Plastic Pollution in Yangtze River



Plastic Pollution Is A Global Problem



Plastic Emissions From Rivers To Ocean



... about **17 000 (6 750 – 33 600) tonnes** annually (Mai et al., 2020)

Yangtze River an annual input of **330 000 (310 000 – 480 000) tonnes**

1.15 - 2.41 million tonnes of plastic waste currently enters the ocean every year from global rivers, with over 74% of emissions occurring between May and October (Lebreton et al.,

more than 1000 rivers account for 80% of global annual emissions, which range between 0.8 million and 2.7 million tons per year, ... (Meijer al., 2021)

Rivers Are Highway for Plastics into Oceans ?

TOOLS OF THE TRADE

Understanding river plastic transport with tracers and GPS

Plastic pollution in the ocean has become a key concern because of its longevity and harmful effects on wildlife and, potentially, human health. A major fraction of marine plastic is believed to originate on land and is subsequently transported via rivers. However, relatively little is known about how plastic moves in rivers because most research has focused on estimating emission, rather than understanding transfer dynamics.

Tracers are a simple tool that can be used to improve understanding of riverine macroplastic transport. Using this technique,

it is possible to determine how far plastic travels; where and what causes plastic debris to become trapped; the effect of river discharge, seasonal change in vegetation characteristics, plastic properties and other factors on plastic transport; and the residence time of plastic debris in storage. Tracers are items of plastic debris, such as single-use plastic bottles, that are introduced to rivers and their locations recorded over time. The number of tracers released and timescales before recovery vary with each experiment, but large sample sizes (>100 tracers) and long monitoring

periods (months to years) allow variability and long-term transfer dynamics to be understood. The tracers can be tagged with paint or coloured tape to ensure that they are easy to identify, and to prevent littering, tracers are subsequently retrieved from boats, bridges or the riverbank using fishing nets. More sophisticated tracers contain GPS trackers, providing high temporal resolution data on tracer location. They are limited, however, by poor spatial accuracy (typically around 5 m) and relatively high procurement and running costs. Additionally, there is a trade-off between battery life and frequency of signal acquisition.

Tracer experiments show that macroplastic debris moves slowly and intermittently in rivers. Many items appear to be retained in freshwater systems and might never make it to the ocean. This information was initially surprising and it suggests that current estimates of riverine plastic flux to the ocean may have been overestimated. Elsewhere, tracer data can be used to inform numerical models that simulate the transport of plastic debris in rivers. The identification of accumulation hotspots can also allow mitigation efforts to be more focused and prioritized.

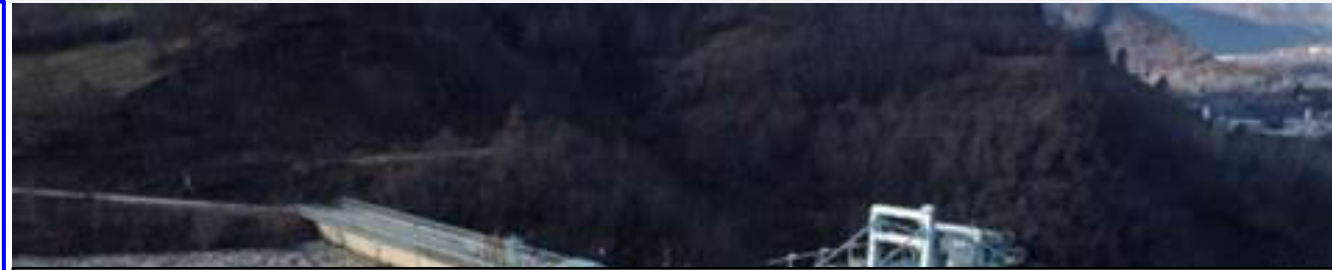
Robert Newbould

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Competing interests



... current estimates of riverine plastic flux to the ocean may have been overestimated (Newbould, 2021)



the sedimentation behind dams is one sink for microplastics in river systems



Science of The Total Environment

Volume 664, 10 May 2019, Pages 834-840

The effect of dams on river transport of microplastic pollution

Lisa Watkins^a, Susan McGrattan^a, Patrick J. Sullivan^b, M. Todd Walter^a



1.15 and currently e rivers, wit between M

II. Actions To Control Plastic Pollution in Yangtze River



English ▾

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China unveils 5-year plan to control plastic pollution

Source: China Daily 2021-09-23
Font Size: [S M L] [Print] [Close]

BEIJING -- China on Wednesday unveiled a plan on controlling plastic pollution over the next five years, aiming to effectively curb white pollution by 2025.

1. Implementation of National Actions

- **Notice of the General Office of State Council on Restricting the Production, Sale and Use of Plastic Shopping Bags (“Restriction On Plastic Bags” , 2008.10.1)**
- **Water Pollution Prevention and Control Action Plan (2015)**
- **Prevention and Control of Pollution from Ship and Ports Plan (2015-2020)**
- **Soil Pollution Prevention and Control Action Plan (2016)**
- **Release of the Opinions on Promoting the River Chief System in an All-Round Way (2016)**
- **Implementing Program for Prohibiting the Entry of Foreign Refuse to Promote the Reform of the Solid Waste Import Management System (2017)**
- **Three-year Action Plan For Rural Environment Governance (2018-2020)**
- **Implementation of the Plan for Pilot Development of Solid Waste-Free Cities (2019)**
- **Opinions on Further Strengthening Plastic Pollution Control (2020)**
- **Notice on Solidly Promoting Plastic Pollution Control (2020)**
- **14th Five-Year Plan for Plastic Pollution Control Action (2021-2025)**
-

14th Five-Year Plan for Plastic Pollution Control Action

(2021-2025)

Measures
for
sources
of
pollution

Target
for

Defining
measures

Measures
for
**collection,
disposal
and
recycling**

Target
for

Defining
measures



Prevent plastic waste harmness

...ing retailing, e-commerce,

...ackages

...ds for single-use and other

...al impact of materials such
...op necessary standards for

...household waste in cities at
...of plastic waste collection

...about 800,000 tons per day

...an increase of agricultural

...of waste is adopted more

...to enhance the capacity to

Domestic Waste Classification System in Chongqing City

共建美好家园 垃圾分类从我做起

垃圾袋扫码身份识别

投放准确鉴别

满溢报警

IC卡身份识别

安全监控

空气质量监测和远程除臭

计算给予投放者现金余额

定位

自动称重

APP二维码身份识别

安全监控、空气质量监测和远程除臭、定位

An Individual Plastic Waste Recycling Enterprise



XVIII
World Water Congress
International Water Resources Association (IWRA)



Abandoned woven bags
(polypropylene, PP)

20 000 tonnes/year

2. Implementation of the Regional Actions

- **Clearance Action in Yangtze River Basin (2018)**
 - **In 2018, 150 inspection groups inspected the waste dumping specially along Yangtze River, 1308 problems about solid waste dumping were found and amended**
- **Yangtze River Protection Law (2021)**
- **14th Five-Year Plan for Implementation of Plastic Pollution Control in Yangtze River Economic Belt (2021)**
- **Action Plan to Further Advance the Ecological and Environmental Protection and Restoration of the Yangtze River Basin (2022)**



首页 > 政务公开 > 政府信息公开目录 > 政策文件



> 其他文件

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[体裁分类]	其他公文
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关于开展重庆市江河水域清漂专项行动的通知



Clearance in Three Gorges Reservoir



Clearance in Tributaries

Clearance in back of dam

3. Establishing the National Joint Research Center of

Yangtze River Eco-Environment Protection and Restoration

- **269** research institutions , universities, colleges, ...
- More than **5000** scientists ...
- **58** cities along Yangtze river ...
- Platforms for Scientific and Technological Innovations and Demonstration application



4. Joint Actions for Controlling Plastic Pollution in Yangtze River



Governments



Yangtze River



Citizens



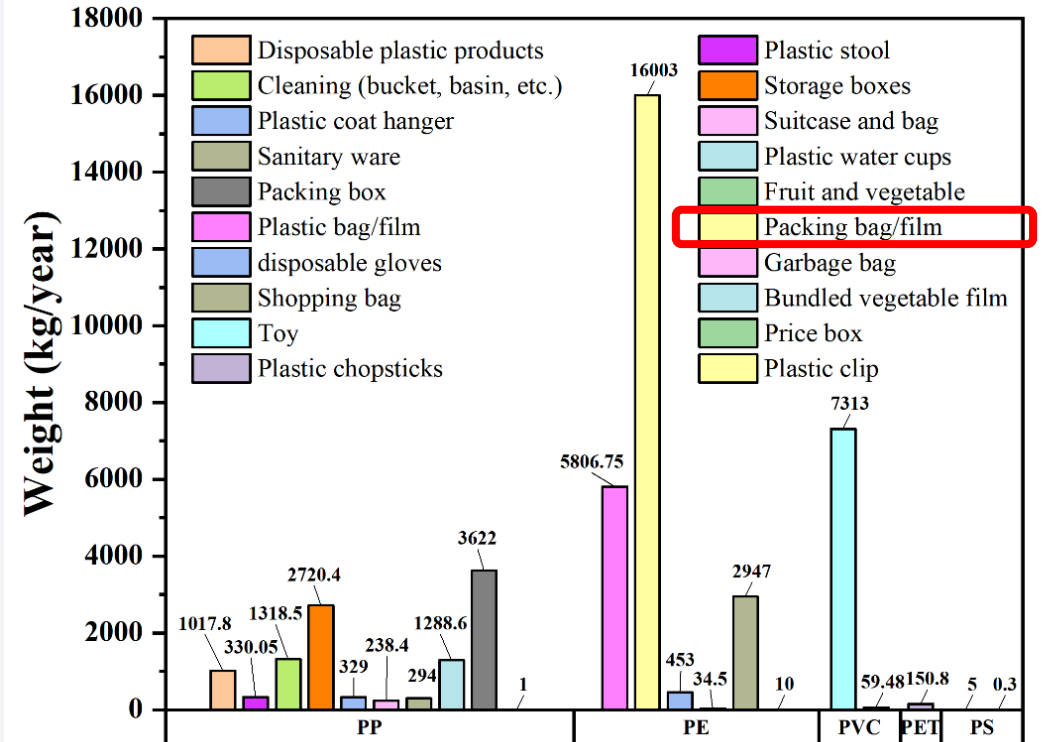
Plastic Pollution Treatment in Fujian Mulan River Basin



TA-9753 PRC: Preparing Environmental and Rural Development Projects
Fujian Mulan River Basin Integrated Ecological and Management Project
(53042-001)

Knowledge Product

An Analysis of the Potential for Plastic Pollution Control in
Xianyou County with Policy Recommendations



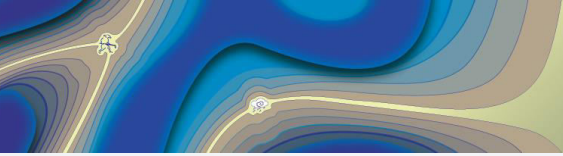
Sales consumption of plastic products
in supermarkets in Xianyou County

- Increase collection and disposal of domestic garbage and urban sewage
- Enhance publicity and public participation
- Manage the whole life cycle of plastics
-

III. Next Plan To Address Plastic Pollution in Yangtze River



- **To further implement the national and local actions on plastic waste control and management, such as cleaning floating wastes in rivers**
- **To strengthen scientific & technological support for preventing plastic wastes and microplastics into rivers from sources**
- **To strengthen school-community collaboration**
- **To strengthen cooperations with all stakeholders, including international and regional cooperations**
-



Thanks

