

How can we reduce marine plastic pollution from the river?

A case study in the Hozu-river in Kyoto, Japan.

OSAKA UNIVERSITY OF COMMERCE

NPO PROJECT HOZUGAWA

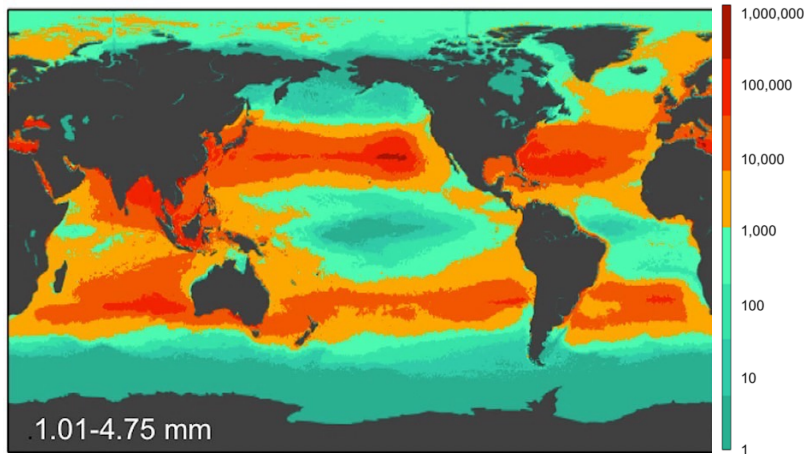
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Outline

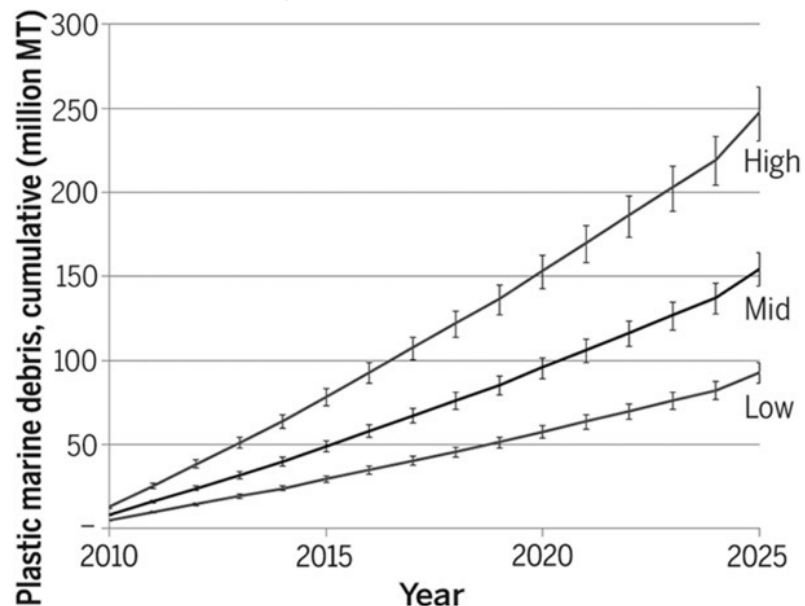
- River Litter : Major Source of Plastic Pollution in the Ocean
- Reduce **Marine Litter** from Inland Area :
 - Case Study in the **Hozugawa** River, Kyoto.
 - River Litter **Mapping** Project : Visualize and Analyze the garbage problem
 - **3 steps** to organize clean-up activities and building social institutions.
- Other Issues and Forward Agenda

- *Key Words: WEB-GIS, Community Based Research, Plastic bag ban, Plastic pollution*

Marine Plastic Pollution



Eriksen M, Lebreton LCM, Carson HS, Thiel M, Moore CJ, et al. Mar. Pollut. Bull. 2013; 77: 177-182



In order to prevent plastic pollution of oceans and rivers, it is essential to understand how much plastic litter leaks into the environment and how it enters the ocean through rivers.

- However, there is currently insufficient data on the existing amount of plastic litter on land and in rivers.

Estimates of the amount of plastic litter leaking from land to sea.

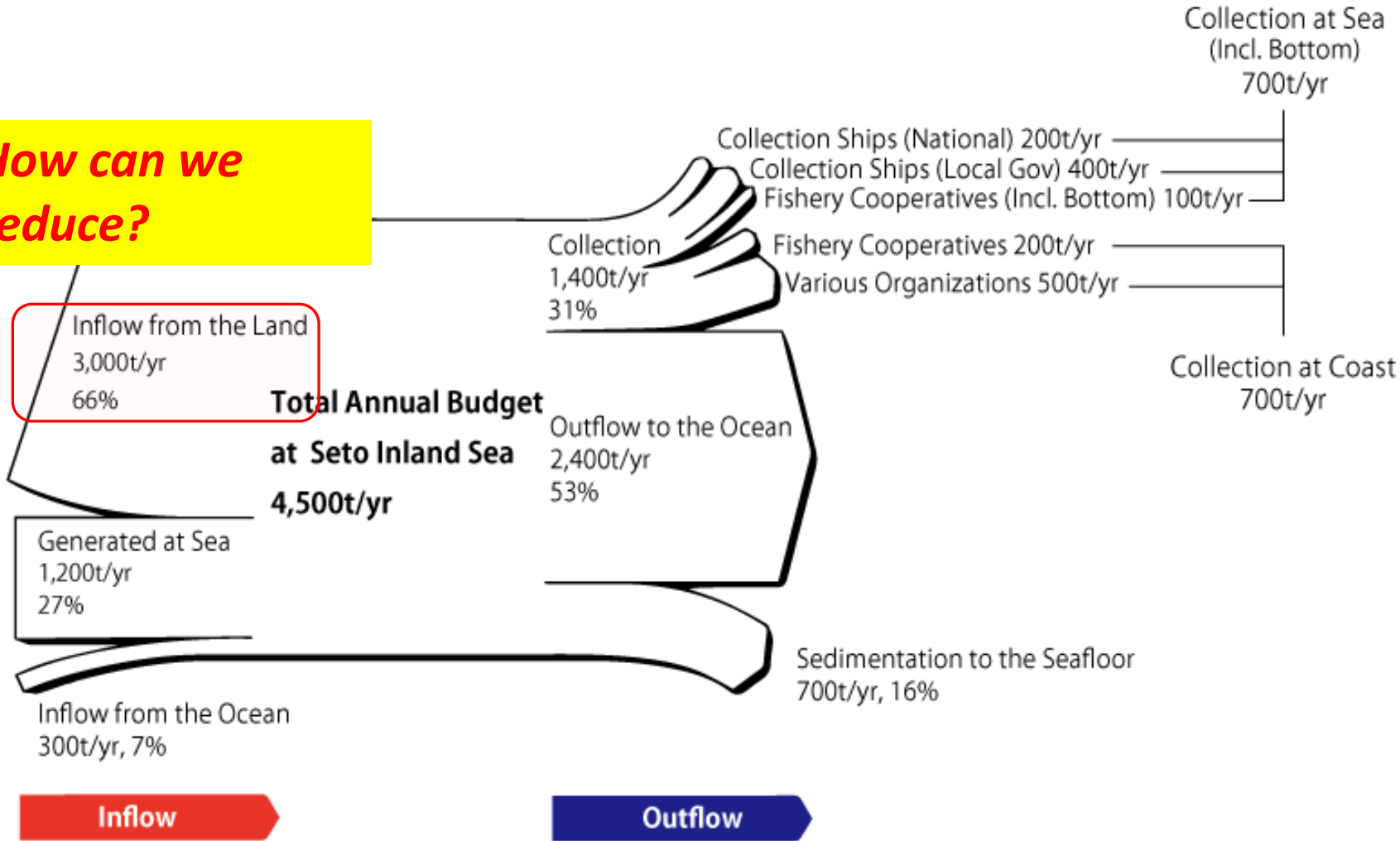
- Jambeck et al. (2015) estimated that 30 million tons of plastic litter leaks into the environment annually worldwide
- Lebreton et al. (2017) estimated that around 2 million tons of it is out to sea.

Previous studies have mainly based their estimates on waste disposal data, and none have estimated the amount of plastic litter present based on actual data on plastic litter in urban areas and rivers.

Collecting extensive data through citizen participation surveys to promote clarification of the actual situation and encourage changes in people's attitudes and behaviour.

Estimated Total Annual Budget at Seto Inland Sea of Japan

How can we reduce?



Fujieda et. al (2010)

Case: Kameoka City and the Hozu River

Kameoka City

- The 3rd largest population in Kyoto Prefecture: 87,090 (Jan 1, 2023).
- Basin surrounded by mountains, with the Hozu River running through the city.

Hozu River

- One of the largest river systems in Japan, the Lake Biwa-Yodo River system.
- Located approximately 70 km upstream from Osaka Bay.
- One of of Kyoto's most famous tourist spots, River Boat Cruise and Arashiyama.







3 Steps to the Solution: Citizen Science

1. Monitoring River Litter with Community People

- Create a solution that makes the clean-up day happen.
- Map the garbage in the river by simple app and web solutions.
- Data collected and keep it updated by community people.

2. Visualization by WEB-GIS and Data Analysis.

- Visualize the garbage problem and make people understand it.
- Planning the cleanup activities in the communities and connect them.
- Opportunities for scientists, educators, organizations to analyze the data, look for patterns, seek for trends and make a policy.

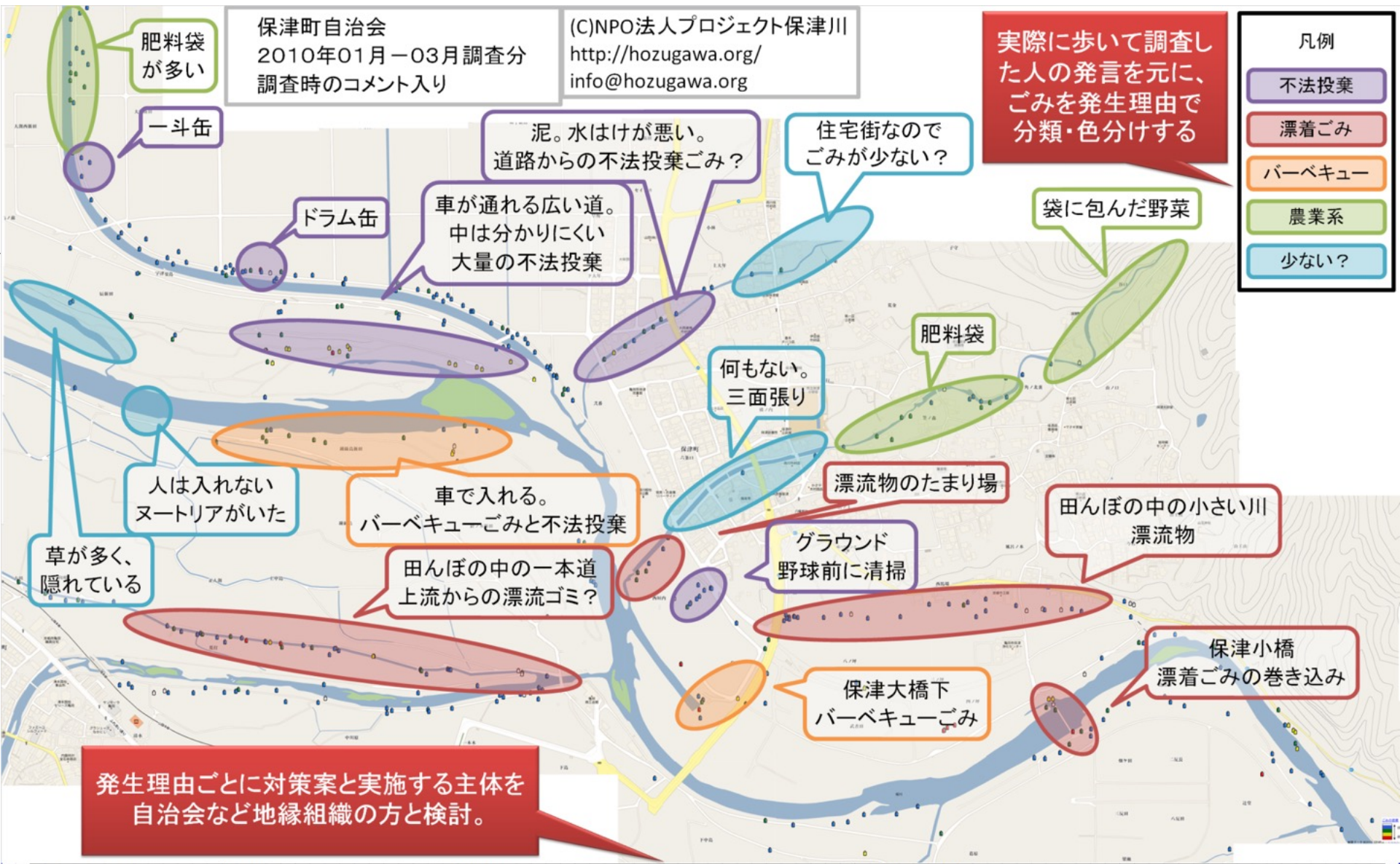
3. Let's Start Clean-up and Keep Do It!

- Increasing public eco-awareness and regional initiatives.



River Litter Mapping System





ゴミの種類	概要	対策案	実施主体案
不法投棄	そこで捨てた	看板設置。監視カメラ設置。	
漂着ごみ	流れ着いた		
バーベキューごみ	遊びに来て捨てた		
農業系ごみ	仕事	農家の方に現状を知ってもらう?	
少なく見えるところ	無い? 見えない?		

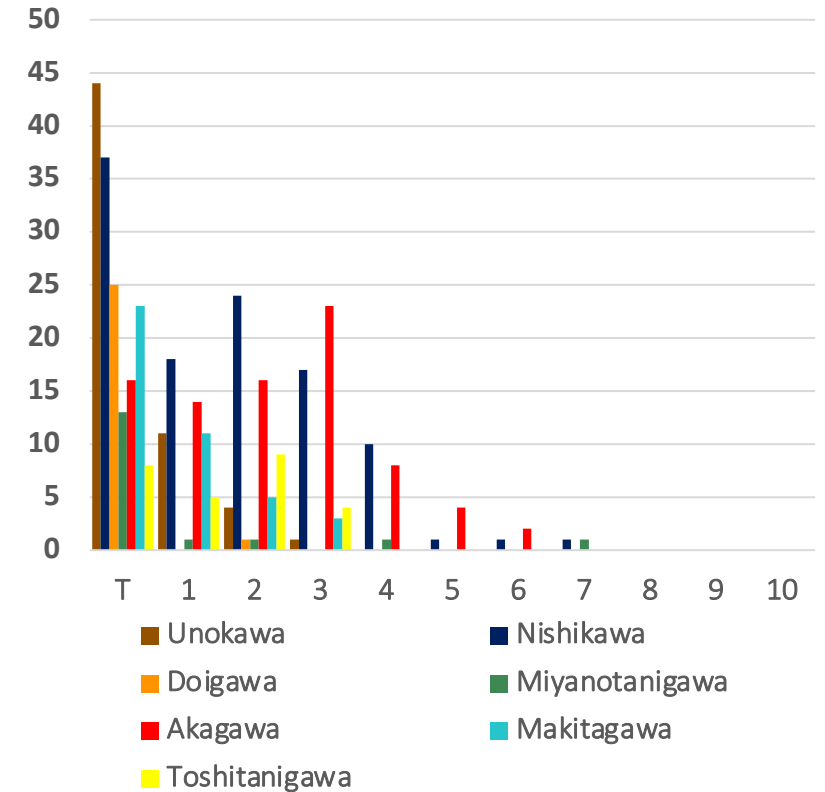
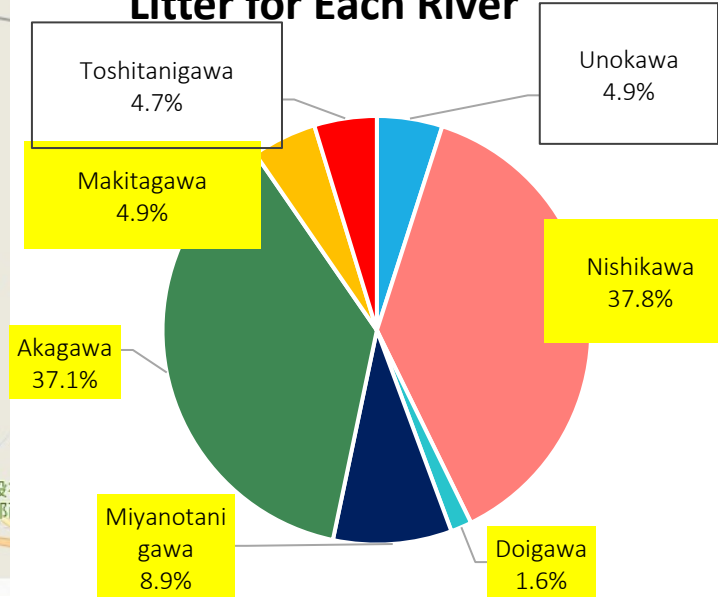




Distribution of litter in 3 rivers in Shino-cho area, Kameoka.



Ratio of the Amount of Litter for Each River

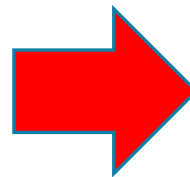


90.3% of garbage was concentrated in Nishikawa riv. System.

After the Monitoring...



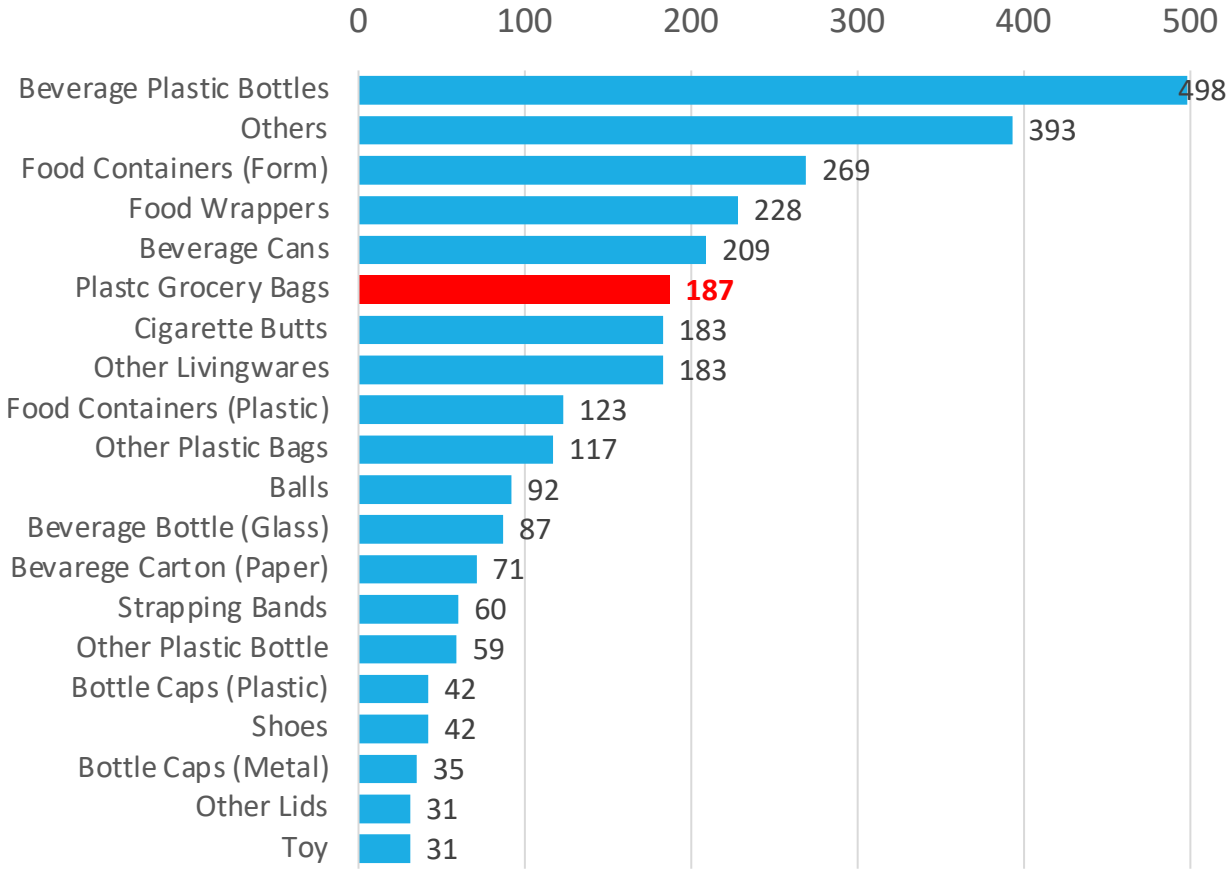
20L bag × **190**
lots of bulky garbage
(2011.1)



20L Bag × **10**
no bulky garbage
(2016.8)



Top 20 Items Collected in the Hozu River (2012-2019)



Garbage Survey of Hozu River by Kids Marine Litter Detective Team

Cleanup and research activities at the sea and rivers for elementary school students and their guardians during summer vacation.

Kameoka Zero Plastic Waste Declaration

Dec. 13, 2018

4th declaration by local government in Japan
➤ 1st municipality **not facing the sea**

Goals (excerpt)

- ① To make all stores offer plastic bags for a charge, in order to first **eliminate plastic bag usage**, and proceed with efforts that aim for **a 100% complete switch to eco-friendly bags**.
- ③ To **collect 100% of all plastic waste** that is currently being generated while aiming for sustainable resource **recycling** within the region.

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Kameoka city in Kyoto Pref. becomes 1st local body to seek to end plastic waste

December 13, 2018 (Mainichi Japan)

Japanese version



Kameoka Mayor Takahiro Katsuragawa, third from right, shows off the "Kameoka zero plastic waste declaration" in Kameoka, Kyoto Prefecture, on Dec. 13, 2018. (Mainichi/Yoko Kunimoto)

KAMEOKA, Kyoto -- The city of Kameoka in this western Japan prefecture became the nation's first local body on Dec. 13 to declare that it will strive to completely get rid of plastic waste.

[\[Related\] Austria to ban most plastic bags starting in 2020](#)

[\[Related\] Japan lagging in measures to curb plastic waste despite int'l support pledge](#)

[\[Related\] Environment Ministry compiles targets to combat single-use plastic pollution](#)

The municipal government and assembly released the "Kameoka zero plastic waste" declaration with a plan to enforce an ordinance banning local retailers from handing out plastic shopping bags for one time use by fiscal 2020. The city government is even considering introducing penalties for violators.

No other local body in the country has enacted a similar ordinance while the central government is poised to require retailers to charge customers for plastic shopping bags.

Kameoka City Banned the Plastic Bags (Jan 1, 2021)



NATIONAL | BEYOND TOKYO

As the world drowns in plastic, Kameoka in Kyoto and other cities across Japan fight back



Local efforts to clean up the Hozu River in Kameoka, Kyoto Prefecture, started in the 1990s and continue today. | COURTESY OF PROJECT HOZUGAWA

Japan's First Plastic Bag Ban Ordinance



Prohibited from **Free Distribution** except Permitted bags (Non-petroleum based and biodegradable).

Conclusion

No single approach that can solve plastic pollution.

A lot of time and cost for government regulations to be enacted.

- Combine of **social action**, **legislative** and **collaborative approaches** that respond problems.
- **Effective action** at the national, local, regional, corporate, and individual levels.
- **Shared values** from the local to the international level are needed.