

PLASTIC-FREE RIVERS

Strategies to tackle litter and microplastics in Amersfoort's canals and the Eem River, the Netherlands

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The challenge: plastic pollution

Plastic pollution is everywhere, in all **aquatic habitats and even in the human body** (1, 2), impacting ecosystems, human health, and infrastructure (3). 80% of this waste **originates on land**. From human activities, plastics enter the local stream, are **transported by rivers**, accumulate in the ocean and degrade into microplastics, particles smaller than 5 mm. The plastic problem is a local-global 21st-century challenge with **microplastics as an invisible pollutant**.



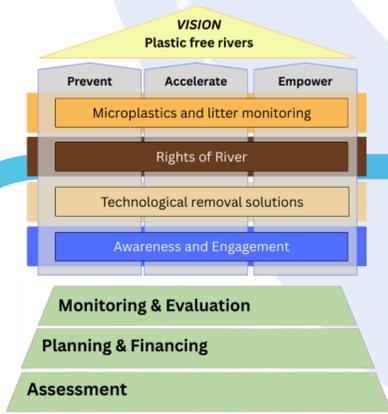
In collaboration with the Municipality of Amersfoort and the Water Board, this research aimed to determine **pathways to reduce plastic pollution in Amersfoort's urban canals and the Eem River**.

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SCAN ME



The **Clean River Model** was adapted to form the base framework for this research (4)

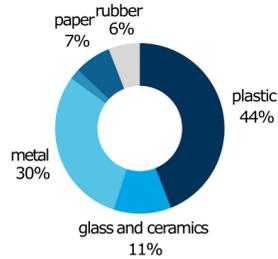
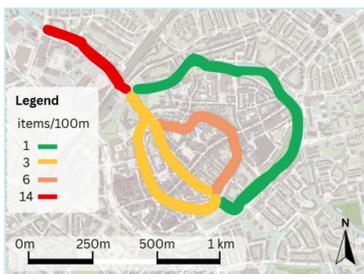


The **results were analysed and structured** using the adapted Clean River Model

Transdisciplinary methodology

<p>Microplastics Study on methods of microplastics measurement and microplastics monitoring plan</p>	<p>Litter Study on floating litter: concentrations, behaviour, and composition</p>	<p>Technologies Study on plastic removal systems, and how to select the most suitable one</p>	<p>Rights for Rivers Study on key enablers for Rights of Rivers in Amersfoort's context</p>	<p>Awareness Understanding resident awareness, behaviour and campaigns</p>
Science		Problem framing Collaborative research Exploring impact		Society

Floating litter pollution

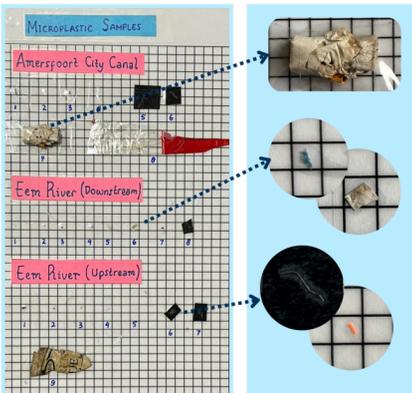


Litter mapping in Amersfoort revealed **the Eemhaven and inner centre to be the most polluted**. The dominant pollution comes from **single-use food and drink packaging**.

How to tackle this pollution?

- ▶ **Continued data collection** on the pollution to understand and prove the problem
- ▶ Implementation of technological solutions for **plastics removal**
- ▶ Implement the Rights of Rivers at municipal scale to **accelerate systemic change**
- ▶ Foster pro-environmental behaviour for **upstream plastic prevention** through resident empowerment

Microplastic pollution



±6,493 microplastic particles per km² is found in the city canals of Amersfoort

±23,589 microplastic particles per km² is found in the Eem river

Fibres and fragments are the most microplastic type found

From research to impact!

During a stakeholder workshop, a roadmap towards a plastic-free future was created.



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References

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- (3) Nur Sakinah Roslan, Yeong Yeh Lee, Yusof Shuaib Ibrahim, Sabiqah Tuan Anuar, Ku, Lisa Ann Lai, & Brentnall, T. (2024). Detection of microplastics in human tissues and organs: A scoping review. *Journal of Global Health*, 14. [https://doi.org/10.7189/jogh.14.04179\(3\)](https://doi.org/10.7189/jogh.14.04179(3))
- (4) Meaza, I., Toyoda, J. H., & Wise Sr, J. P. (2021). Microplastics in Sea Turtles, Marine Mammals and Humans: A One Environmental Health Perspective. *Frontiers in Environmental Science*, 8. <https://doi.org/10.3389/fevs.2020.575614>



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