

# LIVES: Litter Free Rivers and Streams

Working towards a litter-free Meuse  
in the Euregio Meuse-Rhine





# Foreword

---

As a regional government the province of Limburg stimulates the development of a healthy and appealing environment in which we live, work and spend leisure time. Water is the fundament and steering factor for the wellbeing of citizens, economic development and biodiversity. Improving the quality of our transboundary river Meuse and its side rivers and streams is a major challenge. We can only successfully approach this challenge through cross-border cooperation together with our neighbors in the international Meuse catchment.

As one of Europe's major rivers, the Meuse springs in France before flowing through Wallonia and Flanders in Belgium, through the Netherlands – forming the border for 30 km– complemented with German streams, emptying after 950 kilometers into the North Sea in the Meuse-Rhine delta. In the Meuse and many other transboundary rivers and streams all over the world, plastic litter negatively affects the environment, landscape, nature areas, recreational hot spots, health of inhabitants and economic enterprises across administrative borders.

Over the years it became clear that simply removing the plastic from the banks of the river Meuse on known hot spots is not enough. Stopping the inflow on a catchment scale is increasingly important. Further collaboration across our borders, using an integrated approach to remove litter and increase awareness, is necessary to ensure a healthy Meuse river basin which is free from plastic pollution. Such an integrated approach will also reduce the amount of plastic entering the marine environment of the North Sea.

This was the reason for the province of Limburg to take lead in the Interreg-project LIVES (Litter free rivers and streams). From 2018-2022 we worked together with nine

national and regional water and waste management organizations and universities in the area of the Euregion Rhine-Meuse (EMR), to take further action in developing an international and integrated approach. Our common approach involved data collection and monitoring, cleaning up, litter traps, citizen science, communication and education to improve awareness, policy recommendations and further cross-border exchange and cooperation.

LIVES is the first regional project that is tackling the issue of plastic in rivers and streams across borders in the EU. While the cross-border collaboration has been welcomed by many partners and associated partners, it has brought to light the lack of common registration, legislation and guidelines on how to tackle the plastic problem across the region.

Although the Interreg-EMR project LIVES has come to an end, it is clear that there is still a lot of work that needs to be done. LIVES is now functioning as a basis for cross-border cleaning the Meuse and may form the foundation of future efforts, contacts and actions. LIVES may thus be a starting point to influence a wide array of actors on the subject. I am happy that together with many of our partners we can continue the cross-border cooperation to reach a clean Meuse for the inhabitants in its catchment.



**C.W.J.M. (Lia) Roefs**

*President of LIVES*

*Regional Minister for  
Water Management  
in the Dutch Province  
of Limburg*

# Contents

What is LIVES?	5
1. Getting an overview of the plastic waste problem	6
2. How to reduce litter	9
3. How to prevent litter	14
4. Lessons from LIVES	18
Summaries (English, Dutch, French, German)	22
Partner overviews	26
Acknowledgments	28
Colophon	30

# What is LIVES?

---

From food packaging over synthetic clothing to materials to build our houses: plastic is everywhere. The wide-spread and ever-growing use of plastic in our daily lives confronts us with many challenges. One of the biggest environmental challenges world-wide is how to deal with plastic that ends up as litter in and around our rivers, where it stays in the sediment or from where it floats into the seas and oceans.

Between 2018 and the beginning of 2022 the Litter Free Rivers and Streams (LIVES) project brought together 10 water and waste management organizations, knowledge institutions, and NGOs from Belgium, the Netherlands and Germany to address the timely issue of macroplastic pollution in the Meuse River basin. This cross-border cooperation was supported by a grant from the Interreg V-A program from the Euregion Rhine-Meuse.

In this brochure we present an overview of the first steps that were taken to realize a structural, sustainable and efficient approach to reduce litter across borders.

We first provide you with an analysis of the distribution of litter within the Meuse catchment, followed by information on the development of a cross-border database with data on litter and methods of monitoring. Secondly, we tackle the issue of how to get waste out of the Meuse basin. In this part we detail our experiences with different litter traps that were distributed over the catchment area and focus on cleanup actions that took place. In the third part of the brochure, we question how we can prevent waste from getting into the water. Two issues stand out: raising awareness (through education and communication) and enforcement. In the final part we take stock of the LIVES project, by highlighting short and long-term agreements that help us to continue and expand cross-border cooperation structures concerning river litter. A key facilitator is the use of Political Expert Fora, which made room for knowledge exchange, development of policy recommendations and practical solutions.

***‘Plastic is the most wide-spread archeological footprint of our time’***

*plastic pollution artist Marcia Jose Arceo*

# 1. Getting an overview of the plastic waste problem

*‘Apart from actually picking up trash, I know something happens with the data: polluters are being addressed and litter traps are installed. It’s a fun, accessible and different way of spending time on the banks of the Meuse’*

*Matty Roumans, citizen scientist (cited in ‘Maasblad’)*

## Monitoring of litter

No international standards exist for measuring, registering, interpreting and reporting of plastic pollution. Consequently, every country and organization has its own strategy for the monitoring of plastic litter in the environment. At the beginning of the LIVES project, all partners had a limited and fragmented understanding of the macroplastic problem in the Meuse River. To get an overview of the presence and distribution of plastic litter in the entire river system, **Rijkswaterstaat (RWS)** laid the foundations for a cross-border monitoring strategy (see insert).

Standardization of monitoring methods was quintessential to make this program successful. In order to gather representative data, uniform measurement techniques and protocols had to be developed and applied. The data systems also needed to be accessible so the data could be used for a cross-border analysis of the problem. To discern trends across these data, it was important the data sets were comparable. The monitoring program is therefore developed in such a way that even after the LIVES project has ended, all partners can continue to use the results from the program for their own work on plastic pollution.

To get a shared image of cross-border litter pollution we set out five deliverables that are required to gain a shared understanding of plastic pollution in the LIVES region:

1. Cross-border hotspot map: a geographical representation of hot spots of macroplastics in the Meuse River basin. *Figure 1*
2. Open-access data system: a proof of concept for an open-access data system with geolocation-based information. This system can be used by LIVES partners to share data on macroplastic pollution with each other.
3. Inventory of best practices: a list of best practices with lessons learned in relation to the monitoring of litter during the LIVES project.
3. Inventory of best practices – Creating an overview of best practices in monitoring of riverine litter, and how the process can be improved in the future.
4. Cross-border dataset: input for the cross-border open-access data system based on pilots or projects. *Figure 2*
5. Monitoring strategy 2022-2027: recommendations for future development of a cross-border monitoring strategy. *Figure 3*

Figure 1. Cross-border hotspot map / Overview of the hotspot map for litter monitoring in the Interreg Euregio Meuse-Rhine.

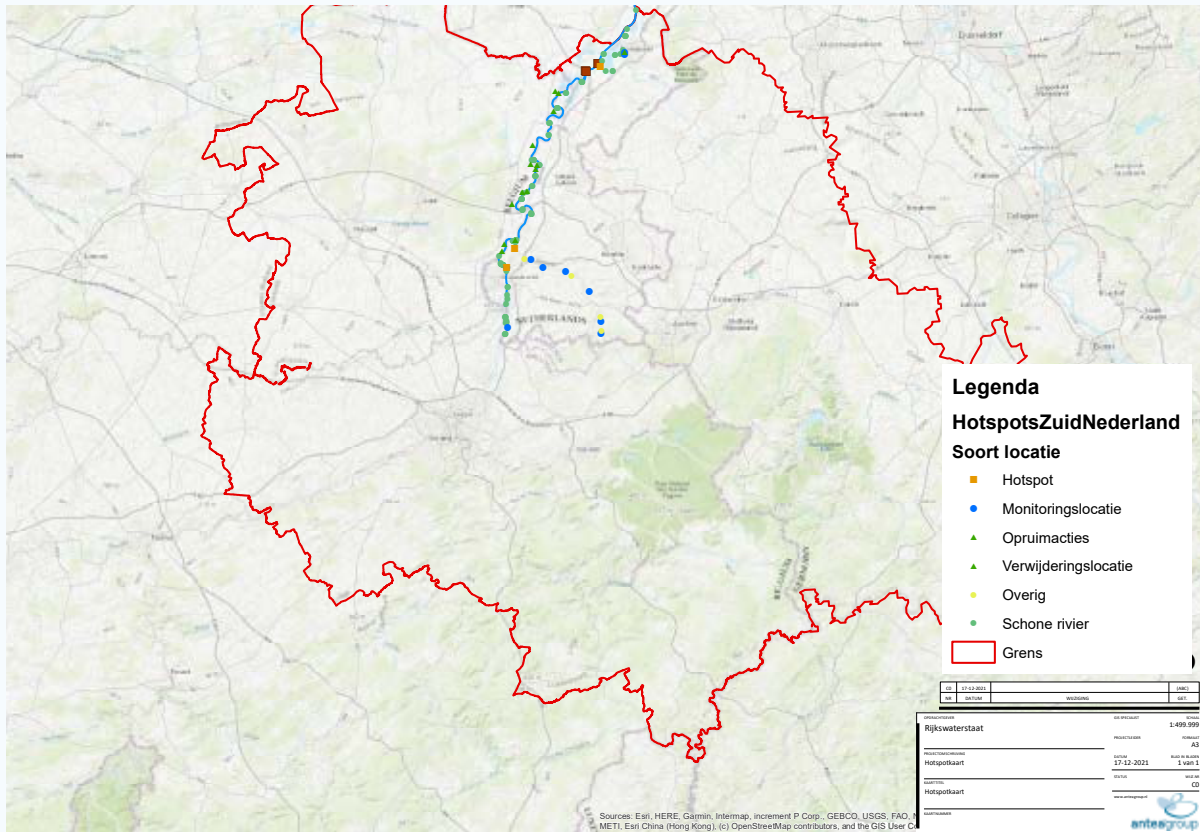
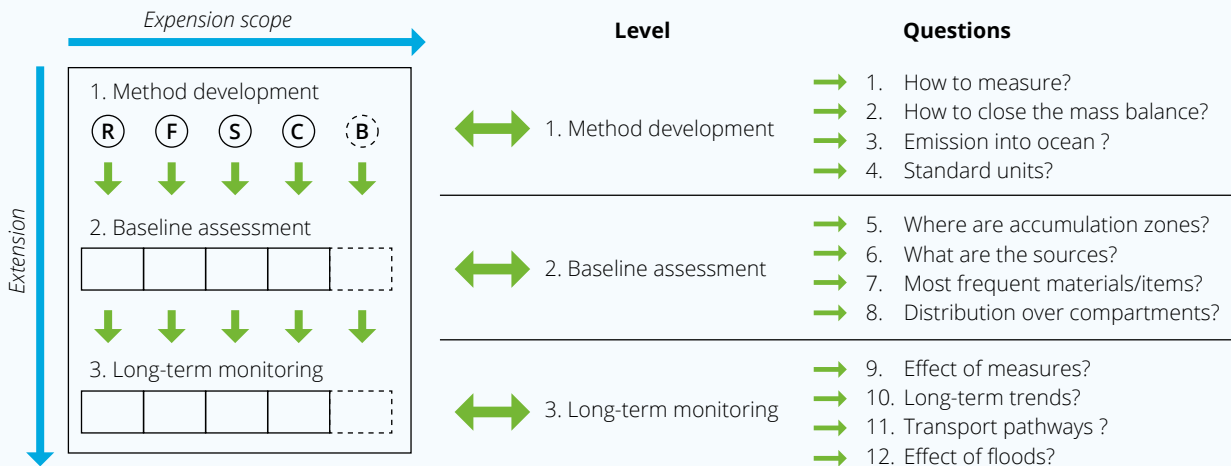


Figure 2. Input for crossborder dataset collected by Schone Rivieren

	Dutch Meuse banks 2020	Flemish Meuse banks 2020	Dutch Meuse banks 2021	Flemish Meuse banks 2021
<b>Monitor locations</b>	22	7	26	8
<b>Total amount of dirt items</b>	20.632	4.805	26.521	11.078
<b>Dirt items each 100 meter banks</b>	596	376	1.020	1.385
<b>Composition</b>	91% plastic 5,5% wood 1,6% metal < 1% rubber, textiles, paper & glass	91% plastic 3,1% metal 1,6% textiles & paper < 1% rubber, wood & glass	91% plastic 1,3% metal 1,1% textiles, rubber < 1% wood, metal & glass	91% plastic 6,1% textiles < 1% rubber, paper, wood, metal & glass
<b>Most found items</b>	1. (indefinable) polystyrene 2. plastic beverage packaging 3. candy & snack packaging 4. plastic cotton swabs 5. polystyrene food packaging	1. (indefinable) polystyrene 2. candy & snack packaging 3. plastic beverage packaging 4. plastic food containers 5. wet wipes	1. (indefinable) polystyrene 2. plastic sheets 3. hard plastic 4. plastic beverage packaging 5. candy & snack packaging	1. plastic sheets 2. candy & snack packaging 3. hard plastic 4. (indefinable) polystyrene 5. plastic beverage packaging

Figure 3: Overview of the Roadmap presented by van Emmerik et al. (2022), on which the monitoring strategy 2022-2027 is based. The roadmap has 3 development levels (Method development, Baseline assessment, Long-term monitoring) for each river compartment (**R = Riverbank**, **F = Floating**, **S = Sediment**, **C = Water column**, **B = Biota**) the level of questions that can be answered for each development level, and the option to expand the scope of monitoring by adding river compartments (dotted line around Biota).

Emmerik T, Vriend P and Copius Peereboom E (2022) Roadmap for Long-Term Macroplastic Monitoring in Rivers. *Front. Environ. Sci.* 9:802245. Doi:10.3389/fenvs.2021.802235



## The black box of waste

Thanks to previous monitoring efforts we already gained insights into litter on the banks of the Meuse. Citizen scientists of ‘Schone Rivieren’ surveyed what type of litter was found, enabling us to use these data for further analysis within the LIVES project (see figure 1). However, techniques to monitor litter in the water column were virtually non-existent and underdeveloped. The water column remains a black box, as we have very little understanding of what type of waste is transported below the water surface. To tackle this problem, a new method had to be developed which would allow for the sampling of litter in a consistent and systematic way. During the LIVES project we tested for example an innovative monitoring technique based on an existing method, which uses a net to catch larvae, and was adapted for researching litter.

[Learn more about cross-border monitoring](#)





## 2. How to reduce litter

In order to get waste out of the Meuse basin, LIVES focused on two areas: the study and installation of litter traps and cleanup actions.

### Litter traps

The LIVES project enabled us to try and test different kinds of litter traps and determine what location is most suitable to install a trap. 21 littertraps were placed in the Euregio Meuse-Rhine (see figure 4). Every situation demands a different trap. Many issues are at

play, of which we will mention three. First you must find what we like to call a 'hot spot', a visible and accessible location, where lots of trash can be caught. Second you must look at the river dynamics at this specific spot. Third you must determine who is responsible for the place where you wish to install the litter trap and who will clean the trap.

Figure 4. Overview of litter traps

Partner	Total	Removal System(s)
VMM	9	7 floating barriers, 2 dirt socks (to be installed in 2022)
De Vlaamse Waterweg nv	2	Implementation of special shovels and boats at culverts
WVER	2	1 tree trunk, 1 dirt sock
WL	8	1 trash rack cleaner (Rur), 2 floating barriers (Rur and Geul), 4 screens at water mills (Geul) and 1 screen at a weir (Geul)
RWS	0	No removal systems were installed during this project, but extensive monitoring took place both inside and outside the Euregio Meuse-Rhine. Also, several litter removal techniques were tested outside the Euregio Meuse-Rhine.

Floating barriers placed by VMM



## Flanders

---

On the Flemish side of the Meuse basin, the **Vlaamse Milieumaatschappij (VMM)** placed 7 new litter traps in tributaries of the river: Warmbeek, Bosbeek, Dommel and Jeker (*see photo p 9*). An innovative model of mobile trap – a floating barrier – was used, which, in contrast to static traps, can be moved along the river. The local governments of the municipalities or local volunteers where these rivers run, agreed to empty the traps and keep track of what kind of pollution ends up in the traps. VMM also decided it will set up 2 dirt socks in 2022, the first time this type of litter trap is used in Flanders.

De **Vlaamse Waterweg nv** investigated several potential systems of litter removal, taking into account a range of factors. The most important one is that the litter removal systems should not hinder navigation. One system under consideration is the H2O bubble barrier, whereby air is blown into the water from the bottom. Subsequently, a bubble screen is created which transports floating and suspended waste from the water column to the surface. Due to time constraints, this solution will be further developed on the Zuid-Willemsvaart, a navigable canal parallel and connected to the Meuse, in the future.

Another system is the specially designed shovel and boat which can be used at every culvert along the Zuid-Willemsvaart, as these are the places where plastic pollution is most prominent. Finally, the WasteShark, which will potentially be implemented in the Maasplassen,

is an aquadrone that removes plastics and other floating debris from the water surface. It can collect 350 kg of trash at a time.

## Germany

---

In Germany, the **Wasserverband Eifel-Rur (WVER)** installed a dirt sock in the Schwarzbach, (*see photo p 13*) which flows north of the city of Aachen and is a tributary of the river Wurm. The dirt sock was designed by a WVER employee and consists of a metal box with a frame and net ('sock') that captures outflowing water from the sewer system. For a float beam in the Dürener Mühlenteich, a tributary of the Rur, the WVER attached the log of a dead tree with chains to the riverbed. This is a more cost-effective and natural way of building a trap, as the timber blends easily into the environment.

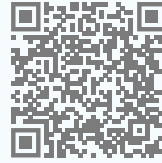
## Netherlands

---

**Waterschap Limburg (WL)** decided for the time being that no new litter trap would be installed in the Geleenbeek stream. Instead, this partner opted to implement a smart monitoring system, using cameras and Artificial Intelligence. This will enable them to determine the best requirements of a new litter trap, which will be designed according to principles of robustness, durability and labor-extensiveness.



In the Geul and Rur, two other tributaries of the Meuse, research was executed on the results of using existing litter traps. [This study](#) showed certain types of litter are related to specific sources. During peak disposals more garbage is found in the traps. A potential explanation are high water levels, which cause litter from the banks to drift into the water column. A preventive measure to help solve this problem would be to remove litter from hot spots. A notable difference between the Geul and the Rur was that in the latter the examined garbage was of a different type, consisting, for example, of car tires. Most trash was not caught by the floating beam, but by a duckweed fence cleaner.



Our partners at **Hogeschool Zuyd** are in the process of designing a trap, where a cylinder-shaped mechanism is used to get floating debris out of the water.

At the Border Meuse **Rijkswaterstaat (RWS)** decided not to install litter traps, due to the river's strong currents and too high investment costs (for example, at the weir of Borgharen).

[Learn more about our litter traps](#)



***'Every Wednesday I check and empty the litter trap. The first thing we do afterwards is clean up all the litter in the nature reserve. We do this as quickly as possible, as litter attracts more litter! At the end of the day the municipality picks up the trash bags. Sometimes people throw away the weirdest things'***

*conservator and volunteer Francis Telen  
(quoted on the LIVES blog)*



## Cleanup actions

Since 2013 the **Flemish Regionaal Landschap Kempen & Maasland (RLKM)**, and the **Dutch Institute for Nature & Environment Education (IVN)**, bring together municipalities, water & waste management institutes and terrain owners to coordinate cleanup actions with volunteers on their respective sides of the

Meuse. Normally most cleanups take place in March and April, when the winter water levels have lowered and lots of debris has been washed up on the banks of the river and at the end of the recreation season in September. Cleanups during summer and birding season are not recommended. Organizing cleanups with existing volunteering groups coordinated by NGOs is very efficient.

Figure 5. Overview cleanup actions

In the Netherlands				
Cleanup name	Amount of actions	Number of volunteers	Number of garbage bags (60 liters)	Kg garbage
Schone Maas 2020-2021 (spring)	259 planned, 79 done	1.200	2.426	10.917
(disaster) Maas Clean up (summer 2020-2021)	460	15.850	-	245.000

In the Flemish area				
Cleanup name	Amount of actions	Cleaned area (ha/year)	Number of garbage bags (60 liters)	Kg garbage
Maas.net 2012-2018	12	100	445	2.000
Maas.net 2019	12	100	688	3.100
Maas.net 2020 and 2021	incomplete information due to COVID pandemic			

LIVES was instrumental in creating important networking opportunities. For example, the project was an opportunity to connect with partners in Walloon, in the 'Grand Nettoyage de Wallonie', coordinated by Contrats de Rivière Meuse Aval and BEWAPP. Or in the German Rur area – where only sporadic cleanups are organized with kayak groups, NGOs or citizens. Our partner RWTH connected us to Everwave, a growing cleanup NGO in Germany who is now joining us in a cross-border approach.

The first LIVES conference in 2019 was a pivotal moment, bringing together entrepreneurs, NGOs and water and waste management institutes to set up 'Maas Cleanup', an annual event first organized in September 2020, as part of World Cleanup Day. De Vlaamse Waterweg nv and Rijkswaterstaat take care of discharging all the collected waste during cleanups and at litter hot spots.

The LIVES cross-border cleanup moment had to be canceled due to the COVID pandemic.

In our opinion literally getting your hands dirty during a cleanup makes the litter problem more tangible and it can lead to behavioral changes in the participants' everyday relationship to and use of plastic. During our project we have noticed a general shift in attitude to plastic litter and more awareness raising around the issue. The number of volunteers involved in cleaning up nature and riverbanks has grown steadily, and municipalities are more inclined to facilitate the work of volunteers. Unfortunately, the amount of waste found during cleanups does not lessen.

Want to know more about our clean-up actions? Scan QR code for the [full report](#)





*Dirtsock placed by WVER*



*Float beam placed by WVER*



# 3. How to prevent litter

The question of how to prevent waste from getting into the river water, is another important issue LIVES wanted to address, by focusing on enforcement and awareness raising, through education and communication.

## Enforcement


In terms of enforcement, our partner **Openbare Vlaamse Afvalstoffen Maatschappij (OVAM)** chose an integral approach, based on their yearlong expertise with the 'Mooimakers' project. Such an integral approach entails a combination of actions in five key domains: infrastructure, environment, participation, communication and enforcement. Enforcement is then used as a matter of last resort and its use depends on the specifics of the local situation. Close cooperation with local governments is a must to get an idea of the situation on the ground and to implement a plan of action.

To set up a plan of action, OVAM first made an analysis of local problems and challenges on the banks of the Meuse. Questions that were addressed included: where are the litter hot spots? What is already being done about it? Is there infrastructure? Is there any cleaning being done? OVAM suggested to act in these 5 key themes. Most of the work within the LIVES project consisted of organizing joint enforcement actions on the Meuse.

Local authorities, supra-local agencies and nature managers were called in to carry out extra checks on litter on recreational sites during the months of May and June 2021.

### How to prevent waste? 5 key themes

1. Infrastructure: the installment of visible trash bins on logical spots
2. Environment: determining the hot spots for litter and set up different measures to tackle the specific challenges
3. Participation: clean-up actions
4. Communication: general awareness raising and communication on the ground (eg. putting signs near hot spots)
5. Enforcement: determining what instruments can be used on a local and interlocal level (eg. agreements with police & fine system), so these can be activated through agreements and effective action on the ground.



*‘The plastic pollution is really a thorn in my side. In winter the river is much higher than in summer, so a lot of plastic gets stranded on the riverbanks. That’s why we agreed to offer the Maas Cleanup Package. With a kayak you can reach difficult places or little islands in the river. Schools and companies have always shown interest to help keep our beautiful river clean. The Cleanup Package helps raising awareness and gives teambuilding activities of schools and companies an ecological dimension.’*

*Koen Heemskerk, owner of Kayak Maasland (quoted in ‘Maasblad’)*



## Raising awareness by communication and education

Education and raising awareness are essential to keep rivers plastic free in the future. The (associated) partners set up different campaigns around LIVES, falling along six lines.

1. Direct communication on site, for example, through the placement of signposts near litter hot spots and traps.



our communication strategy. Apart from the aforementioned initiatives, we designed a timeless, sober cotton tote bag, printed with the slogans, 'I love the Maas' and 'That's why I take my rubbish home'. The tote bags were distributed to all participants of the clean-up actions, NGOs and partner associations. Through an (online) campaign people were encouraged to post a selfie on social media where they showed they were cleaning up litter. In return they received a tote bag.



2. Communication through specific (social) media campaigns. Three examples stand out: the [LIVES film](#), World Cleanup Day and the summer floods of 2021. Our corporate project film was distributed and posted on several social media outlets. In social media communication around 'World Cleanup Day' all LIVES partners cross-referenced each other, using hashtags in four different languages: #hierbegintdezee #icommencelamer #hierbeginntdasmeer and #litterfreeriversandstreams. Several press releases and press moments devoted attention to the LIVES project, as well as litter research and enforcement. This resulted in a wide coverage in regional and national newspapers, in radio and television broadcasts, and other local mediachannels.

The excessive rainfall during the summer of 2021 was another event which drew the attention of Dutch and Flemish national media to LIVES and its partners.



3. 'World Cleanup Day' showcases several aspects central to the LIVES project: cross-border cooperation around the plastic pollution of rivers, through involvement of several stakeholders, including the general public. Highlighting this event was central to

4. Involving young people is another key strategy that was used. Getting youngsters on board is important to create long-term awareness. One example is two high schools in the city of Maaseik, who engage in an artistic manner with the 'plastic soup' theme. Students visit the litter traps and use the caught waste to create and exhibit 'animals of the Meuse'. Another example is Hogeschool Zuyd, where attention is given in the curriculum of third year Bachelor students, so undergraduates get more knowledge of the riverine litter removal.



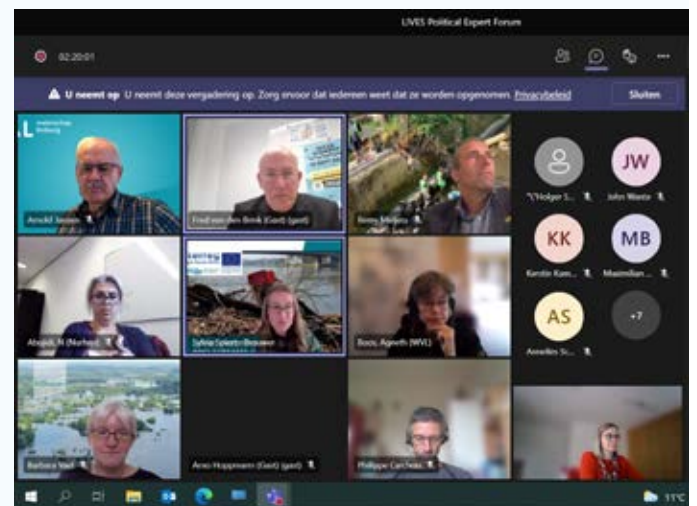
5. A good combination of clean-up, awareness raising, and education was the Maas Cleanup Package, in partnership with Kajak Maasland (KM). KM organizes kayak



and rafting tours on the Border Meuse between the municipalities of Lanaken and Maasmechelen. At the starting point of the tour an information sign gives participants explanations about the plastic litter problem. Participants can book the Cleanup Package in advance and in return receive a free pair of gloves, a litter picker and a garbage bag. Our target groups are schools and companies. The municipality of Maasmechelen provides the packages, full bags are collected by De Vlaamse Waterweg nv. The partnership between LIVES, Regional Landscape Kempen and Maasland (RLKM) and KM is based on exchange: we promote the kayak tours and KM communicates around the litter issue.



*Physical project meetings & conferences could only take place in the start of the Interreg project. Due to COVID pandemic also most Political Expert Forums had to take place on a digital way. This made it more difficult to really exchange thoughts.*



6. Our partnered knowledge institutes developed digital education modules about the LIVES project. These modules were designed to inform and motivate people into action and are targeted towards higher education students, professionals or anyone interested in becoming well-informed in plastic litter issues. The material was also used in our corporate project film.

Want to know more? Check out the [education program on our website](#)



## 4. Lessons from LIVES

During the LIVES project partners started cooperating crossborder on the subject of riverlitter in the Meuse catchment.

This resulted in two statements and many recommendations.

### Joint Statements on cross-border cooperation

The cross-border cooperation in the LIVES project translated into two joint statements, for short and long term: The Meuse Cleanup and the Clean Meuse Joint Statement.

#### *Short-term: The Meuse Cleanup*

During the LIVES Political Expert Forum (PEF) in 2019 the Meuse Cleanup initiative was set up, under the motto, 'clean rivers – better business.' This is a three-year agreement between companies, NGOs and governments in the Netherlands which strives towards participation of thousands of volunteers & employees of (associated) partner associations in annual clean-up activities along the banks of the Meuse and concrete actions from companies to help reduce the inflow of plastic litter into the environment.

Scan QR code to learn more about [Maas Cleanup](#)



#### *Long-term: The Clean Meuse Joint Statement*

The fundament for this Joint Statement was developed during the PEF in 2021, under the motto, "LIFE after LIVES". To all stakeholders, LIVES has made clear that we need long-term cross-border collaboration in order to reduce the plastic pollution of our rivers. All partners therefor agreed upon setting up a **Joint Statement**, offering possible pathways for the future. This will allow us to continue and deepen cooperation across borders. The joint statement consists of the import of knowledge exchange, information and good practices, on a range of key issues, including: awareness raising, clean-up action, litter traps, research, data collection and monitoring, education and communication.

Whenever possible, our cooperation will equally entail cross-border joint action, including exploring the potential for more cross-border partnerships and learning exchanges with other countries who are implementing projects at a transboundary basin level.

## Suggestions for improvements

Our annual Political and Expert Forum (PEF) brought together politicians, managers and experts of (associated) partners of LIVES. PEF functioned as an international discussion and exchange forum, where stakeholders helped us to discuss the direction, challenges and results of the project. Even though discussions were initiated by politicians and the managers of partner organizations, all attendees, including associated partners and other stakeholders, were invited to give their input via the Mentimeter app. The results of these questionnaires formed the basis for some panel discussions.

The exchanges in PEF resulted in a series of suggestions on a European, national, regional and local level, by a variety of partners and other stakeholders. They may form a basis to inspire further discussions on various governmental levels. These suggestions are directed at topics such as prevention of plastic litter, accountability and cross-border cooperation. Some of these recommendations link the plastic river litter problem to the EU Packaging and Packaging Waste Directive and the EU Water Framework Directive and they include clearness of responsibilities, ways to enhance awareness, prevention and reduction of waste in the environment and the stimulation of reducing, reusing and recycling within the product chains.

Figure 6. What should be most promoted after the LIVES project according to the PEF meeting October 2021 ?



Figure 7. What effects do you see within your organization as a result of LIVES ?



### Suggestions to the European Union:

- Introduce reuse and waste targets to enhance prevention and the reductions of the amount of waste we produce during the revision of the EU Packaging and Packaging Waste Directive;
- Focus on limiting residual waste and increasing recycling targets;
- Develop plastic reuse targets and phase out single use plastics on the long term by an EU tax on single use of plastic products;
- Set rules for product chain responsibility;
- Integrate the limitation of micro- and macro-plastics as part of the chemical targets in water bodies under the Water Framework Directive;
- Develop a uniform monitoring strategy on macro/micro plastics in rivers;
- Exchange good practices through the Water Information System for the European-Water Framework Directive website.

### Suggestions to the International Meuse Commission:

- Put the problem of plastic river litter on the agenda of the IMC;
- Develop an overview of the problems, hot spots and possible measures for the entire Meuse catchment area;
- Stimulate the cross-border exchange of good practices concerning the approach of the plastic river litter problem between the Meuse border states;
- Stimulate and develop international plastic river litter monitoring and data sharing and assessment;
- Stimulate and develop joint awareness and participation campaigns.

### Suggestions to national governments:

- Develop a national product-chain policy;
- Embed national policy on the prevention of plastics in environmental and water management plans: stimulate cross-border cooperation on preventing litter entering rivers and streams;
- Mention micro- and macro-plastics as water quality targets and integrate these targets into the national water programme;
- Set norms for the number of micro-plastics and macro-plastics in water bodies;
- Stimulate the exchange of best practices on clean up measures and monitoring in (shared) river systems;
- Set rules for deposit money on plastic products;
- Stimulate and develop a follow-up programme to continue the LIVES actions;
- Facilitate awareness and participation campaigns on plastic litter with schools, industries and local communities to raise awareness to the environmental impacts of plastics (e.g. a plastic free environment month).

### Suggestions to regional governments and municipalities:

- Develop a regional policy in environmental and water management plans: stimulate (cross-border) cooperation on preventing litter entering rivers and streams;
- Stimulate the cross-border cooperation between regional water governments, water boards and communities in taking measures and joint awareness campaigns;
- Stimulate the exchange of best practices on clean up measures and monitoring in shared river systems;
- Stimulate and develop a follow-up programme to continue the LIVES actions;
- Increase awareness by involving citizens into the citizen science group and involving business enterprises as partners into further cooperation.



# Summary

---

The wide-spread and ever-growing use of plastic in our daily lives confronts us with many challenges. One of the biggest challenges we face is how to deal with plastic that ends up as litter in and around our rivers, where it stays in the sediment or from where it floats into the seas and oceans.

Between 2018 and the start of 2022 the Litter Free Rivers and Streams (LIVES) project brought together 10 water and waste management organizations, knowledge institutions and NGOs from Belgium, the Netherlands and Germany to address the timely issue of plastic pollution in the Meuse River basin.

In order to get an overview of the presence and distribution of plastic litter in the river and on the riverbanks, LIVES laid a basis for a standardized litter monitoring system. Based on uniform measurement techniques and protocols, the outcome was a start for, amongst other things, an open access data system, cross-border data sets and hot spot map.

In order to get waste out of the Meuse basin, LIVES focused on two areas. Firstly, concerning litter traps, a total of 21 were installed and/or tested, including a tree trunk, floating barriers, dirt socks, trash rack cleaners, screens at water mills & weirs. In-depth research was executed on potential litter removal systems and existing litter traps for future reference. Secondly, cleanup actions were organized along the banks of the Meuse and some of its tributaries in Belgium, the Netherlands and Germany, bringing together more than ten thousand people to collect over 260 ton of waste.

The question of how to prevent waste from getting into the river water, is another important issue LIVES wanted to address. In terms of enforcement, LIVES put forward an integral approach, which combines interventions in infrastructure, environment, communication

and enforcement, the latter being used as a matter of last resort. Education and awareness raising consisted of a series of strategies, including, for example, direct communication on site, (social) media and press campaigns and the educational and involvement of civil society organizations, high schools and universities.

The cross-border cooperation in the LIVES project translated into two agreements, for short and long term: The Meuse Clean-Up and the Clean Meuse Joint Statement. The former strives towards participation of thousands of volunteers & employees of (associated) partner associations in annual clean-up activities along the banks of the Meuse. The latter offers future pathways for the exchange of knowledge, information and good practices, on a range of key issues concerning riverine litter.

A key facilitator is the use of a Political Expert Fora, which brought together partners and a variety of other stakeholder, and which made room for knowledge exchange, offered a podium for discussions between politicians, experts and other stakeholders, leading to series of suggestions and practical solutions. The exchanges in PEF helped us to develop a series of suggestions on a European, national, regional and local level. Some of these suggestions link the plastic river litter problem to the EU Water Framework Directive and they include clearness of responsibilities, ways to enhance awareness, limiting the use of (non-degradable) plastics and the stimulation of recycling within product chains.

# Samenvatting

---

Het grootschalige en steeds toenemende gebruik van plastic in ons dagelijks leven stelt ons voor vele uitdagingen. Een van de grootste uitdagingen waarmee we geconfronteerd worden, is hoe we moeten omgaan met plastic dat als afval in en rond onze rivieren belandt, waar het in het sediment blijft zitten of van waaruit het in zeeën en oceanen drijft. Tussen 2018 en begin 2022 verenigde het project Litter Free Rivers and Streams (LIVES) 10 water- en afvalbeheerorganisaties, kennisinstellingen en ngo's uit België, Nederland en Duitsland om het dringende probleem van plasticvervuiling in het stroomgebied van de Maas aan te pakken.

Om een overzicht te krijgen van de aanwezigheid en de verspreiding van plastic afval in de rivier en op haar oevers, legde LIVES de basis voor een gestandaardiseerd afvalmonitoringsysteem. Aan de hand van uniforme meettechnieken en protocollen werd een aanzet gegeven tot, onder andere, een open datasysteem, grensoverschrijdende datasets en een hotspotkaart.

Om het afval te verwijderen uit het stroomgebied van de Maas, legde LIVES zich toe op twee aspecten. Ten eerste werden er in totaal 21 afvalvangsters geïnstalleerd en/of getest, waaronder een boomstam, drijvende dammen, vuilniszakken, afvalrekschoonmakers, schermen bij watermolens & waterkeringen. Er werd grondig onderzoek verricht naar potentiële afvalverwijderingsystemen en bestaande afvalvangsters voor toekomstig gebruik. Ten tweede werden er opruimacties georganiseerd langs de oevers van de Maas en enkele van haar zijrivieren in België, Nederland en Duitsland. Meer dan tienduizend mensen namen deel en verzamelden samen meer dan 260 ton afval.

Hoe we kunnen voorkomen dat afval in het rivierwater terecht komt, is een andere belangrijke kwestie die LIVES aan de orde wilde

stellen. Wat de handhaving betreft, stelt LIVES een integrale aanpak voor, die interventies inhoudt op het gebied van infrastructuur, milieu, communicatie en ook handhaving, wat slechts een laatste redmiddel is. Voor voorlichting en bewustmaking werden een aantal strategieën toegepast, waaronder een directe communicatie ter plaatse, (sociale) media- en perscampagnes en de voorlichting en betrokkenheid van maatschappelijke organisaties, middelbare scholen en universiteiten.

De grensoverschrijdende samenwerking in het LIVES-project vertaalde zich in twee overeenkomsten, voor korte en lange termijn: de Meuse Clean-Up en de Clean Meuse Joint Statement. De eerste overeenkomst wil ervoor zorgen dat duizenden vrijwilligers & werknemers van (geassocieerde) partnerverenigingen deelnemen aan de jaarlijkse opruimacties langs de oevers van de Maas. De tweede biedt toekomstige manieren om kennis, informatie en goede praktijken uit te wisselen die te maken hebben met kernvraagstukken rond rivierafval.

Een belangrijke facilitator is het gebruik van een Political Expert Fora, een forum voor politieke deskundigen, dat partners en verschillende andere belanghebbenden samenbracht, ruimte bood voor kennisuitwisseling en een platform was voor discussies tussen politici, deskundigen en andere belanghebbenden. Dat alles leidde tot suggesties voor beleidsaanbevelingen en praktische oplossingen. Dankzij de uitwisselingen van het forum konden we een reeks voorstellen op Europees, nationaal en regionaal niveau uitwerken. Een aantal van deze suggesties legt een verband tussen het probleem van plastic rivierafval en de EU-Kaderrichtlijn Water. Ze omvatten duidelijke verantwoordelijkheden en manieren om het bewustzijn te vergroten, beperken het gebruik van (niet-afbreekbaar) plastic en stimuleren recycling binnen productketens.

# Résumé

---

L'utilisation généralisée et croissante du plastique dans notre vie quotidienne nous confronte à de nombreux défis. L'un des plus grands défis auxquels nous sommes confrontés est de savoir comment traiter le plastique pollue nos rivières et leurs berges, où il reste piégé dans les sédiments, et finit dans les mers et les océans. Entre 2018 et le début de 2022, le projet Litter Free Rivers and Streams (LIVES) a rassemblé 10 organisations de gestion de l'eau et des déchets, des institutions de connaissances et des ONG de Belgique, des Pays-Bas et d'Allemagne pour aborder le problème opportun de la pollution plastique dans le bassin de la Meuse.

Afin d'obtenir une vue d'ensemble de la présence et de la répartition des déchets plastiques dans la rivière et sur les berges, LIVES a jeté les bases d'un système normalisé de surveillance des déchets. Sur la base de techniques et de protocoles de mesure uniformes, le résultat a été le lancement, entre autres, d'un système de données en libre accès, d'ensembles de données transfrontalières et d'une carte des sites prioritaires.

Afin d'éliminer les déchets du bassin de la Meuse, LIVES s'est concentré sur deux aspects. Tout d'abord, en ce qui concerne les pièges à déchets, 21 pièges au total ont été installés et/ou testés, dont un tronc d'arbre, des barrières flottantes, des poches filtrantes, des systèmes de nettoyage par pièges à débris, des tamis aux moulins à eau et aux déversoirs. Des recherches approfondies ont été menées sur les systèmes potentiels d'élimination des déchets et les pièges à déchets existants pour référence ultérieure. Ensuite, des actions de nettoyage ont été organisées le long des rives de la Meuse et de certains de ses affluents en Belgique, aux Pays-Bas et en Allemagne, rassemblant plus de dix mille personnes pour plus de 260 tonnes de déchets collectés.

Savoir comment empêcher les déchets d'atteindre l'eau de la rivière est une autre question importante que LIVES voulait aborder. En ce qui concerne l'application de la loi, LIVES

a proposé une approche intégrale combinant des interventions dans les domaines de l'infrastructure, de l'environnement, de la communication et de l'application de la loi, cette dernière n'étant utilisée qu'en dernier recours. L'éducation et la sensibilisation ont impliqué une série de stratégies, dont par exemple, la communication directe sur site, sur les médias (sociaux) et dans les campagnes de presse, ainsi que l'éducation et la participation des organisations de la société civile, des écoles secondaires et des universités.

La coopération transfrontalière dans le cadre du projet LIVES s'est traduite par deux accords, à court et à long terme : le mouvement Meuse Clean-up et la Déclaration commune pour une Meuse propre. Le premier s'efforce de faire participer des milliers de bénévoles et d'employés d'associations partenaires (associées) aux activités annuelles de nettoyage des berges de la Meuse. Le second offre des voies futures pour l'échange de connaissances, d'informations et de bonnes pratiques sur une série de questions clés concernant les déchets fluviaux.

L'un des principaux facilitateurs fut l'utilisation d'un forum d'experts politiques (FEP), qui a rassemblé les partenaires et une variété d'autres parties prenantes, a permis l'échange de connaissances, et a offert un podium pour les discussions entre les politiciens, les experts et les autres parties prenantes, ce qui a conduit à des suggestions de recommandations politiques et de solutions pratiques. Les échanges au sein du FEP nous ont permis de développer une série de suggestions au niveau européen, national, régional et local. Certaines de ces suggestions établissent un lien entre le problème des déchets plastiques dans les rivières et la directive-cadre sur l'eau de l'Union européenne. Elles portent notamment sur la clarté des responsabilités, les moyens de renforcer la sensibilisation, la limitation de l'utilisation des plastiques (non dégradables) et la promotion du recyclage au sein des chaînes de produits.



# Zusammenfassung

---

Die weit verbreitete und ständig wachsende Verwendung von Plastik in unserem täglichen Leben stellt uns vor viele Herausforderungen. Eine der größten Herausforderungen, vor denen wir stehen, ist der Umgang mit Plastik, das als Abfall in und an unseren Flüssen landet, wo es im Sediment verbleibt oder von dort aus in die Meere und Ozeane schwimmt. Zwischen 2018 und Anfang 2022 brachte das Projekt LIVES (Litter Free Rivers and Streams) zehn Wasser- und Abfallwirtschaftsorganisationen, Wissenseinrichtungen und Nichtregierungsorganisationen aus Belgien, den Niederlanden und Deutschland zusammen, um das aktuelle Problem der Plastikverschmutzung im Einzugsgebiet der Maas anzugehen.

Um einen Überblick über das Vorhandensein und die Verteilung von Plastikmüll im Fluss und an den Ufern zu erhalten, legte LIVES die Grundlage für ein standardisiertes Überwachungssystem für Plastikmüll. Auf der Basis einheitlicher Messtechniken und -protokolle wurden unter anderem ein offen zugängliches Datensystem, grenzüberschreitende Datensätze und eine Hot-Spot-Karte entwickelt.

Um die Abfälle aus dem Maasbecken zu entfernen, konzentrierte sich LIVES auf zwei Bereiche. Erstens wurden insgesamt 21 Abfallfänger installiert und/oder getestet, darunter ein Baumstamm, schwimmende Barrieren, Schmutzsäcke, Rechenreiniger sowie Siebe an Wassermühlen und Wehren. Es wurden eingehende Untersuchungen zu potenziellen Abfallbeseitigungssystemen und bestehenden Abfallfängern durchgeführt, die als Referenz für die Zukunft dienen sollen. Zweitens wurden an den Ufern der Maas und einiger ihrer Nebenflüsse in Belgien, den Niederlanden und Deutschland Säuberungsaktionen organisiert, bei denen mehr als zehntausend Menschen zusammenkamen und über 260 Tonnen Abfall sammelten.

Die Frage, wie verhindert werden kann, dass Abfälle in das Flusswasser gelangen, ist ein weiteres wichtiges Thema, das LIVES

angehen wollte. Für die Durchsetzung der Vorschriften schlug LIVES einen ganzheitlichen Ansatz vor, der Maßnahmen in den Bereichen Infrastruktur, Umwelt, Kommunikation sowie Zwangsmaßnahmen kombiniert, wobei Letztere nur als letztes Mittel eingesetzt werden. Die Aufklärungs- und Sensibilisierungsmaßnahmen umfassten eine Reihe von Strategien, darunter die direkte Kommunikation vor Ort, Kampagnen in den (sozialen) Medien und der Presse sowie die Aufklärung und Einbeziehung von Organisationen der Zivilgesellschaft, Schulen und Universitäten.

Die grenzüberschreitende Zusammenarbeit im Rahmen des LIVES-Projekts führte zu zwei kurz- und langfristigen Vereinbarungen: Die Maas-Sanierung und die Gemeinsame Erklärung "Saubere Maas". Erstere strebt die Teilnahme von Tausenden von Freiwilligen und Angestellten von (assoziierten) Partnerverbänden an jährlichen Säuberungsaktionen an den Ufern der Maas an. Letztere bietet zukünftige Wege für den Austausch von Wissen, Informationen und bewährten Praktiken zu einer Reihe von Schlüsselthemen im Zusammenhang mit Abfällen in Flüssen.

Ein wichtiger Faktor war die Durchführung politischer Expertenforen (PEF), die Partner und eine Vielzahl anderer Interessengruppen zusammenbrachten und Raum für den Wissensaustausch boten, ein Podium für Diskussionen zwischen Politikern, Experten und anderen Interessengruppen schufen und zu Vorschlägen für politische Empfehlungen und praktische Lösungen führten. Der Austausch im Rahmen der PEF half uns, eine Reihe von Vorschlägen auf europäischer, nationaler, regionaler und lokaler Ebene zu entwickeln. Einige dieser Vorschläge stellen eine Verbindung zwischen dem Problem des Plastikmülls in Flüssen und der EU-Wasserrahmenrichtlinie her und umfassen die Klärung der Zuständigkeiten, Möglichkeiten zur Sensibilisierung, die Einschränkung der Verwendung von (nicht abbaubaren) Kunststoffen und die Förderung des Recyclings innerhalb von Produktketten.

# Partner index

The LIVES project consists of a broad alliance between regional authorities and stakeholders.

## Main partners



**De Vlaamse Waterweg nv:** Flemish government agency responsible for all the navigable waters.



**Open Universiteit (OU):** University in Heerlen, the Department of Environmental Sciences embodies the commitment of the Open Universiteit to excellence in the environmental sciences, science for impact, and lifelong learning in sustainability.



**Openbare Vlaamse Afvalstoffenmaatschappij (OVAM):** Flemish government agency responsible for materials, soil and waste management.



**Provincie Limburg (PL):** Dutch regional government, responsible for spatial, nature, water, mobility, culture, economic and environmental policy, and ground water management in the province of Limburg.



**Rijkswaterstaat (RWS):** Dutch national government agency, responsible for the management of the large rivers, canals and lakes and the Dutch part of the North Sea.



**Rheinisch-Westfälische Technische Hochschule (RWTH):** a public research university located in Aachen. Institute of Hydraulic Engineering and Water Resources Management was involved in the LIVES project.



**Vlaamse Milieumaatschappij (VMM):** Flemish government agency with a wide range of responsibilities concerning water, air, and the environment.



**Wasserverband Eifel-Rur (WVER):** German regional public water cooperation, responsible for the supply of raw water for drinking water production, flood protection and restoration, watercourse maintenance and wastewater treatment of non-navigable waters in the German part of the Rur catchment.



**Waterschap Limburg (WL):** Dutch regional government organization on water management, responsible for the management of the regional water system and flood protection measures along the Meuse in the province of Limburg.



**Zuyd Hogeschool (ZH):** university of applied sciences located in Maastricht, focusing on three core activities: education for students, research for companies and institutes, and training courses and study programmes for professionals.

## Associated partners



**Contrats de Rivière Meuse Aval:** Walloon operational organization, which brings together all stakeholders involved in the management of water resources, focusing on consultation, awareness raising and participation.



**Everwave:** German non-profit organization located in Aachen, who help to protect oceans from plastic waste with technological solutions.



**Instituut voor Natuureducatie (IVN):** institute for nature education, connects people and nature through a range of activities, projects and campaigns.



**Regionaal Landschap Kempen en Maasland (RLKM):** Regionaal Landschap Kempen en Maasland (RLKM): Flemish non-profit organization who develops the cross-border River Park Valley of the Meuse on both the Flemish as Dutch side of the Border Meuse. It acts as a liaison between local and regional governments, nature organizations, inhabitants and other parties involved in this river landscape.

# Acknowledgments

---

At the start of my involvement in the river litter in the Meuse catchment in 2012 I thought I'd only be dealing with this problem for a few years. Now, 10 years later, I have experienced what a complex, cross-border, and world-wide problem litter in rivers and streams is.

I'm glad Belgium, the Netherlands, and Germany could work together across borders on this topic for three years, thanks to Interreg EMR and the great (associated) partners of the LIVES project. At the start of the LIVES project, I used the metaphor of different boats somewhere on the Meuse or tributaries heading for litter free rivers and streams. My hope was that by the end of the project we would have realized an armada of boats by which the problem of river litter would be understood and solved. Of course, this was too ambitious. On our shipping tours we met problems like differences of languages, differences in boat building, and some boats that were not even constructed. We met people on the shore who wanted to come along with us in our mission. On our way we lost some of our crew members and welcomed new ones. We faced a worldwide pandemic which made it impossible to jump over easily into another boat or even talk in real-life from skipper to crew.

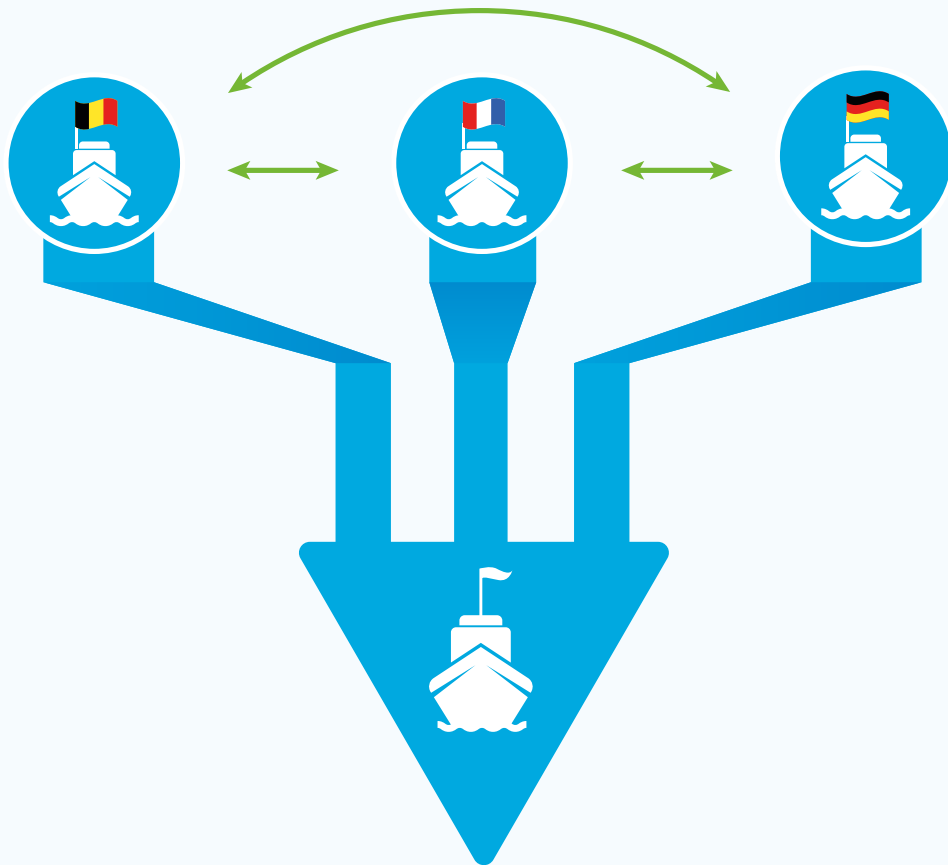
The disastrous floods of July 2021 gave our crew loads of extra work and other priorities. However, by then we at least knew which ships had joined our armada, bringing us to a place where we could finally begin knowledge and resource sharing from ship to ship.

As the commodore of this armada, I realize we haven't reached the port of destination yet, but we are on our way there. I am convinced that if our boats stay floating together on the same river, we will be able to reach our destination in years to come!

Thanks to all for being a captain in this armada. I hope to continue to travel together to our goals: litter free rivers and streams!



Ir. Sylvia Spierts-  
Brouwer  
*Projectmanager LIVES*



**Institutional arrangements**  
Crossborder cooperation structures  
for prevention and sensibilisation



**Partners**

# Colophon

Copyright© 2022 Litter Free Rivers and Streams, Provincie Limburg (Netherlands)

*Authors & images:*

(Associated) partners LIVES and Wim Peumans

*Editor:*

Wim Peumans ([www.wimpeumans.be](http://www.wimpeumans.be))

*Design and lay-out:*

Stefan David ([www.stefandavid.be](http://www.stefandavid.be))

*Year of publication:*

2022

Edition: 1

Printed on 150 copies



The Lives project, was being carried out within the context of Interreg V-A Euregio. Interreg is part of the European Union's Cohesion Policy and is funded by the European Regional Development Fund for spatial and regional development. Parties from various countries cooperate on Interreg projects. There are three different Interreg strands, focusing on **cross-border cooperation** (like [the Interreg V-A Euregio Meuse Rhine](#)), focusing on **transnational cooperation** (like the [Interreg North West Europe](#) and [Interreg North Sea Region](#)) and focusing on **interregional** and Europe-wide cooperation ([Interreg Europe](#)).

**More info**

<https://litterfreeriversandstreams.eu/>

<https://www.facebook.com/litterfreerivers>

Interreg provides a framework for the implementation of joint actions and policy exchanges between national, regional and local actors from different Member States. The overarching objective is to promote a harmonious economic, social and territorial development of the Union as a whole.

Interreg Euregio Meuse-Rhine is a collaboration between 13 regions from Belgium, Germany and the Netherlands. Together, they invest in shared solutions for common challenges. This gives Interreg its own, distinct spirit of cooperation: across regions and across borders.

*This brochure, or any part thereof, may be reproduced, stored in or introduced into a retrieval system, and transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, by adding the LIVES and EMR logos and citing LIVES and Provincie Limburg.*



**Interreg**  
Euregio Meuse-Rhine



**LIVE2** litter free rivers  
and streams

EUROPEAN UNION  
European Regional  
Development Fund

