LESSONS-LEARNED FROM UPSCALING A CITIZEN SCIENCE INITIATIVE ACROSS EUROPE

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INTRODUCTION

"Plastic Pirates – Go Europe!" is a large-scale citizen science initiative aimed at tackling plastic waste pollution in rivers, waterways, and coastlines across Europe. By engaging children and young people in data collection, the initiative empowers participants to contribute to valuable scientific research on the origins and pathways of plastic pollution while fostering environmental awareness and scientific literacy. Participants include a diverse range of actors such as students, teachers, municipalities, research centers, NGOs, sports clubs, and fishing associations.

Originally launched in Germany, the initiative expanded to Portugal and Slovenia as part of the TRIO presidency from 2019-2022. It received strong backing from the European Council, which recognized its potential to raise public awareness on the impact of research and innovation (R&I) on everyday life. As part of the European Research Area (ERA) Policy Agenda 2022-2024, Plastic Pirates contribute to ERA Action 14, "Bringing Science Closer to Citizens," and play a vital role in addressing the twin green and digital transition.

Additionally, under the European Union's Mission Restore our Oceans and Waters by 2030, the Plastic Pirates initiative works toward reducing macro- and microplastics, actively promoting ocean literacy, and involving the public in restoring Europe's aquatic ecosystems. With €2 million of funding from the European Commission's Coordination and Support Action (CSA), the project has expanded to 13 European countries, engaging more than 16,000 students who have sampled over 350 rivers and coasts as of July 2024.

Samples collected are processed by a network of 26 research institutions, and the resulting data will be made publicly accessible through open access platforms such as Zenodo. The initiative's efforts have been showcased by EuroNews, reaching millions across Europe, and the project has garnered widespread media attention through various channels.

#1: UNDERSTAND THAT THE TOPIC IS A FACTOR

The topic is the foundation of an initiative - and in the case of the Plastic Pirates initiative, a major success factor. There are various arguments showing that the **topic of plastic pollution in waters is decisive** for the initiative's positive development and they are **mutually dependent**. This makes the special strength of the topic all the **more powerful**.

Firstly, microplastic in seas and oceans is one of the **priority topics worldwide**. In the media, in scientific journals, in research publications, in national parliaments, in the European Commission – the topic of microplastic pollution in water and possible solutions for the challenges this brings are widely discussed. Because of the **great popularity** of the topic, broad sections of the population recognize it as a great environmental challenge and demand effective solutions of the political decision makers. This societal pressure possibly increases the political will.

Secondly, microplastic in water is not only a national challenge, but a **European and international** one too. The Plastic Pirates initiative researching microplastic in and along rivers is thus well suited to be upscaled. As rivers do not stop at national borders, the **cooperation** of several countries along one river makes particular sense. The objectives to study sources and origin of pollution and paths of plastic pollution from the river to the sea even requires the cooperation of several European countries.

Thirdly, the topic is ideally suited to being researched by citizens in general and **young citizens** – such as schoolchildren - in particular. Because engaging young adults to jointly combat plastic in Europe is an engaging story that raises **public interest** and that the public identifies with. In addition, working with young people - especially school classes - is **easily scalable upwards** ('outscaling'), as large numbers of participating citizens can easily be reached.

#2: COMBINE SCIENTIFIC STANDARDS WITH SIMPLE IMPLEMENTATION

The success and rapid upscaling of the Plastic Pirates initiative largely stems from the availability of a simple, self-explanatory research protocol. This protocol, specifically designed for young participants such as schoolchildren, plays a pivotal role in ensuring the initiative's widespread adoption and impact across 13 European countries and beyond.

A research protocol serves as a predefined written guide that standardizes the design and implementation of experiments—in this case, (plastic) waste sampling. By creating a protocol that is easy to understand and follow, the Plastic Pirates project enables participants to conduct data gathering activities with minimal guidance, ensuring that the results can be consistently replicated across different regions and groups.

The project's approach organizes participants into subgroups to examine various types of litter at different locations—such as rivers, riverbanks, and sandy areas—clearly outlined in the protocol. Other sub-groups focus on identifying litter sources and documenting environmental conditions like the weather. This detailed organization allows the project to gather high-quality, scientifically valid data from a wide variety of locations.

Making the protocol and supporting materials openly available on the project's website is another key factor in its success. By enabling participants of all ages and backgrounds to carry out samplings independently—without requiring direct scientific oversight—the initiative becomes scalable on a large geographic scale. Moreover, the use of low-cost, commonly available sampling tools (such as ropes, tape measures, and smartphones) makes participation accessible to schools and households. Almost none of the tools used in sampling need to be bought.

A critical aspect is the inclusion of a central platform where participants upload their data in a standardized format. This ensures consistency and comparability of the data across regions, enabling large-scale analysis by researchers.

Ultimately, this combination of simplicity, scientific rigor, and broad accessibility allows the Plastic Pirates to scale up rapidly, engaging over 16,000 schoolchildren and numerous school and youth groups. Since June 2022, more than 350 sampling locations—including rivers, waterways, and coastal areas—are covered. The ability to replicate the initiative across so many locations, with consistent data collection, highlights the crucial role the protocol plays in the project's rapid upscaling and overall success.

#3: PROVIDE STEP-BY-STEP GUIDES WITH ACCOMPANYING TEACHING MATERIAL

The success of the Plastic Pirates is also driven by the comprehensive and diverse range of accompanying explanatory materials, which are crucial for both teachers and young participants in implementing the sampling protocol. These materials provide the necessary guidance to ensure the protocol is followed correctly while making the process accessible to schoolchildren and youth groups across different countries.

At the heart of this campaign are the educational materials created by the Plastic Pirates, particularly the project booklet. This step-by-step guide offers clear, specific instructions on how to collect scientific data during sampling. By dividing the tasks among different groups, the booklet simplifies the process, making it more manageable for participants. Each group's responsibilities are explained in detail with plenty of text, illustrations, and examples, ensuring that even complex sampling tasks are easy to understand. This allows young participants to follow the protocol independently, without needing constant supervision.

Another key resource is the teacher's booklet, which serves as an educational tool for the classroom. This booklet, with its interactive design and visually appealing layout, makes it easier for students to engage with topics like environmental protection, plastic pollution, and marine and freshwater life. By integrating the subject matter into classroom learning, teachers can introduce the sampling activities, reinforcing the importance of environmental stewardship. The fact that both booklets are translated into 14 different languages (including English, German, French, Spanish, and even Arabic) is critical in facilitating widespread access to the campaign across diverse linguistic regions, helping the initiative scale quickly.

Beyond the booklets, additional formats support teachers in carrying out the sampling with minimal preparation while still ensuring consistent, comparable data. Explainer videos walk students and teachers through the sampling tasks, allowing classes to visualize the process before heading out to the field. Worksheets and checklists provide quick, easy ways for teachers to organize a sampling day at a nearby river with little effort, streamlining preparation time. Moreover, the Plastic Pirates website offers contact information for teachers to reach out to experts if they have any questions, ensuring smooth implementation of the protocol. Social media content further amplifies the campaign, providing visibility and engagement with a broader audience.

Workshops for teachers, held in participating countries by national contact points, are another component of the support infrastructure. These workshops introduce educators to the protocol and materials, equipping them with the knowledge to lead their students through the process.

EXERCISE 10:

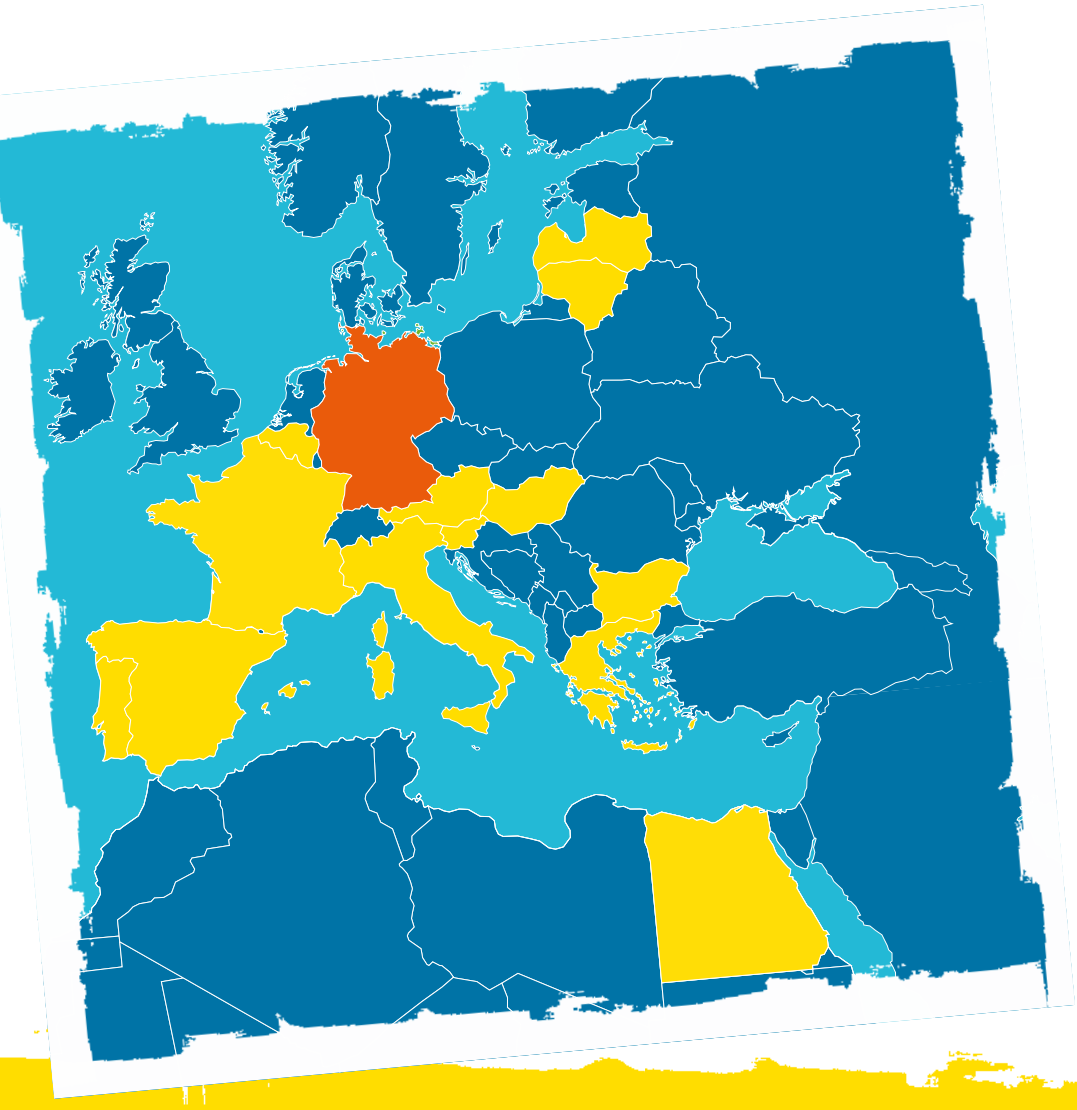
#4: HAVE A PROVEN CONCEPT BEFORE SCALING-UP

Another lesson from the Plastic Pirates initiative is the importance of proving and testing the concept before attempting to scale up to a broader, international level. The initiative was first implemented regionally in Germany, and this initial phase was essential for refining the project's approach. By focusing on the regional scale, the Plastic Pirates team was able to test their protocol in the field, gather feedback from teachers and participants, and make necessary adjustments.

The value of a proven concept lies in the ability to refine both the practical and educational elements of the project. The Kiel Science Factory and Ecologic Institute, the founders of the Plastic Pirates in Germany, took feedback very seriously, using it to simplify the protocol, improve clarity, and ensure that the activities could be easily managed by young participants and their teachers. This careful adaptation ensured that the protocol was not only scientifically rigorous but also user-friendly, making it possible for participants to carry out sampling independently with minimal supervision. This groundwork proved essential in preparing the initiative for a larger scale.

Before scaling, it is important to ensure that the concept can be effectively applied in different contexts and conditions. The early testing phase in Germany as well as the experiences from the "small expansion" into Portugal and Slovenia allowed the Plastic Pirates initiative to prove that its methodology was flexible enough to work across diverse environments. This was key when the project expanded to 13 countries, as it was able to maintain consistency in its data collection while respecting and being flexible enough for the unique logistical circumstances of each region it expanded to in Europe.

In summary, proving a concept at a smaller, regional level before attempting to scale is crucial for the success of any citizen science initiative. The Plastic Pirates' experience shows that this approach ensures the project's methods are tested, refined, and adaptable, laying the foundation for successful expansion across borders.



#5: CHOOSE THE RIGHT FORM(S) OF SCALING

The Plastic Pirates initiative is an example of how a citizen science project can successfully integrate all three forms of scaling—scaling up, scaling out, and scaling deep—allowing it to expand effectively across Europe. This approach offers insights for other citizen science initiatives that aim to scale, suggesting that the form of scaling chosen must align with the project's specific research objectives.

1. SCALING UP

The Europeanization of Plastic Pirates, supported by Horizon Europe, shifted the initiative from a centralized German project to a decentralized European effort. This shift is a feature of scaling up, which involves institutional changes that create long-term impact. Through decentralized pilot projects, each participating country was able to adapt the initiative to its local context while maintaining overall coordination at the European level. This kind of scaling up leads to local authorities and institutions taking ownership of the initiative, allowing it to integrate more seamlessly with local policies and structures.

2. SCALING OUT

Scaling out involves replicating the project across new geographic areas and increasing the number of participants and data points. In the case of the Plastic Pirates, the initiative expanded from a national project to one spanning 13 European countries, significantly increasing the volume of data collected. The geographic spread also allowed the initiative to address a wider range of environmental and societal challenges across diverse contexts.

3. SCALING DEEP

The impact of Plastic Pirates goes beyond numbers and geographic reach—it has also led to cultural and societal shifts. Scaling deep refers to the process of changing mindsets, values, and cultural practices within a community. In the case of Plastic Pirates, participants—particularly young people—gain a deeper connection to scientific inquiry and environmental stewardship. A survey of European teachers who participated in the Plastic Pirates initiative reveals that the awareness-raising aspect is the main reason they chose to participate. When asked why they chose to participate, 87% of teachers from 10 of the 13 participating countries stated that their motivation to take part in the initiative was to raise environmental awareness amongst young Europeans. In another question were asked whether they think that the project had an impact on young European's. They have been given five different possible answers. The majority of teachers stated in this question that the need to reduce (plastic) waste had probably been influenced the most. In second place was learning about the environment.

For other citizen science projects looking to scale, it is crucial to consider which form of scaling—up, out, or deep—best addresses their research goals and societal needs. A project may require institutional changes (scaling up), broader participation (scaling out), or deeper cultural impact (scaling deep), and choosing the right approach will determine its effectiveness. Furthermore, a well-considered implementation strategy should align with the chosen form of scaling to ensure the initiative's long-term sustainability and relevance. The Plastic Pirates' experience shows that an integrated approach, combining all three scaling models, can enhance both the scientific outcomes and societal impact of citizen science projects, making them more resilient and far-reaching.

#6: FIND THE BEST TIMING IN A FAVOURABLE POLITICAL CLIMATE

The 'Plastic Pirates - Go Europe!' citizen science initiative emerged at a time when the political climate in Europe was ideally suited for its recognition and growth. The initiative's alignment with key EU environmental and research policies, combined with a public shift toward greater environmental awareness and a renewed focus on citizen engagement in science, created the perfect conditions for its rapid expansion. From its beginnings in Germany, Slovenia, and Portugal, the Plastic Pirates initiative has grown to include 13 Member States, demonstrating its resonance with political priorities and societal needs across the continent.

The initiative's focus on tackling microplastic and macroplastic pollution in freshwater and marine ecosystems addresses one of the most urgent environmental issues in Europe. This environmental challenge has been a central theme in multiple EU policy frameworks, including:

- The Water Framework Directive, which aims to protect and improve water quality across the EU, aligns directly with the Plastic Pirates' focus on freshwater ecosystems.
- The Marine Strategy Framework Directive, which targets the health of European seas, including efforts to reduce marine litter.
- The Zero Pollution Action Plan, part of the European Green Deal, which sets ambitious goals to significantly reduce pollution, including plastic waste, by 2050.
- Mission Ocean – Restore our Oceans and Waters by 2030, which aims to clean up plastic pollution and contribute to healthier marine environments.

At the same time, environmental protection is a top political priority across Europe, with governments and the public becoming increasingly aware of the need for concrete action against pollution and climate change. The timing of the Plastic Pirates initiative could not have been better, as it provided a tangible, citizen-driven response to these issues. The initiative's work aligned perfectly with the EU's environmental agenda, positioning it as a key player in addressing one of the most visible and widespread forms of pollution—plastic waste.

The political climate was also shaped by a growing recognition of the disconnect between society and science, particularly in the wake of the COVID-19 pandemic. Public distrust in science, fuelled by misinformation and the spread of so-called "alternative facts," became a major concern for policymakers. In response, European governments placed a renewed emphasis on bringing science closer to citizens, recognizing the need to rebuild trust and increase scientific literacy. The 'Plastic Pirates - Go Europe!' initiative capitalized on this shift by offering a hands-on, citizen science approach that directly engaged the public—particularly young people—in environmental monitoring and scientific data collection.

With young people seen as the next generation of researchers and leaders, initiatives like Plastic Pirates offered a way to both educate and inspire them. By participating in scientific fieldwork, students and young citizens gained first-hand experience in tackling real-world environmental problems, while also learning about the importance of science and research in shaping a sustainable future. This focus on youth engagement aligned perfectly with the EU's long-term goals of encouraging scientific careers and fostering a culture of innovation and inquiry.

Moreover, the European Research Area (ERA) Policy Agenda 2022-2024 included an action specifically aimed at "Bringing Science closer to Citizens." This emphasized the growing importance for the EU of involving citizens in the scientific process. . The Plastic Pirates initiative became a model for this vision, demonstrating how a citizen science project could not only engage the public in environmental protection but also contribute to the EU's broader research and policy goals. By aligning itself with Action 14 of the ERA Policy Agenda, the initiative demonstrated its relevance within the context of Europe's research and innovation strategies, further solidifying its success.

In summary, the success of 'Plastic Pirates - Go Europe!' was also the result of perfect timing in a political climate that increasingly prioritized environmental protection and public engagement in science. The initiative's alignment with key EU policies such as the Green Deal, the Water Framework Directive, and the Zero Pollution Action Plan, combined with its focus on mobilizing young people and fostering citizen involvement in research, made it a natural fit for the EU's policy landscape. The expansion from three countries to 13 underscores the broad appeal and recognition the initiative has received, proving that citizen science can play a critical role in addressing today's most pressing environmental challenges.

#7: COMBINE LOCAL EXPERTISE WITH CENTRALIZED COORDINATION

With the Europeanization of the Plastic Pirates initiative in 2022, the campaign's structure evolved significantly to support its rapid expansion. Early experiences from the "small expansion" into Portugal and Slovenia during their Presidencies of the EU Council demonstrated the value of decentralized control. This led to the establishment of national contact points in each participating country, responsible for locally implementing the campaign and securing national funding after an initial pilot phase.

However, the real key to the success of the initiative was the combination of decentralized national contact points with a centralized European secretariat. The national contact points managed the campaign within their own countries, ensuring it adapted to local contexts and needs. Meanwhile, the European secretariat coordinated the overall initiative, overseeing its expansion and ensuring consistent implementation across all countries. This hybrid structure allowed for flexibility at the local level, while maintaining a unified vision and strategy for the project across Europe.

The selection of the right local organizations as national contact points was crucial. These organizations needed either experience in managing citizen science projects or access to networks of schools and teachers. Experience in citizen science was particularly important, as managing such projects requires specific expertise—recruiting and engaging volunteers, training participants to follow scientific protocols, and handling the large amounts of data collected. Additionally, effective science communication was essential to ensure the public understood the project's goals and impact. Organizations familiar with citizen science also knew how to navigate common challenges, ensuring smoother implementation.

Equally vital was the organizations' connection to schools and youth groups. Organizations with established networks were able to quickly mobilize participants, ensuring that schoolchildren and youth groups could take part in the sampling activities with minimal logistical barriers. Their understanding of school curricula and extracurricular activities helped integrate Plastic Pirates samplings into classroom settings.

In selecting these local partners, national ministries of research and science played a key role by recommending organizations that met the necessary criteria. This ensured that only qualified and experienced organizations were chosen to implement the campaign in their respective countries. To help launch the initiative, these local organizations were provided with pilot funding to conduct initial samplings. After the pilot phase, the organizations were responsible for securing additional national funding, a task made easier when national ministries were supportive.

The European secretariat, on the other hand, ensured that the project maintained consistency and upheld scientific standards across all participating countries. It provided guidance, support, and oversight, ensuring that national contact points aligned with the broader European objectives. This centralized coordination helped the campaign grow quickly while maintaining its integrity, ensuring that the data collected was reliable and comparable across regions.

#8: ADDRESS A SIGNIFICANT RESEARCH GAP FOR EFFECTIVE UPSCALING

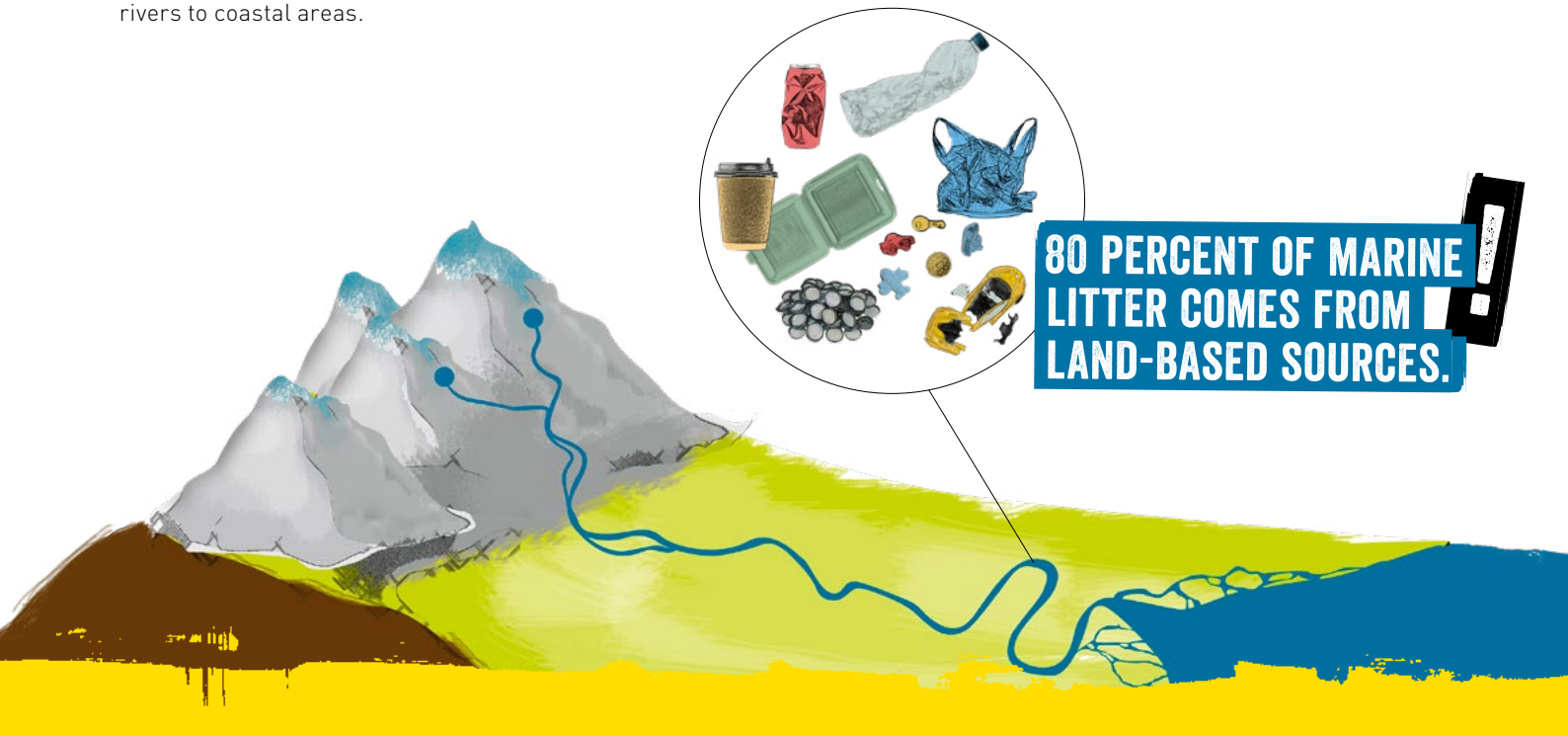
For a citizen science initiative to be upscaled, it must address a scientific research gap of sufficient scale—one that presents a meaningful opportunity to generate new, reliable, and validated data across countries that otherwise could not be gathered in such high numbers. This is precisely the case with the Plastic Pirates initiative, which tackles an important but under-researched area: plastic pollution in rivers and waterways, and connecting it to coastlines and oceans.

Plastic pollution in marine environments has been extensively studied; however, it is estimated that around 80% of marine litter comes from land-based sources. Rivers play a significant role in transporting waste from inland areas to the ocean, yet the dynamics of litter in river systems are still not well understood. Recent research indicates that rivers contaminated with anthropogenic litter serve as major conduits for waste traveling from land to coastal regions and the sea. Despite this, the focus of litter studies has primarily been on marine environments, leaving a gap in our understanding of litter dynamics in rivers.

This presents a clear research gap: the pollution of river systems, which are closer to the sources of pollution, has not been studied as comprehensively as marine environments. By filling this gap with reliable and validated data collected through citizen science, the Plastic Pirates initiative provides valuable insights into both national and transnational pollution trends. The data gathered can reveal hotspots and sources of pollution, as well as how litter is transported through Europe's rivers to coastal areas.

Citizen science initiatives like Plastic Pirates have the potential to fill significant research gaps when they generate scientifically sound data that is reliable and validated in high numbers. By involving thousands of participants and conducting samplings across multiple countries, the initiative provides a scalable and scientifically robust solution to understanding river pollution while minimising the margin of error.

Furthermore, the significance of this research is heightened by growing public awareness of plastic pollution, even as the global issue persists and worsens despite regulatory measures such as the EU's Single-Use Plastics Directive (SUPD), which was introduced in 2019. The combination of addressing a pressing research gap and producing validated data ensures that the initiative has a broad and lasting impact, contributing both to science and to the development of effective policy solutions.



#9: ENSURE THE DATA IS RELIABLE AND COMPARABLE

In addition to its educational goals, the Plastic Pirates initiative aims to generate valuable scientific insights into plastic pollution's origins and pathways. Achieving this goal requires ensuring that the data collected is of the highest quality, as citizen science projects often face scepticism regarding the reliability of their data. This scepticism can lead to studies based on such data being dismissed as unsuitable for publication. However, rigorous data quality control and validation can address these concerns and demonstrate the added value of large-scale citizen science initiatives like Plastic Pirates.

The Plastic Pirates initiative has implemented a structured data verification process to ensure the accuracy, reliability, and integrity of the data collected. This process involves several key steps:

- **Sampling Attempt Confirmation:** The first step is to confirm whether the participating group made a genuine attempt at data collection. If a group had to cancel their mission due to illness, weather, or logistical challenges, this is noted. This ensures transparency from the outset.
- **Metadata Verification:** Essential information, such as the sampling date and location, is verified. If any critical metadata is missing, the dataset is disqualified, ensuring the data's overall reliability.
- **Verification of Riverside Litter Data:** The data collected by groups investigating riverside litter is thoroughly checked for participation, method deviations, illegible data, and missing photos. Groups A, B, and D all undergo separate but similar processes of verification, with specific attention to data accuracy and source matching between groups.
- **Verification of Floating Litter Data:** Groups focusing on floating macroplastics and microplastics are subject to detailed verification processes. This includes ensuring adequate observation time, quantifying litter, and visually sorting and measuring microplastics through FTIR analysis. Flow velocity data is also checked to ensure consistency and accuracy in estimating microplastics per volume unit.
- **Post-Data Verification and Quality Assurance:** Once local partners submit their verified datasets, they are further compared to identify gaps, discrepancies, and errors. Any inconsistencies are addressed by working with the data providers to clarify issues, and, in rare cases, certain data points may be excluded if they cannot be validated.

This thorough verification process shows that data gathered through citizen science can adhere to the standards set by the scientific community. Research has indicated that data obtained from citizen science initiatives, such as those targeting marine debris, can be of comparable quality to data collected by experts. By implementing robust quality control measures, the Plastic Pirates initiative ensures that the data it collects is reliable and contributes valuable insights into river and coastal pollution.

#10: BE AWARE THAT IT'S A LONG ROAD TO SCIENTIFIC ANALYSIS OF THE DATA

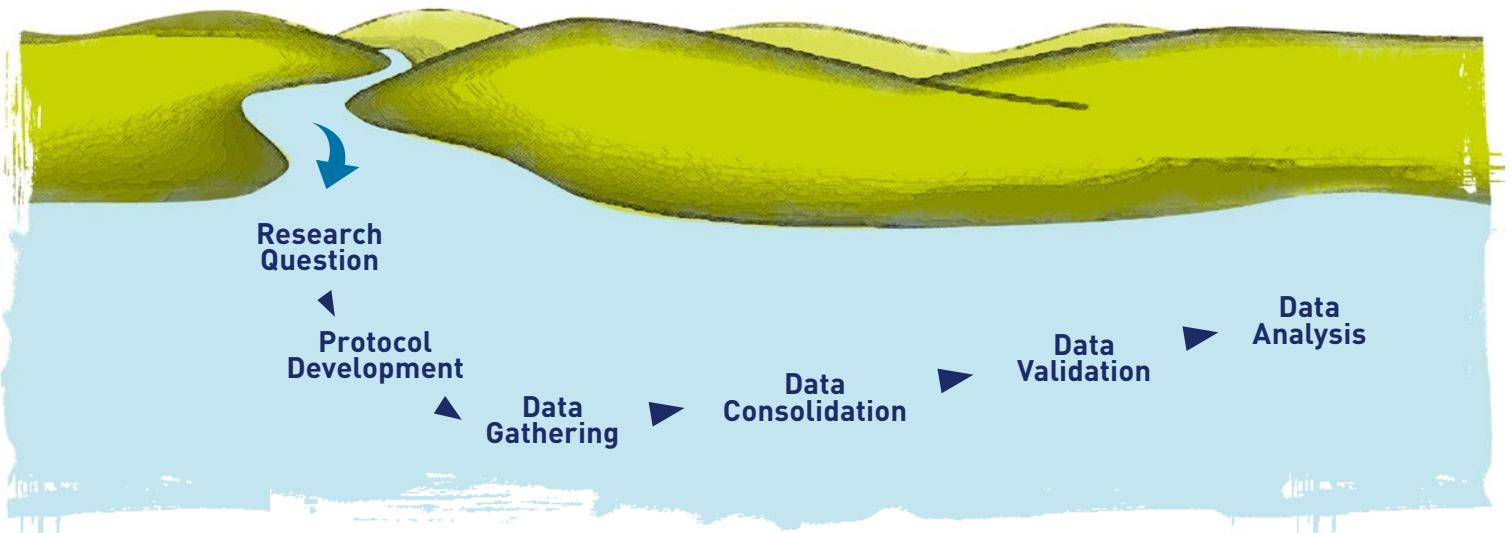
One of the key lessons learned from the Plastic Pirates initiative, and one that other citizen science projects aiming to scale up across Europe should heed, is the significant amount of time and resources required to turn collected data into scientifically valid insights. While citizen science has the unique strength of mobilizing large groups of people to gather data over vast geographical areas, the process doesn't end with data collection. It is just the beginning of a lengthy process that includes consolidation, validation, and scientific analysis, especially when dealing with data across multiple countries and ecosystems.

The Plastic Pirates initiative successfully gathered valuable data with the help of thousands of citizen scientists across Europe. However, what became apparent early on was that the sheer volume of data required careful consolidation and validation before any meaningful scientific analysis could begin. This process is far more complex when the data is collected in different countries with varying environmental conditions. Discrepancies in the data must be addressed, which demands considerable time and coordination between local partners and researchers.

Citizen science is a holistic approach. It doesn't just involve collecting data—it encompasses the entire research process, from identifying a scientific question and gathering data with the help of citizens, to ensuring the quality of that data and conducting scientific analysis. Each step is interdependent, and any shortcomings at one stage can affect the whole process. In a project as large as Plastic Pirates, which spans numerous European river systems, the need to validate and harmonize data before scientific analysis can begin is critical. It requires patience and long-term planning.

Another important consideration for citizen science projects looking to expand is the necessity of integrating scientific partners from the outset. By securing partnerships with research institutions early on, initiatives like Plastic Pirates can ensure that their methodologies, and data infrastructure are aligned with scientific standards from day one. This early integration not only ensures data quality but also helps manage the timeline and resources needed for thorough data analysis. Relying solely on volunteers for data collection, while important, is not enough—scientific expertise is essential to make sure the gathered data can withstand scrutiny in the research community.

Finally, perhaps the most critical lesson from Plastic Pirates is that scaling a citizen science initiative to a European level cannot be achieved within just a few years. Scientific research, particularly at a transnational scale, is inherently slow and methodical. The process of consolidating and validating data from multiple regions, ensuring that it meets the necessary scientific standards, and then performing a comprehensive analysis takes time. Therefore, projects that seek to expand across borders must set realistic timelines and understand that the true value of their work will unfold over many years, not in the short term. For citizen science to make a lasting scientific impact, it requires careful planning, continuous collaboration with scientific partners, and the patience to allow the process to run its full course.



#11: VISUALISE, EMPHASISE AND LIVE THE TRANSNATIONAL SPIRIT

For a citizen science initiative to successfully upscale to the European level, it is crucial to foster a sense of belonging among participants, making them feel that they are part of something larger than just a local or national project. This sense of connectedness to a broader European effort is essential for motivating and engaging participants, especially when the initiative involves young people, as seen in the Plastic Pirates initiative.

One of the key elements in creating this European character is enabling participants to see themselves as contributing to a collective mission that spans multiple countries. In the case of Plastic Pirates, schoolchildren and youth groups can view their sampling efforts and preliminary data on an interactive map on the Plastic Pirates website. This map shows all the samplings done across Europe, allowing participants to see the full scope of the initiative and how their work is part of a larger European movement. This visual representation fosters a strong sense of unity and purpose, making it clear that they are playing an active role in addressing a shared European environmental challenge.

Cross-border cooperation is another critical aspect of creating this sense of connection. The Plastic Pirates initiative regularly brought together participants from different countries, allowing them to interact and share experiences. Meetings between the participating countries, along with the European coordinators, fostered collaboration and problem-solving across borders. These in-person gatherings in various countries, such as Germany, Italy, and Austria, help reinforce the idea that the initiative transcends national boundaries, and that the participants are contributing to something bigger—an initiative that spans the entire continent.

Additionally, the Plastic Pirates summit held in Belgium gathered young Ambassadors from across Europe, providing them with the opportunity to network and collaborate on future environmental projects. These kinds of transnational experiences are key in helping young participants feel connected to the larger European community. It emphasizes that the environmental issues they are tackling are not just local, but shared challenges that require collective action from young Europeans.

Educational materials also play a role in reinforcing this European identity. While the materials were translated into each country's national language to ensure accessibility, they maintained a strong European focus, including elements such as a map of Europe's major rivers. This helps participants not only understand the importance of their local environment but also see how their efforts fit into the bigger picture of European environmental conservation.

Finally, the initiative's branding and public presence further contribute to this European character. Social media channels in national languages promote content that consistently emphasizes the European scope of the initiative. Logos and visual materials prominently feature the European flag, reminding participants and the public that this is part of a larger European project. Furthermore, the presence of Plastic Pirates at major European events such as the Mission Ocean Forum and European Maritime Day showcases the initiative as part of a broader European movement, linking the participants' efforts to high-profile European environmental goals.






#12: SECURE FUNDING AND COMMITMENT EARLY AND CONTINUOUSLY

The citizen science initiative 'Plastic Pirates - Go Europe!' has been successful in engaging young citizens in the monitoring of plastic pollution across European rivers, significantly contributing to the EU's efforts under the Mission Restore our Ocean and Waters by 2030. However, this success story also highlights lessons for other citizen science initiatives considering upscaling to a European or international level.

Despite widespread enthusiasm, Plastic Pirates has faced challenges in securing sustained national funding after the successful establishment of its pilot projects. These difficulties can serve as a cautionary tale for other initiatives aiming to grow beyond their initial phases.

One key challenge has been the delay in translating political interest into concrete financial commitments at the national level. While many countries initially supported the initiative, the formal commitment required to maintain and expand the project beyond the pilot phase has been slower to materialize. This underscores the importance of securing early and sustained funding agreements when planning for large-scale expansion.

While the current geopolitical climate, particularly the war in Ukraine, has placed additional strain on national budgets, particularly in research and innovation, Plastic Pirates' experience also demonstrates the resilience and importance of citizen science. In times of financial pressure, citizen science initiatives remind us of the power of public engagement in addressing environmental challenges, but they also underline the need for reliable funding structures to sustain them.

Additionally, the initiative's overlap across multiple policy areas—research, education, and environmental protection—is a great asset, but it has made it difficult for a single ministry to take ownership of the project in some countries, leading to fragmented support. Future initiatives aiming to scale should ensure clear roles and responsibilities across different sectors to avoid similar hurdles.

In conclusion, while Plastic Pirates has made a significant impact in its pilot phase, its experience offers valuable lessons for other citizen science projects looking to scale. By proactively securing national commitments and navigating the complexities of cross-sectoral support, future initiatives can avoid some of the challenges that Plastic Pirates has faced. The initiative remains a shining example of the potential for citizen science to drive meaningful change, but its continued success will depend on overcoming these obstacles to ensure its long-term sustainability and scientific rigor.


Global production:
359 million tonnes of plastic in 2018
Global discharge:
4.8–12.7 million
tonnes of plastic a year
Concentration of plastic in
major ocean currents
Mussels, barnacles
and copepods consume
microplastics
Plastic waste transports
non-native (invasive) species
and pathogens
200 m
Fish eat plastic
400 m
700 m
1,000 m
Plastic disintegrates into
microplastic and harmful
substances are deposited
Marine creatures perish
in ghost nets
1,500 m
Plastic sinks to the deep sea
PLASTIC WASTE IN
THE OCEAN
3,000 m
Plastic is deposited in sediments
The creatures are not shown in proportion.
11,034 m

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Plastic Pirates – Go Europe! is a European citizen science campaign with the aim of strengthening scientific cooperation in Europe, promoting citizen science engagement and society's participation in the European Research Area, and raising awareness for a conscious and careful approach to the environment. During the German EU Presidency in 2020, the campaign was extended to the countries of the Trio Presidency and became a joint action of the Federal Ministry of Education and Research (BMBF) with the Portuguese Ministry of Science, Technology and Higher Education and the Slovenian Ministry of Education, Science and Sport for the period 2020 to 2021. Since January 2022, the action has been extended to other EU Member States with the support of the EU Commission.