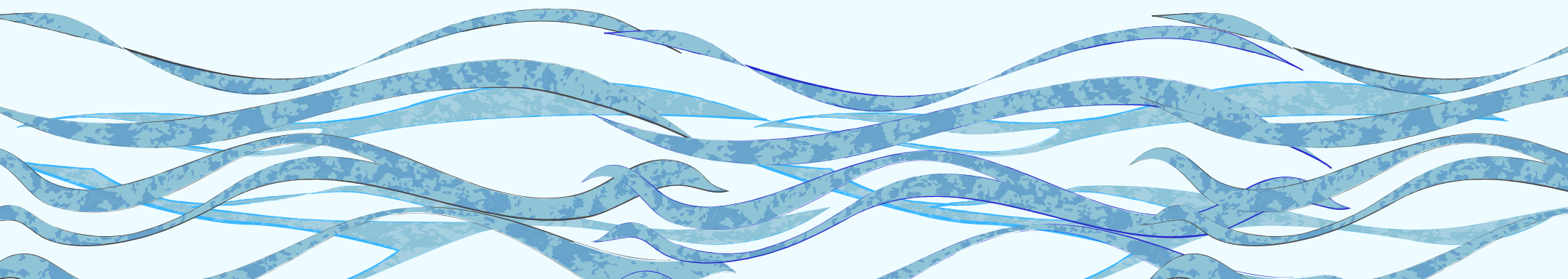




**UNAVEX**  
**SUSTAINABILITY ACTION TASK**

# **Sustainable water initiatives**

**FROM ALL OVER THE WORLD**



# Introduction

Rivers and seaside worldwide are essential lifelines, supporting ecosystems, biodiversity, and human communities. However, increasing pollution from industrial waste, agricultural runoff, and urban expansion has severely impacted water quality, leading to habitat degradation and biodiversity loss. From the Po River in Italy to the German North Sea or to the Vistula River in Poland, water bodies across the globe are facing alarming levels of contamination.

In response, governments, researchers, and local communities have initiated innovative and sustainable solutions to restore these vital waterways. Whether through large-scale renaturation projects, biological methods such as fungal bioremediation, or community-led initiatives promoting sustainable water management, these efforts highlight the power of collaboration in addressing pollution. By investing in science-driven and grassroots solutions, we can safeguard these rivers for future generations and set an example of sustainable water conservation worldwide.

A crucial aspect of our project is **education (SDG 4)**, which empowers communities from all over the world with the knowledge and skills needed to protect their water resources. Also, it is related to raising awareness and equipping communities with the knowledge to implement sustainable practices.

Moreover, **access to clean water and sanitation (SDG 6)** is at the heart of these projects, preserving biodiversity, and create more space for the communities.

Lastly, creating **sustainable cities and communities (SDG 11)** depends on responsible **water management**, as healthy rivers contribute to resilient urban environments, reduce flood risks, and enhance overall quality of life. By integrating education, water conservation, and sustainable urban planning, these efforts set a precedent for a cleaner, healthier future for both people and the planet.



# Countries studied



Italy  
Germany  
Poland  
Belgium  
Ethiopia  
Kenya  
India

 **TAKE  
ACTION**





# Reducing waste & restoring the River Po basin



## THE PROBLEM

Rivers worldwide are suffering from increasing pollution due to industrial waste, agricultural runoff, and urban expansion. The Po River, Italy's longest waterway, is no exception. Decades of human activity have led to habitat degradation, water contamination, and biodiversity loss, threatening both ecosystems and local communities.

## THE SOLUTION

To combat these environmental challenges, Italy has launched an ambitious renaturation project aimed at restoring the Po River's natural balance. The initiative focuses on **improving water quality**, reducing pollution, and enhancing flood prevention by reintroducing native vegetation and restoring wetland areas. These efforts will not only protect biodiversity but also create a healthier environment for people living along the river.

## ORGANISATIONS INVOLVED

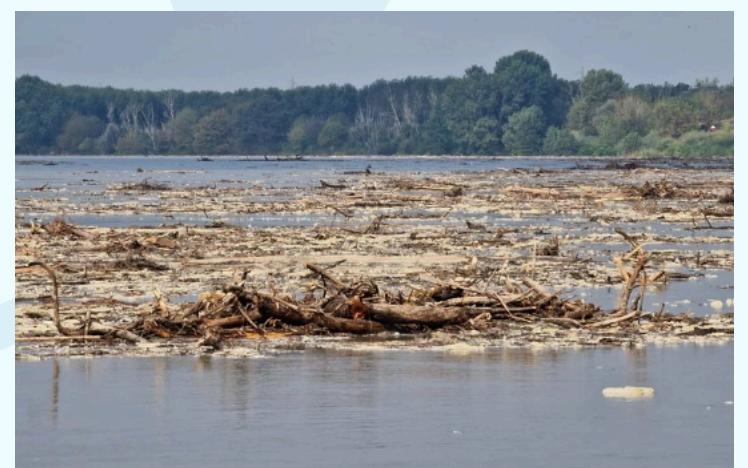
The Italian government, in collaboration with regional authorities and environmental organizations, is spearheading this project as part of the **National Recovery and Resilience Plan (PNRR)**. This initiative is backed by EU funds and aims to align with global sustainability goals. Other organizations involved are:

- The **Agenzia Interregionale per il fiume Po (AIPO)** is dedicated to ensuring hydraulic safety and managing navigation infrastructure across the Po River basin.
- The **Autorità di Bacino Distrettuale del Fiume Po** is a public entity focused on the integrated management of the Po River basin. Established to address issues such as soil protection, water resource management, and environmental preservation.

Also, many non-profit organizations like WWF-Italy are involved in the restoration of the river.

## CONCLUSION

These organizations and projects exemplify the collaborative efforts underway to restore and protect the Po River, ensuring its ecological health and sustainability for future generations. By investing in sustainable solutions, Italy is setting an example of how governments and communities can work together to fight river pollution and protect vital water resources for future generations.







# Fungi for reducing plastic pollution in the German North Sea: A global and local approach



## THE PROBLEM

**Plastic pollution** is a global crisis, threatening ecosystems, wildlife, and human health. The German North Sea for instance is heavily polluted with microplastics, with concentrations reaching up to  $1,396 \text{ mg/m}^3$ .

This pollution is exacerbated by offshore activities and shipping routes. The problem is even more pronounced in regions with underfunded waste management systems, where plastic pollution exacerbates biodiversity loss and environmental degradation. Plastics persist in the environment for decades due to their resistance to natural degradation processes, creating a long-term ecological challenge.

## THE SOLUTION

Researchers have discovered that certain fungi from the *Ascomycota* group, including *Fusarium*, *Penicillium*, *Botryotinia*, and *Trichoderma*, can **naturally degrade plastics** like **polyurethane (PU)**, **polyethylene (PE)**, and **rubber** without chemical or thermal pre-treatment.

This biological method holds promise for large-scale bioremediation in marine and terrestrial environments.

Social media campaigns, educational programs, and community clean-up events could help raise awareness about this innovative fungal solution to plastic pollution, aligning with **UN Sustainable Development Goals** 9 (Industry, Innovation, and Infrastructure), 12 (Responsible Consumption and Production), 14 (Life Below Water), and 15 (Life on Land).

## ORGANISATIONS INVOLVED

- Leibniz Institute of Freshwater Ecology and Inland Fisheries
- University of Potsdam
- IUCN Species Survival Commission
- AQUACOSM

## CONCLUSION

In conclusion, plastic pollution is a global issue affecting us all, from contaminated waterways to endangered wildlife. The innovative use of fungi to degrade plastics offers hope for a cleaner future. However, this research needs funding and support to scale up. By advocating for this cause at our universities and communities, we can help bring this solution to life. Together, we can make a difference and ensure a healthier planet for future generations!



Sample of a plastic eating fungi, Amira Farzana Samat/University of Sydney





# Operation Clean River



## THE PROBLEM

It's inevitable to detect progressive tendency to **litter** the natural environment. While towns and touristic attractions have units designated to deal with pollution, many people forget to notice the damage hidden in local rivers. Those often become local rubbish pits - place where residents tend to dump bothersome garbage (such as furniture or tires) or everyday litter (e.g. wrappers) during walk back home.

## THE SOLUTION

The problem of rivers' condition was raised to public by the organisation "Operation Clean River" (pl. Operacja Czysta Rzeka). The project started in 2018, when one of Polish newspaper published article about vastness amount of trash being found in and by the river Bug. They motivated local community to take the matter in their hands and all together organize a **clean up**. It didn't stop right there, soon it became an action happening all over Polish rivers. As of today every year people have a chance to join (or create) a voluntary unit in their area by simply registering at [operacjarzeka.pl](http://operacjarzeka.pl). It holds over 500 squads with almost 37 thousands participants that collected 875 tons of trash.

## ORGANISATIONS INVOLVED

"Operation Clean River" fund, cooperating with many schools and firms

## PROMOTION

The key to success turned out to be local communities. Thousands of schools and firms are engaging members to take part in their action. Celebrities became ambassadors, helping social media promotion. But for many people still all it takes is to see a printed out flyer at a nearby bus stop.



## CONCLUSION

Success and development of this project proves, that individuals can, and are, making a change. The growth in numbers of participants shows awareness level of rivers' pollution is increasing. Importantly, it's an initiative open for everybody and easy in understanding. The fact that many formal entities became part of this project and the main organisation itself is developing (so far they created school programs on the topic and recorded an podcast) gives hope that the problem could disappear in the future.





# Wodna Masa Krytyczna: Residents reclaiming their river



## THE PROBLEM

Unsustainable water management practices. The event intends to draw the attention of the residents of Kraków (Poland) to the problem of taking care of rivers and the often **excessive human interference in their natural course**. Every year a different aspect of sustainable water resources management is highlighted, but the overarching area of focus – exemplified by the area of the event – remains on rivers.

## THE SOLUTION

**Annual performative event** in Kraków, where dozens of residents sail along Poland's longest river, Wisła (eng. *Vistula*) on self-made water structures, boats, rafts, kayaks, created by using **upcycled materials**, in the spirit of zero waste. Prior to the event, organisers host workshops on building **eco-friendly vessels**. The sail itself is accompanied by concerts and a meal provided by one of Kraków's best vegan and vegetarian restaurants.

## ORGANISATIONS INVOLVED

CSW Wiewiórka; local residents, artists and NGOs; Municipal Police of Kraków

## PROMOTION

The event is supported by a social media campaign educating people on a chosen aspect of sustainable water resources management. Professional photographers and media attend, ensuring further dissemination of information among the city's residents.



## CONCLUSIONS

The success of Wodna Masa Krytyczna, given that the event runs its XV edition in 2025, proves that even relatively small activities play an important role in educating people on sustainability issues, here those focused on sustainable water management. Intertwining education on serious issues with a fun way of spending people's leisure time is the way to do it!





# Addis Ababa: Water scarcity and rapid urbanisation



## THE PROBLEM

In Addis Ababa, the African continent's hub for diplomacy and international affairs, current water supply only meets about 60% of the city's demand, leaving millions without **access to reliable running water**. As one of the fastest growing African cities, driven by population increase, rural migration, and industrial expansion, **water demand** has and continues to surge. To meet the skyrocketing demand, water supply infrastructure has been developed in a spontaneous and unplanned manner, increasing pressure on water sources. This is especially true concerning well drilling, which results in private investors drilling wells to suit their own needs, prioritizing short term gains over long term sustainability. Additionally, water distribution networks are extremely outdated resulting in over 40% water loss through leaks across the entire system.

## THE SOLUTION

To address Addis Ababa's water crisis, the federal government has prioritized **expanding dam storage**, improving **treatment facilities**, developing new **surface water sources**, and drilling additional **deep wells**. Meanwhile, the Addis Ababa Water and Sewerage Authority (AAWSA) has also undertaken various initiatives, including replacing aging pipelines, **repairing and renovating infrastructure**, implementing a **system for network monitoring**, safeguarding reservoirs through **reforestation**, promoting the **use of treated wastewater** for non-potable purposes, **enhancing staff training** to **reduce non-revenue water (NRW)** with international collaboration, and **educating the public** on water conservation.

## ORGANISATIONS INVOLVED

Wateraid, World Resources Institute, AAWSA, UNICEF, World Bank



## CONCLUSION

There have been considerable efforts by various governmental and independent actors to find and fund solutions to Addis', and Ethiopia as a whole, issue with water security. The World Research Institute and Water Aid are both non profits that have worked on driving urban water resilience and WASH programs aimed at increasing access to reliable sources of clean water. Similarly, the World Bank and UNICEF have implemented projects with the same goals but on a macro scale, targeting the nation as a whole.





# Planning for floods in Nairobi, Kenya



## THE PROBLEM

With the advent of climate change, the cities of East Africa including Nairobi receive **higher rainfall amounts**, a departure from previous experiences (Chapman et al., 2023; Michael, 2006). Infrastructural advancements, minimal rehabilitation and expansion, and inadequate maintenance of existing drainage systems have also resulted in **clogging of the natural water ways** and **destruction of natural wetlands** which used to act as 'sponges' (Msingi Afrika Magazine, 2024). Consequently, Nairobi experiences significant **flooding** whenever extreme rainfall events occur in the city leaving roads and homes flooded and affecting commuters and homeowners respectively.

## THE SOLUTION

Continuous and collaborative **maintenance and expansion of existing drainage infrastructure** and **strict implementation urban development laws**.

## ORGANISATIONS INVOLVED

- Kenya Meteorological Department
- Kenyan State Department for Housing and Urban Development
- Nairobi City County Government



(The Standard, 2018: Aerial view of flooded Nairobi CBD)



(Saisi, 2024: Flooded home in Garden Estate)



(Saisi, 2024: Residents of Garden Estate wade the floods)

## CONCLUSION

In conclusion, collaboration between the city environment department and the meteorological department is crucial for effective urban flood management. By anticipating rainfall quantities, they can strategically plan and execute drainage maintenance, reducing flood risks. Additionally, urban planning agencies can play a transformative role by enforcing regulations that require property developers to designate a portion of their land for grass lawns. These measures together enhance urban resilience, promoting sustainable practices to mitigate the impact of flooding.





# Ganges 2.0: Rethinking Conservation for a Cleaner Tomorrow



## THE PROBLEM

The Ganges River, one of the most significant and sacred rivers in the world, is facing a severe pollution crisis due to industrial discharge, untreated sewage, plastic waste, and agricultural runoff. Additionally, during major religious gatherings, pollution levels surge dramatically, exacerbating water contamination. High concentrations of **microplastics**, **heavy metals**, and **microbial pollutants** threaten aquatic life, biodiversity, and human health. The persistence of these pollutants in the river system has made sustainable intervention crucial for restoring the Ganges' health.

## THE SOLUTION

Efforts to restore the river focus on multiple strategies, including **expanding sewage treatment plants (STPs) and zero-liquid discharge (ZLD)** systems to prevent wastewater pollution. Automated cleaning boats and floating barriers help remove plastic and debris, while biodiversity conservation initiatives protect endangered species like the Ganges River Dolphin. **Afforestation** along riverbanks prevents soil erosion, and **sustainable farming practices** reduce agricultural runoff. Public awareness campaigns and eco-friendly pilgrim initiatives promote responsible behavior, while industrial pollution control is strengthened through real-time monitoring of effluents. **Advanced IoT-based sensors** track water quality for quick responses, and **eco-friendly religious practices** encourage biodegradable offerings and designated immersion areas.



## ORGANISATIONS INVOLVED

- Namami Gange Programme
- National Environmental Engineering Research Institute (NEERI)
- Wildlife Institute of India (WII)
- Ganga Action Parivar
- Banaras Hindu University (BHU)
- United Nations Development Programme (UNDP)



## CONCLUSION

The pollution crisis in the Ganges River demands comprehensive, science-backed solutions that go beyond traditional cleanup efforts. By integrating waste management infrastructure, biodiversity conservation, policy enforcement, and community engagement, India is making significant strides toward restoring the health of the Ganges. With continued investment, innovation, and global collaboration, we can ensure that the river remains a lifeline for future generations while balancing environmental sustainability with cultural and religious traditions.



# Conclusions

## DIFFERENT PROBLEMS

Although the sustainability challenges in our action task spanned different problems from various countries and continents, they all shared a common thread: **water**. This highlighted not only water's fundamental role in our daily life but also the growing threats it faces, including both those regarding its quality and quantity.



## SIMILAR SOLUTIONS

Different problems sometimes call for similar solutions. The solutions presented in our sustainability action task had some overlapping themes, such as community engagement through a participatory process, the use of widely understood nature-based solutions (NbS) or cooperation with academia. This goes beyond sustainable water practices and is in line with the global approach of the UnaVEx programme: ***in an increasingly interconnected world, the ability to apply global knowledge in local contexts is crucial.***

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