



# PLASMA (Microplastic pollution in the Mayotte lagoon) : participatory sciences to access closed investigation areas

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## Context

**The question :** The PLASMA project aims to better understand the origins and dynamics of microplastic pollution in one of the world's most beautiful lagoons, Mayotte, which has been affected by this pollution for several years now. Funded by the Mayotte Marine Nature Park, this project is part of a philosophy of knowledge specific to nature parks in general : **participatory science**.

**Where does the pollution come from ?** Either from oceanic inputs from other regions of the world, atmospheric inputs, or **terrestrial inputs** (the goal of 'PLASMA').

**What are the vectors for these terrestrial inputs ?** Small coastal rivers (intermittent depending on the season, dry or rainy).

**What is the problem ?** Microplastics = products of the degradation of macroplastics : it is therefore the **relationship to waste** that must be questioned.

**Subject of the survey :** The **practical dimension** of relationships to waste (origins, uses, local contexts).

The focus on practices means being able to access areas of investigation that have been little studied : **informal settlements** (slums), known as « **Bangas** » in Mayotte.

Particularly difficult to access, it is thanks to **participatory science** that we have been able to open up this field.

## How ?

### « Participatory science » = ?

A research method that differs from and complements 'traditional' scientific protocols : reliance on **local actors** (residents, neighbours, citizens, etc.) and their **skills** = « **lay expertise** ».

Advantage : their **ability to access certain areas** or their own experiences

**Why use participatory science in Mayotte?** The poorest of France's departments, with a structural problem of illegal immigration (Comoros, Madagascar, East Africa, etc.), accounting for around 30% of its population of nearly 400,000 inhabitants; **problems accessing resources, particularly water**.

Consequence = **endemic violence and a strong sense of insecurity**.



### Initial hypothesis

Plastic waste and its impact on the environment are mainly caused by these informal populations, who are not very sensitive to these issues and have other more vital priorities.

### How to access the bangas?

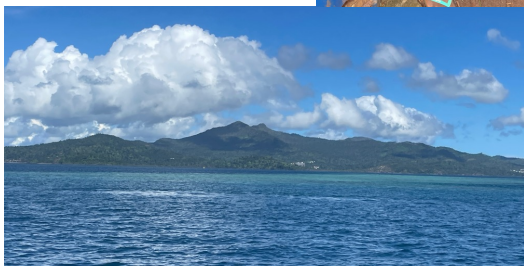
At the heart of the investigation, **STUDENTS** as « **guides** » and « **translators** » : living mainly in the bangas around their schools, the students **opened up their territory to us** (with the help of the local prevention and mediation association 'ABK'). And they speak the local languages (Shimaore and Kibushi) !



### Three social science research protocols for these « budding ethnologists » :

- **Cartographic surveying** (observations and recording of practices, waste) + Plasma tracker app : « life of the river »
- **Interviews** with local residents
- **Questionnaires** (translated into Shimaore)

+ a low-tech protocol for students to collect water samples from rivers



## Results

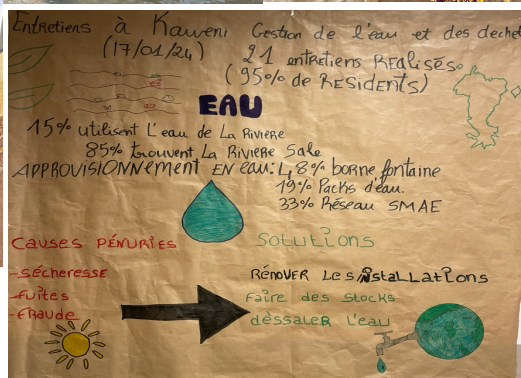
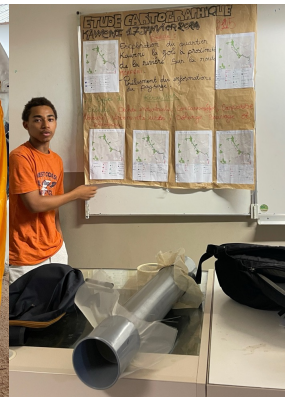
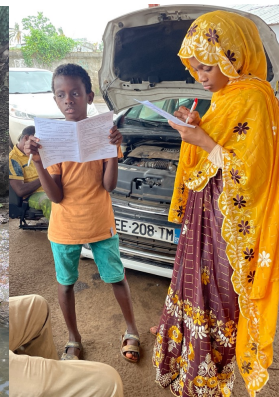
Thanks to the students, access to ... **AUGMENTED REALITY!**

### Contributions from on-site observations :

- The river, a **source of multiple uses** (housing, leisure, work, livestock, daily tasks, relationship to the body, etc.) : a central element of local life, **strong attachment!** : "It's not normal to have to wash our clothes in the river" (new generation awareness, question posed to the public authorities)
- The faces of the river : **uses dependent on the presence of the resource** (dry/rainy season)
- Small **arrangements with the river** : small "pirate" dams to create ponds, undeclared individual pumping...
- **Uses that emit microplastics** : plastic sheeting to cover plots of land or bangas, tyre walls to hold the banks, multiple small illegal dumps.
- Rubbish containers **unsuited to local practices** (children responsible for rubbish in households are too small to lift the lids) : bags left on the ground
- Impossibility of installing a collection centre for cans or plastic bottles next to schools : pupils, who are undocumented minors, are afraid of the Border Police (PAF)

### A hypothesis to be clarified : mixed findings regarding the origin of microplastic pollution by banga inhabitants

- "Les lavandières" (women who wash clothes in Mayotte) **emit few microplastics** (compared to a washing machine) : even if there is a **persistent problem with the products used** (bleach, etc.)
- Origin of wastewater discharged into the environment : **connection rate to the sanitation network** in Mayotte (around 15%) : significant discharges from "concrete (official) block houses"
- Existence of **local initiatives** (in the bangas) : organisation of large-scale collective clean-ups in partnership with municipal services



### Conclusions & perspectives

- Residents with **very little connection to their lagoon** (disconnection between land and sea) but **very close to their rivers**
- Provisional conclusions that **question the absence of public authorities in informal sectors** (in relation to public health).
- Current events (**Cyclone Chido**, December 2024) that **reveal management weaknesses** but force us to consider new development models that take into account the issues of pollution and water management.

## References

Ethnographic surveys conducted between 2022 and 2025 by students from the following schools in Mayotte :  
 Lycée des Lumières (Kaweni), Collège de Passainty, Collège de Tsingoni, Collège de Koungou