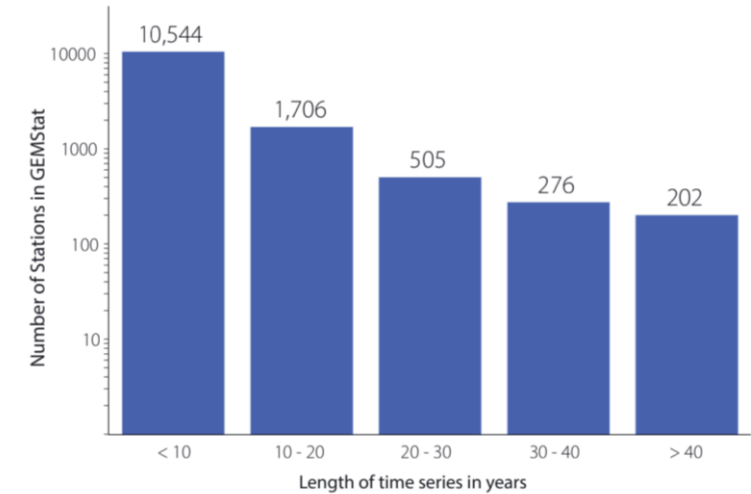
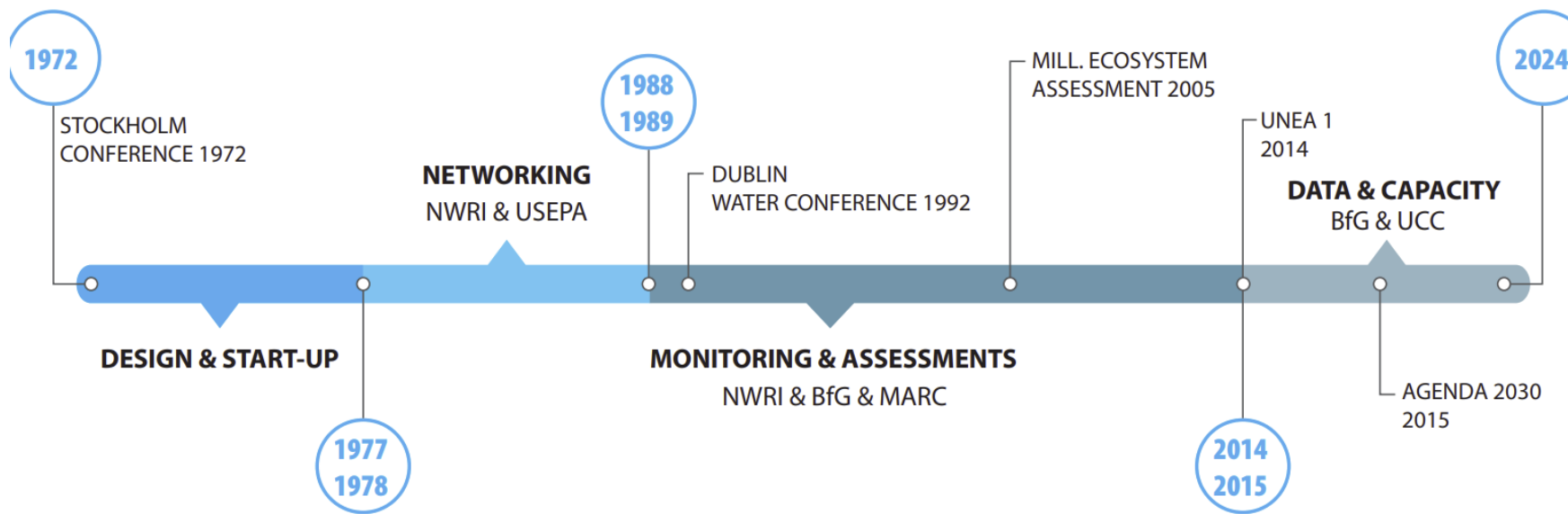


GEMS/Water Exploring Citizen Science to fulfil 50-year-old objectives

Stuart Warner, UNEP GEMS/Water

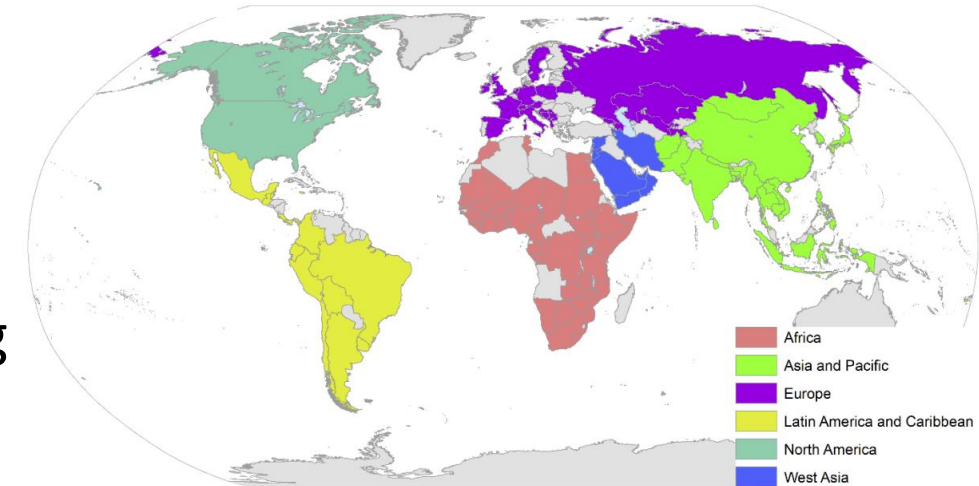


Quick History Lesson

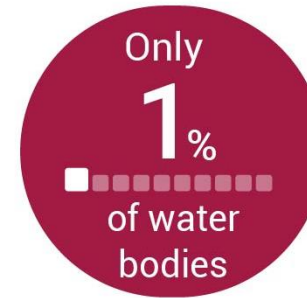
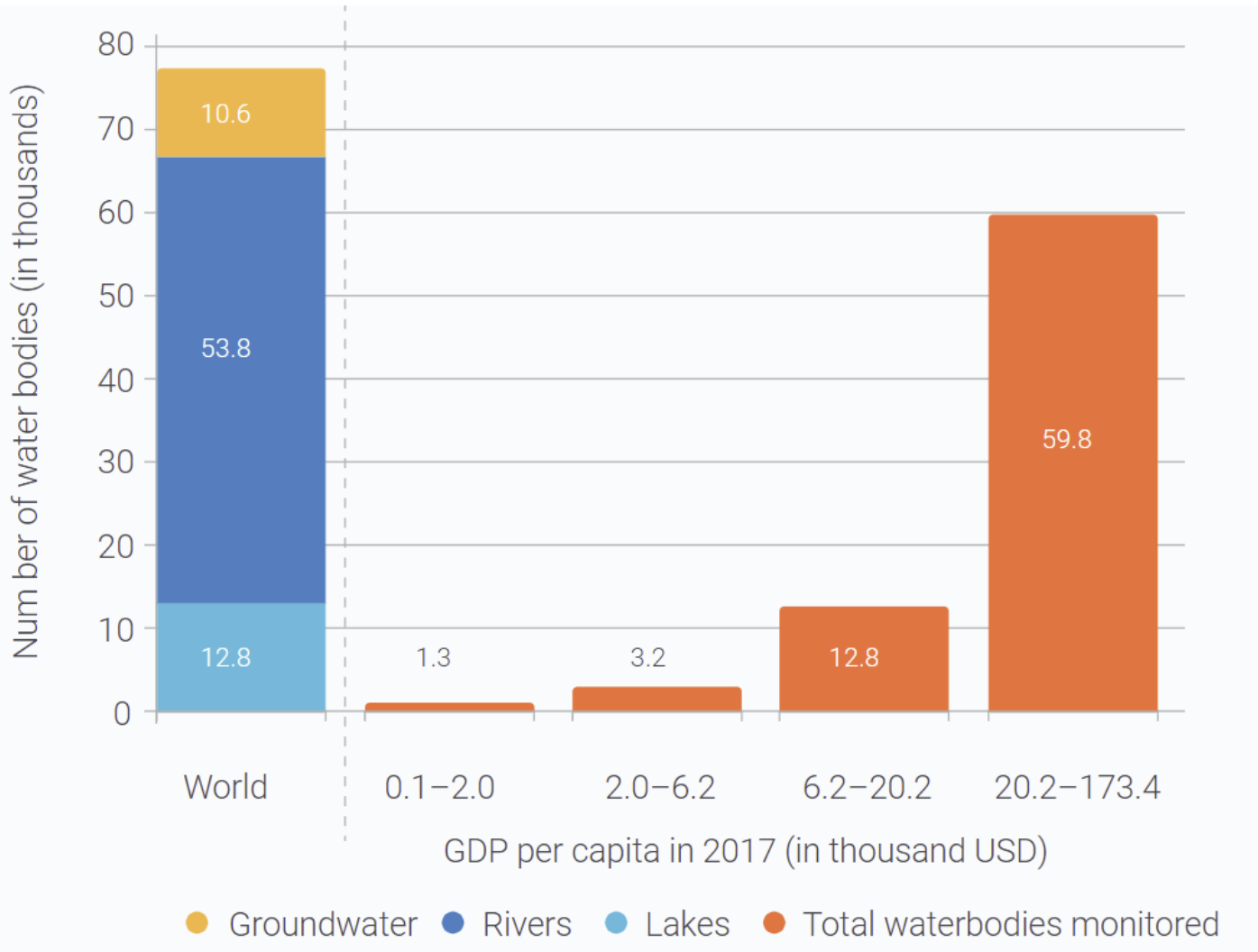


Objectives

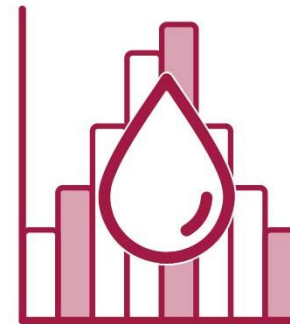
- Provide data and information...
- Strengthen the reliability of monitoring data
- Assess the status and trends in freshwater quality
- Support national and regional water quality monitoring networks through capacity development



Latest SDG indicator 6.3.2 Information



where we have information are in the **20** lowest GDP countries



In low-GDP countries, there is an **urgent need** for **better data** on the **health** of rivers, lakes and groundwater

Strategy

‘Normalize’ use of citizen-generated data for SDG6 reporting and thereby bring about positive environmental and social change

Rationale

- Citizen science data can be valuable source of reliable *in situ* data
- Provides a pathway for community-level engagement which is needed to improve and protect water quality

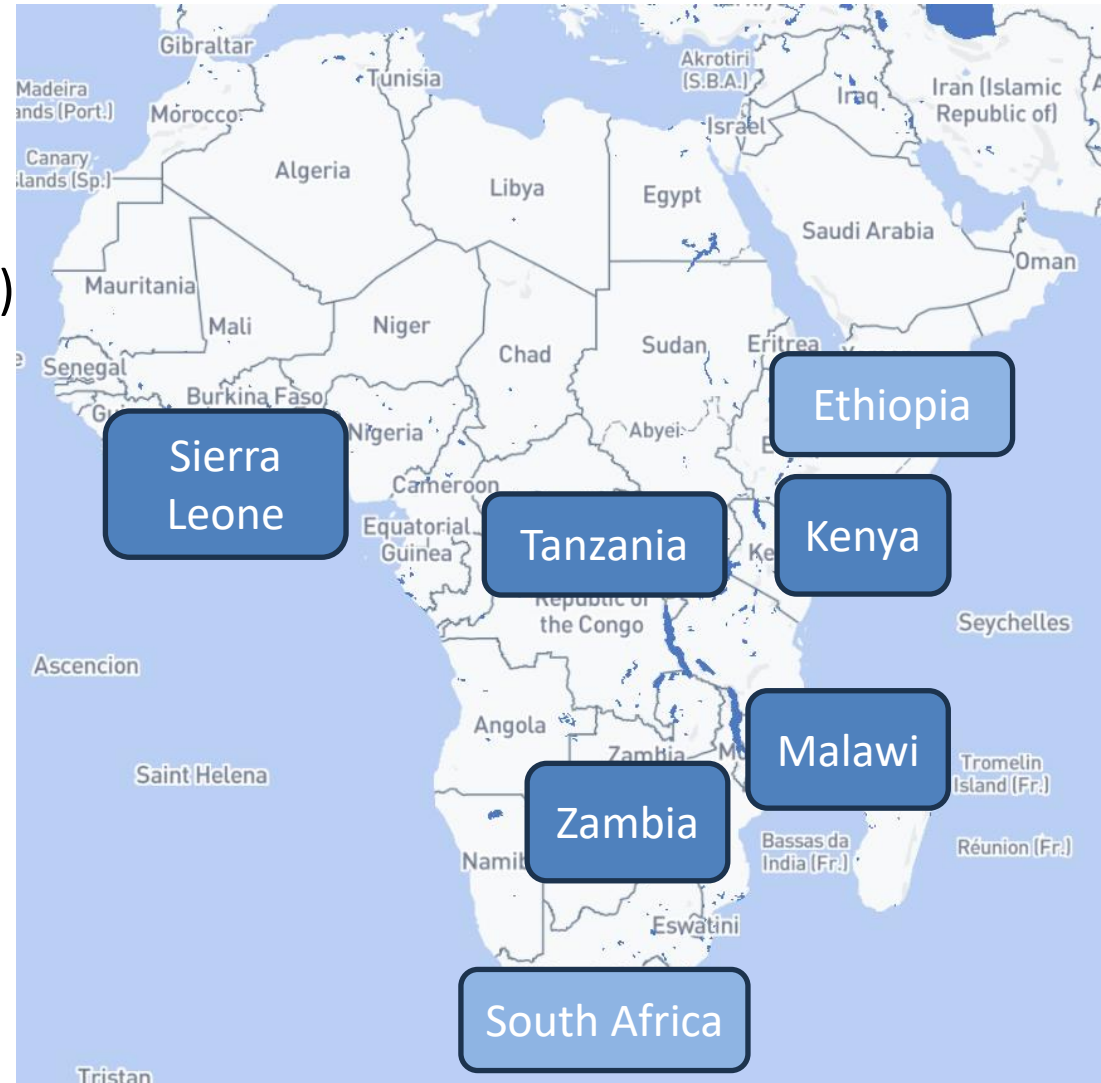
But several barriers to be overcome

- Awareness
- Acceptance
- Technical
- Policy

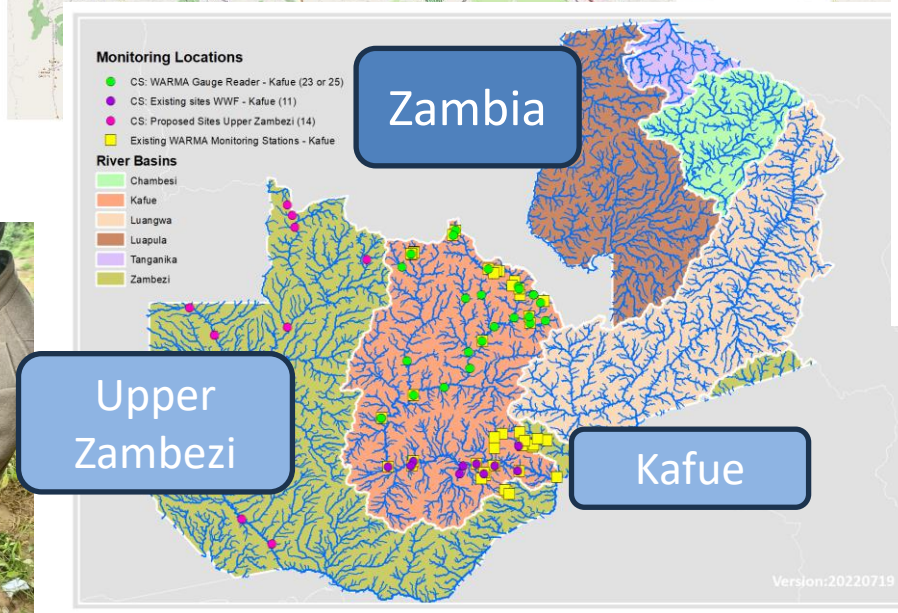
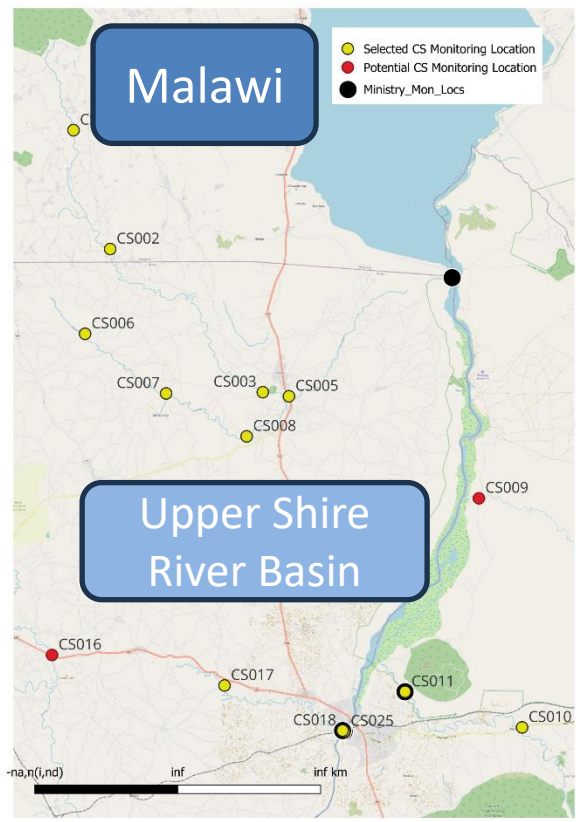
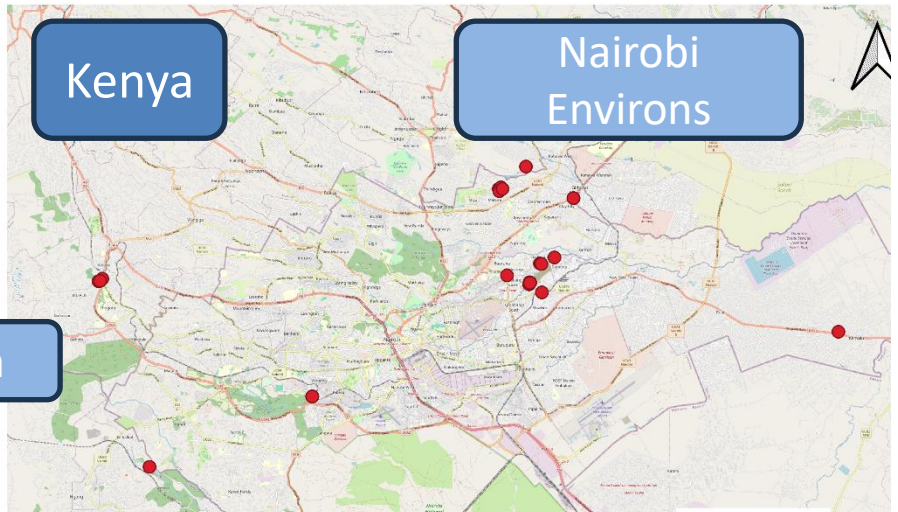
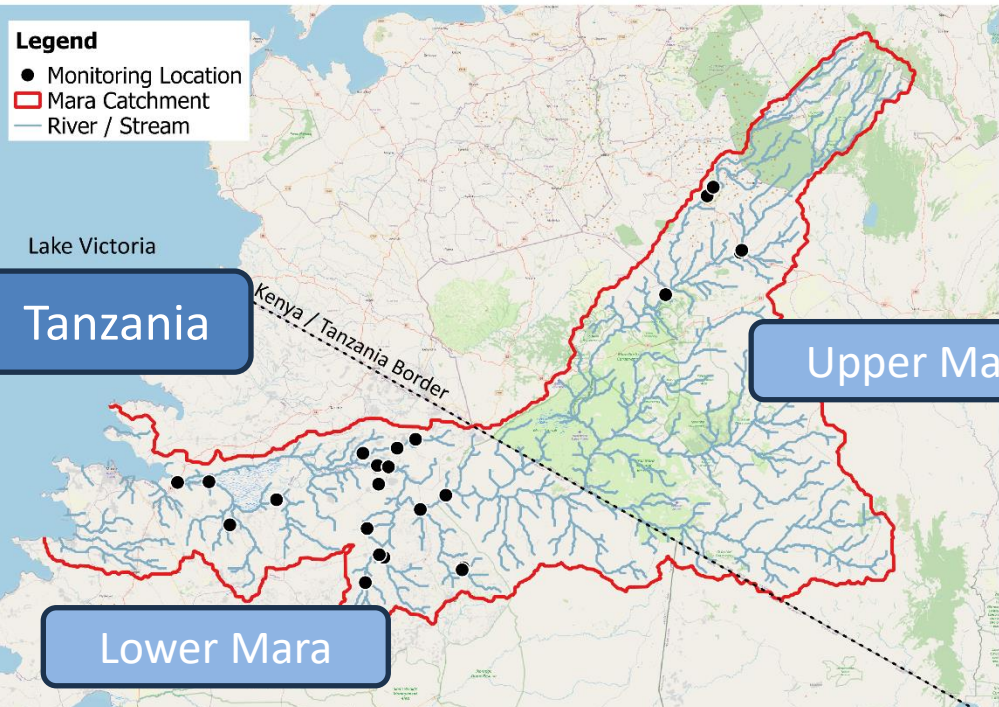
This is where the work is!

Citizen Science - Overview

- **WWQA Workstream** – *Citizen Science for SDG indicator 6.3.2*
- Established a **Working Group** of practitioners and experts
- Drafted **Policy brief** (two-page) **Technical brief** (20+ pages)
- Established **projects** in five countries (including transboundary Mara project)
- Two countries already incorporated citizen data for **SDG indicator 6.3.2** 2023 submission
- Knowledge exchange **Workshop** Nairobi 2023
- **Article** in press: *Frontiers in Water Empowering citizen scientists to improve water quality: from monitoring to action*
- **Expansion plans**



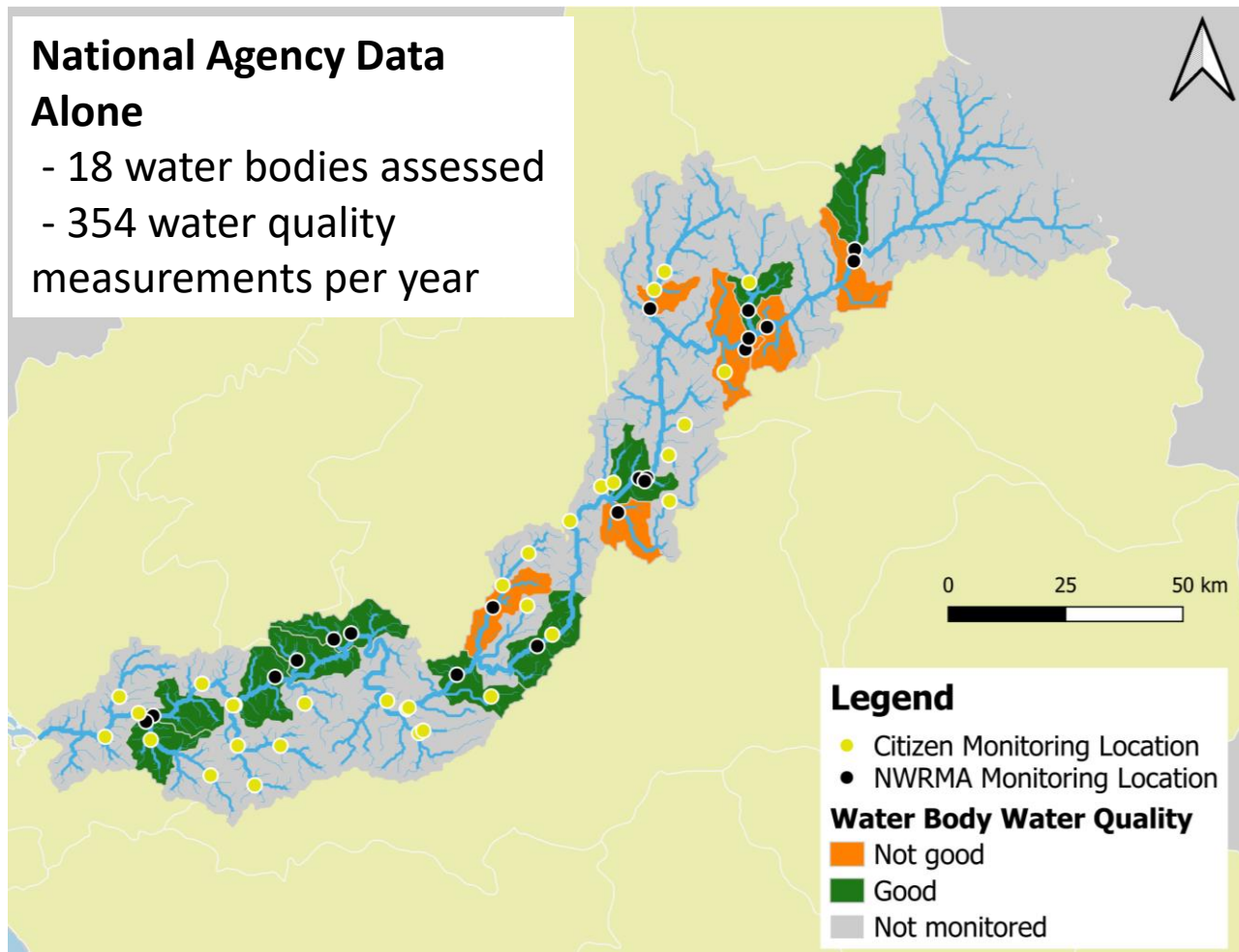
Active Projects



Latest SDG indicator 6.3.2

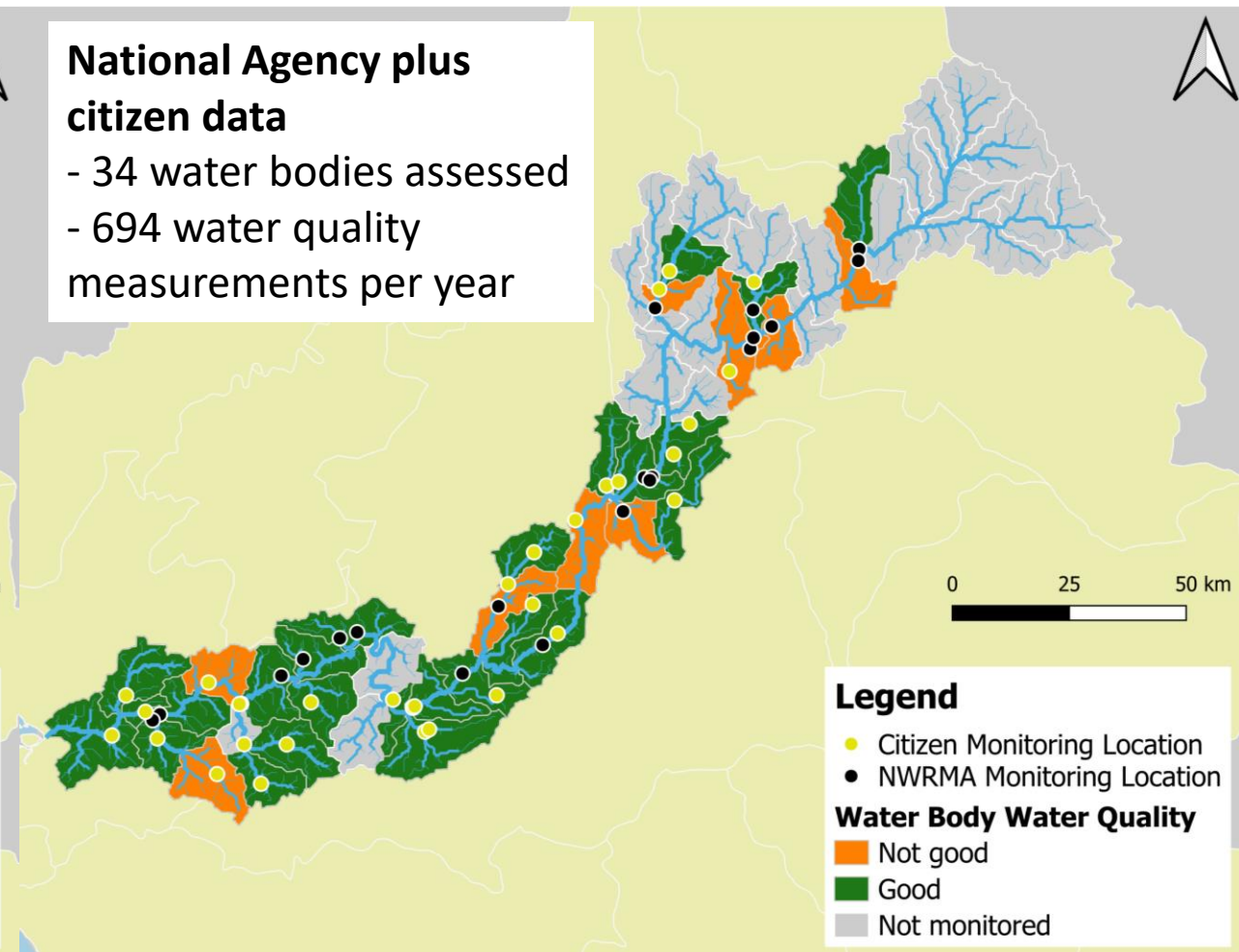
National Agency Data Alone

- 18 water bodies assessed
- 354 water quality measurements per year



National Agency plus citizen data

- 34 water bodies assessed
- 694 water quality measurements per year

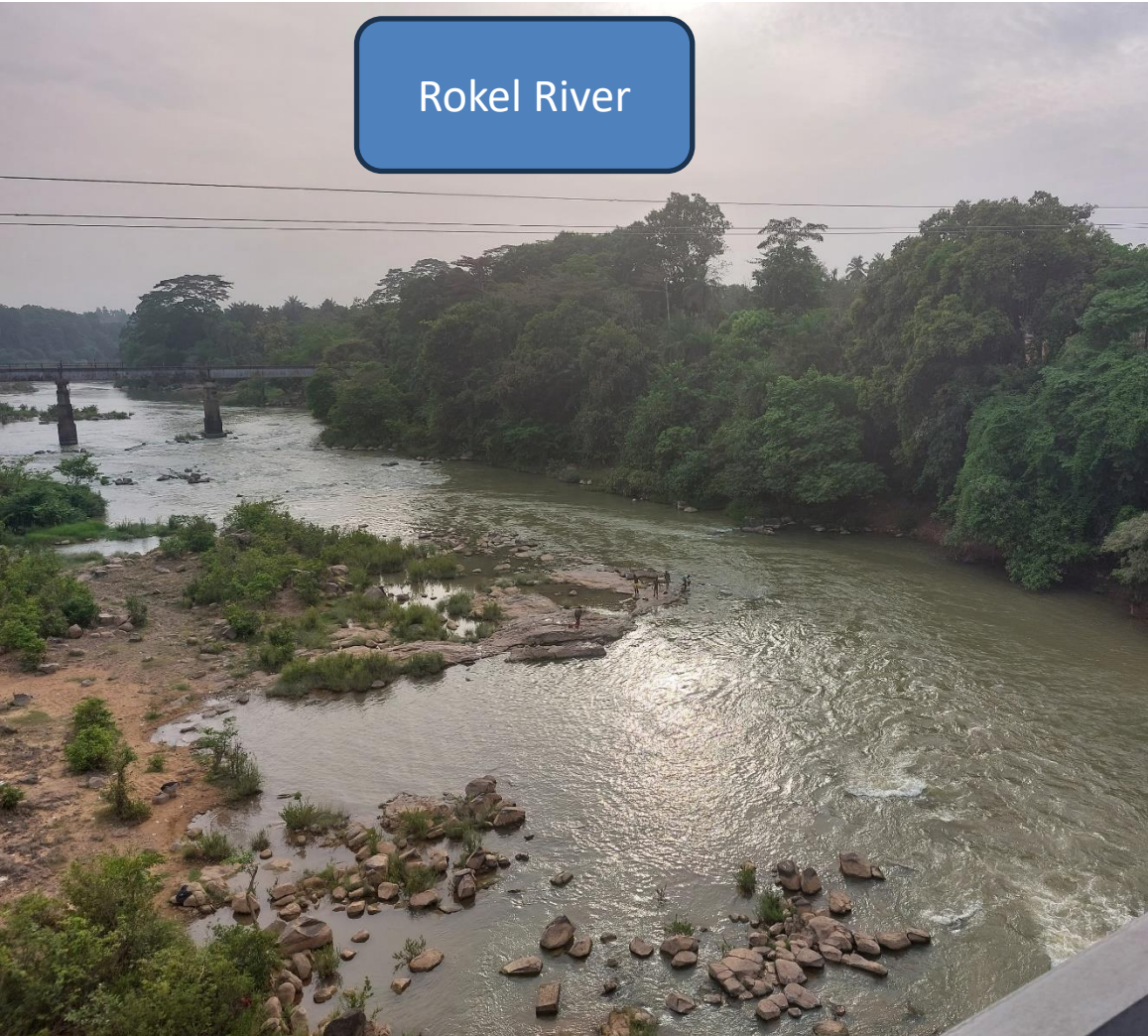


Sierra Leone



Sierra Leone

Rokel River



Prolific artisanal mining



Workshops



Citizen Science & UN Sustainable Development Goal 6 3 2 Knowledge sharing Workshop
28th November 2023

Knowledge Exchange WS: Nairobi, November 2023

- Citizen scientist recruitment and engagement
- Site selection
- Addressing Gaps in Official Monitoring of SDG 6.3.2
- Design and set up of Citizen science Monitoring Programmes

Innovation in WQ Workshop: Petten, September 2023

Hackathon- type event

Empowering citizen scientists to improve water quality: from monitoring to action

Article submitted to Frontiers in Water



Policy and Technical Briefs

Policy Brief

The role of citizen science in monitoring progress towards Sustainable Development Goal Target 6.3

[Date of release]

[Authors and contributors, including a brief description of the WWQA working group]

Good ambient water quality is crucial for human survival. It is alarming that we have very little data or information about the quality of water in lakes, rivers, and groundwater globally. Urgent action needs to be taken if we want to understand and protect our water supplies. This brief calls for international policymakers and local communities to work together to monitor and improve water quality using a readily available tool – citizen science. Without immediate adoption of this tool, the authors believe that Sustainable Development Target 6.3 will not be met.

The challenge of water quality monitoring

We currently monitor water quality in less than 1% of the world's lakes, and, although the lack of data makes it impossible to provide a similar figure for rivers and groundwater, the situation is likely just as bleak. We need an urgent solution.

Many communities around the world take water directly from ambient sources for domestic use without treatment. Where water is treated, poor water quality places additional pressure on treatment processes which can be expensive and carbon-intensive. Climate change is likely to exacerbate existing water quality issues. It's imperative that we understand the quality of our raw water resources and do our best to protect them.

Through UNEP's implementation of SDG indicator 6.3.2, a clear picture emerged of the capacity of national authorities tasked with monitoring and assessing their freshwaters to fulfil their role. In the 2021 Progress Report, a clear link was established between GDP per capita and monitoring capacity with low-income countries reporting on only a small fraction of the total water bodies that were reported (ref 2021 progress report). This means that without these data on water quality, the scientific basis for protection and restoration activities is missing.

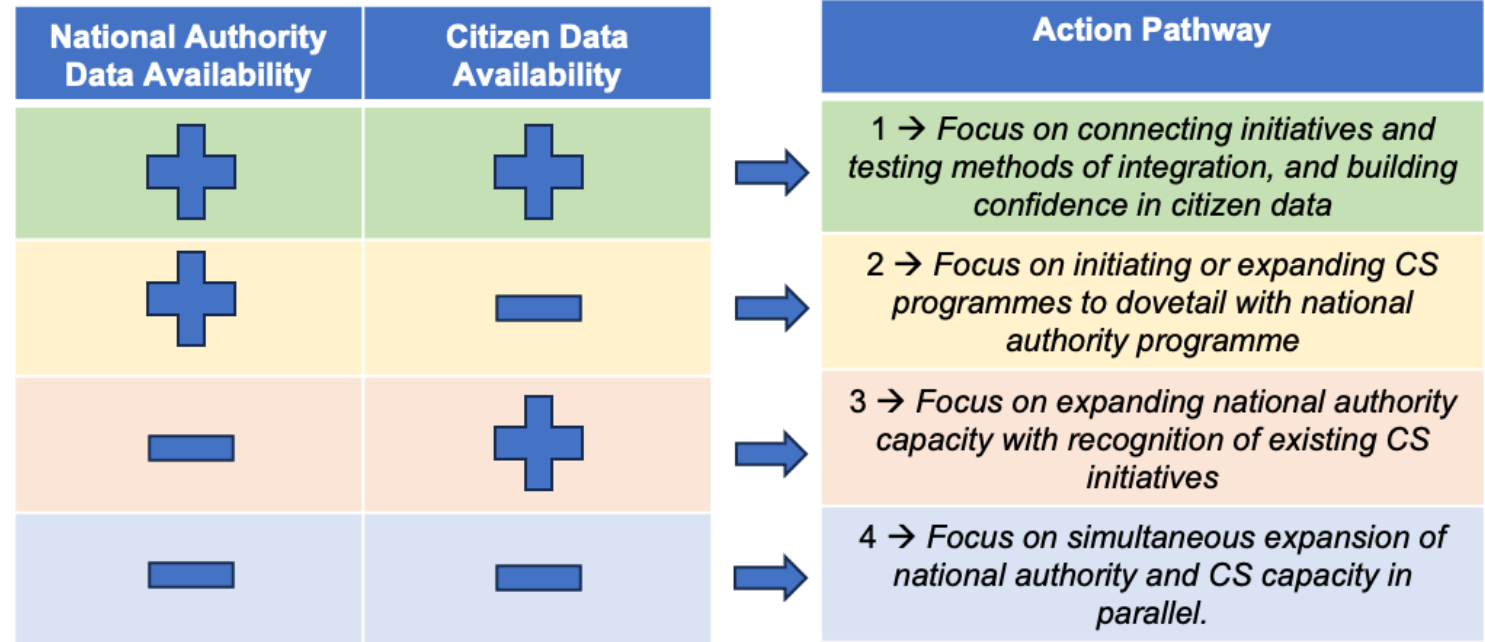
This report also made clear that despite a wealth of data in high-income countries, poor water quality was still reported. Therefore, although collecting and assessing water quality data is an essential prerequisite to management of water resources, it does not necessarily mean that with the availability of these data, that good management is inevitable - these data are only one piece of the puzzle. For water quality to be protected or improved all stakeholders must have a voice and means to provide input.

Citizen science as a solution

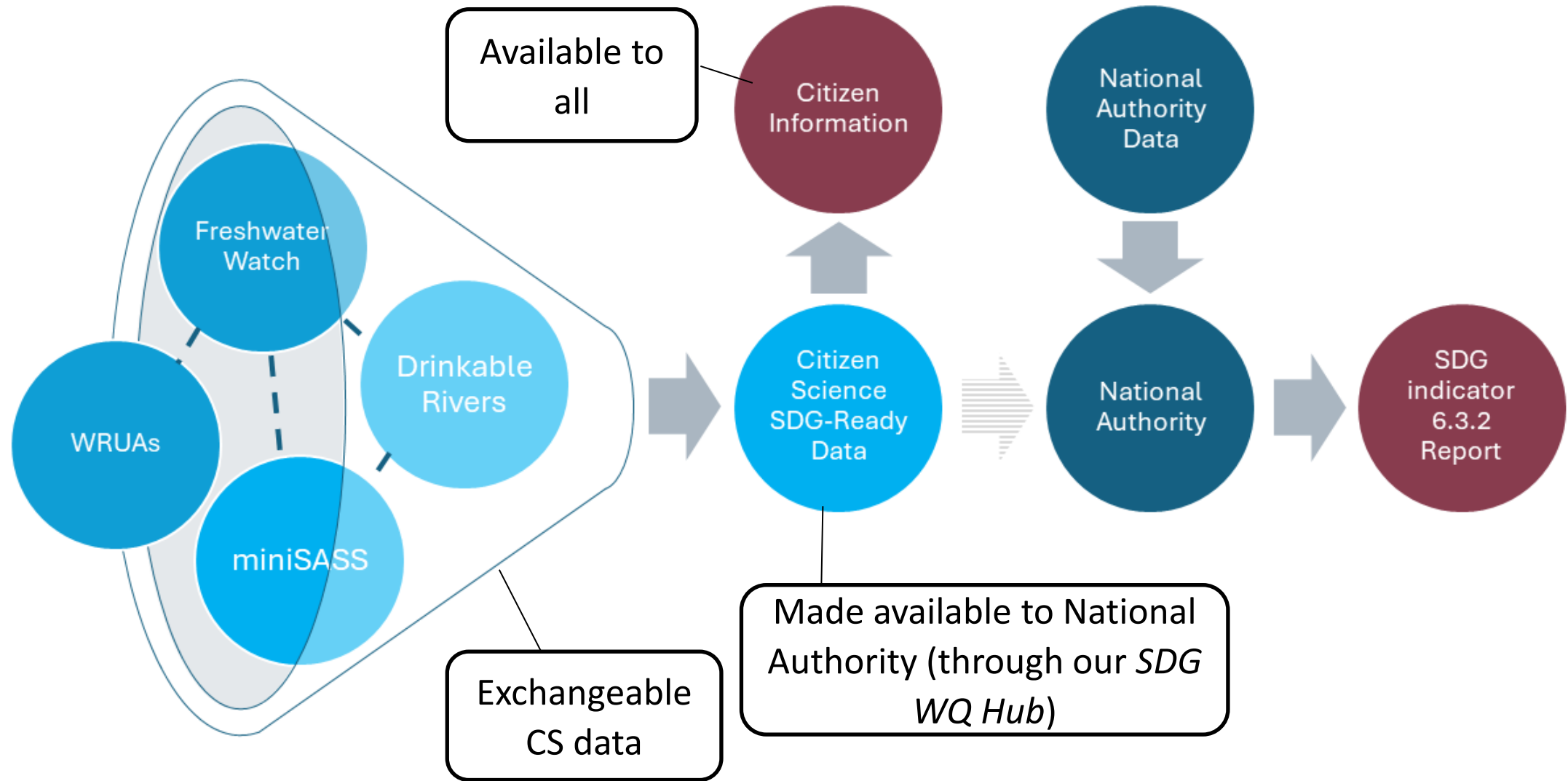
Citizen science is a wide-ranging term that refers to the involvement of non-professional scientists in scientific work. Citizen science data is widely used in global and local biodiversity monitoring, and already directly contributes data towards Sustainable Development Goals 14 (Life Below Water) and 15 (Life on Land). In addition to data provision, this citizen science activity is also providing opportunities for public engagement and education, making better use of local knowledge, increasing support for decision making processes, and promoting inclusion and more just access to science.

In fresh water, many citizen science projects have been identified in both surface waters and groundwater. These include monitoring of chemical and biological parameters included in SDG indicator 6.3.2. Outcomes include increased availability of data, increased spatial and temporal resolution of data, greater participation of local people in water resource management, and public education and awareness raising on water-related issues^{12, 13}. There is therefore huge potential for citizen science to be applied directly to monitor ambient water quality (SDG Indicator 6.3.2) while simultaneously increasing the participation of local communities in water resource management (SDG target 6b).

Global Biodiversity Monitoring	Global Biodiversity Information (GBIF)
Water Quality - chemical monitoring	FreshWater Watch Water Rangers
Water Quality - biomonitoring	MiniSASS Riverfly Monitoring Initiative
Local benefits of citizen science	Diamonds on the Soles of our Feet



Where we want to get to



Where we want to get to

- Expand existing projects
- Start in new projects
- Create Citizen Science space on the *SDG Water Quality Hub* - SDG-Ready information
- Work on data integration
- Test novel financing models
- Integrate different data sources
- Normalize use of citizen-generated data to help achieve SDG6
- Make progress towards those 50-year-old objectives

Thank you

Further info:

- Latest progress report:
<https://www.unwater.org/publications/progress-on-ambient-water-quality-632-2021-update/>
- [SDG Water Quality Hub \(sdg632hub.org\)](https://sdg632hub.org)
- Contact: SDG632@un.org or stuart.warner@un.org

