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Prof. Dr. Uta Wehn

Making Participation Matter?

Citizen Science for Sustainability and Governance



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Bij ons leer je de wereld kennen

Making Participation Matter?

Citizen Science for Sustainability and Governance

Inaugural Lecture by

Prof. Dr. Uta Wehn

on the acceptance of her position as Professor by special appointment

Citizen Science and Sustainability

at Leiden University

on Monday, 13 October 2025



**Universiteit
Leiden**

Madam Rector magnificus of Leiden University, Rector of IHE Delft, esteemed members of the Curatorium of this professorship by special appointment, dear colleagues from CWTS and IHE Delft, beloved family and friends, dear members of the audience.

It is an honour to officially start the professorship of Citizen Science and Sustainability today.

This professorship may be new, but citizen science is not. In fact, some say that in the early days, all science was done by curious amateurs, long before being a scientist became a profession. Others believe that pointing to this history of citizen science, helps to show its value—after all, *‘if Darwin was a citizen scientist [...], then today’s amateurs participating in science must also be up to something valuable.’* [1]

Some citizen scientists are observing birds, bees and other ‘things that are colourful and fly’¹, either regularly or during annual bird counts. For others, citizen science is a serious matter: they monitor and report threats to their health, such as air pollution, or use citizen science to protect and conserve resources that are essential for their livelihoods. There is no shortage of initiatives focused on “all things” related to water: people are monitoring the health of coasts² or rivers, lakes, streams, and wetlands with kits³ or using low tech such as the miniSASS tool. The Drinkable Rivers initiative engages people in Europe and other parts of the world to experience and monitor the health of their rivers and to track progress towards their goal: a world with drinkable rivers. ‘Outfall safari’ takes participants not to Africa but literally through streams in London, to identify and report polluted surface water outfalls. And water monsters are not scary creatures but water sampling schemes in the Netherlands and Belgium.

Citizen science is often referred to as the involvement of the public in data collection or other steps in the scientific method [2]. De facto, by now citizen science has become an “umbrella

term” for a wide range of participatory approaches, activities and interactions that are related to bringing together various stakeholders in data and knowledge production. To capture and understand this variety, various typologies and definitions have been developed by the ‘science of citizen science’ field [3], distinguishing who’s in the lead (e.g. scientist, citizens and communities, or authorities) and whether initiatives are more contributory in nature, compared to those that are collaborative or even co-created [2]. Not only is there variation in the forms of interactions and roles, there are also different purposes of citizen science initiatives: these can range from the production of scientific knowledge, to civic mobilisation, to fostering public understanding of science and the scientific method, or to those aiming for participatory governance and management [4]. Overall, citizen science refers to a *plurality* of valid participatory practices [3], which in their various forms, present diverse opportunities to reshape science – society – policy interactions.

Generally speaking, citizen science is on the increase, especially during the last 1.5 decades, not least due to the wide availability of smart phones, apps, ever cheaper sensors and also drones. Sometimes citizen science is also called a movement. One indication of the increasing level of activity are the citizen science associations that have been set up in different parts of the world (Europe, the U.S., Latin America, Australia, Africa, and Asia) over the years. As the community of citizen science practitioners (be they researchers, citizen scientists or authorities) is growing, regional initiatives are being complemented by increasing numbers of national citizen science associations. In the Netherlands, that is the Citizen Science NL network. And recently, the Citizen Science Global Partnership (CSGP) was formed to serve as a bridge between the associations at national and regional levels and between those in the Global North and the Global South. The CSGP promotes exchange and collaboration on citizen science initiatives that focus on similar topics and aims to leverage the strengths and address the challenges particular to each

context. Overall, these national and regional associations and – now - the global association are helping to form and support communities of practitioners and to exchange and advance best practices. There are increasing resources for citizen science practitioners: a rich array of methodologies, tools, platforms is available, although not necessarily fully aligned or easily accessible. Collaboration around thematic interests are now gaining momentum, such as dedicated conferences and communities for citizen science for health ([CS4Health](#)) and Citizen Science for water (CS4Water). At the end of the first 3-day conference dedicated to [citizen science for water](#) that took place in Delft this June⁴ with 120 participants from Europe and further afield, we concluded that citizen science for water is, in fact, ‘coming of age’.

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And there is evidently great potential of citizen science for various purposes, including for the Sustainable Development Goals (SDGs) [5]. The SDGs are the agreed agenda for sustainable development at global level, a call for action by the United Nations, and, sometimes, called the greatest social contract that society has achieved so far. Some claim that “*citizen science is the only way to achieve all the SDGs*” [6].

A closer look under the lead of colleagues from IIASA in Austria has revealed that citizen science data can, in principle, help monitor progress of all 17 SDGs (with at least one indicator per goal) [7]. Citizen science is already, or could, contribute to 40% of environmental indicators, 68% of which lack data; and to 76 indicators (i.e. 33%) overall. And of particular interest to the water management community is that the ‘water goal’, SDG6 Clean Water and Sanitation, is among the four goals most benefiting from citizen science-based monitoring (the others being SDG 15 Life on Land, SDG 11 Sustainable Cities and Communities, SDG 3 Good Health and Wellbeing). However, as Stuart Warner from UNEP GEMS Water⁵ has argued, “*we cannot monitor ourselves out of the freshwater quality crisis, but it definitely helps*”⁶. In order to achieve the SDGs, transformation will be necessary across

various scales and organizational levels, guided by intentional normative direction [8]. Yet the focus on sustainability is rapidly being lost: as national, European and global agendas are increasingly dominated by concerns over security and competitiveness, it seems that the window of opportunity for sustainability as a key item on political agendas is closing. And we are dangerously behind in achieving the SDGs by 2030: “*the Sustainable Development Goals have improved millions of lives, but the current pace of change is insufficient to fully achieve all the Goals by 2030*” [9].

This also relates to broader discussions on the *role of science* for sustainability. It is commonly agreed that we cannot achieve the SDGs if we continue with “business as usual”. The UNESCO Recommendation on Open Science is based on the realisation that it will also be very hard, if not impossible, if we continue with ‘science as usual’, with technological and knowledge divides between and within countries. Open Science seeks to “make scientific research from all fields accessible to everyone for the benefits of scientists and society as a whole” via an agreed set of principles and practices. Opening up research infrastructures, intermediate results and data, as well as final outputs is necessary, but not sufficient. As those of us practicing citizen science have argued, “citizen science can contribute to making science more open in a *process dimension*”, “*inviting citizens and communities into science and opening science to the world*” [6].

Encouragingly, there is interest from some science, policy and societal actors in citizen science and its role for sustainable societies. Citizen science is considered as a novel form of stakeholder engagement to address societal challenges [5], for democratizing science and policy [10], and for improving transparency, equity, inclusiveness and justice [11]. It can be seen as a way to respond to today’s environmental crises, by opening up new ways of co-creating knowledge and fostering collaboration between science, society, and policy actors. In many ways, citizen science can indeed help foster practices

that promote conservation, efficiency, and equity, including intergenerational equity, to create a more balanced and harmonious relationship between humans and the natural world. Citizen science holds considerable potential for sustainability transformations, and expectations are high.

Making participation matter?

As will not surprise you, I agree that citizen science is a promising approach. But along with the increasing interest in and popularity of citizen science, there is also emerging evidence of the difficulties with its implementation for sustainability-related ends and with its uptake and institutionalisation in science, policy and environmental management. My goal is to neither exaggerate or downplay the potential of citizen science, but to argue for a nuanced and holistic view of citizen science. In essence, citizen science is about more than data - it is about the people and communities that engage in citizen science, and the communities of stakeholders that form around common issues of concern or interest.⁷

Within the larger topic of citizen science and sustainability, the purpose of this professorship is to contribute to a deeper understanding of how we can leverage citizen science in societal transformations towards sustainability. Based on relevant concepts and theories from science & technology studies (STS), behavioural science, innovation studies and sustainability science, I want to provide scientific underpinnings for detailed changes this implies in science, society and policy.

To do so, I will pursue three lines of research related to making participation matter: incentives and barriers for participation, impacts of citizen science, and institutionalisation of citizen science. Let me briefly take you through these.

Incentives and barriers for participation

This professorship departs from the simple but important realisation that citizen science can, at least in principle, make a difference in environmental governance and strides towards sustainability. But it is also clear that success is not automatic. To make citizen science truly effective for sustainability, we need to understand *how* we can make that happen.

One key aspect is the reason for participation. After all, citizen science depends entirely on the active, ongoing participation of citizens and communities. For them, it begs the question: “*What’s in it for me/what’s in it for us?*” Different stakeholders - citizens, scientists, environmental authorities - each have their own motivations, incentives and barriers. Not all citizens and communities are ready, willing or able to participate, especially not over time. Many scientists are still sceptical of citizen science and other participatory approaches. And in environmental governance, the motivations of authorities matter just as much as those of the citizens themselves.

Many studies have explored these incentives and barriers, often through empirical research. My own work in this area started some 20 years ago, during my PhD on data sharing motivations [12, 13] – a conceptual basis that I have continued to develop further and apply with some of my Masters and PhD students since.

In a meta study – that is, a study of studies - that I undertook with Abeer Almomani, we reviewed 42 existing empirical studies into motivations for participation in citizen science [14]. We consolidated their findings within a common framework, mapping the perception-based factors that influence the extent to which citizen science can trigger a paradigm shift in environmental management.

Let me briefly highlight three insights from that study:

- First, we found uneven attention to different stakeholders. Almost all studies looked at the motivations of citizen scientists, only a few considered scientists themselves, and even fewer examined authorities and decision makers.
- Second, the quality of many studies is questionable. Important methodological details are often missing, making results difficult to replicate or validate. When research on citizen science advances in isolation – without building on existing knowledge – we duplicate existing work unnecessarily. Also, critical factors, like social pressure, were rarely considered in the studies we reviewed.
- Third, as you might expect, incentive systems vary widely across actors. There are many positive drivers, but also barriers that discourage participation. And we have to bear in mind that even among citizen scientists themselves, motivations are not uniform. Understanding this diversity is crucial: it allows us to design engagement strategies that encourage not just initial participation but long-term commitment.

The idea that their participation matters, depends on the alignment of citizens, scientists and authorities: their expectations, efforts, pressures and capacities must complement each other. How we study motivations and incentives directly influences the strategies used for making participation meaningful.

Going forward, I want to further advance research into what drives participation for all core actors in citizen science, across different types of initiatives and in varying socio-economic, political and geographic contexts. This will help us better understand the different factors at play (cognitive, attitudinal,

and agency-related). Ultimately, the goal of my research is practical: to inform and improve societal transformations towards sustainability. By understanding these dynamics, we establish a basis for managing expectations, navigating conflicts, building common ground, and governing our shared environment more effectively.

This also means moving beyond static “maps” of incentives to developing more advanced conceptual frameworks to better understand how these incentive systems shape the interaction dynamics among key actors as well as the ultimate results in terms of addressing sustainability challenges. Work like the GRETA project on energy citizenship has shown what is possible with models of behavioural dynamics that can rely on large quantitative data sets [15]. I will explore how insights into behavioural dynamics can be generated even with small, qualitative data sets, so we can inform and guide citizen science practice quickly to guide and inform changes towards sustainability on the ground. And how we can frame and implement more long-term, consistent studies of how motivations to participate change over time. This will generate an overall body of research that allows us to draw broader conclusions, identify effective incentive systems and help shape these.

Impact of citizen science

Another key element for realising the potential of citizen science for sustainability is evidence and demonstration of its impact and value. “Show that it works!” is a frequent request, particularly by sceptics of citizen science. Such evidence is also needed to provide realistic expectations, for example, when initiating distinct types of citizen science or when reporting back to funders. But it is also key during project implementation, so that it is possible to learn and adjust and steer towards impact; *measuring* impacts of citizen science is also inherently linked to *creating* impact. At meta level, insights into the impacts of citizen science are crucial for shaping policy.

Inquiries into changes that can be causally attributed to a specific citizen science initiative are inherently difficult, particularly using scientifically sound approaches, and not just for citizen science. For one thing, impacts take time to evolve: project-based initiatives often finish (long) before impacts materialize. What counts as results and impacts, differs from one initiative to another, from one context to another. And not all forms of citizen science can be expected to have the same or similar impact, so approaches need to accommodate this.

When studying impacts of citizen science and other participatory approaches, there are often fundamentally different schools of thought at play, ranging from reductionist to post-positivists. There is a lack of consensus regarding approaches and this can lead – once more – to the reinvention of the wheel in terms of methods, but also to results not being easily comparable from the evaluation of one citizen science initiative to another. Finally, in terms of priority, for many forms of citizen science, the focus is on *creating* change, not measuring it. Yet citizen science initiatives themselves are often expected to provide the best of both worlds: key contributions to science and policy *and* evidence of their impacts, ideally using minimal resources [16].

Nevertheless, the consolidation of the thinking and actual practice of the citizen science community with respect to measuring the impacts of citizen science has made some strides. For example, in the Horizon 2020 project Measuring impacts of Citizen Science (MICS), we carefully mapped existing approaches, identified potential weaknesses and pointed to the resource intensity of such efforts. We provided guiding principles for measuring citizen science impacts [17]; created an Impact indicator explorer that allows users to select relevant indicators for measuring impacts in distinct domains; and developed and tested a co-evaluation approach, so that coordinators and participants can identify and monitor the

pathways of change of their initiative (and incidentally also demonstrate to funders and higher management levels the relevance of their work).⁸ And in the WeObserve Community of Practice, we created and tested an impact story telling instrument, to understand and communicate policy impacts [16]. So quite some groundwork on measuring citizen science impacts has been done⁹. You might say that there is quite a toolbox here.

With this research line, I would like to explore how research into the impacts of citizen science for sustainability can be strengthened by sound theories, methods and approaches from relevant disciplines. In particular, adjusting and applying established approaches from social psychology and sociology to provide a sound understanding of how participation in citizen science contributes to changes in knowledge, attitudes and behaviour to protect nature and other sustainable practices [18]. And a clearer distinction of citizen science impact evaluation (*ex post*) from broader appraisals of likely or actual consequences (impact assessment - often *ex ante*, but also during and *ex post*). These efforts are also important in the context of monitoring, around the globe, the implementation of the UNESCO Recommendation on Open Science. This sets important impulses for national and regional science policy, but sound evidence for the engagement of societal actors, incl. via citizen science, is still largely lacking. This is an area where I am particularly looking forward to joining forces with colleagues at CWTS and their long standing work on evaluating research impact, namely with Thomas Franssen on his work on participatory research evaluation, with Laurens Hessels who specialises in evaluating the societal value of research, with Thed van Leeuwen whose research focuses on monitoring open science policies and practices, and not least with the UNESCO Chair on Diversity and Inclusion in Global Science at CWTS held by Ismael Rafols, Rodrigo Costas, André Brasil and Louise Bezuidenhout.

Institutionalisation of citizen science within environmental governance

In the third line of my research, I focus on how citizen science can be institutionalized within environmental governance. By *governance*, I refer not to government itself, but the broader processes through which decisions are made and acted upon.

One line of my work has centred on developing, applying and validating methods to co-design new, or enhance existing, citizen science initiatives (and other innovative forms of stakeholder engagement, such as LivingLabs); in particular, initiatives like citizen observatories and community-based environmental monitoring schemes in countries in Europe, Africa and the Middle East, so that they are directly relevant to environmental decision making. Their primary purpose, in other words, is to inform and improve environmental management, not ‘just’, or not primarily, to contribute to science.

The role of citizens and communities in addressing environmental issues was already recognised and encouraged decades ago, for example in the Rio Declaration (1992) and the Aarhus convention (1998), with variable progress to date. Now that citizen science initiatives are more widely established, we can—and should—ask how citizen science can be more firmly embedded in environmental governance, generating shifts in the role of citizens and communities in environmental monitoring, management and decision making.

There are inspiring examples, like the longstanding Coastwatch initiative in Ireland led by Karin Dubskey which she started almost 40 years ago. To give you just one example of Coastwatch’s contributions¹⁰: During the regular Coastwatch surveys, volunteers from all walks of life check their chosen 500m stretch of coast once around low tide and report their observations. At the turn of the 21st century, the annual eco-audit data collected all around the coastline demonstrated

clearly that Ireland had a plastic litter problem. While some plastic bags may have drifted from abroad, the continued survey data showed that a national levy could have a dramatic impact upon behaviour among shoppers, and on Ireland’s coastal environment. Once the Dublin government introduced Europe’s first plastic bag levy, plastic bags dropped from 5% of litter found every year on Irish shores to less than 1% in 2002. That overnight success took years of citizen science *and* campaigning that Coastwatch and Karin Dubskey were deeply involved in. Importantly, the levy was designed to contribute to a government Environment Fund, not just general government spending.

To leverage citizen science at scale, we need to understand how to embed these efforts institutionally—across very different socio-economic settings, environmental challenges, and legal systems, in both the Global North and Global South. Institutionalization calls for changes to the systems and norms themselves. My research advances and validates methods for these transformative change processes: how we can truly “make citizens and communities part of the solution” for environmental challenges.

In this research line, I will focus on how we can catalyse transformative change in the promotion, monitoring and enforcement of environmental regulation. Environmental regulation is key to achieving sustainable societies. However, implementation often falls short, leading to further environmental degradation and species loss. In contexts where official monitoring and enforcement are weak—whether by oversight or design—citizen science can make important contributions. Amongst others, this is related to my role in the Horizon Europe-funded more4nature project, where I lead a consortium of 21 partners in an ambitious program of Action Research. The approach is called Action Research because we are not just studying change—we are triggering change in the real world, while learning from it.

We are working with more than 160 existing Citizen Science initiatives and almost 100 authorities and national agencies in Europe, Latin America, Asia and Africa in a Double Loop Action Research, in two rounds of 20 case studies. Thematically, these 40 cases address regulation to achieve zero pollution (clean air for all, clean and healthy surface waters, chemical-free slipway cleaning, preventing plastics in the ocean), protect biodiversity (reversing the decline of pollinators, free-flowing rivers for freshwater and wetland biodiversity, and monitoring and achieving global biodiversity targets), and prevent deforestation (halting illegal deforestation and reducing forest loss from fires).

Based on a framework which carefully combines relevant theories (from environmental governance, compliance theory and approaches, behavioural science, the science of citizen science, sustainability science and innovation studies) that I developed together with Ellen Pfeifer, our goal is to drive systemic change via a consistent methodology: to reshape collaboration between civil society and authorities, improve environmental compliance assurance, and strengthen their capacity to face future challenges. Envisioning and experimenting with new roles and interactions to create possibilities that were previously unimagined will not occur by coincidence and requires facilitated social learning. A key principle in this work is that stakeholders in these cases are not 'just' solving one-off problems. They are working toward more pervasive shifts in governance — turning citizen science data and community-led actions into meaningful contributions to monitoring, enforcement, and policy evaluation. And as these collaborations evolve, the roles of civil society and institutional actors themselves are being renegotiated.

Complementing this work are two new PhD studies. One will examine how trust between the involved communities and authorities, but also trust in civil society, in science and in public institutions, is created and reshaped during these transformations. The other PhD study will explore how

different forms of justice—procedural, recognitional, and epistemic justice—shape and can be activated within these processes. Insights from both studies will feed into our Action Research, deepening our understanding of how the inclusion of citizen science can strengthen environmental governance towards sustainability.

Final reflections

I firmly believe that citizen science play a key role for sustainability, but only if we employ sound and intentional approaches. With this professorship, my central aim is to provide a better understanding of how we can embed various forms of citizen science in participatory environmental governance to help govern the commons and foster sustainable societies. My Action Research is typically focused on sustainability challenges related to water and environment, particularly in the Global South. The goal is to make insights actionable on the ground while working towards generalisable insights that are relevant to science policy as well as environmental policy. My hope is that this work will contribute to improving participatory practices in support of sustainability and ensure that participation truly matters for all parties involved.

This professorship entails me working at both, IHE Delft and CWTS. IHE Delft Institute for Water Education is dedicated to strengthening the capacity of people, institutions and countries to address the world's water challenges. We cover what is sometimes called the "A to Z" of water science, technology, engineering, as well as water governance and management. We create knowledge through our research, we share that knowledge in our post graduate education and we help apply this knowledge in our capacity development activities in countries directly with partners such as water utilities, universities, ministries, NGOs and community organisations. As an interdisciplinary research institute at Leiden University, CWTS studies societal engagement and citizen science as part

of a larger interest in the research system and its connections to society. CWTS's mission is to improve how science is practiced and governed and how it serves society. Both institutes share salient synergies and strong interests in innovative, participatory societal engagement at the science-society-policy interface in sustainability transformations. IHE Delft endeavours to incorporate more citizen science into our own knowledge creation practices as we address complex societal challenges related to water and sustainability. CWTS is already expanding its expertise and involvement in policy debates beyond European and Western science policy, becoming more open to science policy in other world regions, especially with the UNESCO chair. I appreciate the chance of contributing with my work to the ambitions of both institutes.

10 Going forward, I will also continue and expand collaboration with the Citizen Science Lab and the Citizen Science network CS NL (both led by Margaret Gold) and also with new the Citizen Science Hub that Leiden University is part of. We will continue to join forces on creating and further improving an “enabling environment” for citizen science practices, both in the Netherlands and abroad. And for those interested, a paper with our “wish list” for policy makers and funders is readily available, detailing what the citizen science community of practitioners considers is necessary for creating this enabling environment [19].

Education is a key component, for both IHE Delft and Leiden University, in achieving their respective missions. There is a critical need to actively prepare our faculty and students to tackle complex global challenges through informed, participatory approaches such as citizen science. Practically, this means that current curricula may need to be strengthened. Both IHE Delft and Leiden University are committed to implementing the UNESCO Recommendation on Open Science. As we equip our students with Open Science skills, in my view, this training must include a sound understanding of different forms of citizen science and their respective

purposes. We must also instil realistic expectations and a clear understanding of the ways in which improvements toward sustainability can truly be achieved with citizen science.

Furthermore, we must enhance the in-house capacity to teach citizen science, to undertake participatory research, and crucially, the capacity to undertake research *on* citizen science and sustainability transformations, contributing to the science of citizen science and sustainability science alike. In my past appointments as visiting professor in Mexico and in Sweden, the Communities of Practice I set up provided an effective means and safe spaces for faculty members across disciplinary boundaries and faculties to jointly learn about citizen science. This approach may be worthy of exploring closer to home.

Word of thanks

I would like to thank IHE Delft for setting up this special professorship. I would also like to thank the Board of Leiden University and the Board of the Faculty of Social and Behavioural Sciences for their trust in me.

Over the years, many people have supported me on my path to arriving here. Thank you to my supervisors and colleagues during my early career, at IBM UK, the Science Policy Research Unit (SPRU), and TNO. At SPRU, Robin Mansell, Nick van Tunzelmann and Richard Hawkins all shaped my thinking on the role of science and technology in society that I was so keen to explore.

My thanks also go out to my colleagues at IHE Delft. Our shared commitment to strengthening water management in the Global South is what makes our work so purposeful and rewarding. Particular thanks go to Jan Luijendik, Guy Alaerts, Maarten Blokland, Jetze Heun and Frank Jaspers for sharing their immense experience in capacity development with me during our overlapping time at the institute. And to Leonardo Alfonso – who, in his PhD on water modelling, quite some

time ago by now, was one of the first – if not the first - to practice citizen science at IHE Delft. We started working on citizen science pretty much the day I started at IHE and I appreciate our great teamwork on various ‘socio-technical’ terrains.

I would also like to thank Ken Irvine for the many ways in which we have collaborated so fruitfully. And for sharing his passion for wetlands and aquatic ecosystems, especially during the lectures we jointly gave on the Philosophy of Science: pretty much any question could be answered by referring to fish. Many thanks also to the MSc and PhD students I had the opportunity to supervise over the years. It has been a pleasure to see you grow professionally.

I am thankful for the warm welcome I have received from the colleagues at CWTS since joining last December, with special thanks to Tjitske Holtrop. Thank you also to Margaret Gold - I look forward to continuing our great cooperation on ‘all things’ citizen science in her new home at Leiden University with one of her many hats on.

I am also grateful to the many funders who have financially supported my research and capacity development work over the years: various framework programmes of the European Union, the Dutch government, the World Bank, the Coca Cola Foundation, the European Space Agency, EuropeAid, the United Nations, and MISTRA – the Swedish Foundation for Strategic Environmental Research.

The more than 30 research and capacity development projects that I have worked on over the last 25 years, were rich experiences for me of working with partners from diverse disciplines, sectors, types of organisations and especially in very different countries. These collaborations have taken many forms; all have been inspiring in their own way. Thank you all for sharing your expertise and for what we have accomplished together, sometimes against all odds and very often against the

clock. I owe particular thanks to Joan Masó and Ellen Pfeiffer – I couldn’t have done some of my flagship projects without you, your sharp intellect and your dedication to making the world a better place, whether through data interoperability or co-design.

And I would like to thank the many citizen scientists and citizen science practitioners in the – very different - parts of the world that I have had the pleasure of collaborating with and learning from. It has been both humbling and an honour.

Last, but not least, I would like to thank my family and friends, near and far, for your support and constructive advice in times of need. I owe special thanks to our friends in the Netherlands. You helped us make a life here and your friendship and support over the years have been invaluable.

And thank you to my children, Carlota, Clemens and Vincens. My work has been demanding and has often taken me far afield. All three of you, in your own ways, regularly helped me to readjust my life-work balance.

And to Carlos: thank you for your unwavering support, your love and for sharing your life with me.

Ik heb gezegd.

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Noten

1. E.g. <https://ebird.org/home>
2. e.g. <https://www.coastwatch.org/>
3. e.g. FreshWaterWatch by earthwatch Europe
<https://www.freshwaterwatch.org/>
4. co-organised by IHE Delft (chair), TU Delft (host, sponsor), Pulsacqua (coordinator), Earthwatch Europe, Groundtruth SA and The WaterLab
5. United Nations Environment Programme - Global Environment Monitoring Unit/Water
6. LinkedIn post 2024
7. Which differs from one form of citizen science to another, e.g. for science-driven research projects, initiatives to democratize science and policy via science citizenship, civic and community-based (environmental) monitoring, and citizen observatories
- 14 8. MICS also developed a platform for citizen science projects to report their impacts (continuously) and for others to view impacts across a range of citizen science projects.
9. e.g. ACTION <https://actionproject.eu/> , INCENTIVE <https://incentive-project.eu/>
10. https://www.umweltbundesamt.de/sites/default/files/medien/378/dokumente/09_clarke_vortrag_dialogveranstaltung_einweg-tragetaschen.pdf

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A social scientist from the field of innovation studies with a background in ICTs, Uta Wehn draws on more than 25 years of combined experience in research, education, international development and industry. In her Action Research in Europe and the Global South on water and environmental challenges, she focuses on how innovative societal engagement in data and knowledge co-creation, such as Citizen Science, can advance transformative changes in science, policy and society towards participatory environmental governance and sustainable societies. Ultimately, the goal of her research is practical: to inform and improve societal transformations towards sustainability.

