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Anna Berti Suman

CIVIC MONITORING FOR ENVIRONMENTAL LAW ENFORCEMENT

Civic Monitoring for Environmental Law Enforcement

To Diane Wilson,
shrimper and award-winning activist, leader of the fight against Formosa Plastics.

Civic Monitoring for Environmental Law Enforcement

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About the author

Anna Berti Suman was Marie Skłodowska-Curie Individual Fellowship grantee and previously Dutch Research Council fellow at the European Commission's Joint Research Centre (JRC), Ispra, Italy, from June 2020 until August 2023. She founded and developed the 'Sensing for Justice' project aimed at exploring the potential of civic monitoring as a source of evidence for environmental litigation and as a tool to foster environmental mediation. Currently, Anna is research fellow at Luiss – Libera Università Internazionale degli Studi Sociali, Law School, Rome, in collaboration with LabGov – the Laboratory for the Governance of the City as a Commons, with the research mission to explore the law as an enabling tool for accelerating responses to climate change, biodiversity loss and water scarcity. She is also Qualified Barrister, admitted to the Bar of Rome, and she collaborates on climate and environmental law matters with Systasis – Centre for the Prevention and Management of Environmental Conflicts, Milan. Earlier, she worked on the project 'EFFIGIES – Efficiency in Justice and Sustainability' aimed at developing solutions to improve judicial rights protection at the University of Florence, Law School. Between 2016 and 2020, Anna led the 'Sensing the Risk' research project at the Tilburg Institute for Law, Technology, and Society, The Netherlands. The project aimed at investigating how civic monitoring influences the governance of environmental health risk and how the practice can be integrated within institutional models of risk governance. Anna has a background in Law from the University of Bologna and Transnational Law from the University of Geneva. She has work and research experience in health law and technology (UK), environmental litigation (Italy, The Netherlands, Ecuador) and water law (Chile, Switzerland).

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Foreword

We live in both exciting and challenging times, in which the role of citizens in decision-making processes and in the setting of political priorities needs to be revisited. The European Commission asked for a push for European democracy and increased citizen engagement more than four years ago; and the Defence of Democracy Package was just adopted recently (in December 2023). These much needed initiatives do not exist in a vacuum. They are situated in already established processes of evidence-based policy anticipation, design, implementation and evaluation, i.e., along the entire policy cycle.

The requested change can benefit from – but also has to address the challenges of – the continuous digital transformation, where new technologies impact people's lives more than ever before and unprecedented amounts of data are collected by a heterogeneous mix of actors. This transformation increases the need of data and scientific literacy so that we can cope with issues, such as, infringements of privacy and the spread of disinformation. Accordingly, in its call to make Europe fit for the digital age, the current European Commission underlines the need to improve the governance of data ecosystems and calls for investigations about the role of Artificial Intelligence (AI).

Within this wider landscape citizen science (which includes the forms of civic environmental monitoring discussed in this book) – being people-centric by definition – has a particular role to play. And this is for two important reasons. First, the citizen science community has a strong sense of inclusivity and transparency. By their very principles, citizen science initiatives are cautious about the values, interests, motivations and learning pathways of their participants. Furthermore, they pay close attention to make resources, as well, as results openly available and provided in an understandable and clear form. Second, the different practitioners and supporters of citizen science got well organised over the past years. Many national and international associations could be established and they became interconnected. The improved governance of these parties led to an impressive growth and recognition of citizen science. It

also established a baseline infrastructure that can now be used – within Europe and globally.

During the past decades, citizen science approaches became more mature, and they spread in a remarkable way into new research areas, into more and more geographical territories and across communities of engaged citizens. Arguably, the sensing of our surroundings and related contribution to environmental research and policy-making is one of the most advanced areas of activity. Countless highly valuable initiatives contribute to related data collections, and many of them are well used to take stock of the status and to detect changes in our environment – often in close collaboration between citizens and public sector organisations (such as environmental protection agencies). Yet, we also witness cases in which the trust between citizens and organisations (public administrations or governments, as well as, private actors) is challenged – especially in cases of perceived personal harms or violations of rights.

Related research on the potentials and challenges of citizen science in a legal context, and in particular for litigation and mediation, is still in its early days. Until recently, open questions included, for example: What are the potentials and challenges of introducing citizen science data as evidence for litigation in courts? How can the use of such data be legitimised as evidence in litigation? Could citizen science help in mediation and avoiding the conflict's escalation to courts?

The 'Sensing for Justice' project was set up to address exactly these questions by exploring civic environmental monitoring in theory and in practice and concentrating on environmental legislations. In doing so, it pioneered in an area of research that directly contributes to the trust building between people and institutions. The project opened up a field for promising theoretical and applied research that will help to push democracy and increased citizen engagement in a way that is meaningful and entirely fit to the digital age we live in.

I had the great honour to be the scientific supervisor of this project over the past years and learned a lot. In this book Anna Berti Suman, the principal investigator of the Sensing for Justice project, shares key insights from an almost four-years long research. I am sure that every single dear reader will take something useful out of this shared experience.

Sven Schade
Scientific project leader – Digital Transformation of Governance & Innovative Public Services, Digital Economy Unit – European Commission, Joint Research Centre (JRC)

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Abbreviations

ACHR	American Convention on Human Rights
ARPA	Agenzia Regionale di Protezione Ambientale (the Italian regional environmental protection authority)
BISE	Biodiversity Information System for Europe
CDA	Critical Discourse Analysis
CDCA	Centro Documentazione Conflitti Ambientali
COM	Communication by the European Commission
DG	Directorate-General of the European Commission
EC	European Commission
EEA	European Environment Agency
EU	European Union
FEPS	Foundation for European Progressive Studies
IACHR	Inter-American Commission on Human Rights
IACtHR	Inter-American Court on Human Rights
INSPIRE	Infrastructure for Spatial Information in the European Community
ISO	International Organization for Standardization
JRC	The European Commission's Joint Research Centre
RO	Research objective
RQ	Research question
RUEBES	Research Unit on Everyday Bioethics and Ethics of Science
SDGs	Sustainable Development Goals
SensJus	Sensing for Justice
SLAPPs	Strategic lawsuits against public participation
STS	Science & technology studies
SWD	Staff Working Document
TAP	Trans Adriatic pipeline in Southern Italy
TAV	High speed train from Turin to Lyon
UNECE	United Nations Economic Commission for Europe
VGI	Volunteered Geographic Information
WHO	World Health Organization
WISE	Water Information System for Europe
XR	Extinction Rebellion

1. Introduction to *Civic Monitoring for Environmental Law Enforcement*

THE SENSING FOR JUSTICE RESEARCH PROJECT: CONTEXT AND SCOPE

Civic environmental monitoring is the use by ordinary people of monitoring devices (e.g., a sensor) or their bare senses (e.g., smell, hearing) to detect environmental issues. It can be regarded as a form of reaction to environmental injustices (Ottinger 2010), a reactive practice to the status quo of institutional and corporate environmental monitoring (Berti Suman and Alblas 2023; Berti Suman and Bollon 2023), a new paradigm in how people engage with daily environmental stressors to foster change (Berti Suman et al. 2022b), a form of political contestation through data (Beraldo and Milan 2019; Gabrys, Pritchard and Barratt 2016) and as a practice of care (Berti Suman 2022a).

The practice is on the rise in the last decade, especially thanks to the growing availability of audio and video-recording devices in the hand of diverse publics, but also due to the increase in public literacy and concern on environmental matters. The notion can border other typologies of civic engagement with environmental matters, such as citizen sensing, citizen science, citizen observatories and mobile crowd-sensing (for a review of these typologies, see Berti Suman and Van Geenhuizen 2019: 6).

Civic monitoring can be a powerful source of evidence for law enforcement, especially when it sheds light on official informational gaps associated with the shortages of public agencies' resources to detect environmental wrongdoings. Furthermore, action in court through civic evidence can signal unaddressed claims to competent institutions. The emersion of a spontaneous civic environmental monitoring initiative may indeed indicate the presence of distrust attitudes but can also be an occasion for cooperation between citizens and authorities on a shared issue. Civic environmental monitoring is also contributing to the provision of

public services, in particular in terms of strengthening environmental monitoring and compliance assurance.

Embracing these practices can be an opportunity for authorities to make governance models more inclusive and responsive to what matters to people. Performing civic environmental monitoring should be recognised as a rightful contribution to official environmental law oversight, although mechanisms to ensure that civic contributions are scientifically sound and truly contributory to improve societal response to environmental issues must be in place (Berti Suman et al. 2023). The book *Civic Monitoring for Environmental Law Enforcement* discusses key findings stemming from the multi- and interdisciplinary research performed within the framework of the 'Sensing for Justice' (SensJus)[1] research project, which explored how people use monitoring technologies or just their senses to gather evidence of environmental issues and claim environmental justice in various fora.

Since June 2020 until August 2023, the author of this book conducted as Principal Investigator the SensJus research project, which was funded through a Marie Skłodowska-Curie Action Individual Fellowship and, in its earlier pilot, by the Dutch Research Council Rubicon Fellowship. The project was deployed at the Digital Economy Unit of the European Commission's Joint Research Centre (JRC)[2] and also foresaw a secondment period at Systasis – Centre for the Prevention and the Management of Environmental Conflicts, Milan.[3] The opportunity to deploy the research at the European Commission's JRC, leading actor on citizen science for environmental policy, enabled the project to play a crucial role to demonstrate the potential of civic environmental monitoring for law enforcement and for mediating conflicts across Europe (see Figure 1.1).

The contribution offered by the SensJus project to advance this research field has been recognized – among others – by the incorporation of its findings in the 2023 United Nations Environmental Programme

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[1] SensJus project web page: https://sensingforjustice.webnode.it/ (last accessed 14 October 2023).

[2] JRC web page: https://commission.europa.eu/about-european-commission/departments-and-executive-agencies/joint-research-centre_en (last accessed 14 October 2023).

[3] Systasis web page: https://www.systasis.it/homepage/?lang=en (last accessed 14 October 2023).

(UNEP) report on the status of the environmental rule of law globally. The report affirms that civic environmental monitoring can support environmental law enforcement, filling gaps in official data and reducing dependence on data generated by governmental or corporate sources (UNEP 2023). The report explicitly mentions the advancements made in the field thanks to the SensJus project, in particular through the Formosa case study, Texas, as researched in the framework of the SensJus project. The report acknowledges that there is the need for further research, along the lines of the SensJus project, offering research capacity on the ability of civic monitoring to inform environmental law enforcement. It should be noted that, already in 2019, the first UNEP Global Report on the Environmental Rule of Law (UNEP 2019) noted that there were promising signs indicating that data collected through civic monitoring could foster the environmental rule of law.

Source: Alice Toietta, illustrator for SensJus.

Figure 1.1 Civic sentinel in action for environmental justice

FROM RESEARCH QUESTIONS TO PROJECT DEPLOYMENT

On 27 June 2019, a landmark court decision was issued in Texas, in which a judge found the petrochemical company Formosa Plastics Corporation liable for violating the Clean Water Act because of plastic discharge into local waters (Berti Suman and Schade 2021). The case was brought by a civic group based mostly on citizen-gathered evidence which involved volunteer observations performed over years. This practice, entailing grassroots-driven environmental monitoring, could be qualified as 'civic environmental monitoring'. The contamination could not be proved through existing data held by competent authorities since the company never filed any record of pollution. Rather, the monitoring and data collection was almost entirely conducted by local residents.

Cases such as the Formosa litigation are expected to increase drastically, posing urgent research questions. Above all, the case motivated an investigation of the potential of relying on civic evidence in litigation over environmental wrongdoings. Furthermore, it seemed that civic monitoring could also play a role in avoiding the court stage, as a tool to mediate the environmental conflict. Lastly, we posited that these manifestations demand an inquiry into the right of every person to contribute environmental information, in particular in light of the Aarhus Convention framework (Berti Suman 2023c; Berti Suman et al. 2023; Berti Suman 2021a; Balestrini 2018). Related research was still in its infancy. The few championing actors in the debate were located in the US (per es., Ottinger 2023: 2010) and, to a minor extent, South Africa (Scott and Barnett 2009), not flanked by a parallel inquiry from the European perspective. The key goal of the Sensing for Justice project was to fill this knowledge gap in order to avoid a possible scientific and legislative vacuum, and provide newly required research capacity in Europe, and beyond, with lessons transferable to other contexts such as in Asia and Latin America.

Based on this background, the SensJus project set the following research objectives (ROs):

1. *RO1 – to explore civic monitoring as a source of evidence in courts.* For attaining this objective, we explored the following research questions: What is the potential of introducing citizen-gathered evidence for environmental litigation in European courts? Which barriers need to be removed?

2. *RO2 – to understand how civic monitoring could be an instrument for mediating environmental conflicts*. In order to achieve this objective, we posited the following question: Could civic monitoring be conceived also as a form of alternative dispute resolution promoting environmental mediation and avoiding escalation to court?
3. *RO3 – to frame a right to contribute environmental information*. For this objective, we questioned: How can the use of civic evidence be legitimised on the basis of existing and new rights? Which legal and governance adaptations are needed to ensure greater reliance on civic environmental monitoring and civic evidence?

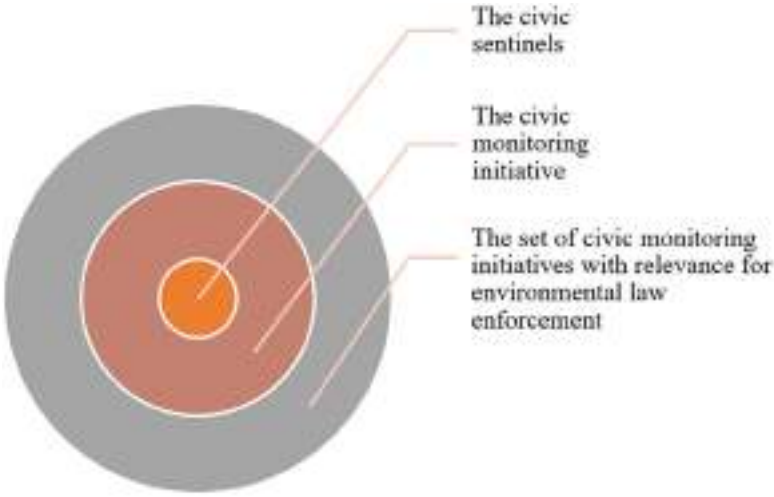
In light of these research objectives, SensJus researched how people ('civic sentinels') use monitoring technologies or their senses to gather evidence of environmental issues ('civic environmental monitoring').[4] The project explored in practice how ordinary people use monitoring technologies and their senses to gather evidence of environmental issues and to claim justice within and outside the judicial arena. We questioned whether and how civic environmental monitoring could be an effective new way to find evidence about environmental wrongdoings and to leverage this evidence in different institutional fora, such as in courts and for conflict mediation.

From the beginning of the research, we chose to focus only on a sub-set of the broad lay/non-expert/ordinary people group, composed of the civic sentinels as simple 'sensing' beings or non-professional users of monitoring technologies, who are experiencing ways of information generation 'from below' and new forms of participation in detecting environmental issues. This sub-group represents just a small, specific portion of the society, which decides – for their needs or ethical, social or political beliefs – to embrace a non-standard system of monitoring and reporting an environmental issue. Conversely, the 'expert group' for our research is composed of professionals (e.g., environmental scientists, lawyers), authorities and policy-makers that act in their institutional role and rely on professional knowledge to orient their decisions and are confronted with these alternative forms of monitoring. We acknowledge

[4] It should be noted that in the original project proposal we used the term 'citizen sensing'. However, after deepening our understanding of scholarship in the field and related discourses explored through our case studies, we decided to adopt a more encompassing term, that is, 'civic (environmental) monitoring'.

that the lines between these two categories can become blurred at times, for example when an expert acts not in their institutional roles to respond to a matter of concern.

Civic monitoring is considered in this book as a practice entailing the mobilisation of a group of lay people. The unit of analysis of the research is that of the 'group of monitoring people' which gives origin to a civic initiative. Isolated practices of civic monitoring not emerging as a collective have not been analysed in this book. We made this choice as we were interested in the potential of civic monitoring to mobilise 'assemblages' of social actors that get organised in a group with the aim of addressing an environmental problem, complementing or bypassing the work of appointed institutions. We thus researched initiatives that stemmed from and/or managed to activate a group of lay people, forming a civic monitoring community. We consider civic monitoring as a collective action. Yet, the individualities of each participant emerged in the research and played a particularly important role during the ethnography phase, as discussed in Chapter 2 (see Figure 1.2).



Source: Author's elaboration.

Figure 1.2 The research population

The inquiry addressed an urgent need to understand emerging possibilities of the practice across Europe, learning from cases from around the world. The project has achieved most of its objectives and milestones, with just minor deviations which are illustrated in Chapter 2. We ensured that our results could reach the target audience, including civil society and policy-makers. For example, to refine engaging methods of dissemination we cooperated with the JRC Science & Art initiative.[5] We also joined efforts with two other Marie Skłodowska-Curie Action Individual Fellowships for deploying an outreach strategy and disseminating our results widely. For example, we produced an accessible factsheet[6] and a catchy video on our methodological advancements[7] with the support of the Horizon Results Booster. The project has been very active in offering to policy-makers science for policy briefs.[8]

In order to ensure the usability of our results, we believe that a short definition of key terms is crucial. We engaged in this work of definition at the beginning of the research to also delimit the research scope. Box 1.1 – Glossary of key terms summarises this work of definition.

BOX 1.1 GLOSSARY OF KEY TERMS

Environmental law enforcement = actions that governmental actors take to ensure compliance with environmental legislation and to prevent incompliance.

Environmental litigation = court cases on environmental issues involving citizens and civil society organizations, corporations, governmental and non-governmental actors.

Environmental conflict mediation = ways to address an environmental conflict outside of the court (e.g., through alternative dispute resolution techniques).

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5 Page of the initiative at https://resonances.jrc.ec.europa.eu/front (last accessed 10 November 2023).

6 Accessible at https://tinyurl.com/mty6jftv (last accessed 10 November 2023).

7 Accessible at https://www.youtube.com/watch?v=z8vn86Js29k&t=1s (last accessed 10 November 2023).

8 Comprehensive summary page on the project at https://joint-research-centre.ec.europa.eu/scientific-activities-z/innovations-public-governance/civic-monitoring-environmental-enforcement_en (last accessed 13 Novem-ber 2023).

Civic environmental monitoring = the use by ordinary people of monitoring devices (e.g., sensors) or their senses (e.g., smell, hearing) to detect environmental issues.

Civic sentinels = people spontaneously performing environmental monitoring without any duty to do so; in other words, watchful people that intervene upon experienced environmental issues.

METHODOLOGICAL APPROACHES

The methodology developed and put into practice during the course of the SensJus project starts from the critique of an 'extractivist' approach to research, that is, a stance with respect to the subjects of the research and the field studied that aims to get data and insights relevant to the researcher without engaging in the restitution of the results and possible benefits of the research for the actors and contexts studied. Moreover, we regarded the research methods not as mere processes to justify and explain our data collection, but as a practice in evolution within a research event. Finally, we tried to avoid a solutionism approach, according to which methods are created to offer different solutions to research problems. Methods were conceived as 'means', that is, mediating tools between the researcher and the research subjects.

The methodological approach adopted for our research is based on three stages. The first step is to conduct literature, legal and judicial research starting from alerts from communities and individuals affected by an environmental issue, that present traits that respond in some forms to our research questions and objectives (*purposive sampling*). We complement this data with exchanges with leading experts and institutions in the field. Then, the project deploys open-ended observations of potential case studies, starting from academic sources, grey literature and the media on such cases, shaping the research design together with the actors in the field, embracing *co-creation methods*. Furthermore, the research moved to the field physically or through physical or virtual ethnography, and performs *art-based research elicitation methods*, embracing 'research-creation' approach, as discussed in-depth in Chapter 4. We also scaled up the research to larger trends exploring a dataset of 500+

cases of broadly citizen science projects for environmental policy developed by the European Commission's JRC and a dataset of 400+ citizen science cases by the US Federal government, adopting in particular *critical discourse analysis*. The data gathered have been analysed through theory-informed categories, adopting qualitative methods. Table 1.1 summarises the data used, sources, sampling methods and modes of analysis.

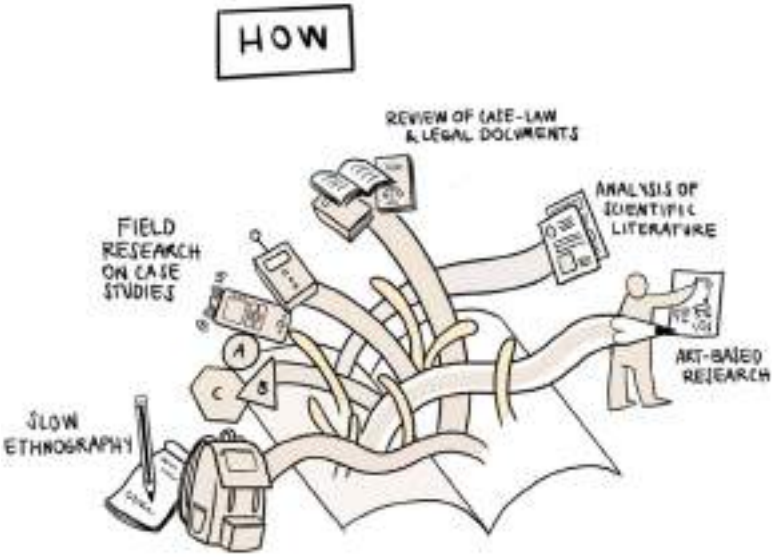
Table 1.1 Synthesis of data used, sources, sampling methods and modes of analysis

Data	Source	Sampling method	Mode of analysis
Secondary data on civic environmental monitoring; legal, socio-political and STS scholarship on environmental justice, co-production and the role of non-expert knowledge in steering decision-making	Academic and grey literature	Systematic, involving theory-driven search	Literature review
Environmental law from national, international and European Union legislation and regulatory frameworks for environmental governance	Public (online) repositories and archives	Purposive, adopting a topic-relevance criterion	Legal review
Case law on environmental matters, especially relevant for civic monitoring initiatives and for the use of citizen-gathered data in courts	Public (online) repositories and archives	Purposive, adopting a topic-relevance criterion	Case law review; critical discourse analysis
Secondary data of earlier social research on civic monitoring initiatives	Academic and grey literature	Quota sampling to the extent possible, for an overview of the population studied	Case study analysis
Civic monitoring (and adjacent practices) – related media including social media, web pages and mailing lists discussions	Digital platforms and discussion groups	Referral or snowball sampling	Critical discourse analysis

Data	Source	Sampling method	Mode of analysis
Spontaneous behaviours in the field of civic sentinels and recipient institutional actor (primary data)	Observations from presence on-site	Purposive, adopting a topic-relevance criterion	Qualitative analysis
Responses of key informants in the civic monitoring field/ adjacent, and of participants of citizen sensing initiatives (primary data)	Data elicited from in-depth semi-structured interviews	Purposive, adopting a topic-relevance criterion	Qualitative analysis
Data set of 500+ cases of broadly citizen science projects for environmental policy developed by the European Commission's JRC and dataset of 400+ citizen science cases by the US Federal government	Public dataset	Availability/No sampling (only dataset of this kind to date in Europe and the US), search for variables of interest (e.g., early warning, compliance assurance dimensions)	Descriptive analysis; critical discourse analysis

Source: Inspired by the structure developed in Berti Suman 2020.

In the final phase of our research cycle, we shared our results with our participants and with broader publics in a participatory manner, through inclusive communications such as accessible blog posts, videos, illustrated briefs and podcasts. We also engaged our research participants and wider publics in discussing our findings in a more active manner, using experimental methods such as graphic novels, drawing sessions, theatre performances, sensorial approaches and emotional storytelling. In our dissemination and outreach strategy, we managed to engage a multitude of relevant actors, from interested communities, to students, researchers, academics, policy-makers, legal practitioners and even enforcement authorities. This dissemination phase often created opportunities for gathering new research insights, which then fed back into the research process and re-initiated the circle (see Figure 1.3).



Source: Alice Toietta, illustrator for SensJus.

Figure 1.3 The methodological approach unpacked

Through our methodological approach, we learned the following lessons:

1. That civic monitoring initiatives require to be studied 'from close' and with appropriate time dedicated, through physical and virtual fieldwork aimed at study in specific contexts how and why civic actors and communities perform environmental monitoring, and which impact their monitoring have on institutional decisions and interventions.
2. That art-based research and elicitation methods can enrich the field and advance our understanding of the subject matter studied with insights from participants that are more difficult to reach such as low literacy and marginalised communities; furthermore, it will be discussed how emotional and engaging communication strategies offer valuable avenues for making wider publics aware of the research results.

The research methods adopted proved to have potential to be replicated and scaled up to different research contexts and practical applications. Chapter 4 of the book will discuss exactly this dimension.

ETHICS IN THE RESEARCH[9]

The research conducted for the SensJus project had a very relevant empirical component. The research received, in August 2020, ethical clearance from the Research Ethics Board of the European Commission's JRC, which was then re-discussed and re-affirmed in fall 2021, considering developments in the research project. In addition, the project had to respond to ethical advice received from the funding body. The discussion with these committees was an opportunity to reflect on the notion of ethics in embraced research and to rethink some procedures in order to make them more effective.

An engaged approach to researching divisive issues such as environmental conflicts requires particular attention to the possible ethical issues that research and methods raise. Conflicts had also to be moderated by the researcher where opposing viewpoints precluded respectful spaces for listening. The dialogue with the involved ethics committees provided a space to reflect and design strategies to manage the possible conflict and emotions of both the researcher and those involved in the research. We viewed the confrontation with ethics committees as an opportunity to reflect on the limitations and risks of seeking empathy with research participants. This required that the discussion with ethics committees would go beyond merely procedural approaches to ethics. Proceduralism can indeed cause a disconnect between the everyday behaviour of the researcher and the institutional guidelines that aim to ensure an ethical research practice (Springgay and Truman 2018).

As Hammersley (2009) pointed out, the need to comply with ethical regulations in social research, on one side, ensures external accountability of the researcher, on the other side; however, it raises the risk of missing the substantial underpinning of ethical considerations in an attempt to abide by imposed, one-size-fits-all ethical schemes. In the research, we strived to pay deep attention to ethical aspects, trying to go beyond a procedural understanding of ethics to embrace a substantial dimension of it. In dealing with questions on data management and informed consent, we

[9] This section draws on Berti Suman 2023a (published in Open Access in Italian in the journal *Ragion Pratica*).

reflected on what would have been meant in practice to respect the autonomy and rights of our participants, not harming or exploiting them, treating them fairly, and respecting their privacy and confidentiality. After all, conducting field-based ethnography is always contextual, relational and situated. In this phase, it is essential to recognise own positionality in order to establish a research attitude that is ethical but also realistic (Sultana 2007). We adopted an 'ethics-of-care' and adaptive attitude in our approach to the field by being highly responsive to changes in the field that required adjustments.

Another challenge encountered in approaching research ethics has been the fact that ethical processes cannot predict and anticipate the possible problems that will arise in the field, where things can also go differently from what is planned or expected. We had to equip ourselves for dealing with possible participants' refusal to engage or desire to disengage with our research. We ensured that this could occur in the smoothest way possible. There is a need to explain all this to ethical committees, in order to establish spaces and tools to adapt preset ethical procedures to such context-variability. This implies adopting an attitude of openness and transparency on the part of both the researcher and the ethical committees.

The field-based research carried out for the research project SensJus confronted us also with considerations of intimacy in research. Fraser and Puwar (2008) believe that the researcher should reflect on the sensory, emotional and affective relationships that form an integral and crucial, though often invisible, part of the process by which researchers engage, produce, understand and share their research. These processes, because they inform each phase of knowledge creation, must be considered and included when discussing research findings.

We engaged with the notion of 'ethics-ontology-epistemology', coined by physicist-philosopher Barad (2007) to emphasise the inseparability of ethics, ontology and epistemology when engaging in knowledge production through field interactions with human and non-human beings. Such interactions shape power relations between researcher and research subjects and enable or constrain the practical negotiation of ethical issues in the field. Recognising such relationships poses challenges for the researcher but is also a way to *take care* of our findings so that they can actually benefit the realities encountered in the field in the way such people have manifested to us as preferable.

Finally, in adopting creative and empathetic methods of sharing our research results, we acknowledge that we could fail in storytelling and

restitution. We embraced a humble approach to field research which recognises the difficulty of doing justice and representing the lives of others, especially when stories fail in telling them, both in providing adequate explanations and in the ways in which trauma and suffering can remain incommunicable (Page 2017).

In order to put into practice these values and because the research also engaged participants with a low level of education and literacy, we had to implement creative adaptation strategies. In particular, we decided to create, together with an illustrator, informed consent forms that were completely visual or otherwise combined images and text. In addition, with the help of experts (including experts in citizen science and science engagement, the ethics committees, the Clear Writing team at the JRC, and the JRC Data Protection Officer) and the participants themselves, we refined the text of these forms to make it more accessible.

We implemented this experiment to respond to the challenge of achieving participation that was *truly* informed and consensual. We were concerned that standard consents would have been ineffective for this purpose considering our target group. There was a risk of the proceduralism entailing the researcher simply asking for a signature on an often-incomprehensible form. We used these forms in our research process, tested and refined them, and then made this resource accessible to and editable by other researchers as creative commons material. We have evidence that many individual researchers and research centres are using these resources. Mindful of potential challenges to reuse, in providing these tools we recommend that the forms are always accompanied by an exchange (in person or virtual) between researcher and participant to address any concerns the participant may have. Annex I – 'The illustrated consent forms' contains both the illustrated forms and the fully visual representation of consenting.

Overall, we aligned our research practice to the highest standards of research ethics and integrity.[10] As an overarching guide, this research followed the principles of reliability in ensuring the quality of research; of honesty in developing, undertaking, reviewing, reporting and commu-

[10] All research has been performed in compliance with Horizon 2020 ethical framework, and specifically with the European Code of Conduct for Research Integrity, with the Charter of Fundamental Rights of the European Union and the European Convention on Human Rights and its Supplementary Protocols.

nicating our research results; and of accountability for this research in all of its phases. We paid attention to ensuring the respect for colleagues, for research participants and society at large.

The most 'ethically sensitive' part of this research was the qualitative inquiry through semi-structured interviews and observations. The ethical risks have been considered mild as the empirical research involved interviews with individuals that either held a role of expert/professional in the field studied or voluntarily joined a civic initiative to monitor an environmental issue. They were all adults, fully able to express consent and understand the purpose of the research. However, in specific political contexts, we acknowledged that these experts, professionals and participants could have been exposed to risks for their environmental protection activities which at times bordered on activism. Therefore, we decided to refrain from citing names of volunteers or experts, unless they did explicitly tell us that they preferred to be. Sometimes, even in case of a request to be named, we decided not to name the person anyway, especially if the environmental conflict at issue was particularly controversial or politicised. Instead, when quoting ideas of experts, for example academics who shared with us insights from their research experience, we opted for reporting the name of the person – when appropriate – to attribute credit.

We committed to respect human dignity and integrity by bearing in mind the eventual need to deal with controversial and sensitive topics such as exposure to stressors associated with environmental degradation and endangering a good life. Components such as frustration for the feeling of deprivation of homeland and of unjust environmental management had to be handled with particular care. We also refrained from asking details on environmental issues that may have caused distress to our respondents, such as loss of relatives for environment-associated illnesses.

We particularly strived to ensure honesty and transparency towards our research subjects resorting to data collected only through free and informed consent and paying special attention to the debriefing phase. Mechanisms aimed at ensuring privacy and confidentiality of the respondents, either experts, professionals or ordinary people, have been stringently implemented. In terms of debriefing, we have been careful to ensure that the results of this research are made available to all actors involved under the form of accessible findings. We have been and are still actively trying to reach wider audiences that may benefit from the insights of this research, especially those disadvantaged populations more exposed to environmental stressors. We do so by publishing almost always in

Open Access, disseminating findings in accessible formats, and engaging with/speaking in public spaces, such as schools, squares and libraries, as detailed in Chapter 4.

We devoted attention to promote an open, inclusive dialogue on environmental justice and on avenues to enhance it. For achieving this mission, we strived to give space to all stakeholders, involved and affected, trying to limit as much as possible partisan biases from ourselves. In addition, we kept in mind the relativity of the concept of environmental justice and avoided to the extent possible to come to the research field with a preset idea of justice.

We also tried as much as possible to limit the environmental footprint of our research, avoiding non-essential printing, relying on energy from renewable sources to power our laptops, and opting for train-based mobility when possible.

In terms of gender, from our empirical and theoretical analyses, we realised that women and non-binary people are a minority in civic monitoring projects (with some exceptions, for example in the Formosa case). This despite the fact that in recent history women have played a crucial role in championing environmental rights[11] and in acting as environmental activists, such as the recently murdered leader Berta Cáceres and Diane Wilson, key leader of the civic battle against the petrochemical corporation Formosa. We could not perform a deeper scrutiny of the reasons underpinning this trend, as falling beyond the scope of our analysis, but we advocated for further research targeting these aspects. We privileged less prominent voices in our interviews and observations and engaged in our project a majority of female and non-binary people.[12] Migrants' communities and ethnic minorities are also less visible in civic monitoring projects. We actively engaged in projects that explored the dimension of knowledge contributions from these actors, for example through the project 'Climate Routes',[13] aimed to research the complexity of the phenomenon of climate and environmental displacement. The project aims at reaching a shared definition of environmental and climate

[11] See https://www.eli.org/vibrant-environment-blog/gender-and-envir o nment (last accessed 5 September 2023).

[12] For a team overview, see https://sensingforjustice.webnode.it/about -us/ (last accessed 14 September 2023).

[13] Climate Routes project web page: https://www.systasis.it/le-rotte-del -clima/?lang=en (last accessed 14 October 2023).

migrants, in order to promote their protection. Through our support to the project, developed at Systasis, our secondment site, we could gather insights into the phenomenon, nurture awareness of the condition of environmental and climate migrants, and deploy activities aimed to listen to and recount the experiences of the migrants themselves, fostering the understanding of their knowledge and experiences.

AUDIENCE OF THE BOOK

The book aims at demonstrating how civic environmental monitoring can be an effective new way to find evidence about environmental wrongdoings and to leverage this evidence in different institutional fora, such as in courts through judicial proceedings and in civic and official reporting mechanisms to environmental protection agencies. However, the book also unveils the challenges and implications associated with a greater reliance by institutions and society at large on civic environmental monitoring.

The book is addressed to academics, researchers and students, not only in the legal field but also in political sciences, sociology, science & technology studies (STS), anthropology and communication studies, with an interest on public engagement in environmental matters and in environmental governance. The book can also be valuable for practitioners and policy-makers. Respectively, the book targets legal experts specialised in environmental law, environmental enforcement and environmental participation, and policy-makers working in institutions engaged in the application of environmental law and, for example, in the framework of the Aarhus Convention. The book can also be valuable for art practitioners and science communicators that are searching inspiration for the application of their methods in the socio-legal research sphere.

Furthermore, the book aims to be used by civic initiatives and interested communities that wish to proactively use environmental law and gather evidence for law enforcement. Lastly, the book wishes to reach every person concerned for the environment and with some basic knowledge of/interested in environmental law dimensions. To these civil society actors, the book offers an understanding of the potential of environmental civic monitoring for the production of environmental information and for environmental law enforcement.

STRUCTURE OF THE BOOK

After this Introduction, in Chapter 2 the book discusses how courts can be promising spaces for civic-gathered evidence, drawing from theoretical and empirical insights. Subsequently, the potential of civic monitoring to mediate conflicts is discussed, again basing our analysis on theoretical and empirical foundations. Chapter 3 instead explores civic monitoring under the Aarhus legal framework, and questions which legal and governance transformations are undergoing to accommodate and enable (or resist) the changes triggered by civic environmental monitoring. The impact of the research is addressed in Chapter 4, where also our outreach strategy is disentangled. The Conclusion develops concluding remarks and reflects on limitations of the research and on future research avenues.

2. Civic evidence for demonstrating environmental issues

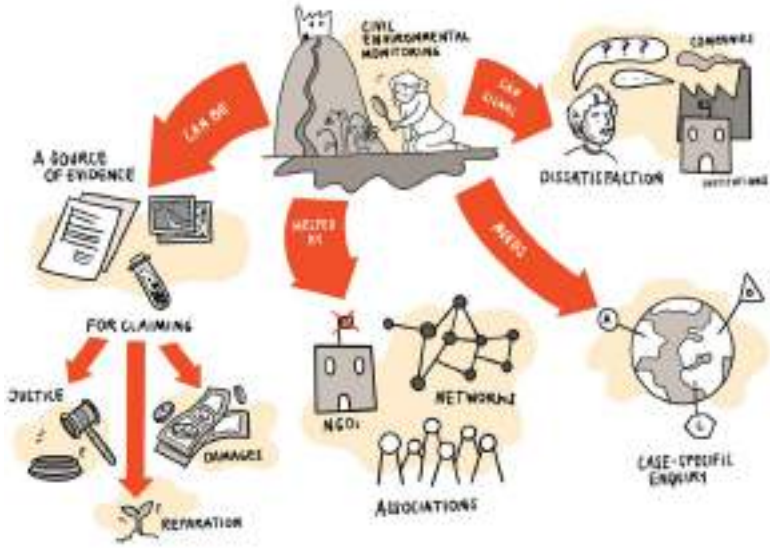
COURTS AS PROMISING SPACES FOR CIVIC-GATHERED EVIDENCE

Theoretical Foundations

Civic action in court can be regarded as a signal of unaddressed claims, as individuals and communities may use this resort as they are unsatisfied with private actors' conducts and/or the oversight performed by the government for ensuring environmental protection. The first phase of our research started from the following research questions: What is the potential of introducing citizen-gathered evidence for environmental litigation in European courts? Which barriers need to be removed? We immediately understood that the role, use and weight of civic evidence in litigation differ greatly between countries and jurisdictions, and it requires a case-by-case inquiry. It also depends on the type of litigation, which adds a layer of complexity in analysing this field.

Despite these research challenges, we could extract overarching lessons, starting from the study of a milestone case occurred in the US and, from there, explore potentially comparable cases in Europe. We focused on the criteria determining the validity of civic evidence and on the actors mediating this space. Lessons that can be generalised include, for example, that existing non-governmental actors and networks such as the European and the US Citizen Science Associations are well suited (although still not properly equipped) to offer guidance both to ordinary people that wish to have their evidence considered in court rulings, and to practitioners and institutions that are confronted with such evidence. Figure 2.1 offers an illustration of our first research objective.

Environmental litigation (as defined in Box 1.1) can be regarded as an arena for 'co-producing' a shared understanding of an environmental – or



Source: Alice Toietta, illustrator for SensJus.

Figure 2.1 A graphic representation of the concept of civic evidence entering courts

even climate change-related – issue (Fisher, Scotford and Barritt 2017: 198). Litigation practices have been framed as 'deeply institutionalized modes of achieving pragmatic closures around epistemic claims and controversies that science alone could not have settled' (Jasanoff 2011: 309). Individuals, communities and non-governmental organisations have turned to litigation to challenge specific laws, policies and projects that governments or corporations have enacted, using a variety of legal grounds, such as human rights, tort and international law (Sindico, Mbengue and McKenzie 2021), with the ultimate objective of fostering environmental protection.

More recently, claims related to environmental and climate displacement, i.e., when people are forced to move within or outside their country in response to environmental/climate stressors such as an oil spill or a flood, are growing as a distinct category of rights-based litigation (Wewerinke and Antoniadis 2022). Authors have defined this trend as 'Environmental Legal Mobilization', defined broadly as 'the mobili-

zation of law to address the degradation of the environment implicates a wide range of institutions, actors, and materials' (Vanhala 2022: 101).

The inclusion of civic evidence in litigation can tackle the limitations of an overly technocratic approach to environmental and climate litigation, which risks detaching ordinary people from courts. A gap often persists between affected people and the practitioners that are litigating cases on their behalf (Petersmann 2021a). People may feel excluded from these arenas, even more when their knowledge is disregarded, which just reinforces existing inequalities and fuels epistemic injustice (Whyte 2017). The evidence gathered by affected people could be framed as 'disqualified' (Foucault 1980: 81) and 'marginalised' knowledges (Mignolo and Walsh 2018: 59), which are to date largely invisible in litigation. Foregrounding the role of personal narratives can promote the agency and participation in litigation of those people most affected by environmental issues. Litigation can be a 'powerful catalyst to give agency, autonomy, and participation' to particularly vulnerable groups (Celorio 2023: 155).

Lastly, environmental disasters and even more climate change are example of 'hyperobjects', entities so massively distributed in space and time that defies our understanding and ability to cope with it (Morton 2013). Civic evidence of lived impacts through individual and/or collective 'sensing' (i.e., perception by own senses or monitoring through simple sensing devices) can represent a way to emotionally relate to and engage with environmental issues, including climate change (Berti Suman and Petersmann 2021: 229), improving public understanding of the problem (Dillon and Craig 2023) and turning this awareness into action (Nosek 2018). In addition, such evidence could even help embracing environmental impacts from a value-based and spiritual perspective (Barritt 2023) and foster a sense of inter-generational responsibility (Haraway 2016).

We trust that our research – demonstrating the power of civic evidence in litigation – crucially contributed to the evolution of the epistemology of environmental knowledge in Europe but also beyond. The research advanced existing scholarship on the recording of scientific knowledge (Bowker 2005), on epistemic cultures (Knorr Cetina 1999) and epistemological pluralism (Miller et al. 2008), and on south/north epistemologies (De Sousa Santos and Meneses 2014) – understood beyond the geographical dimension, as multiple 'souths' can be found also in the relative 'north' (Berti Suman 2022b). Furthermore, our insights enriched theories at the intersection between science and the law, namely on the negotiation

of expertise in society (Grundman 2017; Collins and Evans 2007); on the notion of scientific authority (Latour 1987) and on evidence construction in court settings (Latour 2009); on expert-lay knowledge divide (Wynne 1998) and on courts as democratising agents which can advance a public dialogue about expertise and its limitations (Jasanoff 1995).

Evidence from the Case Studies

Methodological considerations

The case study research deployed for the SensJus project from June 2020 to August 2023 was based on a *population* represented by the set of civic monitoring initiatives tackling environmental issues that represented a matter of concern for the engaged civic sentinels. The *units* composing this population are therefore the single civic monitoring projects (see Figure 1.2). These units have sub-units, which are the civic sentinels representing the *lowest level of aggregation* of the present research. These individuals – when grouped in organised collectives or assemblages of civic sentinels – form the population of the present research (Swanborn 2009: 17–19).

Research participants engaged in the projects can be mainly divided under two categories: (1) initiators or participants of a civic monitoring initiative; (2) recipients of a civic monitoring initiative (e.g., judges, mediators, public officials, fellow citizens). In relation to category (1) i.e., initiators or participants of a civic monitoring initiative, we identified individuals to be engaged in our research on the basis of the following criteria:

1. Our pre-existing desk research on literature and on secondary data from previously conducted empirical research which signals us initiatives that stand out for their relevance in light of the focus and aims of the project: in particular, as examples, we can list the Formosa case (Texas, US), the Coal Ash case (North Carolina, US),[1] the Analyze Basilicata case,[2] the Aniene and Tiber cases,[3] the Brenta-Bacchiglione case, and the Lambro case (Italy, Europe), the Flemish Air Quality case (Belgium, Europe),[4] the Mecheros case in

[1] Discussed in Berti Suman and Burnette 2024a.
[2] Discussed in this chapter and in Berti Suman 2022b.
[3] Discussed in this chapter and in Berti Suman et al. 2022b.
[4] See Misonne 2021.

the Amazon Rainforest (Ecuador, Latin America),[5] the Arica case (Chile, Latin America, and Sweden, Europe),[6] and the Southeast Asian Haze case (Indonesia).
2. Our ongoing presence in the field, which, through a snow-balling approach, brought us in contact with emerging initiatives that were promising for the focus of our project: in particular, as examples, we can list the ongoing exploration of civic evidence gathered by environmentally and climate-displaced people, introduced in strategic litigation as a source of evidence, and the numerous environmental mediation pilots that we monitored.

In terms of procedures that we used to recruit and engage participants for this research group, we mainly followed the 'key-contact' approach, making our project known to a central contact point from the initiative/case who could introduce us to the context of the initiative and facilitate our research. With this group of participants, we combined field observations of spontaneous behaviour on-site when the civic sentinels are in action, in addition to occasional observations at thematic workshops and civic gatherings. We also conducted in-depth semi-structured interviews with selected participants and project leaders of the initiatives that stood out for our project's focus.

In relation to category (2), i.e. recipients of a citizen sensing initiative, we selected our respondents based on the following criteria:

1. Institution-wise: because they were affiliated to specific institutions or organisations that we considered relevant for the aims of the project (e.g., staff from the Aarhus Compliance Committee, from the European Court of Human Rights, from Milan Arbitration Chamber etc.);
2. Function-wise: because they performed a specific role of 'interface'/contact point between the institution and the citizens or because they had the task of deciding a case based on citizen-gathered evidence, or still because they perform the role of attorneys of the citizen sensing group standing as affected party in the litigation;

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[5] See Facchinelli et al. 2022.

[6] Explored based on exchanges with Professor Sebastián Ureta (Universidad Católica de Chile, Santiago, Chile). See https://desarrollosustentable.uc.cl/equipo/sebastian-ureta/ (last accessed 28 September 2023).

3. Knowledge-wise: because, regardless of their institution or role, they were recognised as 'expert' in the field of interest and were vocal in the literature or in other communications on the topic of citizen sensing for litigation and mediation.

With this group of participants, we mainly conducted in-depth semi-structured interviews. When needed, we observed the interactions between the citizens and public officials (recipients of the evidence collected by the citizens) through on-site observations.

The time period under analysis for the case study research goes from the start of the specific project to 2023. Each civic monitoring project was studied in a specific point in time, in general coinciding with our direct encounter with the case (e.g., interview of participants) or the moment when the case was captured in the dataset that we analysed. We also embraced a *longitudinal* approach to the case studies (Swanborn 2009: 61) as we could follow each project's development over time and its evolutions that were particularly relevant for our research questions.

The two key case studies analysed through physical and virtual ethnography are:

1. the Formosa case (Texas, US) of civic sentinels that brought to court a petrochemical company based substantially on civic evidence and obtained a landmark court decision in their favour;
2. the Analyze Basilicata case (Italy, Europe) of civic monitoring of environmental health issues associated with oil extraction, which became an alert for public prosecutors and practitioners such as lawyers, doctors etc.

During the exploratory phase of this project, the two case studies (*pilot case studies*, Yin 2018: 106) have been intensively researched through theory-driven interviews with key informants (experts on the two cases), semi-structured in-depth (individual and group) interviews, and observations (both *direct* and *participant-observations*; Yin 2018: 114). The participants' actions, their perceptions of the group's dynamics and activities, their interactions as well as their relations with institutional players, their motivations, values, expectations, opinions, experiences, attitudes, intentions and behaviours (Swanborn 2009: 96) have been explored. We chose these specific two cases as we considered them particularly informative of the matter studied (Swanborn 2009: 99), from the perspective of what Yin (2018) frames as 'internal and external validity' in the selection of case studies. They indeed seemed to represent good exemplification of

the status quo for the use of civic monitoring in litigation and mediation. Furthermore, they mirrored two different pathways for influence on law enforcement.

Overall, the protagonists of this qualitative case study research have been ordinary people engaging with forms of civic monitoring, as well as institutional players confronted with the practice. Both types of actors have been either interviewed and/or observed on-site in order to get acquainted with day-to-day practices (through virtual or physical ethnography). In general, the sample included people over the age of 20 and below the age of 70, mostly male participants,[7] of diverse nationality and language. The research took place mostly in Italy for the physical ethnography, and mostly in the US for the virtual ethnography. In the Chapter 1 and Annex I – 'The illustrated consent forms', the overarching methodological approach and safeguards adopted in terms of participants' protection (ethics, privacy and data management) are described. Chapter 4 instead offers a discussion of the engagement strategies, including art-based research methods deployed, and the impact that the research achieved.

The qualitative empirical data deriving from exploratory analysis has been mostly analysed through a combination of a grounded theory approach through *in vivo* coding, visualisation strategies and pattern coding. In terms of *in vivo* coding, while reading our transcripts and observation results, labels were assigned to data sections taking a word or short phrase from the statements made by the respondents themselves in order to better capture their expressions and meanings. From the words of the participants, by working data *from the ground-up* (Yin 2018: 168–9) aiming to embrace a grounded theory approach (Corbin and Strauss 2015), theoretical prepositions were derived. Despite the fact that the respondents used different expressions, some *patterned consistency* emerged in relation to certain themes.

These themes have been regarded as socially constructed by the discourses of participants, expressing a multiform reality to be navigated in a reflective manner. In analysing the quotes, our own interpretation of what the message would mean for the hypotheses-building process was added and compared with the interpretation from other researchers that

[7] We tried to ensure a gender balance in our sample targeting especially female and non-binary participants; however, we had to acknowledge that, currently, civic monitoring is a primarily men-driven field.

inspected the same case or from theory. Lastly, each quote was accompanied by a specification of the role of the person expressing that specific view (e.g., project founder, participant, policy-maker, etc.) and by an indication of whether (the majority of) participants affirmed that or if the statement was a counter-trend.

In terms of *visual strategies* (Yin 2018: 167), while reading people's discourses, matrixes of the elements that emerged from their words and their interconnections were created, also resorting to visual displays with arrows and keywords, as displayed in Figure 2.1. This approach helped us to isolate key elements and structure our hypotheses. With (tentative) hypotheses, we proceeded with *pattern-matching* or *pattern coding* (Yin 2018: 175), i.e., comparing empirically found patterns with theoretical expectations. Despite being careful at spotting patterns, we also looked at the data to search for countertrends to make sure that, if any, they could emerge and receive proper attention. We embraced an iterative process to refine our hypotheses (Yin 2018: 179). An example of this iterative approach is that, through the analysis of field notes, we realised that themes that we did not consider at the start of the analysis were emerging in the words of the participants, policy-makers or experts. We thus went back to the identified themes and refined them.

After our exploratory analysis, codes were built and could be tested on other cases. In addition, we also built theoretically informed codes (*theoretical coding*) such as 'environmental democracy' and 'environmental rights'. In these cases, the emersion of relevant themes and trends in the empirical analysis backed up and complemented or contested the theoretical underpinnings of the project. The aim was to compare the two intensively researched cases with a broader panorama of civic monitoring cases, explore situation-specific questions and gather context-specific observations.

Through comparison and lesson-learning from successful and failed US cases, it was possible to identify conditions that could enable the acceptance of civic evidence also in European environmental litigation. In order to deploy this comparison, we performed traditional legal review (case law analysis and inspection of legislative texts cited by the judges or the plaintiffs to admit the civic evidence) of further judicial cases. We also explored a 500+ cases dataset curated by the JRC on citizen science

for environmental policy[8] searching specifically for cases of forms of civic monitoring that matched our inclusion criteria and which aimed at 'compliance assurance',[9] and analysed this information in comparison with a 400+ dataset of Citizen Science cases compiled by the US Federal government ('Federal Crowdsourcing and Citizen Science Catalog').[10]

On these large datasets, we originally planned to run fuzzy-set Qualitative Comparative Analysis (fsQCA) and text mining techniques to identify trends on actual and potential uptake of the civic data for law enforcement purposes. After careful analysis, we rather decided (as a minor deviation to our first research objective, RO1) to adopt Critical Discourse Analysis (CDA) techniques as the cases turned out to be, especially in Europe, of an amount allowing a more in-depth case-specific analysis. In addition, the topic of inquiry, very context- and country-dependent, made it more difficult to have homogenous sets of cases to compare. We could instead refine our understanding of the topic with in-depth case knowledge. In addition, we could rely on the expertise of the JRC in relation to the European dataset, and of the Citizen Science Association's Law & Policy Working Group and of the Environmental Law Institute for the US dataset. Exchanges and collaborations with US legal scholars in the field also allowed us to bring key insights to the European side of the research.

CDA is an interdisciplinary method to study discourse that views language as a social practice (Fairclough 1995). CDA systematically relates text to broader socio-political contexts. It aims at uncovering power dynamics and the social construction of claims underlying discourses. CDA is applied in both social and legal studies, also on environmental and climate matters (Calliari 2018). To date, however, CDA has not been applied to this specific field of research (i.e., on the insertion of civic evidence in court). We used CDA to explore the logic behind evidence-related arguments, and to identify elements of re-contextualisation and of oppositionality of discourses vis-à-vis others (Krzyżanowski 2019). We questioned what the civic evidence demonstrates, which

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[8] Dataset at https://data.jrc.ec.europa.eu/dataset/jrc-citsci-10004 (last accessed 9 September 2023).

[9] 'Compliance assurance' indicates that the data can be useful to promote compliance, by helping organizations to comply, monitor compliance, and support enforcement directly.

[10] Dataset at https://www.citizenscience.gov/catalog/# (last accessed 9 September 2023).

imaginaries they represent, and how these imaginaries are built against opposed discourses.

Key results

The research performed was aimed at addressing RO1, i.e., to explore civic monitoring as a source of evidence in courts. For RO1, we looked at successful and failed cases of civic-gathered data introduced in US courts and at resources discussing such cases to extract lessons for the European context. Below, we discuss key insights on the enabling factors and/or barriers on introducing citizen-gathered evidence for environmental litigation.

The Formosa case, Texas (US)[11]

Summary of the case: a landmark court decision (*San Antonio Bay Estuarine Waterkeeper, et al. v. Formosa Plastics Corporation, et al.*, hereafter referred to as the Formosa ruling) was issued in June 2019, in Texas, by the US District Court, Southern District of Texas, Victoria division, where a judge found a Taiwanese petrochemical company liable for violating the US Clean Water Act. The case was initiated by a civic group and was mostly built on citizen-collected evidence involving volunteer observations of plastic contamination discharged in the water over a considerable time span. The contamination could not be proven through existing data held by competent authorities because the company never filed any record of pollution. The evidence submitted for grounding the damage was largely gathered by local residents, who have also been overseeing the application of the ruling delivered by the court in their favour. For an analytical description of the case, see Berti Suman and Schade 2021, whereas for the latest updates on the settlement see Adams, Schütz and Fortun 2023.

Our analysis of the case shed light on key determinants of the case's success (see extensively Berti Suman and Schade 2021, including supplementary documents – Appendixes 1–5), which can be useful for other initiatives across the world, but – specifically for our target – in Europe.

1. The nature of the evidence: in the case, small plastic objects that can be recognised and collected easily by anyone, even without any specialised knowledge, played an important role in the judge's

[11] Adapted from Berti Suman and Schade 2021.

decision. The simple type of evidence, which could be tested against a simple standard and which clearly demonstrated a violation, made the admission of public evidence easier. This trend was found also in other cases (such as the Potomac Riverkeeper case, US). *Lesson:* courts are more willing to accept civic evidence if the pollution can be perceived with unaided use of the senses of sight or smell, rather than if the evidence collection requires sampling or monitoring with equipment or devices.

2. The quantity and time coverage of the evidence: the 2,428 bags documenting plastic pollution collected by the plaintiffs for more than three years almost daily, and hundreds of videos and photos documenting unlawful discharge were a key convincing factor for the court. *Lesson:* civic evidence gathered in a systematic way over a considerable time tends to have more credibility in front of the court.
3. The complementarity of the evidence: in the case, the civic evidence was backed by expert opinions and by company and governmental evidence, including a number of company's audits demonstrating that the company knew about the leakage of plastic. Also agency's documentation included confirmed all these violations. *Lesson:* civic evidence is stronger if confirmed or complemented by the available official data.
4. The plaintiffs' standing and suffered injury: the plaintiffs in the Formosa case managed to demonstrate that the defendant's discharge contributed to pollution impairing the plaintiffs' use of the water body; the plaintiffs also managed to demonstrate violation of their right to access environmental information. *Lesson:* a right-based discourse, both based on substantial and procedural environmental rights can be effective to support the participation of affected people with their evidence in a court case. Below, we offer an insight into the matter of standing in Box 2.1, which can represent a *barrier* for several civic monitoring initiatives wishing to bring their evidence to court.

Other winning factors of the case which are however harder to 'infrastructure' and thus to plan in advance are: the presence of a dedicated champion, i.e., a local resident, plaintiff, and former shrimper, in the case Diane Wilson – recipient in 2023 of the Goldman Prize for Environmental

Protection,[12] – who guided the fight against the company Formosa, coordinating the action of the local civic sentinels and attracting considerable social support and media attention. Media coverage was crucial to the sentinels' strategy. They managed to attract substantial media attention before, during, and after the ruling. This tactic seems promising for both providing larger social support to ongoing actions and mobilising communities for future actions.

It should also be noted that the media that we analysed emphasised especially the civic efforts in evidence gathering. The open-minded attitude of the court was also indicated to us as an important element, which again is difficult to predict. In addition, an interviewee shared with us that she considers it a key success factor that they could get free legal support of high quality from the Texas RioGrande Legal Aid, a no-profit providing free civil legal services to low-income persons. These factors, which clearly contributed to the success of the case, can turn into barriers (e.g., scarce social support or media attention, prohibitive costs of a legal service) for other communities.

BOX 2.1 CASE INSIGHT: STANDING OF THE PLAINTIFFS

The company Formosa challenged the plaintiffs' standing to bring this suit. The judge replied with the principle, affirmed in earlier case law, that 'An individual has standing to sue when they have (1) "suffered an injury in fact" that is concrete and particularised, and actual or imminent; (2) the injury is fairly traceable to the defendant; and it is likely the injury can be redressed by a favorable decision.' The court noted (p. 18 of the ruling) – building on relevant case law – that the plaintiffs' injuries were 'fairly traceable' to the defendant's discharge considering that the 'defendant has (1) discharged some pollutant in concentrations greater than allowed by its permit (2) into a waterway in which the plaintiffs have an interest that is or may be adversely affected by the pollutant and that (3) the pollutant causes or contributes to the kinds of injuries alleged by plaintiffs'. The plaintiffs therefore succeeded in showing to have 'standing' in the litigation, meaning that they showed an interest in the case which allow them to bring the

[12] See https://www.goldmanprize.org/recipient/diane-wilson/ (last accessed 9 October 2023).

lawsuit. They managed to meet the evidentiary threshold (from p. 19 of the ruling) demonstrating to have potentially suffered a violation, which is a central element for our analysis. The steps followed by the judge in the argumentation can be summarised as follows, as a lesson for other communities striving to have their data accepted in courts:

1. Plaintiffs are not required to show to a scientific certainty that defendant's effluent, and defendant's effluent alone, caused the precise harm suffered by the plaintiffs, in line with existing jurisprudence;
2. Plaintiffs must only show that a defendant's discharge contributes to the pollution that impairs the plaintiff's use of the water body, according to solid case law;
3. The damage is evident, demonstrating a clear violation of the plaintiffs' right to a healthy environment, among the others. Indeed, the court notes that the:

> […]undisputed evidence shows that plastic pellets and PVC powder discharged by Formosa caused or contributed to the damages suffered by the recreational, aesthetic, and economic value of Lava[ca] Bay and Cox's [sic] Creek. Evidence also establishes that the recreational and aesthetic value of Lavaca Bay, Cox Creek, and their shores have been diminished for members of Waterkeeper, their families and the public in general for use as recreation and aesthetic pleasure. Hence, the presence of PVC [polyvinyl chloride] powder and plastic pellets distressed the area and lessoned [sic] the enjoyment of the local environment.

4. The damage also entails violation of the right to access environmental information. Indeed, the court notes that 'the plaintiffs have also suffered injury, in fact, because they were unable to obtain information that Formosa was obligated to publicly disclose in a timely fashion in their efforts to combat their injuries', in line with solid case law. Both Federal and state statutes (33 USC §1318(b); Tex. Water Code §26.0151) require reports of permit violations by the permittee to be *publicly available*. In this regard, according to the judge, 'Formosa totally failed and refused to comply with a known duty'.

Even if it did not stress a rights-based discourse, the court noted that 'the plaintiffs have also suffered injury, in fact, because they were unable to obtain information that Formosa was obligated to publicly dis-

close in a timely fashion', which is in line with a solid case law (*Center for Biological Diversity, Inc. v. BP*; *Sierra Club, Inc. v. Tyson Foods, Inc.*). Both federal and state statutes (33 USC. §1318(b) – Records and reports; inspections; Texas Water Code §26.0151) require reports of permit violations by the permittee to be publicly available. In this regard, according to the judge, 'Formosa totally failed and refused to comply with a known duty' (Formosa ruling, XI, p. 20). See Berti Suman and Schade 2021, Appendix 2: 'Focus on Formosa's obligations as documented in the ruling', for an overview of the key duties of the company.

Based on our analysis of the Formosa case and in consultation with actors interested/expert in the use of civic evidence in court we refined a usable table synthesising the relevance of a case for the introduction of civic evidence in a judicial proceeding. Figure 2.2 offers a caption of this table where the information for the Formosa case is filled in (based on Tables 1 and 2 in Berti Suman and Schade 2021). In addition, Annex II – 'Key elements for tracking civic evidence in court' offers the full table version which can be used for other cases. The entries include: Case Name; Litigation or Mediation; Identification; Country; Court; Plaintiffs; Defendants; Status; Alleged violations; Type of evidence submitted; Reaction of the court/defendant to this evidence; Decision issued; 3 top winning factors for the acceptance of civic evidence.

As key scientific deliverables, we can highlight the following items. Stemming from our scientific analysis of the Formosa case (Berti Suman and Schade 2021), we also published a blog post[13] useful for the platform 'Citizen Science Track', offering a useful resource for European interested communities. The post was translated into French and Portuguese for a Brazilian audience. It triggered considerable debate among interested communities. Based on these resources, we extracted lessons that contributed to the Formosa Global Archive, a global platform that unites communities that are denouncing and combating the wrongdoings of the multinational Formosa around the world.[14]

[13] See https://cstrack.eu/format/reports/the-formosa-case-a-step-forward-on-the-acceptance-of-citizen-collected-evidence-in-environmental-litigation/ (last accessed 10 November 2023).

[14] See https://disaster-sts-network.org/content/formosa-plastics-archive/essay (last accessed 10 November 2023).

Case Name	Litigation or Mediation	Identification	Country	Court	Plaintiffs	Defendants
San Antonio Bay Estuarine Waterkeeper et al. vs. Formosa Plastics Corporation et al.	Litigation	Case 6:17-cv-00047 Document 155 Filed on 06/27/19	US - Texas	US District Court, Southern District of Texas, Victoria division	Environmental no-profit and civic activists (fisherwomen and fishermen)	A Taiwanese petrochemical company

Status	Alleged violations
June 2019 released final ruling, in November 2019 emitted consent decree endorsing settlement between parties	Repeated violations of the US Clean Water Act by not compliance with permit due to persistent discharge of floating solids (plastic pellets and PVC powder); violations of reporting duties according to the permit, to federal and state statutes (33 USC. §1318(b) and to the Texas Water Code

Type of evidence submitted	Reaction of the court/defendant to this evidence	Decision issued	3 top winning factors for the acceptance of civic evidence
Expert testimonies, civic testimonies, photos and videos and several containers with samples of plastics collected by the citizens	Civic collected evidence was not contested neither by the court nor by the company	Issuing of monetary relief and injunction against Formosa. In the subsequent settlement between the parties, Formosa agreed to monetary relief amounting to $50 million in mitigation payments. The court endorsed this settlement by emitting a consent decree and awarding a remedy	Straightforward type of evidence; a dedicated 'champion' organizing civic efforts; rigorous data collection conducted over years supported by experts

Source: Author's elaboration.

Figure 2.2 A caption of the table synthesising the introduction of civic evidence in a court case

We continued exploring the US panorama for civic evidence in court to identify comparable cases, and in particular we zoomed in on the US Duke Energy coal ash series of cases of civic evidence in court, working on a scientific article, co-authored with a US lawyer engaged in the case (Berti Suman and Burnette 2024a) that focuses on how civic monitoring can be an instrument for affected communities to (re)gain a sense of agency towards environmental issues.

In order to bring these lessons to Europe, we curated a special issue of the influential journal *Citizen Science: Theory & Practice* containing several articles on civic evidence in court, spanning from European to African courts (as outlined in the Editorial to the special issue, titled 'Where Environmental Citizen Science Meets the Law'; Kasperowski et al. 2023). Particularly fruitful avenues of exploration in Europe turned out to be the notion of victim 'as knower', where the civic sentinel becomes an agent of change in a judicial case for environmental harm (Natali, Berti Suman and de Nardin Budó 2023, contributing to theories on 'activist green criminology') and the relation between civic monitoring and governmental accountability (Berti Suman 2022c).

A barrier proved to be the problem (or sometimes just the fear) of criminalisation and silencing of the civic sentinels which occurs also in Europe (Berti Suman 2022a and 2022b; Natali, Berti Suman and de Nardin Budó 2023), for example through SLAPPs – Strategic lawsuits against public participation, which is a form of strategic litigation intended to censor, intimidate and silence critics from civil society actors or from the media (e.g., journalists) by burdening these actors with the cost of a legal defence until they abandon their opposition (Berti Suman 2022a and 2022b). On this matter, a provisional political agreement was reached in November 2023 between the European Parliament and the Council on new EU rules – in the form of a Directive – to protect those targeted with SLAPPs, such as journalists, rights defenders or civil society organisations.[15] As proposed by the European Commission in April 2022, the Directive creates a system of powerful procedural safeguards for cross-border SLAPP cases. The existence of these rules will enable courts to deal with abusive litigation and hopefully deter potential litigants from engaging in such litigation.

[15] See https://ec.europa.eu/commission/presscorner/detail/en/ip_23_6159 (last accessed 10 October 2023).

Lastly, there is the issue of lack of resources needed to practice civic environmental monitoring and of accessible legal advice comparable to what was offered in the Formosa case (Berti Suman 2023c). Particularly needed would be a typology of legal advice defined as 'rebellious lawyering',[16] which is a form of progressive law practice that serves and supports low-income and underserved communities and populations, becoming a way of empowering disadvantaged and marginalised clients through grassroots, community-based advocacy facilitated by lawyers. The idea is that lawyers become facilitators of meaningful social change (in the case of this book, supporting civic evidence) while at the same time fuelling community activism to empower the subordinated, which can slowly become their own advocates in future struggles when the lawyers end their mandates.

Cases of civic evidence deriving from civic monitoring introduced in European courts are still scant, even after the completion of the project. An interesting case is, however, discussed by Misonne (2021) with regards to litigation on the right to clean air before the Court of Justice of the European Union, which also relied on civic monitoring (the author talks about citizen science but her qualification of the practice can encompass civic monitoring defined for the purposes of the SensJus project). Advancing a solid argument for the role of civic evidence, Misonne argues:

> On 10 October 2018, in a judgment of the Court of First Instance of Brussels in *Greenpeace v Flemish Region*, the question raised was whether the data collected via a citizen science project reporting on air quality should be communicated to the European Commission by regional authorities or if the communication of official data alone would suffice. The tribunal observed that the Directive foresees *a role for so-called indicative measures* when they meet the criteria set out in Article 6 of Directive 2008/50 and its annexes. As a consequence, *that supplementary information based on citizen science must also be taken seriously and passed on to the European Commission* (italics added by the author).

We could also identify and discuss with key actors a number of cases of civic evidence used in courts in Latin America, for example the Mecheros case in the Amazon Rainforest (Ecuador, Latin America). Facchinelli et al. (2022) describe the case as follows (again they talk about citizen

[16] See https://rebelliouslawyeringinstitute.org/what-is-rebellious-lawyering (last accessed 10 October 2023).

science but their qualification of the practice can encompass civic monitoring as understood by SensJus):

> On 26 January 2021 the Court of Nueva Loja issued a historical order to ban gas flaring in the Ecuadorian Amazon. *The present citizen science project played an important role in this process, enabling the production of independent spatial information through participatory mapping with Indigenous and farmer communities*. Globally, lack of independent information about oil activities has led to the monitoring of gas flaring by satellite imagery, achieving remarkable results. However, apart from institutional and remotely sensed data, *reliable spatial information on gas flaring in the Ecuadorian Amazon is not available*. Therefore, *we adopted the community-based participatory action research approach to develop a participatory GIS process, aiming both to provide reliable data and to support social campaigns for environmental and climate justice* (italics added by the author).

In addition, a particular promising avenue for the insertion of civic evidence in a judiciary proceeding proved to be as 'early warning', that is, as alert to enforcement authorities and even public prosecutors, as occurred in the case of river pollution in Rome (Berti Suman et al. 2022b) and of oil-related environmental impacts in Basilicata (Berti Suman 2022b).

In the EU legal panorama, interested civic sentinels can find useful resources from institutional sources, for example those issued in the context of the Directive on Public Access to Environmental Information (Directive 2003/4/EC), implementing the Aarhus Convention in the EU (see Chapter 3 for an extensive discussion on the Aarhus Convention and its implication for civic environmental monitoring). For example, the European Commission released a 'Citizen's Guide to Access to Justice in Environmental Matters' and a 'Notice on Access to Justice in Environmental Matters',[17] with the aim of providing guidance on how individuals and their associations can challenge decisions, acts and omissions by public authorities related to EU environmental law before national courts. In the US, the Environmental Law Institute, some years before, also released a comparable resource, i.e., 'A Citizen's Guide to Using Federal Environmental Laws to Secure Environmental Justice'.[18]

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[17] See https://data.europa.eu/doi/10.2779/010125 and https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52017XC0818%2802%29 (last accessed 9 October 2023).

[18] See https://www.epa.gov/sites/default/files/2015-04/documents/citizen-guide-ej.pdf (last accessed 9 October 2023).

Both documents show institutional attention to citizens' entitlement to have their voices heard on environmental and climate matters, eventually also through litigation. A form of expression of this entitlement can indeed be through the provision of evidence in environmental and climate litigation. To facilitate all this, we published an illustrated booklet for civil society actors, summarising SensJus key results on the use of civic evidence for law enforcement, and made it freely available in English and Italian.[19]

Based on the described research, we also published two 'science for policy' briefs, exploring the role of civic evidence for law enforcement in Europe and specifically within the EU system, to offer guidance to policy-makers that in the future will be willing to foster a greater reliance on civic evidence. One brief target is specifically 'Civic monitoring for environmental enforcement: Exploring the potential and use of evidence gathered by lay people' (Berti Suman 2023b) whereas the other more generally is 'An exploration of science in courts – How science supports the enforcement of EU law' (Beck et al. 2022).

As a promising avenue for introduction of civic evidence in court, we are exploring the possibility of civic-gathered evidence to demonstrate impacts associated with climate change and to promote climate justice, in particular through strategic and often human rights based climate litigation, with two forthcoming publications that explore respectively the role of climate-affected people as 'knowers' and their role as agent of change in grasping the complexity of climate impacts and in particular climate-induced mobility.

The inclusion of civic evidence of climate change is a field under rapid evolution, as the thriving of existing projects demonstrate (see e.g., the Local Indicators of Climate Change – LICCI[20] project by Principal Investigator Professor Victoria Reyes-García).[21] Reyes-García argues that the impacts of climate change depend on where you are and your status. It is important to engage local people to map these impacts as they identify not only environmental issues but also cascade effects in human

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[19] See respectively https://tinyurl.com/mwaxtn4r and https://tinyurl.com/488r3c4r (last accessed 9 October 2023).

[20] See https://licci.eu/ (last accessed 10 November 2023).

[21] See talk by Victoria Reyes-García at Falling Walls Science Summit 2022 https://www.yo utube.com/watch?v=_RNkx3OhCig and https://falling-walls.com/people/victoria-reyes-garcia/ (last accessed 10 November 2023).

and non-human systems, and associate these effects to the socio-political and historical (e.g., colonisation) contexts. What is reported by ordinary people in terms of climate impacts can be useful to show local adaptation strategies and embed Indigenous worldviews in decision-making. In order to grasp this complexity, we need a multiple-evidence based approach and to bring in different knowledge systems especially from people that have a history of marginalisation and disproportional impacts, in multiple for a, such as climate negotiation, historical research on environmental (in)justice(s) and climate (im)mobilty,[22] research and innovation,[23] rethinking democracy to enable distributed participation,[24] but also – we add – litigation and the same notion of 'evidence'.

The evidence offered by the sentinels could help courts and policy-makers embrace 'non-human worlds' (such as plants and fungi suffering the impacts of contaminants and climate change) and influence decisions over the environment. Offering their perception of the non-human (or 'more than human', citing scholars from the Sovereign Nature Initiative),[25] the civic sentinels can go beyond 'facts reporting' to instil in the evidence they report also beliefs, imagination, and – at times – an almost spiritual (re)connection with nature that happens when the human monitors the non-human with their bare senses. They 'hack' institutional knowledge, enrich it with their own very situated understanding of the environment, also embedded with shared imaginaries and values, and offer it back to broader publics in a very decentralised manner.

Decentralised and non-hierarchical systems like networks of civic sentinels can be advantageous as they may prove to be more strategic and effective in offering a fine-grained protection to nature. Yet, actors in

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[22] See talk by Sunil Amrith at Falling Walls Science Summit 2022 https://falling-walls.com/people/sunil-amrith/ and https://falling-walls.com/discover/videos/winner-2022-sunil-amrith/ (last accessed 10 November 2023).

[23] See talk by Nikita Sud at Falling Walls Science Summit 2022 https://falling-walls.com/people/nikita-sud/ and https://falling-walls.com/discover/videos/winner-2022-nikita-sud/ (last accessed 10 November 2023).

[24] See talk by Sheila Jasanoff https://falling-walls.com/event/sheila-jasanoff-inclusive-deliberation/ and Lilia Moritz Schwarcz https://falling-walls.com/people/lilia-moritz-schwarcz at Falling Walls Science Summit 2022.

[25] See https://constitutionalizing-anthropocene.org/events/reconfiguring-more-than-humannormativities-strategic-litigation-collective-actions-and-sensing-technologies/ and http://sovereignnature.com/experimental-zone-event-1 (last accessed 10 November 2023).

these networks may be more vulnerable to attacks and silencing attempts (e.g., from private corporations and adverse governments, for example through the cited SLAPPs) as in any node of the 'net' they are relatively alone. The civic sentinels protect nature as 'stewards' in a legal, emotional, sensorial and even scientific way. The law, however, scarcely captures this multifaceted dimension of nature protection, rarely protecting this form of engagement explicitly (as argued in Chapter 3).

Acting on their behalf, the civic sentinels could be regarded as 'nature representatives' with a clear legal role in the system. Especially in those cases where nature itself has been granted rights of its own, for example the case of Rio Atrato (Colombia), of Wekiva River (Florida), of Te Urewera National Park (New Zealand) and of Turag River (Bangladesh). In these cases, the sentinels just act 'on nature's behalf' and their intervention could arguably be justified on the basis of the fact that they can be considered legitimate 'representatives' of a natural body granted legal personhood and associated rights.

However, when this is not the case, the law does not offer as such a legal recognition to the sentinels and in general to environmental defenders, unless they manage to demonstrate that the act of sensing, of performing environmental monitoring, is an exercise of existing rights, for example of the right to live in a healthy environment (on this see Berti Suman 2021b) or new ones (see Berti Suman 2023c; Berti Suman et al. 2023; Berti Suman 2021a; Balestrini 2018; and Chapter 3 of this book). One limitation is that, often, as empirical research performed for the SensJus project (discussed in this book) and earlier (Berti Suman 2021b) demonstrates, among the sentinels there is no clarity on existing rights and low trust in their enforcement. Recognising and communicating a new right, like the 'human right to contribute environmental information' could be a radical legal innovation that offers legitimacy and protection to the sentinels, as Chapter 3 argues. Yet, it may also risk hampering innovation from below as the law tends to capture the status quo and 'close' it down, forcing social actors and their practices to adhere to fixed regulations.

In facing discussions on the inclusion of civic evidence in court, we believe that interested civil society actors, legal practitioners and scientists have to discuss and understand the differences between the scientific way of operating and the way courts decide. Judges indeed often decided based on incomplete evidence and aim to establish a certain, final ruling when all resorts have been undertaken, whereas science always embraces uncertainty and is open to being disproven. The judicial system is way

more adversarial, and way more confident than scientists with disagreement. Science has to reveal and constantly defend its methods whereas judges base their rulings on the letter of the law. When courts base their decisions on science, they make science more authoritative, and it is there that the two worlds collide, and where interesting research could be performed (see e.g., Beck et al. 2022).

THE POTENTIAL OF CIVIC MONITORING TO MEDIATE CONFLICTS

Theoretical Foundations

As the judicial resort may not always be a viable option for the civic sentinels but also may prove not to be ideal in terms of times and resources depletion, we also explored civic monitoring as an instrument for facilitating conflict mediation, that is, the resolution of environmental conflicts outside the court arena. We started from acknowledging that in conflictual scenarios, civic environmental monitoring can be a way to express both care on a matter of concern (Berti Suman 2022a) and distrust towards the interventions by competent institutions (Berti Suman 2022b; Berti Suman 2021b).

We also posited that civic monitoring initiatives may illustrate the existence of differentiated trust attitudes in terms of administrative levels (e.g., trust towards the judiciary and supra-national governmental bodies, but scepticism towards local and regional government; see on this extensively Berti Suman 2021b). When people turn to monitoring an environmental issue themselves, this may enhance their understanding of the complexity behind the problem. In a second stage, competent authorities facilitated by experts can embrace and recognise the value of the civic contribution in terms of obtaining relevant and complementary (or at times missing) evidence. In a third stage, this recognition can smooth things over and alleviate the civic sentinels' sense of distrust towards institutions. Therefore, the emersion of a spontaneous civic environmental monitoring initiative in conflictual scenarios can eventually be an occasion for cooperation between citizens and authorities on a shared issue, as occurred in some of SensJus case studies, such as that of water monitoring of the Tiber and Aniene rivers in Rome.

Civic environmental monitoring may also contribute to the provision of public services. As an effective practice, it shows that institutional environmental monitoring 'as a service' can be performed not only by

appointed agencies and experts but also by decentralised civic actors (Berti Suman 2023d). Embracing these practices can be an opportunity for competent authorities to make governance models more inclusive, efficient and responsive, as argued in Chapter 3 (see Figure 2.3).

Source: Alice Toietta, illustrator for SensJus.

Figure 2.3 *A graphic representation of the concept of civic monitoring as a tool to mediate environmental conflicts*

We found a theoretical underpinning of our hypotheses in scholarship on the benefits of 'co-production' of knowledge. Ostrom (1996: 1073) defines 'co-production' as 'the process through which inputs used to produce a good or service are contributed by individuals who are not "in" the same organization'. Co-production resonates with broader notions of public dialogue and of public engagement (Irwin 1995, in particular discussing the – at the time emerging – notion of citizen science). The concept focuses the attention on how the knowledge on which decisions are made is essentially the result of a multifaceted interaction of epistemologies, spanning from scientific to civic forms of knowledge. We considered theories on co-production keys for investigating the extent to

which civic monitoring could be conceived also as a form of environmental mediation by fostering an encounter of knowledge(s) and viewpoints on a certain matter.

We also looked at more recent co-production scholarship, for example to Brandsen and Honingh (2016), who revisited the concept and provided a categorisation of the different types of co-production to clarify the meaning of Ostrom's – in their opinion, fuzzy – concept. The authors focused on identifying different regimes for knowledge (co-)production, different temporalities, different kinds of knowledge, etc., offering an useful compass to navigate co-production dynamics. Other authors, using the 'ecology metaphor', analysed co-production as a diverse ecosystem (Chilvers and Kearnes 2015: 13). The authors suggest that co-production, through the inclusion of different forms of knowledge, generates a sense of responsibility and thus leads to new geographies of responsibility, an aspect which appeared particularly evident also in our empirical results. As a matter of fact, new geographies of responsibility may indicate a new allocation of roles among the actors that interplay on the governance arena. This new allocation may respond to a demand from the civic sentinels to be listened to with their evidence by those authorities in charge of addressing a specific environmental matter.

Jasanoff (2004) – further interpreted by Bijker, Bal and Hendriks (2009: 5) – discusses the 'co-production of science and society', referring to the intertwined development of scientific knowledge and social order. Civic monitoring can be regarded as an excellent example of this intertwined development as the scientific knowledge produced through these practices is inherently embedded within civic epistemologies. Jasanoff defines these epistemologies as institutionalised practices by which members of a society test and deploy knowledge claims used as a basis for making collective choices (Jasanoff 2005). We believe that civic monitoring can be a constructive approach for civil society actors to contribute to processes of knowledge-making as well as to institutional decisions that stem from such processes.

Overarching guiding theories have included Latour's notions of 'fact' (Latour 1987: 23), of 'authority' (Latour 1987: 31), and of 'fact construction' as a collective process (Latour 1987: 41). In addition, our research was informed by theories on the way people record knowledge (both as a 'practice of memory' and 'memory of practice'; Bowker 2005: 223), and the web of technical, formal and social practices that surrounds it, forming different 'epistemic cultures' (Knorr Cetina 1999). In observing interactions in the field, we asked theory-informed questions such as:

How are authorities dealing with this unconventional evidence? Who decides which evidence counts? What are the instruments, materials and practices adopted by civil society in recording environmental knowledge? How are actors on the ground deploying legitimisation strategies to make space for civic knowledge? To what extent are experts and civic actors cooperating to deliver new evidence?

The project built on these bodies of literature to demonstrate the potential of civic monitoring as an enabler of conflict mediation through an encounter of knowledge. Our cases studies demonstrated that civic evidence can complement official evidence to foster environmental law enforcement. These findings provide precious and cutting-edge material for interested actors, such as academics researching civic monitoring, non-governmental organisations and individuals relying on civic monitoring, environmental and climate lawyers interested in mediating conflicts on the matter, and, lastly, for governments and competent authorities but also corporations that are facing social and judicial conflicts around environmental matters.

Evidence from the Case Studies

Methodological considerations[26]

For this second part of our research, we started from the in-depth analysis of a case study, as done for RQ1 (i.e., the Formosa case). We zoomed in on a situated instance of civic monitoring in Basilicata, south Italy, in which the local inhabitants are monitoring environmental and public health problems associated with oil extraction. The ethnography was developed on a single case study, engaging the local civic sentinels (people who voluntarily engage in monitoring the environment), analysed on the basis of theoretical notions and through the study of the applicable legal framework (e.g., the rights to civic participation in environmental matters, stemming from the Aarhus Convention as implemented in Italy). The case study research was set up in a 'poly-disciplinary' manner as it was designed at the intersection of socio-legal studies (in particular, theories of diffuse governance and spontaneous civic participation) and art-based approaches, integrating socio-legal literature review, and exploration of the legal framework with art-facilitated ethnography (Loveless 2019a; 2019b).

[26] This section draws on Berti Suman 2023a (published in Open Access in Italian in the journal *Ragion Pratica*).

The empirical analysis of the case provided access to firsthand data (primary data) to complement the existing literature on the case (secondary data), which was scarce or absent on the specific research question embraced. Data were collected during field visits in fall 2020 and summer 2021, which involved (1) site visits led by the civic actors; (2) semi-structured or open-ended interviews with local residents; (3) observations of civic monitoring activities conducted by the initiative's volunteers; (4) interviews with professionals who were aware of the case; (5) communications in the form of email exchanges, physical interviews, and phone calls with associations and non-governmental organisations that were dealing with the issue; and (6) analysis of communications in the media and on social platforms. Ethical considerations that this approach required are detailed in Chapter 1.

In order to reflect the spirit of a situated research, the principal investigator of the research decided to move – as much as possible – on foot (embracing what we defined as 'slow ethnography' (Berti Suman 2023a)) through Basilicata, which led her to be more in touch with the everydayness of the issues studied and everyday agency (or lack thereof) of the sentinels. Being on foot made her more vulnerable and dependent on the territory and the people encountered, which facilitated breaking down some of the power hierarchies often triggered by the presence of the researcher. In addition, she was able to more deeply embrace the realities crossed and notice details, small but relevant, to make sense of a larger picture of the territory and the subject matter. We adopted the methodology of sound or sensory walks, which involves sensory listening of a territory without a preconceived assumption about it (Westerkamp 1974). One traverses a researched territory in order to explore it with all the senses and understand more deeply the complex and often changing dynamics of the (human and non-human) beings who inhabit it.

The walk is also a way of collecting data through focused listening, recording and analysis of the soundscape experienced while walking, situating oneself in the midst of it. Such data collection complements more traditional methods such as interviews and observations, serving as a tool to prepare the researcher for these phases and as a resource to supplement data stemming from these more traditional methods with information that comes from the context. As a listening practice, sound walks indeed have the potential to reveal hidden social and cultural changes occurring within a place, which are less easily understood through other methods of research. Although sound walks appear to be an accessible practice, it is also important to examine which people and in which contexts have

access to this practice and which are excluded from it (e.g., one must be able to walk, possess hearing, and be able to move freely through an area). Moreover, justifying the adoption of such methods poses undoubted challenges to the researcher as it requires time and resources that traditional research institutions may be reluctant to grant.

For the research conducted in Basilicata, sound walks have been used to familiarise with the place, the topic studied and the community involved, but also to engage local people in the research and, finally, to make the results public in an accessible manner.[27] As for engaging the inhabitants, sound walks helped us to integrate into the research the critical perspectives of those who are often unheard voices, developing empathy and multi-level understanding toward a topic and its key actors, practising in the field the caring attitude toward the context studied introduced in Chapter 1.

The slow ethnography performed while in the field has continued to evolve over time into 'patchwork ethnography' (Watanabe and Günel 2023),[28] i.e., research processes designed to continue after the period of stay in the field even at a distance through fragments of the field (e.g., by remaining in virtual discussion groups and maintaining a communication channel with the actors encountered). These fragments are collected at a distance through research efforts and relationships that maintain long-term commitments with the research subjects, making them participants in the next phases as well.

Finally, the ethnography developed required a representation of findings that was aware of the theoretical underpinnings of spatial justice (understood as a reflection on access to resources and services in a given territory; Soja 2010) and of critical cartography (which defends the idea that maps perpetuate relations of power and inclusion/exclusion, highlighting or hiding some issues over others; Kanarinka 2006). This theoretical background has offered us tools to study the socio-environmental issues at stake from a perspective of intersectionality, on three dimensions: social (e.g., gender identity embracing and including non-binary or queer identities, social class, ethnicity, age), geographical (the places of everyday life), and psychological (the effects of living places on emo-

[27] See for example https://branch.climateaction.tech/issues/issue-4/sentinels/ (last accessed 12 October 2023).

[28] See also https://culanth.org/fieldsights/a-manifesto-for-patchwork-ethnography (last accessed 12 October 2023).

tions). The maps produced as a dissemination of our results[29] can have a cathartic value, i.e., they are tools capable of expressing the complexities encountered in the field and generating feelings, which also means new engagement with our results.

We scaled up from the situated case, to also research Italian, European and international cases (with a link to Europe, e.g., for the responsible company) together with our secondment site Systasis – Centre for the Prevention and the Management of Environmental Conflicts.[30] Systasis has a wide network of civic actors, legal practitioners and other professionals that are active on the study of and intervention on environmental conflicts and the mediation thereof. Systasis curated the project 'The Mediation of Environmental Conflicts' in cooperation with the Milan Chamber of Arbitration, the City Council of Milan, and other partners. SensJus could access and build on the learnings of this project thanks to the secondment period that took place at Systasis with recurring visits across years 2022 and 2023. Instead of a six months' secondment, in view of the length of mediation procedures (often spanning over more than a few months) and the risk of Covid-related lockdowns, in agreement with Systasis we decided to have recurring one-day visits and two 'boosts' at the secondment site, each a week long. We also engaged in several online exchanges, teaching experiences and organisation of events with Systasis.

For scaling up our research, we performed stakeholders' analysis (businesses, citizens, public administration, etc.) of those actors involved in specific environmental conflicts (e.g., the long-lasting issue of industry contamination in the Lambro River, Lombardy). We observed their interactions when there was a civic monitoring initiative ongoing (e.g., in the Lambro River case, the Lambro Civic Observatory[31]) and assessed whether the initiative stimulated a dialogue and promoted the search for shared solutions to environmental problems. We also engaged in targeted communications with our case studies participants and key actors (such as the local government, the Municipality of Milan, for the Lambro case) and networks (such as the Italian Observatory of Civic Assemblies,

[29] See for example https://branch.climateaction.tech/issues/issue-4/sentinels/ (last accessed 12 October 2023).

[30] Systasis web page: https://www.systasis.it/homepage/?lang=en (last acc-essed 14 October 2023).

[31] See https://www.lambrolucente.eu/ (last accessed 14 October 2023).

Milan). We did so in focus groups and other creative settings (e.g., we organised 'sensorial walks')[32] to inspect these actors' views on civic practices as a tool for environmental mediation. Lastly, we also explored if specific (often local) laws and regulations or legal instruments (such as the 'River Contract' in the Lambro case) had been used to justify the role of civic monitoring for mediating conflicts.

Side streams in which the research is developing, thanks to the collaboration with Systasis, include: how civic monitoring of climate stress could foster the mediation of conflicts arising from climate change ('Climate Routes' project);[33] and how civic monitoring and cooperation between lawyers and Ukrainian communities can ensure civic engagement in Ukraine's environmental recovery, alleviating social tensions in a post-conflict phase ('Gromada' project).[34] The initiative gathers researchers, lawyers, other professionals, communities and associations in the respective fields. The projects aims to valorise local knowledge in addressing environmental and social conflicts.

Key insights from the cases

Our case study analysis was aimed to respond to our second research objective (RO2), i.e., to understand how civic monitoring could be an instrument for mediating environmental conflicts. In order to achieve this objective, we had to address the following question: Could civic monitoring be conceived also as a form of alternative dispute resolution promoting environmental mediation and avoiding escalation to court? To reply to our questions, we targeted civic monitoring practices in which citizens were effectively performing oversight on specific environmental wrongdoings. We searched whether, when actors responsible for these wrongdoings would become aware that citizens had evidence in their hands apt to challenge their conduct in courts, they were persuaded to adjust their actions towards a more environmentally compliant conduct in order to avoid entering a legal proceeding.

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[32] See https://www.lambrolucente.eu/losservatorio-lambro-aps-partecipa-a-milano-green-week-2023/ and https://www.lambrolucente.eu/passeggiata-sensoriale/ (last accessed 14 October 2023).

[33] See https://www.systasis.it/le-rotte-del-clima/?lang=en (last accessed 15 October 2023).

[34] See https://gromada-erasmus.eu/ (last accessed 20 May 2024).

The Analyze Basilicata case[35]

Our research on field and analysis conducted before/after field observations demonstrated that:

1. People are engaging with civic monitoring practices for two main reasons. First, this engagement manifests an essential need to access accurate and reliable information when faced with environmental stressors that directly affect/concern them. Second, they do so as they perceive that they cannot access – or trust – the information that is provided by appointed institutions, or because this information lacks altogether.
2. People engage in civic monitoring to trigger a response, generally from the competent authorities but also from companies considered responsible for the wrongdoings. The local sentinels do not aim to replace authorities, but through their actions they wish to push them to act.
3. When the response from competent authorities does not come in an effective manner, also taking in due account the results of the efforts of civic monitoring, the conflict may escalate to the media or street protests, and even to court.
4. Delivering a swift and targeted response by authorities which also considers the evidence offered by the civic sentinels may mitigate or even prevent conflicts. Thus, civic monitoring initiatives could be viewed as a way to give competent institutions an opportunity to spot an environmental problem and potential conflict before it escalates.
5. Civic monitoring has a strong component of resistance and contestation of the status quo, as it ultimately expresses distrust towards institutions and/or their handling of a certain environmental issue. However, the sentinels may perceive distrust towards local authorities, and instead trust institutions at a different administrative level (e.g., some of the participants interviewed showed trust in the judicial system and in EU institutions while manifesting strong distrust towards the local government). Such trusted institutions may be the facilitators for mediation processes between the actors in conflict and in particular between the sentinels and the distrusted authorities and/or corporations.

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35 Adapted from Berti Suman 2022b.

6. Also relevant for our RO1, we discovered that the civic sentinels acting under the Analyze Basilicata initiative are constantly 'on the alert' to spot environmental problems. When they spot an issue, they search official data on the problem and, if these data are missing, inaccurate or inaccessible to civil society, the sentinels will run their monitoring. In case they identify a discrepancy between official data (when these are there) and their measurements, they first communicate the results to other social actors and the media. Then, they may file a formal notification to the competent environmental agency or to the public prosecutor office, acting as an 'early warning' system for compliance assurance, in certain cases asking for information release based on the Aarhus Convention. In alternative, they first inform of the problem the competent institutions and then reach the media, depending on the matter at issue, its sensitivity and public concern. rather than from the responsible institutions.

These lessons can be especially useful for institutional actors willing to leverage the potential of civic monitoring for mediating environmental conflicts.

The Rome case[36]

In addition to the in-depth case study, we felt the need to expand our research horizon encompassing other cases that presented a potential for the application of civic monitoring to mediate environmental conflicts. Among others, we studied how individual citizens, organised civil society, associations and social movements have joined forces in the last years to contribute to the city's governance 'from below' and fill institutional gaps, in the context of the city of Rome, Italy. These people and actors started taking care of the city's green spaces and resources in an informal way, including through civic environmental monitoring. This study was useful to map the actors and patterns of actions that surround civic monitoring actions.

An example of this civic proactive engagement is that of the battle carried out by the Territorial Forum of the 'Energie' Park and other local realities. Thanks to their efforts, the area of the former textile factory Snia

[36] In part adapted from Berti Suman et al. 2022b.

was officially recognised as a natural monument.[37] In spite of this victory for the citizens, still today the private sector pushes for cementing the area and local sentinels stay on alert to document the importance of preserving the natural site. Another example is that of the 'Centocelle' Park, where buried waste was found after a fire. After four years, the waste is still there despite the activism of civic sentinels and local committees. Yet, very recently, the local Councillor Ziantoni announced the launch of a 100K euro project for the actual removal of the waste.[38]

In a context of urban distress, the organised civil society became a source for information for fellow citizens. The civic monitoring campaign aimed at the study of nitrogen dioxide (NO2) in the city, conducted by the organisations 'Cittadini per l'Aria' and 'Salvaciclisti',[39] is an example of this alternative information source. The campaign, conducted between February and March 2020, showed that 99 per cent of the approximately 360 passive NO2 samplers placed by participants measured NO2 concentrations above the annual threshold of 20 μg/m³, which is the value from which human health impacts occur, according to the World Health Organization. Monthly, 42 per cent of the samplers exceeded 40 μg/m³, 15 per cent exceeded 50 μg/m³, and 5 per cent even exceeded 60 μg/m³. Official data confirmed it; i.e., the regional environmental protection authority, ARPA (Agenzia Regionale di Protezione Ambientale), in its annual report, affirmed that in 2020 the annual average of NO2 in Rome was higher than the limit of 40 μg/m³.[40]

Water quality of the city's rivers is also a key issue in Rome. In August 2021, the regional environmental protection agency ARPA updated the conditions of the ecological and chemical status of the region's water-

[37] See https://it.ejatlas.org/conflict/riappropriazione-cittadina-del-lago-ex snia (last accessed 20 October 2023).

[38] See https://www.romatoday.it/politica/parco-centocelle-lavori-rimozi one-rifiuti.html (last accessed 20 October 2023).

[39] Web page of Cittadini per l'Aria: https://www.cittadiniperlaria.org/ and Salvaciclisti Roma https://www.salvaiciclistiroma.it/no2-no-grazie-la -mappa-dei-valori-di-biossido-di-azoto-per-roma-nel-2020/ (last accessed 20 October 2023).

[40] ARPA Lazio, *Valutazione della qualità dell'aria nella Regione Lazio* (2020), p. 68 https://www.arpalazio.it/documents/20124/55931/Valutazione+ qualit%C3%A0+aria+2020.pdf (last accessed 20 October 2023).

ways.[41] Between 2018 and 2020, three monitoring stations (out of seven) from ARPA reported poor ecological status in the Tiber. Only one station observed sufficient quality. Moreover, two out of four stations measured chemical pollutants exceeding safety limits. The worst situation was recorded in the urban stretch of the river. This is worrisome especially considering that Italy has implemented the European Water Framework Directive,[42] which called for achieving a good ecological and chemical status of waterways already by 2015.

We could observe the work on the field of the association A Sud,[43] based in Rome, whose mission is indeed to be a facilitator for community's action, providing them tools, advocacy and skills to run environmental monitoring on the ground, and then to trigger legal interventions and policy discussions. In light of this mission, the association established a Documentation Centre on Environmental Conflicts (Centro Documentazione Conflitti Ambientali – CDCA),[44] which, since 2007, offers a space for counter-narratives on environmental matters that gives a voice to those viewpoints that diverge from the mainstream reading of environmental conflicts. Over more than a decade affected communities involved in environmental conflicts found in the Centre a place to encounter other communities and share strategies and knowledge, also stemming from civic environmental monitoring.

Such communities and the supporting organisations, among which A Sud and CDCA, realised that environmental conflicts ask for alliances with the technical and scientific world – within and outside academia, to build a different but equally rigorous and credible reading of environmental problems, to complement or at times substitute the official one. This reading can be both scientifically sound and activist-oriented when stakes are high, and the two approaches are not necessarily in conflict when scientific rigour is preserved. This was visible in the recent history of Italy, for example looking at the scientists' mobilisation in support of

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41 ARPA Lazio, *Classificazione Stato Ecologico e Stato Chimico dei Corsi d'Acqua aggiornata* (2021) https://www.arpalazio.it/documents/20124/55238/Fiumi_classificazione_aggiornata_al_trienno_2018-2020_Rev1.pdf (last accessed 26 October 2023).

42 Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy, transposed in Italy by the Legislative Decree n. 152/2006.

43 A Sud web page: https://asud.net/ (last accessed 18 September 2023).

44 CDCA web page: http://cdca.it/ (last accessed 18 September 2023).

the civic opposition to the TAP (the Trans Adriatic pipeline in Southern Italy)[45] and the TAV (the high speed train from Turin to Lyon) projects.[46]

The work of A Sud in recent years has been inspired by the potential of civic monitoring for social and environmental justice, through the construction of collective knowledge for change. The RomaUP and WalkUP Aniene projects for monitoring the quality of the Tiber and Aniene rivers in Rome (that we studied in Berti Suman et al. 2022b) can be situated in this broader spirit. In the study, we could shed some light on the motivations participants had in joining the initiatives. Some participants wanted to monitor the air in order to understand how green areas could improve air quality; others were keen on assessing the status of green areas and in particular nature reserves in the city; others were interested in monitoring the air quality following a fire to spot eventual presence of dioxins; others wanted to monitor the status of the river to understand the causes of specific episodes of contamination.

The overarching 'citizen sensing paradigm' (Berti Suman et al. 2022b; also featuring on Medium for the Japanese counterpart of this paradigm[47]) is exemplified in the RomaUp and WalkUP Aniene initiatives. It suggests that the collective imagination in which the scientific world is considered impenetrable can be challenged through forms of civic monitoring where science and being a (watchful) citizen converge. Open-minded scientists at present see in the collaboration with communities and citizens a way to put their knowledge at the service of the common good, showing greater flexibility compared to the past. They are often ready to mediate communications and knowledge exchanges with competent institutions, such as, in the Italian case, the ARPA authority. By discussing with citizens methods and results, they help participants to ensure credibility and rigour of their monitoring, therefore putting ordinary people in the conditions to sit at the same table of policy-makers. This can signal a broader phenomenon of hybridisation between the world of research and activism, but – with the due precautions – this should not be seen as

[45] No TAP web page: https://www.notap.it/ (last accessed 18 September 2023).

[46] No TAV web page: https://www.notav.info/ (last accessed 18 September 2023).

[47] See https://medium.com/@anna.bertisuman/citizen-science-and-the-paradigm-of-the-shimin-kagaku-7bd83d589eba (last accessed 18 September 2023).

a challenge for scientific soundness of the results and rather be considered a first step towards the mediation of environmental conflicts based on embracing civic monitoring.

The key lessons extracted from the study of civic monitoring in Rome, can be summarised as follows:

1. Civic monitoring can be regarded as a form of social innovation that starts from situated problems and has the capacity to accelerate or even trigger broader social and environmental justice outcomes.
2. Engagement of professional scientists in the initiatives, the training offered to the participants by a local association and the ability for the citizens to reach difficult-to-access places made it possible to create a robust knowledge base.
3. The knowledge collected proved to be valuable also for the policy-makers in charge of managing the rivers' ecosystems. The civic data complemented official data and even filled data gaps.
4. Civic monitoring created a precious knowledge pool but, as a transition does not stem automatically from knowledge creation; advocacy based on this knowledge was also key to trigger change.
5. Public administration's support is key to start a structural cooperation between civil society and authorities in civic monitoring.
6. Civic monitoring can be recognised as a public service, beneficial not only for public administrations but also at the individual and community level.
7. The civic monitoring initiatives also had a positive impact on individual and collective attitudes towards the city and its resources, stimulating a sense of care and responsibility.

We explored the lessons of the two in-depth researched contexts illustrated in this section by transposing them to other and broader contexts, for example on the occasion of a roundtable organised at the Engaging Citizen Science Conference in Aarhus (Berti Suman 2022d), in a study of reactive citizen science over time (Berti Suman and Alblas 2023), on civic monitoring in relation to governmental accountability claims (Berti Suman 2022c) and to the evolution of the social contract to embrace what we frame as a 'sensing contract' (Berti Suman and Bollon 2023), which will be discussed further in Chapter 3.

3. Legal and governance adaptations needed?

CIVIC MONITORING UNDER THE AARHUS CONVENTION LEGAL FRAMEWORK

The third part of the SensJus project was aimed at achieving research objective (RO3), i.e., to frame a right to contribute environmental information. For this objective, we questioned: How can the use of civic evidence be legitimised on the basis of existing and new rights? Which legal and governance adaptations are needed to ensure greater reliance on civic environmental monitoring and civic evidence? The first section of this chapter will address the first question, whereas the second section will discuss the second question.

For this goal, we explored whether the introduction of citizen-generated evidence in courts and extra-judicial mediation processes could be legitimised under existing and new rights, such as 'the right to contribute environmental information', derived by interpretation from existing rights. We deployed legal analysis and experts' consultations to demonstrate that, from a combined interpretation of the right to a healthy environment and to access environmental information held by authorities, a new right could be derived, especially building on the participation pillar enshrined in the Aarhus Convention. In this section, we focus on the Aarhus Convention as we mainly take the perspective of Europe, but in Box 3.1 we discuss these matters in relation to another region than Europe, namely the Inter-American context.

A particularly valuable instrument to legitimise the contribution of civic environmental monitoring is indeed the Aarhus Convention (Berti Suman 2023c; Berti Suman et al. 2023; Berti Suman 2021a; Balestrini 2018). The United Nations Economic Commission for Europe's (UNECE) Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters of 1998 came into effect in 2001. The Aarhus Convention grants every

citizen and environmental organisation a set of procedural environmental rights, which aim to increase public access to the environmental information held by public authorities (Articles 4–5); enable public participation in environmental decision-making (Articles 6–8); and allow the public to review procedures to challenge public decisions before the courts, by accessing environmental justice (pursuant to Article 9).

Civic, political and scholarly discussions on the Aarhus Convention are primarily centred around the supply of environmental information to civil society by the state. As Whittaker (2023, building on Berti Suman 2021a) argues, this focus downplays the relevance that could have environmental information gathered by civil society for fostering environmental enforcement and the difficulties that individuals face when submitting such information to the competent authorities outside formal environmental decision-making procedures. Throughout the SensJus research project, we therefore analysed the feasibility of this right and advocated for its insertion within the Aarhus Convention.

Recently, the Aarhus Convention recognised the role of civic contributions through scientific data (in particular, acknowledging the role of citizen science) as a legitimate source of environmental information. In particular, in 2020, the UNECE issued a call for a Consultation on the Recommendations on Electronic Information Tools, a document inserted within the Aarhus Convention system. Experts and practitioners from the European Citizen Science Association (ECSA) shared inputs to revise the recommendations to include broader citizen science (and thus also civic environmental monitoring as understood in this book) within the range of information sources that can and should be used in environmental monitoring and management (for details on the recommendations see Haklay et al. 2020 and United Nations Economic Commission and Social Council 2021). The inclusion of this amendment was discussed during the 2021 Meeting of the Parties to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters. This demonstrates already that legal frameworks are being adapted, as argued in the next section, to embrace an active role by civil society, not only as entitled to passively access information but also as active agents that are playing the role of information sources for competent authorities (see Figure 3.1).

We explored a right to contribute environmental information especially in situations where official information is lacking or insufficient, as in the Formosa case. We adopted the word ‘contribute’ because people generate data all the time, but we wished to recognise a different entitlement to

Source: Alice Toietta, illustrator for SensJus.

Figure 3.1 *The legal and governance adaptations needed to accommodate a civic right to contribute environmental information*

meaningfully contribute environmental information gathered through the active engagement in civic monitoring activities, shared with authorities to inform environmental law enforcement. Submitting data is indeed of limited value if there is not a duty to consider and respond from the competent authorities (as argued in Berti Suman et al. 2023). This is why in the next section we discuss governance adaptation needed, especially from competent authorities, whenever such a right would be recognised.

While the Aarhus Convention offers avenues for those civic actors wishing to claim breaches of their environmental rights, it recognises only traditional and unidirectional data flows (that is, from governmental actors to citizens). Environmental information that citizens are entitled to access are only those held by authorities (often coming from private actors which are obliged to report to the authorities the results of their environmental monitoring, as provided under the Pollutant Release and Transfer Registers established by the Kyiv Protocol of 2009). At present, there is no recognition of a right to contribute environmental information expressly recognised by the Convention. However, we argued that

implicitly this right is already foreseen in the letter of the Convention (Berti Suman 2021a). Indeed, the duty imposed on public authorities by Article 5(1)(a) of the Aarhus Convention to 'possess and update environmental information which is relevant to their functions' can be interpreted to oblige authorities to accept civic-gathered information where the authority does not hold the relevant information. However, public authorities can discharge this obligation through other means, which entails that this article does not ensure reliance on civic evidence (Whittaker 2023, building on Berti Suman 2021a).

This is also why the new right is needed. We argue that the right should operate when the following conditions are met (building on Berti Suman et al. 2023):

1. the matter is not duly monitored or addressed by the competent authorities creating a matter of concern for civil society; and/or
2. access to information obligations is not (properly) complied with by the authorities; and/or
3. in any instance in which the civic data produced is of quality and robustness that can reasonably complement and contribute to official data, as civic data does not need to be equal in terms of data quality to government data because even less precise data can still provide useful complementary information.

We engaged in a number of outreach activities and targeted communications to defend that the right could be a powerful source of legitimisation for citizen-gathered evidence for law enforcement and a source of governmental obligations. For example, in the 2023 Meeting of the Parties to the Convention, the principal investigator of the SensJus project, together with Muki Haklay, as experts on citizen science and the Aarhus Convention, presented inputs on this evolving new right with the facilitation of the European Environmental Bureau.

We searched evidence of this right also in our in-depth qualitative knowledge of the analysed case studies, for example we explored how the civic sentinels in the Analyze Basilicata case adopted strategies to advance a right to contribute, in situations of institutional data gaps. The concerned people resorted to civic evidence to prove violation of their right to a healthy environment and to access environmental information, and in order to trigger institutional investigations. We explored both reactive (Berti Suman and Alblas 2023; Berti Suman and Bollon 2023; Berti Suman et al. 2023) and contributory forms of civic monitoring (Berti Suman et al. 2023; Van Oudheusden et al. 2023). We compared in-depth

analysis of cases' patterns with our case knowledge of other cases that we identified across Europe, which succeeded in mobilising or had the potential to mobilise the Aarhus Convention to defend their entitlement to contribute environmental information.

ONGOING TRANSFORMATIONS OF LEGAL FRAMEWORKS AND GOVERNANCE MODELS

The Current and Expected Evolutions

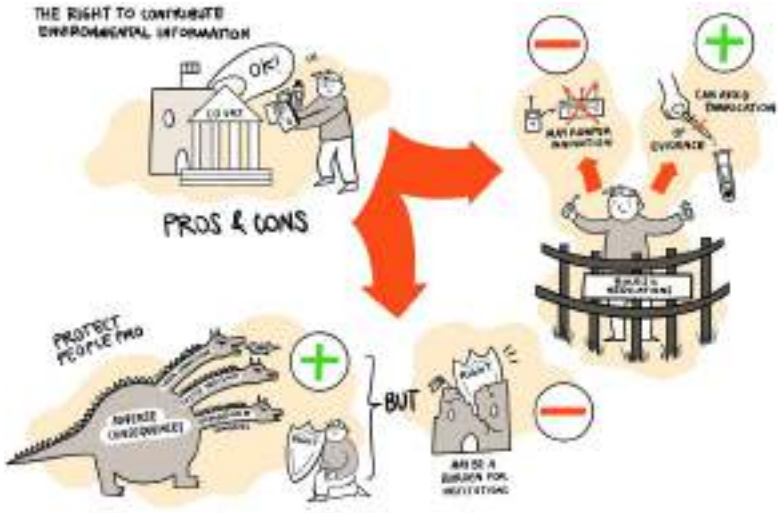
Faced with these innovations in environmental data streams 'from below', legal frameworks and governance models have to adapt and evolve to take the most out of civic environmental monitoring. Legislation may need to be re-designed and new legislation drafted to take stock of the potential for enforcement of evidence gathered by civic actors. The efforts of communities facing environmental issues and performing monitoring should be recognised, for example with the establishment of a fourth right under the Aarhus Convention, i.e., a right to contribute environmental information when institutions struggle to fulfil their duties.

We believe that civic and institutional actors in the field must decide through democratic processes whether a right to contribute environmental information just creates the possibility for authorities to use civic evidence (already possible) or rather obliges them to resort to such data, when certain conditions are met (e.g., insufficient or missing official data), as discussed in the previous section. The recognition of a right to contribute could ensure a more systematic and transparent adoption of citizen-gathered data.

The results of the SensJus project supports the inclusion of a right to contribute as it could shield participants against adverse consequences of their monitoring activities (e.g., legal convictions) as witnessed on the field (Berti Suman 2022a and 2022b). We showed in the previous section some first signs of opening of the Aarhus Convention to make space for information flows from the grassroots.

However, a legal recognition of the conditions under which a right to contribute is granted can prove also to be a regulatory burden for authorities. Moreover, such a legal recognition may hamper innovation, 'capturing' a versatile practice into static boundaries of a law. In addition, this legal intervention also risks excluding initiatives that do not manage to meet the needed conditions. Lastly, we argued that it is important to counterbalance this right with gate-keeping to avoid fabrication of

evidence, infodemics and weakening of the system. Regardless of a legal recognition of civic environmental monitoring, we could witness in practice that civic environmental monitoring is already influencing how authorities handle environmental matters and is pushing adaptations in governance models, challenging traditional allocation of responsibilities. The next section explores scenarios of adaptation (see Figure 3.2).



Source: Alice Toietta, illustrator for SensJus.

Figure 3.2 *The opportunities and challenges of the recognition of a civic right to contribute environmental information*

Integration Scenarios

In Berti Suman et al. (2023), based on theoretical discussions and empirical insights, the authors outline hypothetical but realistic scenarios of interaction between civic-gathered data and existing environmental governance and legal structures. They offer valuable parameters that should be considered in exploring integration between existing governance models and spontaneous civic monitoring initiatives. These include:

1. the type of civic monitoring initiative, from counter-system to collaborative initiatives;

2. the initiator, whether they are state, citizen, or jointly initiated;
3. the institutional attitude towards the initiative;
4. the presence of legal provisions regulating civic monitoring;
5. the existence of a legal obligation by authorities to consider civic-gathered data; and
6. the existence of a platform open to civic-gathered data and its ownership (whether it is owned by the authority/the citizens/a third party/jointly between two or more of these actors).

The authors conclude that different types of initiatives require different levels of integration of the civic data within official infrastructures. In addition, the study argues that even when integration is not performed in terms of governance or legal adaptation, civic monitoring and the resulting data can still impact decision-making and law enforcement in informal ways. The relationship between civic, institutional and corporate infrastructures for environmental data storage and sharing is another very relevant matter tackled in the study.

Figure 1 in Berti Suman et al. 2023 (see Figure 3.3) depicts three possible scenarios of interplay between a civic initiative and public institutions, from high-integration instance (Scenario 1), where a right to contribute is recognised or derived from existing norms and governance models are adapted accordingly, to the least integrated scenario (Scenario 3), in which there is no legal recognition of a right to contribute, authorities and citizens are in conflict, and the existing infrastructures do not make room for civic data. In the middle, there is Scenario 2, a half-way scenario capturing all the other possible configurations (although their nuances go beyond what can be captured in a figure).

In Scenario 1, the recognition of a right to contribute through a legal intervention is considered less useful considering that existing legal and governance structures already can accommodate the cooperation between citizens and institutions. However, also in that case an open indication of the criteria followed to consider civic evidence for law enforcement can be valuable to foster transparency and equity. Scenario 2 would be the context where the recognition of a right to contribute would be more beneficial to push institutions to rely systematically on civic evidence. In addition, a legal recognition could incentivise reliance on civic evidence. However, it is important to keep in mind that a recognition could cause lack of flexibility and agility that instead Scenario 1 enjoys. In Scenario 3, the conflictive situation makes the recognition of a right to contribute not effective, as there would not be the conditions to implement it. In this

scenario, it is first important to ensure that already existing safeguards for the civic sentinels, such as the Aarhus Convention, are respected and enforced. From another perspective, however, the recognition by institutions of the conditions under which they would consider citizen-gathered data could be a signal to civil society of an open attitude by authorities and be a first step to mitigate existing tensions. In this section, we focused on scenarios of integration with governance and legislative frameworks. For a focus on civic monitoring as contributing to risk governance and possible integration scenarios, see Berti Suman 2020.

Source: Author's elaboration, for Berti Suman et al. 2023, Figure 1.

Figure 3.3 *Scenarios of integration of civic monitoring and institutional frameworks*

The Status Quo – The EU Legal Framework[1]

After discussing possible adaptations of legal and governance frameworks to make space for civic monitoring, it is useful to briefly discuss how civic monitoring fits within the current European and international legal and regulatory frameworks on environmental monitoring and reporting. Although acknowledging the importance of an analysis of each

[1] In part adapted from Berti Suman 2023d.

domestic legislation, in the following text we focus on the EU and its legislative framework. Therefore, the section discusses the current European framework on environmental data collection, monitoring and reporting, specifically in terms of the use of such information as basis for policy and law design, implementation and compliance assurance.

Environmental protection is a domain intensively regulated at the EU level, substantially more than other domains (e.g., family or procedural law), exactly due to the importance of cross-national and coordinated environmental strategies. It has been rightly affirmed that 'there are hardly any areas of environmental policy left that have not been regulated at the EU level' (Verschuuren 2015: 383). The EU environmental legislative framework appears as 'an all-encompassing set of laws, regulations and policies on every imaginable environmental issue' (Verschuuren 2015: 385). EU provisions have been either transposed into domestic legislation of the Member States or are directly applicable in domestic contexts. The Member States have been free to implement a level of protection higher than the standards imposed by the EU, but not lower. Consequently, the EU legislation on environmental monitoring and reporting can be considered the 'benchmark' against which to *test* also civic monitoring initiatives.

Zooming in on how environmental monitoring and reporting operates at the EU level, as detailed in the European Commission's (EC) Staff Working Document (SWD) 2017 n. 230, pp. 8–9,[2] a milestone was in 1991 when the European Economic Community adopted the Standardised Reporting Directive (SRD-91/692/EEC).[3] The Directive streamlined reporting procedures and introduced a three-year reporting cycle for all covered legislation concerning environmental protection at the EU level. The content of the Directive was then transposed by the EC in sector specific questionnaires through implementation acts. The next important step to be mentioned is the creation of the European Environment Agency (EEA) in 1994, aimed at providing the EU and the Member States with 'objective information' (SWD(2017)230: 8) on the

[2] EC SWD(2017)230 'Fitness Check of Reporting and Monitoring of EUEnvironment Policy'.

[3] Council Directive 91/692/EEC of 23 December 1991 standardizing and rationalizing reports on the implementation of certain Directives relating to the environment (OJ L 377, 31/12/1991).

status of the environment and at facilitating data and information flows among Member States and across the EU institutions.

In addition to the general reporting scheme, several sectoral initiatives have contributed significantly to the development and improvement of the EU reporting scheme. Among them worth quoting is the Water Information System for Europe (WISE),[4] which streamlined environmental monitoring and reporting of all water-related legislation and harmonised it with the EEA's state-of-the-environment data flows. In the biodiversity monitoring sector, a similar effort was performed through the Biodiversity Information System for Europe (BISE),[5] which is a single entry point for data and information on biodiversity. In addition, the EC recognises that the use of information technology has made the reporting at the EU level expand and increasingly rely on electronic forms (SWD(2017)230: 8).

The use of electronic means for transmission of environmental data and the availability of the reported data online, for example through maps, generated a move towards the definition and harmonisation of electronic data standards, an aspect of which is of particular relevance for the present discussion. This need of data standards led to the adoption of the Infrastructure for Spatial Information in the European Community (INSPIRE) Directive[6] in 2007, creating an EU-wide spatial data infrastructure and setting 'technical standards for the interoperability of spatial data and for the online availability of data discovery and access services, therefore promoting comparability and data sharing' (SWD(2017)230: 9). Many more efforts have been undertaken by the EC to streamline environmental reporting, as detailed in the SWD(2017)230, 'Table 1: Overview of recent or ongoing streamlining initiatives in relation to environmental legislation'.

Furthermore, it is worth quoting the Communication from the EC (2017)312 on 'Actions to Streamline Environmental Reporting'.[7] In the opening of the Communication (COM), p. 2, the EC states: 'we all

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4 See https://water.europa.eu/ (last accessed 4 November 2023).

5 See https://biodiversity.europa.eu/ (last accessed 4 November 2023).

6 Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE).

7 EC COM(2017)312 on 'Actions to Streamline Environmental Reporting'.

want to know if the air we breathe and the water we drink are healthy or if our beaches and lakes are clean. *The European public has a right to know* about the quality of the local natural environment and whether EU actions deliver improvements' (italics added by author). The EC notes that information at the European level on the environment 'usually starts locally: environmental monitoring of air pollution, the state of nature, water quality, etc. is all about seeing what is happening to the environment "*on the ground*"' (italics added by author), acknowledgement that is particularly timely to this discussion. The next step is the monitoring of compliance with existing domestic and EU regulations at national level and, if needed, at the EU level.

The COM(2017)312 at p. 2 indeed continues: 'Some of this information is then reported to the EU level and to the public. At European level it is used for regulatory monitoring to check if the regulation is effectively meeting its objectives.' The importance of the EU reporting scheme is stressed: 'Reporting on policies and the environment provides essential facts and information for informed decision-making. [This] is key to the cycle of analysis, dialogue and collaboration that takes place for the environment implementation review' (COM(2017)312: 2). However, as environmental monitoring and reporting is particularly costly for Member States and private actors, in May 2015 the EC launched a review process of reporting requirements, based on a 'fitness check approach' (COM(2015)215).[8] The aim of the check was to improve public information on the status of EU environmental protection while simplifying the reporting burden for national administrations and corporations.

The review has delivered particularly interesting results for the present discussion (EC COM(2017)312: 4). First, the overall conclusion was that 'most reporting obligations are largely fit-for-purpose' and a number of progresses have been made in recent years. However, what is particularly relevant here is to discuss some of the problems identified and related recommendations, such as to 'promote good IT practices such as *common open source standards*'; 'promote good practices for *active dissemination*'; 'make better use of data … *directly from the public (e.g. in the context of citizen science)*' (italics added by author) (EC COM(2017)312: 4). This sentence, especially, deserves particular attention in the context of this research.

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[8] EC COM(2015)215 on 'Better regulation for better results – An EU agenda'.

As a result of the recognised need to improve the use of data fed directly by the public, in the same COM(2017)312, p. 11, the EC launched a specific action in support of citizen science (thus including also civic monitoring for the purposes of our research), i.e. 'Action 8: Promote the wider use of citizen science to *complement* environmental reporting' (italics added by author), which is crucial here. The Action will be implemented 'stepwise', through the development of guidelines over 2019 on which currently the JRC and the EC Directorate-General (DG) Environment are working, in consultation with relevant stakeholders. The Action reads as follows:

> Another promising source for complementary information and data on environmental issues is *citizen science*. This offers another way to collect environmental data that is cost-effective and is useful in providing early warnings about environmental trends and specific problems. At the same time, it increases awareness and empowers people. However, in spite of an increasing amount of citizen science data and activities, in practice *citizen science data are not (yet) used widely for official environmental monitoring* (especially as for some areas the data is not on par with scientifically more elaborate monitoring equipment) and reporting. Nonetheless, *it can trigger official reporting and action, for example if citizens report problems with a local landfill, and complement it* (last two sentences in italics added by author).

The encouraging approach of the EC, which also commits to the continuous promotion of citizen science activities through EU research and innovation programmes, urges a discussion on forms of regulatory interventions aimed at facilitating the institutional adoption of these types of practices as a complementary form of environmental monitoring and reporting.

As discussed above, a number of specificities are identified at a sectoral level. As an example, it is worth mentioning the EU framework for Air Quality data collection and reporting. This framework cannot be discussed exhaustively here but only selected aspects will be targeted. This is a good example as air quality regulation mostly acts at the EU level, considering that Member States are asked to comply with overarching EU guidelines, and that many adjoining environmental fields, such as noise and water pollution, have been regulated based on the example set by the air quality legislation.[9] Furthermore, it should be noted that

[9] See http://ec.europa.eu/environment/air/index_en.htm (last accessed 8 November 2023).

a wealth of environment-related citizen science and civic monitoring projects tackle air quality issues, considering that air quality is one of the most pressing and widespread concern of EU cities, mainly, but also of rural areas.

Moreover, it is worth adding that a flourishing jurisprudence at EU level (on this, see Misonne 2021) has exactly targeted air quality issues, more than other sectors. The EC's 'Air Quality: Data & Reporting' policy,[10] imposes clear duty on the Member States. First, the EU Member States are requested to ensure that 'up-to-date information on ambient concentrations of the different pollutants is routinely made available to the public as well as to other organisations'. In addition, 'when information or alert thresholds are exceeded, Member States need to inform the public about the exceedance and the actions that are eventually taken'. The importance of keeping the public informed emerges, although through a rather top-down approach. A space for bidirectional information flows, including from the citizens to authorities, would seem appropriate in this context. This general obligation is implemented in different EU directives, which cannot be discussed here for the sake of focus.

In addition, again with the aim to provide proper information to the public, a number of EU-wide databases concerning air quality have been built by the EEA, as for example 'AirBase',[11] which is the public air quality database system of the EEA. AirBase collects information from the continuous monitoring of air quality, as prescribed under the Exchange of Information Decision 97/101/EC.[12] Future research may consider inspecting to what extent these databases allow for input from citizens-generated data. Improvements in this direction are multiplying, as demonstrated by platforms implemented at the EU level such as 'HackAIR', presented as a tool for creating 'collective awareness for air quality'.[13] HackAIR is 'an open technology platform that can be used to access, collect and improve air quality information in Europe'. It was

[10] See http://ec.europa.eu/environment/air/quality/data_reporting.htm (last accessed 8 November 2023).

[11] See https://www.eea.europa.eu/data-and-maps/data/aqereporting-8 (last accessed 8 November 2023).

[12] Council Decision of 27 January 1997 establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States, 97/101/EC.

[13] See http://www.hackair.eu/about-hackair/ (last accessed 8 November 2023).

supported by the EU programme on 'Collective Awareness Platforms for Sustainability and Social Innovation' (January 2016–December 2018). The platform 'enables citizens and organizations to *easily engage in generating and publishing information* relevant to outdoor air pollution, raising collective awareness about the daily levels of human exposure to air pollution' (italics added by author).

Overall, the EU established a quite uniform approach for air quality data reporting at the EU level. An example of efforts towards this uniformed framework is the Common Understanding to facilitate the implementation of the Decisions 2011/850/EC and 2008/50/EC on the reciprocal exchange of information and reporting on ambient air quality,[14] drafted by the Member States and EC, with support by the EEA. In addition, at the EU level uniform air quality standards[15] have been set and relative maps for each country's air quality have been developed. It would be worth investigating whether individual civic monitoring and citizen science initiatives conform to and follow these standards in their daily practices of air quality monitoring.

Over the course of the SensJus research project, we explored how the discussed frameworks and data standards embraced by civic monitoring and broadly citizen science initiatives fit within these legislative and policy contexts, building on earlier work on this matter. More recently (Berti Suman 2023d), we explored how civic-gathered data could fit the new EU data strategy,[16] in particular with regards to the rapid evolutions of the Environmental Data Space, which have been defined as a space for 'data exchange where trusted partners share data for processing without sacrificing data sovereignty'.[17] These trusted avenues for (envi-

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[14] Commission Implementing Decision of 12 December 2011 laying down rules for Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council as regards the reciprocal exchange of information and reporting on ambient air quality (2011/850/EU).

[15] See http://ec.europa.eu/environment/air/quality/standards.htm (last accessed 8 November 2023).

[16] EC COM(2020)66 on 'A European strategy for data'.

[17] Cited from https://wetransform.to/green-deal-data-space-gaia-x/. See also https://environmentaldataspace.com/. According to the European strategy for data, the data spaces will include: (i) the deployment of data sharing tools and services for the pooling, processing and sharing of data by an open number of organisations, as well as the federation of energy-efficient and trustworthy cloud capacities and related services; (ii) data governance struc-

ronmental) data sharing play a crucial role in the implementation of the European Green Deal, as they ensure data flows for fuelling research and innovation, at the same time ensuring data protection and trusted access.

In addition, the EU Data Act and Data Governance Act have been considered key in understanding the evolution of the field and the legal enabling framework. It has been argued (Berti Suman 2023d) that these evolutions should be regarded in parallel with recent progresses on health data flows and on open research data as often civic monitoring initiatives produce Open Access environmental and health data. The European Health Data Space was established to promote societal innovation and trusted health data flows, exactly as the Environmental Data Space. COM(2022)196/2 on the Health Data Space links such space with the European Open Science Cloud, which will 'enable researchers, innovators and policy-makers to more effectively use the data securely and in a way that safeguards privacy'.[18] The data flows stemming from civic monitoring are often valuable for and shared with researchers, thus it seems that they can be very relevant both for the evolutions of the Environmental and Health Data Spaces and for the European Open Science Cloud. During our research project hosted within the JRC, which has the mission to offer independent scientific advice to the EC, we could specifically contribute (and we are still contributing) to the discussion on how civic-gathered data on environmental and health matters can enrich these data flows and on how policy- and law-makers should rethink existing frameworks to make space for this data (Berti Suman 2023b and 2023d; Berti Suman, Heyen and Micheli 2023; Micheli et al. 2020).

Civic Monitoring in Relation to Domestic Legal Systems

In the preceding sub-section, we discussed how current environmental monitoring and reporting schemes work at the EU level and specifically

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tures, compatible with relevant EU legislation, which determine, in a transparent and fair way, the rights of access to and processing of the data; and (iii) improving the availability, quality and interoperability of data – both in domain-specific settings and across sectors. Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act), p. 2.

[18] EC COM(2022)196/2 on 'A European Health Data Space: harnessing the power of health data for people, patients and innovation'.

pinpointed the possible role of civic-gathered data in that frame. Now we question which obstacles may civic monitoring face in domestic legal systems. Secondly, it is inquired which could be the effects of a favourable or rather unfavourable legal endeavour on civic monitoring. Considering again the possible breadth of this discussion and the specificities of each jurisdiction, this section only discusses in general lines possible obstacles.

With regards to the first question, there could be three main steps of scrutiny. First, the question: 'Is there any specific provision on civic monitoring in the specific domestic legislation?' should be asked. If the answer is yes, then the outcome is relatively easy as such practices should conform to these specific provisions. If not, which is the case for most countries (excepted e.g., the US where there is a Crowdsourcing and Citizen Science Act since 2016[19]), it should be investigated whether civic monitoring could be prohibited based on certain grounds. For example, civic monitoring could be regulated or even prohibited if it falls within the category of a monitoring activity that (a) may create nuisance to others (in general monitoring is not intrusive, however for example monitoring with drones can be noisy or affecting privacy); (b) may impinge over private property; or (c) may interfere with radio-signals, etc. Private law, tort law and even criminal law provisions may be at stake. In addition, civic monitoring to be valid for specific purposes (as indicated above for use in courts, for example) may have to comply with certification mechanisms, International Organization for Standardization (ISO) standards, or other specific regulations that affect that monitoring sector.

Overall, it seems that civic monitoring may have to face two main barriers: first, assuring that the kind of monitoring is not prohibited as such/ do not harm legally protected interests; second, meeting the requirements to be a valid monitoring for the specific purposes to which that civic monitoring initiative is aimed. The key question that SensJus advanced on this matter is whether existing barriers must be removed to facilitate the development of civic monitoring or rather civic monitoring has to conform to them.

In terms of legal barriers, it is not possible to provide an exhaustive analysis of the interplay between civic monitoring and the applicable legal frameworks as this mostly depends on the country at issue. A civic monitoring project may, for example, raise some legal issues in a country

[19] 15 US Code § 3724 (2016) – The Crowdsourcing and Citizen Science Act.

and no issue in another, even if the project is the same, as legislation may differ. In Europe, studies on this topic are scarce (however, see recent contributions summarised in Kasperowski et al. 2023). In the US and Canada, this type of research is instead growing especially because broad citizen science has been the object of specific legal provisions.

The work of legal scholar Teresa Scassa (e.g., on data collection and free speech; citizen science and data management issues; Intellectual Property rights and citizen science)[20] from a Canadian perspective can be of inspiration also for an EU legal analysis on the interplay between civic monitoring and domestic legal frameworks. In addition, Cuff, Hansen and Kang (2008) discussed the legal implications of civic monitoring. They mention – among others – a lawsuit against the California Coastal Records Project, US, regarding documenting incremental changes along the Pacific coastline via photographs and privacy. The authors document that, in the end, the lawsuit was dismissed under state laws (anti-Strategic Litigation Against Public Participation statutes). Fonte et al. (2017) present ethical and legal issues associated with Volunteered Geographic Information (VGI) projects. Cho (2014) considers data quality concerns, brought up by participants, as well as liability issues with VGI, for example illustrating the possible exposure to liability of the volunteers. Rak, Coleman and Nichols (2012) also discuss the legal issues associated with VGI data specifically in Canada.

In addition to the possible hindering effect that legislation can have on civic monitoring, there are also instances in which civic monitoring – or rather the wider practice of citizen science – have been recognised in legal texts. Starting from 'the South', there we discovered an outstanding example of legal recognition. As a consequence of a series of successful experiences of community-based monitoring performed in the Ecuadorian Amazon and of lobbying from the collectives involved, for the first time the practice of community-based monitoring was officially endorsed in a legal text. The 'Amazon Law' (Ley Orgánica Especial de la Circunscripción Territorial Especial Amazónica) approved on 13 March 2018, explicitly provides for the practice of community-based

[20] See http://www.teresascassa.ca./index.php?option=com_k2&view=itemlist&task=tag&tag=citizen%20science (last accessed 8 October 2023).

monitoring (‘*monitoreo ambiental comunitario*’) as a legitimate method under Art. 58.[21]

Another noteworthy example is found in the US, where the Clean Water Act[22] and the Endangered Species Act[23] both provide for the reliance on community monitoring for realising their respective aims.[24] In 2015, during President Obama’s administration, the ‘Holdren Memorandum’ was released under the title ‘Addressing Societal and Scientific Challenges through Citizen Science and Crowdsourcing’. The memorandum, directed to the US Heads of Executive Departments and Agencies, provides for an official endorsement of the practice and aims at encouraging ‘the use, where appropriate, of citizen science and crowd-sourcing by Federal agencies’.[25] In 2016, even a Crowdsourcing and Citizen Science Act[26] was released, supporting governmental agencies to adopt crowdsourcing and citizen science in their policies (see further McElfish, Pendergrass and Fox 2016, for a panorama of US legislation dealing with broad citizen science).

Civic monitoring also interacts with the existing legislative framework in the sense of constantly referring to and challenging standards. Innumerable scenarios can be identified for this interplay. Some examples

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[21] ‘*Artículo 58. Monitoreo ambiental comunitario. En la Circunscripción se implementarán mecanismos de monitoreo ambiental comunitario, en coordinación y según las disposiciones y requisitos que la autoridad ambiental nacional determine para el efecto.*’ Unofficial translation by author: ‘Article 58. Community-based environmental monitoring. In the District, community-based environmental monitoring mechanisms will be implemented, in coordination and according to the dispositions and requirements set by the national environmental authority for the purpose.’

[22] 33 USC §1251 et seq. (1972) – The Federal Clean Water Act.

[23] 16 USC ch. 35 § 1531 et seq. (1973) – The Endangered Species Act.

[24] Information presented during the 2018 IUCN Academy of Environmental Law Colloquium ‘The Transformation of Environmental Law and Governance: Innovation, Risk and Resilience’, Glasgow, 4–6 July 2018, by Lee Paddock and, Robert Glicksman, The George Washington University Law School, US, presenting on ‘Citizen Science in Support of Environmental Protection: Innovations, Opportunities and Barriers’ on the Panel ‘Civil Society and Community Participation in Environmental Law and Governance’.

[25] See https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/holdren_citizen_science_memo_092915_0.pdf (last accessed 18 September 2023).

[26] 15 US Code § 3724 (2016) – The Crowdsourcing and Citizen Science Act.

are outlined here. However, these examples do not fully represent a much more diversified, country-specific reality. In addition, the scenarios can likely coexist and be intertwined. One scenario can regard situations where the standards for environmental quality are missing at the national level and people resort to civic monitoring to show incompliance with supra-national standards (such as the World Health Organization – WHO standards). This could occur in countries where implementation of international standards is weaker. In a second instance, the standards are there but are either insufficient or not respected, in which case people use civic monitoring to show such failures, again taking as reference point international standards. Another possible scenario occurs when the state's monitoring shows compliance both with international and domestic (sufficient) standards, but the people still measure the environmental issue via civic monitoring because they perceive that the issue is mismanaged.

As for the second question, namely the conceivable effects of a favourable or rather unfavourable legal endeavour on civic monitoring, it is worth questioning whether an insufficient legislative framework for environmental data collection, monitoring and reporting could hinder or rather stimulate civic monitoring and its institutional uptake (for this concept and in particular 'policy uptake' see Berti Suman 2021b). Legal obstacles could deter civic monitoring practices. On the other hand, a social opposition to existing legislative barriers may produce proactive engagement with civic monitoring practices. In addition, one may question if examples of favourable legislative endeavours, such as the mentioned Ecuadorean Amazon law and the Crowdsourcing and Citizen Science Act are promoting more civic monitoring practices and the uptake thereof or, rather, if by institutionalising it, the practice loses social support (for the notion of 'social uptake' see Berti Suman 2021b). A country-by-country analysis would be needed to address this question. Future research may take inspiration from and build on these reflections.

Shaping a Right to Contribute in Practice: Perspectives from Participants

Introduction to the workshop

The discussion of this section is based on data and reflections collected during an online workshop organised on 7 May 2020, titled 'Civic Monitoring: Towards a Right to Contribute to Environmental Information'. The event, which saw more than 80 participants from all over the world attending, was originally intended to be an in-presence

gathering at the Tilburg Public Library LocHal, supported by the Netherlands Network for Human Rights Research. However, it became virtual due to the Covid-19 pandemic. In July 2021, however, we could organise the event in person, at the Tilburg Public Library.[27] The collective knowledge gathering on a virtual infrastructure enabled participation also beyond Europe. Although the digital nature of the session made it probably less engaging at a personal level, it was nonetheless enriched by the perspectives of participants from countries such as Africa or Japan, that would not have been able to join otherwise.

The workshop focused on two key questions:

1. Whether a legal instrument for regulating civic monitoring is needed, specifically providing for different forms of integration of the practice into institutional settings.
2. Whether such a legal instrument should include the recognition of a right to contribute environmental information and a consequent obligation for authorities to consider civic evidence to take action.

These two triggering questions were shared with the participants beforehand in order for them to come to the event with some ideas on the topic. While the discussion did not provide definitive answers to the posed questions, as it was expected given the topic, inviting different stakeholders to the discussion table offered valuable insights on both the complexity of regulating civic monitoring, but also how to move this conversation further. The various participants brought up cultural and disciplinary differences when considering civic monitoring and regulations, laws, and enforcement mechanisms.

Some of the participants did have experience on civic monitoring specifically, for some others these themes were not their expertise. Some participants mastered legal studies, some other participants were not familiar with the law but were more expert in political studies, STS, environmental policies, etc., either from their research, studies or practice.

Oral reflections were captured in 'live' illustrations of the concepts discussed, to make the workshop more engaging. An artist, contracted by SensJus, while listening to the discussants, created drawings for each perspective, providing a visualisation of the different viewpoints and dis-

[27] See an article on the event published by the Dutch Research Council soon after the event https://www.nwo.nl/en/news/environmental-data-collection-citizens-right (last accessed 11 September 2023).

playing her artwork to the audience. The results were a series of illustrations and a poster compiling together all the different insights.[28] We also invited participants to share with us their visualisations of the discussion. The artist engaged shared her experience of drawing with these words:

> We all have different ways of remembering and understanding: through observing, hearing, writing, or repeating, we learn. Drawing is my way of making sense of complex notions: by using metaphors, I strive to simplify concepts, and make them visible. … There are so many points of view through which one can explore the topic of civic monitoring. During the workshop, … speakers, coming from different areas of expertise, gave us participants a snap of each of their worlds, opening our minds to many questions and sparking our curiosity even further.

The author's stance in the debate was to openly disclose challenges and opportunities of a legal intervention based on her previous research (Berti Suman 2021b and 2020). She acted as moderator, inviting first selected speakers and then opening a group discussion, stimulating different perspectives to be shared in a respectful manner. In addition, she engaged in digesting the results of the discussion. The following text discusses the key themes emergent from the event. These are: (1) whether it is opportune to regulate civic monitoring; (2) how to codify the right in different contexts; (3) the benefits of a legal codification and its possible drawbacks.

Key themes from the workshop

The opportunity to regulate civic monitoring

One of the speakers from Komazawa University, Japan noted that the legal recognition is one of the possible avenues:[29]

> From my fieldwork and historical studies, I am not saying that law instrument is the only resource that citizens use to make an effective argument concern-

[28] All drawings can be viewed at https://blog.uvt.nl/environmentallaw/?p=443 (last accessed 12 October 2023).

[29] The quotations in this section were recorded during the online workshop organised on 7 May 2020, titled 'Civic Monitoring: Towards a Right to Contribute to Environmental Information' detailed earlier. The online workshop has been recorded with the permission of all the participants and transcriptions have been made. Such transcriptions can be made available upon request to the author.

> ing environmental policy, including decontamination in Japan, but I believe a legal instrument should be one of the key resources for citizen scientists to make a claim.

However, the speaker also indicated possible side effects of regulation and noted that citizens in Japan engaging in civic monitoring are often scarcely aware of the legal context and not particularly concerned about the need for a legal instrument.

The need for a legal recognition came from a participant of the 'AiREAS' civic initiative aimed to monitor air quality in the city of Eindhoven (The Netherlands), spotting pollution coming from the neighbouring country Belgium. The speaker argued that, as the citizens are 'standing up' and taking their own responsibility, they also need the government to reach their objectives. The person argued that the legal framework needs to be adjusted to ensure that collaboration between the citizens, governmental and private actors on civic monitoring is smooth and effective. The speaker stated: 'You are smelling, tasting, seeing etc. on a daily basis, and if you want to extend that sensing by use of technology, you have to make it your basic right to do so. Therefore, laws must be adapted.'

How to codify the right in different contexts

A speaker from Komazawa University, Japan stressed the importance of culture and temporality, which implies that the necessity of a legal instrument and the shape thereof may change depending on the cultural and temporal context. A 'one-fits-all approach' would not work, nor a 'one-way communication' between institutions and the citizens that closes possibilities for innovation. Also a scholar from KU Leuven, Centre of Sociological Research, and the Belgian Nuclear Research Centre, argued for the importance of contextual factors specific for a certain society.

A research fellow from the University of Cambridge, based on experience of grassroots citizen science in non-EU contexts and especially in countries with a different 'culture of democracy' like Uganda or China, where 'people are not officially allowed to gather such data', stressed again the importance to consider cultural differences. The speaker made also the case of the Belgian civic monitoring initiative CurieuzeNeuzen as a good example of an 'activist movement tackling air pollution' which soon 'became massive, [and] is now almost an export product in Europe'. The initiative managed to put pressure on the government (and – as noted

in Chapter 2 – also to the judiciary through the support of Greenpeace Belgium), but also on peer citizens as people moved to the coast because they realised that the air quality was better there. For such an initiative, in a country such as Belgium where 'regulation is very much part of our culture', 'there should be some institutionalisation, perhaps not mandatory or official, but some institute that facilitates exchange in two directions, as a dialogue', the person noted.

An environmental law scholar from the Strathclyde Centre for Environmental Law and Governance also called for context-sensitive legal interventions, as regulating civic monitoring in China, Africa or in rural settings may substantially differ from Europe. If we discuss of a 'new' right, it is important to define its conditions for operation and how do we enforce it, especially when larger fringes of society are not really interested in or do not care for civic monitoring.

A researcher from Florence University, Research Unit on Everyday Bioethics and Ethics of Science (RUEBES), noted that in regulating civic monitoring, attention should be paid to public distrust towards science and also towards law-making. As science, but also in general, institutions lose credibility in people's eyes, the right to contribute environmental data should also consider side effects of such new entitlements for civil society.

An environmental activist from the environmental movement Extinction Rebellion (XR) Milan also joined the discussion. XR is a movement for action on climate change and environmental degradation that wishes to change the system, based on non-violent civil disobedience (of which civic monitoring could be regarded as a manifestation, see Berti Suman, Schade and Abe 2020). XR, declaring the climate emergency, wants to make people aware of the problem and push them to join forces, in order to force the government in a non-violent way to take action to halt the climate crisis.

Whereas it may sound paradoxical to ask the government for recognition of a right if XR is a movement that contests the system for not protecting the common good, the speaker argued for a governmental intervention, but in a drastically new way. Instead of a new right, XR asks the government to establish citizens' assemblies where the citizens – selected in a demographically representative ways – can directly participate in the decision-making on the ecological crisis and therefore contribute also with their knowledge to shape decisions.

Civic assemblies could be seen as a 'knowledge infrastructure' and as a powerful response to shared and complex emergencies which demand

for collective understanding. Furthermore, participating in civic assemblies could enhance people's awareness of the environmental and climate emergency. 'If everyone would be aware of how deep we are into the crisis, everyone would be measuring', the person argued.

A practising lawyer contributed, advancing the point that, when environmental issues are at stake, contested environmental information is often the source of controversies. In some instances, there is insufficient information made available or readable to the people. Sometimes the information is lacking altogether. This may augment or originate environmental conflicts. To address conflicts originated from information gaps, it is crucial that information is collected and shared in a trusted and regulated way, therefore she would embrace the recognition of a specific right to contribute. Conscious public participation can really improve shared decisions and deflate the environmental conflict, argued the person. Yet, the system must ensure that the citizens receive feedback from the administration and feel that their contribution really influences the formation and the outcome of decisions. All this would be mandatory only through legal interventions. An open recognition of the right could contribute to rebuild trust between citizens and institutions.

The benefits and drawbacks of regulation

A speaker from the 'Analyze Basilicata' civic monitoring initiative, which denounces oil industry-related environmental contamination in the south of Italy, stressed the need to ensure a legal protection in contexts, such as the Basilicata region, where conducting civic monitoring can imply legal issues for civic sentinels. Especially in contexts with high social frictions, it is important that civic actors can rely on laws protecting them. This is only a part of the intervention, the person noted, as it is essential that these legal provisions are actually enforced.

A speaker form the 'Meet Je Stad' initiative originated in Amersfoort (The Netherlands) and entailing citizens' measurement of temperature and humidity, as proxies to assess climate change effects, argued for the importance of keeping a certain independence while striving for integration. Despite the municipality providing some funding to deploy the monitoring, for the initiative it is key to preserve integrity and autonomy from political oversight. Regulating civic monitoring could pose a risk for the independence of the civic initiatives.

A scholar from KU Leuven, Centre of Sociological Research, and the Belgian Nuclear Research Centre, discussed of field research in Japan that showed 'a general gap between citizens and governments, where

local authorities almost never refer to citizen-gathered data'. This suggests that a legal intervention could bring civil society and institutions closer but could also just be useless if the two parties continue to distrust each other. The person argued that institutions do not believe in the standards used by the citizens and are also concerned that their activities are partisan (although often they are supported by scientists and even lawyers), but these data are not 'wrong or right, they are just from another perspective!', the person noted.

Reflections from the group discussion

After the individual perspectives, we opened a group discussion. The following key themes emerged. In exploring avenues for integration, it is relevant to take into account the varying ecologies of co-creation through civic monitoring, because – as every person may wish to be engaged in a different matter – every civic monitoring initiative may wish to (and be apt to) be integrated in the system differently. A one-fits-all regulatory approach is not advisable.

Another aspect to be considered in regulating civic monitoring and promoting its uptake into decision-making is how we can ensure that the government does not end up abandoning its responsibilities and transferring them to the local communities. A 'co-creation' approach where each citizen takes responsibility but only strengthening governments' intervention seems a preferable approach.

In addition, the issue of representativeness of the civic data came to the fore, which is also a recurring source of concern in citizen science and participation studies. The civic group that gives input may be only a caring minority 'which manages to wield strong influence in comparison to a silent majority', noted a participant to the workshop. Participation might in this sense be only apparently democratic but can revert to its opposite 'if there is a cadre of "professional participators" who … dominate the discussion and gain influence'. Addressing the issue of (mis)representation of marginalised groups lacking the time or resources to conduct civic monitoring effectively ('active' participation, compared to 'passive participation' according to a participant) is a fundamental aspect when discussing a regulation of civic monitoring and a right to contribute environmental information. In addition, in exploring the (in)equality of civic monitoring, also the issue of an equal leadership in such initiatives should be addressed.

Furthermore, the aspect of data quality and precision in civic monitoring measurement emerged as an especially relevant point if the legal use

of these data is discussed. Also this aspect is often recurring in discussions over citizen science. In particular, the participant from the Meet Je Stad initiative noted:

> I hear a number of speakers highlighting uncertainties. For instance a speaker said 'the stations are not very precise, but they give an idea'. However, lawyers need more precision. A limit value is either exceeded or it is not, law is in that sense black and white. And if civic monitoring is transferred from the political to the legal arena, this tension comes up. Is it then a good idea to introduce rights and obligations on civic monitoring, if it cannot live up to the standards of precision?

Members of the civic monitoring communities agreed on the ultimate need 'to use citizen engagement to share responsibility and … participate, for instance by using rights in [supporting] what citizens are doing, and protect them from adverse consequences of their actions'. A right to contribute environmental information under this perspective would be a catalyser, a facilitator, a trigger for attracting governmental attention on the practice and the evidence it produces, but also a shield for ensuring that the participants can freely perform their monitoring activities.

Conclusive reflections

The workshop showed interesting agreements and disagreements between positions. For example, participants share similar views on requiring and enforcing laws, while they differ on the side effects of such laws on civic monitoring. Middle ground was also expressed, for example the participant who noted that citizens do not think of or care about legal instruments, and the environmental activist who suggested government intervention, but in the way of forming citizen assemblies instead. Other themes that appear recurring from different participants are the argument on differing cultures and how this affects regulations and enforcing of laws, as well as the importance of access to information and mistrust, both in authorities and in science.

Our collective efforts could not answer crucial questions such as whether this right to contribute could be considered a new human right and, thus, what would be its relationship to the existing procedural human right to access environmental information under the Aarhus Convention, or how this new right could practically be implemented and enforced. We invited specifically the community of practising lawyers and of legal scholars to explore further these questions.

We invited also regulators to join the discussion as, in terms of regulating civic monitoring, avenues are still open as for what would be the preferable extent and form, considering also the administrative level (e.g., local or national) and cross-country aspects (e.g., an EU-wide provision or per country). Such a new right should stem from participatory debates and should be aimed at preserving a healthy civic participation to environmental matters and promote the contribution of civic evidence for decision-making.

Future explorations should also address the question on whether this legal instrument would create just the 'possibility' for authorities to use civic monitoring or rather be 'obliged' to recur to such data, when certain conditions are met (e.g., information is inadequate from the official side). This discussion would need more legal researchers as they are almost absent from this inquiry, with few exceptions. Social research should also look at why the civic sentinels rarely mention laws and rights in their discussion. One reason could be that they do not know how to use them, or simply do not trust their enforcement. The SensJus project that evolved after this workshop took inspiration from the points raised to offer answers and resources tackling some of the questions that emerged.

BOX 3.1 FROM THE EUROPEAN TO THE INTER-AMERICAN CONTEXT

In this box, we focus on a region other than Europe, namely the Inter-American context. In the Inter-American system of human rights, several procedural norms – functional to environmental protection – open avenues for ordinary people's participation in defence of their environment (Meijknecht 2015). Here, we discuss the role of civic evidence in this context. Article 44 of the American Convention on Human Rights (ACHR) gives a broad *locus standi* to any person or collective or non-governmental entities legally recognised in one of the Member States to stand before the Inter-American Commission on Human Rights (IACHR) in defence of the rights granted by the Convention. A more limited *locus standi* applies instead to the Inter-American Court on Human Rights (IACtHR). Generally, ordinary people and communities would advance a case for a breach of their right to health or to a clean environment. However, the IACHR does not explicitly recognise the right to live in a healthy environ-

ment. Consequently, the functionality of these procedural provisions to protect the latter right has to be creatively deduced by the courts, starting from the IACtHR. Indeed the IACtHR has used its power to interpret extensively the IACHR, and to investigate and issue reports on particularly concerning human rights violations of substantial and procedural environmental law provisions in its Member States. For example, a relatively recent advisory opinion of the IACtHR demonstrates this tendency (Advisory Opinion OC-23/17 of 15 November 2017, Requested by the Republic of Colombia). The court affirms explicitly the link between environmental degradation and fundamental rights by affirming that 'environmental degradation may cause irreparable harm to human beings; thus, a healthy environment is a fundamental right for the existence of humankind' (para. 59). Through this activity, the IACtHR developed also standards for procedural environmental rights. For example, in the Commission's State Report on Ecuador of 1997, the Commission stressed the importance of participatory environmental rights, such as access to information, participation in environmental decision-making and judicial recourse. All these guarantees are clearly crucial for the protection of environmental defenders, and also for legitimising the role of civic environmental monitoring. Public participation in (environmental) decision-making has also been linked to Art. 23 of the ACHR, which provides for the right of every citizen 'to take part in the conduct of public affair' and to receive and impart information. Especially, the aspect of imparting information seems crucial to our case study. The IACtHR has been active in interpreting this right to inclusive decision-making and to bidirectional information in its case law, especially in the context of Indigenous people's land claims. In the *Saramaka People v. Suriname* case of 2007, for example, the Court elaborated on the state's duty to actively consult with the Saramaka people, from an early stage of a plan, engaging in a constant mutual communication and taking into account the Indigenous methods' of decision-making (at para. 133). Meijknecht (2015) acknowledges that the criteria formulated by the IACtHR in the *Saramaka* case, based on the procedural rights granted by the Inter-American human rights system, create an avenue to grant local communities the opportunity to 'have a say' in projects potentially harmful to them and to their environment. We can add that a way to have a say is exactly by feeding data from the ground through forms of civic monitoring. More recently, the right of every person of present and future generations to live in a healthy environment and to sustain-

able development was recognised in a binding document also in Latin America and the Caribbean through the Escazú Agreement (Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean, adopted at Escazú, Costa Rica, on 4 March 2018) entered into force on 22 April 2021. This agreement is the world's first agreement with provisions on the protection of human rights defenders in environmental matters, who are particularly vulnerable and under threat in the region. The agreement, interestingly to our study, also recognises right of access to information, public participation and justice in environmental matters. The process that led to the agreement is the result of a negotiation process where a significant contribution was provided by civil society representatives. The text can be of example also for recent EU discussions on the protection of environmental activists, for example in the context of SLAPPs.

4. Behind the scenes, unpacking approaches and impact

THE RESEARCH-CREATION APPROACH[1]

Why Research-creation

In a brief co-authored with colleagues from the JRC Science & Art initiative (Berti Suman et al. 2022a) we note that art can be a tool for bringing science closer to the public, not limiting itself to science communication, but going much further. Art can indeed connect science to our humanity, and thus can help different audiences to embrace and understand scientific complexity, and at the same time contribute to it by participating in scientific research. Science in this sense is enriched with meanings, values and a sense of belonging to a given problem. Art can also help scientists engage intellectually and emotionally with research participants, lowering barriers and breaking down hierarchies. When *included* in the scientific process (through a 'research-creation' approach), as argued in this chapter, art can create a reciprocal dialogue with science, helping researchers to address divisive and complex issues in an empathic manner.

Research-creation is an emerging category within the social sciences and humanities that encompasses research experiences and ways of knowing that embrace a creative process, an experimental aesthetic component or an artistic work as an *integral part* of a scientific study (Chapman and Sawchuk 2012). More than a methodology, it is a practice informed by theories that aim to blur disciplinary boundaries. Indeed, this practice aims to challenge the boundaries of scientific knowledge and those power structures that surround the production of scientific knowledge in rigid disciplinary categories, enabling more

[1] This section draws on Berti Suman 2023a published in Open Access in Italian in the journal *Ragion Pratica*.

creative yet still rigorous approaches to find a legitimate space in research and academia (Loveless 2019a). In 2022, I followed the course 'Research-Creation: Merging the Critical and the Creative' offered by the Vrije University of Amsterdam,[2] and I could deepen the theoretical foundations and practical application of this approach. A year later, in 2023, I brought these lessons to the legal field, especially targeting early career researchers, co-organising a Winter School on 'Experimental and Engaged Approaches to Legal Research' at Tilburg University.

According to Barthes (2005), research-creation can stimulate a type of knowledge that has an affective and sentimental dimension, which should not be denied but wisely utilised, through a process in which *research becomes creation* and then re-fluxes into research. This goal is endorsed by research-creation modes that do not only wish to communicate through innovative forms, but also to generate new research through creative forms.

As McLuhan (1964) argues, particular attention should be paid to form, as *the medium is the message*. In light of the above, such research-creation approaches become central not only in the phase of communicating research results, but also in data collection. Furthermore, the phase of results communication also becomes a space for stimulating an involvement of the recipients in the research and an opportunity to stimulate reactions, which themselves become research material (the 'more-than-representation' discussed above). This empathic and engaging dimension of the form through which research is developed and communicated is perhaps what most distinguishes research-creation from other, more frontal and one-sided methodological approaches.

Fisher (2015) and Loveless (2019a and 2019b) also offer useful reflections on the challenges and failures a researcher may encounter in experimenting with research-creation within the world of academia and research in general, constrained is disciplinary borders and power structures. In questioning the relevance of research-creation for her own researcher topic, Cvetkovich (2012) reflects on the need to develop a de-romanticised view of creativity, considering research-creation as a real research practice, avoiding a capitalist and neoliberal rhetoric on the valorisation of research results through creative communicative

[2] See course page at https://vu.nl/en/education/professionals/courses-programmes/research-creation-merging-the-critical-and-the-creative (last accessed 18 November 2023).

methods (Deleuze 1994: 147). Rather, the focus is on creativity as *care* for and *empathy* towards the subject studied.

The primary aim of this chapter is that these reflections will inspire other researchers and stimulate a discussion on the importance of not only conducting rigorous research at a scientific level, but also of cultivating empathic and creative methods to bring different audiences closer to research findings. I hope that research-creation methods such as those illustrated here will increasingly be known, recognised and embraced by the socio-legal sciences with awareness and rigour.

Typologies of Research-creation

Chapman and Sawchuk (2012) identify four modes of research-creation. They include:

1. *Research-for-creation*, which entails producing a creative outcome from traditional academic research, for example making a comic book from data collected in the field (as in the case of SensJus graphic novel *Story of a Civic Sentinel*);[3]
2. *Research-from-creation*, which involves using creative tools to innovate the way research is carried out (in the case of SensJus, using illustrations to elicit research data);
3. *Creative presentations of research*, which involves ways of presenting traditional scientific content in a creative way, for example making a play (such as SensJus theatrical performance, 'Terramara');[4]
4. *Creation-as-research*, which can be considered the most difficult form of research-creation, as it aims to fuse research and creation so that they inform each other in a virtuous circle, in which the creative phase confronts theory in order to redefine it and empirical data, both to prompt and interpret it (Truman et al. 2019). This continuous exchange between theory, art and empirical data has the value of prompting the researcher to listen to the field through an empathic approach, avoiding arriving at it with preset theoretical and disciplinary positions, instead allowing for a theoretical and methodological evolution that responds to the needs of the context studied. SensJus

[3] See https://sensingforjustice.webnode.it/l/fumetto/ (last accessed 18 November 2023).

[4] See https://youtu.be/2Tk-vBL1B4g (last accessed 20 November 2023).

tried to embrace also this fourth type of research-creation, as discussed below.

Research-creation, Polydisciplinamory and Critique

Loveless (2019b: 60) (as cited in Truman et al. 2019: 230) considers central to research-creation the assumption that the form and the content are indivisible and therefore the form becomes an important shaping force of the content. A set of ontological, epistemological, ethical and political parameters are enshrined in research-creation, aimed at creating a different world through one's research (Truman et al. 2019: 227). I was fascinated by the transformative potential of embracing such an approach and engaged in its practice to innovate the research methodology 'from within'.

I was also inspired by Haraway's (1988) notion of 'situated knowledge'. Haraway problematises both the subject and object of knowledge and suggests that all knowledge is inevitably situated and therefore partial. Haraway rejects the assumption that objective knowledge can be produced. Rather, each researcher must be aware that his or her way of describing reality is intimately tied to the particular position he or she occupies, the power relations in which he or she operates, and the limits of the perspective he or she adopts. Discourses that present themselves as universal may collapse in the face of the recognition that the speaker is a partial category, for instance a human being, male, heterosexual. This awareness offers a useful tool for the researcher to understand her own positionality.

Being highly critical, research-creation stimulates 'polydisciplinamory' (Loveless 2019b: 60). The neologism takes the transgressive meaning of interdisciplinarity (which defies the limits of disciplinary boundaries) and pushes it further, building on the insights of 'polyamory' theory. Theoretical polyamory reforms the approach to traditional interdisciplinarity, a practice that focuses on inter-theoretical entanglement and on combining different disciplines at the content level. Instead, polyamory strives to produce new links between disciplines not only in terms of content but also in terms of form (Loveless 2019b: 63).

Shannon and Truman (2020) argue for a political and critical stance in embracing research-creation in their field. They regard research-creation essentially as a form of resistance to a tendentially white, cis-masculine and Euro-western methodological orientation. The authors defend the validity of a feminist and neo-materialist approach to research, which

can provoke, contextualise and 'more-than-represent', i.e., not merely representing a phenomenon but rather make it 're-circulate' in order to be (re)experienced by the audience, and nourish further thoughts.

Research-creation is informed by the contribution of queer theory to challenge the 'mononormativity' that pervades many areas of knowledge. The term queer (or curious, bizarre, non-binary) can be understood as breaking norms, thinking outside the box, and constantly questioning the power structures inherent in the world of research and academia. The term suggests that the researcher goes beyond interdisciplinarity, demonstrating an emotional willingness to engage with different disciplines as a practice of care, driven by curiosity (Loveless 2019b). It is argued that this way of approaching the studied topic may prompt the research participants themselves to question schemas and unhinge hierarchies, opening themselves to a freer and more participatory research.

Research-creation for Engaging Participants

The concept of queerness cited in the previous section is directed towards the future and imagining possible and alternative futures, as Haraway's (2016: 34) 'ideas we use to think other ideas' and Jasanoff and Kim's (2015) *imaginaries* suggest. Such an approach valorises everything *in between* as fundamental to promote co-creation, the formation of safe spaces for research, and a sense of belonging to a certain place, theme or social group. The beneficiaries of adopting such an approach to research can be the various plural and situated publics of which a society at large or a specific community is composed (Miller, Little and High 2017: 5) that could particularly be interested in certain research. In the book *Going Public: The Art of Participatory Practice*, the authors emphasise the importance of experimenting with research methods by engaging participants, placing such methods in the contexts in which the researcher operates (Holle 2022; Ammar and Holle 2022).

Tuck (2009: 409) suggests that we should eschew harm-focused research (which is, research focused solely on the problems of a given community), in order to reformulate research farming and deployment in light of an *active* participant perspective. I have also argued in favour of this approach in a co-authored contribution (Natali, Berti Suman and de Nardin Budó 2023) on 'activist criminology'. Rejecting harm and oppression as characterising the subjects of the research, research-creation instead seeks to view them as actors who can envision

and guide the researcher on how findings can be used by, for and with the communities and individuals studied.

Research participants become agents and co-creators in that they exercise constant shaping power over the research, including reacting to vulnerable situations to which they are exposed. As Das (2007) argues, agency is also the doing of small, everyday things, which however have a profound transformative significance. Although the condition of the subjects studied may indeed be precarious and vulnerable, such a focus on being at the margins may preclude the agency of the research subjects, relegating them to a passive condition (Butler 2006). Instead, attention should be paid to the often invisible human investments, such as sensory, affective and physical efforts (Page 2018: 281; Page 2017) as well as tactics of care, hope and creativity (Greene 2019: 731) and rhizomatic (i.e., horizontal) connections between actors (Griffiths 2015) that represent everyday agency.

APPLYING RESEARCH-CREATION

Research-creation for SensJus

Theoretical understanding

The research conducted for the SensJus project embraced a research-creation mode (Chapman and Sawchuk 2012) originally applying to the socio-legal field. The act of considering creation-as-research enabled myself as researcher to trigger a virtuous circle of co-construction between theory and empirical research, in which the creative phase confronts theory to redefine it and data to analyse it. I embraced the importance of polydisciplinamory as a commitment to producing new links between disciplines not only in terms of content but also in terms of form (Loveless 2019b: 63; McLuhan 1964). An empathic and engaging approach to research which devotes attention to the form opened my eyes to less apparent and perhaps neglected aspects that would be lost by adopting other, more frontal and one-sided methodological approaches. I tried to link polydisciplinamory with queer theories, paying attention to what is in between and ensuring the establishment of safe research spaces for non-binary realities (Holle 2022; Ammar and Holle 2022). Lastly, I strived for preserving an active participant view (Tuck 2009: 409) by refraining from damage-centred research and narration of results.

In the research developed, these theories were transferred into concrete applications, for example considering participants as agents and

co-creators of research. Civic sentinels monitoring the environment were studied in their everyday agency practices, which includes both their vulnerability (e.g., to their exposure to legal risks and to their own health) and their modes of resistance and tactics of care (Page 2018; 2017). I have analysed the practice of these sentinels in their inter-relationships and in their relationship with other individuals, institutions and social groups, exploring their more or less rhizomatic, i.e., horizontally developing, networks (Griffiths 2015). I researched all this in a slow, empathic and 'situated' manner (Haraway 1988).

In this chapter, I demonstrate on a theoretical but also applied level how research-creation can be a tool for studying and communicating highly situated research topics which require dialogue between various disciplines, the adoption of special care towards research subjects and an awareness of ethics in the field (also discussed in Chapter 1). Furthermore, I show how research-creation can make scholarly communication a more inclusive and accessible space for disseminating research and generating new research insights. This analysis also aims to offer a thoughtful critique of excessively vertical, frontal and procedural approaches to research (see Figure 4.1).

The challenges that such approaches pose, especially in light of limited resources and time for research and often rigid ethical procedures, are also highlighted. Despite being very enriching, it should nevertheless be noted that the implementation of research-creation poses numerous challenges. It requires a deep commitment on the part of the researcher and the participants, who may not have the resources, energy, time or willingness to commit to these practices. The adoption of these methods, therefore, is a choice to be made with particular care with respect to the audience that one aims to engage and the research context in which one finds oneself. The researcher embracing research-creation must also be prepared to constantly justify the validity of such an approach especially when presenting the research in more traditional contexts.

Practical applications[5]

The research developed for the SensJus project aimed to reach civil society actors, such as ordinary citizens, activists and environmental organisations. In order to offer them usable scientific results, it was nec-

[5] This section draws on Berti Suman 2023a published in Open Access in Italian in the journal *Ragion Pratica*.

Source: Alice Toietta, illustrator for SensJus.

Figure 4.1 Dissemination strategies deployed for SensJus

essary to rethink the approach that socio-legal research would generally take, i.e., scientific articles and presentations at academic conferences. This necessity led to the development of innovative forms of gathering and disseminating research data, in parallel to more traditional modes of scientific publication.

Embracing the concept of creation-as-research, as defined in the opening of this contribution (Chapman and Sawchuk 2012: 5), with the help of artists and experts, we developed a series of scientific-artistic works aimed at creating a sense of understanding and engagement around the topic of civic monitoring of environmental matters. Visual and performing arts were conceived as a research space, before being means for dissemination of results. One example is the monologue 'Terramara',[6] a theatrical text inspired by field experiences gathered from the research conducted in Basilicata and shared with a theatre artist. The aim of the

[6] See https://youtu.be/2Tk-vBL1B4g (last accessed 20 November 2023).

monologue is to bring the matter of oil extraction and its impacts to a sentimental, almost nostalgic dimension, recounting how the people of those places experience their land. The performance, which is still in progress, aims to blend different registers and theatrical languages to develop a unique form of action research, bringing together theatre and music artists, scientists, environmental law experts, and visual and sensorial arts. The aim is also to involve the local communities in Basilicata in the shaping of the work.

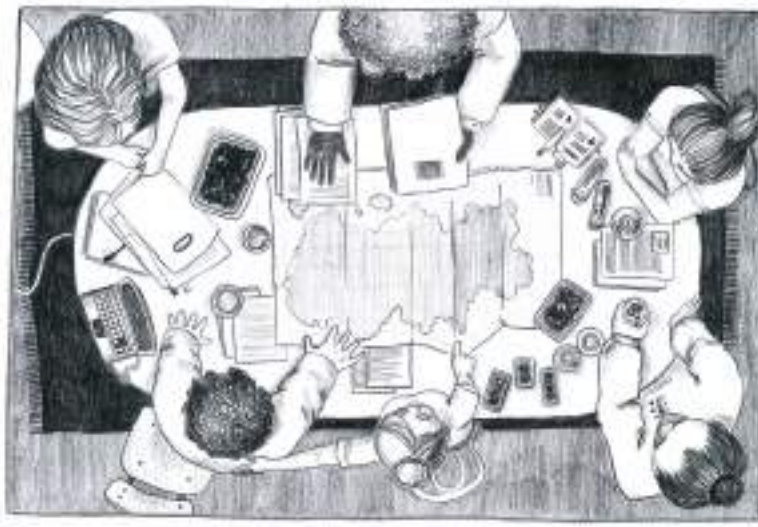
In addition, SensJus collaborated with a contracted illustrator (as discussed in-depth in Toietta, Berti Suman and Schade 2023) to deploy graphic facilitation (*scribbling*) during scientific events or meetings with research participants in order to facilitate mutual understanding and the gathering of perspectives from the audience.[7] Finally, again with the help of the contracted illustrator, we developed a graphic novel, *Story of a Civic Sentinel*, which was translated into three languages (French, Spanish and Italian).[8] The novel uses the *storytelling* approach to address a complex issue such as oil extraction and its impact on health and the environment. The graphic novel is a free, Open Access resource that we often bring to schools and universities, during festivals and in public places such as squares and parks. The novel thus became a tool not only to communicate research but also to stimulate further involvement of different audiences in research, and to generate a dialogue between the researcher and research participants (see Figure 4.2).

Resonances between Artists and Scientists

The engagement with the JRC Art & Science initiative offered me opportunities to reflect on the entanglements between art and science in particular for the research fields that interested the SensJus project. I could attend and actively participate in the shaping of the residential

[7] See, for example, https://sensingforjustice.webnode.it/l/a-june-full-of-science-art-for-sensjus/ and https://sensingforjustice.webnode.it/l/a-collective-reflection-to-explore-citizen-science-to-support-public-and-environmental-health-services-in-crises-scenarios-at-ecsa-2022/ (last accessed 20 November 2023).

[8] See https://sensingforjustice.webnode.it/l/fumetto/ (last accessed 18 November 2023).



Source: Alice Toietta, illustrator for SensJus.

Figure 4.2 *Extract from the graphic novel* Story of a Civic Sentinel

week Resonances IV[9] organised in June 2022 at the JRC to bring together scientists and artists to reflect and co-create on pressing societal challenges. The theme of the week was 'NaturArchy: Towards a Natural Contract', with the aim to re-imagine our relationship to nature and the environment. One of the five core themes guiding the inquiries was 'Nature and Law'.

Artists with their work presented ways of illustrating and channelling evidence gathered locally of environmental and climate impacts that may have the potential to demonstrate judicial causality in litigation through visual storytelling, even before courts, resonating highly with SensJus approaches. They discussed visual, sensorial and performative methods that draw on local and Indigenous culture. With the participants we could reflect on how law is our language, it is a tool, deeply rooted in culture, which is also why it can be valuable to regard it through art-based lenses of inquiry. In addition, art is a powerful mediation instrument to

9 See initiative's page at https://science-art-society.ec.europa.eu/resonances-iv (last accessed 22 November 2023).

reconnect with the environment. We discussed how providing evidence is performance, which legitimises the use of theatrical approaches in SensJus research.

The planetary crises that we are facing demand disciplines to cross-fertilise each other and scientists to cross knowledge boundaries. Growingly, institutions recognise these needs, for example the New European Bauhaus which is a creative and interdisciplinary initiative that connects the European Green Deal to people's living spaces and experiences.[10] Its objectives are to be 'Enriching, inspired by art and culture, responding to needs beyond functionality. Sustainable, in harmony with nature, the environment, and our planet. Inclusive, encouraging a dialogue across cultures, disciplines, genders and ages.'

During the week, reflections pointed to the need of intersectionality (e.g., between qualitative and quantitative approaches and between art and science), creativity and imagination to revert negative imaginaries of the future. We live in a crisis of complexity, which is intellectual, social, digital and emotional. Crises tend to make us feel disempowered, thus we need art to trigger engagement and imagination, but an art that is for all, such as exhibitions[11] and installations in free, accessible public spaces, as the SensJus project tried to do with each research results.

Local knowledge(s) such as that brought by the sentinels can help us reconcile the tensions between nature and norms, they express harmony between the law of nature and that of humans (Serres 1990, discussing a shift from the social contract to a 'natural contract', which has always existed; see also Berti Suman and Bollon 2023, on the 'sensing contract'). The sentinels can ensure that approaches to tackling environmental issues go beyond a human- and rights-based approach – often patriarchal and colonial – focusing instead on the notion of guardians, thus embracing a responsibility-based approach.

The sentinels are only the 'stewards' of some entities which have rights of their own (Berry 2002), which may one day even be able to stand in court themselves on the side of affected people (e.g., through

[10] See initiative's page at https://new-european-bauhaus.europa.eu/index_en (last accessed 22 November 2023).

[11] For an example, see https://www.associazione-culturale-europea.eu/index.php/events/7-23-june-2022-exhibition-stories-from-the-sensing-for-justice-project-joint-research-centre-cafeteria/ (last accessed 21 November 2023).

nature-based litigation). This argument resonates with Earth jurisprudence (Petersmann 2021b; Kotzé 2019; Vermeylen 2017), a philosophy of law approach that posits that humans are only one part of a wider community of beings and that the wellbeing of each member of that community is dependent on the wellbeing of the Earth as a whole. This doctrine argues that human societies will only flourish if they regulate themselves as part of this wider Earth community and do so in a way that is consistent with the fundamental laws and principles that govern how the universe functions, which is the 'Great Jurisprudence'.

OUTREACH STRATEGY DISENTANGLED

In this section, I discuss how our research findings were shared with the actors engaged in the research and with broader publics in a participatory manner, through inclusive communications such as accessible blog posts, videos, leaflets, booklets, podcast episodes and drawings. The research also engaged the participants in debriefing and discussing research findings, for example through theatrical performances and sensorial walks. Among the still alive pages that can be openly accessed on the web, I can list:

1. A JRC SciHub page: https://joint-research-centre.ec.europa.eu/scientific-activities-z/innovations-public-governance/civic-monitoring-environmental-enforcement_en
2. A public website: https://sensingforjustice.webnode.it/ with an active blog, i.e., https://sensingforjustice.webnode.it/project-news/ (150 ave-rage daily views with peaks of 300 per day).
3. An Instagram Page: https://www.instagram.com/sensing_for_justice/
4. A YouTube channel with videos on the project: https://www.youtube.com/@SensingforJustice
5. We also used our Twitter and LinkedIn accounts for a more impactful dissemination strategy, such as the posts shared by https://twitter.com/Abesuman and https://www.linkedin.com/in/anna-berti-suman-439359132/

Furthermore, we shared our research through accessible booklets, aimed to civil society, such as:

1. Berti Suman, A., Toietta, A. and Schade, S. (2023) 'Sensing for Justice'. Illustrated brief printed by the European Commission (avail-

able in English, https://tinyurl.com/mwaxtn4r, and Italian, http://tiny.cc/dmitvz)
2. Berti Suman A., et al. (2022) 'A colorful toolbox: Health Citizen Science under the GDPR'. Brocher Workshop Report. DOI: 10.53962/rq8g-a6kd. https://sensingforjustice.webnode.it/l/a-colourful-toolbox-health-citizen-science-under-the-gdpr/
3. Berti Suman, A., Toietta, A. and Schade, S. (2021) *Story of a Civic Sentinel*. A graphic novel printed by the European Commission. DOI: 10.53962/k5e5-t1dn, https://sensingforjustice.webnode.it/l/histoire-d-une-sentinelle-citoyenne/ (available in English, Italian, Spanish and French).

Besides the more popular outlets, we also engaged in co-authored scientific contributions in neighbouring fields, to cross-fertilise other disciplines and engage with new theories. This has also been an occasion to exchange with colleagues from the JRC and in adjacent fields. Examples include:

1. Berti Suman, A., Heyen, N.B. and Micheli, M. (2023) 'Reimagining health services provision for neglected groups: the "personalization from below" phenomenon'. *Frontiers in Sociology* 8. DOI: 10.3389/fsoc.2023.1052215
2. Göbel, C., Benyei, P., Berti Suman, A. and Riemenschneider, D. (2023) 'Meeting report: "ECSA Conference 2022, Citizen Science for planetary health"'. *TATuP – Journal for Technology Assessment in Theory and Practice* 32(1). DOI: 10.14512/tatup.32.1.74
3. Alonso Raposo, M. (…), Berti Suman, A. et al. (2022) 'Mapping the demand side of computational social science for policy'. In Bertoni, E. et al. (eds), EUR 31017 EN, Publications Office of the European Union. DOI: 10.2760/825111, JRC126781. https://publications.jrc.ec.europa.eu/repository/handle/JRC126781

We also (co-)organised a number of scientific and popular events, such as in 2023, a SensJus final event at the JRC, Ispra, Italy and virtual;[12] a stand and panel at KlimatFest, Milan; two virtual sessions from the SensJus project of the European Citizen Science Collaboration Group on 'Citizen Science & the Law' and on 'Engaging Stakeholders in Citizen Science';

[12] See https://sensingforjustice.webnode.it/l/sensjus-final-event-july-7-2023/ (last accessed 10 November 2023).

in 2022, a session on 'Civic Monitoring and Deliberative Democracy' at the IV Public Participation and Deliberative Democracy Festival, Ispra, Italy and virtual;[13] two sessions on 'Science&Art' and 'Science in Court' at the JRC Science Summit, virtual; an exhibition on SensJus and its artistic outputs at the JRC, Ispra; two interactive discussions at the ECSA Conference, Berlin, Germany;[14] a dialogue roundtable at the Engaging Citizen Science Conference, Aarhus, Denmark;[15] in 2021: a workshop on 'Health Citizen Science Dilemmas under the GDPR', hosted by the Brocher Foundation, Geneva, Switzerland.[16] We delivered several invited talks in popular and scientific events, for example at the Berlin Science Week,[17] at the Amsterdam Public Spaces Conference, at the Foundation for European Progressive Studies webinar series, and in Erasmus+ and Horizon Europe-funded projects' events.

We ensured our presence as contributors in numerous institutional venues, such as in the framework of the InformAria air quality co-creation process launched by Milan City Council; to the Italian Observatory of Civic Assemblies; to the Aarhus Convention Meeting of the Parties; to the scientific journals *Citizen Science: Theory and Practice* and *Ragion Pratica*, as editor. We were also active in the following networks which benefited from SensJus research: the European Citizen Science Collaboration Group; the Lambro River Civic Observatory; the Research Unit on Everyday Bioethics & Ethics of Science; the Citizen Science Association Law & Policy Working Group; the Netherlands Network for Human Rights Research (since 2017).

We also contributed to preliminary research on evidence gathering by climate-displaced people and its potential role to identify harms

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[13] See https://sensingforjustice.webnode.it/l/at-the-convergence-of-civic-monitoring-and-democracy/ (last accessed 10 November 2023).

[14] See https://sensingforjustice.webnode.it/l/on-epistemic-representation-and-resistance-insights-from-our-ecsa-2022-interactive-session/ and https://sensingforjustice.webnode.it/l/a-collective-reflection-to-explore-citizen-science-to-support-public-and-environmental-health-services-in-crises-scenarios-at-ecsa-2022/ (last accessed 10 November 2023).

[15] See https://sensingforjustice.webnode.it/l/sensjus-at-the-engaging-citizen-science-conference/ (last accessed 10 November 2023).

[16] See https://www.brocher.ch/fr/events/417/health-citizen-science-dilemmas-under-the-gdpr (last accessed 10 November 2023).

[17] See https://berlinscienceweek.com/event/listen-to-the-artist/ (last accessed 10 November 2023).

in court, with site of secondment Systasis. We encountered migration scholars, climate scientists and climate litigation experts, presenting at the Conference 'Migration & Societal Change', Utrecht, at the International Conference on Migration, Sarajevo, and at the Conference 'Fundamental Rights of Migrant Children in the EU: Current Challenges and Opportunities', S. Anna di Pisa, in 2022, and at the KlimatFest, Milan, in 2023.

SOUGHT AND ACHIEVED IMPACT

Identifying Target Audiences

This section will dedicate attention to the identified beneficiaries of our research and to how the research results benefited the various target stakeholders. The section will also outline how civic, academic and institutional actors praised our outreach approach. For example, the Falling Walls Foundation, an international no-profit science venture, judged SensJus as the best Science Engagement initiative among projects from around the world, for 'Breaking the Wall to Civic Evidence of Environmental Harms'.[18]

At the start of the research, we identified as beneficiaries:

1. Scientists and policy-makers: to them, we offered a wide array of scientific studies and policy briefs on the potential of civic environmental monitoring for law enforcement.
2. The civic sentinels: to them, we offered accessible resources on the factors that facilitate the acceptance of civic evidence in court, which we made available in usable formats; we also provided them with resources and training material on the potential of civic monitoring to generate evidence and mitigate conflicts, and on the legal implications of the practice.
3. Every person concerned for the environment: to them, we offered an understanding of environmental rights activated by civic monitoring; we shared with diverse publics, such as students, sensorial and emotional experiences on the topic in public places.

[18] See https://falling-walls.com/discover/videos/innovating-scientific-inquiries-breaking-the-wall-to-civic-evidence-of-environmental-harms/ (last accessed 7 November 2023).

Our indirect beneficiary was identified as the environment as a whole, which benefits from the actions of the sentinels. In particular, we fostered a 're-connection' of people with nature as well as a change of perspective: no longer considering nature as a 'space to cross' but rather a living being that deserves all our attention and to which we can contribute even daily by watching over its status and reporting any wrongdoing that we observe, by alerting authorities – when needed – also in court.

All our project results published as scientific and non-scientific publications are in Open Access. Journal and websites' metrics report considerable field-relative download, citation rates and other forms of engagement with our results. Beyond such venues, we are also bringing our results where our target communities are, such as in oil-affected areas of Basilicata and in other environmentally disadvantaged areas. Our presence in public spaces such as squares, schools and libraries with creative ways to recount science enabled us to communicate our research results in ways that were more engaging for civil society and stimulate reactions, in a stimulating cycle of co-creation.

Assessing Impact

The methodological approaches used to conduct the study provided traditional scientific results for the benefit of the field of interest. However, the efforts to communicate these scientific findings in more accessible and engaging ways also and especially benefited civic actors. Our activities and results indeed had positive social impacts especially for local, small-scale and low-budget civic monitoring initiatives and the participating citizens that are neither supported by a public agency nor linked with an academic institution, often being deployed in contexts dominated by high distrust and conflict. These initiatives found usable tools, advice and guidance in our research, but also visibility when such initiatives were selected as case studies. Furthermore, people that were not yet engaged in an environmental monitoring initiative got from our work a motivation to take responsibility for nature and 'become' sentinels. They also found relevant resources in the knowledge that we offered on the potential (legal and health) risks that a person may face when performing civic environmental monitoring especially in conflictive scenarios.

Furthermore, non-governmental actors have benefited from accessible studies from which they can draw insights to build intervention strategies. Practitioners have often made use of these findings to understand the

landscape of civic environmental monitoring and its judicial applications. Policy-makers, on the other hand, have found in the project's results evidence for policy and legislative interventions to increase the potential of this practice and ensure that it can make an effective contribution to monitoring compliance with environmental law. The research conducted enabled us to perform advocacy in institutional fora on the need for legislative intervention at the European level (e.g., on the basis of the Aarhus Convention) to establish what kind of civic evidence is valid for law enforcement purposes, and to be present in international public fora to disseminate the value of civic evidence of environmental damage.[19]

Thanks to our approach, societal impact occurred along multiple lines: communities and individuals from our case studies have increased interest in the legal implications of their civic monitoring activities, and are proactively asking for expanding the links between their work and environmental litigation and/or mediation. Based on our assessments, we can say that more than 90 per cent of our participants increased their understanding of the legal potential and implications of civic monitoring throughout their participation in the project, and made a considerable use of legal avenues in their practice.

We can also report that more than two-thirds of our 'diffuse' audience increased their interest in the legal potential and implications of civic monitoring for environmental justice. Youngsters and other people that were not engaged as civic sentinels are getting enthusiastic about civic monitoring for environmental justice and practice it. We often engage with journalists that are showing great curiosity towards and start engaging with civic monitoring initiatives. Practitioners such as medical doctors and epidemiologists are also expressing attention to our project, and especially to our case studies that focus on spontaneous initiatives in conflictual scenarios. In addition, environmental non-governmental actors are engaging with our accessible studies, drawing insights for building intervention strategies. Lawyers and judges find useful resources for understanding the landscape of civic monitoring and its judicial applications. Policy-makers engaged with our results as an inspiration for shaping future-proof policy and legislative interventions, boosting the potential of the practice. We believe that all this is very

[19] See https://falling-walls.com/discover/videos/innovating-scientific-inquiries-breaking-the-wall-to-civic-evidence-of-environmental-harms/ (last accessed 7 November 2023).

valuable as there is the need to upscale the actual contribution of civic monitoring to societal challenges.

Our research on the field, for example in Basilicata, was also very valuable to refine our approach to ethics and data management, receiving ethical clearance from the JRC Research Ethics Board and approval of our Data Management Plan, and as a stimulus to deploy innovative methodological contributions. In particular, as we had to engage participants with low literacy level, the standard consent forms were not meaningful for the aim of achieving an aware participation and informed consent from participants. Therefore, we created, with the support of an artist, consent forms that combine visuals and accessible text. The forms were made available as non-commercial creative commons resources for any researcher that may want to use them, in English and Italian.[20] Several researchers and civic groups across Europe are making use of adapted versions of these forms, which for example have been translated into Dutch.[21] The forms have been released under a CC BY 4.0 – Creative Commons Attribution Licence, with credits to the SensJus project. Annex I – 'The illustrated consent forms' offers the integral version of the forms.

Our resources are usable not only for our direct case studies but also in different contexts, for example in other countries with a similar legal and judicial system to the ones studied. Furthermore, our visual resources – like the illustrated consent forms – are very adaptable to different contexts with some language cultural adjustments. Lastly, the methodological approach to cases developed for SensJus can easily be replicated in other countries with comparable needs to those witnessed in our case studies. We have tangible evidence that these approaches have been successfully replicated by researchers, civil society and practitioners.

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[20] See https://sensingforjustice.webnode.it/l/our-visual-consent-forms-now-out-as-creative-commons/ (accessed 7 November 2023).

[21] For example, the following actors used and adapted to other languages our illustrated consent forms: the CitiObs 'Leave No One Behind' toolkit, https://www.cwts.nl/projects/current-projects/citiobs; the Pulsaqua research and consultancy firm, https://www.pulsaqua.com/; the In Silico World EU-funded medical project, https://insilico.world/; the UCL Research Ethics Committee is exploring the resource for its purposes, https://www.ucl.ac.uk/research-ethics/committees/ucl-research-ethics-committee (accessed 9 November 2023).

Source: Bela Pinheiro, illustrator for SensJus.

Figure 4.3 Extract from the illustrated consent forms

Recognitions in the Field and Beyond

Multiple actors and venues recognised the scientific, social and policy impacts of SensJus. In 2023, our research featured in the EC's JRC Young Scientist Excellence Award for 'Spearheading (Environmental) Sensing for Justice'.[22] The same year SensJus was shortlisted in the category of 'Citizen-oriented Delivery' at the European Ombudsman Award for Good Administration.[23] In addition, our research featured in

[22] See https://webcast.ec.europa.eu/the-jrc-2023-excellence-awards-ceremony-23-06-21 (accessed 9 November 2023).

[23] See https://www.ombudsman.europa.eu/en/press-release/en/171613 (accessed 9 November 2023).

the '#SHEU LEADS' campaign[24] launched by Commissioner Gabriel for Innovation, Research, and Culture. The project also received three honorary mentions in 2023: at the EU Citizen Science Prize,[25] at the STARTS Prize for Science, Technology & the Arts[26] and at the Marie Skłodowska-Curie Actions Social Impact Award.[27] In 2022, SensJus was chosen as 'Breakthrough of the Year', in the Science Engagement category of the Falling Walls contest, Berlin for 'Breaking the walls to civic evidence of environmental harm'.[28] Still in 2022, SensJus's graphic novel was selected for the Bioeconomy Creative Competition and featured at the Bioeconomy Conference exhibition in Brussels in October 2022, visited by over 400 participants and also accessible as an online gallery.[29] The project featured in several media outlets including on the popular scientific journal *Nature* with an interview on the 'Civic sentinels',[30] and in several international news items after the Falling

[24] See https://www.youtube.com/watch?v=w6VsljBr4-c (accessed 9 November 2023).

[25] See https://ars.electronica.art/citizenscience/en/sensjus-sensing-for-justice/ (accessed 9 November 2023).

[26] See https://starts-prize.aec.at/en/sensing-for-justice/ (accessed 9 November 2023).

[27] See https://twitter.com/RosaAriasAlv/status/1629224017000337408 (accessed 9 November 2023).

[28] See https://falling-walls.com/discover/videos/innovating-scientific-inquiries-breaking-the-wall-to-civic-evidence-of-environmental-harms/ (accessed 9 November 2023).

[29] See https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/bioeconomy-creative-competition-show-us-bioeconomy-your-life-2022-07-22_en and https://eu-bioeconomy-conference-2022.b2match.io/home (accessed 9 November 2023).

[30] See https://www.nature.com/articles/s41893-023-01103-x (accessed 9 November 2023).

Walls award[31] and on other occasions.[32] For all these recognitions, the JRC Digital Economy Unit where SensJus was hosted received a 'Prime' (JRC recognition of policy and/or social impact).

Examples of influential actors that reached SensJus with interest for collaborations or for building on its results include (selected examples): the forest protection and law enforcement team at the JRC (Forests and Bio-Economy Unit); the JRC Art & Science initiative; DG Connect with specific interest towards the illustrated consent forms; social innovation networks such as Ashoka Ecosystem Accelerator; think thanks such as the Engine Room and the Foundation for European Progressive Studies (FEPS); research institutions such as the Dutch Research Council; the Environmental Digital Forum by the German Ministry of the Environment; the recently established Italian Citizen Science Association; several EU-funded research projects such as CitieS-Health, Transform, RadoNorm, Panelfit and CitiMeasure; the US Association of Public Health Laboratories for the Citizen Science Quality Assurance Toolkit (which contributed to the US Environmental Protection Agency's Handbook for Citizen Science Quality Assurance and Documentation[33]).

In the early phase of the project, SensJus supported the provision of scientific advice to the UNECE and the Parties of the Aarhus Convention. This included guidelines and recommendations on the use of citizen science and related environmental information tools for the implementation of the Aarhus Convention. The effort was performed in collaboration

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[31] See Falling Walls press release: https://falling-walls.com/press-releases/falling-walls-announces-the-science-breakthroughs-of-the-year-in-science-engagement-science-start-ups-and-emerging-talents/; Italian news: https://www.premiorobertomorrione.it/aggiornamento-inchiete/sentinelle-vince-il-premio-science-engagement-breakthrough-of-the-year-2022/; Spanish news; https://www.scidev.net/america-latina/scidev-net-at-large/rompiendo-los-muros-de-las-evidencias-civicas-de-danos-ambientales/ and https://www.scidev.net/america-latina/news/compromiso-publico-como-aliado-de-la-ciencia/; German news: https://www.faz.net/aktuell/wissen/falling-walls/der-erste-tag-der-falling-walls-am-montag-dieser-woche-war-den-pitches-gewidmet-18452334/anna-berti-suman-aus-italien-18455604.html (accessed 9 November 2023).

[32] See for example https://www.woonbond.nl/huurpeil-vakblad/actuele-editie; https://ambientenonsolo.com/citizen-science-al-lavoro/; and https://cstrack.eu/format/news/a-colourful-toolbox-health-citizen-science-under-the-gdpr/ (accessed 10 November 2023).

[33] See https://www.epa.gov/participatory-science/quality-assurance-handbook-and-toolkit-participatory-science-projects.

with the European and the US Citizen Science Associations in 2021, and with expert Muki Haklay and the European Environmental Bureau in 2023, as discussed in Chapter 3. For the efforts in 2021, the hosting Unit received another 'Prime' recognition.

Overarching Contribution

The work carried out for the SensJus project enhanced innovation capacity on the topic, created new opportunities for social impact but also for enhancing environmental law enforcement, addressing pressing issues related to the environment, climate change, and stimulating meaningful civic participation in these matters. The project delivered important benefits for society, such as an inclusive engagement of ordinary people on the science behind civic environmental monitoring and its legal potential/utilisation. New products include accessible booklets explaining legal content and the widely reusable illustrated consent forms. Innovative methods include slow ethnography and the legal research based on a graphic novel and performances.

Overall, the project contributed to meeting European policy objectives, in particular for Planetary Health. The project also contributed to a number of Sustainable Development Goals (SDGs). In particular, we contributed to SDG #16 – 'Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels' – by supporting environmental democracy and pushing for greater accountability in the way environmental information is made available by institutions and companies. The project also promoted the realisation of SDGs #3, #6 and #15. SensJus's work contributed to Planetary Health as the study of civic monitoring draws links between human health and the environmental status (focusing on situated, local problems), asking for such interlinkages to be recognised in institutional decisions and interventions. SensJus also embraces the wide range of disciplines that are at stake within the notion of Planetary Health, such as eco-toxicology, public health and epidemiology.

Due to the Covid-19 pandemic unfolding in 2020, some of the planned physical fieldwork had to be performed virtually with the relevant communities, which made us innovate the way we could perform research online, using empathic and aesthetic modes of outreach. Furthermore, the originally planned civic engagement in public spaces was in part moved to digital fora, which required some adjustments (e.g., we made

our events available also on YouTube as a live show and we presented in virtual festivals).

With the pandemic, however, we could benefit from the increased availability of digital opportunities of outreach, which enabled SensJus to reach communities in the Global South or in further areas of the Global North. With lockdowns, it was often easier for polluters to commit wrongdoings without being so 'controlled' (as institutions were struggling with other priorities and the sentinels were in lockdown). This increased the challenges that the sentinels had to face but enabled us to have more occasions for our research, although fieldwork in person was not always possible. Chapter 2 discusses the deployment of both physical and virtual fieldwork, whereas the next chapter, Conclusion, develops final reflections on the research performed.

5. Conclusion: the future of civic environmental monitoring

CONCLUDING REMARKS

From the research performed, we can highlight the following exploitable results reached:

1. Civic monitoring is a powerful source of evidence for law enforcement, especially when it is able to fill governments and companies' reporting gaps. Action in court through evidence gathered by ordinary people can signal unaddressed civic demands to authorities.
2. The hurdle of having civic evidence accepted by courts is lower where the process of gathering evidence is relatively non-technical and based on ordinary observations, as opposed to processes using sophisticated techniques. The more sophisticated the sampling, the greater the likelihood the defendant(s), the court or the enforcement authority may challenge the evidence.
3. As there are no specific rules expressly dedicated to civic evidence, civic actors may be unsure how to proceed for supporting their arguments with civic-gathered data. Yet this can also be encouraging, as courts and enforcement authorities in the case studies did not seem to be concerned about who presented the data.
4. In any case, it would help future cases if courts and enforcement authorities could provide guidance on the standards they apply to civic evidence.[1] A legal recognition at a procedural level of this peculiar category of evidence could also be valuable, especially considering its potential to fill official and private actors' reporting failures.

[1] European institutions could take inspiration from the US Environmental Protection Agency's Handbook for Citizen Science Quality Assurance and Documentation, see https://www.epa.gov/participatory-science/quality-assurance-handbook-and-toolkit-participatory-science-projects.

5. The emersion of a spontaneous civic environmental monitoring initiative indicates the potential presence of distrust but can also be an occasion for cooperation between citizens and authorities on a shared issue. The encounter of knowledge between civic, governmental and even corporate actors can be a first step towards the mediation of environmental conflicts.
6. Civic environmental monitoring can also be regarded as a practice contributing to the provision of public services. Embracing these practices can be an opportunity for authorities to make governance models more inclusive and responsive.
7. Although at present there are no examples of judicial cases where environmental damage was prosecuted mostly based on citizen-gathered evidence in Europe, a potential for this type of evidence can be found in rights-based and climate litigation that are mobilising affected and concerned people in Europe (on this aspect, see Berti Suman and Burnette 2024b). Cases from other countries, especially from the US, should be closely monitored in the future.
8. Performing civic environmental monitoring should be recognised as a rightful contribution to official enforcement of environmental law. This recognition would demand legal and governance adaptations.
9. A civic 'right to contribute environmental information' possibly derivable as a fourth pillar under the Aarhus Convention could boost civic monitoring for law enforcement and shield environmental defenders from adverse consequences of their monitoring activities, in particular from SLAPPs that are a growing source of concern also in Europe.
10. Research centres across Europe can act as mediators between the knowledge produced by such civic initiatives and what institutions need. A work of connecting further and structurally civic actions to enforcement processes is urgent.

At a methodological level, our study demonstrates that:

1. Civic monitoring initiatives require to be studied 'from close' and with appropriate time dedicated, through physical and virtual fieldwork aimed at inquiring in specific contexts how and why civic actors and communities perform environmental monitoring, and which impact their monitoring activities have on institutional decisions and interventions.
2. Art-based research and elicitation methods can enrich the field with insights from participants that are more difficult to reach such as low

literacy and migrants' communities; sensorial and engaging communication strategies offer valuable avenues for making wider publics aware of the research results.

LIMITATIONS AND FUTURE RESEARCH AVENUES

The main limitations of the research conducted derive from the context-dependency of the findings (geographical limitation) and the need for considerably more time and resources (time/resources limitation) to study in-depth and over time the case-specific nuances of this evolving field. Further studies should replicate our questions and approaches to other administrative levels, regional contexts, embracing different cultural, social, political and economic variabilities. In addition, the possibility to rely on a bigger team with different disciplinary backgrounds could have enabled a deeper understanding of possible applications of civic monitoring to other domains and geographical contexts.

In the long-term, we would like to set up a tool that could pair legal experts working pro bono and interested individuals to provide accessible legal aid on the use of civic evidence in court cases and in mediation. This is because we witnessed that often civil society actors struggle to obtain accessible legal advice. To that end, we wish to co-create and implement an 'Ask a legal question' tool where the sentinels can pose their legal questions to selected legal experts, based on a similar US experience.[2] Resulting questions and answers could be published on an Open Access platform, authored jointly by civic actors and legal experts, thus offering guidance to other citizens.

In addition, in the future we see as a promising avenue of exploration the specific area of civic evidence on climate change impacts (on this aspect, see Berti Suman and Burnette 2024b). From our engagement in an ongoing project researching climate change knowledge of climate migrants arriving in Italy,[3] we realised that, often, migrants are regarded as vulnerable subjects deserving protection. However, they also hold a knowledge that could be potentially valuable in understanding the

[2] See https://citizenscience.org/get-involved/working-groups/law-policy/ask-a-legal-question/ (last accessed on 11 November 2023).

[3] See https://www.systasis.it/le-rotte-del-clima/?lang=en (last accessed on 11 November 2023).

manifold causes underpinning migration, triggered or augmented by environmental and climate factors. In order to identify and valorise their knowledge, in the near future, we aim to work in order to co-create trusted spaces and channels where this information can be shared, and then ensure that this knowledge can be valorised in practice, both in scientific and in judicial contexts. Under this perspective, we recently scrutinized the potential for civic evidence to provide valuable testimony in climate litigation, for example, grounding abstract and diffuse harms in personal and locally relevant frames (Berti Suman and Burnette 2024b).

SensJus work was recognised as innovative and not only at a content level, but also at a methodological level. Legal research rarely manages to engage and inspire civil society, breaking the barriers of accessing and understanding the potential of the law for socio-environmental justice battles. Just a few European lawyers are dedicated to leverage the use of civic monitoring as a source of evidence specifically in litigation and mediation. Throughout the SensJus project, we offered resources that could be easily usable by civil society actors. The inclusion of art in our legal research (e.g., graphic novels and theatre performances) was particularly effective and enabled us to achieve an engaged participation of different publics. We hope that future researchers in this field will build on, test and strengthen our approaches and findings.

Annex I: The illustrated consent forms

ALL DRAWINGS BY BELA PINHEIRO,
ILLUSTRATOR FOR SENSJUS

VISUAL AND TEXT-BASED PARTICIPANT INFORMATION SHEET

SensJus Visual Participant Information Sheet

Project title: Sensjus – 'Sensing for Justice' Marie Skłodowska-Curie grant n. 891513.

Host institution: The European Commission Joint Research Centre (JRC), Digital Economy Unit, Italy. The JRC is the science and knowledge service that provides independent scientific advice and support to European Union (EU) policy.

Researchers: Dr Anna Berti Suman and Dr Sven Schade. See: https://sensingforjustice.webnode.it/about-us/

Visual summary: a 'civic sentinel' monitoring radiation in the air around a factory

creative commons

Introduction

My name is Anna Berti Suman. I am a researcher at the European Commission JRC, Italy, together with Dr Sven Schade. Our project is called **SensJus** ('Sensing for Justice'). You can find out more about the project here: https://sensingforjustice.webnode.it/
The project is funded by the EU.

Our research focuses on **how people use monitoring technologies or their senses to find evidence** of environmental damage and use this evidence in **environmental litigation or mediation**. We call these practices '**citizen sensing**'. We explore whether and how citizen sensing can be **an effective new way** to find evidence about environmental wrongdoing.

Environmental litigation = court cases against companies or public bodies that harm the environment.
Mediation = ways to address the problem outside the court.

1

SensJus

Invitation

You are invited to take part in **our research on citizen sensing** under the SensJus project, as an expert or as a participant. Before you decide, you should **understand why** the research is done and what it will involve. Please take time to **read** the following information carefully and **discuss** it with others if you want. If there is anything that is not clear or if you would like more information, please **ask us**.

What is the purpose of our research?

Imagine a **fisherwoman** wants to claim that a river is polluted and she takes some samples as **evidence**. We want to find out whether and to what extent **citizen sensing can be used as a source of evidence in environmental litigation** and **as a resource to facilitate mediation of an environmental problem**.

Why are we inviting you to take part?

We are inviting you to take part in this research because:

- you are an **expert** on citizen sensing, and/or
- you **know about** a citizen sensing initiative due to your job, and/or
- you are **taking part** or you took part in a citizen sensing initiative.

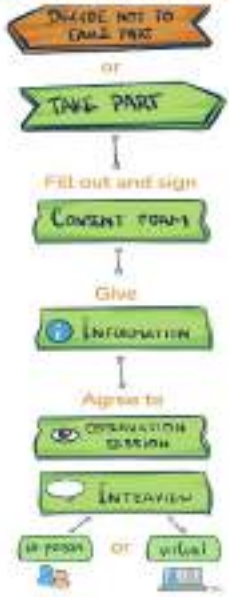
2

SensJus

Do you have to take part?

No. Your participation is **entirely voluntary**. You decide whether or not to take part. If you take part, you can still **withdraw at any time** and without giving a reason.

If you decide to take part, what do you have to do?



- We will ask you to fill out and sign a **consent form**.
- Right after, we will ask you for **some background information** about your involvement in or experience of citizen sensing, in order to decide whether to proceed with an interview and/or observation session.
- We will invite you for an in-person or virtual **interview** about your knowledge or experience of engaging in/with a citizen sensing initiative. We might **take notes** and (if you agree) **record** the interview. It will take around 30 minutes or possibly more (depending on your availability).
- If you agree, we might also **follow** you while you run a citizen sensing initiative (observation). This would be in addition to or instead of interviewing you. We might **take notes** and **record** what we observe (for example by taking photographs). But only if all participants agree.

3

SensJus

Why does your contribution matter to us?

You will actively help us to **better understand** the role and impact of citizen sensing on court cases and on mediation, as a means to **identify and address environmental harm.**

Are there any disadvantages or risks in taking part?

Not really. We **do not expect any risks** to you if you take part in this research. If you fully voluntarily choose to share sensitive and confidential information with us, we will **ensure it is protected.**

If our questions or any part of our research cause you any distress (e.g., re-experiencing previous suffering or forms of 'eco-anxiety'), please let us know via the email address at the end of the form.

Will your personal information be kept confidential?

All personal information we collect about you during the course of the research will be kept **strictly confidential.** We will collect **only information needed** for the purpose of our research. You will not be identified in any publications or presentations. If you like, though, **you can give your consent to be named or identified in this study.** We will discuss the options together. You can express your preferences in the consent form that we will give you.

We will store your personal data **for the time strictly needed** (not exceeding two years from the collection) in electronic format in a safe virtual space owned by the JRC. Anonymized results from our interviews and observations will be stored to ensure long-term preservation of the research, following the **FAIR Data Principles** (Findable, Accessible, Interoperable, and Reusable scientific data).

What will happen to the results of the research?

The **results** will form part of the Sensjus project and its findings. These will be **shared through openly accessible publications and presentations.** If you would like to, just **let us know** and **we will inform you about these results** through the communication channel of your choice.

SensJus

What procedure will we follow for processing personal data?

Any personal data you voluntarily share with us will be processed in accordance with EU data protection rules, namely **EU Regulation 2018/1725** on the protection of natural persons with regard to the processing of personal data by EU bodies.

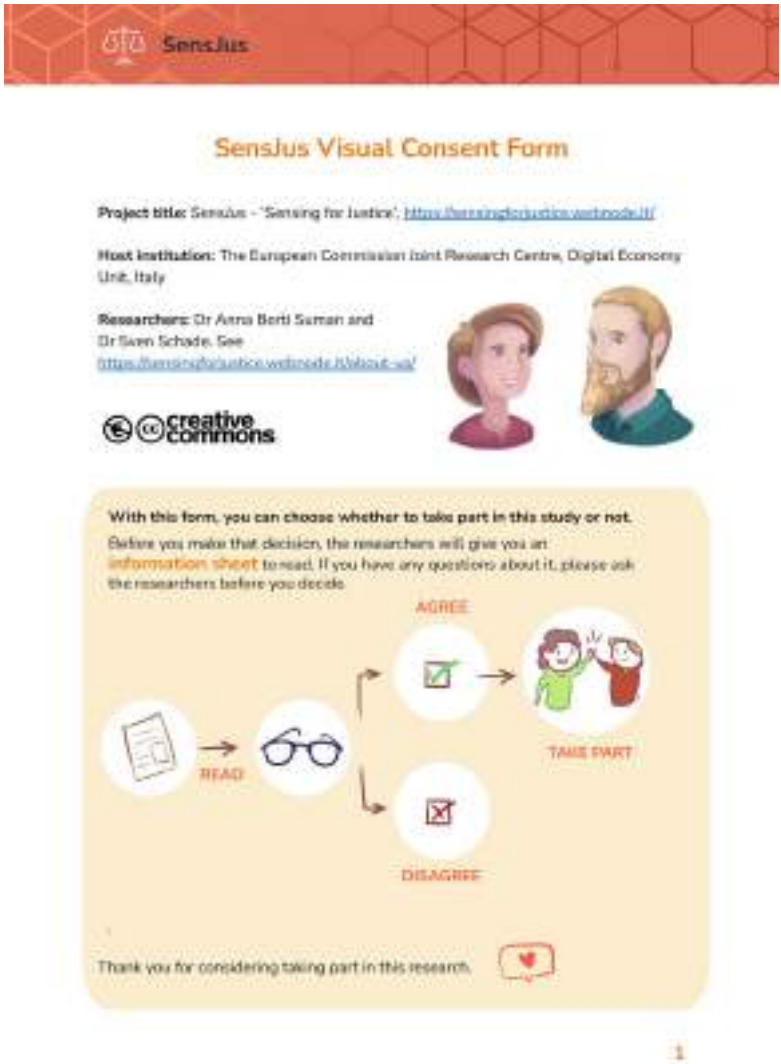
This regulation aligns data processing by EU bodies with the guarantees of the **European General Data Protection Regulation** (GDPR). Also, the data protection officer at the JRC will keep **records of our data processing activities** for this project. We can share details of this with you if you want.

Contact details

If you have any questions or concerns regarding your participation in this research, please contact Anna Berti Suman at Anna.BERTI-SUMAN@ec.europa.eu

5

VISUAL AND TEXT-BASED PARTICIPANT CONSENT FORM



SensJus

1. I confirm that I have read and understood the information sheet for this research. I have also received sufficient information on how the Joint Research Centre will process and protect my personal data. I have had enough time to consider the information, ask questions and have them answered satisfactorily.

2. I understand that my participation is **voluntary**. And I am **free to withdrew at any time**. This would not cause any penalties for me and I would not have to explain why.

3. I understand that any information I give may be used in **future publications or presentations** about SensJus. And that this information may be communicated to others. This can only happen for scientific purposes. And it must comply with **scientific ethical standards**.

Scientific ethical standards are agreed ways that scientists should behave, in their job. They should not act in a way that harms the interests of other people, in any way.

4. I am aware that any personal data that I voluntarily share with the researchers will be processed following the European Union (EU) rules on the **protection of natural persons** with regard to the processing of personal data by EU bodies. These rules grant me the following rights:

- I can access my personal data at any time;
- I can ask that the researchers rectify any mistakes;
- I can demand that the researchers delete my data;
- I can expect that the researchers only process my data in the ways described above;
- I can object if the researchers do not do this.

5. If I agree to being interviewed or observed by the researchers, I will tell them whether or not they can use any recording they make of it.
I understand that any recording will be used only as an aid for the researchers or for communication activities strictly related to the research.

2

SensJus

6. Encircle the answer that applies to you:

a. I **agree to take part** in the research;

b. I **do not want** to take part in the research;

c. I want to **leave** the study. But the researchers can still **use the data** they collected so far;

d. I want to **leave** the study. And I want the researchers to remove **all my data** that they have collected so far.

7. If you answered "a", please **encircle the answer that applies to you**:

a. I prefer to be referred to as '**anonymous**' and to have my **role** described as _____ *(add a description of your role, e.g., fisherwoman)*

b. I prefer to be referred to as '**anonymous**';

c. I am happy for you to **mention my name and my role.***
** This choice can still be changed by the researchers if it is likely to cause you any harm.*

If I chose options a. or b., I understand that **no information that identifies me will be made publicly available.**

3

SensJus

8. *This question is optional, leave it blank if you do not consent.* Otherwise encircle the option that applies to you.

I give my consent for the data collected from my participation in this study to be used for **future research** by:

a. the same researchers

b. the same researchers **and** other researchers.

Any such future research will be aligned with the aims and values of this research.

Realities outside research, such as non-governmental organisations (NGOs), may want to use the collected data. This could be for purposes that you have not consented to here. If so, you will be notified and be given the chance to give or deny your consent for this.

Name of participant	Date	Signature
Name of researcher	Date	Signature

You will be given a copy of this signed document (consent form) to keep.

Contact details

If you have any questions or concerns regarding your participation in this research, please contact Anna Berti Suman at Anna.BERTI-SUMAN@ec.europa.eu

FULLY VISUAL PARTICIPANT INFORMATION SHEET

FULLY VISUAL PARTICIPANT CONSENT FORM

Annex II: Key elements for tracking civic evidence in court

Table AII.1 First part

Case Name	Litigation or Mediation	Identification	Country	Court	Plaintiffs	Defendants	Status
San Antonio Bay Estuarine Waterkeeper et al. vs. Formosa Plastics Corporation et al.	Litigation	Case 6:17-cv-00047 Document 155 Filed on 06/27/19	US - Texas	US District Court, Southern District of Texas, Victoria division	Environmental no-profit and civic activists (fisherwomen and fishermen)	A Taiwanese petrochemical company	June 2019 released final ruling, in November 2019 emitted consent decree endorsing settlement between parties

Table AII.2 Second part

Alleged violations	Type of evidence submitted
Repeated violations of the US Clean Water Act by non-compliance with permit due to persistent discharge of floating solids (plastic pellets and PVC powder); violations of reporting duties according to the permit, to federal and state statutes (33 USC. §1318(b) and to the Texas Water Code	Expert testimonies, civic testimonies, photos and videos and several containers with samples of plastics collected by the citizens

Table AII.3 Third part

Reaction of the court/defendant to this evidence	Decision issued	3 top winning factors for the acceptance of civic evidence
Civic collected evidence was not contested neither by the court nor by the company	Issuing of monetary relief and injunction against Formosa. In the subsequent settlement between the parties, Formosa agreed to monetary relief amounting to $50 million in mitigation payments. The court endorsed this settlement by emitting a consent decree and awarding a remedy	Straightforward type of evidence; a dedicated 'champion' organizing civic efforts; rigorous data collection conducted over years supported by experts

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