

## 5. Conclusion

---



Source: Alice Toietta for this project, 2020.

Figure 5.1 The citizen-policy-maker interface in tackling crises

### 5.1 FROM CURIOSITY TO DISCOVERY

This research has been a continuous *discovery*. It began with my curiosity towards civil society's responses to the complexity, ambiguity and uncertainty of environmental risk to public health. In past experience with communities affected by environmental issues, I realized that *civil society actors* – especially when they *distrust* institutional interventions – tend to engage *environmental monitoring initiatives* ('citizen sensing') in order to track the *environmental risk* in a way that is alternative to the institutional system. In a context where science is losing social authority and laypersons acquire increasing skills and capabilities, and can rely on constantly evolving technologies, concerned citizens push to enter the debate on environmental risk governance. Over time, I realized that the practice essentially voices demands for *accountability* associated with the dissatisfaction of affected stakeholders towards institutional risk governance.

Often, such grassroots initiatives manage to obtain the support of peer citizens – which I framed as *social uptake* – and to even influence governmental actors – here understood as *policy uptake* – who may ‘adjust’ their interventions as a consequence of a citizen sensing initiative. From the acknowledgement that studies on citizen science and sensing mostly focus on the learning gains for the participants, I decided to rather explore the potential for the sensing citizens to *concretely influence and complement risk governance* through the policy uptake of the practice. It seemed to me logical to inquire ‘which factors contribute to the policy uptake of community-led citizen sensing, responding to a risk and eventually generated by distrust’. This is – in a nutshell – the original contribution that this book brings to the broader debate on civic participation in policy and social responses to environmental challenges.

## 5.2 SITUATING AND LEGITIMIZING CITIZEN SENSING

I started this inquiry by ‘situating’ citizen sensing, its characteristics and manifestations in the reality that I could observe. I *explored* its representation in the literature and its meaning as framed by those experts, policy-makers and sensing citizens that I encountered in the first stage of the project. This way, I could have a ‘taste’ of the discourses surrounding the practice, specifically in relation to risk governance and environmental decision-making. As a result, I reached a definition of citizen sensing for the aims of my research, on which to build my approach to the theoretical and empirical data. I rooted my analysis in a theoretical frame, which I situated at the intersection of participation studies, risk governance theories and environmental law scholarship. I also identified and studied gaps where institutional risk governance fails to respond to the demands of the individuals and communities affected by the risk. I suggested that it was worth inspecting whether practices such as citizen sensing could (contribute to) fill such gaps. I hypothesized a possible role that citizen sensing could play as a practice aimed at *filling institutional gaps*. Subsequently, I defended that citizen sensing, as a manifestation of ‘rights in action’, has a further role to play within institutional risk governance: it can enhance the respect of environmental human rights and *promote their enforcement* (as illustrated in Berti Suman 2021).

Building on these two arguments, i.e. citizen sensing as responding to risk governance failures and citizen sensing as a legitimate exercise of rights, I moved to research deeper the nature of the practice. This resulted in a working definition of citizen sensing in light of this project’s scope. As a subsequent step, I identified four elements characterizing a theoretically relevant sensing initiative. The four elements have been framed as independent variables influencing the outcome that I wanted to inspect, i.e. policy uptake.

In brief, I assessed how *technology, the grassroots-drive, the risk element and distrust* from the sensing citizens towards the responsible institutions influence the *policy uptake* of a sensing initiative. I hypothesized that all these elements did have an impact on the outcome, but I did not know what, although for some of these elements I had some expectations. Partially, such expectations were inspired by the early empirical analysis that helped me shape and refine my hypotheses, together with my theoretical frame.

After having defined which conditions I was interested in studying, I moved to the definition of ‘meaningful policy uptake’ for the aims of this book. I also engaged in the analysis of the social uptake of the practice as this seemed to matter for policy uptake. I referred to theories discussing the two uptakes and their relationship, and from these I extracted my intermediary and dependent variables, respectively *considerable social uptake* and *meaningful policy uptake*. The logical follow-up was the empirical analysis of how the four variables (plus social uptake) influenced the outcome here of interest, i.e., policy uptake.

### 5.3 EXPLORING INFLUENCES ON POLICY UPTAKE

In light of this question, I adopted a *mixed-methods approach* based on a triangulation of research techniques to target my objective. I concluded that the answer to my inquiry (i.e. ‘which factors influence the policy uptake of citizen sensing’) was the following. Especially from the fsQCA, it emerged clearly that sound technology, good data quality and an effective data visualization strategy are almost ‘*condicio sine qua non*’ to obtain the interest of policy-makers. This outcome was also visible in the targeted empirical analysis. In addition, the fact that the initiative responds to a pressing risk that is mismanaged by the competent authorities (and manages to demonstrate that) particularly facilitates the policy uptake. This finding was evident in the fsQCA but manifested even more in the data collected during my Japan-based fieldwork. Lastly, unexpectedly, the fsQCA showed that a distrusting discourse from the sensing citizens towards the institutional status quo seems a triggering factor for governmental adoption, as if this was a way for the institutional actors to cope with their failures. In alternative, one could conceive that the distrusting discourse shows to policy-makers that the risk is an important source of concern for their electorate and thus officials are motivated to listen to the initiative or to its data.

So far, the discoveries were mostly in line with my expectations, especially in relation to the risk and to the scientific strength of a citizen sensing initiative. On distrust, I had contrasting expectations as I could also imagine that distrust does not favour policy uptake. However, what struck me most was realizing that *the grassroots-drive of the initiative is not beneficial for policy uptake*.

Rather, for increasing its chances of policy uptake, the initiative should collaborate from the beginning with governmental actors, targeting their data needs and jointly addressing relevant risk problems. This finding derived both from the analysis of trends in the JRC inventory and related report (Bio Innovation Services 2018), and from my fsQCA. Yet, this finding is problematic for two reasons. First, whereas risk, distrust and strong technology subsist in/around the initiative or can be achieved with the initiative remaining a community-led project, partnering with governmental actors from the beginning may be unfeasible or undesirable for projects starting with a strong anti-institutional drive. Consequently, pushing this cooperation from the start may change the very nature of the sensing and also undermine its potential to be a critique of the status quo. Second, as noted above, distrusting discourses are not necessarily negative for policy uptake, but it is hard to conceive their coexistence with an initiative collaborating with the government from its early stage. Moreover, the fsQCA and the ethnographical data showed that the policy uptake of citizen sensing proved to be facilitated by a strong social support gained by the initiative. However, involvement of government from the beginning of the initiative seems not favourable for social uptake. Although a deeper study of social uptake would be needed, I could already note that there seemed to be a trade-off (or ‘dilemma’) between social support of peer citizens and institutional support. This dilemma appeared even clearer in performing the analysis on avenues to integrate citizen sensing within institutional governance (as discussed in Berti Suman 2020e).

#### 5.4 LIMITATIONS OF THIS STUDY AND SPARKS FOR FUTURE RESEARCH

This study could achieve a number of intriguing findings. Yet, there are a number of avenues that I could not explore. I accounted for that through suggestions for future research in Berti Suman 2020e. Here, I will briefly touch upon some limitations of the present inquiry, which will also open avenues for future investigations.

First, as a *geographical/contextual limitation*, my research gives account of mostly EU-based citizen sensing initiatives, considering that the JRC inventory of 500+ cases mostly targets the EU (although some cases, such as Safecast, have a global scope). In addition, it primarily focuses on EU (environmental) policy and legislation. Nonetheless, insights from other continents (e.g. the USA; Asia) could enrich this study. Furthermore, as a *perspective-related limitation*, my work mostly takes the stance of the sensing citizens and of the sensing initiatives (with some exception, for example with regards to policy uptake against the civic will). Conclusions could have been different taking the perspective of the (adopting) institutions. A deeper analysis of how govern-

ment functions including operational, legal and cultural factors would also have been relevant for understanding how citizen sensing could play a bigger role in policy and decision-making. Future research may consider developing such a study through empirical analysis of institutional settings and a theoretical review of public administration literature related to uptake of new approaches in governance structures. Lastly, I adopted the narrower perspective of *citizen sensing-based forms of public participation* in governmental and governance processes. However, where appropriate, I stressed implications and lessons of my study that could be extended to participatory government and governance more in general. In order to maximize the value of this study especially for use by government agencies, practical aspects of the issues associated with the uptake of citizen sensing could have been more emphasized (as done in Berti Suman 2020e) and generalized to other participatory instances.

In terms of *overarching scope of the literature analysis and of the gaps in existing scholarship*, I acknowledge that my work focused mainly on literature on *risk and risk governance*. As I mainly devote attention to ‘governance discourses’, a limitation and spark for future research could be a deeper analysis of the perspective of *government*. Furthermore, although the primary lens of analysis was a policy/legal approach to citizen sensing, a limitation (which could also have been seen as a plus) is that of having not exclusively focused on that perspective but having also ‘taken on board’ discussions from other bodies of literature such as sociological and STS studies on public health. In spanning across different disciplines, however, I may have missed the opportunity to dive deeply enough into a specific body of theory in a way to challenge existing theories with my findings.

In relation to *scope and understanding of citizen sensing*, another limitation regards the fact that – among the broad panorama of citizen sensing manifestations – here I adopted the narrower focus of inspecting only those citizen sensing practices that relied on sensor technology and were aimed at monitoring environmental risk affecting public health, with a community drive and eventually motivated by distrust. Interesting findings could have been gathered considering different types of citizen sensing initiatives and exploring their policy uptake dynamics.

At the level of *the design of the hypotheses*, the project focuses on six variables which represent only a small part of the ‘realm’ of citizen sensing’s manifestations. By focusing on other key elements or inverting the role of dependent and independent variables, other still relevant lessons could have been extracted. Furthermore, the final goal of the research was to verify the possibility and eventually design of an integrative framework. I achieved this aim, defending that – under certain conditions – citizen sensing should be considered a ‘legitimate’ alternative or complementary addition to existing forms

of risk governance. This argument can, of course, be challenged from many perspectives and be seen as a limiting lens.

At a *methodological level*, I discussed after the use of each method and the analysis of related findings the intrinsic and specific limitations associated with each of my research phases. Overall, I can conclude that it does not exist or, at least, I did not find a method (and a data pool) that presented no shortcomings and that could exhaustively answer my research questions but just a combination of them seemed to be the most effective strategy for running my study. Furthermore, in the book I adopted choices in terms of presentation of my empirical material which may be seen as unusual and may be considered a limitation of this work (although, from another perspective, this can also be seen as a point of originality). For example, over the book – beyond structured empirical analysis – I also referred to findings from informal interactions, which may sound unusual. Yet, this somewhat ‘reporting’ style was used to capture a dynamic field where important messages may have emerged from informal research settings. Related to this last point, my choice to adopt a storytelling approach in illustrating the theory building process and the empirical data collection and analysis could be seen as unconventional. Nonetheless, I believe that this approach does justice to how this research was conducted and to the nature of the field, in constant transformation and evolution, which requires adjustments and a flexible mentality.

Lastly, this is an extensive piece of work, which has the intrinsic limitation of being somewhat difficult to navigate. As a downside of having been an evolving, progressing and adaptive research is that of creating to the reader possible difficulties in following both the methodological thread that informs the arguments and the relationship between evidence and findings. This could be seen as – again – giving justice to the nature of this research, but it could also leave a sense of dismay in the reader. The figures and the chapter highlights help, guiding the reader.

Overall, this study opens avenues for future inquiries on several fronts. After having assessed the factors that could stimulate the policy uptake of citizen sensing in the present book, it is worth exploring how this uptake can concretely occur, as explored in Berti Suman 2020e through an accessible ‘roadmap’ for interested policy-makers and citizen sensing communities. Moreover, a needed inquiry is on whether my study ‘just’ suggests the possibility for authorities to use data from citizen sensing or rather if – as a result of targeted legal interventions (along the lines of European Commission 2020) – policy-makers could be under an obligation to resort to citizen-sensed data when certain conditions are met (e.g. information is inadequate from the official side). Related open questions, among the others, are whether this legal

intervention should occur under a cross-national regime, such as that of the Aarhus Convention, or under national legislations.<sup>1</sup>

---

<sup>1</sup> See on these questions the findings of the ongoing research project 'SENSJUS', <https://sensingforjustice.webnode.it/>. Accessed 26 November 2020.