

The Role of Scientific Knowledge in Local Sustainable Practices: Addressing the Challenging Relationship between Science, Politics and Public

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Abstract This chapter examines the use of scientific knowledge for sustainable development at the local level, emphasizing the relationships between science, politics, and the public. While science and technological innovation offer solutions to global challenges, including climate change, their application depends on effective collaboration and public trust. Drawing on literature and selected case studies the chapter explores how local governments and communities engage with scientific knowledge through policymaking, deliberative initiatives, and citizen science. It identifies limitations in knowledge utilization, evaluates collaboration between actors, and highlights local initiatives' potential to bridge gaps between science and society for a more sustainable future.

Keywords: • science-politics-public relationship • sustainable development • local sustainable practices • deliberative democracy

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1 Introduction

The aim of ensuring sustainable development has been in the forefront of political and public discourse in the last decades. It envisions growth without harming opportunities for future generations with special emphasis on social and environmental dimensions. The United Nations points out that science is “*at the heart of sustainable development. It establishes the factual basis, anticipates future consequences, and contributes to finding pathways to sustainability transformations*” (United Nations, 2019, p. 111). As such science can provide advice for policymaking. Furthermore, technological innovation can lead to solutions that enable more sustainable practices and address some of the most pressing challenges of our society, such as global warming and its consequences.

These challenges, although global in their nature, are increasingly affecting local communities. On the one hand, local communities are often the ones dealing with the consequences of severe weather disasters caused by the environmental changes, especially on the infrastructure. On the other hand, local communities are the source of community-driven actions towards a more resilient and sustainable society focusing on the local ecosystem (United Nations Development Programme, 2012). This was recognized already in 1990s where Agenda 21 predicted that every local government should create its own Agenda 21 for sustainable development (United Nations Conference on Environment and Development, 2010). Consequently the focus on local sustainable development has been gaining importance in research (Milán-García, Uribe-Toril, Ruiz-Real, & de Pablo Valenciano, 2019).

Recent global pandemic showed that there are several limitations in using scientific knowledge for the greater benefit of the society. Despite fast technological and scientific progress management of the pandemic remained challenging. Strong groups refusing scientifically based advice and explanations formed all around the globe (Adam & Gorišek, 2022). It became even more evident that utilization of scientific knowledge for public good depends on the complex set of relationships between science, politics, and the general public.

In the last decades several authors observed that scientifically produced knowledge is becoming less and less valued (Collins, 2014; Nichols, 2019). On the one hand we are dealing with the question of how scientific advice should be used in political process. In contemporary societies policymakers rely on experts and scientists through a complex network of advisory boards, expert groups and other consultations. During the pandemic we often heard appeals for politics to just *follow the science*, however, political process requires deliberation and search for consensus (Lavazza & Farina, 2020). Complexity of our reality means that it is not easy to translate scientific explanations of the world into straightforward guidance for government action (Stevens, 2020). On the other hand, the general attitudes of people to science have been changing. Nichols (2019) describes the

increasingly common contempt for expert opinion as a way of establishing one's own autonomy. With universally available information, it is easy for individuals to feel like they themselves are also involved in scientific processes and that each opinion is equally relevant (Collins, 2014, p. 16).

The obstacles in utilizing scientific knowledge for public benefit are thus multifaced and complex. They mostly revolve around roles and relationships of different actors. This chapter observes how scientific knowledge is used for sustainable development on local level while focusing on the relationships between science (and experts), politics and general public. We address the following questions:

- Which are the main limitations in utilization of scientific knowledge on local level?
- How does focusing on sustainable development fuel collaboration between scientists, politicians and public on local level?
- Which kind of local initiatives can help bridging the gap between science, politics and public?

These questions stem from observations of several sustainable development projects and initiatives that emerged on the local level. We discuss them from the perspective of actors' relationships and evaluate the potential they hold for addressing some of the more global challenges related to the use of scientific knowledge and creating a sustainable future. The first part of the chapter is based on the analysis of the literature and observes the relationships between science, politics and general public. Special attention is given to the role of scientific knowledge in sustainable development and the uses of scientific knowledge on local level. In the second part, the article focuses on the empirical evidence to address the research questions. This is done on two levels. First, we discuss the collaboration between local politics and science. On the basis of case studies from Europe, and especially Slovenia, we first observe how focusing on sustainable development indeed promoted more collaboration between scientists and local politics. Second, we focus on the relationship between science and citizens in local communities. Here we observe case studies of deliberative initiatives and examples of citizen science projects and discuss the potential they hold for bridging the gap between science and public. Building on these observations, the chapter discusses deliberative local practices as a potential for enhanced cooperation between experts, local politics and the public.

2 Complex relationships between science, politics and public

Modern societies are very complex and functionally differentiated. In this context, no scientific discipline alone can encompass all aspects of reality, and even less so are we individuals capable of doing so. Societies have become too complex even for governments and decision-makers, and thus virtually all political spheres have become dependent on the input of experts. Politicians and decision-makers must consider different

aspects of a problem when making decisions, e.g. environmental, social, political and economic.

In modern democracies, the tendency towards greater inclusion of science and experts in political processes is also captured in the idea of evidence-based policy making, which strives for greater rationality, systematicity and reliance on objective evidence in public policy processes. In practice, politicians most often rely on science and scientific knowledge through a complex network of advisory bodies and institutions, committees, hired experts and think tanks (Knight, 2019). These are established on different levels, from partisan, local, to national and even international ones. They combine expert advice and political action, as the appointment of members to individual bodies is often a matter of political debate, which can affect the way they operate and the quality of expertise. Choi et al. (2005) point out that scientists and politicians have different goals and attitudes towards information, speak different languages, and have different perception of time.

While politicians usually strive for fast, visible results, scientific process is long and ever changing. In political process, science is often understood in oversimplistic manner as a unified and consensual system that produces indisputable truths. This fails to recognize the actual complexity of the scientific process, which involves disagreements and debates as essential components of progress. Furthermore, scientific or expert advice does not mean a unanimous fact as experts and scientists often disagree between each other.

On the one hand, different disciplines can reach different conclusions based on the same data (Knight, 2019) but even within the same discipline there are disagreements on certain topics. The advice of experts is not always technical and neutral and often holds strong axiological implications. The opinions and recommendations of experts during the pandemic often go beyond just finding the best technical solution and interfere with certain key human values (Lavazza & Farina, 2020). However, they point out that this is not only a simple question of translating scientific evidence in action. While scientific facts can describe the problem and offer options, it cannot make decisions on behalf of society. In this sense, leaving the decision-making to experts would be impractical and immoral (Willis, Curato, & Smith, 2022). This shows that exaggerated emphasis on politicians following the science, as was often observed during the pandemic, might be used by politicians to avoid blame and shift responsibility and accountability to scientists and experts (MacAulay, Fafard, Cassola, & Palkovits, 2023).

Nevertheless, experts and scientists are themselves a part of social and political process with their own values and political preferences and can follow specific ideologies and interests. While this represents a kind of obstacle to recognizing the legitimacy of experts, public attitudes still distinguish between politics on the one hand, which acts biasedly and within the framework of interests, and experts, who have a non-political function of

finding the best possible solution to problems, ideologically unencumbered and without political prejudices (Stehr & Grundmann, 2014, p. 105).

2.1 Science, politics and public on local level

Political decision-making differs on national and local level. While on the national level politicians deal with country-wide issues such as national welfare, security issues and larger policy frameworks, local politics are more specifically oriented in concerns regarding living in the area, such as providing infrastructure and services to the needs of the community. In this sense they are often more pragmatic and less ideologically charged. National and international level set a legal framework in which local politics acts. It is often considered that local politics are closer to citizens, rely more on citizen participation and take their needs in consideration more directly. Eurobarometer studies also show that citizens trust local governments considerably more than national or EU level of government (Arrighi et al., 2022).

Similarly to this, the role of science differs on national and local level as well. Especially because of the practical orientation, the use of science is in local context more often linked to the actual local problems, local cooperation networks and practical outcomes, and less likely for strategic orientations and structured scientific advisory processes. This might give a false impression, that scientific advice is not present at local policy-making level. Since there are often less structures, such as advisory boards and scientific expert groups, formed at local level, scientific knowledge is still included in local level politics (Mason, 2016). Lundin and Öberg (2014) analyse the case of Swedish local politics when addressing how public administrators use expert knowledge when preparing policy advice. They find out that expert advice is more likely used in cases where either political dispute or public attention is high.

Combating climate changes without a doubt belongs to these categories and demands scientific input in political process. Willis et al. (2022) count the way in which technical, scientific and expert advice are used in political process as one of the main reasons for the failure of addressing climate crisis. It is not only a lack of translating scientific facts to the policymaking, but a lack of proper cooperation and dialogue between actors. Richards (2019) points out the need for true science-policy co-production for concrete mutual influence. This includes being open to broad discussion with accepting each other's feedback, identifying and resolving disagreements and holding one another accountable. These so-called science-policy partnerships can more easily be established at municipal or local level of government, especially in the case of climate changes. There are several reasons for this. As mentioned before, municipalities are often the ones dealing with adaptation and recovery measures for several immediate and concrete impacts of climate change, especially in infrastructure. Furthermore, municipal governments are often smaller and less formalized compared to the national ones and often under less

public scrutiny which can make new interactions and initiatives more likely to form (G. Richards, 2018).

However, the way in which scientific advice is used in society does not depend only on the extent to which scientific advice is included in policy process. The way public perceives these advices and how they react to them is equally important. Collins (2014) explains that the public attitudes towards science and experts changed significantly in recent decades. The knowledge produced by scientists is becoming less valued. Nichols (2019) adds that experts no longer have real value in society and that society believes that every opinion is equally valuable. The authors cite several reasons for this change in relationships. On the one hand, it is a kind of empowerment of the individual – despising expert opinion means a kind of establishment of one's own autonomy. With the widespread availability of information and the awareness that science is also fallible, there has been a stronger sense in society that every individual is part of the scientific process and that every individual has the right to an opinion that is equivalent to an expert opinion (Collins, 2014: 16). Furthermore, many individuals see experts as members of political elite and grow similar dissatisfaction and distrust in them.

We are thus dealing with a situation where people are more and more dependent on experts and their advice without establishing dialogue between the two sides. On the one hand, dialogue is rejected by citizens with a negative attitude towards experts, and on the other hand, many experts, especially those from the academic and scientific spheres, completely neglect this task and do not actively engage in greater communication with the public (Nichols 2019). The scientific community often sees laypeople as uneducated and unqualified to discuss scientific matters and that discussion of science should only take place within the scientific sphere. Laypeople do not understand science for the most part, but as Knight (2019) explains, scientists too often ignore or reject the weighty points of the public or laypeople in their work. Furthermore, there are important problems within scientific field as well, that influence public perception of science. For example, a crisis of reproducibility of research, publish or perish concept (De Rond & Miller, 2005), overhyping research findings, predatory publishing and citation misdirection (West & Bergstrom, 2021).

The concept of Open Science is intended to target several of these challenges. The beginnings of the open science movement were largely focused on open access to scientific publications, data, and software. Several authors speak about the benefits of such data openness, like enabling diverse data analysis, verifying existing results, generating new knowledge, and promoting interdisciplinarity (Uhlir & Schröder, 2007). Already nearly 20 years ago, Eysenbach (2006) noted that open-access scientific publications offer advantages in terms of citation rates, accessibility to relevant actors (user uptake advantage), and the promotion of connections between disciplines (cross-disciplinary fertilisation). This encouraged investments to develop data-sharing platforms

such as the European Open Science Cloud (European Research Area), a stronger focus on data management planning, and national (and supranational) guidelines for open access and open science. Nowadays, open science is not just a recommendation, but a mandate in many European countries that have included it in the national legislation. The goal of open science is no longer to merely enable open access to research data, but to assure the participation of the public in science (citizen science) and renovate the criteria for evaluating scientific performance. While this approach is targeted to ensure greater cooperation between science and general public, it focuses only on the openness of science without taking into account the complexity of the scientific process, relationships between different actors and the problems within science that influence them, such as narrow specializations, lack of interdisciplinary cooperation or conflicting opinions within science.

The concentration on the over-simplified idea of trust in science as opposed to a more complex understanding of public attitudes to science has several other problems as well. On one side, they presume that people's reported attitudes to science predict their behaviour. Au et al. (2024) warn that those who report low levels of trust can still take medicine and follow medical experts' advice. On the other side, through a series of experiments O'Brien, Palmer and Albarracin (2021) find that people with a higher level of trust in science can be more vulnerable to misinformation containing pseudoscientific content. They explain that the sole presence of scientific labels (like the name of an institution or credentials of an "expert") makes them believe the information and also likely to share it with other people. The authors argue that more than trust in science, the methodological literacy and ability to critically and systematically process information impact people's resilience to pseudoscience and misinformation.

3 Sustainable development as a catalyst for cooperation

As mentioned in the previous chapter, municipalities are often directly involved in sustainability challenges through infrastructure and services management. Ensuring resilient and sustainable practices require multi-stakeholder approach with knowledge-based policymaking. As such, sustainable development can also be understood as a policy framework which encourages cooperation between municipalities and different stakeholders, including scientific and academic institutions. This often takes place through joint projects and initiatives supported by national, regional or international funding schemas. In this chapter we first explore how these projects can encourage cooperation between science, politics and general public in two ways. First, we address the question whether global focus on sustainable development emphasizes and advances cooperation between local authorities and scientific organizations, and with this the use of scientific knowledge in public policy process. Second, we observe how local initiatives and projects that support citizen science and other similar participatory scientific practices help bridge the gap between science and public.

3.1 New framework for policy-science intersect

Global focus on sustainable development resulted in many legal and strategic frameworks which influenced local policymaking. Already in 1990s, following the UN's Agenda 21, local communities were expected to adopt their own Local Agendas 21, a plan for sustainable development. These were mostly focused on the environmental aspect of sustainable development, and while putting emphasis on stakeholder cooperation and engagement, they often excluded scientific and academic actors and focused on cooperation with local inhabitants, organizations and private enterprises ('DSD :: Resources - Publications - Core Publications', n.d.). It was in later documents and strategic plans that the important role of science in the process of sustainable development was emphasized. In last few decades, several EU, international and national programs were established which promote partnership between local authorities, stakeholders and academic institutions. This led to more project-based cooperation through grant-funded projects. In this chapter we focus on the case-study of Association of Municipalities and towns of Slovenia (SOS) which is the biggest representative association of municipalities in Slovenia, covering more than 90% of the municipalities.

Since 2008 SOS took part in 27 different national and international projects. Out of these, 21 were directly connected to one of the 17 Sustainable Development Goals and other 6 were at least indirectly connected to them as well. Most commonly they dealt with sustainable energy and energy efficiency, circular economy, inclusion and lately climate change adaptation and preparedness. In observed projects 18 of them directly included cooperation with academic organizations, meaning that either a university of research institute was part of the consortium conducting the project. In three projects, scientific knowledge was indirectly involved through think-thank type of NGOs or external experts that were involved in the project. The remaining 6 projects were mostly oriented towards municipalities networks and peer-to-peer collaboration. Here, we present two case studies of interdisciplinary projects, one national and one international, aimed at achieving greater sustainable development. The cases were chosen as a good practice example because they showcase how sustainable development can serve as a framework for cooperation between science and local authorities.

Project LIFE4ADAPT is a strategic integrated national project funded by the European programme LIFE through the Slovenian Ministry for Environment, Climate and Energy. It joins 19 partners from science, administration, NGOs and local authorities with the main goal to increase climate change preparedness through cooperation, knowledge and action on all administration levels. Other than raising awareness, the project intends to conduct pilot projects in the areas of farming, forestry, nature preservation, health and water management. Furthermore, the project intends to create educational programmes for teachers, students and experts, aimed at the transfer of knowledge in practice.

3.2 Local knowledge in scientific research: participatory and citizen science

The discussions regarding the role of science in society often highlights the gap between scientists and general public. It is often considered that the process of scientific research is the domain of scientists, who work far away from lay public, which does not understand science. Recent open science movements address this gap through promoting participatory and citizen science research. These approaches are especially relevant for local communities and show considerable potential in the field of sustainable development.

The term citizen science refers to the inclusion of non-scientists in scientific process. Early definitions describe citizen science as the participation of non-scientists in the process of gathering data according to specific scientific protocols and data interpretation as well as in the decision-making on policy issues with technical or scientific components and engagement of research scientists in democratic and policy processes (Lewenstein, 2004). More modern approaches refer mostly to the scientific process where non-scientists can take up different roles. The European Citizen Science Association states that even minimal participation, such as downloading an app that automatically collects data, can count as citizen science if “if it aligns with 10 principles or supports the production of scientific results that would not have been possible without the informed decision of volunteers to contribute” (Haklay et al., 2020).

Although similar concepts have been long recognized in social sciences research (for example participatory action research, see (Lewin, 1946), citizen science gained considerable popularity in recent years, being vastly promoted “as a recognized, promoted and funded approach, which fosters scientific literacy and the democratization of science” (ESCA.ngo, 2023). Such participatory projects should benefit both sides of the coin. On the one hand they increase citizens’ understanding of scientific process, educate them in specific fields and empower citizens to actively participate in society. On the other hand, these projects are aimed at enriching science or the otherwise narrow expert scientific point of view. In this sense they hold great potential for research connected to sustainable development.

The United Nations Environment programme (2019) point out that citizen science enables researchers to include large numbers of individuals in data collection phase, which can help monitor the sustainable development goals and improve community awareness and action. Fraisl et al. (2020) note that citizen science is already contributing to the monitoring of five sustainable development goals, and could contribute to many more, especially in the areas *Life on Land*, *Sustainable Cities and Communities*, *Good Health and Wellbeing* and *Clean Water and Sanitation*.

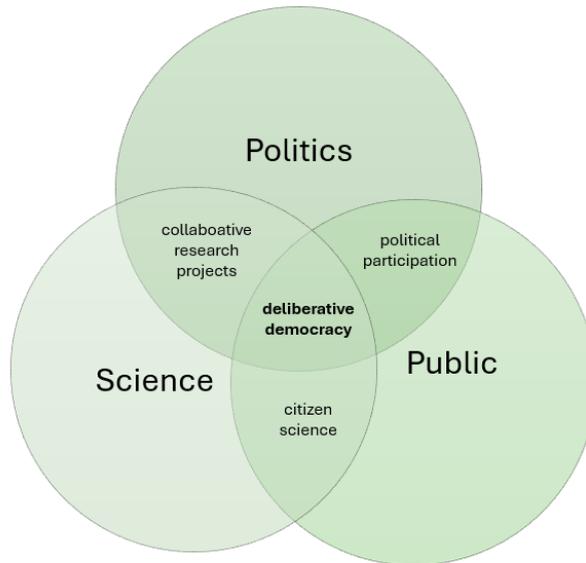
Citizen science projects can also promote community-based data collection. For example, a participatory project in Brazil involved local community groups in mapping and managing risks of natural disasters and identifying changes in landscape, risk areas and disaster events. The authors report the learning benefits for both, involved members of the community and the scientific team on the effects of extreme weather events in their territories. This approach enabled integration of knowledge from different systems – local and scientific knowledge (Albagli & Iwama, 2022). Ijatuyi and others (2025) speak of importance of including indigenous knowledge in scientific knowledge. This is knowledge rooted in cultural and environmental context of indigenous people and is mostly tied to land use, ecosystems and sustainable practices. Several authors (Naess, 2013; Reyes-García et al., 2016) and institutions point out the importance of local knowledge in addressing climate change and adaptation to climate change.

Researchers have discovered that participative and citizen science projects hold wider societal implications in terms of direct practical effect (King, Winter, Chrisinger, Hua, & Banchoff, 2019), the more applied orientation of projects and influence the democratisation of science (Sauermann et al., 2020).

4 Local communities as areas of deliberative democracy

The relationships between science, politics and public are complex and multifaced even on local level. Based on the previous chapter we can see different arenas where these three spheres meet. This is shown in figure 1. However, each of these intersections has limitations. Collaborative scientific projects that establish cooperation between scientists and politics often lack involvement of public and have limited policy implications. Similarly, citizen science projects often stay on the level of research without including local political actors in them. In the search of activities that would ensure cooperation between all three spheres, we look at the deliberative local practices as a potential solution.

Figure 1: Visual representation of intersections between the spheres of politics, science and public



Deliberative democracy shares features with direct democracy of citizens and goes a step further than the types of direct democracy that are already embedded in modern liberal democracies, such as civil initiatives or referendums. It is a model of political and social relations where legitimacy derives from extensive public debate (Pinter, 2004). Individuals should not be seen merely as passive subjects of legislation, but as autonomous agents who are actively involved in the governance of their society (Gutmann & Thompson, 2004). Deliberation therefore involves more than simply expressing individual preferences and values, and is based on more complex communication in which opinions are weighed and transformed on the basis of logic and reason. One of the key proponents of deliberative democracy is Jürgen Habermas, who bases his argument on the idea of popular sovereignty, whereby the key source of legitimacy is collective judgment. This theoretical foundation also has practical implications, particularly at the local level.

In its essence, local self-government is a form of exercising citizen self-management and gives residents the right to manage local affairs themselves (Brezovšek, 2009). This idea is also embodied in the concept of deliberative democracy. It refers to the idea of policymaking and political decision-making in which the public plays a key role,

participating in the political process through deliberation—that is, through discussion and the confrontation of different opinions and perspectives—formulating proposals and alternatives and voting on them.

Despite its broad theoretical scope, deliberative democracy is often applied more modestly in practice. Besides the organizational challenges of such activities, the authors also point out other dilemmas, such as the question of who participates in these activities, how the process itself unfolds, how the results are influenced by the dynamics of each group, and how the products of deliberation are subsequently integrated into the political decision-making process (Ryfe, 2005).

Among these dilemmas, perhaps the most significant concerns the role of knowledge in such decisions. As mentioned, the involvement of science and experts in political decision-making is a consequence of the increasing complexity of modern societies and the issues that governments must decide upon. If a government needs the help of experts because it cannot make decisions on such complex matters alone, is it then reasonable to expect that citizens will be able to do so? Somin (2010) explains that the concept of deliberative democracy assumes that participating citizens possess two types of knowledge – factual knowledge about a particular topic and an understanding of moral and philosophical arguments. In the deliberation process, it is not enough for citizens to simply have their opinions and preferences on certain issues; they are also expected to defend and discuss them in an informed manner, with detailed arguments.

Given these challenges, especially those related to knowledge it is unrealistic to expect deliberative democracy to serve as the primary model for policymaking and political decision-making, the principles of deliberative democracy can be actively incorporated into narrower and more specific contexts in various forms, such as deliberative workshops and discussions.

Recent research illustrates this point. Willis et al. (2022) argue that a deliberative approach offers an opportunity for better reaction to climate change, as it still regards scientific and technical evidence while also recognizing the value of knowledge of different actors, as well as ethical and moral positions. They describe two case-studies of deliberative mini-publics, one in UK and one in France. In both cases, scientific advice was part of the process. A learning phase was included, where independent advisory group chose evidence and witnesses that the participants were exposed to before deliberation (Willis et al., 2022).

More broadly, deliberative democracy encompasses a variety of formats. Ayano (2021), for example, mentions consensus conferences, deliberative polling, citizens' juries, and planning cells. In Europe, there are also several practical examples of incorporating deliberative democracy into decision-making at the local level. The report of the Congress

of Local and Regional Authorities of the Council of Europe, for instance, cites examples such as a citizens' contact group or forum in the Belgian rural community of Oud-Heverlee, which developed proposals on water management; the Scottish Citizens' Assembly on Climate Change; and the German-speaking community of Ostbelgien in Belgium, which has developed its own model of deliberative democracy and integrated it into its institutional framework (Congress of Local and Regional Authorities, 2022).

However, the success of such deliberative practices depends on the planning and implementation. The Congress of Local and Regional Authorities (2022) outlines several principles of deliberative processes that municipalities should consider when introducing deliberation into policy-making procedures. Key principles include clearly predetermined and communicated ways in which the result of deliberation will be used in the political process, careful definition of how participants are selected and how who determines the agenda. Organizing the process also involves preparing facilities, staff, materials, and compensating participants. Transparency, impartial and understandable informational materials, and skilled moderation are essential to ensure equal participation and reasoned discussion, with input from science enhancing the quality of deliberation. The success of deliberative processes can be measured using the OECD framework, which highlights the integrity of design, the quality of deliberation, the influence of proposals on decision-making, and the broader impact on public attitudes (Gastil, Knobloch, & Kelly, 2012). When implemented properly, this approach allows well-informed citizens to actively engage in the political process, ensures scientific evidence is considered, and increases the likelihood of meaningful policy outcomes.

5 Discussion and conclusions

Modern societies are complex, requiring scientific input in policy processes at all levels: global, national, and local. This is especially true when addressing some of the most pressing global challenges such as climate changes and a transition to a more sustainable future. Ensuring strong scientific advice and evidence-based policies is not enough. The public may still not accept these solutions or adapt their behaviour. A coordinated response between politicians, scientists and public is needed with strong collaborative and deliberative note.

The question of ensuring more sustainable way of living especially concerns local communities and municipalities as they are the ones governing practical ways of life and in the forefront when dealing with the consequences of global warming and related disasters. Complex relationships between science, politics and public can be even more challenging on the local level. On the one hand, local political institutions, especially in smaller places, form less expert groups and advisory boards. Their policymaking process happens within the broader scope of national policies and mostly deals with more practical governance. However, this chapter shows that local communities have strong

potential for collaboration between science, politics, and the public. Focusing on sustainable development may even act as a catalyst for such collaborations.

Case studies show that focusing on sustainable development, combined with supportive funding schemes, led to strong cooperation between local municipalities and university- or research-led projects. These projects created a new area for science-politics cooperation on local level. However, the question of actual policy implication of such projects remains. Furthermore, they rarely include the aspect of public, their attitudes and behaviour.

Citizen science and participatory research designs can offer a good starting point for bridging this gap. They also hold great potential for directly addressing sustainable development goals by providing access to additional data that scientists alone cannot gather. Even though some of the early definitions assumed policy implications and a strong tie of these projects to the actual societal problems as central to citizen science projects (Lewenstein, 2004), recent authors and institutions employ a more general definition of any scientific activity involving non-scientists. While citizen science contributes to public engagement, it rarely integrates politics and decision-making; this is where deliberative democracy can play a role.

This chapter discusses the potential of deliberative democracy as the concept that can act as a field for cooperation of all three spheres – science, politics and public, especially on local level. Deliberative process is often seen as a central process in democracies and deliberative democracy is often seen as a more complex type of direct democracy. It is a process in which citizens not only express their attitudes and opinions, but through complex argumentative discussions cooperate in governance. This assumes that citizens who cooperate possess some kind of knowledge – a skill to participate in deliberative process on one hand, and factual information to make reasoned judgements. In this sense, deliberative practices must include some type of scientific or expert input to ensure that participants are informed, and the deliberation process is of the appropriate quality. Furthermore, the issues at hand are often complex and technical and require involvement of highly specialized knowledge.

Deliberative democracy is often criticized as too logistically complex to implement in practice. However, there are many successful examples of mini-publics and citizens' assemblies that show its feasibility, especially on local level. This shows potential for local communities to address the challenges of sustainable development through ensuring tight cooperation between science, politics and public. However, the actual implication of such deliberative practices greatly depends on how these are organized. Here, more applied research is needed to determine the best possible model that would enable the most fruitful collaboration and actual practical outcomes.

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