



Exploring procedural justice in stakeholder identification using a systematic mapping approach

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ABSTRACT

In the face of complex societal challenges, stakeholder participation/engagement and knowledge co-production have become increasingly important to the sustainability sciences. Why and how these stakeholders are identified frequently remains unclear, which raises concerns regarding rigor and procedural justice of research processes. Against this background, this paper seeks to contribute to a better understanding of how and why procedural justice issues materialize in stakeholder identification and assess the extent to which they can be addressed. We build on proposals for stakeholder identification in the academic literature that integrate three common approaches: analytical, sampling, and participant-based approaches. Further zooming into these approaches and related methods through a procedural justice lens, we show how the inclusion of stakeholders, the influence of stakeholders on the identification process, and the transparency of the overall identification process matter. We draw upon our own case study experiences to share the lessons learned, including the benefits of systematic mapping approaches for stakeholder identification. We conclude that stakeholder mapping facilitates accurate documenting of identification procedures and supports iterative refinement and adjustments of the stakeholders identified, whilst also creating reflexive potential to address intuitive and past experience-based practices, ultimately opening promising avenues to advance procedural justice in stakeholder identification.

1. Introduction

With the rapidly evolving research agenda on climate change and complex environmental problems, researchers are increasingly incentivized to work with and on stakeholders. The democratization of scientific practice has accordingly been advocated over the last decades with a paradigm shift towards post-normal science, legitimizing extensive participation to bring diverse societal perspectives into scientific discourse (Funtowicz and Ravetz, 1993; Gibbons et al., 1994; Jasanoff, 2003). Especially in sustainability science, the transdisciplinary research and knowledge co-production approaches have thus gained traction to denote such engagement efforts with a strong emphasis on plurality, empowerment, and collaboration (Chambers et al., 2021; Jacobi et al., 2022; Norström et al., 2020). Participation of- and engagement with stakeholders from outside academia have therefore become crucial but

no less difficult research endeavours for sustainability science.

More concretely, sustainability science is confronted with the challenging task of deciding who gets to participate and who is being engaged in research processes, or “*who, precisely, counts as a relevant stakeholder in the making of planetary knowledge and policy*” (Miller and Wyborn, 2020, p. 90). Accordingly, stakeholder engagement and participation efforts are deeply entangled with questions of procedural justice, which is defined as “*the ways policies, research and decision-making are done and who is involved*” (Zimm et al., 2024, p. 24). In this paper, we seek to examine the underpinning methodological nuances of stakeholder identification, the very first step to every stakeholder engagement process. We seek to understand how and why procedural justice issues materialize in stakeholder identification and assess the extent to which they can be addressed. Our proposition is that the ways in which we identify stakeholders hold several aspects of

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procedural justice, which, if expressed and addressed explicitly, can contribute to more just processes. We thus build our argument on the body of literature that has highlighted the risks of stakeholder elitism, which results in the exclusion of marginal stakeholder groups and their knowledge, and reduces the opportunities for amplifying lesser-heard voices, particularly in policy-relevant research endeavors (George and Reed, 2016; Zurba and Papadopoulos, 2023). We endorse emerging studies highlighting the need for transparent stakeholder identification processes, which are crucial for rigorous social empirical and transdisciplinary research.

To this end, we present an overview of stakeholder identification theory and approaches and find, similar to other scholars, comparatively limited comprehensive guidance and evidence on how stakeholders are identified (Colvin et al., 2016; Fritz et al., 2018; Land et al., 2017). We then critically review existing stakeholder identification approaches through the lens of procedural justice and analyze to what extent and how procedural justice issues emerge, especially regarding the methodological implications for stakeholder inclusion, influence, and information (Simcock, 2016). Based on these insights, we expand on state-of-the-art methods in stakeholder identification, which build on the iterative integration of multiple methods and sources. This results in a process overview with corresponding guiding questions, which helps to build a rigorous and transparent stakeholder identification process that makes aspects of procedural justice more explicit. Finally, we reflect on our experiences from a case study in Austria and discuss subsequent insights from a transdisciplinary project on climate change and social vulnerabilities. We find that particularly the stakeholder mapping exercise throughout the identification enables more explicit engagement with procedural justice questions.

2. Theoretical background

2.1. Origins of stakeholder identification theory

Scholarly engagement with stakeholder theory usually begins with Freeman's conceptualization of stakeholders in organizational contexts (1984), and then consults the work of Mitchell et al. (1997) on stakeholder identification and salience. Inarguably, these two cornerstone pieces established a strong foundation in business and management studies to raise the question of who qualifies as a stakeholder and for what reason. In this context, stakeholder identification was predominantly examined in the organizational environments surrounding firms, with the aim of better understanding managerial strategies differentiating stakeholders from non-stakeholders (Freeman, 1984; Mitchell et al., 2021; Mitchell et al., 1997). Accordingly, stakeholder theory evolved to understand corporations as constellations of cooperative and competitive interests, based on the overall idea that effective stakeholder management contributes to successful economic performance (Donaldson and Preston, 1995).

The subsequent debates on stakeholder status, however, were deeply entangled with business ethics, raising the issue of those, who do not directly influence the productivity and profit of the firm, but were otherwise affected by a business and its services, or served as a means to non-profitable ends (Crane and Ruebottom, 2012; Gregory et al., 2020; Kaler, 2002). In methodological terms, this meant that generic stakeholder categories, including, for example, customers and shareholders, were deemed insufficient to provide an overview of those interacting with the firm (Perrault, 2017). Identifying and prioritizing stakeholders was thereby increasingly seen as an issue of classification (Vos and Achterkamp, 2006). Many of the classification models are built on the idea that different attributes like power, legitimacy and urgency define stakeholders, and therefore require managerial attention (Mitchell et al., 2021; Mitchell et al., 1997; Parent and Deephouse, 2007). Additional widely accepted distinctions in the business and management literature include internal and external stakeholders (Jones, 1995), primary or secondary stakeholders (Clarkson, 1995), and claimants and influencers

(Mitchell et al., 1997). All these distinctions had in common that they viewed different stakeholder groups from the perspective of the firm and sought to enable the management of different interests in corporate environments. Thinking about different stakeholder classification models allowed critical engagement with stakeholder identification approaches, and on the one hand highlighted the normative perspectives through which organizations were seen to owe obligations to those whose wellbeing was affected by their activities (Vos and Achterkamp, 2006). The instrumental value of the stakeholder framework, on the other hand, showed in the practical value for stakeholder management for the achievement of corporate performance goals (Donaldson and Preston, 1995).

2.2. Stakeholder identification in sustainability sciences

Beyond research efforts in the business and management literature, stakeholder identification also flourished in the fields of health (Brugha and Varvasovszky, 2000; Montgomery et al., 2018), politics (de Bussy and Kelly, 2010) and education (Elneel et al., 2023; Mainardes et al., 2013) to name a few. In these areas and also the sustainability sciences, the focus of stakeholder theory and identification extended beyond firm stakeholders. Especially Reed et al. (2009) helped reframe the stakeholder issue in environmental management, because the alignment of heterogeneous stakeholder interests was considered crucial to the success of natural resource management projects. Once again, the distinction between normative and instrumental theory was shown in this context. In normative terms, stakeholder participation was seen to "empower marginal stakeholders to influence decision-making" (Reed et al., 2009, p. 1934). Stakeholders were thus identified largely for legitimacy reasons, meaning that knowledge production was respectful of divergent stakeholder beliefs and values (Cash et al., 2003). Here, the aspiration lied in identifying a sufficient number and ensuring diversity of stakeholders with a legitimate stake, who could be either negatively affected by the problem or responsible for it (Lang et al., 2012). Stakeholder would then contribute to more detailed and contextual understandings of local socio-ecological systems (Denney et al., 2018) and different individuals, groups and organizations would positively influence decision-making processes and their outcomes (Brugha and Varvasovszky, 2000; de Bussy and Kelly, 2010; Gomes et al., 2010). In contrast to the normative viewpoint, the instrumental view was more pragmatic. It was primarily concerned with how organizations, projects, and policymakers can identify, elucidate, and regulate stakeholder behavior to attain desired environmental management outcomes (Reed et al., 2009).

Irrespective of these different departure points, however, whether that be normative aspirations or instrumental purposes, stakeholder research was confronted with the initial challenge of stakeholder identification. The corresponding challenge was to draw boundaries to define whom qualifies as a stakeholder. Theoretical debates, for example, continued with respect to the status of the natural environment and non-human entities, or future generations (Kortetmäki et al., 2022; Laine, 2010). The ongoing theoretical disagreements indicate that there is no overall agreement on who or what qualifies as a stakeholder in sustainability science. Nonetheless, stakeholder identification developed into a prominent and frequently used analytical tool in various environmental management fields, with empirical insights emerging on renewable energy (Johnson et al., 2013; Li et al., 2017), protected areas and conservation (de de Marins Costa et al., 2022), mining (Famiyeh, 2017), forests (Elbakidze et al., 2012; Raum et al., 2021), fisheries (Duggan et al., 2013; Krupa, 2016) and water resources (Hargrove and Heyman, 2020). These studies overall illustrate how stakeholder research has empirically moved forward, while theoretical foundations may still be contested.

3. Stakeholder identification approaches

The literature on stakeholder identification approaches covers a

wide range of different methods, sources, and sampling strategies. Recent literature reviews in environmental resource management have provided extensive insight into the use and application of these identification approaches (Bendtsen et al., 2021; Hoare et al., 2023). Table 1 summarizes some of the most prominent approaches and related methods and sources that can be used for stakeholder identification. Analytical approaches refer to reviewing of e.g. archival documents (Johnson et al., 2013), websites (Raum, 2018; Tsang et al., 2021) and academic literature (Inam et al., 2015). Arguably, pilot studies with participant observations could also be added to this category, as scoping research and field visits can likewise be useful for stakeholder identification (Mannetti et al., 2019). The second approach refers to different sampling techniques. Hoare et al. (2023) differentiate between purposive, stratified, and snowball sampling and, similar to Bendtsen et al. (2021), found that snowball sampling is used most frequently. Snowball sampling refers to the process where participants are asked to recommend or nominate additional stakeholders in e.g. informal conversations, expert consultations, or interviews. Although somewhat linked to sampling, the third approach has a more explicit emphasis on participant involvement. Prominent methods mentioned with more in-depth participant involvement include, for example, focus groups and questionnaires, where multiple participants are consulted to inform the identification process (Li et al., 2017).

Overall, stakeholder identification thus presents an overarching methodological umbrella term, which results in different theoretical points of departure and approaches that can be operationalized in different ways (see Table 1). Researchers can use qualitative and quantitative research methods and rely on primary and secondary sources. These approaches have furthermore shown to vary significantly in terms of the resources and experience needed. Some approaches, particularly those involving participants, were described as more time- and labor-consuming and intensive than others (Es'haghi and Karamidehkordi, 2023; Haddaway et al., 2017; Raum et al., 2021).

4. Procedural justice in stakeholder identification

Procedural justice refers to the (perceived) fairness of processes, and the design of just decision-making procedures (Hanger-Kopp et al., 2024). It is linked to the demand for recognition of entities as stakeholders, inclusiveness of diverse and marginalized voices, epistemic justice with respect to the access and value of knowledge, as well as interactional justice (George and Reed, 2016; Holland, 2017; Zimm et al., 2024). Procedural justice is deeply entrenched also with the legitimacy of institutions and process outcomes. In the sustainability sciences, procedural justice has been discussed particularly in environmental governance and decision-making (George and Reed, 2016; Maguire and Lind, 2003; Marion Suiseeya and Caplow, 2013). Stakeholder identification only intersects with some aspects of procedural justice. To explore these intersections, we employ three related categories proposed by Simcock (2016) and discuss some of the pertaining issues. *Inclusion* refers to who is given a voice in the decision-making process; *influence* relates to what extent participation influences the decision outcomes; and *information* applies to the availability of materials and transparency throughout the decision-making process (Simcock, 2016).

4.1. Inclusion & the usual suspect issue

Strategies for identifying stakeholders have repeatedly been criticized as inconsistent and biased, which has been attributed, amongst other factors, to the purposeful selection of well-known stakeholders (Haddaway et al., 2017) and issues of representation and diversity of the stakeholders identified. Research with practitioners in the mining sector, for example, has underlined that some stakeholders are invited much more frequently than others (Mercer-Mapstone et al., 2019). Moreover, inclusivity often appears to play a negligible role in many

research projects, as Bendtsen et al. (2021) found that only 4 % of the studies reviewed in their work specifically aimed to include marginalized stakeholders. This phenomenon has been coined as the *usual suspect issue* (Colvin et al., 2016; Lang et al., 2012; Reed et al., 2009), or stakeholder *elitism* (George and Reed, 2016). Lang et al. (2012) described this issue as the temptation of researchers to rely on a network of usual suspects including those previously involved in research projects, or people generally interested in civic participation, such as professional participants (Colvin et al., 2016). Colvin et al. (2016) further elaborate that the exclusion of unconventional stakeholders can also be due to cognitive and institutional factors, with certain policies or mandates reinforcing the tendency to rely on these usual suspects. Inclusion issues in stakeholder identification may accordingly be an unintended result of subconscious preferences by the researchers and the institutional context they work in; or it could be driven by more pragmatic issues, such as accessibility, feasibility, and research habits.

When examining the different stakeholder identification approaches, the risk of identifying the usual suspects may be relevant to several of the identified approaches. In the analytical approaches, academic literature may show higher levels of pre-existing knowledge bias, as the authors of those sources were likely scholars embedded in academic networks, grounding their work on previous research efforts. When relying on expert consultations or snowball sampling, stakeholder nominations are likely based on subjective observations and past experiences of the researcher and participants (Li et al., 2017). At the same time, these sampling based approaches offer prospects to diversify the perspectives informing the identification process beyond the researcher alone. For approaches involving participants, the commitment & resource bias may be particularly relevant to issues of inclusiveness because some stakeholders may not be able to afford to partake in the identification (Kuhn et al., 2023). In this instance, inclusion in the identification may be more of a structural issue, rather than a matter of oversight or unintentional exclusion due to cognitive biases.

4.2. Influence & top-down issue

Reed et al. (2009) differentiate between top-down approaches on the one hand, where researchers review sources and identify stakeholders, and bottom-up approaches on the other hand, when participants are involved in the identification. Stakeholders are typically identified in a top-down manner (Raum et al., 2021), which means the investigating researcher leads the stakeholder identification process without involving stakeholders in the identification. Accordingly, the degree of influence that the researchers have is to be seen in contrast to the research participants' ability to influence or say in whom is being identified. Simcock (2016) adds that influence deals with how suggestions and concerns by participants are taken into consideration. The author distinguishes different types of participation, with stakeholders listening as spectators, exercising consultative influence or exerting direct authority. In other words, influence is concerned with the meaningful participation of stakeholders and deliberative and equitable knowledge-sharing for the purposes of identification. Chunga et al. (2023) for example found in their study that individual interviews mostly helped to pinpoint government stakeholders, group discussions however resulted in more diverse and numerous identification. Accordingly, they conclude that even though individual approaches are quicker and cheaper to implement, such approaches miss out on opportunities to identify more stakeholders (Chunga et al., 2023).

Although the top-down critique and a lack of participant influence are usually discussed governing sustainability projects (Elbakidze et al., 2012), it shows to apply to established stakeholder identification practices as well. Influence seems to be foremost pertinent to the analytical identification approaches. Academic literature analysis, for example, is mostly conducted by individual researchers and relies on previous research work, likely to maintain and reinforce top-down identification. The hierarchical and centralized nature of such top-down approaches is

because related methods are usually a lot easier to execute, given that stakeholder identification is rarely the sole aim of a research project. Interviews, questionnaires and focus-groups are considered bottom-up approaches because stakeholders can contribute to the research (Bendtsen et al., 2021). These approaches are seen to potentially bypass top-down identification approaches (Colvin et al., 2016) since participants can influence in the identification process. But this still depends on the degree of participation and subsequent influence credited to participants. None of these methods however guarantee that different voices are actually influencing the decision outcome, and the involvement may be passive. The issue of influence is thus closely related to inclusion and the balancing of stakeholders in focus groups and workshops, which likewise influences the procedural justice in bottom up identification processes.

4.3. Information & the transparency issue

Many times, stakeholder identification occurs without conducting a detailed analysis (Li et al., 2017). Research has thus repeatedly emphasized that stakeholder identification processes are rarely explicitly mentioned in the literature (Achterkamp and Vos, 2007; Fritz et al., 2018). In their systematic review, Bendtsen et al. (2021) for example found that in 33 % of the studies analyzed, it was neither clear who the identified stakeholders were nor why they had been included. This points to the issue of transparency in stakeholder identification, or limitations in scientific practice with regard to “*sharing information and acting openly*” (Chen and Musango, 2022, p. 7). Sharing information in this instance entails explicit references to the approaches used to identify stakeholders.

The transparency issue is thus closely related to the documentation and availability of information later on, influencing the degree of accountability (Marion Suiseeya and Caplow, 2013). Exact protocols for how such processes are to be documented are, however, rare. Concerns regarding information sharing may not only show in the overall identification procedure, but are also difficult in approaches based on recommendations and snowball sampling. Tracing and replicating results is confined by the contextual and situational nature of, e.g., informal conversations. In other approaches, like the analytical ones, ensuring traceability may thus be easier. Analytical approaches, which rely on systematic literature review or similar replicable research methods, may thus facilitate a more transparent identification process.

5. Integrated stakeholder approaches

Each stakeholder identification approach, when viewed through the lens of procedural justice, has issues or limitations, which produce blind spots and biases that prevent the inclusion of lesser-known stakeholders (Colvin et al., 2016; Haddaway et al., 2017; Tsang et al., 2021). Against

this background, critical scholars have advocated the combining and mixing of different identification approaches (Fritz and Binder, 2018; Hoare et al., 2023; Raum and Rawlings-Sanaei, 2022). This enables researchers to make use of the prospects to address procedural justice shown in Table 1 and reveals additional complementary opportunities for integrating different approaches. Thus, we further examined such integrated stakeholder approaches, including the step-by-step guides that have been proposed (Fischer, 2019; Raum and Rawlings-Sanaei, 2022), recommendations that were articulated (Bendtsen et al., 2021; Fritz and Binder, 2018), and principles developed to enable more just stakeholder identification processes (Gregory et al., 2020; Pouloudi and Whitley, 2017).

These identification approaches generally have in common that they advocate for an iterative process in which different methods and sources are being integrated (Fritz and Binder, 2018; Raum, 2018; Tsang et al., 2021). The flexibility related to this iterative process makes continuous revisions, refinements, and amendments of the identified stakeholders possible, and arguably posits a never-ending task within a dynamically changing stakeholder landscape. Integrated approaches to stakeholder identification are furthermore composed of mixed methods and multi-source analysis, which can help to triangulate and scrutinize the stakeholders identified, promising a more reliable and verifiable stakeholder identification process (Haddaway et al., 2017). This is because comparing the results of different sources allows for a closer examination of overlaps and differences between the stakeholders mentioned in different sources (Holm and Fischer, 2023). Accordingly, social media platforms like Twitter, for example, may reveal more stakeholders compared to conventional newspapers because there are lower entry barriers to participate in online debates (Holm and Fischer, 2023). Similarly, qualitative and quantitative methods were found to identify different stakeholders (Wutich et al., 2020).

Although diverse terminology is used to describe the phases of stakeholder identification, integrated approaches can generally be summarized in an initial design or planning phase, followed by the data collection phase and subsequent data analysis. Each phase is then comprised of several research steps, with the order somewhat varying in different works. Fritz et al. (2018) and Hoare et al. (2023) for example, begin the identification process with the definition of the research problem and issue. Other works, like Holm and Fischer (2023) begin with setting the selection criteria for the stakeholder identification process. Data collection then entails the use of one or more methods to analyze different sources including some verification or validation steps in between (Fritz and Binder, 2018; Raum and Rawlings-Sanaei, 2022). Verification may be consultations and reflections within the research team, consulting additional sources and exchanging with experts or other stakeholders. Another step listed in some works is the visualization of results. Especially visual stakeholder mapping processes have accordingly been proposed as promising iterative tools to help

Table 1

Stakeholder identification approaches encompassing different methods and sources (adapted from Hoare et al., 2023, Bendtsen et al., 2021, Reed, 2009). Examples provide illustrative applications from the literature. Next to some advantages of each approach, both procedural justice issues and prospects are listed.

Approach	Method	Sources	Example	Procedural justice issue	Procedural justice prospect
Analytical Approaches	Literature Review	Academic literature Policy documents Media Websites	(Johnson et al., 2013; Raum et al., 2021; Tsang et al., 2021)	Pre-existing knowledge bias in the sources (Inclusion) Top-down approach (Influence)	Large verifiable data set (Transparency)
Purposive/Snowball sampling	Interviews Questionnaire Informal conversations	Stakeholder nomination Professional networks	(Duggan et al., 2013; Mercer-Mapstone et al., 2019; Rahimi-Feyzabad et al., 2022)	Pre-existing network bias (Inclusion & Influence) Traceability and replicability issue (Information)	Diversified perspectives (Influence)
Participant involvement	Interviews Focus groups Workshops	Experts Key informants	(Elbakidze et al., 2012; Mannetti et al., 2019; Wutich et al., 2020)	Commitment & resource bias (Inclusion) Unbalanced group of participants (Inclusion)	Stakeholder representation (Inclusion)

Table 2

A synthesis of different phases, steps and corresponding guiding questions that capture an integrated and iterative approach to stakeholder identification.⁴

Phase	STEPS	Guiding Question	Procedural Justice Implications
Design	Research Objective	What is the objective of the research and stakeholder identification?	Inclusion: examining goals/focus/issue of the research e.g. whether stakeholder inclusiveness is part of the objective (Bendtsen et al., 2021)
	Identify Sources & Methods	What data sources are available and what methods can I use to analyse these?	Inclusion: Multiple data source(s) help in addressing the usual suspect issue (Holm and Fischer, 2023) Inclusion: Triangulate methods to provide a more comprehensive and reliable view of the stakeholders (Fritz et al., 2018) Information: Using reputable published lists and authorized sources in the identification increases the chances that these have been screened for rigor and transparency (Raum, 2022) Influence: Early co-design helps in developing shared understandings and facilitate communication e.g. on the purpose of stakeholder identification (Leventon et al., 2016)
	Documentation	How do I best ensure data traceability?	Information: The creation of a replicable database and systematic gathering of data will later add to ensure replicability and transparency (Raum et al., 2021)
	Selection Criteria	What are the selection criteria for stakeholder identification?	Information: Selection criteria enable transparency and research defensibility later on in the research (Raum and Rawlings-Sanaei, 2022; Sharpe, 2021; Tsang et al., 2021)
	Planning	What is the timeline of the identification procedure?	Information: Stakeholder landscapes are changing (Mannetti et al., 2019) and identification only provides snapshot in time (Fritz et al., 2018; Hoare et al., 2023; Mannetti et al., 2019)
	Coding	What information about the stakeholders do I collect?	Inclusion: Stakeholders have multiple roles and are members of different groups that can be accounted for (Gregory et al., 2020)
Data Collection	Extraction	Who meets the selection criteria in e.g. the literature?	Information: Documentation of how the potential stakeholders were assessed is important for transparency in decision making (Sharpe et al., 2021)
	Validation/ Verification	What stakeholders are additional sources revealing?	Influence: Verification e.g. semi structured interviews with experts can help in pointing to additional sources and stakeholders (Eshagi, 2023)
Data Analysis	Categorization/ Classification	How can I classify & categorize stakeholders?	Inclusion: Going beyond predefined classifications and groupings can help address cognitive bias (Fritz et al., 2018; Gregory et al., 2020; Holm and Fischer, 2023)
	Visualization	How do I synthesize my findings?	Inclusion: e.g. visual tools like mapping can help to identify representation gaps (Chen and Musango, 2022; Hoare et al., 2023; Raum, 2018)

⁴ *Main sources consulted for this synthesis included Fritz, M. M. C., Rauter, R., Baumgartner, R. J., & Dentchev, N. (2018). A supply chain perspective of stakeholder identification as a tool for responsible policy and decision-making. *Environmental Science & Policy*, 81, 63–76. <https://doi.org/10.1016/j.envsci.2017.12.011> , Haddaway, N. R., Kohl, C., Rebelo da Silva, N., Schiemann, J., Spök, A., Stewart, R., Sweet, J. B., & Wilhelm, R. (2017). A framework for stakeholder engagement during systematic reviews and maps in environmental management. *Environmental Evidence*, 6(1). <https://doi.org/10.1186/s13750-017-0089-8> , Hoare, V., Hinson, C. E., Reyniers, B. M., O'Shea, R., & Howe, C. (2023). MAPTKit: An environmental management decision-tool for inclusive, equitable and representative stakeholder attribute mapping. *Ecological Solutions and Evidence*, 4(2). <https://doi.org/10.1002/2688-8319.12235> , Holm, F., & Fischer, A. P. (2023). Combining multiple data sources to identify actor involvement in environmental governance: Wildfire in the American West. *Environmental Science & Policy*, 147, 361–378. <https://doi.org/10.1016/j.envsci.2023.05.022> , Leventon, J., Fleskens, L., Claringbould, H., Schwilch, G., & Hessel, R. (2016). An applied methodology for stakeholder identification in transdisciplinary research [Article]. *Sustainability Science*, 11(5), 763–775. <https://doi.org/10.1007/s11625-016-0385-1> , Raum, S., & Rawlings-Sanaei, F. (2022). WCM: A web content-based method of stakeholder analysis. *MethodsX*, 9, 101635. <https://doi.org/10.1016/j.mex.2022.101635> , Raum, S., Rawlings-Sanaei, F., & Potter, C. (2021). A web content-based method of stakeholder analysis: The case of forestry in the context of natural resource management. *J Environ Manage*, 300, 113733. <https://doi.org/10.1016/j.jenvman.2021.113733> , Tsang, E. M., Barnes, J. C., & Dayer, A. A. (2021). A Web-Based Approach to Stakeholder Analysis for Identifying and Understanding Broader Constituencies in Wildlife Conservation. *Society & Natural Resources*, 34(8), 1133–1146. <https://doi.org/10.1080/08941920.2021.1921319>

researchers systematically collect data (Raum, 2018), strengthen dialogue with participants (Styk and Bogacz, 2022) and reflect on equitable stakeholder representation (Hoare et al., 2023). Table 2 synthesises these efforts and includes visualization, as a more recent innovation, that also from the authors experience has been extremely useful (see also Section 6, case study).

Furthermore, it is important to highlight that guidelines propose a variety of sequences, which shows that phases and steps may vary depending on the study design. Indeed, steps in stakeholder engagement are often unfolding iteratively, if not simultaneously. The tabular overview is thus just indicative of the various prospects to build in different approaches and methods, and iterations to verify the stakeholders identified (Raum and Rawlings-Sanaei, 2022; Raum et al., 2021). The guiding questions and related opportunities to consider procedural justice are mostly illustrative, rather than exhaustive. One also needs to consider the varying objectives that were pursued in these different works. Haddaway et al. (2017) and Leventon et al. (2016) for example designed their guidelines with stakeholder engagement in mind, whilst Tsang et al. (2021) and Raum and Rawlings-Sanaei (2022) were more focused on developing a tool for web-based analysis. Yet, despite these differences, they generally share a common point of departure in that they seek to contribute to more systematic, robust, and

transparent scientific research approaches for stakeholder identification in the sustainability sciences. In synthesizing from these approaches, tools, and recommendations, various procedural justice implications manifest alongside the operationalization of stakeholder identification. Others, like Haddaway et al. (2017) have somewhat similarly referred to these as mitigation strategies to reduce bias. Collecting these and assigning them to the different steps thereby shows a synthesis of concrete steps, questions and strategies to address procedural justice throughout stakeholder identification.

6. Case study

Despite these promising integrated approaches to stakeholder identification, recent literature reviews on stakeholder identification suggest that these have not yet translated into firmly established practices (Bendtsen et al., 2021; Hoare et al., 2023) and it is not entirely clear why. Despite finding that procedural justice issues are recognized in the literature from a theoretical perspective, especially in environmental and resource management, we find that an engagement with these procedural questions in the stakeholder identification process is rarely made explicit, especially in empirical research applications. To therefore advance the current state-of-the-art in stakeholder identification, we

used the three phases and corresponding steps for stakeholder identification to reflect on our case study experiences from a research project on the distributional effects of climate change impacts in Austria.

6.1. Design – research objective, selection criteria

The overarching aim of the DISCC-AT project was to inform decision makers in Austria about group-specific social vulnerabilities to key climate risks – flood and heat related health risks– as well as the within-country distributional effects of climate change impacts and adaptation on a national scale. The project thus considered expressly diverse and marginalized stakeholders, who are frequently vulnerable to climate risks. Considering procedural justice, this would call for amplifying lesser-heard voices through inclusive research practices starting early in the project. However, because of the overall scope of the project, focusing on national economic implications, and the limited resources, it was clear from the beginning that involving vulnerable stakeholders directly was not an option. Vice versa, important criteria for including stakeholders were the proximity of stakeholders' operations, activities, and expertise on people vulnerable to flood or heat risk. Stakeholder identification for the project, thus had at least two specific objectives, first navigating the scope of the study with the diverse stakeholder profiles and interests at local, regional, and national levels, and second creating a database for selecting stakeholders for a variety of interactions, such as informal conversations, workshops, and interviews.

6.2. Design – planning, data sources & methods, documentation

Stakeholder identification and engagement started at the proposal writing stage and continued throughout most of the project (October 2022 - January 2025). The identification followed no protocol but was planned as an iterative and explorative exercise building on ideas of qualitative systems mapping (Hanger-Kopp et al., 2024). This mapping inspired the continuous visualization of the stakeholders identified, as well as the continuous expansion of the resulting stakeholder map. Main data sources were the extensive experience of the interdisciplinary project team itself, the stakeholders involved, as well as results from previous projects and academic literature.

Seeking a well-structured and coordinated effort, a shared table format was built, which was also used as a backend for visualizations producing stakeholder maps from an early stage of the project. The program kumu.io was selected for both visualization and documentation, with a table underlying each map. We ensured to track when and how information was added to the map to keep a transparent log. Ultimately, two versions of the map were necessary, one for project internal communication with stakeholders and an anonymized version for documentation beyond the project.

6.3. Data collection - extraction and validation

The first iteration was a brainstorming exercise by the research team, where stakeholders were listed, who had some relation to the key research issues. The stakeholder map was developing in the preparatory phase of the first workshop based on stakeholders that were mentioned during informal conversations, and also during the subsequent workshop, as well as interviews.

Next to these interactive efforts, additional sources were consulted. This included reviewing pre-defined lists from civil society organizations and a web search with different strings including *human rights organizations in Austria*, *advocacy organizations* and *disaster management organizations*, which however only resulted in five additional stakeholders being identified. The researchers found in this instance that it was difficult to formulate a meaningful search string to identify especially those stakeholders operating at the intersection of social vulnerabilities and climate risks. Also, reviewing websites was difficult, because of the various ways organizations were providing information

concerning their operations. In subsequent team meetings, and with the stakeholder engagement in mind, stakeholders were thus excluded from the list, if neither social vulnerability and climate risks (heat and flood), or at least one of these topics was mentioned on their website. They were, however, kept on the map for transparency, but not engaged at later stages.

Next to the team efforts and web search, an academic and grey literature review was conducted primarily aiming to summarise the already identified factors and drivers of social vulnerability in Austria, and three stakeholders were added to the map. In this instance, numerous quantitative modelling studies were analysed, which perhaps explains why only few additional stakeholders were identified in this stage. The preliminary stakeholder maps were then consulted to select and invite stakeholders to the first science-stakeholder workshop of the project. In the beginning of the workshop, a printed version of the preliminary stakeholder map was presented to the participants, who were asked to help complete the map. Interestingly, no additional stakeholders were identified at this stage, which may however have been due the limited time and room available for the exercise. Accordingly, the majority of stakeholders were identified between the start of the project and the first workshop. Subsequent additions to the stakeholder map were mostly identified in the context of networking and outreach events such as conferences, as well as during interviews and in the preparation phase to the second stakeholder workshop.

6.4. Data analysis - categorization & visualisation

Because the research looked at the distribution of risks and vulnerabilities on a national scale, stakeholders were instantly categorized on national and provincial levels, and aggregated at the organizational level, identifying departments and, where available, individuals that could be contacted. Some of these maps are presented in Figs. 1 and 2, illustrating stakeholder mapping snapshots, which were further advanced throughout the project and subject of repeated reflection within the team and together with the stakeholders.

6.5. Case study learnings

In retrospect, the case study showed that an iterative process addresses several concerns of procedural justice that coincide with stakeholder identification; at the same time, it confirmed that procedural justice concerns often collide with pragmatic decision-making.

6.5.1. Inclusion through interdisciplinarity & triangulation

In the design phase of the case study, we found that including vulnerable groups was not feasible, which was reflected in the identification objective early on. Instead, we pursued a descriptive objective, which was to navigate through the Austrian stakeholder landscape, and an instrumental objective, which was to identify stakeholders for subsequent research engagement. In the data collection phase then, inclusion was at least partially addressed because the project team comprised experts from various disciplines who had not cooperated in this constellation before, yet worked on similar issues at a variety of scales. Furthermore, team members who were new to the research topic were part of the team and likewise invited to add stakeholders. Involving the entire team in an effort to collectively map helped to partially address the issue of the usual suspects (Spangenberg, 2011; Colvin, 2016), because several people were involved in the mapping. Triangulation of sources happened throughout the identification process but was rather a co-benefit of other data collection and analysis efforts. In hindsight, conducting stakeholder identification alongside ongoing research processes showed feasible and time efficient, but suggested that multiple data sources alone may not always reveal additional stakeholders.

6.5.2. Influence through bottom-up approaches

The identification process was primarily organized in a top-down

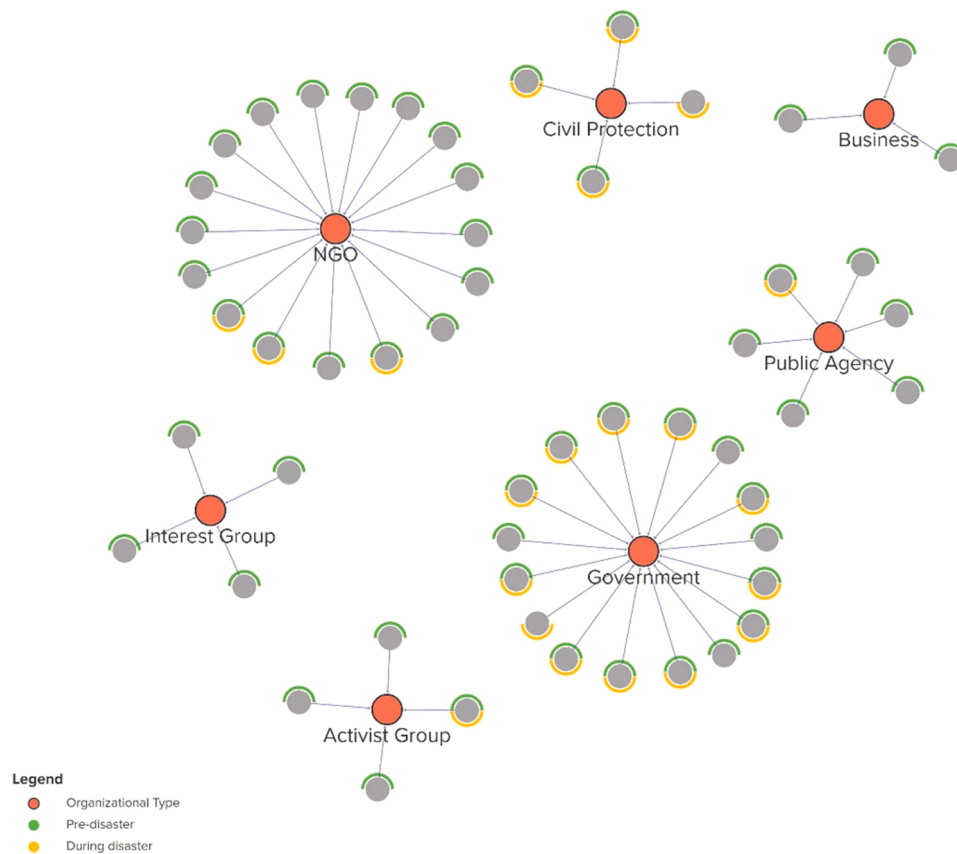


Fig. 1. shows a stakeholder map produced with kumu.io and depicts the organizational types considered in this study connected to each other. The color code of each node (stakeholder) provides an indication of the phase of disaster risk they are concerned with (pre-disaster — anticipation phase; or during disaster — resistance and coping phase). This is based on literature that outlines the importance of considering different temporal scales in order to analyze vulnerability to climate impacts, which is why we emphasized this scale in the stakeholder map. There is a balance between NGOs and governmental organizations on the map, but an imbalance regarding other organizational types. Even though civil protection is usually centered around post-disaster aid, analysis has shown that these services are often also concerned with social vulnerability in pre-disaster phases.

manner, which was arguably one of the main weaknesses in the identification process, at least when viewed through a normative lens. One of the more implicit selection criteria we identified in relation to the instrumentalist objective was related to research “engageability”. Namely, anticipating whether some groups were more or less likely than others to participate in the research project and this was mostly based on experiences of the researchers. Having connections to important decision makers and experts promised to make the outreach easier and increased the chances of participation. Reasons to exclude some stakeholders were thus also possible stakeholder fatigue (Gramberger et al., 2014; Støttrup et al., 2019), meaning stakeholders that are unwilling or unable to participate because of numerous uncompensated requests in the past and the workload related to partaking in research projects. Discussions in the team revealed the difficulty of balancing between the history of prior consultation experiences and ensuring procedural justice and inclusiveness throughout the identification. However, identifying, listing and mapping even those stakeholders who were later not engaged, helped to ensure a degree of transparency and traceability to review these decisions at later stages, and follow up on these in future research projects.

Stakeholder involvement through the workshop facilitated a bottom-up identification opportunity but did not result in additional stakeholders being identified. Although this can be interpreted as a satisfying result in which a sufficient degree of saturation has been reached, we found that simply asking for completion may not always be enough to obtain additional nominations and recommendations. Similar to what other scholars suggested (Haddaway et al., 2017; Kuhn et al., 2023;

Leventon et al., 2016), we learned the engagement effort was confronted with time constraints, and participants may need further encouragement to help scrutinize the stakeholders identified. Here, alternative methods like questionnaires or focus groups could have potentially yielded additional insights.

6.5.3. Information through documentation & transparency

The project made an effort in transparent documentation and communication. Especially the continuous visualization helped to ensure both a degree of systematicity in the identification process and well-structured documentation. Similar to Hoare et al. (2023), we found that the stakeholder map helped to reflect on potential representation gaps, or blind spots. Analyzing the distribution of stakeholder groups on the map indicated that visualizing stakeholders through categorizations (e.g., geographical location, governance level, economic sectors) helped gaining insights on who may be missing. These blind spots, like for example local government bodies could then be searched for and added to the map. Reflecting on these case study experiences thereby revealed procedural justice issues and biases in our identification process especially with regard to inclusion and influence. Yet, making these explicit, reflecting on them, and addressing the inevitable risks of certain groups falling off the radar (Maguire & Allan Lind, 2003; Marion Suiseeya and Caplow, 2013), helped in better navigating the abundance of different stakeholders typically found in research on complex problems.

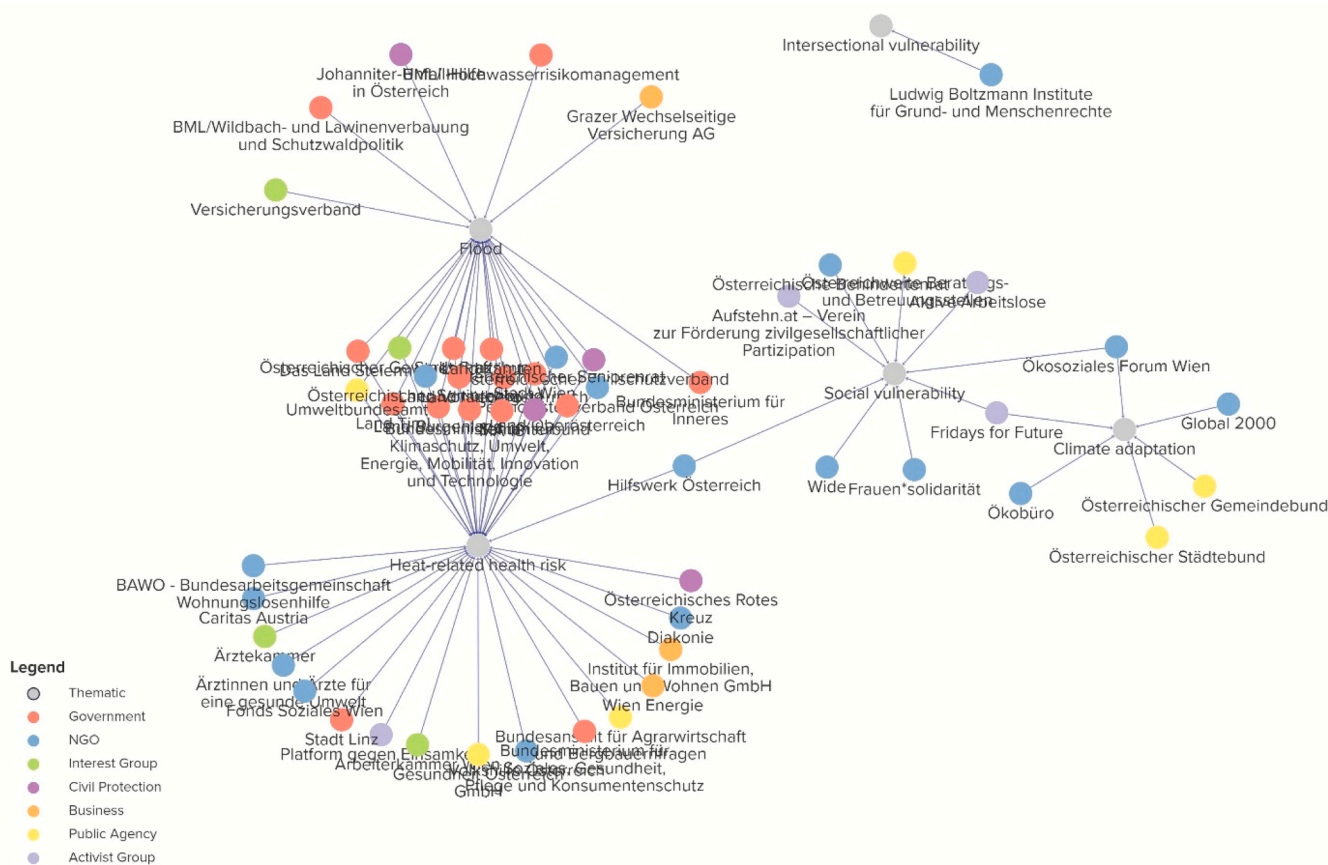


Fig. 2. was built from the table created during the stakeholder identification and depicts different stakeholders as colored nodes. These were categorized and connected accordingly to at least one thematic focus area such as flood- and heat-related health risk. They are also classified according to organizational type (NGO, government, public agency, business, etc.). These thematic tags, which are visualized as blue nodes, are based on the scope of the study, namely the goal of developing indicators for social vulnerability and climate adaptation to flood- and heat-related health risks. As the research focus lies on the two different climate impacts, most of the stakeholders identified focus on at least one of them.

7. Discussion

Donaldson and Preston (1995, p. 71) wrote “normative concerns dominated the classic stakeholder theory statements from the beginning” and Agle et al. (1999) concluded over two decades ago that a normative discourse remained indispensable to stakeholder theory in business management. When examining stakeholder identification in the sustainability sciences today, we may reach similar conclusions when reflecting on the question of who matters to researchers, especially when viewed through the lens of procedural justice. This research likewise originated from a somewhat normative point of departure, in which inclusion, influence, and information on identification processes were seen as desirable attributes to make stakeholder identification more procedurally just. Such a claim was not substantiated with empirical evidence and requires further examination regarding the empirical benefits and disadvantages that may emerge regarding the quality and reliability of subsequent research outcomes.

By adopting the conceptual delineation of procedural justice from Simcock (2016), namely the three categories of inclusion, influence, and information, we furthermore extracted these terms from the research context in which they were previously used. The author developed the analytical framework from a range of literature and insights articulated by research participants in public opposition to infrastructure (Simcock, 2016). This does not affect the conceptual relevance of these categories to stakeholder identification, but highlights that other conceptual dimensions and parameters of procedural justice were not considered in the analysis. It would thus be interesting to explore, how other types of

justice, like distributive and corrective justice (Hanger-Kopp et al., 2024) interact with stakeholder identification. Overall, we however believe procedural justice was particularly relevant for stakeholder identification based on the premise that even the study of distributive injustices, such as environmental harm that is disproportionately suffered by some groups, requires prior identification of these groups (Juhola et al., 2022).

The applied justice dimensions are furthermore not mutually exclusive or fully distinct, which proved to be analytically challenging. Including different stakeholders, for example, determines whether different participants get the chance to influence the identification process. Here, it became evident that much research has been dedicated to stakeholder identification for engagement purposes (Haddaway et al., 2017; Leventon et al., 2016), but less guidance exists regarding stakeholder engagement for identification. This suggests that procedural justice issues even pertain to research projects with explicit trans-disciplinarity and co-production objectives. Despite aiming for participation, focus often lies more on the engagement efforts than on the initial identification of stakeholders. We found that the identification objectives therefore predetermines to what extent procedural justice issues can be addressed. Therefore, it is crucial to thoroughly evaluate the significance of the stakeholder identification process in a research project and allocate adequate resources. Addressing inclusivity and influence in this instance would then require additional research efforts in the design phase and sufficient resource allocation to conduct an integrated stakeholder identification approach.

Altogether, this makes it difficult, if not impossible, to determine

whether stakeholder identification processes, including our own case study, are procedurally just or unjust. We however had no intention of reaching such definite conclusions. Although different indicators have been developed for measurement (Ruano-Chamorro et al., 2021), our contributions aimed to raise awareness with respect to procedural justice in stakeholder identification and encourage more procedurally just practices.

While integrated and iterative approaches are frequently promoted for normative reasons of inclusivity (Hoare et al., 2023; Tsang et al., 2021), we found the systematic and transparent identification of stakeholders showed additional value. In our case, this showed mainly in the systematic documentation and verification executed through a iterative stakeholder mapping process that arguably contributed to replicability and research rigor. Our research findings, specifically the synthesis and overview of various methods to identify stakeholders, may thus contribute to the field of sustainability sciences, but may likewise appeal to other scientific disciplines working with and on stakeholders.

8. Conclusion

In this paper, we explored stakeholder identification approaches and related issues of procedural justice and tried to understand how and why procedural justice issues materialize in stakeholder identification and assess the extent to which they can be addressed. We began with a brief review of stakeholder theory and examined three approaches: analytical-, sampling-, and participant-driven stakeholder identification. We then analysed each approach through the lens of procedural justice and elicited issues from the literature concerning the inclusion of lesser-known stakeholders, limited influence attributed to participants, as well as overall transparency problems related to the stakeholder identification processes. This led us to a fourth approach for identifying stakeholders, which involves using multiple sources and various analysis methods in an iterative and integrative manner, which arguably help to address procedural justice issues in stakeholder identification. To expand on these approaches, we reviewed our own case study from Austria and discovered that systematically gathering information about the stakeholders identified allowed us to create a more transparent and replicable data collection process. The iterative visualization through stakeholder maps furthermore helped in recognising some of our own biases, which can contribute to more inclusive identification processes. Visual maps thus generated reflexive potential to counteract intuitive and experience-based practices and open promising avenues to ensure more procedurally just stakeholder identification. Certainly, we found that stakeholder mapping is no guarantor or easy fix to foster inclusive and just stakeholder identification, but it may play a role in it. Finally, we see much potential in further investigating the empirical and conceptual implications of the iterative stakeholder mapping process elaborated in this paper. Such a process overview certainly provides no blueprint that applies to any research context, but offers an operational foundation to ensure more procedural just stakeholder identification that researchers can adapt and apply in their own specific contexts.

CRedit authorship contribution statement

Leonard Kwhang-Gil Lemke: Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing. **Julia Beier:** Validation, Visualization, Writing – original draft, Writing – review & editing. **Susanne Hanger-Kopp:** Conceptualization, Funding acquisition, Project administration, Supervision, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

Data will be made available on request.

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