

Jan 17th, 12:00 AM

## **A Taxonomy of Engagement Barriers for Municipal Climate Action Planning: Work in Progress**

Timon Sengewald  
FAU Erlangen-Nürnberg, Germany, [timon.sengewald@fau.de](mailto:timon.sengewald@fau.de)

Tim Posselt  
FAU Erlangen-Nürnberg, Germany, [tim.posselt@fau.de](mailto:tim.posselt@fau.de)

Follow this and additional works at: <https://aisel.aisnet.org/wi2022>

---

### **Recommended Citation**

Sengewald, Timon and Posselt, Tim, "A Taxonomy of Engagement Barriers for Municipal Climate Action Planning: Work in Progress" (2022). *Wirtschaftsinformatik 2022 Proceedings*. 12.  
[https://aisel.aisnet.org/wi2022/student\\_track/student\\_track/12](https://aisel.aisnet.org/wi2022/student_track/student_track/12)

This material is brought to you by the Wirtschaftsinformatik at AIS Electronic Library (AISeL). It has been accepted for inclusion in Wirtschaftsinformatik 2022 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# A Taxonomy of Engagement Barriers for Municipal Climate Action Planning: Work in Progress

Timon Sengewald<sup>1</sup>, Tim Posselt<sup>1</sup>

<sup>1</sup> FAU Erlangen-Nürnberg, Chair of Information Systems – Innovation & Value Creation,  
Nürnberg, Germany  
{timon.sengewald,tim.posselt}@fau.de

**Abstract.** Sovereignty and equity-seeking groups are poorly engaged in municipal climate action planning due to various barriers. By using digital technologies, these barriers may be partly overcome. Due to the multitude of requirements regarding accessibility and simplicity, it is challenging to use or design a single application. Instead, a combination of multiple technologies can help overcome individual accessibility barriers and generate co-creative relationships across all stakeholder groups, allowing all groups to be involved in communication according to their accessibility needs. This study identifies design principles for such digital engagement tools and technologies to improve sovereignty- and equity-seeking groups' engagement within municipal climate action planning. It also provides a toolbox for municipalities to support the design of hybrid online-offline engagement systems with digital technologies. A design science research approach is used to develop a method for analyzing engagement systems.

**Keywords:** climate action planning, engagement barriers, sustainability justice

## 1 Introduction

Involving equity- and sovereignty-seeking groups (e.g., low-income groups, workers affected by sustainability transitions [1]) in municipal decision-making processes for Climate Action Planning/Plans (CAP/CAPs) is a significant undertaking that could be supported using appropriate technology – information and communication technology is broadly used to support governments in their functioning [2, 3]. Since the Club of Rome's "Limits to Growth" report almost 50 years ago [4], more and more communities are addressing the challenges of climate change for their citizens with CAP [e.g., 5–10]. This requires a closer look at two issues: On the one hand, municipalities are faced with the challenge of protecting their communities from the consequences [e.g., 6, 11]. On the other hand, cities and municipalities also play an important role in combating climate change, as they directly influence the greenhouse gas emissions of their operations and land use policies and zoning regulations [6, 10]. There are already many municipalities around the world (e.g., Canada [6], Denmark [7], Germany and the United Kingdom [8]), which are developing CAPs to address this challenge. Few CAPs, however, consider social and racial equity and justice, although CAPs provide a good

opportunity to address equity concerns [5]. At the same time, CAPs can also open up barriers to equity, which is why such concerns should be considered [5]. In this context, the term sustainability justice is often used, which refers to the consideration of the interests of different social groups [12]. In addition, both current and future generations and nature itself as a stakeholder group must be taken into account [13]. However, some stakeholder groups are not sufficiently involved in the decision-making process on municipal CAPs. This could lead to an imbalance, as actually all stakeholder groups should be encouraged and supported by good governance to achieve sustainability justice [12]. While stakeholder engagement is already well established in environmental sustainability management [14], the study of stakeholder engagement to achieve sustainability justice is a relatively new field. Stakeholder engagement can be viewed from both a management and an ethical perspective [15]. The management perspective deals with *"the capturing of knowledge, increasing ownership of the project by users, reducing conflict, encouraging innovation and facilitating spin-off partnerships."* From the ethical perspective, it can *"enhance inclusive decision making, promote equity, enhance local decision making and build social capital"* [15]. Guyadeen et al. [6] have shown that stakeholder engagement and public participation are relatively weak in most plans. According to the authors, there is more focus on information rather than engagement and inclusion. A literature review by Leyden et al. [16] showed that there is little consensus on how to make stakeholder engagement in the public sector more inclusive and increase public participation - even with digital tools. According to Pina et al. [17] and Pratchett et al. [18], three main advantages can be generated through electronic participation: 1) by liberating people from the constraints of time and place, more opportunities for participation can be created, 2) this allows more groups of participants to be addressed, and 3) participation can be improved through better availability of information. For example, research has already shown that stakeholder engagement can be increased and value created through online communities in various domains [e.g. 11, 19]. Online communities are technology platforms that enable their members to exchange, collaborate or interact virtually towards a common goal [20]. Online communities could help to improve engagement by helping overcome geographical, temporal and organizational barriers [21]. While overcoming barriers of time and place in online communities [22] seems obvious, the question arises whether other barriers such as trust and participation [23] can also be dissolved. It may be that digital technologies can potentially break down barriers to entry and enable better engagement. Leist and Smith [24], argue that e-government services are usually monopolies and therefore maximizing inclusion is important. A lack of accessibility and inclusion, in contrast, can lead to the exclusion of certain stakeholder groups, which could, in turn, jeopardize the stated goals of many CAPs, such as a better exercise of liberal democratic values [25] and sustainability equity [5]. The design of digital technologies to support stakeholder engagement within municipal CAP must therefore be done with strict accessibility and inclusivity in mind. To this date, however, there is little research on how specific stakeholder engagement barriers in CAP can be identified and classified, which could help to look for suitable solutions. To ensure better inclusion of equity-seeking groups, and thus to improve sustainability justice, the technologies used must meet the needs of these groups in terms of

accessibility, usability, and usefulness. Therefore, the following **research question (RQ)** is addressed: *How can engagement barriers for municipal climate change planning be systematically characterized and classified?*

By answering this research question, the ability of researchers and municipal community engagement managers to select an appropriate technology for stakeholder engagement in CAP without jeopardizing sustainability justice may be improved as a better classification of barriers may help to improve and simplify the search of suitable technical solutions to overcome these barriers.

## **2 Theoretical Background**

### **2.1 Sustainability Justice within Municipal Climate Action Planning**

CAP evolved in the 1990s and refers to two main areas: 1) the policy setting of goals and actions to address climate change (e.g., reducing greenhouse gas emissions), and 2) actions to adapt to changes caused by climate change [9]. In this context, the orientation of the Municipal CAP towards sustainability justice can be seen [e.g., 5, 26] as it could be already shown that social inequalities can be reinforced by planning activities [26]. For this, the three dimensions of inclusion, equity, and justice must be taken into account [26]. Inclusion aims to involve as many different voices and perspectives as possible in the decision-making process [26] – inclusion thus aims to reach citizen participation. For example, by including equity- and sovereignty-seeking groups (e.g., *people experiencing homelessness, low-income groups, racialized groups, immigrants, people with disabilities, indigenous people, 2SLGBTQIA+ and gender-based, youth, and workers affected by sustainability transitions* [1]). Equity should address the equal and fair distribution of opportunities and resources regardless of personal background [26]. Justice addresses that minority groups are structurally vulnerable and generationally disadvantaged in their cultural, political, and socioeconomic rights [26]. In this study, we consider barriers to be factors that compromise sustainability justice (in the dimensions of inclusion, equity, and justice).

### **2.2 Engagement Barriers Compromising Sustainability Justice**

Barriers to citizen participation can be considered at different levels. Firstly, a lack of institutional infrastructure and other reasons are attributable to the organization of a state [27]. Secondly, Alemanno [28] describes various factors why citizens do not participate in existing participatory processes. This study focuses on this second type of individual barriers that can be traced back to individual citizens or stakeholder groups. Basically, such individual barriers for non-participation can be divided into two main categories: 1) "*people are willing to contribute but are unable*" and 2) "*people are able but unwilling*" [28]. Among the reasons why citizens who are willing do not participate are cultural and language barriers, socioeconomic status, and disabilities [28]. However, the use of technology can also create new barriers due to disabilities - the literature uses different terms for this (e.g., inclusive design, design for all, universal

access) [29]. Reasons for the second category may include lack of time, lack of trust in policymaking, lack of incentives to participate and lack of interest in policy [28]. Alemanno [28] also mentions lack of awareness as a reason why certain stakeholder groups are not seen in the participation processes [28], but he does not list it as a main category. However, a lack of awareness should also be considered as a separate main category for non-participation, as people could be willing and be able to participate but are simply unaware of the possibility. Overall, it can be concluded that people do not participate because they are either *unaware*, *unwilling*, or *unable*. The reasons for these can again be divided into various subcategories. Attention should be paid to all three causes.

### 3 Research Design

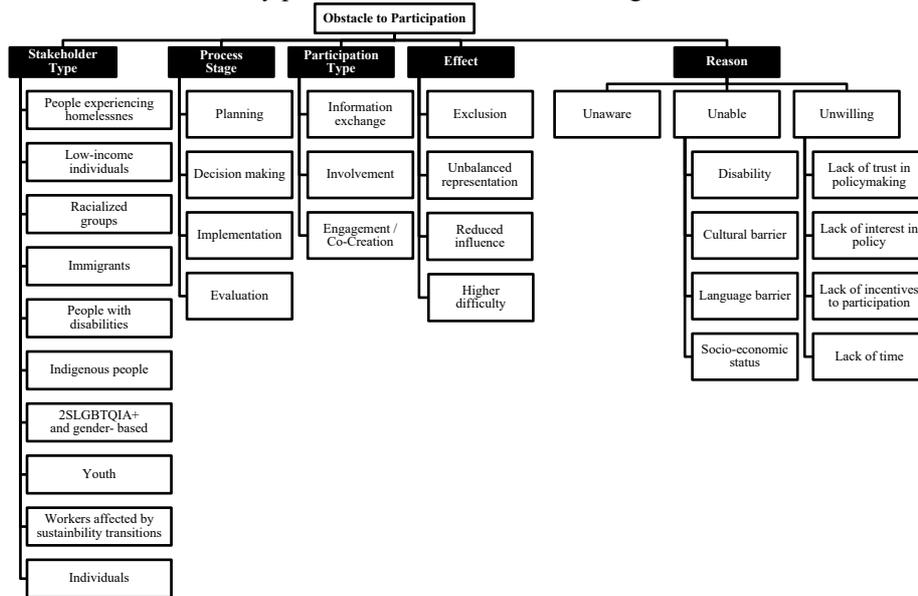
To answer the research question, we plan to apply a design science research (DSR) approach following the principle guidelines of Simon [30], March and Smith [31], and Hevner et al. [32]. The artifact to be created for this purpose consists of a taxonomy for the classification of engagement barriers in the domain of municipal CAP. The users of this artifact are primarily municipal community engagement managers concerned with designing equal and just participation processes for all affected stakeholders. The addressed problem is the simplification of the analysis of a complex problem domain since, due to the nature of technologies or their use, different barriers can cause inequity or injustice. To create this artifact, a taxonomy development method designed for use in the Information Systems discipline [33, 34] is applied. This includes developing appropriate dimensions and characteristics based on a literature review [33]. The resulting artifact will subsequently be evaluated using the extended *Build&Evaluate pattern* of Sonneberg and Vom Brocke [35]. We have chosen a *Purely Technical Artefact DSR evaluation strategy* [36], as a taxonomy can be considered as purely technical in nature and we assume that an application is only suitable in combination with a corresponding application method – which has yet to be developed.

### 4 Artifact Design

Current literature on citizen participation, stakeholder engagement, and municipal CAP was analyzed to define different dimensions and characteristics for clustering engagement barriers in municipal climate change planning. An initial design can be seen in Figure 1. Proposed dimensions are: *Stakeholder Type* – addressing who is affected [e.g., 1, 37], *Process Stage* – addressing when participation is disrupted [e.g., 9, 28, 37–39], *Participation Type* - addressing which kind of participation is hindered [e.g., 37], *Effect* - addressing how equity and justice of participation between all stakeholder groups is impeded [e.g., 1, 37] and *Reason* - addressing to what reason the barrier is related [e.g., 28].

The characteristics of the dimension *Stakeholder Type* are drawn from a previous literature review [1]. The determination of suitable characteristics for the dimension *Process Stage* is somewhat more complicated since there is no consensus in the

literature on the different process stages [e.g., 37, 38]. However, all models in the viewed literature have stages addressing *planning, decision-making, implementation, evaluation*. The dimension **Participation Type**, which deals with the impact of participation, can be characterized as *information sharing, involvement, and engagement or co-creation* [37]. The characteristics of the dimension **Reason** derive from the barriers already presented in the theoretical background section.



**Figure 1.** Initial design of the taxonomy for classifying engagement barriers in CAP

## 5 Conclusion

Although the artifact has not yet been formally evaluated, consultations with the involved stakeholders in the development process indicate the applicability and suitability of the proposed artifact. We anticipate that in a more comprehensive formal evaluation, we will be able to validate the artifact and further expand on the proposed dimensions and characteristics. If the evaluation is positive, the taxonomy presented can help municipal community engagement managers to identify and classify barriers in their engagement processes. The following steps within the research plan include an evaluation of the proposed artifact and developing a method to perform an analysis using this taxonomy. This research contributes to the design of socio-technical systems of citizen participation for CAP, as it helps to classify barriers – caused by technology or for which a solution can possibly be found through technology. With the help of the taxonomy, barriers can then be identified, for which, in turn, solutions can be sought through classification using the taxonomy developed within this study. If necessary, by identifying these barriers and appropriate solutions, higher sustainability justice can be achieved within the CAP.

## References

1. Dobai, J., Riemer, M., Dreyer, B.: Sustainability Justice in the Context of Municipal Climate Action Planning: Key Consideration, <https://researchcentres.wlu.ca/viessmann-centre-for-engagement-and-research-in-sustainability/assets/documents/sustainability-justice-in-the-context-of-municipal-climate-action-planning-key-consideration.pdf>, (2020).
2. Holzer, M.: Restoring Trust in Government: The Potential of Digital Citizen Participaton. *Frontiers of Public Administration*. 6, 6–23 (2004).
3. Malhotra, C., Sharma, A., Agarwal, N., Malhotra, I.: Review of Digital Citizen Engagement (DCE) Platform: A Case Study of MyGov of Government of India. In: *Proceedings of the 12th International Conference on Theory and Practice of Electronic Governance*. pp. 148–155. ACM, Melbourne VIC Australia (2019). <https://doi.org/10.1145/3326365.3326385>.
4. Meadow, D.H., Meadow, D., Randers, J., Behrens, W.W.: *The Limits to Growth : A Report to The Club of Rome ( 1972 )* by Donella H . Meadows , Dennis I . Meadows , Jorgen Randers , William W . Behrens III Abstract established by Eduard Pestel “ The Limits to Growth .” , New York (1972).
5. Schrock, G., Bassett, E.M., Green, J.: Pursuing Equity and Justice in a Changing Climate: Assessing Equity in Local Climate and Sustainability Plans in U.S. Cities. *Journal of Planning Education and Research*. 35, 282–295 (2015). <https://doi.org/10.1177/0739456X15580022>.
6. Guyadeen, D., Thistlethwaite, J., Henstra, D.: Evaluating the quality of municipal climate change plans in Canada. *Climatic Change*. 152, 121–143 (2019). <https://doi.org/10.1007/s10584-018-2312-1>.
7. Damsø, T., Kjær, T., Christensen, T.B.: Local climate action plans in climate change mitigation - examining the case of Denmark. *Energy Policy*. 89, 74–83 (2016). <https://doi.org/10.1016/j.enpol.2015.11.013>.
8. Bulkeley, H., Kern, K.: Local government and the governing of climate change in Germany and the UK. *Urban Studies*. 43, 2237–2259 (2006). <https://doi.org/10.1080/00420980600936491>.
9. Wheeler, S.M.: State and Municipal Climate Change Plans: The First Generation. *Journal of the American Planning Association*. 74, 481–496 (2008). <https://doi.org/10.1080/01944360802377973>.
10. Bassett, E., Shandas, V.: Innovation and climate action planning: Perspectives from municipal plans. *Journal of the American Planning Association*. 76, 435–450 (2010). <https://doi.org/10.1080/01944363.2010.509703>.
11. Barret, M., Oborn, E., Orlikowski, W.: Creating Value in Online Communities: The Sociomaterial Configuring of Strategy, Platform, and Stakeholder Engagement. *Information Systems Research*. 27, 1–37 (2016). <https://doi.org/10.1287/isre.2016.0648>.
12. Agyeman, J., Evans, B.: “Just sustainability”: The emerging discourse of environmental justice in Britain? *Geographical Journal*. 170, 155–164 (2004). <https://doi.org/10.1111/j.0016-7398.2004.00117.x>.
13. Stumpf, K.H., Baumgärtner, S., Becker, C.U., Sievers-Glotzbach, S.: The justice dimension of sustainability: A systematic and general conceptual framework. *Sustainability (Switzerland)*. 7, 7438–7472 (2015). <https://doi.org/10.3390/su7067438>.
14. Amaeshi, K.M., Crane, A.: Stakeholder engagement: A mechanism for sustainable aviation. *Corporate Social Responsibility and Environmental Management*. 13, 245–260 (2006). <https://doi.org/10.1002/csr.108>.

15. Mathur, V.N., Price, A.D.F., Austin, S.: Conceptualizing stakeholder engagement in the context of sustainability and its assessment. *Construction Management and Economics*. 26, 601–609 (2008). <https://doi.org/10.1080/01446190802061233>.
16. Leyden, K.M., Slevin, A., Grey, T., Hynes, M., Frisbaek, F., Silke, R.: Public and Stakeholder Engagement and the Built Environment: a Review. *Curr Envir Health Rpt*. 4, 267–277 (2017). <https://doi.org/10.1007/s40572-017-0159-7>.
17. Pina, V., Torres, L., Royo, S.: Comparing online with offline citizen engagement for climate change: Findings from Austria, Germany and Spain. *Government Information Quarterly*. 34, 26–36 (2017). <https://doi.org/10.1016/j.giq.2016.08.009>.
18. Pratchett, L., Durose, C., Lowndes, V., Smith, G., Stoker, G., Wales, C.: Empowering communities to influence local decision making: systematic review of the evidence. (2009).
19. McLure Wasko, M., Faraj, S.: “It is what one does”: Why people participate and help others in electronic communities of practice. *Journal of Strategic Information Systems*. 9, 155–173 (2000). [https://doi.org/10.1016/S0963-8687\(00\)00045-7](https://doi.org/10.1016/S0963-8687(00)00045-7).
20. Barret, M., Oborn, E., Orlikowski, W.: Creating Value in Online Communities: The Sociomaterial Configuring of Strategy, Platform, and Stakeholder Engagement. *Information Systems Research*. 27, 1–37 (2016).
21. Lember, V., Brandsen, T., Tönurist, P.: The potential impacts of digital technologies on co-production and co-creation. *Public Management Review*. 21, 1665–1686 (2019). <https://doi.org/10.1080/14719037.2019.1619807>.
22. Preece, J.: Sociability and usability in online communities: Determining and measuring success. *Behaviour and Information Technology*. 20, 347–356 (2001). <https://doi.org/10.1080/01449290110084683>.
23. Benlian, A., Hess, T.: The signaling role of IT features in influencing trust and participation in online communities. *International Journal of Electronic Commerce*. 15, 7–56 (2011). <https://doi.org/10.2753/JEC1086-4415150401>.
24. Leist, E., Smith, D.: Accessibility Issues in E-Government. In: Kő, A. and Francesconi, E. (eds.) *Electronic Government and the Information Systems Perspective*. pp. 15–25. Springer International Publishing, Cham (2014).
25. Irvin, R.A., Stansbury, J.: Citizen Participation in Decision Making: Is It Worth the Effort? *Public Administration Review*. 64, 55–65 (2004). <https://doi.org/10.1111/j.1540-6210.2004.00346.x>.
26. Chu, E.K., Cannon, C.E.: Equity, inclusion, and justice as criteria for decision-making on climate adaptation in cities. *Current Opinion in Environmental Sustainability*. 51, 85–94 (2021). <https://doi.org/10.1016/j.cosust.2021.02.009>.
27. Denhardt, J., Terry, L., Delacruz, E.R., Andonoska, L.: Barriers to Citizen Engagement in Developing Countries. *Int. J. of Public Administration*. 32, 1268–1288 (2009). <https://doi.org/10.1080/01900690903344726>.
28. Alemanno, A.: Stakeholder engagement in regulatory policy. In: *Regulatory Policy in Perspective*. pp. 115–158. OECD Publishing (2015). <https://doi.org/10.1787/9789264241800-6-en>.
29. Persson, H., Åhman, H., Yngling, A.A., Gulliksen, J.: Universal design, inclusive design, accessible design, design for all: different concepts—one goal? On the concept of accessibility—historical, methodological and philosophical aspects. *Univ Access Inf Soc*. 14, 505–526 (2015). <https://doi.org/10.1007/s10209-014-0358-z>.
30. Simon, H.A.: The Science of Design: Creating the Artificial. *Design Issues*. 4, 67–82 (1988). <https://doi.org/10.2307/1511391>.
31. March, S.T., Smith, G.F.: Design and natural science research on information technology Salvatore. *Decision Support Systems*. 15, 251–266 (1995).

32. Hevner, March, S.T., Park, J., Ram, S.: Design Science in Information Systems Research. *MISQ*. 28, 75–105 (2004). <https://doi.org/10.2307/25148625>.
33. Nickerson, R.C., Varshney, U., Muntermann, J.: A method for taxonomy development and its application in information systems. *European Journal of Information Systems*. 22, 336–359 (2013). <https://doi.org/10.1057/ejis.2012.26>.
34. Omair, B., Alturki, A.: An Improved Method for Taxonomy Development in Information Systems. *IJACSA*. 11, (2020). <https://doi.org/10.14569/IJACSA.2020.0110470>.
35. Sonnenberg, C., Vom Brocke, J.: Evaluations in the science of the artificial - Reconsidering the build-evaluate pattern in design science research. *International Conference on Design Science Research in Information Systems*. pp. 381–397 (2012). [https://doi.org/10.1007/978-3-642-29863-9\\_28](https://doi.org/10.1007/978-3-642-29863-9_28).
36. Venable, J., Pries-Heje, J., Baskerville, R.: FEDS: a Framework for Evaluation in Design Science Research. *European Journal of Information Systems*. 25, 77–89 (2016). <https://doi.org/10.1057/ejis.2014.36>.
37. Dietz, T., Stern, P.C.: *Public Participation in Environmental Assessment and Decision Making*. National Academies Press, Washington, D.C. (2008). <https://doi.org/10.17226/12434>.
38. Sarzynski, A.: Public participation, civic capacity, and climate change adaptation in cities. *Urban Climate*. 14, 52–67 (2015). <https://doi.org/10.1016/j.uclim.2015.08.002>.
39. Carvalho, A., Pinto-Coelho, Z., Seixas, E.: Listening to the Public – Enacting Power: Citizen Access, Standing and Influence in Public Participation Discourses. *Journal of Environmental Policy & Planning*. 21, 1–19 (2019). <https://doi.org/10.1080/1523908X.2016.1149772>.