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Geo-information tools for stakeholder engagement in environmental decision-making: "best practice" recommendations from a UK case study

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Summary

This paper provides knowledge and recommendations for the "best practice" use of information, communication, and collaboration technologies for stakeholder engagement in UK-based planning and environmental decision-making. Tackling complex environmental issues requires inclusive and participatory decision-making processes, however current frameworks overlook the impact of technology on achieving positive outcomes. We conduct a two-stage study (including a survey, N = 58; and semi-structured interviews, N = 38) to capture experts' experiences of engagement during the Covid-19 pandemic. Results offer a snapshot into the use of participatory geo-information tools – highlighting key challenges and considerations for policymakers and practitioners.

KEYWORDS: public and stakeholder engagement; participatory geo-information tools; environmental decision-making; best practice; UK

1. Introduction

This paper provides insights and recommendations for the "best practice" use of geospatial tools for engagement in planning and environmental decision-making processes. We explore how organisations (including planning and public bodies) engage the public and other stakeholders with environmental, planning, and policy decisions. Our study was conducted during the first coronavirus (Covid-19) UK national lockdown, providing a snapshot of the challenges, opportunities, and areas for future innovation presented by a surge in the use of digital and geospatial tools. This provides a unique opportunity for research because technology-related disparities have been brought into clearer resolution (Robinson and Johnson, 2021), linking with current debates around the changing role and influence of technology in planning and decision-making (Potts, 2020; Zhang, 2019). Our research aims to translate this knowledge into practical, workable recommendations which can be incorporated into frameworks for "best practice" engagement in policy and planning arenas.

1.1 Background

Stakeholder engagement is key for democratic governance, particularly within the context of environmental decision-making. Tackling complex environmental issues requires flexible, adaptable decision-making processes which are inclusive of a diversity of knowledges and values (Reed, 2008). We define participation as a process where individuals, groups, and organisations take an active role in making decisions that affect them (Reed, 2008: 2418). Prominent concepts and frameworks for "best practice" participatory environmental decision-making demonstrate how the likelihood of achieving positive outcomes of engagement can be explained by a variety of factors, including the context, process design, management of power dynamics, and variation across space and time (Reed *et al.*, 2018).

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However, much of this literature overlooks the role and impact of technology in shaping these debates, signifying a gap in current knowledge and understanding in participatory environmental decision-making.

There is a growing reliance on digital tools for participation such as the internet, social networking sites, videoconferencing, and geo-information tools. Participatory geo-information tools (sometimes referred to as geoparticipation) have become a prominent research field (Pánek, 2016), including digital participatory platforms (Falco and Kleinhans, 2018) which often feature geo-located inputs for participatory mapping (e.g. comments, pins, and other geographical features). This study is concerned with *online* and *remote* digital tools and media (including geo-information tools) for public and stakeholder engagement. These studies contribute to our understanding of how geospatial methods can be used to meet the principles and criteria of good governance in spatial planning and decision-making (Mccall and Dunn, 2012). We bring these understandings and recommendations for "good governance" into the arena of environmental management and decision-making, to explore how participatory geo-information tools can be used to inform current frameworks for "best practice" public and stakeholder engagement in the environment sector.

2. Methods

2.1 Context and setting

We captured the experiences, attitudes, and opinions of *engagement coordinators* (i.e. professionals and experts involved with carrying out engagement) regarding their use of geo-information tools and other participatory technologies to involve *participants* (i.e. the public and other stakeholders) in environmental decision-making processes. Here, *environmental decision-making* was broadly defined as any form of decision-making process which aimed to address environmental and sustainability issues. **Figure 1** shows the different areas of specialism included in our study, which embraced a diversity of perspectives from academia, policy, and practice within the environment sector and related areas (such as planning and research).

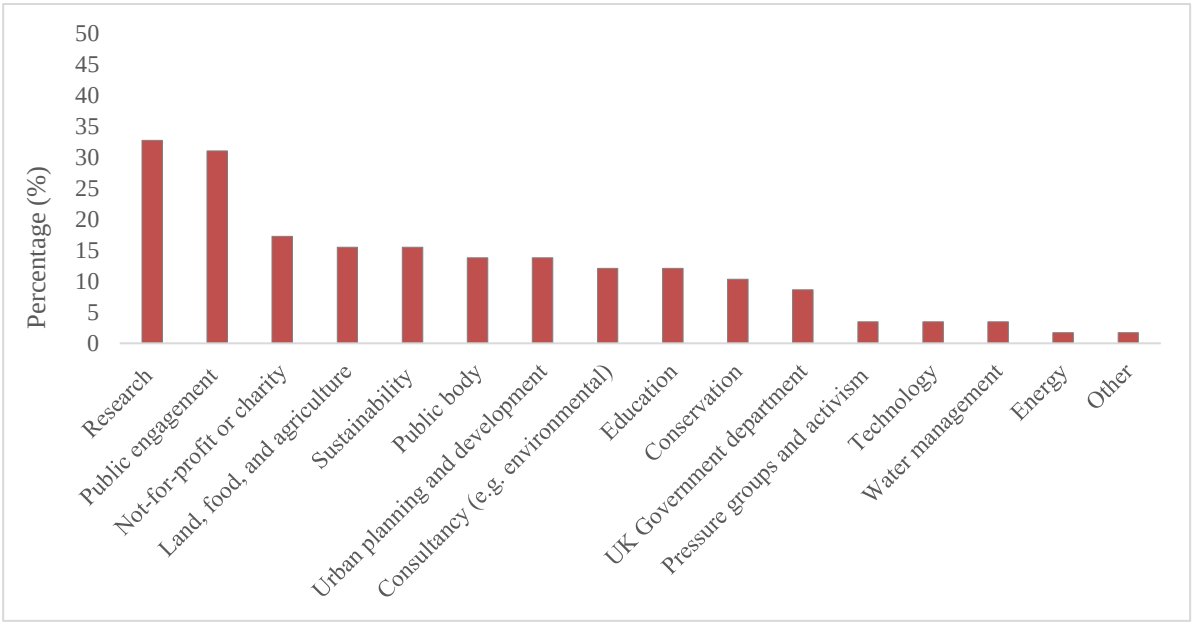

Figure 1. Percentage of study participants working within different areas relating to the environment sector (UK)*

**Out of 58 participants. The percentage of respondents represents the percentage who selected each answer option.*

2.2 Design and data collection

We designed a three-stage mixed-methods study. This paper focuses on the first two stages, however reflects on the third (ongoing) stage as an area for further research. First, we ran a short online survey to explore broad themes in our case study area, collecting information from 58 experts and professionals within the environment sector (and related areas). We launched this survey in May-June 2020, which enabled us to capture a snapshot into the changes, adaptations, and experiences of those conducting public and stakeholder engagement during the first UK lockdown. These themes were used to inform 38 in-depth, semi-structured interviews with participants recruited from the online survey and using a 'snowballing' technique.

3. Results

Our survey showed that public and stakeholder engagement processes had been disrupted by lockdown restrictions – over 80% had moved planned in-person engagement online. Participants reported that they used online participatory mapping (e.g. apps and websites), digital participatory platforms (map-based online consultation platforms Commonplace and Engagement HQ), and GIS software tools (e.g. ArcGIS, QGIS) to facilitate participation. Participants had different understandings of key concepts and terminologies relating to participatory geo-information tools depending on their area of work.

Preliminary analysis revealed some of the challenges and opportunities associated with digital and geospatial participatory tools. We found that experiences and considerations were highly context-dependent and interlinked. Compared to in-person techniques, digital and geoparticipatory tools can increase the accessibility and inclusivity of engagement processes, promoting more representative outcomes through the widening of opportunities to participate. However, others reported the opposite experience – these tools can introduce barriers which can exclude people based on, for example, their socio-demographic background. This can lead to the marginalisation and (further) disempowerment of groups and individuals. Another benefit of online, remote engagement included saving time and resources, e.g. through reduced travel and venue costs. On the other hand, some digital participatory platforms were found to be expensive and required additional training. Others felt that it was beneficial to use a digital map-based 'hub' which can help users make more robust, transparent, place-based decisions based on quantifiable data. This was challenged by others who were concerned about the privacy, security, safe storage, and accountability of these platforms. Furthermore, an over-reliance on digital platforms could result in the loss of context and nuance – details which could be captured more effectively with qualitative, in-person techniques.

4. Discussion, conclusions, and recommendations

Our preliminary analysis has highlighted some emerging themes regarding the challenges and opportunities for engagement using digital and geo-information tools. We can use these findings to inform existing frameworks for "best practice" engagement within the environment sector, filling a gap in current frameworks which overlook the impact of information and communication technologies on the likelihood of achieving the positive outcomes of engagement (e.g. Reed *et al.*, 2018).

Our findings offer a snapshot of the unevenness and subjectivity of the impacts of using geoparticipatory tools for public and stakeholder engagement – highlighting key challenges and considerations for policymakers and practitioners (Falco and Kleinhans, 2018; Robinson and Johnson, 2021). We need to understand the context in which participatory technologies are used and show an awareness of potential barriers to engagement, working with and actively including those who could be disproportionately affected.

For participatory processes to be successful in the long-term, they must be institutionally embedded in policy (Reed, 2008). Further research will include testing these findings and recommendations in a policymaking setting within the environment sector, to provide an evidence-based approach to public and stakeholder engagement. Our research recommends that engagement coordinators define a clear

strategy and framework for engagement, considering the variable impacts of different digital and geoparticipatory tools on successful, inclusive engagement strategies. Practitioners don't need to adopt a "one size fits all" standard of engagement – a flexible and 'blended' approach, which has been carefully adapted to a particular context, can improve participatory processes. By doing so, include the voices of those who hold less power in society, be open minded to new opportunities, and promote shared learning between professional specialisms and disciplines.

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Biographies

Caitlin Hafferty is a third-year PhD researcher at the Countryside and Community Research Institute, University of Gloucestershire. Her research is transdisciplinary, with specialist interest in stakeholder participation, technology, planning and environmental decision-making. Engagement is central to Caitlin's approach, collaborating with diverse stakeholders to generate outputs with tangible benefits for society.

Robert Berry is a Research Fellow at the Countryside and Community Research Institute, University of Gloucestershire. Rob's research interests include the use of 3D landscape visualisation technology and participatory GIS in collaborative environmental management, and the integration and analysis of qualitative data in GIS through the development of mixed-methods GIS (MMGIS) approaches.

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