Transdisciplinary research on virtual participation processes in Austrian mountain UNESCO Biosphere Reserves - Digitalisation for sustainable development as a relevant research field

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UNESCO Biosphere Reserves (BRs) are internationally recognized model regions for sustainable development and used to conducting participation processes. This research explored the need and research design options for multi-channel participation approaches including digital systems for Austrian BRs. With the support of an online survey and a two-day virtual workshop with people from the management and stakeholders of three Austrian BRs as well as researchers from different Austrian scientific institutes, traditional participation formats were discussed. This inter- and transdisciplinary approach indicated that Austrian BRs face difficulties to reach certain target groups using traditional participation formats. Participants agreed on the need to try new approaches and that the gradual introduction of digital transformation in rural areas is important. The study shows the great need for action and research in the field of e-participation to implement multi-channel participation systems with new online components. The role and effects of electronic support for civic participation and the effects on BR management and decision-making need to be evaluated, as well as the wider impacts on local democracy and sustainable development.

1 Introduction

The Covid-19 pandemic has reinforced a growing use of digital communication tools in nearly all societal groups and sectors of society. In early spring 2020, public life came to an unforeseen standstill, and digital communication methods had to be installed as quickly as possible, especially in areas of work where information sharing is vital and necessary. For this purpose, already existing communication tools like video conference tools or virtual collaboration plattform' etc. have been widely used. Yet the participation of the interested public who wants to take part or become involved in societal democratic and consultative processes need different approaches. E-par-

ticipation could be a solution which aims to support active citizenship with the latest technology developments, increasing access to and availability of participation in order to promote fair and efficient society and government (Sæbø et al. 2011).

E-participation tools are especially important in areas where active stakeholder participation is part of the concept as in UNESCO Biosphere Reserves (BRs) which are model regions for sustainable development. BRs are experienced in participation processes which are supposed to involve local communities and all interested stakeholders in planning and management (UNESCO 2019). The BR concept as advocated by UNESCO is considered a permanent

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intervention towards sustainable development (Jungmeier et al. 2011). In recent decades, the concept of top-down governance of protected areas has evolved into more bottom-up participatory approaches aimed at societal transformation in accordance with sustainable development (Mose & Weixlbaumer 2007; Vilsmaier 2010). Participation processes are essential management tasks of BRs but depend on active support from the local population (Arnberger & Schoissengeier 2012; Borsdorf et al. 2020; Huber & Arnberger 2021; Jungmeier et al. 2021; Stoll-Kleemann 1999). A participatory and transparent approach that takes into consideration the views of all stakeholders is crucial for the successful progress of the management of protected areas (Karthäuser et al. 2011).

The manifold subjects of participatory decision-making may include land-use regulations, conflicts related to natural resources, the allocation of subsidies, budgets or investments. Recently, topics such as power plants, wind farms, solar energy systems, the return of predators like wolves or otters, pressures of high recreational use or investments in tourism infrastructure have triggered heated debates in BRs in Austria and many other countries.

Existing participatory processes in BRs are normally based on few stakeholder groups, who, due to issues of mobility, time, finances, language and other constraints, do not necessarily represent the diversity of groups interested in protected areas like BRs (Larson & Lach 2008; Martinez & McMullin 2004; Mosler & Tobias 2000). Dominant stakeholder groups are landowners, politicians and representants of important user groups like hunters (e.g. Borsdorf et al. 2020; Jungmeier et al. 2019). They exert a strong influence on management processes, outcomes and policies of the BRs. According to a study in a BR in Austria it is especially challenging to reach and mobilize teenagers and elderly women for taking part in the participatory processes; possible reasons could be the assessment of older women that they cannot make a relevant contribution, the lack of appeal to young people and the thematic interest (Snajdr 2016). The extent of the representation of the total resident population in societal democratic and consultative processes has not yet been studied in more detail and might even vary across the different Austrian BRs.

The progress of e-participation and e-government worldwide is well documented (cf. UN 2020a) including application and best practice examples in various contexts. The recent document from the "International Observatory on Participatory Democracy" on its 15th award on best practices lists a wide variety of success stories including examples about e-government. The examples illustrate that e-participation is possible in various settings and topics and could therefore also be transferable to BRs.

Previous research has shown that the quality of information provision and participation are crucial factors influencing residents' attitudes and acceptance of protected areas (Josephs & Humphries 2018; Schenk et al. 2007; Stoll-Kleemann 1999; Xu et al. 2006). Although a wide and diverse set of participatory tools for conservation and protected area management exists (Borrini-Feyerabend et al. 2013; Stoll-Kleemann & Welp 2008), there is little practical and scientific evidence on the effects of transdisciplinary approaches in e-participation in the context of BRs. Little is known on whether e-participation can address segments of local populations so far underrepresented in the governance of BRs (cf. Gibson et al. 2005 for positive effects), and whether their inclusion in participation processes may influence or even change management strategies and policies. Whereas, for example, e-participation and multi-channel designs in participatory budgeting are fairly well researched as participatory democracy practices in different contexts (Sintomer et al. 2008; OIDP 2021), there is a big research gap in the BR context.

This pilot-study explored the need and research design options for multi-channel participation approaches in Austrian BRs. Multi-channel (also called blended or hybrid) participation processes integrate multiple forms of engagement processes (cf. Spada & Allegretti 2017). In particular, they extend traditional forms and means of interaction (face-to-face, via mail, telephone, etc.) with new digital forms known as online- or e-participation (e.g. e-consultation, e-deliberation, e-participative budgeting) (cf. Aichholzer & Rose 2020). An interdisciplinary team of researchers and representatives of three Austrian BRs participated in the pilot-study to address if the Covid-19 pandemic has changed the participation processes in the BRs, if there is a need for multi-channel participation, if the current participation system involves all local groups and which user groups are so far underrepresented, if there are current efforts of BRs in e-participation and if digital participation formats have an impact on the representation and diversity of actively involved stakeholders. The pilot-study was focused on a workshop financed by the FWF programme # Connecting Minds (CMW 55-G)

2 Study areas

Currently four BRs in Austria are recognised by UNESCO: Großes Walsertal BR, Wienerwald BR, Salzburger Lungau & Kärntner Nockberge BR and Unteres Murtal BR. The four regions differ significantly in their physio-geographical situation, size, and economic and demographic developments (Table 1). Due to capacity reasons, the recently established Unteres Murtal BR could not participate in the study and is not represented in the results.

	Großes Walsertal BR	Wienerwald BR	Salzburger Lungau & Kärntner Nockberge BR
Size (ha)	19,200	105,645	149,600
Size of the core zone (ha)	3,304	5,576	8,192
Population	3,400	855,000	33,350
Communities	6 municipalities (Vorarlberg)	51 municipalities (Lower Austria), 7 districts (Vienna)	15 municipalities in Salzburg and 4 in Carinthia
Demography	population stable	population growth	Population decline, ageing population
Rural/peri-urban/urban	rural/remote	periurban/urban	rural
Recognised by UNESCO	2000	2005	2012
Initiative	regional development	political decision	regional development
National/international	provincial	2 provinces	2 provinces
Landscape	cultural landscape/ Alpine mountain landscapes	forest/cultural landscapes (hills)	cultural landscapes/ Alpine mountain landscapes

Table 1: The mountainous UNESCO BRs in Austria.

3 Methods

In cooperation with BR managers, a research design was developed. This included a short survey on e-planning topics and a 2-day workshop. The online survey included questions on digitalisation and was conducted before the workshop among the management and key stakeholders in all three BRs (N = 69; response rate > 50%).

The workshop took place exclusively online. A team of researchers and representatives of all three UNESCO BR regions (see Table 2) met online via the communication platform Zoom in November 2020. The meeting was divided in the following sessions: introduction, panel discussions on the status quo of participation; on how to implement e-participation in the management of the BRs; on how to identify target groups, and on how to evaluate and to transfer the results. Further discussions developed around the selection of virtual tools and platforms as well as on democratic principles. Additionally, stakeholders from the regions were invited to discuss on the different ways virtual tools could expand the range of participation. Discussions in small groups were possible within break-out sessions. The visualisation and documentation of the workshop happened via the virtual whiteboard Miro.

Number of participants	Disciplines
10 researchers	ecology, e-democracy, education for sustainable development, electronic governance, e-participation, human geography, landscape planning, mountain research, outdoor recreation, protected area management, sociology, technology assessment, technology risk assessment, transdisciplinarity, visitor management and protected area planning
	Institutions
6 representatives and 12 stakeholders of Austrian BR	Großes Walsertal Biosphere Reserves (BR) Salzburger Lungau & Kärntner Nockberge BR Wienerwald BR

Table 2: Participants of the workshop

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4 Results

All BR administrations had to react immediately to the Covid-19 pandemic. Like many other institutions, the administrations had to suspend or digitalize meetings and workshops. According to the BR managements, the reaction of various BR partners and stakeholders towards digitalization was unexpectedly positive. The experience of the severe restrictions on personal contacts and mobility has highlighted the need for developing and establishing new methods of digital participation in decision-making processes. The participants of the BRs welcomed the research idea because BRs are designed as learning places for sustainable development and are therefore ideal model regions for working on topics of current and future social relevance. The discussion on the status quo of public participation in BR governance showed that a transformation in e-participation is necessary as a complement to on-site participation. This was also mirrored in the online survey with a high response rate. Most respondents (47 out of 69) were of the opinion that digitalization was a great opportunity for BRs especially in rural areas and many expected that additional groups could be reached for participation in the BRs.

The discussion on the status quo of public participation in BR governance showed that the BR representatives and the scientific team were well aware of the need for change as well as of the big transformative challenge of e-participation. The BRs agreed that possible target groups for e-participation should be young people because of their absence in activities in all three involved BRs and specific disadvantaged groups which need to be identified separately. These groups could possibly be different in the three BRs.

There are already existing examples of virtual participation processes (e.g., Youth Forum Nockberge in Salzburger Lungau & Kärntner Nockberge BR; bottom-up processes for the partner companies in Wienerwald BR; virtual village square for former inhabitants of Großes Walsertal BR who are currently living abroad).

Respondents stated that an e-participation process should in any case enhance participation in a quantitative and qualitative way and should provide a socio-demographic balance of participants. The questions of how an e-participation process should be evaluated; how the results should be transferred (e.g., horizontal, vertical, cross-sectoral) and how interdisciplinary and transdisciplinary knowledge should be integrated (e.g., co-creation) needs to be addressed in further studies.

The workshop partners were convinced that urgent problems with future-oriented participation processes will result in socially robust solutions in an inter- and transdisciplinary manner. They believed that inter- and transdisciplinary knowledge integration is very important including cross-disciplinary explication of key concepts and methods as well as of BR goals and management.

The discussion highlighted that the e-participation touches on a number of very fundamental ethical questions. In addition to aspects of gender, diversity, participation and representation, questions of data security, personal rights and privacy play an important role. At the interface with democratic principles, for example, the secrecy of the ballot or the power of the moderator to exclude someone from the discourse must be taken into account.

5 Discussion and recommendations for the implementation of e-participation / multi-channel participation in BRS

Basically, in participation we can distinguish three levels of interaction: information, consultation and co-decision (cooperation). Participatory methods can fulfil several functions for citizens: easier access to information, awareness raising and opinion forming, exchange of experience and discussion, making suggestions, contributing to problem-solving and decision-making, and strengthening actions (Aichholzer & Strauß 2010). BRs, in cooperation with research institutions, have experimented with participatory governance, using methods such as memory mapping, participatory observation, standardized questionnaires, qualitative interviews, Delphi surveys, feedback loops, expert workshops and so on (Jungmeier et al. 2011). Some of these methods may also be applied online (e.g. Delphi survey), but they have mainly been designed for use in a non-digital environment.

For the evaluation of an e-participatory process, the IAOOI framework (input, activities, output, outcome, impact: see Kubicek & Aichholzer 2016, 31 ff) which is a practice-oriented approach and is anchored in the context of the theory of change could be a viable approach. An e-participation process should address self-reflexivity and the importance of capacity building and training. The selection of virtual tools and platforms which consider e.g., accessibility, usability, security, costs, is very important to gain trust and achieve transparency. With regard to transferability, transfer partners play an important role to discuss the possibilities and limits of the tools to contribute to deeper reflection and outreach.

The implementation, adaptation and evaluation of integrated multi-channel or cross-media participation systems with newly adapted e-participation components relies on transdisciplinary collaboration to test novel approaches in participation processes within the BR governance. Transdisciplinary collaboration aims to enhance public partici-

pation and BR governance and to generate new practical and scientific knowledge. So far, e-government in the environmental sector is rather focused on the provision of information and services (Koliouska et al. 2015). Few examples put the emphasis on active participation (Lee 2017).

Today a variety of online tools is available for local participation, including social media (Schauppenlehner et al. 2012, 2014, 2016). Yet, for a participatory process, digital platforms need to include additional functions to facilitate citizen information and discussion, including data visualisation tools, mapping, and aggregation of opinion (Cho et al. 2020). In addition, concerns about privacy and surveillance raise questions about the use of commercial social media as communication channels for participation endeavours, with recent years having seen the rise of so-called alternative social media platforms, which respond to these concerns and represent viable alternatives (Gow 2020; Schauppenlehner et al. 2016).

Heaton and da Silva (2020: 17) argue that "civic engagement and participation transcend the type of media used". They present participatory projects around environmental issues as examples of how personal outreach and social media can complement each other. Since BRs are testing sites for inter- and transdisciplinary approaches, e-participation and decision-making through online workshops and a variety of e-tools could provide good-practice examples on how e-participation could work in an environment already used to and experienced in participation processes.

Lindner and Aichholzer (2020) describe e-democracy as a broad range of uses of information and communication technology (ICT) to support democratic communication, including any means of digital inclusion of the public (individual citizens, informal groups and civil society organizations). The spectrum ranges from passive forms of social media or online monitoring, informing about societal developments, making decision-making processes and underlying documents accessible and transparent, to more active and collaborative forms, such as involving citizens in decision-making through online voting and online spaces for public consultation, debates on key policy issues and the joint production of policy documents (ibid.). Since the 1990s, expectations have been high for the new media to strengthen the ties between citizens and their governments and to renew democracy (ibid.), but decades later, the main achievement of e-democracy still seems to be the political and government provision of information. Moreover, a number of digital skills are required to benefit from this information: operational skills with computers, browsing and navigation skills on the internet, information skills to searching for information on the web and strategic skills with using internet applications (van Dijk 2013) (in sum: digital literacy).

A well-known issue is how participation is socially skewed in favor of those with higher socio-economic status (SES) and education levels, which calls for careful corrective design measures by practitioners (Ryfe & Stalsburg 2012). This was also a concern reported by workshop participants The observed limited progress in broadening and deepening citizen participation despite the steady expansion of e-participation tools (Le Blanc 2020) is a fact that needs more inter- and transdisciplinary research. This certainly includes the question how citizens value policy outcomes (output legitimacy) and how far these relate to citizen concerns expressed via participation (input legitimacy) (Scharpf 1997).

The UN E-Government Survey of 2020 found that the uptake of e-participation opportunities is relatively low, varying highly across contexts (such as countries, sectors, nature of participation), stating: "[...] available survey data for Europe indicate that, in spite of a rapid increase in the availability of online services between 2014 and 2019, the proportion of individuals engaging in e-consultation or e-voting has not changed at the scale of the region." (UN 2020a: 131). While the report notes that the global Covid-19 pandemic has reinvigorated the role of e-government, it also maintains that countries with very advanced e-government still face challenges regarding e-participation, citing reasons such as digital divide, lack of clear objectives, failures in stakeholder analysis, and not linking e-participation initiatives with formal institutional processes, and others (UN 2020a). The report also highlights a positive global trend in the use of ICT to offer opportunities for e-participation that go beyond the provision of information, a trend aligned with goal 16 of the 2030 Agenda for Sustainable Development. Target 16.7 specifically addresses the need for responsive, inclusive, participatory and representative decision-making. It focuses on supporting national efforts to promote open, transparent and inclusive participation and decision-making in development, including e-participation, as well as the promotion and use of open government data (UN 2020b). The use of ICT is already increasing in protected area management (Hennig et al. 2013; Job et al. 2016). However, the use of this technology focuses more on visitor information and management than on resident's participation.

6 Conclusion

Covid-19 has necessitated drastic government measures and brought about an enormous expansion of executive government power, often in contradiction with SDG target 16.6, "develop effective, accountable, and transparent institutions at all levels" (UN 2020b). In line with SDG target 16, e-participation can bring about open, transparent and inclusive participation in BRs integrating local people on the broadest possible basis. Due to the integration of disruptive technologies into the everyday life of BRs, the

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transformation challenge at regional level is high. It will have considerable effects on the institutions themselves. However, if BRs are understood as model regions embedded in the global networks of UNESCO institutions, e-participation can provide important impulses of European or global dimension. In particular, the transfer potential associated with the educational formats in BRs (e.g. GEO Nature Day, Biosphere Reserve Schools) must be taken into account (Falkner & Rauch 2020).

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