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The use of focus groups in cultural ecosystem services research: a systematic review

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Focus groups are an increasingly popular method for eliciting non-material values and cultural ecosystem services (CES) in the context of studying human–nature relationships. We conducted a systematic review of the literature with the aim of exploring where and how focus groups were used in the research into CES. Furthermore, we aimed to highlight good practices and potential caveats of the use of the focus groups method with respect to recommendations in methodological literature. We employed an inclusive CES classification framework and observed that focus groups were mostly used to research Recreation, Aesthetics, and Education categories. The review also discovered insufficient reporting and methodological inconsistencies in some of the studies. We provide suggestions for more robust and trustworthy applications of the focus group method, which can advance both research in this field and the implementation of the ecosystem services concept in the future.

Introduction

Nature and its ecosystems provide a plethora of benefits to people and society, which can be conceptualized in various ways. The ecosystem services (ES) framework provides one such lens to look at human–nature relationships which can highlight the importance of nature for human well-being (Millennium Ecosystem Assessment, 2005). Traditionally, ES are distinguished into three to four main categories—regulating, provisioning, cultural, and (in some cases) supporting (Costanza et al., 2017). The latest ‘evolution’ of the ES framework into nature’s contributions to people (NCP) framework by Díaz et al. (2018) brought up many conceptual discussions (e.g., Peterson et al., 2018; Maes et al., 2018), some of them focusing on the role of social science in ES research (Kadykalo et al., 2019). Especially in the case of cultural ES (CES), scholars were calling attention to insufficient research coverage in other than ecological and economic disciplines (Daniel et al., 2012). The involvement of social science researchers and methods in ES research seems to be growing (Kadykalo et al., 2019). Thus, we assume that the social perspectives on ES are better reflected in this growing body of research (Scholte et al., 2015). Generally, the ES framework can be applied as a transdisciplinary and multidisciplinary approach that has the potential to work as a boundary object across disciplines (Milcu et al., 2013; Steger et al., 2018).

Most CES are intangible and therefore need different approaches to elicit them compared to other ES categories which can be relatively ‘straightforwardly’ measured in biophysical or

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economic terms (Raymond et al., 2013). Thus, the specific nature of CES calls for appropriate methods for an empirical assessment (Dickinson and Hobbs, 2017). On the one hand, CES can be measured or assessed with biophysical or economic indicators (e.g., diversity of potential for nature experiences, the density of monuments and cultural historical facilities, and number of tourists per year) (Jakubínský et al., 2021). Such approaches are more suitable to address the potential of a certain landscape or ecosystem to provide specific ES. They can also provide information on the actual use of CES but with a significantly limited depth compared to other, e.g., social science methods. On the other hand, the actual use of CES calls for its empirical measurement with the actual beneficiary of the service, which is a cornerstone of socio-cultural valuation methods (Scholte et al., 2015). The importance of involving the human element in the study of CES is highlighted by the fact that CES is inextricably linked to e.g., the physical and mental health of humans, their emotions and perceptions, meanings of nature and landscape, identities or sense of belonging to a place: in other words, they are co-constructed by humans (Fischer and Eastwood, 2016). Given the increasing number of CES publications (Milcu et al., 2013; Gould et al., 2019), we suggest there is a need to reflect on and discuss the use of specific methodological tools. Such integration and synthesis of research can enrich scientific discourse and progress in the ES field. We also acknowledge the need to be clearer and reflexive within the CES research to overcome existing confusions and contradictions (Gould et al., 2020a).

The social science arena has a range of methods from both qualitative and quantitative domains which can be used to address and systematically assess CES, or non-material NCP, that people obtain from nature, landscape, and ecosystems (Daniel et al., 2012). The need to elicit in-depth information or meaning of phenomena favors qualitative and participatory methods such as interviews, focus groups, or ethnography methods (Bryman, 2016). In this paper, we will look more closely at the focus groups method, which is an established interpretative approach suitable for researching a range of intangible benefits stemming from the human–nature relationship (O'Brien, 2003) and as such can presumably be successfully used also to study CES. However, it has been argued that it could have often been adopted as a fashionable research technique that is considered to be easy to organize and inexpensive and used “without any prior consideration of whether it really is the most suitable research technique for achieving the cognitive goals of the research” (Acocella, 2012, p. 1126). Further potential concerns can be drawn out from reflections on the use of focus groups (or other typologically similar methods such as interviews) in other related areas, such as biodiversity and conservation research (Young et al., 2018; Nyumba et al., 2018).

In this paper, we aim to provide an overview of the current state of research and critically reflect on the use of the focus group method to study CES. Furthermore, we highlight good practices and limitations of the method in addressing CES. For these purposes, we use a systematic literature review and apply recommendations from methodological literature. Our review consists of both quantitative and qualitative components (Palmatier et al., 2018). In order to achieve our aims, we first develop our methodological approach. To assess the use of the focus groups method in the studies, we produce a synthesis of recommendations found in methodological literature. Then we develop a CES conceptual framework based on a synthesis of various established classifications. This framework will be used to analyze the reviewed studies. The section “Methodology” concludes with an elaboration on the systematic review method we used. For the review itself, we then defined four objectives. First, to provide an overview of how the focus groups method was used

to elicit CES, including the temporal trends, the geographical distribution of case studies, and specific characteristics of the use of the focus groups method. Second, to provide descriptive characteristics of CES conceptual frameworks used and categories addressed in the studies. Here we apply the CES classification developed in our framework. Third, to critically assess the reported use of the focus groups method with respect to general recommendations in methodological literature. Moreover, fourth, to provide critical reflection on selected aspects of the use of the focus groups method— suitability, limitations, and its use in combination with other methods. For the latter two objectives, we utilize the methodological synthesis from the focus group’s literature. The results are presented in the “Results” section according to the four objectives. In the “Discussion” section, we discuss the most important issues encountered in the review and compare the findings with similar reviews, especially the use of focus groups and interviews in conservation research (Young et al., 2018; Nyumba et al., 2018) and examine the most problematic issues discovered. Finally, we provide suggestions for more robust and trustworthy use of it in future research and discuss the general question of the suitability of the focus groups method for the research into CES.

Methodology

Focus groups in the methodological literature. First, we summarize key characteristics and recommendations in methodological literature in order to provide an analytical framework to critically reflect the use of focus groups in our sample of case studies.

Uses and dis/advantages. The focus group methodology is a qualitative method based on group discussions aimed at eliciting the perspectives and experiences of their participants on a particular topic, especially when the intersubjective dimension is important. Similarly to in-depth interviews, focus groups are used to not only discover what the participants think but also why. Focus groups stem from a premise that these perspectives, experiences, and thoughts are not static, but dynamic, i.e. can be modified through interaction with others; focus groups can, and are, particularly suited for capturing this process (Morgan, 2019). Similarly, they are useful for studying group norms, meanings and processes and can be well used as a method of public participation (Bloor et al., 2001). In terms of participants, they are especially good for “accessing the hard-to-reach” persons due to their informal character (Barbour, 2018, p. 17). Furthermore, they can allow the researchers to reach vulnerable groups—also thanks to their informality as well as allowing the participants to meet with others with a similar experience. Content-wise this means that sensitive topics might be more easily discussed in a focus group than in an interview (Barbour, 2018).

If one needs to find out as much as possible about individuals, interviews are a better choice, as in a focus group, there is comparably less time for each participant and much of the time is spent discussing, not elaborating one’s own views. However, if one is interested in diversity, consensus, group meanings, and processes, focus groups are better (Morgan, 2019). It might even be said that these aims are better and economically more efficient than other ethnographic methods in general (Blor et al., 2001). Though, if only idea generation is required, several interviews are proven to be more effective than a focus group with the same number of participants, basically because of a “process loss” with the discussion between participants in a focus group (Morgan, 2019). On the other hand, focus groups are not very good for studying group behavior or group attitudes, “since intra-group variations will be under-reported” (Bloor et al., 2001, p. 17). Interviews or questionnaires are better for this goal.

There are also disadvantages and issues to pay attention to. Focus groups are generally rather difficult to organize—e.g. to find a common time and to get the right number of participants, since often they may not even turn up if they signed up for the discussion (Bloor et al., 2001). Therefore, it might be desirable to over-recruit a bit (but not too much). There are also challenges arising from group dynamics. Some people tend to be more dominant in discussions, while others are rather submissive or not assertive enough to express their true views (Morgan, 2019). Dominant participants may not only steer the discussion towards issues they consider important, but also intimidate other people. Good facilitation is crucial to tackling these possible problems. Attention should also be given to how the participants may feel within the group and also with the facilitator. It is important that precautions are taken to allow them to feel as comfortable as possible (Morgan, 2019).

Combining with other methods. Focus groups might be and indeed often are employed together with other methods, both qualitative and quantitative. Within qualitative research, focus groups and interviews are complementary (Morgan, 2019), though not equivalent methods, as they produce different kinds of data (Barbour, 2018). Interviews may be used e.g., to inform the discussion guide for focus groups or to select participants. Conversely, focus groups might be utilized to select participants for more in-depth interviews. Combination with quantitative methods is also common. They might serve as input, e.g., to help create or validate a questionnaire, or as a follow-up method to expand findings with deeper insights or to improve the interpretation of results (Bloor et al., 2001; Barbour, 2018; Morgan, 2019). They can also be used to communicate the findings to the research subjects or to get feedback on these findings (Bloor et al., 2001). In such multi-method research, combining focus groups with other methods should not be understood as a way to validate the results, but rather as expanding or complementing them for a better understanding of the phenomenon (Bloor et al., 2001; Barbour, 2018). Richardson (1994; in Barbour, 2018) calls this crystallization, as it is different from triangulation (see also textbox Quality in qualitative research).

Doing focus groups—crucial aspects. In the following table, we compiled the recommendations and best practices from selected methodological literature concerning design, conducting of the discussions, and data analysis. We selected the literature based on three criteria: first, the recency of the title. Methodologies evolve and we wanted to capture the current standard. Second, we included authors that are heavily cited in social sciences (Morgan, Barbour). Third, we aimed for a diversity of approaches in terms of the aspects in Table 1.

Drawbacks and limits. One set of drawbacks is logistical. Focus groups are harder to organize than individual interviews. While for some people and in some cases, group discussion might be more comfortable, it is usually harder to get more people to attend at the same time (Morgan, 2019). In terms of data, focus groups are not able to yield narrative data and they are not very well suited to elicit attitudes (in a manner relevant to social science research; marketing applications aside) (Barbour, 2018). The disadvantages in comparison to other methods, especially interviews, were already discussed (see the section “Uses and dis/advantages”).

Conceptual framework of cultural ecosystem services. Here, we define our analytical framework of CES, including specific categories which we applied to each case study in order to provide descriptive characteristics of CES across the publications reviewed.

The intangible nature of CES and their difficult operationalization in the context of other ES categories motivated us to use an inclusive CES framework which could accommodate a broad and detailed range of benefits derived by qualitative methods such as focus groups or interviews (see also Daněk et al., 2023). Since we found that some CES categories would fit into one classification but not into another, we conducted a “concept matching” exercise (Czúcz et al., 2018) by linking correspondent categories of CES or non-material NCP from the following frameworks: MA—Millennium Ecosystem Assessment, TEEB—The Economics of Ecosystems and Biodiversity, CICES—Common International Classification of Ecosystem Services, and NCP—Nature’s Contributions to People (Millennium Ecosystem Assessment, 2005; TEEB, 2010; Haines-Young and Potschin, 2018; Díaz et al., 2018). This allowed us to find both similarities and variations across the classifications and in this way to arrive at a classification that tries to be as granular as possible while keeping a reasonable degree of abstraction. We complemented this desk research exercise with empirical findings from the “CultES” project focused on socio-cultural valuation and participatory mapping of CES in the landscape. It was an iterative dialectic process of categories clarification between established CES definitions and qualitative findings from the field. In the end, we established 15 CES categories that were used in the analysis presented in this paper (Fig. 1).

In general, we do not distinguish between ecosystem “services” and “benefits” as would be the case, e.g. when employing the ES cascade model (Potschin and Haines-Young, 2011). Rather, we conceptualize CES as the benefits stemming from interactions between the cultural practices of people and the environment or landscape (Fish et al., 2016). This provides a rationale for the co-constructed nature of CES (Fischer and Eastwood, 2016). We agree with Gould et al. (2020a) and use CES in a broader way that is similar to the approach established by the NCP framework (Díaz et al., 2018). From the conceptual perspective, it is important that both frameworks (Fish et al., 2016; Díaz et al., 2018) consider the constituting role of the human element in CES or its equivalent non-material NCP. The involvement of human individuals or the collective is in line with the notion of relational values, which can be understood as a complementary concept to CES (and has some overlapping aspects such as Social cohesion or Cultural identity) (Chan et al., 2016, 2018). While there are only four non-material categories in the NCP framework they actually cover all 15 CES categories in our framework. For a better understanding, we provide the corresponding non-material NCP category for each CES listed in Fig. 1.

Material and methods

Systematic review. We used a systematic review of the literature to create our sample and to collect, assess and synthesize data in a structured, reliable, and replicable way. The preparatory phase of systematic review consists of establishing eligibility criteria and methodological protocol to ensure “consistent conduct by the review team, accountability, research integrity and transparency of the eventual completed review” (PRISMA Group guidelines in Moher et al., 2015). Systematic review is a popular methodology across many disciplines, such as medical or environmental science, and with recent applications also in ecosystem services science (Czúcz et al., 2018; Vačkář et al., 2018).

We established an input—process—output protocol that clearly defined each step of the systematic review (Fig. 2). Our systematic review process was guided by the following question—How and to what methodological detail was the focus group method used in research addressing CES? In 2021, we searched the following keywords in the academic journal database Scopus: “focus group” and “cultural ecosystem service” which

Table 1 Description of key characteristics and stages in a focus group process.

<i>Initial focus group design</i>	
Participant selection	The most important criterion is the participants' interest in the topic and in other people's views on it. Homogeneous groups are usually preferred, where homogenous means that participants have a similar background or experience with regard to the topic (Barbour, 2018) or even a rather common, though not equal perspective. Demographic variables are relevant only as far as they significantly influence the input of the participants (Morgan, 2019). Heterogeneous groups might run into problems with understanding each other or even conflicts leading to discomfort (Bloor et al., 2001; Morgan, 2019). A commonly applied solution is segmentation: creating several homogeneous groups while having heterogeneity between the groups (Morgan, 2019). Pre-existing groups might achieve a more natural feeling in the discussion and might be easier to recruit (Bloor et al., 2001).
Number of participants	In social sciences, the usual size of one focus group is around 6–8 participants, but it sometimes varies from 3 up to 14 (Bloor et al., 2001; Morgan, 2019). Smaller groups might have a more relaxed atmosphere and give more space to each of the participants who can also get to know each other better. However, if their engagement in the topic is low, the discussion may get stuck (Morgan, 2019). There is also the risk of the group falling apart when some people do not attend (Bloor et al., 2001). Larger groups alleviate these problems and it is easier to discuss topics less interesting to the participants, but it is harder to facilitate and transcribe and each participant has less space (Bloor et al., 2001; Morgan, 2019).
Number of focus groups per study	The appropriate number of focus groups in a study is usually determined by saturation and segmentation. At least one, but rather a few focus groups should be done for each segment of participants (saturation cannot be judged from a single focus group per segment) (Bloor et al., 2001; Morgan, 2019). Having more focus groups with similar participants also allows for ruling out specifics of one group in the interpretation of results (Barbour, 2018). Repeating the same focus group within one study is done very rarely and is extremely difficult to realize (Barbour, 2018; Bloor et al., 2001).
<i>Conducting group discussions</i>	
Length of the discussion	The usual length is around 90 min, and it is recommended not to make the discussion much longer. Even more so if the participants do not get any financial compensation (Bloor et al., 2001; Morgan, 2019).
Facilitation/execution	Facilitation is a crucial point of focus groups. General requirements for a facilitator (often also called 'moderator') are similar to interviews: the ability to listen, not judge, motivate and incite the participant's input and make them feel comfortable (Morgan, 2019). Matching between the moderator and the group is sometimes desired, but other times not—comfort and topic specificity should be considered (Barbour, 2018; Morgan, 2019). Specific to focus groups are some common issues that the facilitator must cope with: less or no input from some participants on the one hand, people dominating the discussion on the other. Domination might not only be due to the participant's talkativeness but also due to strong involvement in the topic leading to an urge to express oneself (Morgan, 2019). Sometimes a "dual moderators" approach is used, either dividing roles (facilitator vs. expert on the topic) or simply having a different approach to incite more varied discussion (Barbour, 2018; Morgan, 2019).
Activities and exercises	It is common to use various techniques to start the discussions or to make them more engaging, such as ranking or voting, pile sorting, projective and associative techniques, photovoice, photo interpretation, mind maps, and vignettes (Bloor et al., 2001; Morgan, 2019).
Data collection	Usually, audio recording is made, and sometimes also a video recording (which might help with identifying participants' voices). Contrary to interviews, nonverbal language is usually not recorded or analyzed (Morgan, 2019). Sometimes we might need some additional data or insight into the initial standpoints of participants, which might be collected using a pre-group self-completion questionnaire (Bloor et al., 2001).
<i>Data analysis</i>	
Methods of analysis	It is not always necessary to transcribe the recordings, notes and repeated listening might suffice (Barbour, 2018). If a transcription is done, it is better when it is done by the researchers. If not possible, it is still recommended that they go through the transcript and recordings before beginning to analyze (Morgan, 2019). Often, notes about the way of speaking and interacting might be useful (Barbour, 2018). Data from all focus groups within research dealing with the same topic/research questions should be coded together, i.e. using/developing only one set of codes. Methods of analysis are mostly similar to interviews, with the most used being: summary-based analyses, qualitative and quantitative content analysis, thematic analysis, or even grounded theory (Morgan, 2019).

yielded 15 results. The year of publication was limited to include all results until the end of 2020. As this first search brought only a small number of potentially relevant studies, we added a second search string: "focus group" and "ecosystem service" which resulted in 230 publications. Consequently, all 245 search results were analyzed in the systematic review process following the established protocol.

The systematic review process had four stages to ensure the selection of only relevant studies for further analysis (see Fig. 2 for more information on the content of each step). After the first round of title and abstract screening, we ended up with 100 potentially relevant studies. These were checked with a full-text screening based on inclusion and exclusion criteria resulting in a selection of 49 relevant studies (for a list of publications reviewed,

see Supplementary material). During the last stage, we created a template spreadsheet to collect and organize data extracted from relevant studies. To provide a general context on the use of the focus groups method, we established the following categories: case study country, year of publication, type of study area (ecosystem or landscape type), number of focus groups per case study, type and number of participants, use of other methods. We also extracted the following CES-related characteristics: CES classification used, other ES groups addressed, number and categories of CES researched.

We found no review papers but two methodological or conceptual studies which deal specifically with the use of the focus groups method to identify, assess or map CES (Kaplowitz and Hoehn, 2001; Orenstein et al., 2015).
















Cultural ecosystem services		Non-material nature's contributions to people
 RECREATION	The use of natural and cultivated landscapes and entities (e.g. lakes, hills, trees, boulders, etc.) for pleasure and recreational activities through active (experiential) or passive (observational) interactions.	Physical and psychological experiences
 MENTAL AND PHYSICAL HEALTH	The use of natural and cultivated landscapes and entities that promotes health and recuperation.	
 AESTHETICS	Aesthetic appreciation of and experiences with natural and cultivated landscapes and entities.	
 EDUCATION	Natural and cultivated landscapes and entities as a subject matter of learning, or as an environment for training skills and cognitive development.	Learning and inspiration
 KNOWLEDGE SYSTEMS	The use of natural and cultivated landscapes and entities for scientific investigation or the creation of traditional or indigenous knowledge.	
 ENTERTAINMENT	Ex-situ viewing / experience of nature and landscape through different media, such as photographs, films, literature.	
 INSPIRATION	Natural and cultivated landscapes and entities as an inspiration for art and other creative activities. The use of natural motives or artifacts in arts, folklore etc.	
 HERITAGE	'Memories' in the landscape from past cultural ties. Historic records, cultural heritage e.g. preserved in water bodies and soils. Traditional uses of nature.	Supporting identities
 IDENTITY	Natural and cultivated landscapes and entities contributing to the creation and expression of identity, both personal, group or cultural.	
 SYMBOL	Emblematic natural and cultivated landscapes and entities or species, e.g. regional symbols.	
 SOCIAL COHESION	Natural and cultivated landscapes and entities that allow nurturing of human relationships.	
 SENSE OF PLACE	Sites that foster a sense of authentic human attachment. "I feel home" places.	
 SPIRITUALITY	Sacred, religious, or other forms of spiritual values derived from natural and cultivated landscapes and entities.	
 EXISTENCE	Appreciation of the existence of natural and cultivated landscapes and entities or species itself.	Maintenance of options
 BEQUEST	Capacity of ecosystems and species to keep options open in order to support a good quality of life. Natural and cultivated landscapes and entities motivating preservation for the experience and use by future generations.	

Fig. 1 CES classification applied in the review. CES categories used in this paper (including their description) and their accordance to non-material nature's contributions to people (for the description of NCP categories see Díaz et al., 2018).

During the last stage (P4) of the systematic review analysis, we assessed two aspects of the focus group method use. Firstly, we focused on the level of comprehensiveness of the reporting on the use of the focus groups method and distinguished three categories: high (detailed description including all main steps—initial focus group design, data collection, data analysis); medium (average description but some key steps missing); low (insufficient description with many or most key steps missing). Second, we tracked any significant inconsistencies from the main characteristics of the focus groups method as described in the methodological literature (e.g. extreme number of participants or joint data analysis from different methods). Additionally, we provide a reflection on selected aspects of the use of the focus groups method in order to demonstrate good practices but also highlight potentially problematic applications. We guided this reflection with the following questions—why were focus groups chosen as a suitable method? Do studies include a critical reflection on the use of focus groups? What is the rationale for using focus groups in combination with other methods?

Results

Each subsection in this section is focused on describing results according to objectives one to four. First, we describe the systematic review results from the 49 relevant publications about the

general context and design of focus groups. In the second subsection, we report on CES-related characteristics. In the third subsection, we present results regarding the use of the focus groups method. In the last subsection, we provide a reflection on selected aspects of the use of the focus groups method—suitability, limitations, and use in combination with other methods. Where applicable, we also contextualize selected results with recommendations from methodological literature.

Context and design of focus groups. Geographical distribution of case studies is uneven across the globe and across continents (Fig. 3). We found no case study in South America and Australia, while most case studies were conducted in Africa (*n* = 16) and Europe (*n* = 15), followed by Asia (*n* = 12). and North America (*n* = 6). The only country with four case studies was the United Kingdom, followed by several countries with three studies (Italy, Ethiopia, Tanzania, USA, Vietnam).

There is an increasing trend in the number of studies (Fig. 4a) with most being published in the years 2016–2020. The majority of studies were focused on a specific ecosystem or landscape, most frequently on forest (*n* = 11) and wetland (*n* = 8) ecosystems and mountain landscapes (*n* = 9) (Fig. 4b). However, some characterized their study area as a national park (*n* = 5), watershed

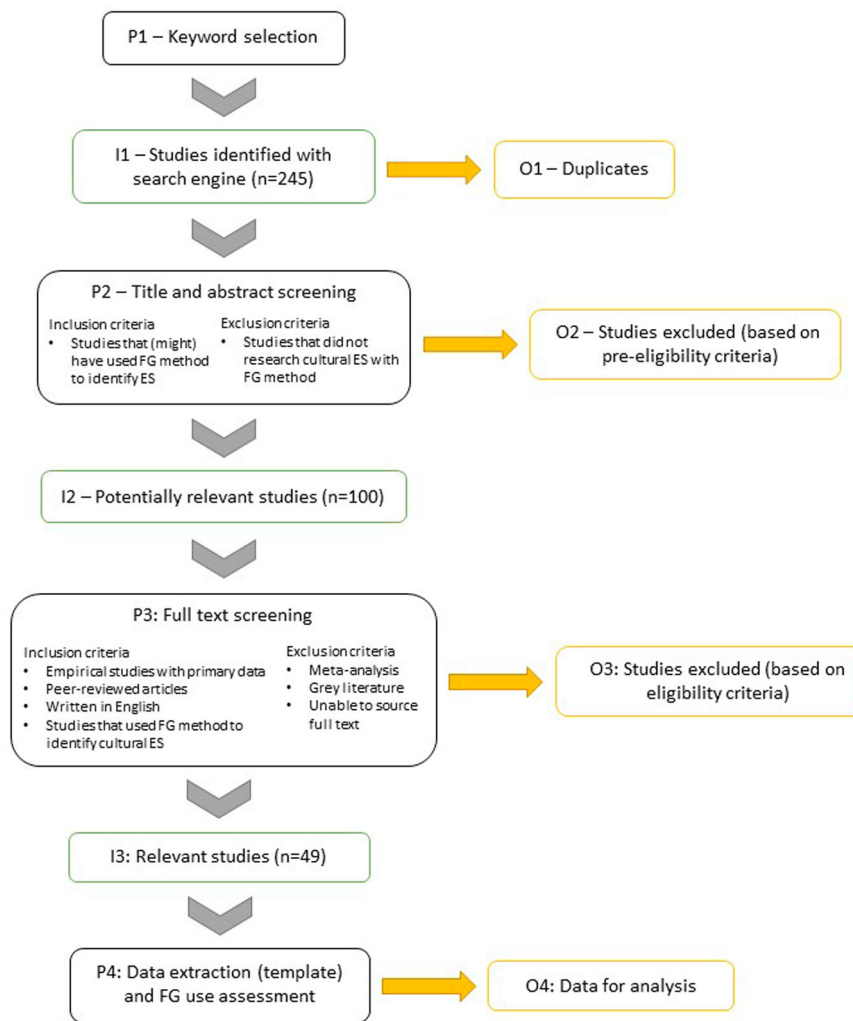


Fig. 2 Conceptual diagram illustrating how the literature for analysis was selected. This conceptual diagram shows the protocol of systematic review process (P = process; I = input; O = output).

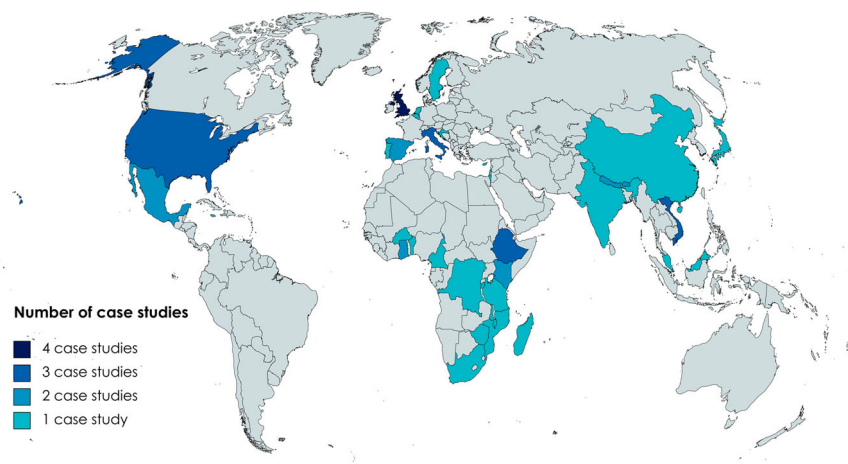


Fig. 3 World map illustrating the origin of case studies. Geographical distribution of case studies using focus groups in CES research.

($n = 2$) or district/region ($n = 2$). The number of focus group discussions per study greatly varied with the minimum being one focus group ($n = 5$) and a maximum of 42 focus groups ($n = 1$), with a median of 5 (Fig. 4c). Usually there was more than one focus group per study, most often three. Two studies did not report the number of focus groups.

The types of participants most targeted in the studies reviewed were community members ($n = 12$) followed by farmers ($n = 11$) and local inhabitants ($n = 8$) (Fig. 4d), with some studies creating homogeneous groups while others mixed the types of participants. The number of participants per focus group per case study also varied significantly, with the minimum being 3–4 to the

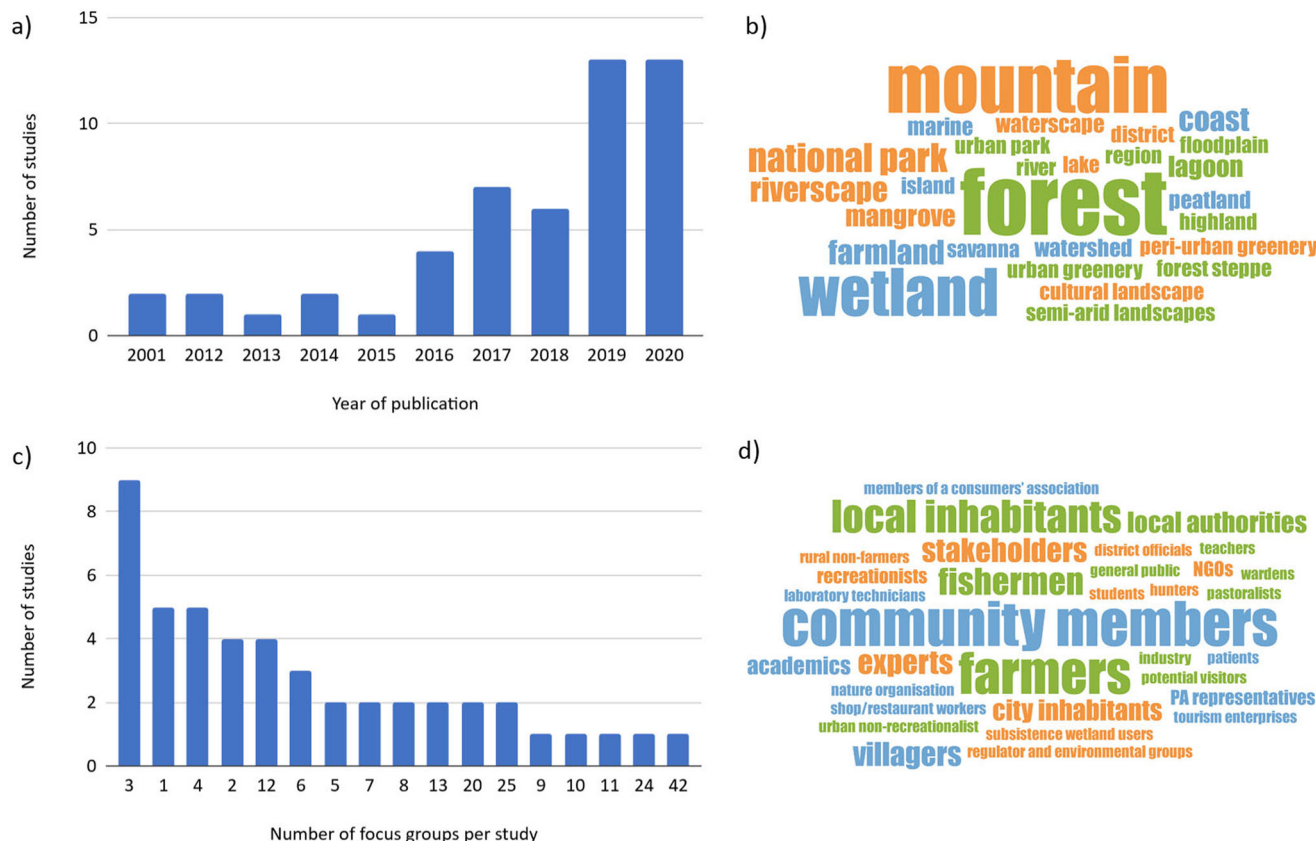


Fig. 4 Characteristics of case studies presenting year of publication, types of study areas, number of focus groups per study, types of participants. **a** Number of case studies using focus groups in CES research published in academic literature. **b** Wordcloud presenting various types of study areas (mixture of ecosystems, landscapes, and governance status of study areas based on available data). **c** Number of focus groups per case study. **d** Wordcloud presenting various types of participants in focus groups (coded into similar groups as reported in case studies).

maximum being 41–58. The majority of studies ($n = 28$) reported such intervals for the number of participants per focus group, but some also reported exact numbers (from 5 to 12 participants). Due to these variations in reporting on the number of participants, these different types of variables are not simply comparable by computing a mean number of participants. Two studies reported an average number of participants (5 and 10, respectively) and twelve studies did not mention any specification on the size of their focus groups. Total sample sizes (number of participants) ranged from 7 to 160 with a median size of 46. Several studies did not report a total sample size ($n = 12$).

Regarding gender, only a part of the studies ($n = 19$) reported the exact ratio of men and women among the participants. Several studies ($n = 15$) indicated both men and women participating or verbally specified a majority of one gender (“mostly males”). The same number of studies ($n = 15$) did not specify the gender composition (or it was reported jointly with another method, esp. individual interviews). In some studies, the cultural context was mentioned as the reason for including only one gender (e.g., Cuni-Sanchez et al., 2019; Gupta et al., 2021) or having gender-homogenous groups in each focus group (Kaplowitz and Hoehn, 2001; Chaigneau et al., 2019; Ngwenya et al., 2019; Kpienbaareh et al., 2020).

Cultural ecosystem services addressed. Generally, the majority of studies did not aim at researching only CES categories but targeted more ES groups (provisioning, regulating, supporting). Most of the studies were based on the MA classification ($n = 22$) of CES while a few studies used the TEEB classification ($n = 5$)

(Fig. 5a). One study was based on the UK National Ecosystem Assessment approach (Church et al., 2011) and one study was based on the framework proposed by de Groot et al. (2002). Some studies ($n = 11$) used their own, inductively built classification of CES without adhering to any established framework. In one of these cases, researchers aligned their approach with an established conceptual model of “final” ecosystem goods and services but used their own, inductively built categories (Weber and Ringold, 2019). Thus, the majority of studies employed a deductive approach with predefined categories of CES. Unfortunately, some studies did not describe or mention which classification of CES was used ($n = 11$). Regarding the range of CES researched, most studies selected or ended up (depending on the chosen approach—deductive or inductive) with one to five, or ten CES categories (Fig. 5b). Only six studies researched solely CES while most other studies also addressed other ES categories such as provisioning, regulating or supporting services.

Recreation (including tourism) was the most researched CES category ($n = 39$) followed by Aesthetics ($n = 28$) and Education ($n = 24$) (Fig. 6). Nearly half of the studies also focused on Spirituality ($n = 21$) and Identity ($n = 20$) CES categories. Only two studies researched Symbol or Bequest CES. Reflecting the qualitative character of focus group inquiries, many CES researched do not fit into established categories. Therefore, we present them in a list to provide an overview of what other CES or CES-reported categories appeared in relevant studies (list sorted alphabetically): a place of solitude; animal welfare; archive of plant history; archive of society and civilization history; built features; commerce; festivals; general cultural value; hunting; innovation; landscape variety (colors); management; open space

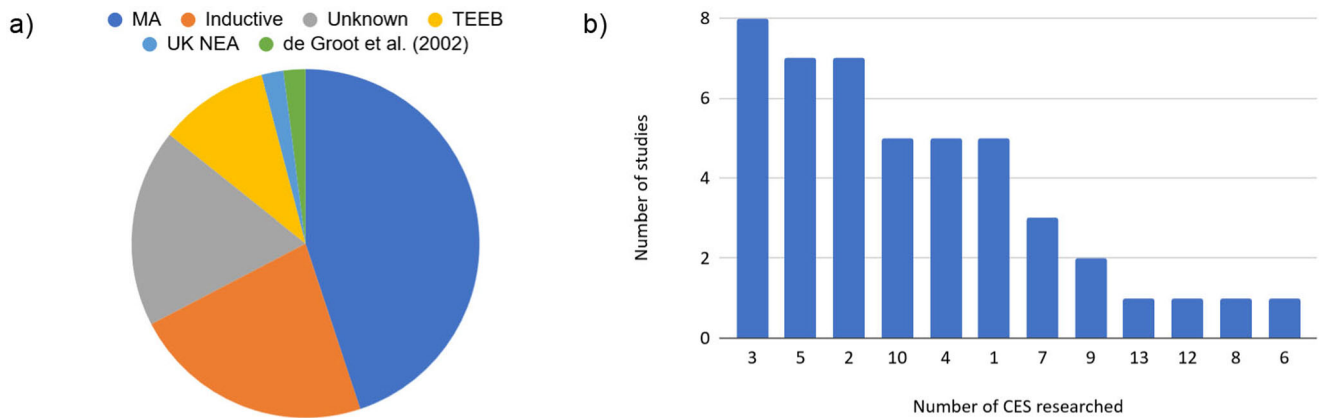


Fig. 5 Characteristics of case studies presenting CES classification used, number of CES addressed. **a** Proportion of case studies distinguished by the type of CES classification used. **b** Number of CES categories researched per study.

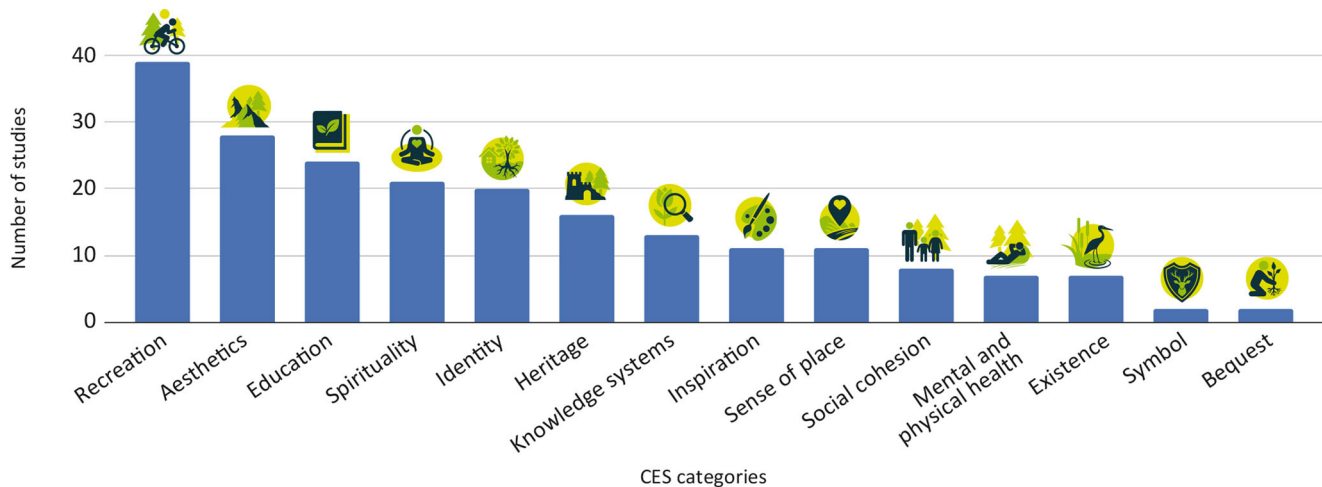


Fig. 6 CES categories addressed in the studies. Categories are based on MA, TEEB, CICES, and NCP frameworks but were elaborated into our own CES classification.

(and sense of), sense of fresh air; opportunities to contact nature; topography; traditional architecture; traditional boats; traditional products and handcraft; transportation.

Use of the focus groups method. The extent of reporting on the use of the focus groups method varied greatly across the studies. The biggest group of studies was classified as having insufficient description (low level) of the use of the focus groups method, with many key steps missing ($n = 20$). These were followed by studies with an average description (medium level) of the use of the focus groups method but some key steps were missing ($n = 18$). Lastly, the smallest group of studies had a detailed description (high level) of the use of the focus groups method, including all steps ($n = 11$). Regarding methodological inconsistencies, only ~25% of studies ($n = 12$) were classified as having some aspect of the focus groups method that lies outside the recommendations and common practice in focus groups literature (see Table 1: Main characteristics of the focus groups method). Most studies ($n = 30$) did not report any aspect that would not be aligned with the methodological recommendations. However, some studies ($n = 7$) did not provide enough information about the use of the focus groups method, so we could not classify them. We distinguished two main aspects regarding methodological inconsistencies. First, there was an extreme number of participants ranging from 25 to 49 participants per focus group in some studies (e.g., Rai et al., 2020; Dou et al., 2020; Gupta et al., 2021).

Second, some studies analyzed data from focus groups together with data from other methods such as interviews (e.g., Adhikari et al., 2018), or it was not clear whether the data from the focus groups were analyzed separately or not (e.g., Ward et al., 2018; Tran and Brown, 2019).

The focus group method was often used in conjunction with other methods. In our final review sample, several studies ($n = 12$) used (or reported) the focus group method as the only method for data collection. Mostly, the other methods used were questionnaires or surveys ($n = 22$), closely followed by interviews ($n = 19$). Several studies also used participatory mapping (but in 4 out of 6 cases it was part of the focus group) or field observation ($n = 4$). Other methods include, e.g., workshop, expert panel, scenario building, spatial analysis, modeling, biophysical assessment, stakeholder analysis, remote sensing, transect walk, participant observation, literature review, Q-methodology, Delphi, and secondary data collection.

Reflection on selected aspects of the use of the focus groups method. In many cases, the focus group method was selected due to its suitability to attain a rich or in-depth understanding of people’s perceptions and experiences. Specific reasons why focus groups were particularly suitable included the aim of studying group meanings, values, or processes, or inciting a deeper examination through discussion (Asah et al., 2012; McDonough

et al., 2014; O'Brien et al., 2014; Stålhammar and Pedersen, 2017; Chan et al., 2019).

A critical reflection on the limitations of the approach was scarce even in the studies that reported the use of the focus groups method quite comprehensively. For example, Weber and Ringold (2019) were an exception in their discussion of limitations, e.g., people were reluctant to speak about controversial topics and repeatedly slipped into the discussion of other, well-known and general topics that were not the focus of the study. A few other studies discussed the challenges and limitations related to sampling.

Other methods can be either a part of the actual focus group or used alongside focus groups as complementary methods. In the case of using other methods within focus groups, participatory mapping was used to catalyze the discussion using visual and tactile stimuli (Chan et al., 2019), or a socio-cultural valuation was done through a scoring exercise (Jeanloz et al., 2016). When using focus groups as one of the methods for collecting data, it is important to acknowledge data differences between various methods. Some studies did not do this and used interviews alongside focus groups to presumably get the same type of data that was then processed in a similar way (Moore and Tully, 2018). An example of a better approach is analyzing the data from focus groups and interviews separately and then combining only the results (Chan et al., 2019). Another study used an approach employing interviews as a sort of validation for checking the results from focus groups (Weber and Ringold, 2019). This adheres to recommendations in the methodological literature (see the section “Doing focus groups—crucial aspects”) and serves to improve the trustworthiness of the results (see the box “Quality of qualitative research”). Moore and Tully (2018) also used additional methods to accompany the focus groups and interviews, namely perception mapping and questionnaires.

An exemplary use of focus groups in combination with other methods can be seen in O'Brien et al. (2014), where the focus group was used as a direct follow-up after an in-situ walk in woodlands, during which the technique of photo-elicitation was also used. Such a procedure can create a very good setting for the group discussion, which is stimulated by both the previous walk and the photographs, and which can easily connect to the recent experience of the participants. Also, the group has more time to get to know each other during the walk, which might also enhance the quality of the follow-up discussion.

Discussion

Our review confirms that the focus groups method has been increasingly employed in CES research, although most of the studies focused on more ES groups and categories. Most of the studies utilizing focus groups were done in Africa and Europe, while in many parts of the world, we found no evidence of the use of this method in relation to CES research. Such geographical bias could be partly explained by our systematic review approach, which excluded studies in languages other than English and gray literature. The focus groups method was used for eliciting (C)ES in a range of environments, from forests and mountains, through wetlands, to urban parks, and with different groups of people, from community members and farmers, through local authorities to hunters and pastoralists. Regarding specific CES categories, focus groups were employed to elicit a broad range of CES, either deductively (most often based on the MA classification) or inductively. Recreational and aesthetic services were then the most frequently addressed in the studies examined. This finding is consistent with Milcu et al. (2013), who report them as the most frequently studied categories of CES in general. There were also many CES-reported categories that do not fit into established classifications. While there can be new categories emerging based

on empirical findings (cf. Gould and Lincoln, 2017), in some cases, it is questionable whether categories such as built features, traditional architecture, or transportation really fit into the conceptual framework of CES.

If we compare our results with that of Nyumba et al. (2018), who assessed the use of the focus groups method in the context of conservation research, we can see both similarities and differences. Regarding the number of focus groups per the study, they reported a median of 7, while in our sample, it was 5. The size of the groups in our case varied much more, with a few studies having more than 20 participants per focus group, while Nyumba et al. (2018) observed a maximum of 21, with a median of 10. We were not able to calculate the median value because many studies reported only a range across all focus groups conducted. However, in our sample, only 24% of studies did not report the size of groups, whereas, in conservation research, it was 55%. This suggests somewhat better reporting about the usage of the method in our sample, but there were also important issues in this regard (see the section “Reflection on selected aspects of the use of the focus groups method”).

Focus groups were often used as a part of multi-method research. In such cases, proper integration of complementary methods might prove very useful to better explore the complex nature of CES. As one typical use, other methods (such as participatory mapping, walk with photo elicitation, or scoring exercise) might be used to improve or catalyze the focus group itself and help participants with grasping the eluding characteristics of CES (O'Brien et al., 2014; Jeanloz et al., 2016; Chan et al., 2019). Another option is to use focus groups as one of several complementary methods (e.g., with individual interviews, questionnaires, etc.) to look at the research question from different angles (O'Brien et al., 2014; Moore and Tully, 2018; Weber and Ringold, 2019). However, it is crucial to acknowledge the different nature of data from different methods. For example, the similarity with individual interviews in terms of the nature of data and methods of their analysis might mislead some researchers into the unreasonable simplification of data analysis. In one case, the researchers tried to get as similar data as possible from focus groups as from interviews in terms of the type of data and did so by more strict methodological constraints placed on the focus groups (Jeanloz et al., 2016). That caused the focus groups being effectively reduced to group interviews. Other studies neglected even the question of the type of data generated by the two methods and simply mixed them together in the same stage of the research—part of the data obtained through interviews, part through focus groups, but treated as one homogeneous data set analyzed in the same way they would analyze interviews (Moore and Tully, 2018). Such studies did not use any of the advantages of focus groups regarding group processes and attitudes and instead presumably obtained much less data from each of the focus group participants than from their interviewees, making the former underrepresented in the overall data set. Such an approach prompts the question of the suitability of focus groups for their purposes, as it seems that using just interviews would have provided more consistent and possibly richer data. Differences in the type of data obtained through interviews and focus groups should also be considered when choosing approaches to analysis (Barbour, 2018).

One of the aspects we studied proved similarly ambivalent—the number of participants per focus group. Although there is a quite strong recommendation as to the maximum number of participants in one discussion, this still leaves space to do small groups of a few people, going deep into the topic, or larger groups of up to 12–13 people, and various sizes were also seen in the review. In most cases, the studies were complying well with methodological recommendations, with the number of participants between 3 and 13. However, there were also a few unusual cases with sizes of groups ranging from 25 to as much as 58.

One of these (Ngwenya et al., 2019) divided the group into smaller subgroups, which is similar to conducting several smaller focus groups. Others, however, seemed not to do any kind of division (Gupta et al., 2021; Rai et al., 2020). In such big groups, it is questionable whether even the basic processes in focus group discussions can be achieved (e.g., suitable facilitation or that every participant can be given enough space). Good facilitation of a group discussion with tens of people is nearly impossible, and it raises questions about the available time for each participant, or the possibility of meaningful interaction. Regarding gender composition of groups, it is in general only relevant in focus group design when it has an important bearing on the participant's background or experience in relation to the studied topic. However, the comfort of the group is an important factor as well, which corresponds with conducting gender-homogenous groups in certain cultural contexts, such as traditional societies (Bloor et al., 2001; Morgan, 2019).

A general insight from this review is that many studies suffer from improper or inadequate reporting on the use of the focus groups method. This is in line with results from other fields such as conservation regarding the use of qualitative methods such as focus groups and interviews (Young et al., 2018; Nyumba et al., 2018). What we found particularly lacking was providing a rationale for the suitability of the method (including its role in the research framework), reporting key aspects of its application (separately from the description of other methods), or acknowledging the different nature of data from different methods. These three practices were also among the basic recommendations for best practices in focus groups in a similar review of the use of focus groups in the context of conservation (Nyumba et al., 2018). Also, a discussion of limits and critical reflection on the methodological approach applied were often missing. In many cases, we were thus not able to do a more detailed assessment of their use. This lack of key information supports the argument that focus groups can be in some cases chosen due to their perceived simplicity and cost-effectiveness (Acocella, 2012).

Insufficient reporting and methodological issues might jeopardize the quality of the research in question. And although the quality of qualitative research might be perceived as tricky or unattainable due to the non-exact nature of such research, there are various established approaches that improve it significantly (see the following box, Quality of qualitative research).

Suitability of the focus groups method for CES research. The observed methodological inaccuracy might be the flipside or a misunderstanding of the possible flexibility in the application of the

method. However, this flexibility, in our view, makes the method particularly suitable for the research of CES, which are complex, elusive and context-dependent in character (Chan et al., 2012; Fish et al., 2016). Furthermore, due to its possibility to capture meanings stemming from interpersonal interactions, it can be a suitable approach to provide insights into the intricate socially constructed, or co-produced nature of CES (Fischer and Eastwood, 2016).

The suitability of focus groups for studying CES may be shown by the use of this method in some of the reviewed studies. These examples may also be considered good practices within the current state of the field. First, the co-production of CES may be well accessed through studying group views, attitudes, or values. For this purpose, focus groups are especially suitable (Morgan, 2019) and were successfully employed to this end, for instance, by Asah et al. (2012) and Stålhammar and Pedersen (2017). If one aims to reach a more definitive group view or valuation of CES, focus groups may well be utilized to facilitate a deliberative process or to reach a consensus, as in McDonough et al. (2014) or Shipley et al. (2020). And finally, as a qualitative method that is particularly suitable for exploring diversity in a certain topic, focus groups may provide means of discovering a wide range of CES, including ones that do not fit into established categories (if using an inductive approach to analysis). Such a diversity of CES was found in e.g. Asah et al. (2012) and Byg et al. (2017). Therefore, we suggest that focus groups are a potentially unique and insight-generating methodology in CES research.

On the other hand, the elusive nature of CES together with unsettled classification based on various conceptualizations can be a double-edged sword in such research (Blicharska et al., 2017). Drawing on our results, the unclassified CES-reported categories may be the result of unsettled terminology and poor understanding of CES conceptual foundations (Gould et al., 2020a). However, these 'other' categories may also be just a legitimate result of an inductive approach which is often applied in qualitative methods such as focus groups or interviews. Some of these 'other' CES could fit into the conceptualization of cultural practices (e.g., hunting), environmental spaces (e.g., a place of solitude; built features), or cultural goods (e.g., traditional products and handcraft; traditional boats) in the CES framework by Fish et al. (2016). Furthermore, this 'extension' of what CES can encompass supports the trend of broadening conceptualizations of CES (Gould et al., 2020b). Nonetheless, we would need enough justification for CES to be placed in a certain established category and this information was not always reported in the publications reviewed. Another flaw in reporting is that every fifth study did neither describe which CES classification was used nor that they did not use any classification intentionally. Furthermore, a potential limitation of our systematic

Box 1 | Quality of qualitative research

There has been an overall move away from trying to establish generally accepted universal criteria of quality akin to those applied in quantitative research. This reflects both the fact that qualitative research does not and cannot adhere to the positivist requirements, and that there is actually no one universal research paradigm for qualitative research but rather a plurality of paradigms. Thus, the established notions from quantitative research, such as validity and reliability, cannot be easily adapted and applied in qualitative research, although there are also approaches that try to do this (e.g., Silverman, 2017). Nevertheless, there are various approaches developed that can be used to reflect on and ensure the quality of research. In one of the quite well-established schemes, Lincoln and Guba (1985) state that the overall goal of ensuring the quality of any research is its trustworthiness. However, as Seale (1999a:468) notes, "trustworthiness is always negotiable and open-ended, not being a matter of final proof whereby readers are compelled to accept an account." Lincoln and Guba (1985) proposed five criteria of trustworthy qualitative research: credibility, transferability, dependability, confirmability and authenticity (expanded from four, see Guba and Lincoln, 1989, 1994). Silverman (2017) also offers his proposal for evaluating qualitative research through quality criteria. Seale (1999b), on the other hand, is more skeptical about general criteria and proposes rather that a variety of procedures might be used to improve the quality of research regardless of the research paradigm applied, such as triangulation, member checking, accounting for contradiction, or grounding of theory. In general, it can be said that while qualitative research does not and cannot aim at objectivity, validity or reliability in the positivist sense, the quality of such research should not be neglected. Critical self-reflection of the research, application of established techniques of improving quality, and transparency and rigor in reporting are key to ensuring the trustworthiness of qualitative research, including studies using focus groups.

review design is that we were not able to systematically explore the rationale behind the CES categories addressed as such information was not provided in most of the studies, e.g., due to their broader focus on more ES groups. Therefore, our suggestions are rather based on the general characteristics of CES in relation to possible applications of the focus groups method.

The aforementioned flexibility of the focus group method combined with the elusiveness of CES might also lead to untrustworthy results. This can be mitigated by a more rigorous application of the method that can be achieved by following a plethora of recommendations from the literature (some included in our review) and applying processes for ensuring the quality of research (see above). For instance, an appropriate combination with other methods acknowledging various pathways between different types of data and their analysis might also help address this potential pitfall.

Conclusions

In this article, we have provided a systematic review describing the use of the focus groups method in CES research, including its variations in both quantitative and qualitative terms. They suggest that opportunities for how and in what context the focus groups method might be successfully utilized are ample. The potential to uncover the co-constructed nature of CES, coupled with the ability to capture nuances in perception, valuation, etc., of non-material benefits in our view makes the focus groups method an effective tool in the CES research toolbox. But such flexibility and potential also require the researchers to be very conscious of when, why, and in particular how they apply the method and to report on these methodological aspects (Young et al., 2018; Nyumba et al., 2018). Nevertheless, we suggest that focus groups are a highly suitable method for researching CES. It provides a way to access both personal and group perceptions, meanings, and values, that are particularly relevant when studying CES. In the reviewed sample, focus groups have been used to elicit a broad range of CES both deductively and inductively. Furthermore, the increasing use of the method in recent years may also suggest that more researchers find this method suitable. At the same time, we have seen significant variations in the contextual but also practical methodological approach. Therefore, the research community can benefit from summarizing the most frequent applications as well as a synthesis of benefits and drawbacks learnt from the past use of the focus groups method.

A common issue we discovered is inadequate reporting on how the method was employed within a research design and how it was conducted. Also, a critical assessment of its use is often lacking. Still, to the extent that the level of reporting allowed us to assess the methodological rigor, most of the studies seemed to adhere to general methodological recommendations as we summarized them in the section “Doing focus groups—crucial aspects”. Among those we identified as methodologically problematic, two issues were the most prominent. The first is the relatively common practice of analyzing data from focus groups and individual interviews together as if they were equivalent. That shows either methodological negligence or a misunderstanding of the data that a focus group produces, which are specific due to the interactions in the group. The second issue that we observed has to do with the size of the groups, which in some cases exceeded 14, and in a few cases reached tens of participants. This also indicates a misunderstanding of the method and its goals.

We conclude that the good suitability of focus groups for research of CES might sometimes be hindered by methodological and reporting inadequacies. To strengthen the use of focus groups in future research, we would thus recommend the following. First of all, we would propose to use the method only after careful

consideration of its suitability and refrain from opting for it merely because of its presumed simplicity or inexpensiveness. Second, a good design of the place of the method within a frame of larger research is a crucial first step both to avoid methodological issues and to fully utilize the potential of the method. In particular, the differences in the data produced, especially in the context of other qualitative methods, need to be considered. Proper reporting on the design is a general imperative to complement this. The reporting should cover all crucial design choices (integration of the method within research, number and size of groups, their composition) and methodological steps (design of the discussion guide, facilitation, additional techniques used, analysis of data) and a reflection on the limits and the quality of research. In designing and executing the focus groups themselves, we would obviously suggest adhering to generally accepted methodological recommendations, particularly with regard to the number of participants and the crucial role of facilitation. To this end, our summary (see the section “Doing focus groups—crucial aspects”) might be utilized. Overall, these recommendations all relate to the question of the quality of qualitative research, which needs to be considered and ensured by the researchers to improve the trustworthiness of their results.

Data availability

All data generated or analyzed during this study are included in this published article and its supplementary information files.

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Competing interests

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Ethical approval

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