Received: 5 March 2017 | Accepted: 20 July 2017

DOI: 10.1111/2041-210X.12860

QUALITATIVE METHODS FOR ELICITING JUDGEMENTS FOR DECISION MAKING

Methods in Ecology and Evolution BRITISH ECOLOGICAL SOCIETY

The use of focus group discussion methodology: Insights from two decades of application in conservation

Tobias O.Nyumba[1†] | Kerrie Wilson[2,3] | Christina J. Derrick[4] | Nibedita Mukherjee[4,5†]

[1]Department of Geography, University of Cambridge, Cambridge, UK

[2]School of Biological Sciences, University of Queensland, St. Lucia, Australia

[3]Australian Research Council Centre of Excellence for Environmental Decisions, The University of Queensland, Brisbane, Queensland, Australia

[4]Conservation Science Group, Department of Zoology, University of Cambridge, Cambridge, UK

[5]Centre for Ecology and Conservation, College of Life and Environmental Sciences, University of Exeter, Penryn, Cornwall, UK

Correspondence
Nibedita Mukherjee
Email: nibedita.41282@gmail.com

Funding information
Fondation Philippe Wiener - Maurice Anspach; Scriven post doctoral fellowship; Centre of Excellence for Environmental Decisions, Australian Research Council, Grant/Award Number: CE11001000104; Cambridge Overseas Trusts; Wildlife Conservation Society; Wildlife Conservation Network; WildiZe Foundation; Future Fellowship, Grant/Award Number: FT100100413; NERC Grant/Award Number: NE/R006946/1

Handling Editor: Davide Geneletti

Abstract

1. Focus group discussion is frequently used as a qualitative approach to gain an in-depth understanding of social issues. The method aims to obtain data from a purposely selected group of individuals rather than from a statistically representative sample of a broader population. Even though the application of this method in conservation research has been extensive, there are no critical assessment of the application of the technique. In addition, there are no readily available guidelines for conservation researchers.
2. Here, we reviewed the applications of focus group discussion within biodiversity and conservation research between 1996 and April 2017. We begin with a brief explanation of the technique for first-time users. We then discuss in detail the empirical applications of this technique in conservation based on a structured literature review (using Scopus).
3. The screening process resulted in 170 articles, the majority of which (67%, n = 114,) were published between 2011 and 2017. Rarely was the method used as a standalone technique. The number of participants per focus group (where reported) ranged from 3 to 21 participants with a median of 10 participants. There were seven (median) focus group meetings per study. Focus group discussion sessions lasted for 90 (median) minutes. Four main themes emerged from the review: understanding of people's perspectives regarding conservation (32%), followed by the assessment of conservation and livelihoods practices (21%), examination of challenges and impacts of resource management interventions (19%) and documenting the value of indigenous knowledge systems (16%). Most of the studies were in Africa (n = 76), followed by Asia (n = 44), and Europe (n = 30).
4. We noted serious gaps in the reporting of the methodological details in the reviewed papers. More than half of the studies (n = 101) did not report the sample size and group size (n = 93), whereas 54 studies did not mention the number of focus group discussion sessions while reporting results. Rarely have the studies provided any information on the rationale for choosing the technique. We have provided guidelines to improve the standard of reporting and future application of the technique for conservation.

[†]These authors are contributed equally.

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.
[The copyright line for this article was changed on 22 January 2018 after original online publication]
© 2018 The Authors. *Methods in Ecology and Evolution* published by John Wiley & Sons Ltd on behalf of British Ecological Society

KEYWORDS
biodiversity, conservation, decision making, focus group discussion, literature review, research agenda

1 | INTRODUCTION

Conservation social science has come of age (Bennett et al., 2017). From being an outlier and on the sidelines of the discourse on conservation, the importance of understanding human perspectives is now centre stage in conservation decision making (Bennett et al., 2017; Khadka, Hujala, Wolfslehner, & Vacik, 2013; Paloniemi et al., 2012). Within the repertoire of tools that conservation biologists can use, focus group discussion is a commonly used method. Focus group discussion is a technique where a researcher assembles a group of individuals to discuss a specific topic, aiming to draw from the complex personal experiences, beliefs, perceptions and attitudes of the participants through a moderated interaction (Cornwall & Jewkes, 1995; Hayward, Simpson, & Wood, 2004; Israel, Schulz, Parker, & Becker, 1998; Kitzinger, 1994; Morgan, 1996).

Focus group discussion is widely used in conservation research unlike some of the other relatively lesser known techniques such as Nominal Group Technique (Hugé & Mukherjee, in prep) and Q methodology (Zabala & Mukherjee, 2017). The method's popularity is closely linked to the rise of participatory research, especially the "active experimentation with focus groups" in the academic social sciences during the 1980s (Morgan, 2002). The technique emerged as a qualitative data collection approach and a bridging strategy for scientific research and local knowledge (Cornwall & Jewkes, 1995). Focus group discussion is perceived to be a "cost-effective" and "promising alternative" in participatory research (Morgan, 1996) offering a platform for differing paradigms or worldviews (Guba & Lincoln, 1994; Orr, 1992). Sociologists and psychologists have used the method since the 1940s (e.g. Merton & Kendall, 1946; Merton, Fiske & Kendall 1956). However, its popularity and application has grown across a wide range of disciplines including education (Flores & Alonso, 1995), communication and media studies (Lunt & Livingstone, 1996), sociology (Morgan, 1996), feminist research (Wilkinson, 1998, 1999), health research (Wilkinson, 1998) and marketing research (Morgan, Krueger, & King, 1998; Szybillo & Berger 1979).

Focus group discussion is sometimes seen as synonymous with interviews, especially the semi-structured "one-to-one" and "group interviews" (Parker & Tritter, 2006). Similarities between these techniques relate to the tendency to uncover people's perceptions and values (e.g. Hargreaves, 1967; Lacey, 1970; Mac an Ghaill, 1994; Sewell, 1997; Skeggs, 1997). Consequently, there are cases where authors have confused and conflated these two distinctive methods (Parker & Tritter, 2006). However, existing evidence on the role of the researcher and the relationship with the participants points to a fundamental difference between the two techniques (Smithson, 2000). Interviews involve a one-to-one, qualitative and in-depth discussion where the researcher adopts the role of an "investigator." This implies the researcher asks questions, controls the dynamics of the discussion, or engages in dialogue with a specific individual at a time. In contrast, in a focus group discussion, researchers adopt the role of a "facilitator" or a "moderator." In this setting, the researcher facilitates or moderates a group discussion between participants and not between the researcher and the participants. Unlike interviews, the researcher thereby takes a peripheral, rather than a centre-stage role in a focus group discussion (Bloor, Frankland, Thomas, & Robson, 2001; Hohenthal, Owidi, Minoia, & Pellikka, 2015; Johnson, 1996; Kitzinger, 1994).

The link between people's perceptions and their socio-cultural situation is critical to decision-making on natural resources since most people derive their notions, mental constructions and interpretations from their immediate surrounding and develop these from experiential knowledge (Berkes, 2004). Given the rise of participatory research in conservation over the last few decades (Bennett et al., 2017), it is crucial to reflect on the scope and remit of focus group discussion as a methodological tool. Currently, there is relatively little or no critical discussion on the merits and demerits of focus group discussion in comparison to other similar qualitative techniques. It is therefore difficult to ascertain when and in which context, focus group discussion would be most appropriate. There are no guidelines for best practice for the application of the technique in conservation literature. In addition, there are no comprehensive reviews of the use of focus group discussion in conservation to the best of our knowledge.

Here we assess the strength and weaknesses of the focus group discussion technique based on a review of its application in conservation in the last two decades. We first briefly explain the procedure of the technique and then provide an overview of the different forms of focus group discussion. On the basis of a critical analysis of the relevant literature, we discuss the merits and potential pitfalls of the technique. Finally, we provide guidelines for reporting future applications of the technique and suggestions to address key psychological biases that can impact group interactions.

2 | BRIEF DESCRIPTION OF THE TECHNIQUE

Focus group discussion consists of four major steps as shown in Figure 1. These include (1) research design, (2) data collection, (3) analysis and (4) reporting of results (Morgan et al., 1998).

2.1 | Research design

The process begins with identifying the main aim and defining the key research objectives of the study. Based upon the research objectives,

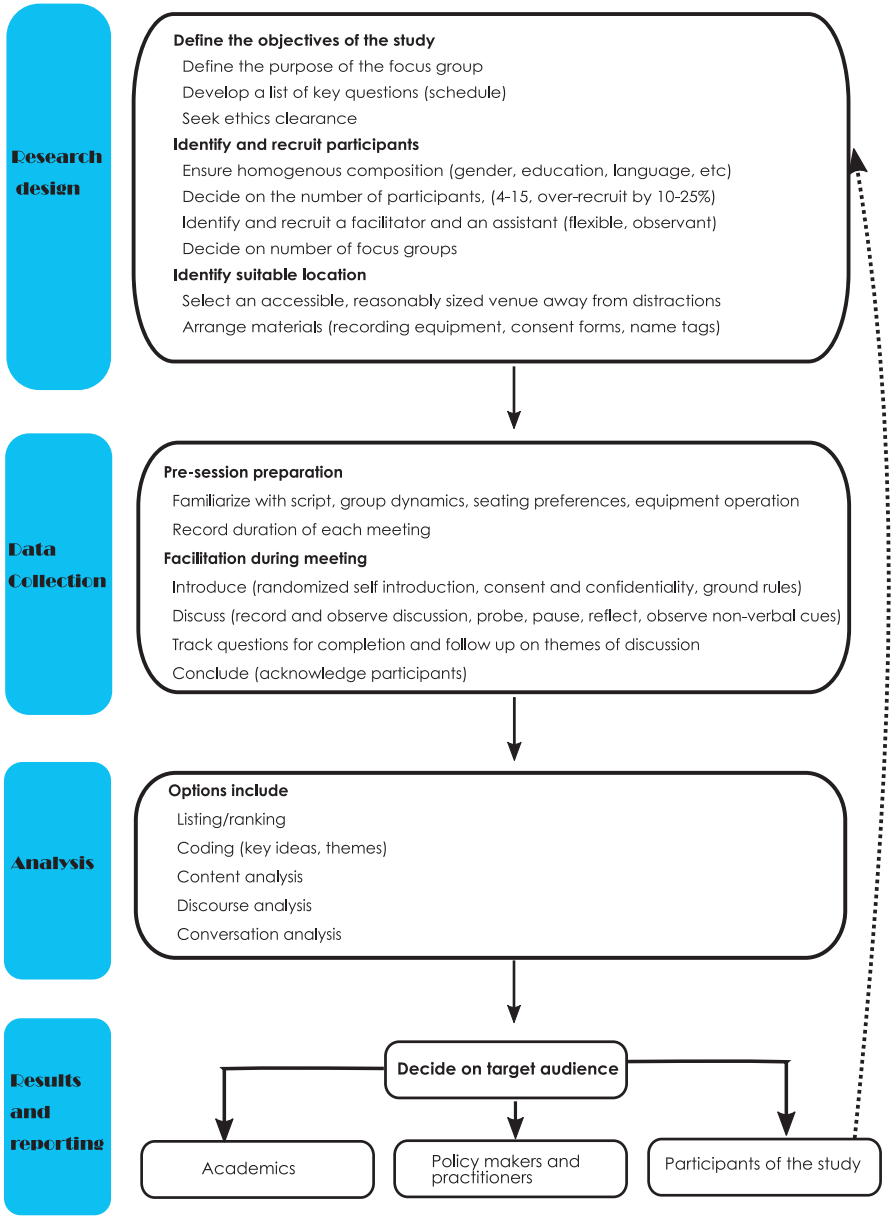

FIGURE 1 Flow chart of the steps of the focus group discussion technique

a list of questions (schedule or script) is prepared as guidance for each focus group discussion session. This is followed by seeking ethics clearance. Thereafter, participant identification is perhaps the most critical step since the technique is largely based on group dynamics and synergistic relationships among participants to generate data (Green, Draper, & Dowler, 2003; Kitzinger, 1994; Thomas, MacMillan, McColl, Hale, & Bond, 1995). The composition of the group will depend on the main aim of the research. According to Krueger and Casey (2000), individual's self-disclosure tends to be natural and comfortable. However, for some, it requires trust and effort. Willingness to fully engage in a group discussion is instrumental in generating useful data and can be achieved more readily within a homogenous group (Krueger, 1994). Consequently, Krueger (1994) suggests that participants should share similar characteristics such as gender, age range, ethnic and social class background. However, homogeneity is challenged by some researchers since unfamiliar participants can give honest and spontaneous views and can overcome pre-existing relationships and patterns of leadership in the group (Thomas et al., 1995). Furthermore, evidence suggests that mixed gender groups tend to improve the quality of discussions and its outcomes (Freitas, Oliveira, Jenkins, & Popjoy, 1998).

Participant recruitment follows participant identification. Recruitment can be expensive, difficult, and continues to be a source of contentious debate (Krueger & Casey, 2000). Although approaches to participant recruitment are contested, the underlying consideration should be the impact on the discussion. Researchers can use different methods to recruit suitable participants, including recruitment questionnaires and telephone, or door to door canvassing. Furthermore, participants can be recruited by offering incentives or through local networks and contacts (Krueger, 1994). However, the use of local contacts has been criticised for its dependence on the availability, willingness and accessibility of the local contact and the loss of control

and direction of the researcher in the recruitment process. This can lead to convenience sampling by selecting participants based on their accessibility (Krueger, 1994) easily leading to "volunteer bias" (1960; 1963). Purposive sampling is widely recommended since focus group discussion relies on the ability and capacity of participants to provide relevant information (Morgan, 1988).

Another important consideration is the number of respondents to be invited for discussion. Although it is generally accepted that between six and eight participants are sufficient (Krueger & Casey, 2000), some studies have reported as few as four and as many as fifteen participants (e.g. Fern, 1982; Mendes de Almeida, 1980). One potential drawback in focus group discussion is the lack of guarantee that all those recruited will attend the discussion. To overcome this, Rabiee (2004) recommends that researchers may over-recruit by 10–25%. Ten participants are therefore considered large enough to gain a variety of perspectives and small enough not to become disorderly or fragmented (Krueger, 1994). With more than 12 members, the group becomes difficult to manage and may disintegrate into two or even three small groups, each having their own independent discussion.

Given the small number of participants in a focus group discussion and the general design as a one-off encounter, one cannot exhaustively discuss a topic just by conducting a single group discussion. Consequently, some authors have recommended a minimum of three to four group meetings for simple research topics (Burrows & Kendall, 1997). The principle of theoretical saturation, where focus group discussion sessions are run until a clear pattern emerges and subsequent groups produce no new information (Krueger, 1994) has been applied for studies covering larger study areas, wider interest groups and complex topics. Some instances of reconvening a group for subsequent meetings have been reported, but this can be difficult due to changes both in people and circumstances (Bloor et al., 2001).

The next step is to identify a convenient venue for the discussion. Researchers must take into consideration participants' comfort, access to the venue, and levels of distraction (Smith, 1972). In addition, they should be in a normal and familiar setting with sufficient space for different activities within the focus group discussion, such as examination of samples, ranking activities, and exercises. There must also be enough seating that enables participants with a clear view of each other and the facilitator(s) (Sampson, 1972).

2.2 | Data collection

Focus group discussion requires a team consisting of a skilled facilitator and an assistant (Burrows & Kendall, 1997; Krueger, 1994). The facilitator is central to the discussion not only by managing existing relationships but also by creating a relaxed and comfortable environment for unfamiliar participants. Similarly, the assistant's role includes observing non-verbal interactions and the impact of the group dynamics, and documenting the general content of the discussion, thereby supplementing the data (Kitzinger, 1994, 1995). Non-verbal data rely on the behaviour and actions of respondent's pre-focus group discussion, during and post-focus group discussion. Non-verbal data provide "thicker" descriptions and interpretations compared to the sole use of verbal data (Fonteyn, Vettese, Lancaster, & Bauer-Wu, 2008). Gorden (1980) outlines four non-verbal communication data sources based on participants' behaviour reflected by body displacements and postures (kinesics); use of interpersonal space to communicate attitudes (proxemics); temporal speech markers such as gaps, silences, and hesitations (chronemics); and variations in volume, pitch and quality of voice (paralinguistic). The main methods of data collection during a focus group discussion include audio and tape recording, note-taking and participant observation (Stewart, Shamdasani, & Rook, 2007). However, each of these methods presents different advantages and disadvantages and researchers should consider context-specific issues in selecting a method of data collection (Krueger 1998; Stewart & Shamdasani, 1990).

Regardless of the number of focus group discussion meetings, it is important to consider the duration of the meetings. Participants are likely to suffer from fatigue when discussions are longer. The rule of thumb is *c.* 1–2 hr, based on the complexity of the topic under investigation, number of questions and the number of participants. This might differ when the group consists of younger participants such as school children (Gibson, 2012; Heary & Hennessy, 2002). This is because children tend to have shorter attention spans and will begin to lose focus and interest in the topic quicker than adults.

2.3 | Analysis

Focus group discussion usually yields both qualitative and observational data where analyses can be demanding. According to Leech and Onwuegbuzie (2007, 2008), qualitative analysis techniques that can be used to analyse focus group data include grounded theory analysis (Charmaz, 2006; Glaser, 1978, 1992; Glaser & Strauss, 1967, Strauss, 1987), content analysis (Morgan, 1988) and discourse analysis (Potter & Wetherell, 1987). Morgan (1988) recommends the use of *content* and *ethnographic analytic* techniques to analyse data from a focus group discussion since it affords the researcher an opportunity to obtain both qualitative and quantitative information through a "three-element coding framework" leading to mixed content analysis (Morgan, 1988). The "three coding-framework" refers to the two steps involved in the content analysis that yields quantitative results and the one step involving the ethnographic analysis that yields qualitative results.

Data coding is accomplished in two stages. The first step is the *initial coding* which involves the generation of numerous category codes without limiting the number of codes (Charmaz, 2006). At this stage, the researcher lists emerging ideas, draws relationship diagrams and identifies keywords used by respondents frequently as indicators of important themes. The second stage involves *focused coding* where the researcher eliminates, combines or subdivides the coding categories identified in the first step. Attention should be drawn to recurring ideas and wider themes connecting the codes (Charmaz, 2006; Krueger, 1994; Ritchie & Spencer, 1994). This process can yield quantitative results to draw comparisons across focus groups, group dynamics, individual participants or the participants' statements (Carey & Smith, 1994; Morgan, 1995).

Content analysis enables a systematic coding of data by organising the information into categories to discover patterns undetectable by merely listening to the tapes or reading the transcripts (Robson, 1993; Yin, 1989). Ethnographic analysis, on the other hand, is strictly qualitative, drawing primarily on direct quotes from the group discussion. Consequently, the process is not systematic and relies on the researcher's ability to label the material into "themes," "discourse" or "illustrative quotations" while maintaining the integrity and accounting for the context of the focus group. However, ethnographic analysis does permit a detailed interpretative account of the everyday social processes of communication, talk and action occurring within the focus group, which can be useful in some instances (Krippendorff, 2012).

2.4 | Results and reporting

Once all the data are analysed, the researcher needs to consolidate the results into a coherent report for dissemination. Key decisions regarding the audience must be made to tailor the report to meet the needs of the target audience. The report can be presented in a narrative or pointwise format. The report should capture participant information such as gender, age and education level in addition to key quotes from participants to emphasise points. The findings should be shared with the participants of the study through a process called member checking, respondent validation, or participant validation to validate the results thereby increasing the credibility of the report or study (Birt et al., 2016; Lincoln & Guba, 1985). Although member checking affords the focus group discussion participants the opportunity to check for accuracy and resonance with their experiences (Doyle, 2007), the process has been criticised based on epistemological and methodological challenges as outlined by Sandelowski (1993), Morse (1994) and Angen (2000).

3 | TYPES OF FOCUS GROUP DISCUSSION

Five types of focus group discussion have been identified in the literature, and a further two are emerging with the growth in access and variety of online platforms.

3.1 | Single focus group

The key feature of a single focus group is the interactive discussion of a topic by a collection of all participants and a team of facilitators as one group in one place. This is the most common and classical type of focus group discussion (Morgan, 1996). It has been widely used by both researchers and practitioners across different disciplines (e.g. Lunt & Livingstone, 1996; Morgan, 1996; Wilkinson, 1998).

3.2 | Two-way focus group

This format involves using two groups where one group actively discusses a topic, whereas the other observes the first group (Morgan, 1996; Morgan et al., 1998). Usually, this type of focus group is conducted behind a one-way glass. The observing group and the moderator can observe and note the interactions and discussion of the first group without being seen. Hearing what the other group thinks (or by observing their interactions) often leads the second group to different conclusions than those it may have reached otherwise (Morgan, 1988).

3.3 | Dual moderator focus group

Involves two moderators working together, each performing a different role within the same focus group (Krueger & Casey, 2000). The division of roles ensures a smooth progression of the session and ensures that all topics are covered.

3.4 | Duelling moderator focus group

This involves two moderators who purposefully take opposing sides on an issue or topic under investigation (Krueger & Casey, 2000). Proponents believe that the introduction of contrary views to the discussion by the moderators is critical to achieving more in-depth disclosure of data and information (Kamberelis & Dimitriadis, 2005).

3.5 | Respondent moderator focus group

In this type of focus group discussion, researchers recruit some of the participants to take up a temporary role of moderators (Kamberelis & Dimitriadis, 2005). Having one of the participants lead the discussion is thought to impact on the dynamics of the group by influencing participants' answers, thereby increasing the chances of varied and more honest responses.

3.6 | Mini focus group

Researchers are usually faced with a situation where there is a small potential pool of participants and are difficult to reach, yet the research design requires that the topic must be discussed in a group. Under these circumstances, researchers can only convene a small group of between two and five participants (Kamberelis & Dimitriadis, 2005). Such groups are usually made up of individuals with high level of expertise (Hague, 2002).

3.7 | Online focus groups

Online focus groups are not a different type of focus group discussion per se but one borne out of the introduction of the Internet as an adaptation of traditional methods. It is applied within the online environment, using conference calling, chat rooms or other online means (Kamberelis & Dimitriadis, 2005). Online focus groups boast an aura of dynamism, modernity and competitiveness that transcends classic problems with face-to-face focus group discussion (Edmunds, 1999). However, these discussion platforms are only accessible to participants with access to the Internet and are prone to technical problems such as poor or loss of connectivity and failure to capture non-verbal data (Dubrovsky, Kiesler, & Sethna, 1991).

4 | MATERIALS AND METHODS

Our primary aim was to understand how focus group discussion has been used as a methodological tool in conservation in the last 20 years. Using a stepwise, structured approach, we reviewed the literature on the use of this method in biodiversity, ecology and conservation research. We used a combination of "Focus Group Discussion*" AND "conserv*," OR "ecology," OR "biodivers*," where "*" denotes a wild card to search for alternative word endings, in a search query within the Scopus database (https://www.scopus.com), from 1996 to 2016 (accessed on 20th April 2016). A subsequent search using the term "Focus Group" with the other terms was run on 21st April 2017 in the same database.

The search returned 438 peer reviewed articles excluding reviews. We screened the titles and abstracts to identify only those relevant to conservation, biodiversity and ecology. Studies which had focused primarily on soil or water conservation and did not have a direct bearing on biodiversity conservation were discarded. This resulted in 196 peer-reviewed papers. We retrieved all the relevant papers and scanned the full text to check if they specifically used focus group discussion as a method to answer a research question. All studies where the technique was merely mentioned in the introduction or conclusion section were eliminated. We developed a protocol (Appendix S1, Supporting Information) for extracting data from the final list of studies.

We conducted coding iterations to generate key conservation and biodiversity themes covered in the studies as described by Charmaz (2006). First, we reviewed all the research "questions" and "purposes" to identify the broad reasons behind the study and the "resource" under study (e.g. examine factors that are responsible for deforestation) and generated a list that informed the next phase of the analysis. We reviewed the list to identify theme attributes (e.g. understand perspectives) and descriptions of the attributes (e.g. causes of deforestation). Finally, we used concept mapping, or a visual display illustrating relationships between and among categories (Miles & Huberman, 1994) to combine theme attributes into main themes without losing individuality, trivialising some concepts over others, or losing detail (Miles & Huberman, 1994). Our final coding categories included the understanding of people's perspectives regarding conservation, assessment of conservation and livelihoods practices, examination of challenges and impacts of resource management interventions and documenting the value of indigenous knowledge systems.

5 | RESULTS

We identified 170 papers (henceforth studies with references as numbers corresponding to Appendix S2) that were relevant to biodiversity conservation and had used focus group discussion as a method, either as a stand-alone technique or in combination with other methods between 1996 and 2016. The studies reported that focus group discussion created a forum to discover the "unexpected" as it allowed for negotiation and evaluation of research problems and findings between different stakeholders including non-sedentary households. It also helped to capture experiential differences in people with similar background thereby giving rise to new perspectives. In addition, focus group discussion often brought out issues of interest to participants rather than researchers. However, one study found the discussion biased in that all participants could not actively take part in discussions due to intimidation or influence by dominant or aggressive participants (179).

Focus group discussions were used in 65 countries from six continents (Figure 2). Most of the studies were in Africa, (n = 76, covering 19 countries), followed by Asia (n = 44 covering 17 countries), Europe (n = 30, covering 17 countries), North and South Americas (n = 18 covering 10 countries) and the Oceania region (n = 2 covering 2 countries). The majority of studies (67%, n = 114,) were published between 2011 and 2016 (Figure 3).

The reported sample size of participants per study ranged from 6 to 240 with a median of 52 participants (Figure 4). The studies had a median of 7 focus group discussion sessions, and there were no iterative focus groups in any study. The number of participants per focus group ranged from 2 to 21 with a median of 10 participants. More than half of the studies (n = 101) did not report the sample size, whereas 55% (n = 93) did not report group size and 32% (n = 54) did not mention the number of focus group discussion sessions while reporting the results (Figure 4).

The focus group discussion sessions ranged between 60 and 240 min with a median of 90 min per session (Figure 4). However, the majority (84%, n = 143) did not report duration. Few studies 15% (n = 25) stratified participants by gender with a mean ratio of 55:45 for males and females respectively (Figure 4), whereas 14 studies stratified participants by age.

In the reviewed studies, two types of focus group discussion approaches were used. The majority of studies used face-to-face approach (n = 168), whereas one study used the online approach and another used a combination of face-to-face and online approach. The studies did not provide any rationale for conducting focus group discussion in either manner. However, the face-to-face approach seemed to offer an opportunity for detailed study of participants' viewpoints and the rationale behind their opinions. In addition, most of the studies were based in rural communities within the developing countries with limited infrastructure for online access. Most of the studies (n = 144) used focus group discussions alongside other methods such as interviews (n = 117), surveys (n = 82), choice experiments (n = 6) and Delphi technique (n = 1). Only 26 of the studies used the method as a stand-alone technique. Some of the studies offered incentives to potential group members (e.g. 209), whereas others relied on local contacts such as community leaders or key gatekeepers to drive the recruitment process (e.g. 61; 116).

6 | THEMATIC AREAS

Four major themes emerged from the review (Appendix S3). The most common theme related to the understanding of people's perspectives regarding conservation (32%, n = 54), followed by the assessment of conservation and livelihoods practices (21%, n = 35), examination of

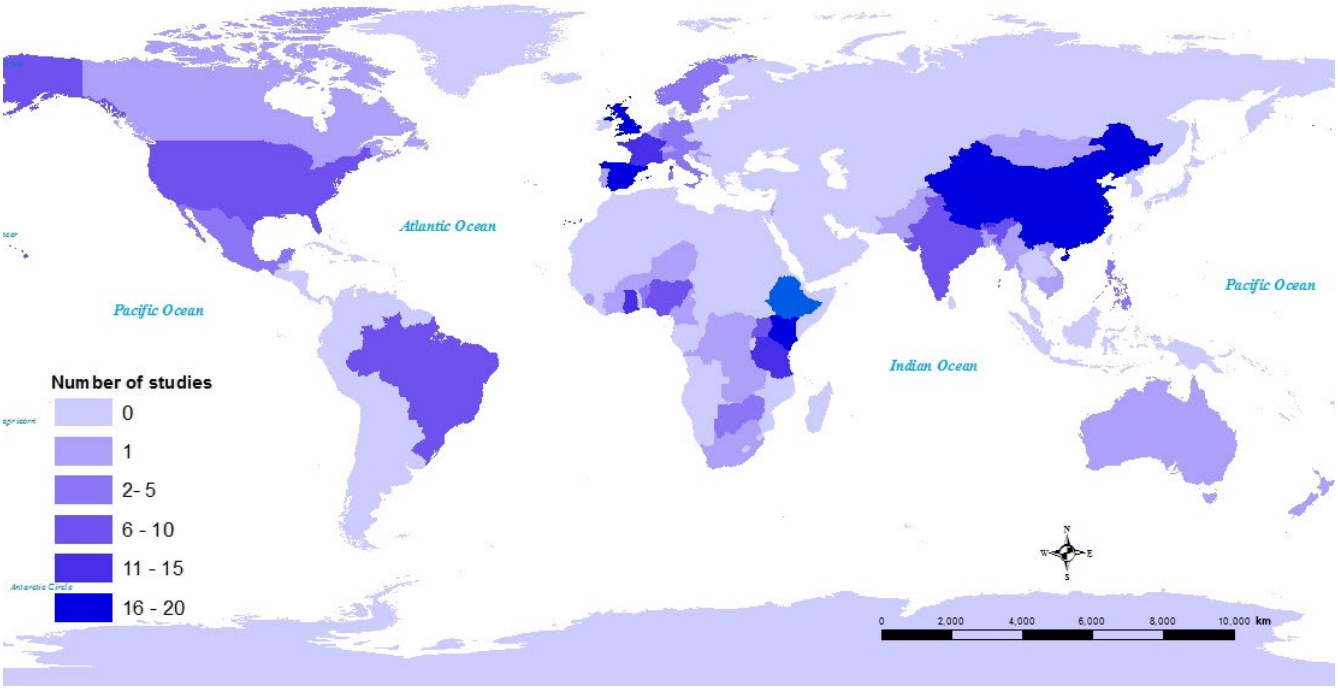

FIGURE 2 Map showing the countries where focus group discussion has been applied. Studies which were global in scope have been excluded. In case if multiple countries were covered in a study, all countries have been noted

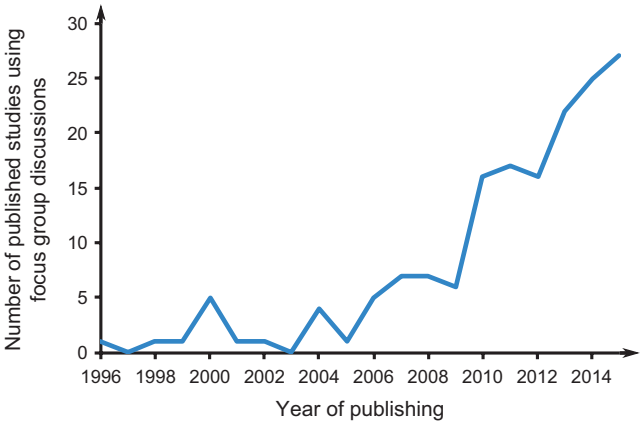

FIGURE 3 Change in the number of published studies in conservation and ecology using focus group discussion over the period 1996–2015

challenges and impacts of resource management interventions (19%, *n* = 33) and documenting the value of indigenous knowledge systems (16%, *n* = 28). Conservation conflicts, application of conservation and research tools, participation in conservation programmes, and profiling of resource users (12%, *n* = 20) were also covered. The contextual exploration of these themes is provided below. An overlap between themes was observed in some studies.

6.1 | Examination of impacts

Decisions in conservation management rely on evidence (both scientific and experiential). Focus group discussion was used to examine impacts of conservation management interventions. These include the use of fire in grassland management, nature-based enterprises, joint forest management systems, REDD+ and Payment for Ecosystem services (108; 71; 30; 50; 46). Focus group discussion facilitated the examination of socio-cultural impacts and gender-based constraints and roles in conservation (54; 66; 85; 24; 4; 1). It was useful in examining impacts of climate change and climate change adaptation measures (96). Impacts of policy changes on the common pool resources, agriculture and rural development and participatory land use planning were also studied (200; 199; 58; 25). As a data gathering process, focus group discussion relied on people's experiences and perceptions to generate anecdotal data.

6.2 | Understanding peoples' perspectives

Understanding people's perceptions are central to establishing how and why people respond to conservation issues in a certain way. Up to 23% of the studies sought to understand perspectives. Focus group discussion was mainly used to explore people's understanding, interpretation and legitimisation of biodiversity management initiatives and levels of support for such initiatives such as deer management, coastal resources management, the discourse around national parks and relationships with park authorities (242; 184; 177; 86; 29). They provided insights into their perceptions on climate and environmental change impacts, deforestation and land degradation and nature-based production systems such as oil sands production, ecotourism and forestry (238; 187; 164; 97; 40; 29). Focus group discussions were also used to understand people's construction, notions, and interpretation of nature. The studies explored the use of metaphors and mental

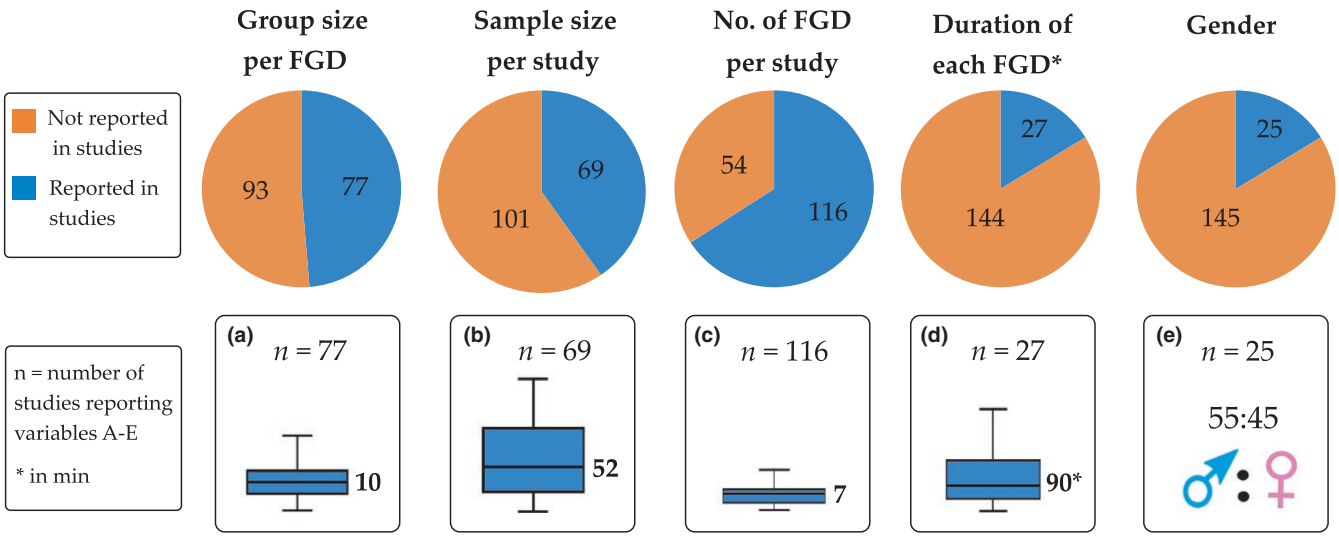

FIGURE 4 Variables of focus group discussion and participant stratification. Boxes a-e depict the reported data for each given variable, where the bolded number is the median average number of participants (a, b), groups (c), and number of minutes (d). Box e depicts the average male to female ratio per study

constructions to drive environmental objectives and understanding of biodiversity issues by different groups (222; 211; 178; 57). In addition, focus group discussion provided insights into the variations in nature constructions based on age and location, for instance between younger and older people living in rural and urban areas (240).

6.3 | Indigenous knowledge systems

The indigenous knowledge systems refer to the knowledge systems developed by a community as compared to conventional scientific knowledge (Ajibade, 2003). Focus group discussion was used to obtain indigenous knowledge-based information on a range of issues. These include cultural, medicinal and nutritional utilisation of a diversity of wild plants, medicinal plants, insects and birds (166; 148; 118; 119; 72; 73; 67; 61; 92; 34). It was also used to explore the contribution of indigenous knowledge to agriculture and climate change adaptation such as rice (*Oryza glaberrima*) farming in Ghana, dairy farming in Ethiopia, and herb harvesting and sale in Nigeria (193; 171; 136). Focus groups were instrumental in exploring the convergence of traditional knowledge and conventional scientific knowledge particularly in the management and conservation of fisheries (26).

6.4 | Assessment of conservation and livelihoods practices

Focus group discussions were used to assess the efficacy of biodiversity monitoring systems to improve natural resources management (158), and biodiversity conservation strategies to improve the quality of forest and marine ecosystems (179; 33; 43; 9). In addition, ecosystem services and disservices were assessed in relation to trade-offs and local preferences (95; 81), quality of natural resources such as water and forests (81; 48), and characterisation and mapping of ecosystem services (93; 32). Furthermore, focus group discussions were used in the assessment of various livelihoods activities such as hunting, agriculture, natural resource extraction and consumption (234; 208; 113).

6.5 | Other thematic areas

Apart from the core thematic areas discussed above, focus group discussion was also used sporadically in a range of contexts. These include conservation conflicts (116; 103) and application of tools such as geographic information systems, agri-environmental measures, immersive visualisation theatre and scenario planning in decision-making (101; 114; 90; 20). In addition, focus groups were used to evaluate people's participation in conservation-related civic organisations, forest, and protected area conservation activities (230; 192; 27; 10). Others include the design of conservation and livelihoods adaptive framework for farmers (89), the ecological importance of medicinal plant trade (91), comparisons of commercially viable butterflies from the forestry-agroforestry interface (70) and profiling legal and illegal natural resources users around key conservation areas (19).

7 | DISCUSSION

Our comprehensive review showed that focus group discussion has been widely used in conservation research over the last two decades. The versatility and ease of use of the technique is demonstrated by the fact that it has been used in a range of contexts and in combination with other techniques. However, the technique is also subject to "careless or inappropriate use," potential data manipulation, and exploitation of participants when researchers tend to assume that group consent represents individual consent (Kitzinger & Barbour, 1999).

Consequently, researchers must be clear on where it is appropriate or not, to deploy the technique.

8 | RECRUITMENT, SAMPLING AND APPROACH

Participant recruitment and selection is a key phase in focus group discussion. However, we observed that the majority of the reviewed papers did not report their sampling and participant recruitment procedures. Failure by half of the studies to report the group size could have far-reaching implications for assessing the reliability of the results. Most of the studies reviewed did not stratify or did not state whether they stratified their participants. For the few that did, they only considered gender as the main factor (e.g. 169). Although studies claimed that participants were community members, decision makers and stakeholders, it is not clear how the groups were defined, verified, and recruited as well as the relationship between sampling and representativeness (e.g. 89). This lack of reporting, according to Andrew and Jonathan (2006) and Moon, Brewer, Januchowski-Hartley, Adams, and Blackman (2016), is a key weakness in the ability of the focus group technique to generate powerful findings that reveal something about social processes, rather than simply reporting a discussion of individual circumstance.

9 | GEOGRAPHICAL DISTRIBUTION OF THE USE OF FOCUS GROUP DISCUSSION

There were a large number of studies in Africa and Asia. Natural resources are central to rural people's livelihoods in both these continents and norms and customs shape everyday forms of resource use (Bisong, 2001). Throughout the review, we noted that rural residents were consulted on issues relating to human–wildlife conflicts, protected area management, participatory forest protection and natural resource exploitation. Local communities are inextricably tied to their cultural resources and societal perceptions (Austin, Smart, Yearley, Irvine, & White, 2010). Hence the need to evaluate such perceptions, find common ground and resolve conflict is paramount for conservation decision making (Redpath et al., 2004). In addition, the increasing focus on indigenous knowledge on resources implies that the residents are likely to become pivotal in ensuring the continued management and relevance to ecological research (Austin et al., 2010).

Focus group discussion has had broad appeal as a research tool, as evidenced by this review. Although the use of focus group discussion as a research technique has been dominant in the other disciplines such as sociology and psychology, its use has recently grown in the conservation social science research (Bennett et al., 2017; Khadka et al., 2013; Paloniemi et al., 2012). During this review, we observed that researchers in conservation have not adequately reported on the methodological choices from planning to data analysis. This is a concern as it gives the false impression that focus group discussion technique is not a rigorous method for data collection.

10 | ADVANTAGES AND CAVEATS

The most compelling reason for using focus group discussion is the need to generate discussion or debate about a research topic that requires collective views and the meanings that lie behind those views (including their experiences and beliefs) (e.g. Asmamaw, Mohammed, & Lulseged, 2011; Buijs, Fischer, Rink, & Young, 2010; Harisha & Padmavathy, 2013; Mfune, 2013; Wibeck, 2011). In addition, researchers may use focus group discussion to explore a topic, obtain information or narratives for use in the later stages of the research, for example testing narratives (Zander, Stolz, & Hamm, 2013) and developing questionnaires (Kelboro & Stellmacher, 2015). Other studies have used focus group discussion to clarify and extend findings, such as motivations for different resource use regimes (Harrison, Baker, Twinamatsiko, & Milner-Gulland, 2015; Manwa & Manwa, 2014), qualify or challenge data collected through other techniques such as ranking results through interviews (Harrison et al., 2015; Zander et al., 2013) and to provide feedback to research participants (Morgan et al., 1998).

However, the use of focus group discussion technique is not recommended when there is a risk of raising participants' expectations that cannot be fulfilled or where "strategic" group biases are anticipated (Harrison et al., 2015). Since focus group discussion depends on participants' dynamics, it should be avoided where participants are uneasy with each other or where social stigmatisation due to the disclosure may arise (Harrison et al., 2015). In such situations, participants may not discuss their feelings and opinions freely or hesitate to participate in the topic of interest to the researcher. Focus group discussion provides depth and insight, but cannot produce useful numerical results, hence must not be used where statistical data are required (Bloor et al., 2001; Morgan et al., 1998).

According to Krueger (1994) and Morgan et al. (1998), focus group discussion, as a qualitative research method, is comparatively easier to conduct since all the target participants and the researcher are readily available in one location at the same time. Geographic proximity is an important consideration for researchers with resources constraints in developing nations. The technique was popular among researchers working within strict timelines, and requiring rapid and resource efficient way of gathering information about complex relationships (199). Under resources constraining conditions, focus group discussion technique minimises travelling between locations and avails a large amount of data within a limited time frame compared to an equivalent number of interviews. However, this setup can also be a disadvantage since the group is not conducted in a natural atmosphere or where the researcher is not located close to the study site. In most of the studies we reviewed, participants were collected in one location and were prepared in advance for the discussion around a topic rather than meeting them in their usual places of work or residence. This arrangement might have the effect of introducing participant expectations and biases, including strategic group biases (e.g. 19).

The value of focus group discussions can be seen in researching communities with high mobility and hence the difficulty in sampling and organising meetings in specific locations. This is usually the case

when working with non-sedentary households especially in the rangelands (e.g. 200). Where such communities or research subjects are involved, researchers are faced with uncertain and unpredictable patterns of movement and hence participant participation. Researching such communities requires additional preparation and resources which might not be readily available to student researchers. It is therefore important to critically think about the nature and occupation of the research subjects well before setting out to use focus group discussion.

One of the key requirements for a successful focus group discussion is a skilled and well-trained group facilitator and team members. We noted that none of the studies mentioned the extent of facilitator engagement or involvement. This is a concern since facilitation is central to unbiased data collection. Our experiences from recent fieldwork point to the difficulty of having an incomplete team in collecting the data. For example asking questions, recording the discussion and non-verbal data cannot be accomplished by one or two research members only. We, therefore, recommend that future users pay adequate attention to recruiting an experienced facilitator team while planning to use this technique and include the additional cost to the research project (see recommendations on facilitator skills).

Our review indicates that the researchers often set out to explore topics of their interest and worked with the participants to explore, present, negotiate and evaluate the research problems and findings (e.g. CD4). While this is the normal structure of a research project, especially those based on a priori hypothesis, the value of the focus group discussions for such studies is diminished. In most cases, the range of topics that participants feel comfortable discussing may not be what the researcher intends to explore. Furthermore, some topics may be more difficult to discuss among some categories of participants than others (e.g. 18). Our experiences in using the technique indicate that restricting participants to the topic of researcher's interest constraints creativity and encourages conformity and strategic biases. The aims of the research might also determine the extent to which the researcher can allow the participants to address issues that are perceived as particularly relevant to them, rather than those chosen by the researcher (e.g. 211).

Focus group discussion is a flexible technique and is adaptable at any stage of the research. Compared to more conventional techniques such as individual interviews and surveys, focus group discussion offers an opportunity to explore issues that are not well understood or where there is little prior research on the topic (e.g. 239). This is because, focus group discussion builds on the group dynamics to explore the issues in context, depth and detail, freely without imposing a conceptual framework compared with a structured individual interview (e.g. CD31; 240; CD5; 199). Our field experiences point to the fact that such dynamics and the process of sharing and comparing understandings and views mean that the focus group discussion can yield more insights than the equivalent number of individual interviews. Researchers can hugely benefit from the group context since it provides insight into social relations, and the information obtained reflects the social and overlapping nature of knowledge better than a summation of individual narratives through interviews and surveys.

However, focus group participants are sometimes reluctant to deal with sensitive topics in a discussion setting compared with an individual interview or a survey (18). Researchers must be aware of this constraint when planning and framing the group discussion questions. Under such circumstances, focus groups discussion can be used alongside other techniques within the context of mixed methods approach. Triangulating the results with two or more different methods, in a complementary way can offer an opportunity to draw conclusions from such a focus group.

11 | RECOMMENDATIONS FOR BEST PRACTICE IN FOCUS GROUP DISCUSSION

1. Provide a clear rationale for the choice of focus group discussion: The researcher must be able to provide adequate justification for the choice of focus group discussion technique as the "best suited to answering their questions about a phenomenon" (Berry & Kincheloe, 2004, p. 4). A clear rationale should provide the readers with confidence that the selection of data sources, the analysis and the interpretation is reliable and valid and that the quality of research is not compromised (Wilson, 2009, p. 81).
2. Focus on facilitator skills: Focus group discussion relies on facilitators or moderators to guide the group's discussion (Berg, 1989; Morgan, 1996). According to Morgan et al. (1998) and Litosseliti (2004), the facilitator must have a set of skills and techniques to ensure that the issues under discussion are addressed comprehensively. Here is a suggested skill set:
   - **a.** Ability to build rapport by creating a warm, supportive and comfortable environment to foster open and honest dialogue among diverse groups and individuals.
   - **b.** Have good and active listening skills to help engage with the respondent by paraphrasing or summarising their responses and using gestures to encourage conversation.
   - **c.** Have good observation skills, pay attention to participants' body language or demeanour and recognise group dynamics.
   - **d.** Have good speaking, communication skills and knowledge of the topic of discussion including some basic information on the subject to help in probing different answers for more in-depth discussion but should demonstrate some degree of "naïveté" to encourage participants' responses.
   - **e.** Flexibility to adapt to the flow of the discussion, remain open to changes in the discussion guide, adjust to participants' requests during the group and adjust physical behaviours and activity around the room.
   - **f.** Ability to remain impartial by getting involved while maintaining verbal and non-verbal objectivity.
   - **g.** Should have a sense of humour to keep the discussion relaxed, encourage sharing of information and maintain a human connection.
3. Report methods and results based on Figure 1: The review revealed that a major lacuna of most of the studies was improper reporting or inadequate reporting of key attributes of the

application of the technique. We, therefore, recommend that future studies should explicitly mention the methodological decisions based on the guidelines provided in the flow chart (Figure 1).

4. Beware of biases affecting group discussions: Unlike interviews or Q methodology which are individually administered, focus group discussion is a group-based technique. It is subject to the biases which are commonly encountered in any group setting. These include dominance effect (a dominant individual shapes the discussion), halo effect (the perceived status of a group member influences the discussion), groupthink (the members in a group tend to think similarly to maintain group cohesion) among several others (Mukherjee et al., 2015). The facilitator (and/or assistant) should keep a keen eye out to spot and address such biases in the data collection phase.
5. Ensure a clear pathway between the data obtained, coding and subsequent analysis of data: The review revealed that 144 out of 170 studies used focus group discussion alongside other techniques in the same study. In most of these studies, it was extremely difficult to tease out what component of the results and inferences were derived from the focus group discussion alone. Providing this information might enable the reader to make a clear connection between the research question asked, results obtained and subsequent analysis.

Focus group discussion can be utilised within a suite of techniques in a multi-method research design, as a principal research method in its own right, or as a form of participatory action research to empower participants and promote social change (Wilkinson, 1998, 1999). Our review showed that a range of topics ranging from community participation in natural resource management and governance, human-wildlife conflict mitigation, to indigenous ecological knowledge systems had been investigated using focus group discussion. The evidence suggests a rapid growth in the application of focus group discussion technique in biodiversity research. However, the growth is steeper in biodiversity-rich developing countries such as Ethiopia, Kenya, Tanzania and Nepal. While focus group discussion can be a cost-effective and a quick approach to data collection, they require proper planning and organisation (Burgess, 1984; Goss & Leinbach, 1996; Kitzinger, 1995; MacIntosh, 1993; Powell, Single, & Lloyd, 1996). The current review might be useful for academics and practitioners keen to apply focus group discussion in their research and conservation practise.

ACKNOWLEDGEMENTS

Tom Finch is thanked for comments on the draft. N.T.O. was funded by Cambridge Overseas Trusts, The Wildlife Conservation Society, Wildlife Conservation Network and WildiZe Foundation. NM was funded by the NERC grant (NE/R006946/1), Fondation Wiener Anspach and the Scriven post doctoral fellowships. K.W. was supported by the Australian Research Council Centre of Excellence for Environmental Decisions (CE11001000104) and Future Fellowship (FT100100413) programs and funded by the Australian Government.

AUTHORS' CONTRIBUTIONS

N.M. designed the protocol and conducted the literature screening. T.O.N. and C.J.D. conducted the review. T.O.N., K.W. and N.M. interpreted the data and wrote the manuscript. All authors have read and edited the manuscript.

DATA ACCESSIBILITY

The manuscript does not include any primary data. Information about the studies reviewed can be found in the appendices.

ORCID

Nibedita Mukherjee http://orcid.org/0000-0002-2970-1498
Tobias O.Nyumba http://orcid.org/0000-0002-7821-5197

REFERENCES

Ajibade, L. T. (2003). A methodology for the collection and evaluation of farmers indigenous environmental knowledge in developing countries. *Indilinga African Journal of Indigenous Knowledge Systems*, *2*, 99–105.

Andrew, P., & Jonathan, T. (2006). Focus group method and methodology: Current practice and recent debate. *International Journal of Research & Method in Education*, *29*, 23–37.

Angen, M. J. (2000). Evaluating interpretive inquiry: Reviewing the validity debate and opening the dialogue. *Qualitative Health Research*, *10*, 378–395.

Asmamaw, L. B., Mohammed, A. A., & Lulseged, T. D. (2011). Land use/cover dynamics and their effects in the Gerado catchment, northeastern Ethiopia. *International Journal of Environmental*, *68*, 883–900.

Austin, Z., Smart, J. C. R., Yearley, S., Irvine, R. J., & White, P. C. L. (2010). Identifying conflicts and opportunities for collaboration in the management of a wildlife resource: A mixed-methods approach. *Wildlife Research*, *37*, 647–657.

Bennett, N. J., Roth, R., Klain, S. C., Chan, K., Christie, P., Clark, D. A., … Wyborn, C. (2017). Conservation social science: Understanding and integrating human dimensions to improve conservation. *Biological Conservation*, *205*, 93–108.

Berg, B. L. (1989). *Qualitative research methods for the social sciences*, 4th ed. Long Beach, CA: Allyn and Bacon, California State University.

Berkes, F. (2004). Rethinking community-based conservation. *Conservation Biology*, *18*, 621–630.

Berry, K., & Kincheloe, J. (2004). *Rigour and complexity in educational research. Conducting educational research*. Maidenhead, UK: Open University Press.

Birt, L., Suzanne, S., Debbie, C., Christine, C., & Fiona, W. (2016). Member checking: A tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health Research*, *26*, 1802–1811.

Bisong, F. E. (2001). Community institutions and resource management. resilience and adaptation of traditional mechanisms for sustainability. *South-South Journal of Culture and Development*, *3*, 92–131.

Bloor, M., Frankland, J., Thomas, M., & Robson, K. (2001). *Focus groups in social research*. Thousand Oaks, CA: Sage Publications Inc.

Buijs, A. E., Fischer, A., Rink, D., & Young, J. C. (2010). Looking beyond superficial knowledge gaps: Understanding public representations of biodiversity. *International Journal of Biodiversity Science and Management*, *4*, 65–80.

Burgess, R. G. (1984). *In the field: An introduction to field research*. London, UK: Unwin Hyman.

Burrows, D., & Kendall, S. (1997). Focus groups: What are they and how can they be used in nursing and health care research? *Social Sciences in Health*, *3*, 244–253.

Carey, M. A., & Smith, M. W. (1994). Capturing the group effect in focus groups: A special concern in analysis. *Qualitative Health Research*, *4*, 123–127.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. London, UK: Sage Publications Inc.

Cornwall, A., & Jewkes, R. (1995). What is participatory research? *Social Science and Medicine*, *14*, 1667–1676.

Doyle, S. (2007). Member checking with older women: A framework for negotiating meaning. *Health Care for Women International*, *28*, 888–908.

Dubrovsky, V., Kiesler, S., & Sethna, B. (1991). The equalisation phenomena: Status effects in computer-mediated and face-to-face decision-making groups. *Journal of Human-Computer Interaction*, *13*, 133–152.

Edmunds, H. (1999). *The focus group. Research handbook*. Chicago, IL: American Marketing Association and NTC Business Books.

Fern, E. F. (1982). The use of focus groups for idea generation: The effects of group size, acquaintanceship and moderation on response quantity and quality. *Journal of Marketing Research*, *19*, 1–13.

Flores, J. G., & Alonso, C. G. (1995). Using focus groups in educational research: Exploring teachers' perspectives on educational change. *Evaluation Review*, *19*, 84–101.

Fonteyn, M. E., Vettese, M., Lancaster, D. R., & Bauer-Wu, S. (2008). Developing a codebook to guide content analysis of expressive writing transcripts. *Applied Nursing Research*, *21*, 165–168.

Freitas, H., Oliveira, M., Jenkins, M., & Popjoy, O. (1998). The focus group, a qualitative research method: reviewing the theory, and providing guidelines to its planning. 1–22.

Gibson, J. E. (2012). Interviews and focus groups with children: Methods that match children's developing competencies. *Journal of Family Theory & Review*, *4*, 148–159.

Glaser, B. G. (1978). *Theoretical Sensitivity*. Mill Valley, CA, USA: Sociology Press.

Glaser, B. G. (1992). *Discovery of Grounded Theory*. Chicago, IL, USA: Aldine.

Glaser, B. G., & Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine Transaction: A Division of Transaction Publishers, New Brunswick, NJ, USA.

Gorden, R. L. (1980). *Interviewing: Strategy, techniques, and tactics*. Homewood, IL: Dorsey Press.

Goss, J. D., & Leinbach, T. R. (1996). Focus groups as alternative research practice: Experience with transmigrants in Indonesia. *Area*, *28*, 115–123.

Green, J. M., Draper, A. K., & Dowler, E. A. (2003). Shortcuts to safety: Risk and 'rules of thumb' in accounts of food choice. *Health, Risk and Society*, *5*, 33–52.

Guba, E. G., & Lincoln, Y. S. (1994). *Competing paradigms in qualitative research*. Thousand Oaks, CA: Sage Publications Inc.

Hague, P. (2002). *Market Research*, 3rd ed. London: Kogan Page Ltd.

Hargreaves, D. H. (1967). *Social relations in a secondary school*. London, UK: Routledge.

Harisha, R. P., & Padmavathy, S. (2013). Knowledge and use of wild edible plants in two communities in Malai Madeshwara Hills, Southern India. *International Journal of Botany*, *9*, 64–72.

Harrison, M., Baker, J., Twinamatsiko, M., & Milner-Gulland, E. J. (2015). Profiling unauthorized natural resource users for better targeting of conservation interventions. *Conservation Biology*, *29*, 1636–1646.

Hayward, C., Simpson, L., & Wood, L. (2004). Still left out in the cold: Problematising participatory research and development. *Sociologia Ruralis*, *44*, 95–108.

Heary, C. M., & Hennessy, E. (2002). The use of focus group interviews in paediatric health care research. *Journal of Paediatric Psychology*, *27*, 47–57.

Hohenthal, J., Owidi, E., Minoia, P., & Pellikka, P. (2015). Local assessment of changes in water-related ecosystem services and their management: DPASER conceptual model and its application in Taita Hills, Kenya. *International Journal of Biodiversity Science, Ecosystem Services & Management*, *11*, 225–238.

Hugé, J., & Mukherjee, N. (2017). The Nominal Group Technique in ecology & conservation: application and challenges. *Methods in Ecology and Evolution*, https://doi.org/10.1111/2041-210X.12831

Israel, B. A., Schulz, A. J., Parker, E. A., & Becker, A. B. (1998). Review of community-based research: Assessing partnership approaches to improve public health. *Annual Review of Public Health*, *19*, 173–202.

Johnson, A. (1996). 'It is good to talk': The focus group and the sociological imagination. *The Sociological Review*, *44*, 517–538.

Kamberelis, G., & Dimitriadis, G. (2005). Focus groups: Strategic articulations of pedagogy, politics, and inquiry. In N. K. Denzin, & Y. S. Lincoln (Eds.), *The Sage Handbook of Qualitative Research*, 3rd ed. (pp. 887–907). Thousand Oaks, CA: Sage Publications Inc.

Kelboro, G., & Stellmacher, T. (2015). Protected areas as contested spaces: Nech Sar National Park, Ethiopia, between "local people", the state, and NGO engagement. *Environmental Development*, *16*, 63–75.

Khadka, C., Hujala, T., Wolfslehner, B., & Vacik, H. (2013). Problem structuring in participatory forest planning. *Forest Policy and Economics*, *26*, 1–11.

Kitzinger, J. (1994). The methodology of Focus Groups: The importance of interaction between research participants. *Sociology of Health and Illness*, *16*, 103–121.

Kitzinger, J. (1995). Introducing focus groups. *British Medical Journal*, *311*, 299–302.

Kitzinger, J., & Barbour, R. (1999). Introduction: The challenge and promise of focus groups. In R. S. Barbour & J. Kitzinger (Eds.), *Developing focus group research: Politics, theory and practice* (pp. 1–20). London, UK: Sage Publications Inc.

Krippendorff, K. (2012). *Content analysis: An introduction to its methodology*, 3rd ed. Beverly Hills, CA: Sage Publications Inc.

Krueger, R. A. (1994). *Focus groups: A practical guide for applied research*. Thousand Oaks, CA: Sage Publications Inc.

Krueger, R. A. (1998). *Developing Questions for Focus Groups: Focus Group Kit 3*. Newbury Park, London: SAGE Publications.

Krueger, R. A., & Casey, M. A. (2000). *Focus groups: A practical guide for applied research*, 4th ed. Thousand Oaks, CA: Sage Publications Inc.

Lacey, C. (1970). *Hightown Grammar: The school as a social system*. Manchester, UK: Manchester University Press.

Leech, N. L., & Onwuegbuzie, A. J. (2007). An array of qualitative data analysis tools: A call for data analysis triangulation. *School Psychology Quarterly*, *22*, 557–584.

Leech, N. L., & Onwuegbuzie, A. J. (2008). Qualitative data analysis: A compendium of techniques and a framework for selection for school psychology research and beyond. *School Psychology Quarterly*, *23*, 587–604.

Litosseliti, L. (2004). *Using focus groups in research*. London, UK: Continuum.

Lunt, P., & Livingstone, S. (1996). Focus groups in communication and media research. *Journal of Communication*, *42*, 78–87.

Mac an Ghaill (1994). *The making of men: Masculinities, sexualities and schooling*. Maidenhead, UK: Open University Press.

MacIntosh, J. A. (1993). Focus groups in distance nursing education. *Journal of Advanced Nursing*, *18*, 1981–1985.

Manwa, H., & Manwa, F. (2014). Poverty alleviation through pro-poor tourism: The role of Botswana Forest Reserves. *Sustainability (Switzerland)*, *6*, 5697–5713.

Mendes de Almeida, P. F. (1980). A review of group discussion methodology. *European Research*, *8*, 114–120.

Merton, R. K., & Kendall, P. L. (1946). The focused interview. *American Journal of Sociology*, *51*, 541–557.

Merton, R. K., Fiske, M., & Kendall, P. L. (1956). *Focused Interview: A Manual of Problems and Procedures*, 2nd ed.. A division of Macmillan Inc, New York, NY, USA: The Free Press.

Mfune, O. (2013). Extending conservation to farmlands in Zambia: Prescribed practices and reality. *Journal of Sustainable Development*, *7*, 46–59.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. London, UK: Sage Publications Inc.

Moon, K., Brewer, T. D., Januchowski-Hartley, S. R., Adams, V., & Blackman, D. A. (2016). A guideline to improve qualitative social science publishing in ecology and conservation journals. *Ecology and Society*, *21*, 17.

Morgan, D. L. (1988). *Focus group as qualitative research*. Newbury Park, CA: Sage Publications Inc.

Morgan, D. L. (1995). Why things (sometimes) go wrong in focus groups. *Qualitative Health Research*, *5*, 516–523.

Morgan, D. L. (1996). Focus Groups. *Annual Review of Sociology*, *22*, 129–152.

Morgan, D. L. (2002). Focus group interviewing. In J. F. Gubrium, & J. A. Holstein (Eds.), *Handbook of interviewing research: Context & Method* (pp. 141–159). Thousand Oaks, CA: Sage Publications Inc.

Morgan, D. L., Krueger, R. A., & King, J. A. (1998). *The focus group kit* (Vols. 1–6). Thousand Oaks, CA: Sage Publications Inc.

Morse, M. J. (1994). Designing funded qualitative research. In Y. S. Denzin & N. K. Lincoln (Eds.), *Handbook of qualitative research* (pp. 220–235). Thousand Oaks, CA: Sage Publications Inc.

Mukherjee, N., Huge, J., Sutherland, W. J., Mcneill, J., Van Opstal, M., Dahdouh-Guebas, F., & Koedam, N. (2015). The Delphi technique in ecology and biological conservation: Applications and guidelines. *Methods in Ecology and Evolution*, *6*, 1097–1109.

Orr, D. (1992). *Ecological literacy: Education and the transition to a postmodern world*. Albany, NY: State University of New York Press.

Paloniemi, R., Apostolopoulou, E., Primmer, E., Grodzinska-Jurcak, M., Henle, K., Ring, I., … Simila, J. (2012). Biodiversity conservation across scales: Lessons from a science–policy dialogue. *Nature Conservation*, *2*, 7–19.

Parker, A., & Tritter, J. (2006). Focus group method and methodology: Current practice and recent debate. *International Journal of Research & Method in Education*, *29*, 23–37.

Potter, J., & Wetherell, M. (1987). *Discourse and social psychology: Beyond attitudes and behaviour*. London, UK: Sage Publications Inc.

Powell, R. A., Single, H. M., & Lloyd, K. R. (1996). Focus groups in mental health research: Enhancing the validity of user and provider questionnaires. *International Journal of Social Psychiatry*, *42*, 193–206.

Rabiee, F. (2004). Focus-group interview and data analysis. *Proceedings of Nutrition Society*, *63*, 655–660.

Redpath, S. M., Arroyo, B. E., Leckie, F. M., Bacon, P., Bayfield, N., Guttiérrez, R. J., & Thirgood, S. J. (2004). Using decision modelling with stakeholders to reduce human-wildlife conflict: A raptor-grouse case study. *Conservation Biology*, *18*, 350–359.

Ritchie, J., & Spencer, L. (1994). Qualitative data analysis for applied policy research. In A. Bryman, & R. Burgess (Eds.), *Analysing Qualitative Data* (pp. 173–194). London, UK: Routledge.

Robson, C. (2006). *How to do a research project: a guide for undergraduate students*. Malden, MA: Blackwell Pub.

Sampson, P. (1972). *Qualitative research and motivation research. Consumer market research handbook*. London, UK and Düsseldorf, Germany: McGraw-Hill.

Sandelowski, M. (1993). Rigor or rigor mortis: The problem of rigor in qualitative research revisited. *Advances in Nursing Science*, *16*, 1–8.

Sewell, T. (1997). *Black masculinities and schooling: How black boys survive modern schooling*. London, UK: Trentham Books.

Skeggs, B. (1997). *Formations of class & gender: Becoming respectable*. Thousand Oaks, CA: Sage Publications Inc.

Smith, J. M. (1972). *Interviewing in market and social research*. London, UK: Routledge & K. Paul.

Smithson, J. (2000). Using and analysing focus groups: Limitations and possibilities. *International Journal of Social Research Methodology*, *3*, 103–119.

Stewart, D. W., & Shamdasani, P. N. (1990). *Focus groups: Theory and practice*. London, UK: Sage Publications Inc.

Stewart, D. W., Shamdasani, P. N., & Rook, D. W. (2007). *Focus groups: Theory and practice*. Thousand Oaks, CA: Sage Publications Inc.

Strauss, A. L. (1987). *Qualitative Analysis for Social Scientists*. Cambridge, UK: Cambridge University Press.

Szybillo, G., & Berger, R. (1979). What advertising agencies think of focus groups. *Journal of Advertising Research*, *19*, 19–23.

Thomas, L., MacMillan, J., McColl, E., Hale, C., & Bond, S. (1995). Comparison of focus group and individual interview methodology in examining patient satisfaction with nursing care. *Social Sciences in Health*, *1*, 206–219.

Wibeck, V. (2011). Images of environmental management: Competing metaphors in focus group discussions of Swedish environmental quality objectives. *Environmental Management*, *49*, 776–787.

Wilkinson, S. (1998). Focus group methodology: A review. *International Journal of Social Research Methodology*, *1*, 181–203.

Wilkinson, S. (1999). A feminist method. *Psychology of Women Quarterly*, *23*, 221–244.

Wilson, L. H. (2009). *Practical teaching: A guide to PTLLS & DTLLS*. Boston, MA: Cengage Learning.

Yin, R. (1989). *Case study research: Design and methods*, 2nd ed. London, UK: Sage Publications Inc.

Zander, K., Stolz, H., & Hamm, U. (2013). Promising ethical arguments for product differentiation in the organic food sector. A mixed methods research approach. *Appetite*, *62*, 133–142.

SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

How to cite this article: Ochieng NT, Wilson K, Derrick CJ, Mukherjee N. The use of focus group discussion methodology: Insights from two decades of application in conservation. *Methods Ecol Evol*. 2018;9:20–32. https://doi.org/10.1111/2041-210X.12860