Q methodology.

Participatory research methods for sustainability – toolkit #14

Achieving inclusive and equitable development requires interventions that account for diverse and sometimes conflicting human perspectives. Q methodology offers a structured approach to exploring human subjectivity, revealing how values align and differ across groups on sustainability issues. When combined with participatory approaches, the method supports the integration of diverse perspectives into planning and decision-making processes, promoting more inclusive and equitable outcomes. This toolkit demonstrates how Q methodology can be used to study participatory processes.

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Achieving inclusive and equitable development requires approaches that consider individual differences while integrating a range of perspectives, including conflicting ones. Therefore, it is essential to understand the diverse views, priorities, opinions, and values held by individuals on a specific topic, while identifying their shared and differing viewpoints. Q methodology facilitates this process through its structured, systematic approach to uncovering individuals' subjective views. Participants are asked to assign priority rankings to a predefined set of statements or images about a specific topic, based on their personal perspectives. This helps to identify areas of consensus and important differences, thereby allowing these insights to be used in the planning and designing of inclusive strategies. This method can be applied on its own or integrated into deliberative approaches, in which stakeholders explore diverse perspectives, engage in discussion, and work toward consensus on a specific issue. Q methodology is also well suited to participatory processes that seek to enhance the relevance of decisions by actively involving stakeholders.

In this series, we aim to alert *GAIA* readers to useful toolkits for participatory research methods for sustainability.
If you would like to contribute a toolkit description, please contact **editorsgaia@oekom.de**.

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Researchers can use Q methodology to capture the views of a range of stakeholders before a deliberative process begins. Based on the results of Q methodology conducted with individuals, subsequent processes can be designed to ensure the participation of diverse people and to better represent diverse perspectives on the issue under study. Q methodology can also be used as a framework to bridge different approaches ranging from participatory scenario development to future backcasting and visioning to ensure that individuals with diverse views participate in these activities and subsequent decision making processes (box 1, p. 172). Additionally, it can serve as an engagement tool for designing and implementing participatory approaches to key sustainability issues. Specifically, researchers can use Q methodology to facilitate stakeholders meetings by framing key themes and structuring the meeting according to Q methodology procedures. These procedures include participants ranking statements and collectively reflecting on the issues. Finally, Q methodology can be used after the deliberative process to collect perspectives on the process itself, thus improving future iterations.

Procedure

Q methodology is a structured approach involving several activities. Generally, six major steps are followed.

1 ***Definition of the research topic:*** Researchers formulate a topic or question of interest with a clear objective that can be explored through the analysis of human subjectivity. Engaging stakeholders early on, for example through focus group discussions, helps ensure the topic is locally and contextually relevant.

2 ***Structuring and building the concourse of statements:*** In Q methodology, the concourse refers to a systematically compiled set of statements that captures the full range of perspectives >

BOX 1: Using Q methodology to bridge participatory scenario planning and landscape visioning

In southwestern Ethiopia, participatory workshops were conducted to generate exploratory scenarios and visions, aiming to create socially and ecologically desirable landscape visions (Jiren et al. 2020). Over six years, the scenario development and landscape visioning process involved over 200 stakeholders. Participants included local people, policymakers and practitioners, academics, and researchers. While visioning and backcasting naturally follow scenario planning, shifting from scenarios to developing normative views is complex. This is due to power asymmetry among participants and the inability of some stakeholders to express their opinions in a group setting. Additionally, participants in the workshops may not represent diverse perspectives, resulting in uniform visions. To address these challenges, Q methodology was employed after the scenarios had been generated but before the visioning exercise. This aimed to bridge the gaps and facilitate the transition from scenarios to visioning (Jiren et al. 2023). The four scenarios developed jointly with stakeholders served as the concourse, from which an equal number of Q sets were selected (figure 1). The P set was determined using prior knowledge and input from local guides. Applying Q methodology, the researchers captured the diversity of preferences for future landscapes and mapped these preferences across individuals from different locations. This approach made the subsequent participatory landscape visioning process more representative, as it enabled careful selection of participants from distinct preference groups. It also facilitated the harmonization of differing visions, supported the co-creation of a shared future, and allowed for proactive management of power asymmetries during the visioning process.

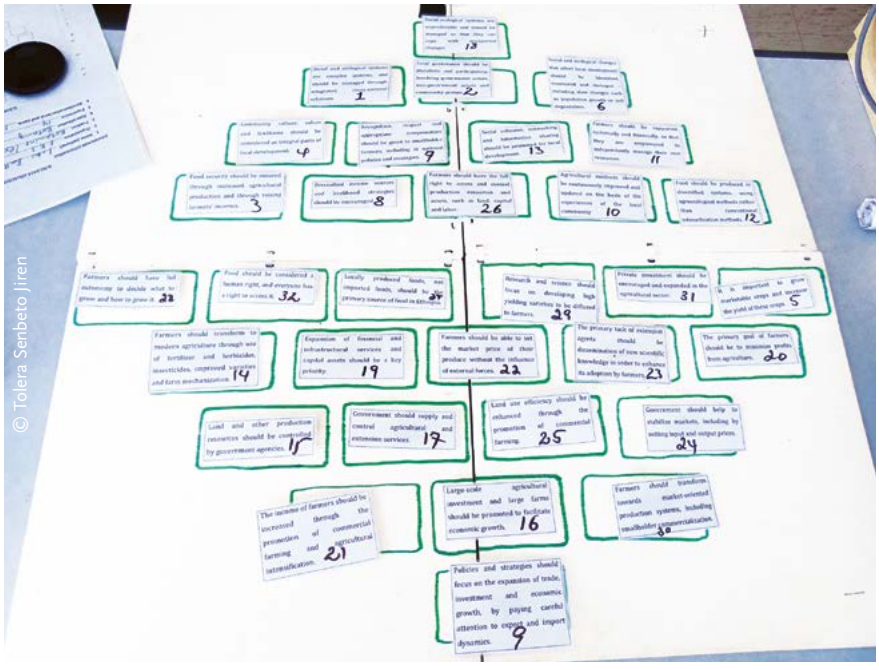

FIGURE 1: Q-sorting grid (Q-sorting board). Each statement card is placed in one box on the grid, and together they form the Q set. The numbers assigned to the statements are nominal identifiers used only for recording and do not carry any substantive meaning. Q-sort scores range from +4 to −4, where +4 indicates the most important view and −4 the least important. The topmost statement on the Q grid reflects the participant's highest priority (+4), while the bottommost reflects the lowest (−4). Statements in the middle (0) represent views considered neutral or of moderate importance (Jiren et al. 2023).

– positive, negative, and neutral – on the research topic. This ensures all statements are presented in a balanced and unbiased manner. The concourse is compiled using various methods and sources, such as reviewing scientific literature, exploring informal or gray literature, analyzing media sources, conducting interviews, or administering surveys (Zabala 2014). Participatory workshops, potentially using the Delphi method with relevant stakeholders, can be employed to ensure the representativeness and validity of the concourses. Obtaining concourses on the topic both structures the different views and provides a foundation on which to construct a small number of representative statements, Q sets (statements or pictures that stakeholders rank).

3 ***Preparation of statements or pictures to be sorted (Q set):*** The next step involves identifying a clear and well-balanced subset of statements or images (Q set), capturing the diversity of views on the topic from the concourse statements. These are the items (variables) that participants (P set, observations) will then rank based on their perceived priorities. At this stage, it is important to ensure that the Q set is unambiguous, culturally appropriate, and representative of all relevant aspects of the topic. Researchers can improve the relevance of these statements by using an iterative process, which involves co-reviewing the Q set with colleagues and participants to minimize researcher bias. In addition, when applicable, each statement should be translated into the local language spoken by the participants. To facilitate the ranking process, each statement should be printed individually and cut into cards for ranking on the Q grid (figure 1). A Q grid is a board containing as many boxes as there are statements in the Q set, arranged in a forced (often quasi-normal) distribution. Participants place one statement card in each box according to how they perceive its priority. The Q grid is often made from cardboard with diamond-shaped boxes for placing the statements. The center of the grid, marked as 0, represents neutral-

ity or indifference, while positions further to the top or right reflect stronger agreement, and those to the bottom or left indicate stronger disagreement (figure 1).

4 ***Selection of individual participants (P set):*** The P set comprises a carefully selected sample of participants who are intended to represent the full range of diverse viewpoints identified in the concourse. These participants are chosen based on their varied backgrounds and perspectives to perform the Q-sorting task. Unlike surveys or experiments, Q methodology does not require a statistically representative sample. Instead, participants are selected purposefully to reflect the diversity of perspectives relevant to the research question. The aim is to select participants who are likely to hold differing viewpoints on the issue, capturing a wider range of views rather than assembling a large sample. Depending on the complexity, a P set typically comprises between 15 and 40 participants. Researchers can employ several techniques, including snowballing, to identify the P set.

5 ***Collection of data (Q sorting) and post-sorting interviews:*** Q sorting is the core activity in which individuals express their subjective viewpoints by arranging the prepared Q set on the Q grid. The sorting process entails an iterative process of categorizing statements or images and sorting them on the Q board based on their priority. Participants place each statement based on personal reflection and prioritization, enabling meaningful engagement with the topic. Following the Q-sorting process, conducting short, semi-structured interviews can foster the interpretive depth of the study. These interviews provide participants with the opportunity to justify their sorting and reflect on their experiences. Example questions may include: Why did you position these statements at the extremes of the grid?

6 ***Data analysis and interpretation:*** In the analysis of Q methodology data, researchers employ by-person factor analysis to explore subjective viewpoints by grouping individuals according to how they ranked the statements or images. This process often involves principal components analysis or factor analysis to identify shared perspectives among stakeholders. It requires computing correlations among individual Q sorts, extracting factors (i. e., clusters of similar viewpoints) to reveal distinct perspectives, rotating the factors (often using varimax) to enhance interpretability, and then examining and comparing the viewpoints the factors represent. These processes can be done using software such as *PQMethod* or relevant R packages. Each factor is assessed for internal consistency and coherence, and its meaning is interpreted by translating statistical patterns (factor scores) into detailed narratives supported by qualitative data obtained from post-sort interviews. To validate or challenge emerging narratives, researchers may facilitate interpretation workshops with participants, ensuring the findings are contextually relevant.

When designed and facilitated carefully, such workshops can create spaces for dialogue across perspectives and provide a basis for more inclusive representation in decision-making.

Strengths

- Q methodology systematically captures human subjectivities in complex, value-driven sustainability issues. It reveals perspectives that conventional methods, such as a survey, may not adequately address.
- The method combines both quantitative and qualitative techniques, allowing for flexibility and providing for a comprehensive understanding of the topic.
- Q methodology supports participatory research by capturing stakeholder opinions in deliberative processes, making it well-suited for evaluating complex issues.
- The method has the potential to support or integrate underrepresented voices through a careful selection and inclusion of participants with diverse views, thereby supporting an inclusive decision-making process.
- By demonstrating the variety of interpretations of the same idea, Q methodology helps to reveal hidden assumptions and tensions.

Weaknesses

- The method identifies subjective opinions using a small but diverse sample size, so the results from Q studies might not be broadly generalizable.
- Q sorts can be prone to researchers' bias, especially if the analysis lacks transparency or is not validated through participant engagement.
- Q methods rely on factor analysis, a process sometimes viewed as complex, making it more challenging to develop clear narratives when participant viewpoints show little divergence.
- Participants may also find the forced sorting of the statements within the Q grid too restrictive (Moroder et al. forthcoming).

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