The “Collaborative” Delphi

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Abstract

Delphi is a method for the systematic solicitation and collation of informed judgments on a particular topic. Here, we introduce the “Collaborative” Delphi used as a conflict resolution and consensus building tool in the Sustainable Rangelands Roundtable (SRR). Traditionally the Delphi process involves a set of carefully designed sequential questionnaires interspersed with summarized feedback of responses. The Delphi strives towards consensus by obtaining opinion from a panel of experts and giving participants the opportunity to revise their opinion based on feedback from the group. The process is iterative and does not end until a pre-specified level of consensus is achieved. The Policy Delphi is issue or question driven; it strives to answer one question. In contrast, the Collaborative Delphi is process oriented; it works in conjunction with group meetings to develop consensus. The SRR can host only 4-5 meetings per year, but uses Delphi to make progress between meetings. We have found that the Collaborative Delphi has been an effective tool for establishing the range of differing positions, more clearly defining areas of agreement and conflicting opinion, and soliciting informed review of documents. Delphi allows for individual reflection on a subject and, because of its anonymous and written nature, gives voice to all concerns and opinions, even those wary of speaking at meetings. It has also been effective in keeping participants engaged in between meetings.

Introducing SRR

A cooperative effort to address issues associated with sustainable management and use of the United States' rangelands is being conducted by Colorado State University (CSU) in cooperation with several federal land management agencies. The Sustainable Rangelands Roundtable (SRR) is identifying a set of "Criteria and Indicators" (C&I), based on social, economic, and ecological factors. These C&I will provide a framework to assess rangeland sustainability in the United States. SRR is a multidisciplinary group, comprised of scientists, economists, sociologists, conservation groups, industry, state and local government representatives, and policy and legal experts.

At present, the United States lacks consistent, standardized indicators for assessing and reporting the status of rangelands. In the absence of an effective system for monitoring social, economic, and ecological aspects of rangeland ecosystems, measurement of progress toward sustainability remains difficult.

Thus, this country needs a national system of indicators for future assessment and planning. These C&I may help direct sampling protocols for national and regional monitoring systems like the National Resources Inventory. Ecological, social, economic, and legal indicators provide a framework for assessing the sustainability of the 240 million hectares of rangelands in the United States. Availability of such uniform information at a national scale would foster informed, sound decision-making relative to sustainable rangeland management in this country.

SRR was formally organized early in 2001 and is a multidisciplinary group that has gathered to identify C&I of sustainable rangeland management. Participants attend 4-5 meetings a year and contribute to the progress of a variety of working groups. They continue this work between meetings through communication with their indicator groups or with the group as a whole through a series of email surveys we call the “Collaborative” Delphi process.

The Delphi

The Delphi is a technique used for gathering and developing opinion. The process requires that, initially, experts be carefully selected. Once participants are chosen, the Delphi is an iterative process whereby questionnaires are sent out, individual responses are collated and returned to participants in the form of analysis and comments, and individuals are given the opportunity to revise their original answers in response to group feedback. In the conventional form, the Delphi process continues until a pre-determined level of consensus is achieved. In reality, the Delphi process tends to continue for three to four rounds (Turoff 1970, Crance 1987). Though it is important to let the group know that they are working with peers, individual anonymity is usually guaranteed. Delphi benefits include: increased participation by respondents who dislike speaking up in group situations for fear of saying something “stupid” or

contradicting superiors in public; the first round allows "fresh" input untainted by the opinions of others; and the process cannot be domineered by the few. The process allows one to freely change an opinion in response to group feedback without embarrassment. It is critical for the legitimacy of the survey that the design team remains unbiased and report the group summary as closely as possible to reflect individual opinions (Turoff 1970).

There have been various forms of Delphi since it was first established as a forecasting technique in the 1950s. The conventional Delphi technique has been used as a forecasting technique as well as a way to establish study results using expert opinion in areas where traditional research techniques are unavailable (Linstone and Turoff 1975). Policy Delphi was established in the late 1960s for application in the social sciences to aid in policy decision-making. The Decision Delphi was proposed in 1979 as a way of consciously developing a field of interest rather than allowing small, unrelated decisions to guide its development (Rauch 1979). In the late 1980s and early 1990s at least three papers introduced the use of Policy Delphi for environmental dispute resolution and economic planning (Miller and Cuff 1986, Smit and Mason 1990, Gibson and Miller 1990).

The Policy Delphi is used for policy questions for which there are no "experts" as there are for the questions targeted in conventional Delphi studies. The Policy Delphi makes use of advocates and referees to resolve issues. This process provides a way to gather differing opinions on a specific policy area for use in a small workable committee. In this way a small committee can use the input of many and, at the same time, have a less cumbersome decision making process (Turoff 1970). The dual purposes of this paper are to introduce a new variant to the Policy Delphi that I will call "collaborative" and to describe its use by the SRR.

Overview

The SRR has been using the Collaborative Delphi in conjunction with group meetings to accomplish its mission. The SRR can meet only 4-5 times per year, but expands its productive capability by using the Delphi between meetings. The SRR has used Delphi to: 1) develop vision and mission statements and guiding principles; 2) illicit feedback on documents produced at meetings; 3) develop a proposed classification system; and 4) allow work groups to obtain input from the larger group.

The main difference between Collaborative Delphi and Policy Delphi is that Collaborative Delphi is part of a larger process in which both meetings and the Delphi are used to establish consensus. The Policy Delphi is a self-contained process that produces a distinct set of results. Rather than doing as many Delphi rounds as needed to reach a pre-determined level of consensus on a specific issue, as in a Policy Delphi, the SRR chooses relevant Delphi questions to make progress on issues between meetings. Progress may occur through eliciting the full spread of opinion, getting feedback on a product or an idea, or from group learning. Delphi can be a powerful tool to inform at least part of the respondent group (Turoff 1970, Turoff 1975, Ludlow 1975). In the case of SRR, the Delphi can be used to inform and build agreement in the group and to allow participation by those unable to attend meetings.

Turoff (1975) describes six phases of the communication process that occurs in the Policy Delphi. "These are:

1. Formulation of the issues…
2. Exposing the options…
3. Determining initial positions on the issues…
4. Exploring and obtaining the reasons for disagreements…
5. Evaluating the underlying reasons…
6. Reevaluating the options…"

All of these phases should be covered to complete a Policy Delphi and can be done in three rounds with careful question design (Turoff 1975). The Collaborative Delphi approach occurs in conjunction with an ongoing process of regular meetings. Turoff's communication process may begin at a meeting and continue into a Delphi and conclude at another meeting. Roundtable work on the vision, mission and guiding principles gives a good example of this. During the first roundtable meeting, participants brainstormed the issues and discussed the options, producing a few draft options for review by Delphi. Two rounds of Delphi conducted between meetings requested reactions and feedback to these initial positions. New ideas were proposed and some reevaluation occurred. At the next meeting, the statements were revisited, but agreement was not reached.

Turoff (1970) notes that in the first few rounds, participants seem to believe that with a few casual comments, the other group members will change their views. By the third round, a profound shift occurs in which people either drop out or sharpen their arguments. After the second round of the mission/vision Delphi, people started to become frustrated with the impasse. The benefit of the collaborative process in this case was that the crux of the disagreement was pinpointed through the Delphi so that discussions on the issue could be more targeted to resolve fundamental issues.

While Collaborative Delphi might not bring the group into consensus, it can clarify the spread of opinion so that when the group re-assembles, compromise is more easily reached. At the meeting

clarification was made on which areas had sufficient approval by the group and which needed more focus through Delphi. Two more rounds ensued which set the stage for a compromise to be reached at the third meeting.

Linstone and Turoff (1975) warn that the Policy Delphi is not a substitute for committee deliberations or studies, but that it organizes views anonymously for these purposes. The Collaborative process is specifically designed to combine the collection of opinion and feedback into a group committee process to further the goals of the group.

Collaborative Delphi Procedures

Delphi seems simple on the surface, which has caused many individuals to try the technique without thoroughly learning the process or understanding its demanding nature (Linstone and Turoff 1975). It was this naiveté that the SRR embarked on employing the Delphi technique. Trial, error, and a great deal of patience on the part of the SRR members have allowed us to refine and define the Collaborative Delphi. What follows is a description of each of the basic aspects of Delphi coordination used by the SRR. Design questions in Turoff (1970) helped identify topics to cover.

Choosing the experts

In the case of a Collaborative Delphi, expertise is not chosen for the Delphi process alone, but for participation in the entire collaborative process. The SRR Steering Committee strived to include representation from all stakeholders in the field of rangeland management and science. Experts for the Roundtable were selected through recommendations and include academics in rangeland sociology, economics and ecology, livestock producers, non-profit environmental organizations, federal research and management agencies, and state and local government representatives. As a result, expertise is both varied and extensive and spawns the hope that products reached by this diverse group will receive widespread national support.

Anonymity

In a Collaborative Delphi, the respondent group cannot remain anonymous because, unlike other Delphis, it involves group meetings. This may not be a disadvantage, however. Knowing the expertise involved in the study can assure participants that they are working with peers which lends validity to the responses of others. Anonymity of individual responses is ensured and provides the participants with freedom in survey completion. To this end, any information that might expose an identity, such as reference to an agency, is changed. Because the surveys are sent and received via email, the person processing the emails will know whom the surveys are from, but this information is confidential, even from the rest of the design team.

Preparing the Delphi participants

In the Policy Delphi, it is crucial to explain to the experts involved how results will be used. The results of a Delphi can be used just to inform and influence the decision makers or actually determine the final decision or outcome. Different expectations of how results will be used might cause some participants to become disenchanted with the process (Turoff 1975). SRR is a participant driven process in which the group makes the decisions. The Collaborative Delphi is a means for helping the group as a whole make decisions and is thus one facet of the collaborative decision making process.

Participants are informed about the Delphi process through handouts and briefings given at each meeting. Respondents generally have at least a week to respond and reminders are sent out a day early to improve the response rate.

Choosing the topic

Topics for Delphi can be chosen on the basis of what will best continue the work of the previous meeting, help prepare for a future meeting, or resolve other needs. Some uses of Collaborative Delphi could be to make progress on a single contentious issue, brainstorm and prioritize issues, review and revise a document, or develop common goals. For the first three meetings, participants and the steering committee were asked for suggestions for Delphi questions. The Delphi design team chose the topics from these suggestions and from topics brought up in a previous Delphi round. At the fourth meeting, criteria groups of the roundtable were encouraged to submit Delphi topics. Allowing the criteria groups to suggest topics and use Delphi to further their criteria group goals increases its usefulness for the group. If a work group reaches an impasse or needs verification from the group on an issue, input can be received by the Delphi.

So far, eight rounds of Delphi had been completed for SRR. In Delphi 1 – 3 and 5, the group worked on finding common ground through developing mission and vision statements. In Round 3, a definition of rangelands proposed at the group meeting was also sent out for review. Delphi 4 gave input on a document listing the “most important issues” work produced at the second SRR meeting. Delphi rounds 6 and 7 were used to receive input on a system to classify indicators. Delphi 8 was the first to include suggestions by criteria groups. One group wanted agreement on whether to reject an indicator; another group requested that SRR consider the application of a “time zero”.

Writing the survey

With the SRR, we strive to provide space for open-ended feedback at the same time as trying to limit the scope of the questions in order to keep the exercise focused. There is a balance between narrowing the focus to reach a conclusion and ensuring all sides of an issue are given space to be considered. Delphi designers must be careful in choosing questions. Once a question is posed, there is no way to control the outcome if it is to be an honest process (Turoff 1975). Therefore, questions must be carefully chosen to reflect group goals. It is important to be absolutely sure that group input is desirable. An open-ended question is always provided which allows respondents to challenge the nature of the question or introduce new issues or arguments.

The design team must be knowledgeable about the subject matter for both the writing and evaluation phases (Linstone 1975). Questions, as in any survey, must be phrased succinctly and clearly and target the question at hand; a poorly worded exercise will not produce useful information and will have to be redone. Designers must be able to interpret answers in order to collate them into a readable form. In cases where it is useful to summarize answers, understanding the responses is even more crucial. All answers must be reflected in the summary, otherwise participants might become discouraged because their input is not being considered.

Choosing a good design team is a necessary step in developing the Delphi. Linstone (1975) lists quality of questions (avoid vague, poorly written questions), lack of imagination (creativity to get the most from the participants), and poorly worded or repetitious statements as common pitfalls. Employing someone experienced in survey design is essential. Dr. Michael J. Manfredo, Department Head of Natural Resource Recreation and Tourism at CSU, provides the team with invaluable advice helping provide clear, concise, and interpretable surveys. The other design team members include E.T. Bartlett and John E. Mitchell who provide evaluation, proof reading, and topic definition support. Helen Rowe writes the surveys, compiles the results, and cooperates with the other team members to choose topics.

The survey instruments must be well defined. Each Delphi survey must be self-contained with directions to complete and return the Delphi. In addition, the rating scales must be clear (Turoff 1970). Only recently did the design team incorporate definitions of the scale to distinguish between levels of acceptability. This clarity greatly improves our ability to evaluate the responses.

Processing the responses

It is important to present the responses in a clear and organized manner so that even those who did not participate in the survey will understand the results. Generally, responses are read carefully for similar arguments and listed under common headings. These headings have the added benefit of giving those who only have time to skim the material the opportunity to ascertain the general thread of the debate. Responses are often reported verbatim, to keep the full meaning and intent of arguments intact. In these cases, only references that would give away the identity of the participant are changed. If the character of the responses is less emotional and more factual and concise, they may be summarized. In such a rewrite, it is crucial to retain the full meaning of the original statement. It is also important to organize the information without placing value or priority on responses. As an exception to this rule, the SRR summaries highlight minority opinions so that voices of dissent are heard.

Deciding on follow up questions

Ideally, a topic will be pursued for at least two rounds to get the benefits of a Delphi, although a one-round Delphi has been useful at times. In a second round, results from the previous round will be distributed along with follow up questions. The design team must carefully consider how to progress. Effort must be made not to be subjective in choosing ideas for further focus. An issue brought up by several persons may be explored further in the next round. A suggestion of compromise or a new idea that may lead to further consensus on a topic might also be a good candidate. All views, regardless of whether they are pursued in the next round, will be heard in the summary.

The number of iterations needed for each issue differs according to logistic parameters and the issue covered. In some cases, time between meetings is adequate to allow for three rounds of Delphi; however, some interludes permit only one or two rounds. The number can also depend on the contentiousness of a given issue. We spent four rounds of Delphi and discussion at three meetings to reach agreement on mission, vision and guiding principles. In contrast, reviewing a list of issues needed only one round of Delphi because most of the discussion took place during meetings.

Specifics on the SRR

In order to explain fully the Collaborative Delphi process used in the SRR, each round of the Delphi is described below along with relevant SRR meeting information.

SRR Meeting 1

The group proposed three alternative vision and mission statements and had a list of nine possible guiding principles.

Delphi Round 1

The purpose of the first Delphi was to narrow down the options. Respondents were asked to rate their level of acceptance for each of the guiding principles, the mission statements, and the vision statements. They were given a scale of four choices: unacceptable, slightly acceptable, moderately acceptable and highly acceptable. For each "unacceptable" response, respondents were asked for an explanation. Respondents were asked to choose their preferred vision and mission statement and explain why. At the meeting there was some discussion about the parenthetical addendum to one of the vision statements. We asked respondents if it should be included in the final vision statement, in order for it to be acceptable.

Delphi Round 2

The responses to Round 1 allowed us to eliminate one mission and one vision statement and propose adoption of the first seven guiding principles at the next meeting. Many respondents gave suggestions for rewriting the statements that the design team felt should be considered. The responses were collated and sent out with further questions. Based on the responses from Round 1, respondents were asked to select their preferences between the two remaining mission statements and the two vision statements. Proposed statements were listed for vision, mission, and guiding principles and respondents were asked if they preferred these to the original statements. An open-ended question allowed for additional comments.

SRR Meeting 2

Responses to Round 2 were distributed before the second meeting. Based on the results, a set of guiding principles was adopted easily. With a little discussion, the mission statement was modified slightly and accepted. A vision statement was crafted for review through the Delphi process. Also, one participant suggested a compromise to adopt two vision statements - one for rangelands and one for the SRR process. In addition, discussion about the definition of rangelands was deferred to the Delphi in the interests of time.

Delphi Round 3

The definition of rangelands written at the meeting and the Society for Range Management's (SRM) definition were presented in Round 3. Respondents rated their level of acceptance for each and stated their preference. Additional space was given for comments. Acceptance level was also rated for the rangelands vision statement, which was edited at Meeting 2. A new vision for SRR was presented, and respondents were asked whether it should be adopted (yes/no) and if so should it be adopted in conjunction with the rangelands vision (yes/no). An option for additional comments was also provided.

Delphi Round 4

At the second meeting, the group developed a list of important issues pertaining to rangeland sustainability. To help focus these issues, the design team decided to send out a Delphi with the list and ask, "What topics or issues that you feel are essential to evaluating overall rangeland sustainability are not included in this list?" The returned comments were collated with the notes into a document used at Meeting 3 to continue issue development.

Delphi Round 5

While a clear majority favored adopting the SRM definition of rangelands, there was enough dissent that a further round was felt to be desirable by the design team. Respondents were asked to review results from Round 3 and rate their level of acceptance on the SRM definition. Additional comments were also solicited. Round 5 also presented five alternative packages containing a mix of the suggested vision statements with the accepted mission statement. Presenting these together as packages was meant to give a clearer idea of how they would look together. For each "package," participants were asked to rate whether it was "acceptable (check all packages that you could live with)" or "not acceptable (check all packages not acceptable to you)" and to "chose only one package that you prefer". Room for comments was provided with a remark that comments on "not acceptable" items would be most useful.

SRR Meeting 3

The SRM definition was adopted for use by the SRR. Limited further discussion revealed lingering disagreement on the mission-vision package, but the group agreed to accept it for the time being with the possibility of revisiting the issue at a later time.

Delphi Round 6

At the end of the third meeting, an indicator classification system was introduced. This round of Delphi asked respondents to rate the level of acceptability for the system and asked for additional comments.

Delphi Round 7

Suggestions for rewording the classification system were incorporated and participants were

asked to re-rate the level of acceptability. Upon doing more research on the Delphi (Turoff 1970), the design team realized that to get a more reliable and specific feedback from the survey, the levels of acceptability should be specifically defined. Levels were defined as follows:

- Unacceptable = disagree fundamentally with this classification and oppose its adoption
- Slightly acceptable = acceptable only with further modification
- Moderately acceptable = acceptable, but there is room for improvement
- Highly acceptable = acceptable without modification

In Round 6, participants identified several new factors with which to categorize indicators. These factors were listed with the question, "What factors would be important to use to classify indicators?" The question was written to encourage more new ideas. As in every round, space was provided for other comments. Results from Delphi 7 were organized and sent out to the group to review in preparation for discussion at the next meeting.

SRR Meeting 4

Discussion on Delphi 7 results focused not on finding closure, but on widening the debate. Participants discussed the factors raised in Delphi 7 and presented some new ideas. The next step in developing this classification system will be done by trying to apply it to developed indicators at a future meeting.

Delphi Round 8

At the fourth meeting, criteria groups were given the opportunity to suggest Delphi topics. This Delphi was in response to two requests. The first topic was suggested by a criterion group that was grappling with an issue it felt should be decided by the SRR as a whole. They wanted to know what "time zero" should be used for the indicators; whether time zero would be the same for all indicators; and whether all indicators need a time zero. A second group had agreed that an indicator should be eliminated, but wanted to assess the SRR's level of support for this action (again levels of acceptance were defined) as well as support for incorporating aspects of this indicator into a new indicator. Space for additional comments was included.

Limitations

The SRR recognizes that there are limitations to Collaborative Delphi. "The strength of Delphi is, therefore, the ability to make explicit the limitations on the particular design and its application. The Delphi designer who understands the philosophy of his approach and the resulting boundaries of validity is engaged in the practice of a potent communication process. The designer who applies the technique without this insight or without clarifying these boundaries for the clients or observers is engaged in the practice of mythology" (p. 586, Linstone 1975).

One limitation of using the Delphi with this group is the specificity of expertise. That is, for responding to some questions, such as reaching agreement on vision and mission statements, participation in the SRR is sufficient expertise. Each roundtable participant should have an equal say in the outcome. However, there are certain technical questions for which there might be what Linstone (1975) calls an anonymity disadvantage, in which the credibility of a response might hinge upon the expertise of the respondent. The SRR participants have expertise in a wide array of areas. For certain technical questions, experts to these areas should be consulted. Opening up such questions to the wider SRR might dilute the true expert opinion, in which case, a Delphi would not be an appropriate forum for gathering input. The Delphi should be reserved for questions of a more general nature that involve consensus building and for gathering feedback from the SRR as a whole.

Some have questioned why Delphi leads to consensus (Kweit and Kweit 1984, Woudenberg 1991). The debate centers on whether it occurs due to group pressure or because of group learning and compromise. Woudenberg (1991) argues that the group pressure to conformity is strong in Delphi, stronger than accuracy. Linstone (1975, p.583) describes the problem well, "[in] a dogmatic drive for conformity the 'tyranny of the majority,' sometimes threatens to swamp the single maverick who may actually have better insight than the rest of the 'experts' who all agree with each other". Jones (1975) found this tyranny of the majority to be tied to the level of expertise. The more expert in their field participants were, the less likely they were to converge. Apparently experts have more confidence to stand their ground against other opinions. Brockhoff (1975) countered this study by looking at self-ratings by experts and found them to be an inaccurate reflection of expertise, based upon tests in their field. In Delphi studies seeking an accurate response to a technical question, this issue has greater ramifications. For questions of a non-technical nature, where agreement, rather than an accurate answer, is sought, conformity or compromise may not be a negative attribute, unless the compromise is superficial and not long lasting. Practitioners of the Delphi, should be aware of this limitation and avoid pushing respondents to agree where fundamental disagreement persists.

Advantages

The advantages for using the Collaborative Delphi on a consensus-building project are great. It saves valuable time in meetings for other work to be accomplished. The Delphi process may not resolve an issue fully, but it will bring the group closer to being able to make a decision during a meeting. Overall, it may reduce the number of meetings needed. It also allows the planners to involve more people in the process. That is, busy schedules may restrict meeting attendance for some critical players. These people may still participate through Delphi. Including Delphi in the process lends continuity and keeps participants engaged in the process. It also serves as an excellent tool for sharing ideas at the same time as gathering support and agreement.

Linstone (1975) lists "illusory expertise" as a possible pitfall in which full representation is hard to come by. The advantage of using the collaborative process is that being a part of a larger process, the project can pull together a larger pool of experts. SRR has successfully brought together a multidisciplinary group, comprised of ecologists, economists, sociologists, conservation groups, industry, state and local government representatives, and policy and legal experts.

Lastly, the Delphi appears to be representative. The eighth round of Delphi elicited responses from 22 participants, an average response rate, from a database that now includes 115 names. At the most recent meeting, held after Delphi 8, participants were given a three-question survey in which 41 responses were returned. The results showed that for 17 respondents that had read the results, but had not participated in Delphi 8, 13 felt represented by the results, 1 did not feel represented, and 3 responded n/a to whether they felt represented (they possibly did not understand the question). Although the Delphi does not illicit feedback from all of the possible respondents, the responses seem to represent views of a wider audience. Though some opinions are undoubtedly missing that would be included were larger numbers to participate, this representation nonetheless validates the notion of using the Delphi to identify a fairly representative spread of opinion on a given issue.

Summary

Over the past three decades of its use, Delphi has proven to be a highly malleable instrument, finding uses in a multitude of arenas. The Collaborative Delphi, as a new variation, has been integral to the SRR process. We will continue to use the Collaborative Delphi for the SRR and explore further application in other projects.

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