

Conducting the Needs Assessment #11: Causal Analysis Techniques¹

Amy Harder²

Introduction

Some community needs are persistent challenges; examples include lack of clean water, lack of quality education opportunities, and lack of accessible healthy food. The same holds true within organizations; ongoing challenges for Cooperative Extension, such as employee burnout (Russell et al., 2019) or lack of public awareness of the organization (Harder, Moore, Mazurkewicz, & Bengé, 2013), are readily found in Extension literature. Simply having data to show the continuing nature of persistent or unsolved needs may not be enough to change the status quo; causal analysis techniques can be used to more deeply understand the reasons and conditions contributing to the present situation and what might happen in the future if needs persist. This publication in the *Conducting the Needs Assessment* series provides Extension educators and other service providers with an introduction to two techniques that can easily be used when seeking information about relationships between causes and needs: fishboning and cause and consequence analysis.

Why use causal analysis techniques?

Causal analysis is the term used “to refer broadly to techniques that describe or analyze factors or conditions that contribute to the existence of perpetuation of a need or an unresolved problem” (Witkin & Altschuld, 1995,

pp. 239–240). Witkin and Altschuld (1995) explained that causal analysis can be used to qualitatively explore questions such as:

- Why has a need persisted over time?
- What factors or conditions influence the existence of the need?
- Why haven’t previously attempted solutions worked to solve the need?
- Is the need genuine?

Causal analysis techniques help Extension educators and those they work with consider needs in the context or system in which they exist; otherwise, the scope of the needs assessment may be too narrowly focused or important factors overlooked. Typically, causal analysis techniques will be used early in the needs assessment process (Phase 1; see Bengé, Warner, & Harder, 2019) so informed decisions can be made about the types of data that will be necessary to collect in Phase 2 (Witkin & Altschuld, 1995).

Fishbone Diagram

A common tool used to visually illustrate cause and effect is the fishbone diagram. Ishikawa (1983) is credited with popularizing the technique, which is “designed to identify all of the causes of a specified problem and then, from these possible causes, determine the one that is most likely to be the root cause” (McLean, 2006, p. 104). A wide variety of

1. This document is AEC689, one of a series of the Department of Agricultural Education and Communication, UF/IFAS Extension. Original publication date March 2020. Visit the EDIS website at <https://edis.ifas.ufl.edu> for the currently supported version of this publication.

2. Amy Harder, professor, Department of Agricultural Education and Communication, and director, Program Development and Evaluation Center; UF/IFAS Extension, Gainesville, FL 32611.

fishbone diagram templates are available for free online, including PowerPoint and Excel templates.

The fishbone technique uses a set of simple procedures. An Extension educator will need to facilitate the following process if he or she wishes to use the fishboning technique.

1. Invite a small group to participate in the development of the fishbone diagram. The invited individuals should be knowledgeable about the need that will be discussed. Witkin and Altschuld suggested (1995) including 10 to 12 individuals. Larger groups should be split and facilitated independently, which can yield useful comparisons between the final diagrams.
2. Use poster-sized paper (or larger, such as sticky walls that allow papers to be added and rearranged) or a large whiteboard to draw the large fish skeleton that will provide the framework for the discussion. The need or problem being discussed should go at the head of the fish, on the right-hand side. A spine with at least four ribs should be added and labeled. In corporate settings, the labels commonly include materials, workers, methods, and machines (McLean, 2006; Witkin & Altschuld, 1995). However, in an Extension setting, it may be more appropriate to consider labels such as clientele, stakeholders, or volunteers instead of workers and to replace machines with policies or organizational culture. See Figure 1 for an example of a fishbone skeleton.

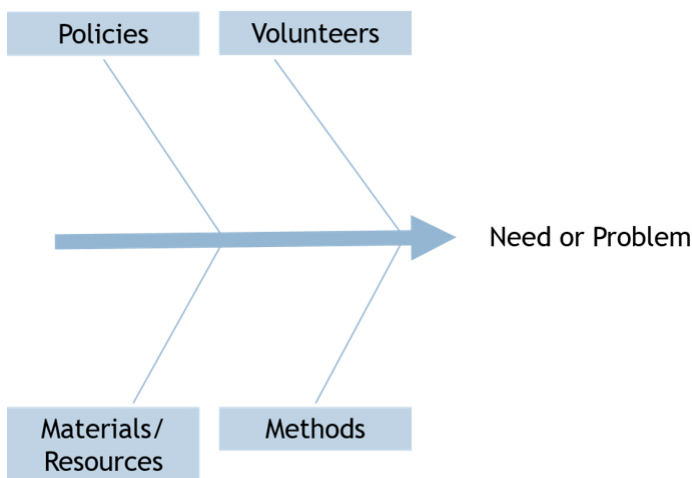


Figure 1. Example template for fishbone diagram.
Credits: Amy Harder, UF/IFAS

3. Small-group participants should be instructed to independently brainstorm and list possible causes of the identified need or problem.
4. Once all participants have finished their brainstorming, the members should take turns sharing their thoughts about causes and where the cause should be placed on the

diagram. The Extension educator should take the role of scribe for this portion of the process and is responsible for soliciting input from each participant until no new causes are suggested. Participants should be instructed not to discuss the merit or placement of the causes during this stage. New ribs may need to be added to accommodate causes that do not fit the existing ribs on the diagram.

5. A facilitated discussion of the diagram should be led by the Extension educator. Participants should be encouraged to consider if causes are clustered appropriately on each rib or if changes should be made. Relationships between causes and subcauses should also be clarified and illustrated. The group is ready to move forward when there is consensus that the diagram portrays an accurate view of the causes contributing to the need or problem.
6. The next step requires participants to assign values to each cause. Some variation in methods exists. Witkin and Altschuld (1995) recommended having participants vote on the “degree of likelihood” (p. 245) that a cause created the need or problem, using a scale from 1 to 5. McLean (2006), however, suggested instructing participants to vote only for the cause that they believe is the root cause of the problem. In this method, participants can check the single cause they want to vote for or can be given a limited number of colored dots (such as three) to place next to the cause(s) they consider most likely to be the root cause.
7. The results of the voting are tabulated to show what the small group believes are the most critical causes of the need or problem. The results can be used to inform the next phase of the needs assessment process (Witkin & Altschuld, 1995).

Cause and Consequence Analysis

Similar to fishboning, the cause and consequence analysis (CCA) can be used to identify priorities, but instead of focusing on the most important causes, a CCA identifies the most critical needs. CCA also goes a step further by also generating information about potential consequences of not addressing the causes of a need or problem, a step that can easily be overlooked when conducting needs assessments (Witkin & Altschuld, 1995). Additionally, CCA is used to evaluate multiple needs simultaneously, whereas the fishbone diagram is used to examine only one need at a time. For this reason, an Extension educator should proceed with the CCA only if a list of needs has already been generated in the needs assessment process.

Follow the below procedure to complete a CCA. The steps are based on the process explained by Witkin and Altschuld (1995), modified for use in Extension settings.

1. Invite a small group of stakeholders who represent diverse viewpoints, such as clients, volunteers, county commissioners, or representatives from other local service providers, to participate in the CCA. Convening the group in a room with a large whiteboard is recommended; multiple poster-sized sheets of paper may be used as an alternative option.
2. Create a very large chart that includes five columns, labeled as follows: (a) need/concern, (b) causes, (c) consequences, (d) difficulty to correct, and (e) criticality. See Table 1 for an example of how to set up the chart.
3. Use Column 1 to list the needs that have already been identified during the needs assessment process.
4. Facilitate discussion with the group to brainstorm all possible causes for each need; causes should then be listed in Column 2 next to the corresponding need in Column 1.
5. Facilitate discussion with the group to brainstorm all possible consequences if the cause is not addressed and the need remains unresolved. Consequences should be listed in Column 3, again next to the corresponding information in Columns 1 and 2.
6. Provide participants with paper that they can use to list each need and individually judge the difficulty of addressing it, using a rating system of low, medium, or high.
7. Participants can use the same sheet of paper to rate how critical it would be if the need is not met, with 1 being the least critical and 5 being the most critical.
8. Tabulate the individual ratings either through a show of hands or collect the papers to provide respondents with confidentiality. The most frequent responses serve as the group judgment for the difficulty and criticality of each need. The results can be used to set priorities for action.

Summary

The causal analysis techniques presented in this publication can easily be applied by Extension educators for use in Extension settings to improve the quality of the needs assessment process and, in turn, for planning better programs that address priority community needs.

References

- Benge, M., Harder, A., & Warner, L. (2019). *Conducting the Needs Assessment #1: Introduction*. AEC677. Gainesville: University of Florida Institute of Food and Agricultural Sciences. <https://edis.ifas.ufl.edu/wc340>
- Harder, A., Moore, A., Mazurkewicz, M., & Benge, M. (2013). Problems impacting extension program quality at the county level: Results from an analysis of county program reviews conducted in Florida. *Journal of Extension*, 51(1). Retrieved from <https://joe.org/joe/2013february/rb2.php>
- Ishikawa, K. (1983). *Guide to quality control*. Tokyo: Asian Productivity Organization.
- McLean, G. N. (2006). *Organization development: Principles, processes, performance*. San Francisco: Berrett-Koehler Publishers, Inc.
- Russell, M. B., Attoh, P., Chase, T., Gong, T., Kim, J., & Liggins, G. L. (2019). Burnout and extension educators: Where we are and implications for future research. *Journal of Human Sciences and Extension*, 7(1), 195–211.
- Witkin, B. R., & Altschuld, J. W. (1995). *Planning and conducting needs assessments: A practical guide*. Thousand Oaks, CA: Sage Publications.

Appendix A: Conducting the Needs Assessment Series Overview

Conducting the Needs Assessment #1: Introduction

General summary of needs assessments, including what a needs assessment is, the different phases, and tools to conduct a needs assessment.

Conducting the Needs Assessment #2: Using Needs Assessments in Extension Programming

Overview of using needs assessments as part of the Extension program planning process.

Conducting the Needs Assessment #3: Motivations, Barriers, and Objections

Information about the motivations, barriers, and objections to conducting needs assessments for Extension professionals and service providers.

Conducting the Needs Assessment #4: Audience Motivations, Barriers, and Objections

Information about the motivations, barriers, and objections that clientele and communities may have for participating or buying-in to a needs assessment.

**Conducting the Needs Assessment #5: Phase 1
—Pre-assessment**

Introduction to the Pre-assessment phase of conducting a needs assessment, including defining the purpose, management, identifying existing information, and determining the appropriate methods.

**Conducting the Needs Assessment #6: Phase 2
—Assessment**

Introduction to the Assessment phase of conducting a needs assessment, including gathering and analyzing all data.

**Conducting the Needs Assessment #7: Phase 3
—Post-assessment**

Introduction to the Post-assessment phase of conducting a needs assessment, including setting priorities, considering solutions, communicating results, and evaluating the needs assessment.

Conducting the Needs Assessment #8: The Borich Model

Overview of using the Borich Model to conduct a needs assessment.

Conducting the Needs Assessment #9: The Nominal Group Technique

Overview of using the Nominal Group Technique to conduct a needs assessment.

Conducting the Needs Assessment #10: The Delphi Technique

Overview of using the Delphi Technique to conduct a needs assessment.

Conducting the Needs Assessment #11: The Causal Analysis Technique

Overview of using the Causal Analysis Technique to conduct a needs assessment.

Table 1. Template for a CCA chart.

Need/concern	Causes	Consequences	Difficulty to correct—low, medium, or high	Criticality 1 (least critical) – 5 (most critical)