People, Partnerships, and Communities

USDA Natural Resources Conservation Service

Social Sciences Institute

Locations:

North Carolina A&T State University

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Prioritizing Issues or Concerns
Using the Paired Comparison Technique

Why prioritize issues or concerns?

Prioritizing items discussed at a meeting with a group of people can often be difficult and time consuming. A technique called *paired comparison* can be useful for ranking items related to a particular issue that are too numerous or too similar to mentally rank order. This technique also ensures that every participant has a vote in what gets prioritized.

The use of paired comparisons can be found in situations as common as getting your eyes examined for glasses. The doctor has you look at an eye chart through a number of different lenses. The goal is to find "Which of these lenses enables you to see the eye chart better? This first one or this second one?" They switch the lenses back and forth until you tell them which one makes your vision better. Then the doctor goes on to another set of lenses and repeats the process until the best lenses are identified to correct your vision. The exam is a systematic process of presenting pairs of different lenses and eliminating lens options until the best lens is found.

Who can use this technique?

Anyone may use this technique and apply it to a collection of items addressing a particular topic or issue. This can be an especially useful technique in the Conservation Partnership when prioritizing issues such as conservation practices, resource problem areas or watershed issues.

When can this technique be used?

After brainstorming with the community

members about priority concerns in their community, you usually end up with a long list of issues. It is not always easy to prioritize that list after issues have been raised.

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Depending on the number of items needing to be prioritized, paired comparison may be done manually or with computer software. With fewer than ten items, prioritizing the list by hand using a matrix is recommended. For longer lists of items, you might want to use a paired comparison software program.

How do you use this technique?

The following example shows you how prioritization can be done manually using a flip chart. You meet with conservation partners in a small community in your district and work with them to try to identify significant resource concerns. Through brainstorming and discussion, the community comes up with the following concerns: animal waste, cropland erosion, ground water quality, urban encroachment on farmland, biological diversity and wetlands (See Figure 1).

All of these issues are important to the community, but community members need to prioritize them to determine which item to address first. To use this technique, your first step would be to draw a matrix similar to the one shown in Figure 2.

The purpose of using the matrix is to identify all possible pairs of resource issues. Each cell in the matrix represents a pair of resource issues that will be compared to one another. For example, moving down the "Animal Waste" column, "wst/ero" represents the comparison of animal waste and erosion; "wst/urb" further down the column represents the comparison of animal waste and urban encroachment on farmland.
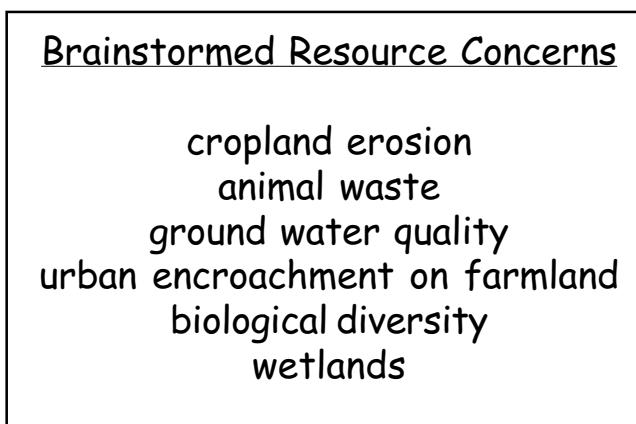

Brainstormed Resource Concerns

cropland erosion
animal waste
ground water quality
urban encroachment on farmland
biological diversity
wetlands

Figure 1

Paired Comparison Matrix
First Iteration

	Animal Waste	Cropland Erosion	Ground Water Quality	Urban Encroachment	Bio Diversity	Wetlands
Animal Waste						
Cropland Erosion	wst/ero					
Ground Water Quality	wst/wat	ero/wat				
Urban Encroachment	wst/urb	ero/urb	wat/urb			
Bio Diversity	wst/div	ero/div	wat/div	urb/div		
Wetlands	wst/wet	ero/wet	wat/wet	urb/wet	div/wet	

Figure 2

However, two modifications need to be made to the matrix before pairs can be used.

#1) It is senseless to compare a natural resource issue with itself (Animal Waste/Animal Waste). Therefore, where this occurs, the cell is shaded out and not used.

#2) Choosing between erosion and wetlands is the same as choosing between wetlands and erosion, so we need to eliminate any duplicate pairs. An easy way to do this is to shade out all cells above the diagonal you shaded out in #1 above. The matrix in Figure 2 clearly shows this.

Compare Pairs of Issues to Prioritize for the Community

Now we are ready to compare pairs of issues to determine which issue is the most important to the community. Start with the first pair in the upper left of the matrix (in this example it would be animal waste and cropland erosion) and work through all the pairs remaining in the matrix. Choices (or votes) can represent one individual or they can represent a group of individuals that have voted on each choice. Individual choices can later be summed up to arrive at an average choice for the group. In this example let's assume you are working with a small group of individuals.

The preference for each pair is determined by reading each possible pair off of Figure 2, taking a vote on each pair and recording the result of the vote (See Figure 3). Then, list the issues on a separate piece of paper and place a tic mark next to the issue preferred in each pair (See Figure 4). Count the tics to get the "Preference Scores".

Using the totals in our example, we can see that the community perceives urban encroachment as their number one issue. The community's second issue is erosion. Issues of animal waste and water quality are tied at 2 while diversity and wetlands each had one mark.

If issues are "tied" then another matrix needs to be constructed to do the paired comparison with the remaining issues.   In this example our second matrix would look similar to Figure 5.

Comparison Results

Comparison	Preferred Choice
Animal Waste/Cropland Erosion	Cropland Erosion
Animal Waste/Ground Water Quality	Animal Waste
Animal Waste/Urban Encroachment	Urban Encroachment
Animal Waste/Bio Diversity	Bio Diversity
Animal Waste/Wetlands	Animal Waste
Cropland Erosion/Ground Water Quality	Cropland Erosion
Cropland Erosion/Urban Encroachment	Urban Encroachment
Cropland Erosion/Bio Diversity	Cropland Erosion
Cropland Erosion/Wetlands	Cropland Erosion
Ground Water Quality/Urban Encroachment	Urban Encroachment
Ground Water Quality/Bio Diversity	Ground Water Quality
Ground Water Quality/Wetlands	Ground Water Quality
Urban Encroachment/Bio Diversity	Urban Encroachment
Urban Encroachment/Wetlands	Urban Encroachment
Bio Diversity/Wetlands	Wetlands

Figure 3

Preference Scores

Issue	"Tic" Marks	Total
Animal Waste	II	2
Cropland Erosion	IIII	4
Ground Water Quality	II	2
Urban Encroachment	IIIII	5
Bio Diversity	I	1
Wetlands	I	1

Figure 4

Paired Comparison Matrix
Second Iteration

	Animal Waste	Ground Water Quality	Bio Diversity	Wetlands
Animal Waste				
Ground Water Quality	wst/wat			
Bio Diversity	wst/div	wat/div		
Wetlands	wst/wet	wat/wet	div/wet	

Figure 5

Again we would go through the paired comparison and selection. The process would need to be repeated with a flip chart and marker to tabulate choices once again àcross these remaining issues. All "ties" would need to be eliminated to obtain a final prioritization.

The final prioritization for this example, after all the "ties" were voted on again, was as follows:

1. Urban encroachment on farmland
2. Cropland erosion
3. Water Quality
4. Animal Waste
5. Wetlands
6. Biological diversity
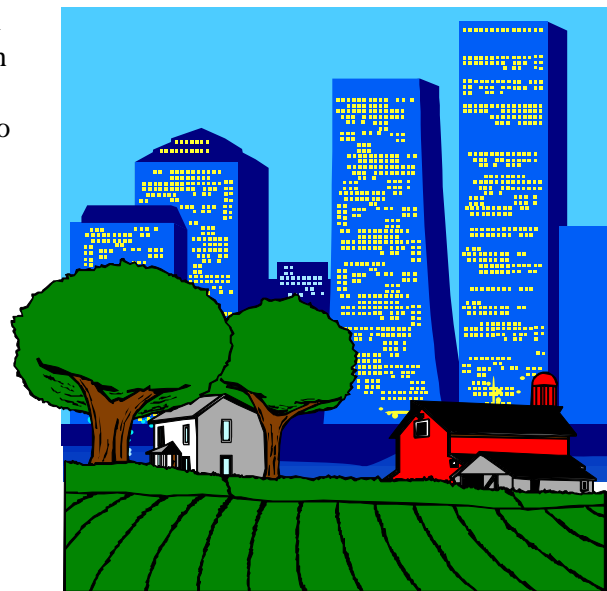
With this list of prioritized natural resource issues, the community now has a place to start. Each participant in the process has had a vote in this prioritization.

For More Information:

For more information on this technique or to obtain a diskette with the Paired Comparison technique contact Andrea Clarke with the NRCS Social Sciences Institute at aclarke@tasc.usda.gov or call (970) 498-1895.

David, H.A. (1988). The method of paired comparisons, Alan Stuart, (Ed.). London, Great Britain: Charles Giffin and Company Limited.

Thurstone, L.L. (1927). A law of comparative judgment. Psychological Review, 34, 273-286.

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