

3.8.1

SERIES 3

Building Resilience



Multi-Criteria Analysis

Activity 3.8.1

Prioritization of resilience options is about far more than just cost or technical feasibility. Yet subjective features of an activity, such as social benefit or inclusiveness, are often omitted when projects are prioritized because they are difficult to incorporate into a numeric ranking. In this activity you will develop scoring and weighting systems that can be used within multi-criteria analysis matrices to numerically rank your potential resilience actions. The strengths and weaknesses of this scoring will be discussed and the limitations of the methodology identified.

IN THIS ACTIVITY YOU WILL:

- ✓ Design a simple multi-criteria analysis matrix based on your city's resilience criteria;
- ✓ Use the matrix to prioritize proposed resilience actions; and
- ✓ Articulate the limitations of the ranking and why selection of an option based on the ranking alone might not be a good idea.

ACTIVITY 3.8.1: MULTI-CRITERIA ANALYSIS

For this activity, you will need the following information, much of which will come from previous modules:

- Your resilience criteria (Set 1.4)
- City capacity assessment (Set 3.4)
- A list of proposed resilience projects (Set 3.3)
- Projected project or activity cost (Set 3.5, 3.6 or 3.7)
- Technical feasibility information
- Vulnerability information (Series 2)

You will use this information to fill in a matrix and numerically score how each proposed resilience activity meets the resilience criteria you have identified. An example from Surat, India is provided in the associated Guide, 3.8.0.

INSTRUCTIONS

1. Discuss and write down the goal you are trying to achieve via your interventions. This could be “increase citywide resilience to climate impacts”, or something significantly more focused, such as “increase resilience to flooding in the downtown business district”.
2. Fill in the column headings across the top of the matrix using resilience options you have identified for your city. (A blank matrix is provided on the next page.)
3. Fill in the row headings with the criteria that you will use to evaluate and rank options. Criteria should include at least some of the resilience criteria you identified in Set 1.4 if you have that information available.
4. Think about how you want to score each criterion. Come up with a scoring method that takes into account the following questions:
 - Will you score all criteria equally from 1 to 5?
 - Do higher numbers indicate more or less desirable outcomes? (This needs to remain constant for all criteria or you can't meaningfully calculate and compare total scores!)
 - Do some criteria require special weighting?
 - Do you have quantitative data to associate with a particular scoring, or will scoring for that criterion be subjective?
5. Fill in the boxes in each column indicating how the resilience option in that column satisfies the criteria in each row.
6. When you have all the boxes in the matrix scored, add up the scores in each column and record the value in the Total row. These values indicate the numerical ranking of each proposed activity with respect to the resilience criteria you have identified.

Criteria	Potential Resilience Actions or Interventions			
	e.g. City develops and enforces new limits on floodplain development			
e.g. City management and capacity				
Total Score				

Once you have completed the scoring and ranking of your potential interventions, reconvene in a large group and discuss:

- Are there factors that are not included in the rankings?
- Which criterion scores are based on qualitative data and which on quantitative data and how does this impact the total score for each proposed activity?
- How would different weighting of the criterion scores (e.g. weighting actions that involve and are supported by vulnerable groups twice as much as other criteria) impact the total score?
- What criteria have you not included in this assessment, but are important in your city and/or country and should be incorporated into the analysis (e.g. support of key political figures or agencies required to make the project a reality)?



To Think About

The scoring and ranking you have done in this exercise is clearly just an exercise. To use Multi-Criteria Analysis to formally rank and prioritize resilience alternatives, you will probably want to collaboratively develop criteria and the basis on which those criteria will be scored. Some criteria scores will be easy to quantify. They will be based on simple judgments, nominal ratings by “experts”, or on cost. Others may require serious study to come up with meaningful scoring. Still others may require discussion by multiple stakeholders. Formulation of these numbers, as for the criterion weighting, will depend on local, regional, and national issues. In cases requiring more thorough study and/or multiple stakeholders, it may take some time to develop the criterion scores. Consequently, how to score project proposals for various criteria should be carefully considered prior to project proposal evaluation.