

research is not destroyed at once. The action selected by the HMPC is in the category of Preventive Measures.

Action 9 Evaluate the benefit of constructing additional greenhouse space.

3.7 Mitigation Actions Prioritization

To focus University time and resources in implementing the actions, it is necessary to determine priorities for actions. The mitigation actions presented in this section were evaluated using the following criteria, which assess the suitability of options based on their social effect on the University, their technical feasibility, and their support by students, staff, and faculty. The STAPLE+E evaluation method (see table below) categorizes these factors into social, technical, administrative, political, legal, economic, and environmental criteria.

Table 10. STAPLE+E Criteria

Criterion	Considerations
Social	<ul style="list-style-type: none"> • Will it cause any one segment of the population to be treated unfairly? • Is the action compatible with present and future community values? • Will the measures adversely affect cultural values or resources?
Technical	<ul style="list-style-type: none"> • How effective is the measure in avoiding or reducing future losses? • Will it create more problems than it solves? • Does it solve a problem or only a symptom? • In light of other community goals, is it the most useful?
Administrative	<ul style="list-style-type: none"> • Does the community have the capability to accomplish the action (i.e. can you implement the mitigation action)? • Can the community provide any maintenance necessary? • Is there enough staff, technical experts, and funding? • Can it be accomplished in a timely manner?
Political	<ul style="list-style-type: none"> • Who are the stakeholders in this proposed action? • Have all of the stakeholders been offered an opportunity to participate in the planning process? • How can the mitigation goals be accomplished at the lowest cost to the stakeholders? • Is there public support both to implement and maintain this measure? • Is the political leadership willing to propose and support the favored measure?
Legal	<ul style="list-style-type: none"> • Does the community have the authority to implement the proposed measure? • Is there a clear legal basis for the mitigation action? Is an ordinance or resolution necessary? • What are the legal side effects? • Will the community be liable for the actions or support of actions, or lack of action? • Is it likely to be challenged?

Criterion	Considerations
Economic	<ul style="list-style-type: none"> • What are the costs and benefits of this measure? • How will the implementation of this measure affect the pocketbook of the University community? • Does the cost seem reasonable for the size of the problem and likely benefits? • Does the action contribute to other University goals such as capital improvements or economic development? • What benefits will this action provide?
Environmental	<ul style="list-style-type: none"> • How will this action affect the environment? • Will this measure comply with local, state, and federal environmental regulations? • Is the action consistent with community environmental goals? • Are endangered or threatened species likely to be affected?

Source: FEMA publication 386-3, *Developing the Mitigation Plan*

Using STAPLE+E criteria, the mitigation alternatives were scored as shown in Table 11. Although a comprehensive cost-benefit analysis was not conducted for each mitigation alternative, a qualitative cost-benefit assessment was done by the HMPC in prioritizing mitigation actions, as explained after the table.

The following process explains how scores were assigned by the HMPC to prioritize mitigation actions:

- If an action is compatible with general University values, it receives a greater score for the **Social** criterion. For example, safe rooms receive a benefit score of +3 because they directly protect people, which is the primary concern of the University, as expressed by the HMPC.
- If an action solves the problem completely, it receives a benefit score of +5 for the **Technical** criterion. For example, safe rooms and stormwater management would reduce damage resulting from tornadoes and flooding, respectively. Because evaluating the construction of an alternate greenhouse might lead to mitigating hail damage when the greenhouse is actually constructed, but the current action does not guarantee direct mitigation, such actions receive a benefit score of +3.
- If the University has some of the capabilities and resources to implement an action, it gets a benefit score of +1. However, an administrative cost will be incurred for many actions because the University will need to seek funding to implement them. These actions receive an **Administrative** cost score of -2.

Table 11. Mitigation Actions Prioritization

Criteria > Actions:	Social		Technical		Administrative		Political		Legal		Economic		Environmental		Total Score
	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	Cost	Benefit	
1. Support implementation of stormwater management plans	0	1	0	5	-2	0	0	2	0	5	0	2	0	5	18
2. Continue to allow no future development in the 100-year floodplain	0	1	0	5	0	1	0	2	0	5	0	5	0	0	19
3. Construct safe rooms at University farms; include siren at Mann Valley farm	0	3	0	5	0	1	0	5	0	5	-1	5	0	0	23
4. Ensure new construction has adequate safe rooms	0	3	0	5	-2	0	0	5	0	5	0	5	0	0	21
5. Provide better signage to inform people about reaching basements or other sheltered areas	0	1	0	3	0	1	0	5	0	5	0	5	0	0	20
6. Augment heating plant capacity when new buildings are constructed	0	1	0	3	-2	0	0	2	0	5	-1	5	0	0	13
7. Develop a snow removal plan in cooperation with the City of River Falls	0	1	0	3	0	1	0	2	0	5	0	2	0	0	14
8. Develop a plan to keep water in pipes in motion	0	1	0	3	0	1	0	2	0	5	0	2	0	0	14
9. Evaluate the benefit of constructing alternate greenhouse space	0	1	0	3	-2	0	0	2	0	5	0	0	0	0	9

C – Cost (range from 0 to -5)

B – Benefit (range from 0 to 5)

- **Political** support is anticipated to be high for actions that address hazards that can destroy the University facilities, interrupt programs, or harm people. Therefore, these actions receive a benefit score of +5, while other actions that will be supported by the University community, but somewhat less enthusiastically, receive a benefit score of +2.
- The University has the **Legal** basis to implement all the actions since it owns the lands and the buildings. Therefore, each action was assigned a benefit score of +5.
- **Economic** scores reflect the relative monetary costs or benefits of an action. An action that will require significant expenditure to implement receives an economic cost score of -1. An action that will result in a relative greater benefit for the University compared to the cost is awarded an economic benefit score of +5; actions that will result in a somewhat smaller benefit for the University compared to the cost are awarded a score of +2.
- The actions will not have significant negative effects on the **Environment**, so each action received an environmental cost score of zero. Because the stormwater management plan will include strategies that will benefit the natural environment, this action received an environmental benefit score of +5.
- Actions for which no particular cost or benefit relative to a particular criterion was identified received a cost or benefit score of zero.

Thus, the prioritization process emphasized the relative benefits and costs of each action. A review of the total scores shows that some actions are a much higher priority or much more important to implement. The highest priority action is the creation of safe rooms at the University farms. They would bring about the biggest benefits per mitigation dollar spent, as they help reduce loss of life where people are most vulnerable to the deadly hazard of tornadoes and high winds.

The resulting prioritized list of mitigation actions, as agreed upon by the HMPC, is:

- Highest: Construct safe rooms at University farms; install siren at Mann Valley farm.
- High: Ensure new construction has adequate safe rooms.
- High: Provide better signage to inform people about reaching basements or other sheltered areas.
- Medium: Continue to allow no future development in the 100-year floodplain.
- Medium: Support implementation of stormwater management plans.
- Medium: Develop a snow removal plan in cooperation with the City of River Falls.
- Medium: Develop a plan to keep water in pipes in motion.
- Medium: Augment heating plant capacity when new buildings are constructed.
- Low: Evaluate benefit of constructing alternate greenhouse space.