Slow-thinking Decision-making Framework
Water Management and Conservation (100 points)

SCIL 101 Water Module Assessment Due: Monday Oct 29th by 10 p.m. uploaded to Canvas (100 points)

In this class you’ve read articles about this issue and you have had group and class discussions about how to conserve water resources in Nebraska. For this assignment you will work through the “Slow thinking framework: steps for high quality decision-making” to support quality decision-making. Remember the “decision” you are making is an individual decision that has societal impact, such as: 1) if you were to give money to support a cause, or 2) if you were to vote on a policy, or 3) if you were to write a letter to a legislator about this issue.

What you write in the “Student work” document should represent your own thinking, which may and should vary from the thinking of your group and students in your recitation.

1. Define the issue
Nebraska has vast water resources. How do we create water policy and management strategies to ensure that water resources are available in the future?

2. Objectives/Evaluation Criteria
To help us think about possible criteria, we asked ourselves: how are you going to choose between these options? What are the important things to consider? What do you care about? When coming up with criteria, we “separated the ends from the means” by asking ourselves “why do I care about that?” multiple times until we could go no further and have found the “ends” or the fundamental thing that we care about. Below is a list of criteria based on class responses:

1. Water is conserved for future use
2. Farmers remain economically profitable
3. There is sufficient water for household use and clean drinking water.
4. Wildlife has sufficient and high quality water and habitat.

[1 point] Assign weights to each criteria. Choose criteria from the above list. Weight each criteria to represent how much you care about it. The sum of all the weights should equal 1. Type the weights into the table in the “Student Work” document.

0 – no weights are assigned to the criteria, or the weights are not clear.
1 – student assigns weights to the criteria that add up to 1, and appropriately fills out the table.

3. Options
Below is a list of options that we’ve discussed in class.
A. **Less restrictions** (reduce regulations including: not restricting farmers to water allotments, not requiring flow meters, not creating moratoriums on well drilling)

B. **More and/or stricter water allotments** (flow meters on wells required and monitored, fine for exceeding allotment or moratoriums on well drilling)

C. **Engineer the location and availability of water resources** (examples: using groundwater to recharge rivers [N-CORPE], using canals to transfer and store water, long distance diversion and of river water [from Platte to Republican])

D. **Encourage efficient water use via new technology** (state or federal research dollars, subsidies for farmers to install)

4. **Information** [81 points total]

*We asked: What additional information do we need to know about each option?*

**Step 1:** We used an objective metric for each criteria. This will allowed us to compare across options while reducing cognitive biases. Below are metrics we will use for each criteria:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Water is conserved for future use</td>
<td>High/Medium/Low conservation (include the amount of water saved for each option)</td>
</tr>
<tr>
<td>2. Farmers remain economically profitable</td>
<td>High/Medium/Low (include the amount of profit for each option, or specifically how the option may impact farmers)</td>
</tr>
<tr>
<td>3. There is sufficient water for household use and clean drinking water</td>
<td>High/Medium/Low (include how much water is available, the extent or frequency of the impact on households)</td>
</tr>
<tr>
<td>4. Wildlife has sufficient and quality water and habitat</td>
<td>High/Medium/Low (include specific ways that wildlife may be impacted)</td>
</tr>
</tbody>
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**Step 2 (80 points):** Research each option to determine if the consequences of supporting that option will result in the criteria. Assign performance metrics to each option, and write an argument that supports why that metric is appropriate. In other words, describe the information known about each option with reference to specific criteria. Based on information, give an argument about what performance metric should be assigned each option for a given criteria.

For Criteria 1 and 2, you discussed these in depth during recitation. You may use information that was gathered by other groups in your recitation, or in other recitations, that is posted on Canvas in “Discussion” in discussion posts for each option and criteria. However, you must write an argument about performance metrics in **YOUR OWN WORDS.** (Copy and pasting arguments from the discussion board will be given a zero.) You may choose to assign the same performance metrics that were decided on in class, or you may argue for a different performance metric. You may use the same references as other groups, as long as they support your argument, are explained in your own words, and are cited properly and clearly traceable to the source. You may also do additional research on your own. Type the results (example, high, medium or low) of your analysis under the column labeled “metric” in the “Student Work” file. You will write arguments that support each performance metric in the “Student Work” file.
Each option and criteria combination will be eligible for up to 5 points based on:

<table>
<thead>
<tr>
<th>Reasoning</th>
<th>Lacking</th>
<th>Developing</th>
<th>Meeting or Exceeding</th>
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<tbody>
<tr>
<td>0 – the argument for how an option meets the criterion does not go beyond assumptions that everyone makes. The reasoning has little argumentative force, and does not add clarity or insight into the consequences of choosing an option and if it will meet the desired criteria.</td>
<td>1 - an argument for how an option meets the criterion has some significant gaps in reasoning, for example large assumptions that could have been supported with evidence or specific information.</td>
<td>2 - the student gives a high quality, thorough argument about the consequences of the option, in terms of if it will meet a given criteria. The argument includes specific reasons -- how, why or how much-- the criteria is or isn't met using specific, relevant information or evidence from research or from class or other sources.</td>
<td></td>
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<table>
<thead>
<tr>
<th>Evidence</th>
<th>Lacking</th>
<th>Developing</th>
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<tr>
<td>0 – no evidence or specific information is given.</td>
<td>1 - evidence/specific information that is cited is irrelevant or disconnected from the argument.</td>
<td>2 - The evidence provided connects to the students' argument about if the option will meet the criteria.</td>
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<thead>
<tr>
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<tr>
<td>0 – no evidence or specific information is given.</td>
<td>0.5 – it is not entirely clear what the specific information/evidence is, and it does not seem to be clearly traceable to a source. (for example, references are to “irs.gov” or “<a href="https://www.lpsnrd.org%E2%80%9D">https://www.lpsnrd.org”</a> instead of linking or referencing specific information that supports the argument).</td>
<td>1 - The source of information is cited in a way that it is clear what the specific information/evidence is, and the information is traceable to the source.</td>
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Therefore, 4 criteria x 4 options x 5 points = 80 points total are possible

Step 3 (1 point): Assign performance scores, or a number from 1 to up to 4, with 1= the worst, and 4= the best performance for a given criteria. See the last page of the Group Collaborative Research & Evaluation for an example. If two options perform the same according to the metric then they should get identical performance scores. Type these performance scores under the column labeled “performance score.”

0 – no performance scores are assigned, or the scores are not clear.
0.5 – student assigns performance scores inappropriately.
1 – student assigns performance scores appropriately that align with the metric assigned to each option.

5. Analysis of options based on the criteria (tradeoffs) (2 points)
Multiply the weight of each criteria by the performance score of each option. Write the results of that multiplication in the cells as indicated in the columns for option 1.
Add up the weighted performance scores of each option and write the results of that addition in the bottom row of the table as indicated in the columns for option 1.
0 – no total weighted performance scores are assigned, or the scores are not clear.
1 – student has a mistake in their math or inappropriately fills out the table.
2 – student does correct math and appropriately fills out the table.
6. Choice (6 points)
A) Choose an “option” based on the analysis undertaken.

B) [3 points] Why do you think this is the best option?
0—the student does not provide reasoning for their choice, or the reasoning is weak, unclear and disconnected with the criteria and tradeoffs illustrated in the analysis table
1.5—the student provides reasoning for their choice that has some weak or unclear connections with the criteria and tradeoffs illustrated in the analysis table
3—the student provides clear and comprehensive reasoning for their choice that clearly links the choice with the criteria and tradeoffs illustrated in the analysis table

C) [3 points] What are the tradeoffs (positive and negative aspects) associated with the option you chose?
0—the student does not provide reasoning for their choice, or the reasoning is weak, unclear and disconnected with the criteria
1.5—the student only provides positive aspects of the option or describes how well the option performs based on only 1-2 criteria
3—the student provides positive and negative aspects of the option or describes how well the option performs based on all of the criteria

7. Review (6 points total)
Reflect on your own decision-making process using these steps.
A) [1.5 points] Who are the stakeholders who are “winners” and “losers” if this option is implemented?
0—the student offers no reflection or what is offered demonstrates no thoughtfulness
1.5—the student offers reflection that demonstrates thoughtfulness, including specific examples of the stakeholders who might gain and the stakeholders who might lose if their decision is implemented.

B) [1.5 points] Some of the options are not necessarily mutually exclusive, and more than one could potentially be implemented at the same time. Are there other options (either the ones listed or other things that you can think of) that you would like to see implemented to help solve this problem?
0—the student offers no reflection or what is offered demonstrates no thoughtfulness
1.5—the student offers reflection that demonstrates thoughtfulness, including specific reasoning about options for solving the problem

C) [1.5 points] Do you think your chosen option is viable to be currently implemented in our society, and would work effectively to resolve the issue? Why or why not?
0—the student offers no reflection or what is offered demonstrates no thoughtfulness
1.5—the student offers reflection that demonstrates a deep enough understanding of the issue to understand what is a viable option, or is thoughtful about what they don’t yet understand to determine what is viable.

D) [1.5 points] Did working through the slow-thinking decision-making framework (7 steps) result in your thinking differently about the issue? How?
0—the student offers no reflection or what is offered demonstrates no thoughtfulness
1.5—the student offers reflection that demonstrates thoughtfulness, including specific examples of why the 7 steps did or did not influence their thinking about this issue.

8. Assigning resources (1 point) See the “student work” file to answer this question.
1 point—complete answer to the question, with an X indicated for each option.
9. Importance of issue (1 point) See the “student work” file to answer this question.
   1- complete and thoughtful answer to the question “why” and a rank given

10. Impact (1 point) See the “student work” file to answer this question.
    1 – the action presented by the student is clearly related to the issue.

11. Your Actions (1 point) See the “student work” file to answer this question.
    1 – complete and thoughtful answer to the question.