Prioritizing nature values based on a typology of intrinsic, instrumental and relational values: insights from the combination of photovoice and simplified multi-objective prioritisation

Method Chapter lab relates to	*Participatory data collection (Chapter 8)* *Decision analysis based on optimisation (Chapter 29)*
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Estimated length	3 hours (or 2 sessions of 1.5 hours)
Intended class	3rd year undergrad or 1st year post graduate level of courses focused on social and environmental issues, but potentially modifiable to fit any year
Group size	any

Objectives of activity

- Elicit and describe values that students have towards nature.
- Classify values across a typology of intrinsic, instrumental and relational values.
- Discuss how values can inform and influence actions within social-ecological systems.

Learning outcomes

As an outcome of the activity, students will be able to:
- Describe a typology of values (intrinsic, instrumental and relational values)
- Identify and articulate their own values towards nature

- Gain insight into basic principles of two different methods: Photovoice and a simplified multi-objective prioritizing actions in regards with different values
- Discuss the implications of diverse nature values for environmental decision-making and management strategies

Practical set-up

This is an activity that requires individual work prior to class meeting. The activity can be done in a variety of settings: in-person classes, online classes, or during a field trip. If conducted in-person, the activity requires a basic classroom setting within a university. Basic classroom infrastructure is also needed (chairs, desks) and a projector/screen may be necessary if the mini-lecture introduced in Step 2 is done through the use of slides. If conducted online, the activity requires stable connection to the internet and access to a virtual meeting application (e.g., Zoom, Google Meets). The group size can vary. Since the active portion of the activity is predominantly conducted within a small group setting (duos or trios), it can be applicable to a broad range of classroom sizes.

Resources needed

- Camera or phone
- Laptop
- Access to internet
- Handout containing Figure 1 and Figure 2
- Handout containing Table 1
- Paper and pen for prioritization calculation or any spreadsheet softwares such as MS Excel or Google Sheets.

Background/Introduction

Social-ecological systems are complex adaptive systems in which multiple stakeholders interact across different scales. The status of a given ecosystem or place is thus highly dependent on the decisions that stakeholders make regarding how a place should (or should not) be managed. However, the decisions that people make are influenced by a set of values they carry towards nature and what values they prioritize in a particular situation. For instance, an agricultural landscape that is managed in a way that prioritizes profit looks different than a landscape that prioritizes biodiversity conservation. Eliciting the values that underpin decisions can be a challenging task, but several methodological advancements have been made in this regard within SES scholarship (for some examples see Chapters 5, 7 & 8 of handbook).

In this highly interactive activity, students will be able to gain insight into how competing or complementary values influence social-ecological systems. To do so, students will go through a process in which they will combine three different methods to elicit values (photovoice), classify values (typology of intrinsic, instrumental and relational values), prioritize values (simplified multi-objectivity), and discuss the implications of values and prioritization for actions within social-ecological systems.

Process Summary

Prior to the class meeting, students are given a prompt to take a photo and write a caption that best captures aspects they appreciate about a specific SES. Then, they are exposed to the theoretical framework of nature values and are asked to map the values that they identify from the photo activity onto a specific values typology (intrinsic, instrumental, relational values). And lastly, they will use a simplified Multi-Objective Decision Making to prioritize their own values and discuss implications for action within SES.

Detailed steps

Step 1: Photo activity

To complete the photo activity, students should be assigned a task prior to the class (see prompt question below for details on the task). For the activity to be successful, it is important to ground the activity within a particular ecosystem or SES (e.g., a university campus, a place that is being visited during a fieldwork trip, student's own neighborhood). The activity is also more productive if students are familiar with the SES and have some sort of relationship with it. Moreover, the activity can be more fruitful if students conduct the task prior to being exposed to the content of nature values. In this way, they can take pictures in a more free manner. Thus, prior to class, students must be given time to reflect on the prompt below and conduct the task described in the prompt.

> Prompt question: "*Think about nature in [insert here the name of the place that is the focus of the activity]. What do you appreciate about nature in this place? Take between 1 to 3 pictures that illustrate something you appreciate and write a short caption (30 - 100 words) that describes why you have taken that picture. Be specific and intentional about your choice of picture, what the picture reflects, and what the caption is describing. Take some time to reflect before taking the picture. Upload your picture and caption to [insert here the educational system that is utilized in your institution] prior to class meeting.*"

Step 2: Introducing Nature Values and Values Typology

After completing the task above and bringing pictures to the classroom, students will be exposed to the key theoretical framework that underpins the classroom activity: nature values and a common typology of values that has been extensively utilized within SES scholarship (intrinsic, instrumental and relational values). The content can be shared via a mini-lecture that describes each of the three values and provides examples for each of them.

Specific values of nature are judgements regarding the importance of nature in particular situations (Pascual et al., 2023). These specific value judgements have been divided into three categories:

1. Instrumental values: means to an end, nature as a resource or asset, satisfaction of needs and preferences, usefulness for people
2. Intrinsic values: agency of other-than-humans, inherent worth of biodiversity as ends in and of themselves
3. Relational values: importance of desirable, meaningful and often reciprocal human relationships

The values can be illustrated in the form of a triangle in which the vertices exemplify the specific types of values. See below the three specific value judgements regarding nature (intrinsic, instrumental and relational values) (Figure 1).
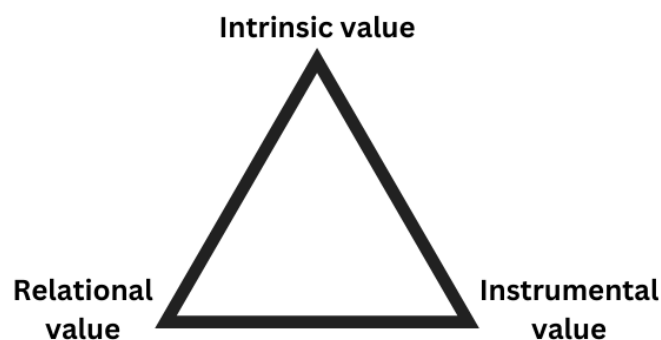

Figure 1. Specific values of nature typology

Although the values are presented in a simplified way as independent vertices within a triangle, it is worth noting that they exist across a gradient. In other words, values that people assign to nature are not *either* instrumental *or* intrinsic *or* relational; rather, the values triangle aims to demonstrate that there is a plurality of values that exist across a gradient. Even though people carry all these values simultaneously, it may be that some values are prioritized at

the expense of others when people take pictures (or make decisions). Therefore, the idea here is not to identify the personal values that students may have towards nature in a broader way, but rather to identify what specific values the pictures and captions reflect.

Considering the values and considerations described above, students will be split in pairs or trios to work together. Students will be asked to discuss and analyze each other's pictures and captions and identify what values they see reflected on them, considering the typology that has been described above. Based on the discussion, for each picture and caption combo, they will mark in the triangle what values the picture reflects (make sure you have a handout that each student can engage with that contains both Figure 1 and Figure 2). In other words, the task is to analyse the picture and caption, identify the values of nature that it captures, and mark the position in the triangle they see that best describes the values they identified. See the example below (Figure 2) that contains mock examples of excerpts of potential captions that a student may write:

Intrinsic value
The intrinsic value of nature.
Space allocated for nature.
- *"It is good that nature still has a place to thrive"*
- *"and there are still many different species found here."*

Relational value
Living in harmony.
People are one with nature.
- *"It is very peaceful here and I feel at one with nature"*
- *"I see my ancestors in this place"*
- *"I come here to connect to Mother Earth"*

Instrumental value
Nature's benefits to people.
Ecosystem services.
- *"I can build my house from the materials around me, like the wood and stone"*
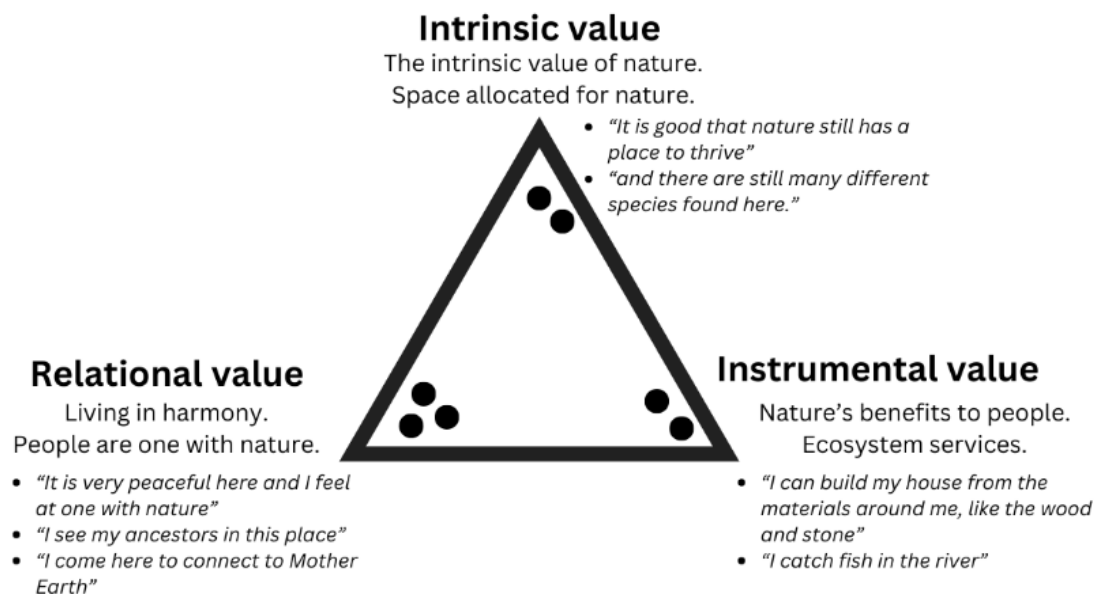- *"I catch fish in the river"*

Figure 2. Example of mapping specific values identified from photo activity onto the Specific Values Typology

It is worth noting that it may be challenging for students to choose a value instead of the other. Make sure to reinforce that these values exist across a gradient, and a mark can be made at a point in the triangle between two vertices, or even in the middle of the triangle. However, it is important that they demonstrate evidence supported by the picture and the caption that demonstrates that the value is indeed reflected by the picture. Recall that the

task is about analyzing the concrete pictures and captions that students created and not their overall values that they have.

Step 3: Simplified multi-objective prioritizing actions

Multi-Criteria Decision Making (MCDM) is an effective knowledge synthesis method to support decision-making, by systematically exploring the pros and cons of different alternatives (Beinat & Nijkamp 1998). This approach is particularly useful in environmental management, where decisions often involve trade-offs between conflicting objectives, such as economic benefits, ecological health, and social equity. Figure 3 below provides a comprehensive view for the multi-criteria decision analysis. A simplified version will be utilized for this exercise.
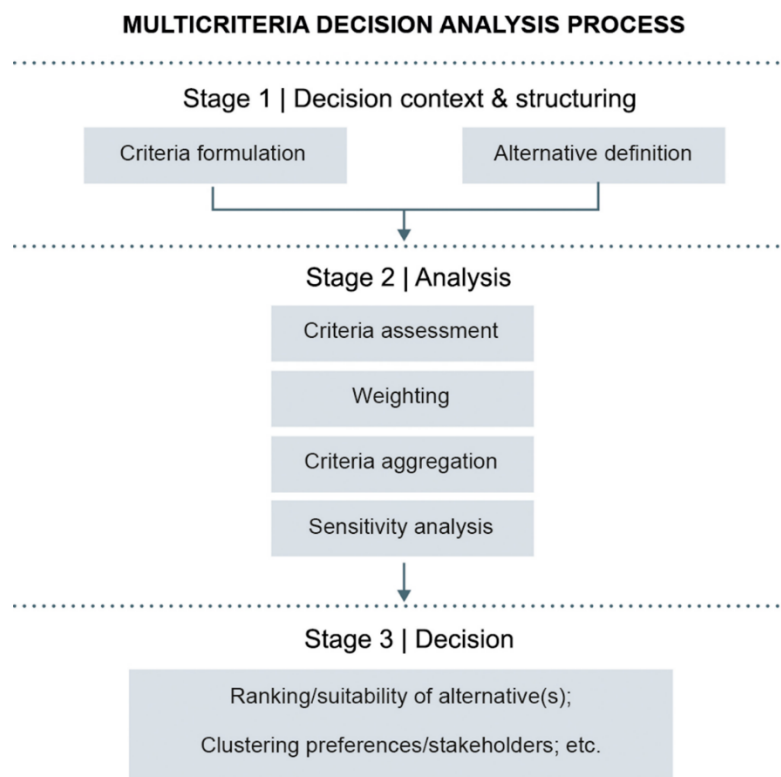

Figure 3. A generalized framework including the main steps in multi-criteria decision-making analysis. Source: Esmail & Geneletti (2018)

Prompt: *"Think about the SES that was analyzed through the photos and the values that were identified. Consider various actions that could be implemented in the area and identify the effects they have for the three values types. Fill in the blanks with a "+" for positive effects, "-" for negative effects, and "0" for neutral effects. Work in small groups (pairs or trios that worked together for the photo activity)."*

Table 1.Template for prioritization activity (see some potential examples to populate the actions column below)

Action in/for the SES	Intrinsic values	Instrumental values	Relational values
1: Building a hiking trail	0	+	+
2: Establishing a nature reserve for wildlife	+	-	+
3: Building a community eco-center	0	+	+
4: Restoring a degraded ecosystem	+	0	+
5: Allowing for regulated use of natural resources	-	+	0
6: Promoting eco-tourism activities	-	+	+

After filling in the blanks, students will be prompted to engage with the following question. The instructor can decide if this will be a facilitated group discussion, a homework activity, or something that they write in class.

> **Prompt:** *"After going through the process of filling in the blanks and considering your own values, imagine you are a decision-maker or policymaker within the SES. What actions would you prioritize, considering the impacts they have on the values? Are there synergies and trade-offs between different actions?"*

To wrap up the activity, the instructor may use the remaining time to emphasize how different people have different relationships with nature and this can influence landscape management and decision-making within SES. Therefore, it is important to be able to identify and describe your own values, as well as be able to figure other people's.

Evaluation/assessment

The activity can be evaluated by the students through a post class survey.
This survey can be generated by the activity facilitator in order to elicit the type of information required. An example of a post-class survey has been provided below:

Evaluation statement:	Disagree	Neutral	Agree
I understand and feel confident in using the three methods presented in this activity.			
I understand that some values and their associated actions are synergistic and that some require trade-offs.			

I can define multiple values of nature and rank them based on a multi-criteria decision making approach.			
I found this activity useful in identifying actions in SES that align with, or diverge from, different values.			
I found the activity enjoyable.			

References:

Beinat, E., & Nijkamp, P. (Eds.). 1998. Multicriteria analysis for land-use management (Vol. 9). Springer Science & Business Media.

Diprose, G., Greenaway, A. & Moorhouse, B. 2022. Making Visible More Diverse Nature Futures through Citizen Science. Citizen Science: Theory and Practice, 7(1): 6, pp. 1–13. DOI: https://doi.org/10.5334/cstp.442

Adem Esmail, B., & Geneletti, D. 2018. Multi-criteria decision analysis for nature conservation: A review of 20 years of applications. Methods in Ecology and Evolution, 9(1), 42-53

Pascual, U., Balvanera, P., Christopher B. Anderson, C.B., Chaplin-Kramer, R., Christie, M., et al. 2023. Diverse values of nature for sustainability. Nature 620, 813–823. https://doi.org/10.1038/s41586-023-06406-9

SES RESEARCH METHODS