

To Plant, or Not to Plant?

Regulation of Invasive Plants in the Mid-Atlantic States

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To Plant or Not to Plant?

Regulation of Invasive Plants in the Mid-Atlantic States

PART 2: Mapping Social- Ecological Systems



Social-Ecological Systems

Solving complex problems

- Complex systems can be difficult to understand
- Elements
- Relationships
- Boundaries
- Visualization
- Conceptual models



Social-Ecological Systems

Solving complex problems

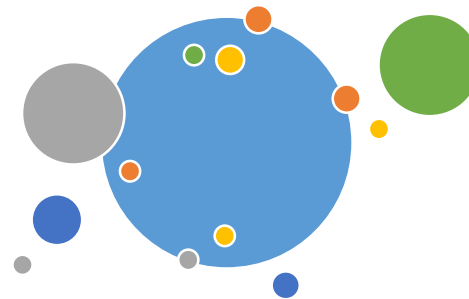
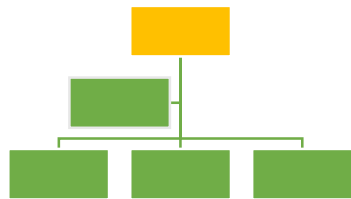
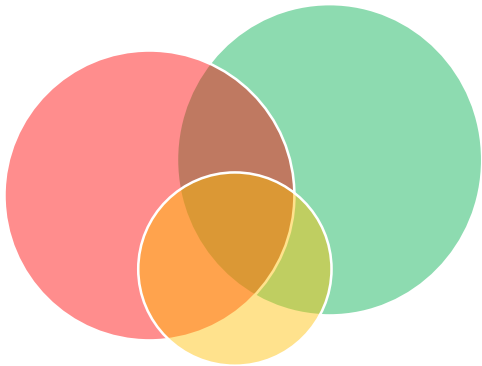
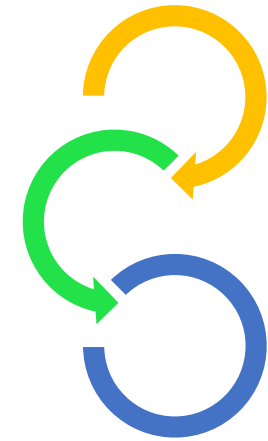
- What are the impacts?
- Are there benefits?
- Who cares? Why do they care?
- What can be done?
- What should be done?
- Who should do it?
- Where will the money come from?
- Do solutions have drawbacks?



Social-Ecological Systems

Representing complex relationships

Sketch a diagram that illustrates your relationship(s) to the environment.

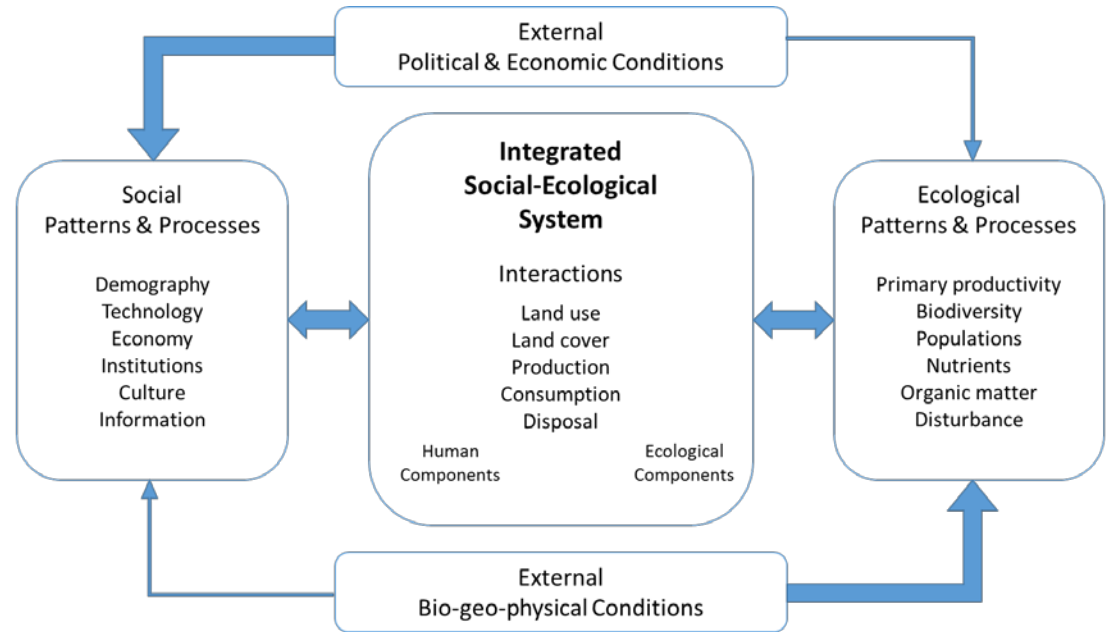


Social-Ecological Systems

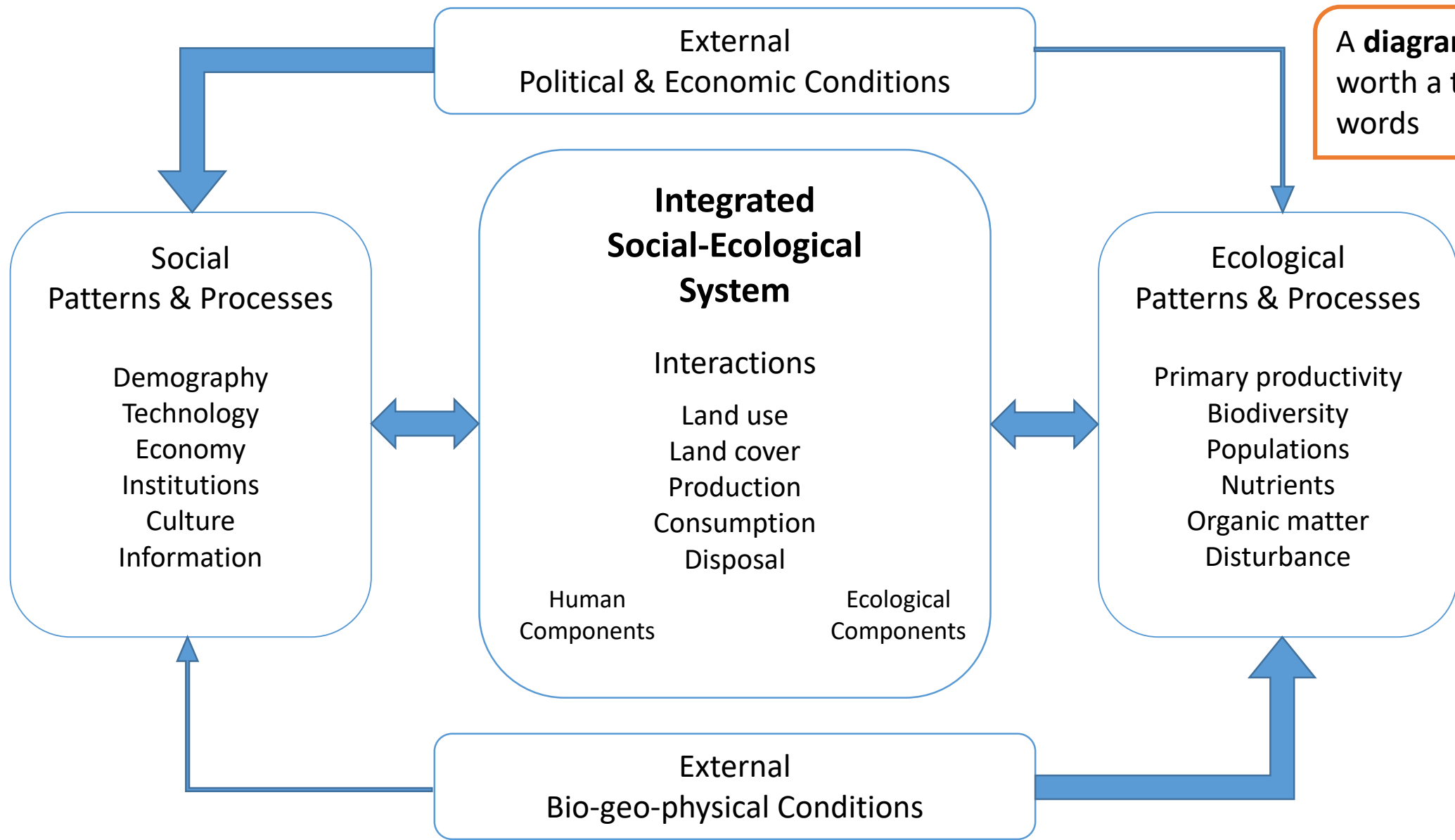
Representing complex relationships

Example:

Integrated Social-Ecological System Model Template

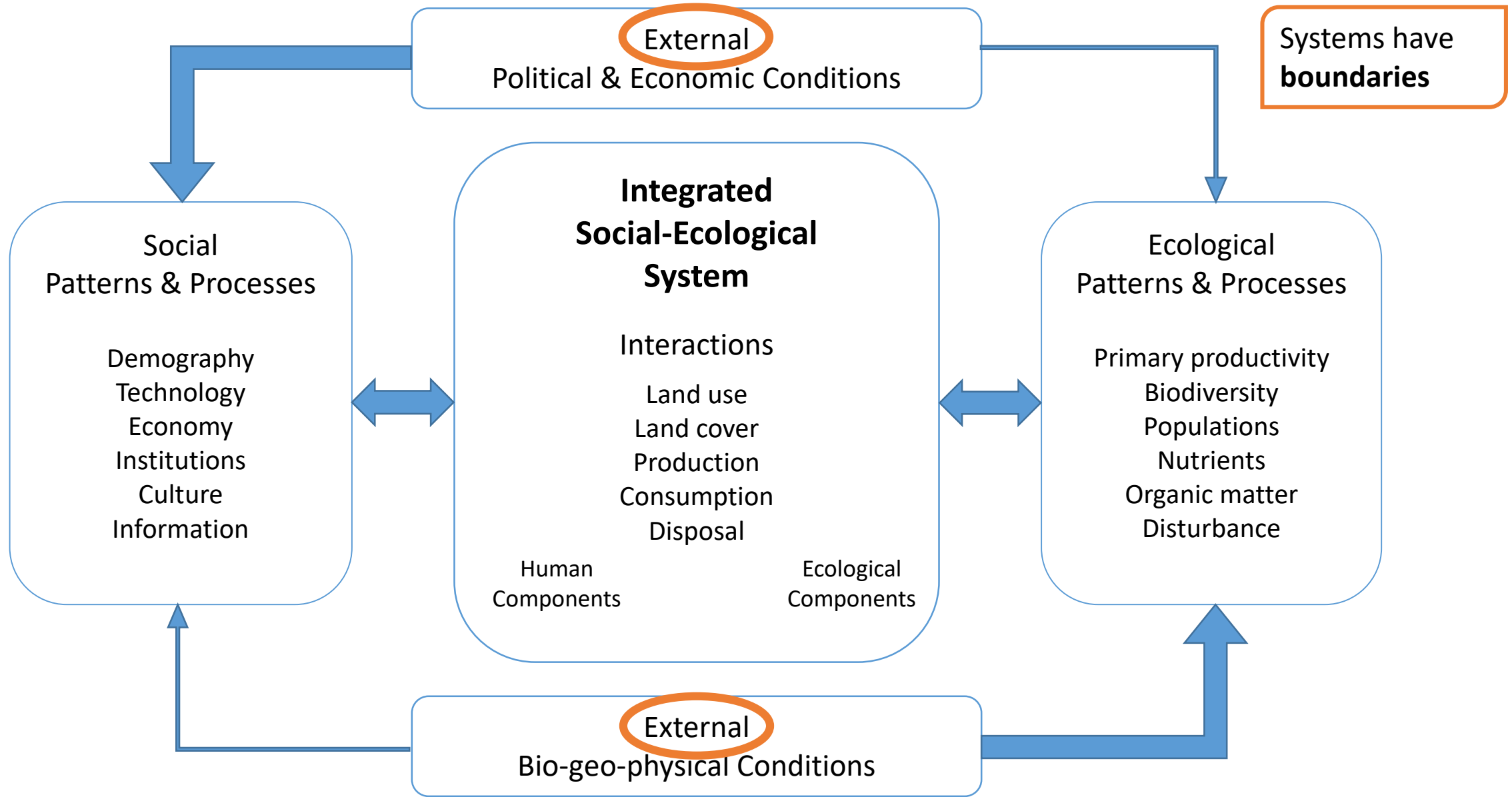


After: S.T.A. Pickett, M.L. Cadenasso, J.M. Grove, Christopher G. Boone, Peter M. Groffman, Elena Irwin, Sujay S. Kaushal, Victoria Marshall, Brian P. McGrath, C.H. Nilon, R.V. Pouyat, Katalin Szlavecz, Austin Troy, Paige Warren. **Urban ecological systems: Scientific foundations and a decade of progress.** Journal of Environmental Management, Volume 92, Issue 3, 2011, 331–362. <http://dx.doi.org/10.1016/j.jenvman.2010.08.022>

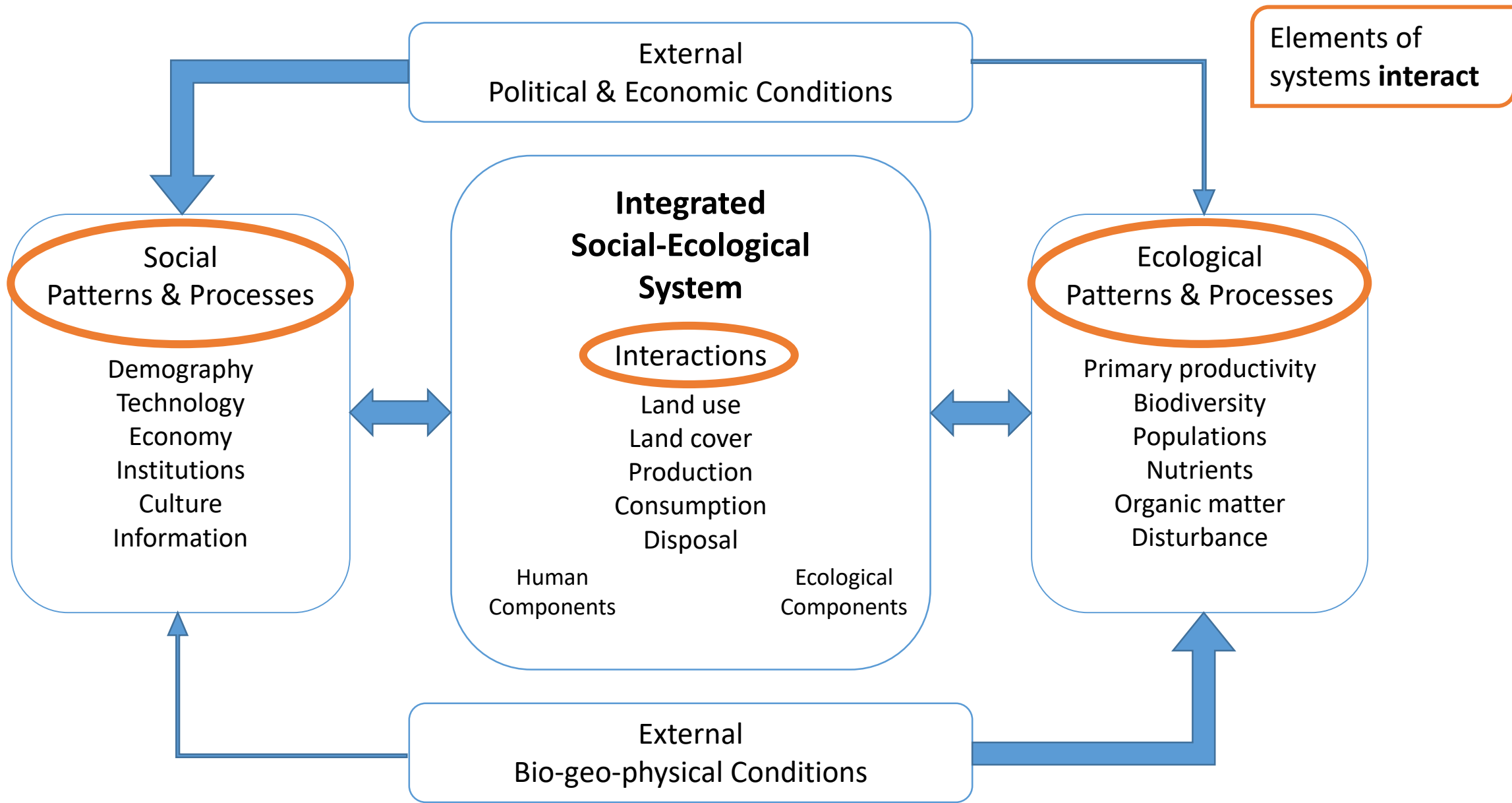


A **diagram** is worth a thousand words

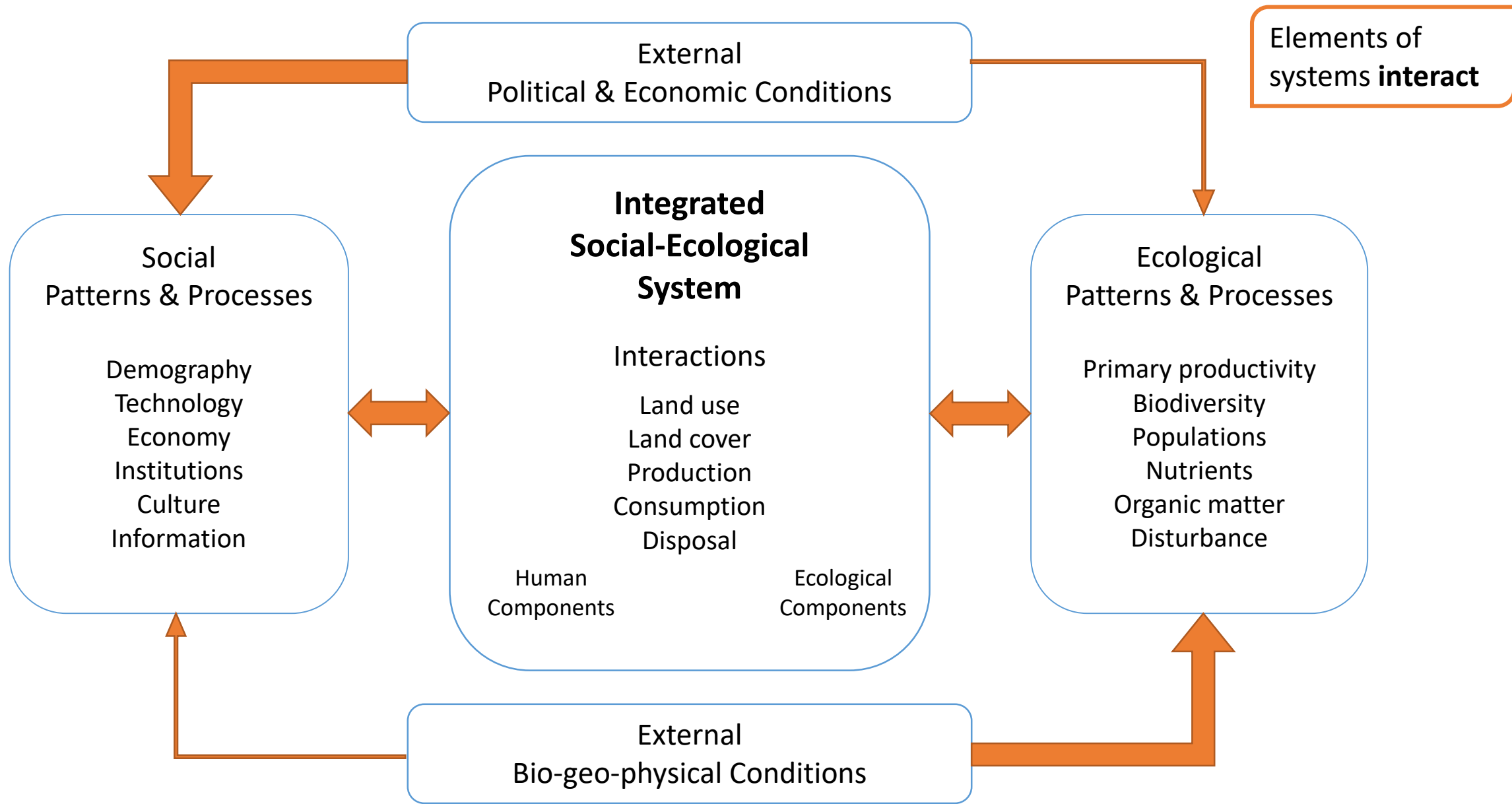
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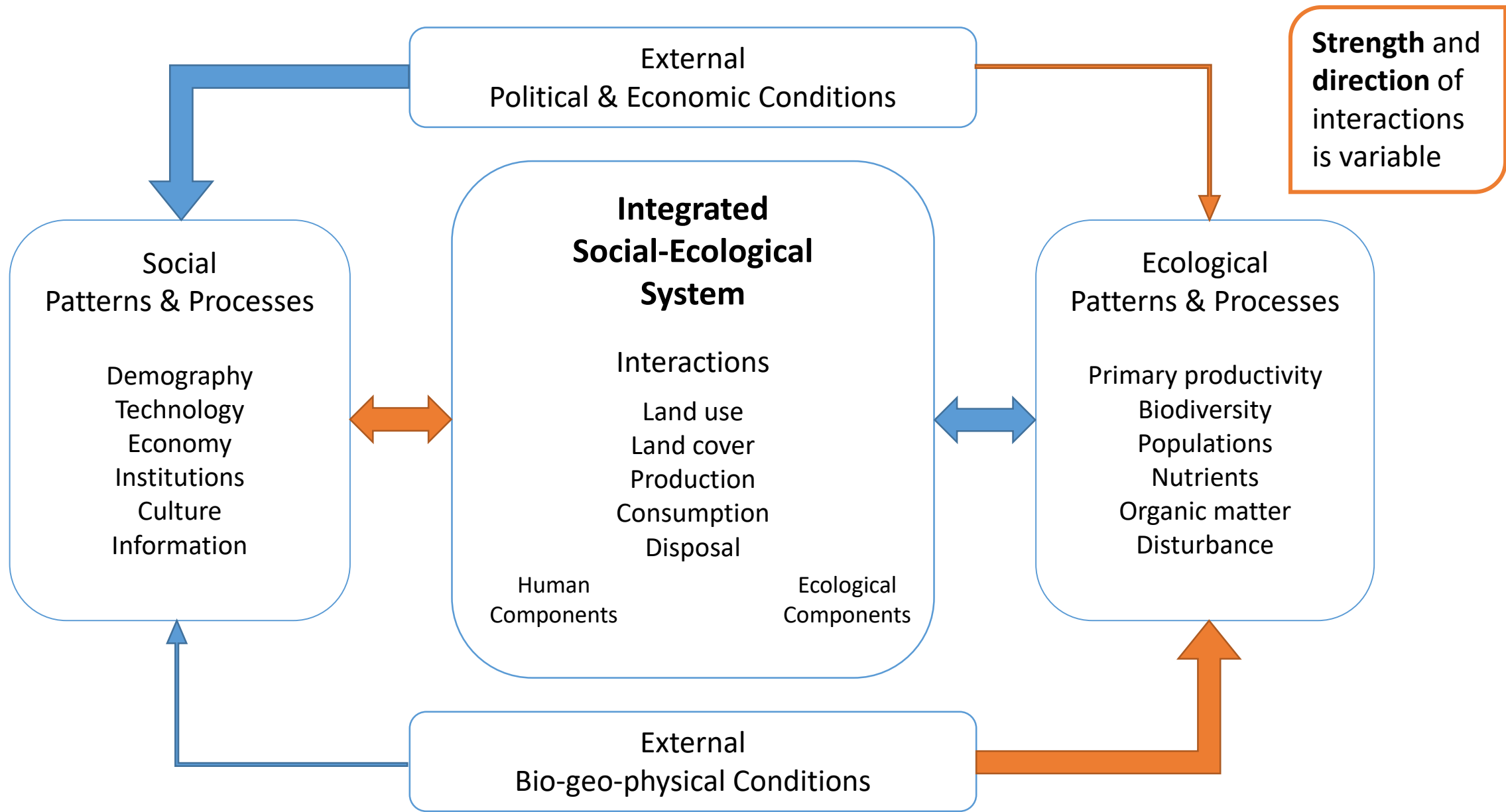
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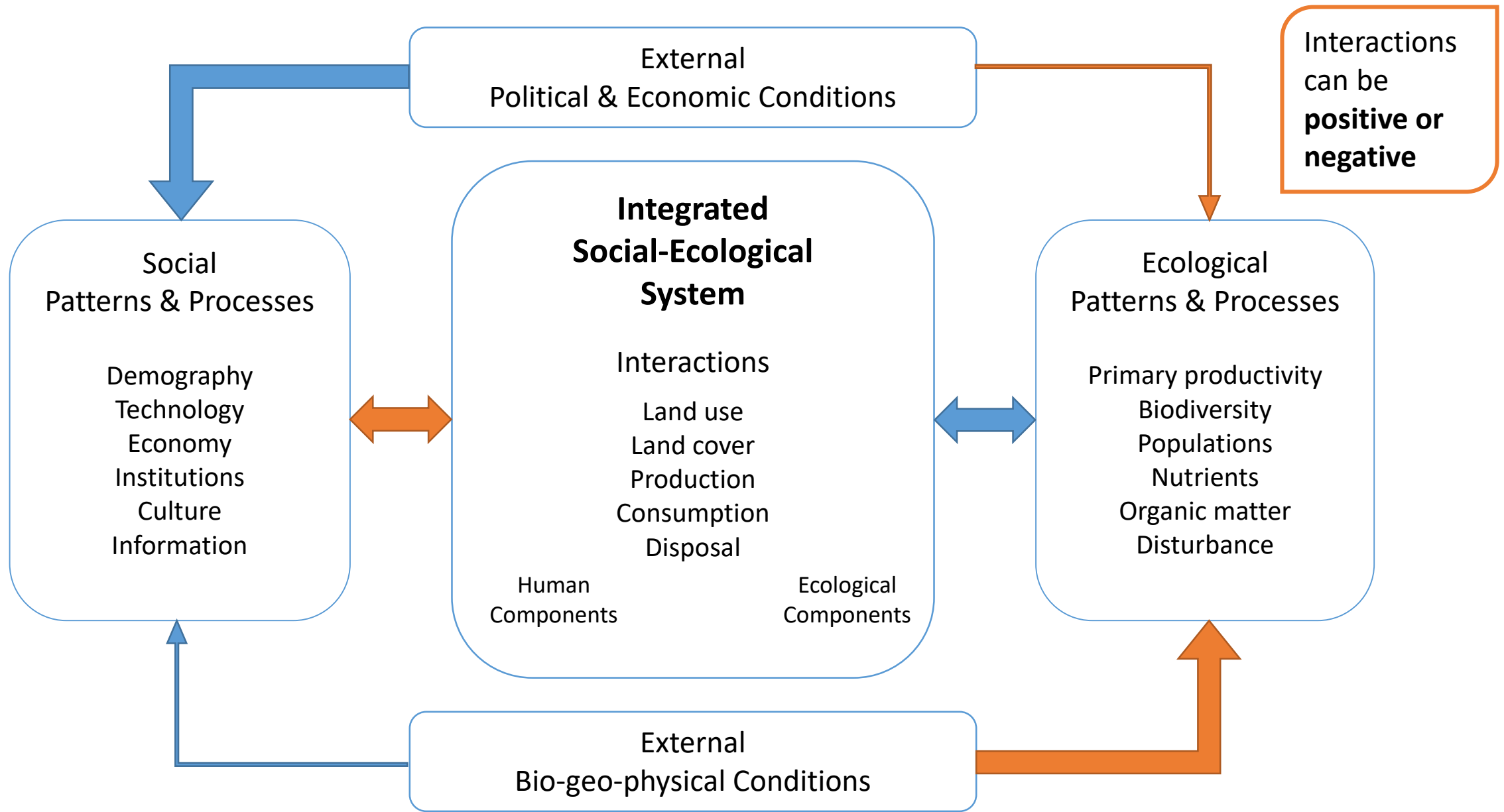
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Mapping a Social-Ecological Problem System

We can use system mapping to understand complex social-ecological problems, where people may have multiple, conflicting, logic-based viewpoints.

- Natural resource management
- Environmental justice
- Genetically modified organisms
- Invasive species



Mapping a Social-Ecological System

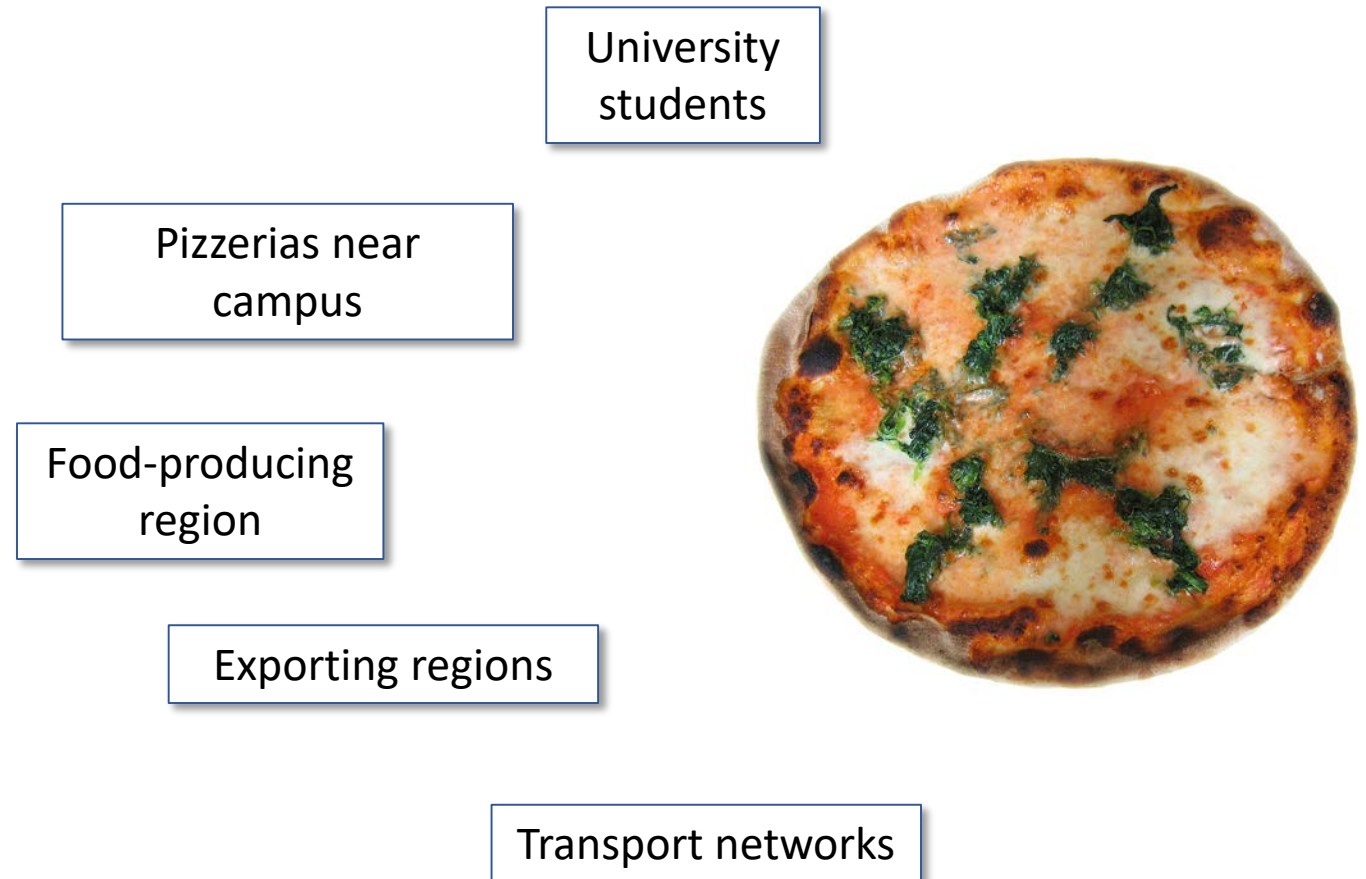
We can use system maps to describe many kinds of systems that have social and ecological elements... like a student having pizza for lunch near campus.



Boundaries

Where is the system? Who is involved?

What is inside the system?
What is outside?



Stakeholders

Who is affected? Who gains or is harmed?

People with an interest or concern (“stake”) in an issue

- Interests
- Concerns
- Values
- Different perspectives
- Common ground

Hungry
students

Farmers

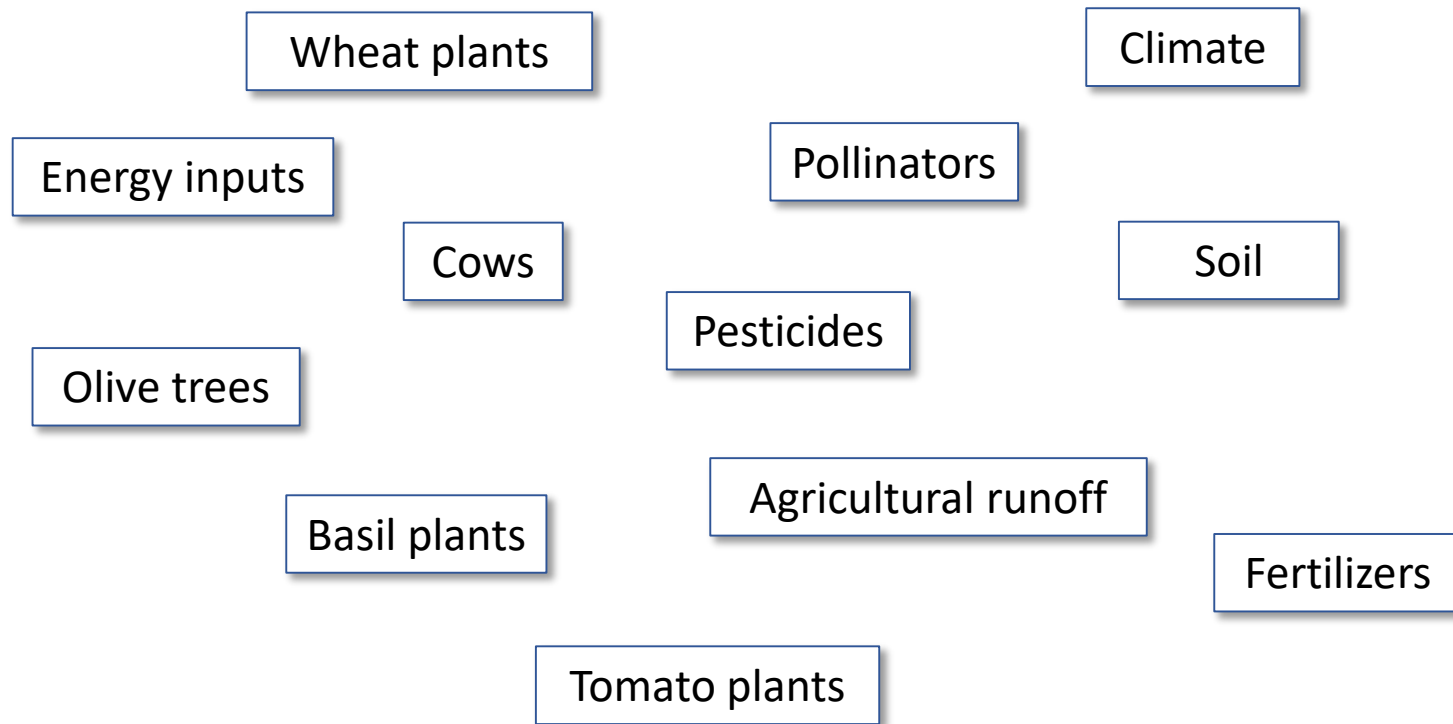
Pizzerias

Trucking company



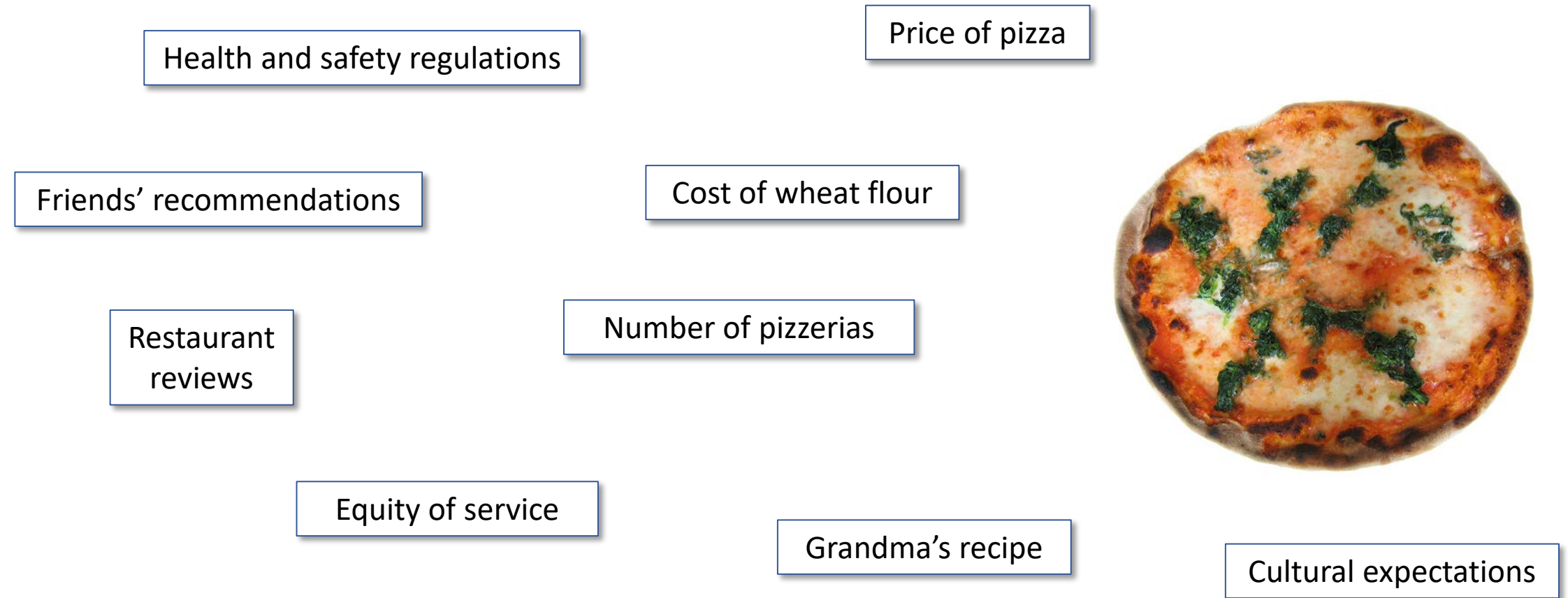
Ecological Elements

How are biological and physical elements of the environment involved?



Social Elements

How do institutions, power, and other social patterns and processes affect the system?



Mapping a Social-Ecological Problem System: Regulation of Invasive Plant Species



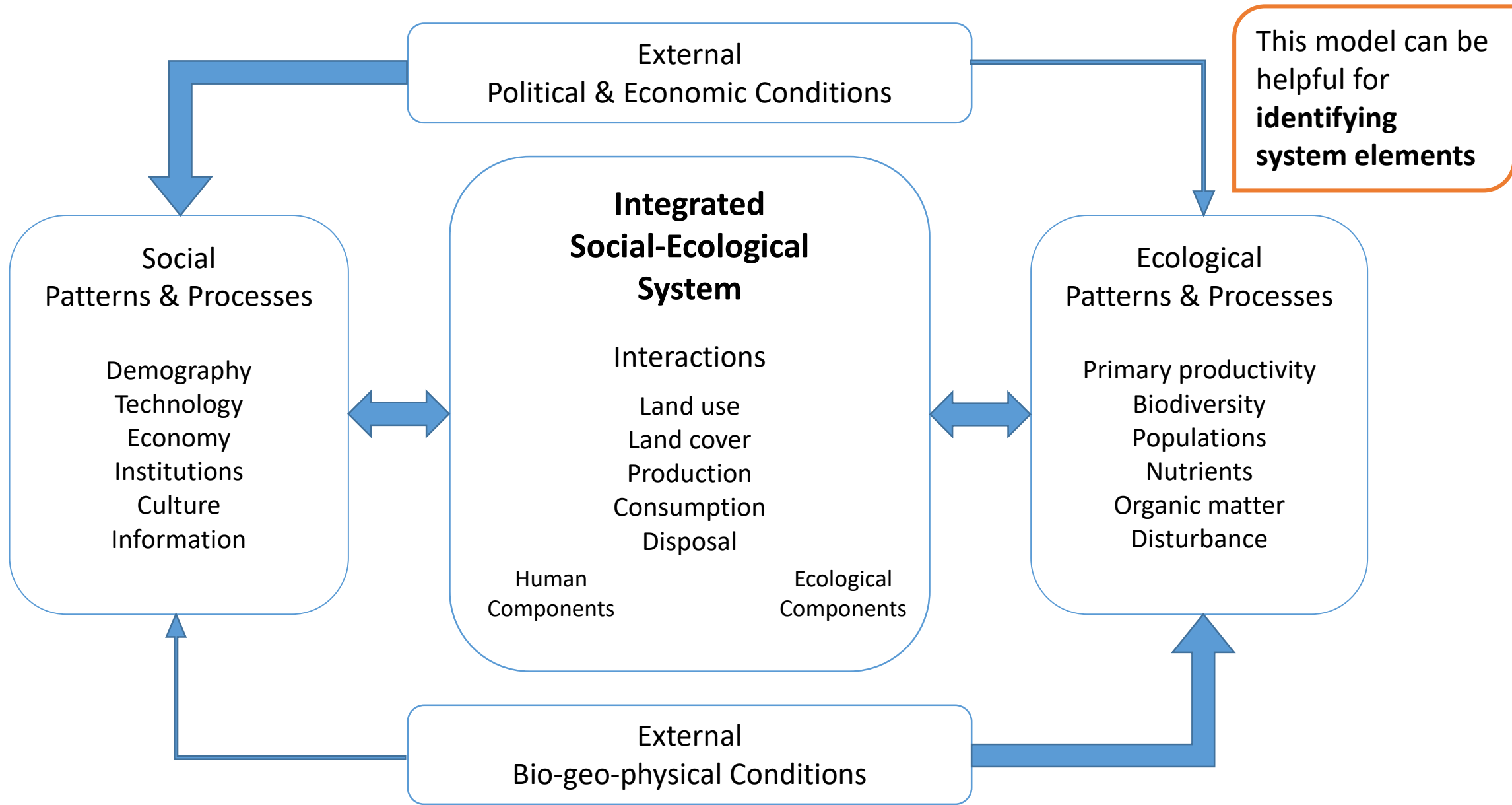
Photo: Lea R. Johnson 2016

Oriental bittersweet (*Celastrus orbiculatus*)
Native to Asia
Invasive in eastern North America

Mapping a Social-Ecological Problem System

Activity: Using information from the article about kudzu, create a system map of the problem of kudzu's expanding range in the United States.

- 1. List system elements on small pieces of paper**
2. Arrange elements
 - Cluster similar elements
 - Leave room for lots of interactions
3. Show interactions between elements with arrows
 - Arrow direction = direction of influence
 - + or - = positive (increase, benefit) or negative (decrease, harm)



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Mapping a Social-Ecological Problem System

Problem System Elements

- **Boundaries**
 - Where is the problem? Who is affected?
- **Stakeholders**
 - Who is affected? Who gains or is harmed?
- **Ecological elements of the problem**
 - Effects of the problem on the biological and physical environment (+/-)
 - Effects of biological and physical environment on the problem (+/-)
- **Social elements of the problem**
 - How do institutions, power, and other social patterns and processes affect the problem?
- **Interactions**
 - Show interactions using arrows between elements in your system map.
 - Indicate whether interactions are positive (increase, benefit) or negative (decrease, harm) using (+/-).

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