

# Week 1

## Day 2

### Ecosystem

- Fundamental ecological unit for the study of the environment.
- Structure
  - biotic and abiotic components and their relationships
- Processes
  - the flow of energy and nutrients within an...
- System Concepts
  1. State Variables → stores resources such energy, matter, water, etc.
  2. Flow → the pathways by which those resources move from one state variable to another
    - Affected by human involvement
  3. Open System → receive from their surroundings and produce outputs and leave the systems
  4. Closed System → no matter and energy exchange with its surroundings; a pseudo-closed system are those that exchange some energy, but no matter with their surroundings
  5. Positive or reinforcing feedbacks → a self perpetuating process that amplifies itself
  6. Negative or balancing feedback that suppress- change and balances itself
  7. Disturbances in Systemic Stability → events that can destabilize or change the system but might be also normal for the system
  8. Resilience → ability to recover from disturbance, but severe disturbance

The sources discuss several interconnected concepts related to environmental perceptions, ecological principles, and environmental movements, ultimately highlighting the social dimensions of environmental challenges and the role of collective action.

Here are the key takeaways and how they connect:

**1. Environmental Perception is a Psychosocial Phenomenon that Shapes Action and Consequences:** Our understanding of reality is a

representation, not a true copy. How individuals perceive the environment and its systems is a psychosocial phenomenon, meaning it's influenced by social and psychological factors. These perceptions are crucial because they directly affect how people act within that environment and, consequently, the outcomes of those actions. This perception forms the basis for environmental awareness.

**2. The Environment Functions as a System with Interdependent Components and Processes:** A system is defined as a network of interdependent components and processes that, when combined, possess properties beyond those of their individual parts, embodying the idea that "the whole is more than just the sum of its parts". An ecosystem is identified as the fundamental ecological unit for environmental study, comprising plants, animals, other organisms, weather, and landscape working together to form a self-sustaining "bubble of life". Ecosystems have both **structure** (biotic and abiotic components and their relationships) and **processes** (flow of energy and nutrients, and events affecting the ecosystem). Key system concepts include:

- **State Variables and Flow:** State variables store resources (like energy, matter, water), while flow describes the pathways by which these resources move between state variables.
- **Feedbacks:** Processes within a system that either amplify (positive/reinforcing) or suppress and balance (negative/balancing) change.
- **System Stability:** Systems tend towards homeostasis or equilibrium, but can be altered by disturbances (events that destabilize or change them, which may also be normal for the system). The ability of a system to recover from disturbance is known as resilience; severe disturbance can lead to a new ecosystem or a "state shift".
- **Open and Closed Systems:** Open systems exchange inputs and outputs with their surroundings, while closed systems (or pseudo-closed systems) exchange no matter and little energy with their surroundings.

**3. Ecological Principles Highlight Fundamental Interconnectedness:** Three key ecological principles underpin our understanding of environmental interactions:

- **"Everything is connected to everything else":** This principle emphasizes the intricate web of relationships within

environmental systems.

- "Nothing is free": Every action or resource use has a cost, often hidden or externalized.
- "Everything goes somewhere": Waste and byproducts do not disappear but are relocated within the system.

#### 4. Environmental Problems are Fundamentally Social Problems:

Environmental issues are presented as originating with people as the cause and ending with people as the victims. This perspective suggests that environmental challenges are not merely ecological but are deeply rooted in human society, behavior, and organization. The concept that "climate responsibility is different from climate risk" further illustrates this, implying that those who contribute least to climate change often bear its most severe consequences. Albert Camus's quote reinforces this, stating that "The evil that is in the world always comes of ignorance, and good intentions may do as much harm as malevolence, if they lack understanding".

#### 5. Environmental Awareness Leads to Pro-Environment Action and

**Movements:** Environmental awareness is defined as being conscious of environmental issues, problems, and concerns. This awareness is a precursor to pro-environment action, which involves behaviors that reduce or negate harmful environmental impacts. When shared concerns about environmental issues motivate collective action, it can lead to the formation of environmental movements.

#### 6. Environmental Movements are Influential, Complex, and Evolving:

The environmental movement has been described as one of the most comprehensive and influential social movements of our time, capable of recreating civil society and pioneering a global civil society. These movements are "great survivors" among new social movements and enjoy widespread public support, often more trusted than governments or corporations on environmental matters. Environmental movements are characterized as heterogeneous, having profoundly transformed, and becoming institutionalized. Despite institutionalization (e.g., EMOs becoming formal organizations, ecology becoming an academic discipline, green parties gaining political power), environmental issues still stimulate popular mobilizations and protests, revitalizing the movement. An environmental movement is broadly defined as a loose, non-institutionalized network of informal interactions, including individuals and formal organizations, engaged in collective action driven by a shared identity or concern about environmental issues. The balance of activities has shifted

from highly visible protest to less public activities like lobbying, yet informal and "subterranean" linkages persist.

**7. Environmental Conflicts Arise from Unjust Resource Use and Impact Vulnerable Groups Disproportionately:** Environmental conflicts are social conflicts over the environment, often overlapping with issues of gender, class, territory, or identity. These conflicts are not solely due to resource scarcity but are often driven by power relations and the "ecological distribution conflicts" that arise from the unfair distribution of environmental "goods" (like clean air and water) and "bads" (like pollution). The "social metabolism" of industrial economies, requiring continuous resource extraction and waste disposal, contributes to these conflicts, with powerful actors shifting environmental burdens to marginalized or poorer actors. Mining, fossil energy, biomass/land use, and water management are frequently reported sectors for environmental conflicts, with mining and land conflicts being particularly deadly. The types of conflicts vary with economic development, shifting from rural/conservation issues in low-income countries to waste management, tourism, nuclear, and industrial projects in high-income countries. Environmental defenders, who protect the environment against unjust and unsustainable resource uses, are often self-organized local groups and frequently belong to vulnerable segments of society, such as Indigenous peoples, farmers, and women. Indigenous people are significantly more susceptible to violence, criminalization, and assassinations when involved in these mobilizations.

**8. Environmental Defenders Employ Overwhelmingly Non-Violent, Diverse, and Strategic Mobilization Forms:** The repertoire of contention used by environmental defenders is overwhelmingly non-violent, including formal petitions, public campaigns, street protests, lawsuits, and the creation of alternative knowledge. Successful mobilization strategies include preventive action (mobilizing before project implementation), protest diversification (using many different forms of action), and legal actions (such as lawsuits and objections to environmental impact assessments). Combining these strategies, especially preventive, highly diverse, and strong legal actions, significantly increases the rate of success, such as project cancellation.

**9. Environmental Conflicts Have Both Positive and Negative Outcomes for Defenders:** Positive outcomes include strengthened community participation, environmental improvements, negotiated alternative

solutions, and the cancellation of conflictive projects. Court successes for defenders are relatively high, indicating that many conflictive projects do not comply with laws and standards. However, defenders also face severe negative consequences, including displacement, physical violence, criminalization of dissent (e.g., imprisonment, prosecution), and assassinations.

#### Connections between the points:

The initial concept of environmental perception directly feeds into environmental awareness, which then motivates individuals and groups to engage in pro-environment action and form environmental movements. These movements emerge in response to perceived threats within environmental systems, especially when those systems are impacted by unjust resource use and ecological distribution conflicts. The ecological principles of interconnectedness, cost, and the persistence of waste underscore the systemic nature of these problems and explain why actions have far-reaching, often negative, consequences that disproportionately affect vulnerable groups, highlighting that environmental issues are intrinsically social problems.

The environmental movements, despite their increasing institutionalization, rely on diverse and often non-violent mobilization strategies employed by environmental defenders to achieve positive outcomes like project cancellation or legal victories. However, their activism often comes at a high cost, facing violence and repression, particularly for Indigenous groups. This cycle—from perception to awareness, to collective action addressing systemic environmental injustices and facing consequences—illustrates the dynamic and often perilous struggle for environmental justice and sustainability. Ultimately, the sources suggest that understanding these complex interdependencies is crucial for effective support of environmental defenders and for fostering more sustainable and just environmental futures.