MANAJEMEN SUMBER DAYA DAN LINGKUNGAN

TATA KELOLA

HUMAN NATURE INTERACTIONS

- Nature has an inherent capacity to reverse negative environmental conditions without creating regime shift

- the status quo condition of environment is not only a product of nature but also the accumulated impacts of the human activities as moderated by governance systems

- If the intervention has passed the tipping point for natural systems, it leads to permanent and irreversible change

Human Nature Interactions
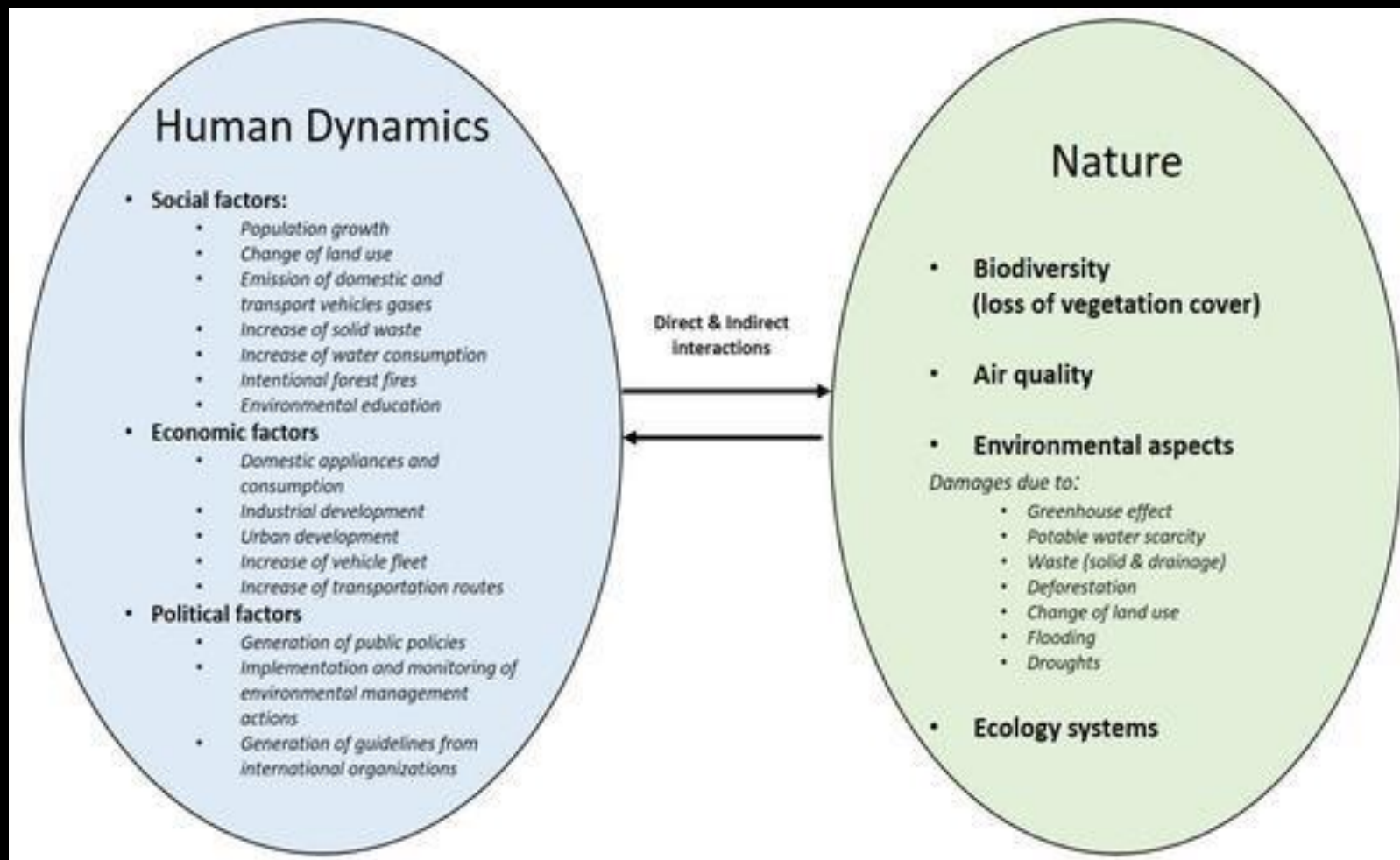
Type of Nature Regime Shifts
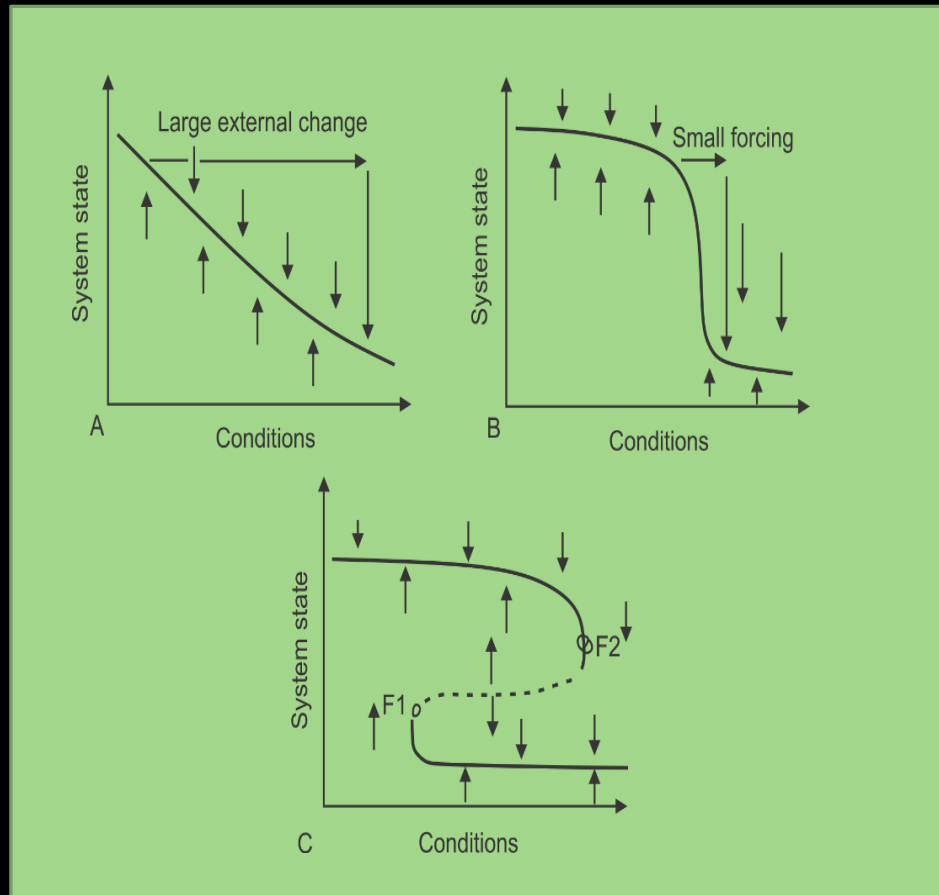
Transition in equilibrium state - response to different types of perturbations.

A. Affecting an almost linearly responding system;

B. Across a non-catastrophic threshold;

C. Across a catastrophic bifurcation threshold to alternative stable state (a critical transition).

Sclar, Volavka-Close & Brown 2013

HUMAN APPROACHES
Human Behavior to deal with Resources and Environment: An Ethics

1. ANTROPOSENTRISME

- Good or bad based on what is written in the rules (duties and obligations)
- Human as a center
- There is no consideration of the impacts of an action
- Threats for Subjectivity and Rationalization

HUMAN APPROACHES
Human Behavior to deal with Resources and Environment: An Ethics

2. BIOSENTRISME

- Human as part of nature
- Good or bad based on the goals and impacts could be created because of an action
- Context specific and subjectivity
- Challenges: benefit for? Inequality? Not every benefit/positive impacts can be quantified

HUMAN APPROACHES
*Human Behavior to deal with Resources and Environment: An Ethics*

3. EKOSENTRISME

- Consider human as part of ecosystem (biotic and abiotic components)
- Be good is a human learning process
- Purposeful change

# HUMAN APPROACHES – INFLUENCING FACTORS
Human Behavior to deal with Resources and Environment: An Ethics

1. SKILL/ABILITIES

2. BELIEFS

3. VALUE

4. IDENTITY

5. PURPOSE

6. ENVIRONMENT

7. BEHAVIOUR
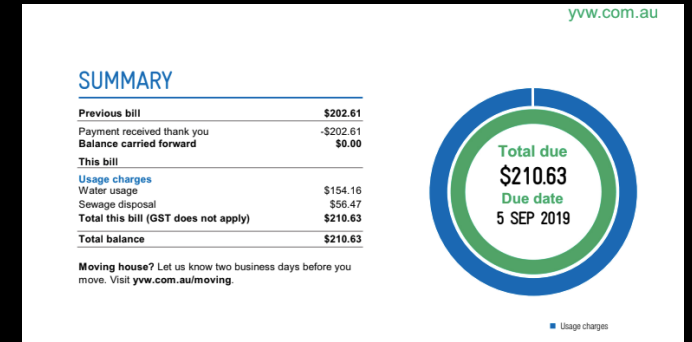
CHARACTERISTICS OF HUMAN NATURE INTERACTIONS

- the status quo condition of environment is not only a product of nature but also the accumulated impacts of the human activities

- Human approaches is a human learning process

- Influencing Factors: SKILL/ABILITIES,, BELIEF
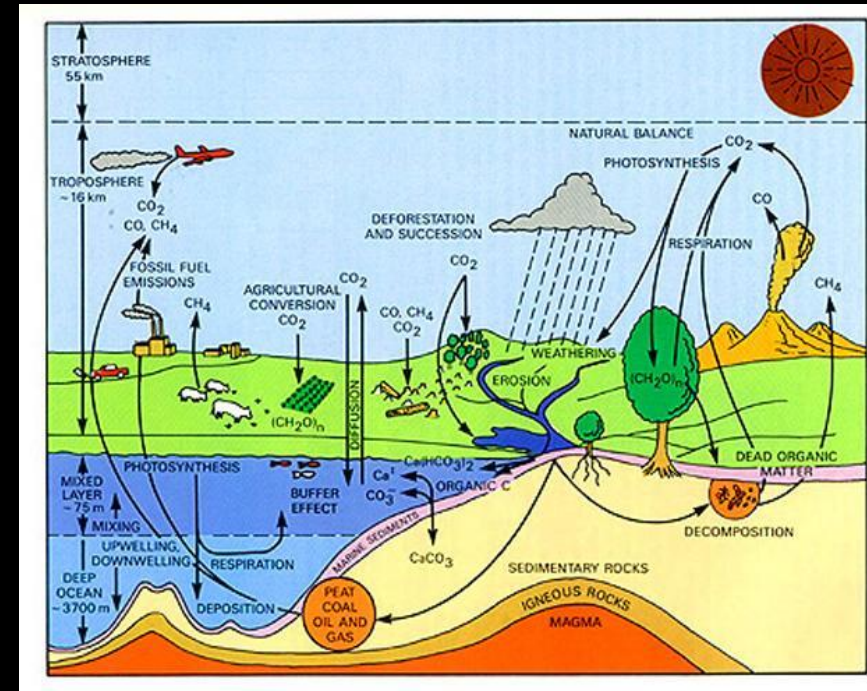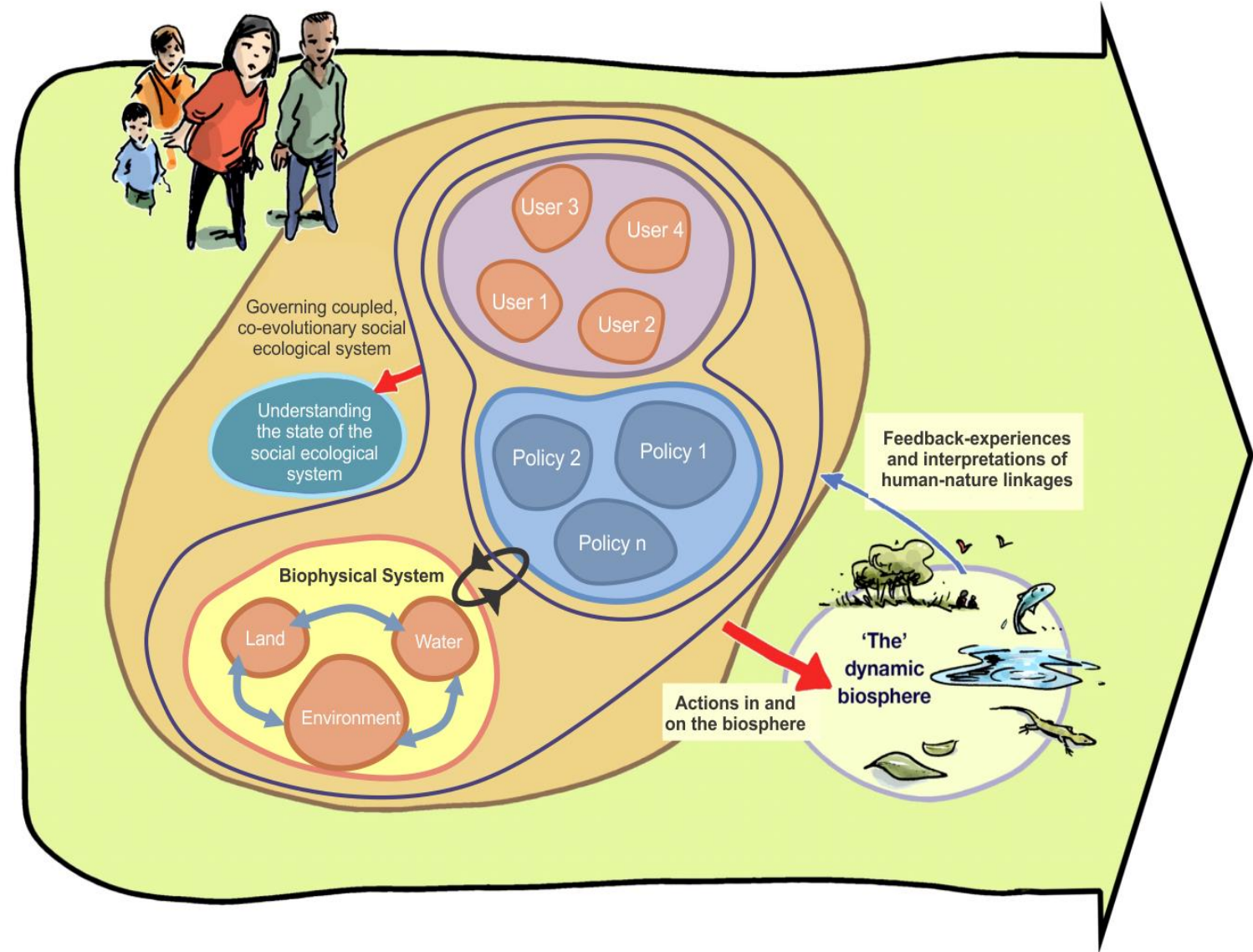

COMPLEX INTERCONNECTED

Human interventions may not only change the conditions of the targeted resources, but also create "downstream" impacts on other resources, and on the whole system.

CHARACTERISTICS OF HUMAN NATURE INTERACTIONS

- the status quo condition of environment is not only a product of nature but also the accumulated impacts of the human activities

- Human approaches is a human learning process

1. Influencing Factors: SKILL/ABILITIES; BELIEFS; VALUE; IDENTITY; PURPOSE; ENVIRONMENT; BEHAVIOUR

CONTEXT - SPECIFIC

- The magnitude of the changes caused depends on the conditions of the biophysical systems social systems and their governance

- The conditions of components of the biophysical and social systems are context specific.

- Resource and their actors differ between regions in their characteristics, capacities, and vulnerabilities to cope with the hazards. As a consequence, their response to perturbation would be also different.

- Pareto optimization is context specific and dependent on the conditions of actors and resources

- The same intervention can produce different outcomes when it is implemented in different biophysical and social contexts

- Require systemic approach to understand

Governing coupled, co-evolutionary social ecological system

Understanding the state of the social ecological system

User 3
User 4
User 1
User 2

Policy 2
Policy 1
Policy n

Feedback-experiences and interpretations of human-nature linkages

Biophysical System

Land
Water
Environment

'The' dynamic biosphere

Actions in and on the biosphere

Designing Policies in Resource Governances

- Governance is about **the arrangement of policies across different level of governments** (Global, national, regional to local policies)

- **Every policy** is structured around (1) **problems, (2) objectives to be achieved**, and (3) **a range of policy instruments to achieve objectives**

- **How problem/objectives translated into policy instrument** are the most significant factors characterizing understandings of resource governance

- **Policy instruments** are about **the myriad techniques of government interventions to implement their policy in practices**

- Resource governance is represented by the **accumulated policy instruments** implemented to cope problem and achieve targeted goal related to the resource
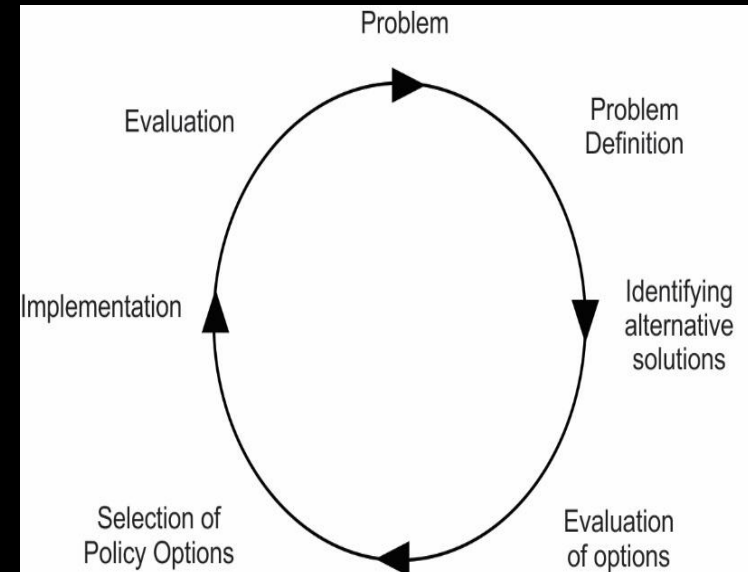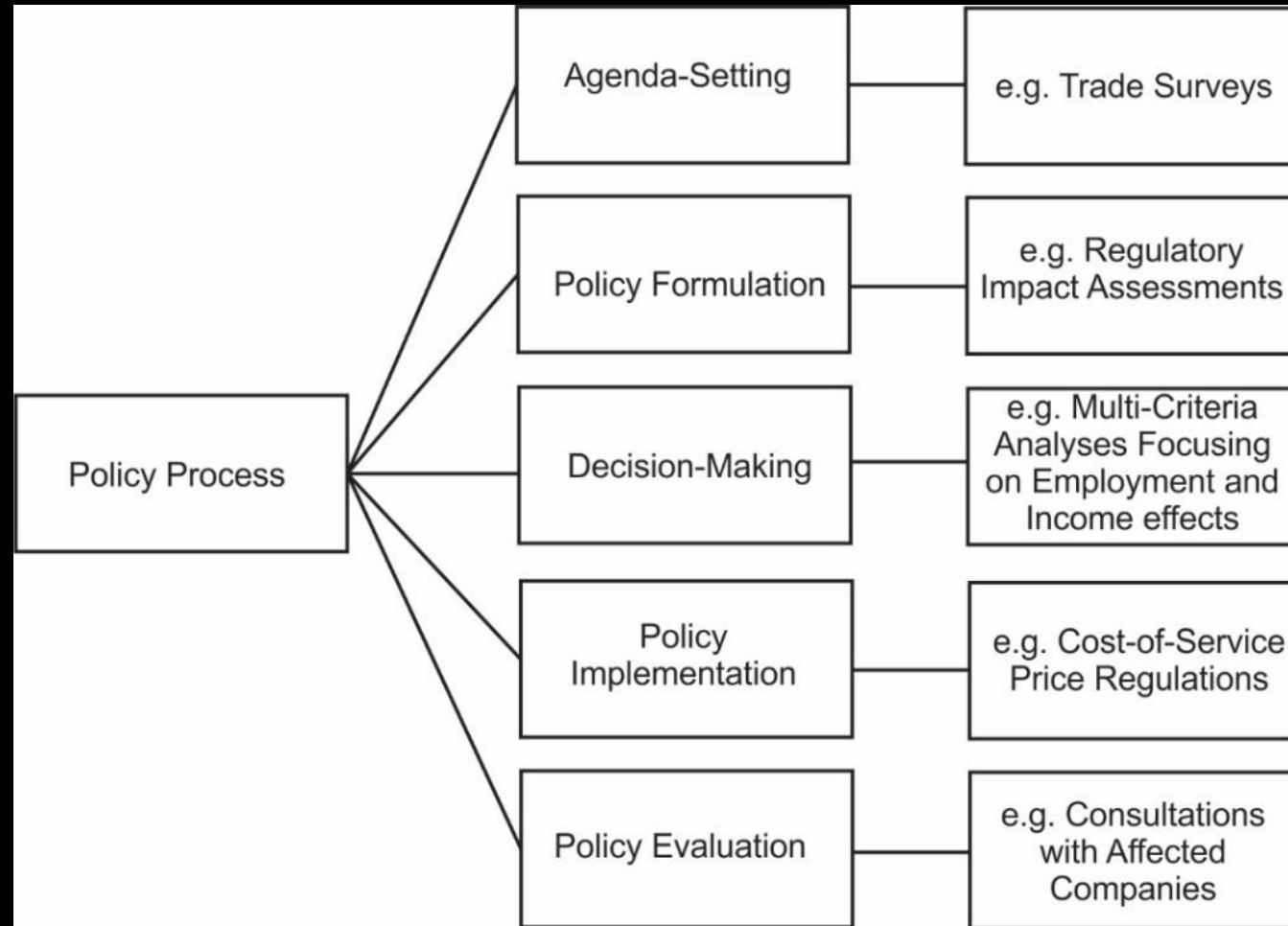
Four types of policy instrument interactions in environmental policy :

- Policy instruments that are inherently complementary;

- Policy instruments that are inherently incompatible;

- Policy instruments that are complementary if sequenced correctly; and

- Policy instruments which are complementary within specific contexts.

Coping process

- Setting of international water limits
- Specification of low flow conditions
- Drought emergency measures
- Strengthening of water use control
- Introduction of water use quotas
- Revision of crop allocation
- Drought prevention measures
- Social security measures
- Optimization of copping patterns
- Social Security Measures
- Program on water saving strategies
- Improvement of land reclamation systems
- Inventory of plot size and consolidation of farms
- Creation of Land and Water Plan
- Fundraising for land reclaim
- Planning of general water allocation
- land and water plan
- Measures for Demage Reduction
- provincial water limits
- water master plan
- Establishment of Water Savings Council
- Planning of irrigation water allocation
- Execution of Land and Water Plan

Reform Process

- Privilazation of agriculture
- Pres. Decree "Strengthening of Agricultural Reforms"
- Introduction of hydrographic principle
- Regulation about new WM aorganizations
- Legal basis of agricultural reforms
- Monitoring of MWR reorganization
- Monitoring of reforms of WRM
- Establishment of Basin Organizations

Legend:
- Action Situation
- Operational-phase AS
- Institution
- Operational Outcome

Resource and Environmental Governance: Definition

GOVERNANCE

- the action or manner of governing.

- the traditions and institutions by which authority in a country is exercised.

- the use of institutions, structures of authority and even collaboration to allocate resources and coordinate or control activity in society or the economy.

- the rules of the political system to solve conflicts between actors and adopt decision (legality).

INSTITUTION

- an organization that exists to serve a public purpose such as education or support for people who need help

- an established law, practice, or custom

Institutional Development Analysis (IAD)Framework
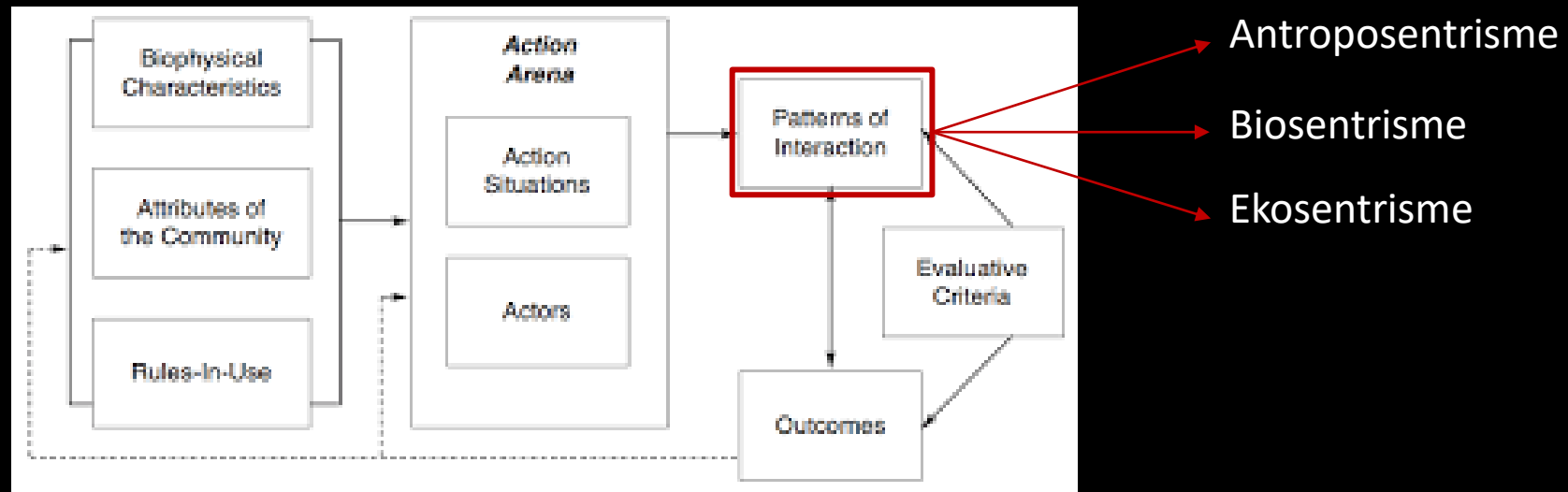
Design principles for governing sustainable resources

Clearly defined boundaries	The boundaries of the resource system (e.g., catchment system and the actors with rights to harvest resource units are clearly defined)
Proportional Equivalence between Benefits and Costs	Rules specifying the amount of resource product that a user is allocated is related to local context and to the rules requiring labor, material and money
Collective-choice arrangements	Rules are modified by most of individuals affected by harvesting and protection rules
Monitoring	Monitors are conducted by the users themselves who actively audit biophysical conditions and user behaviour
Graduate sanctions	Rules enacted are supported by law enforcements
Conflict-resolution mechanisms	Users have rapid access to low cost actions to resolves conflict of interests
Minimal recognition of rights to organize	The rights of users to devise their own institutions are not challenged by external governmental authorities, and users have long-term tenure rights to the resource.
Nested enterprises (for resources that are parts of larger systems)	Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises.
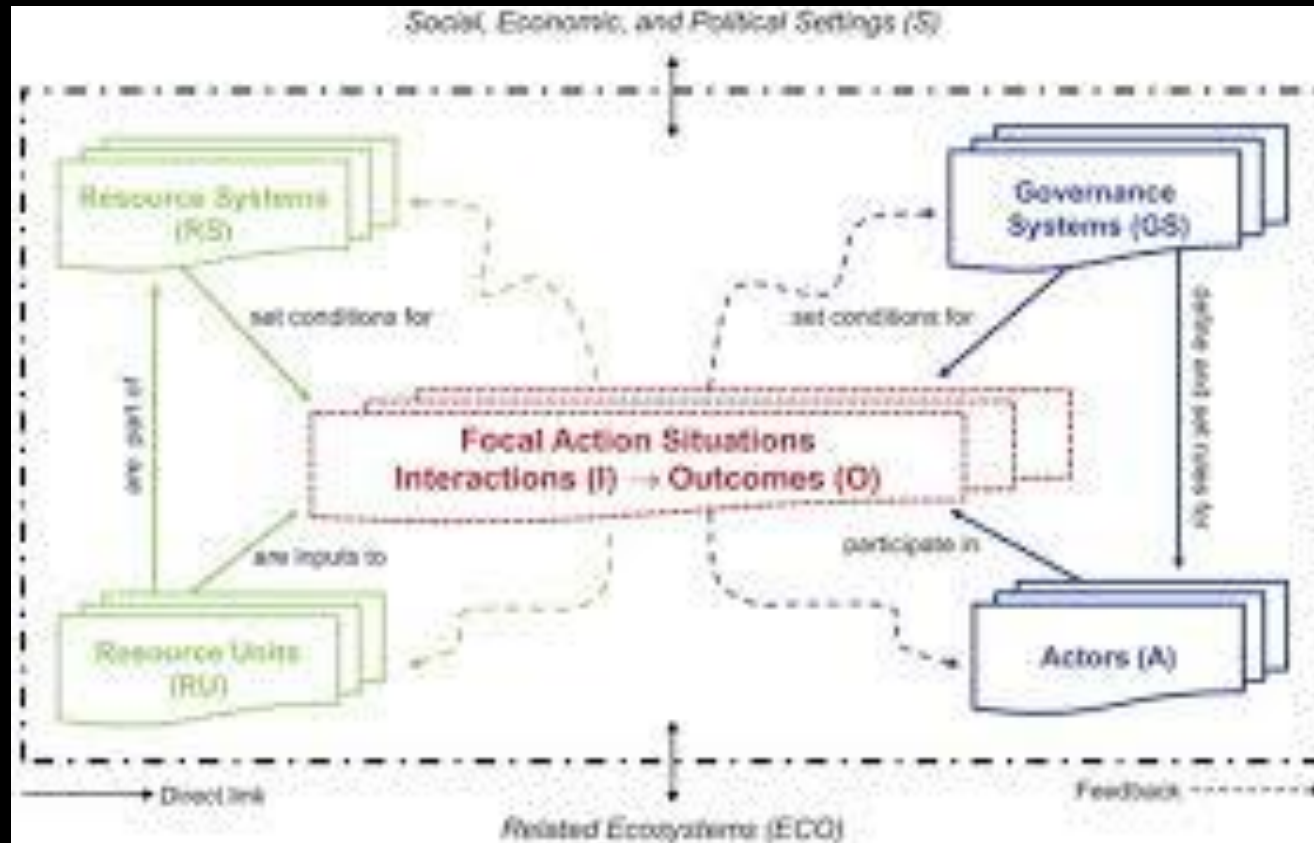
Framework interpretation is not about interpreting variables per se, but about interpreting variables in accordance with their role in explaining outcomes

- The Resource system (RS) creates the conditions for the existence of a stock of resource units. The RS is **the biophysical and technological processes that create, maintain and improve stocks of resource units (RU)**.

- One set of RU belongs to one RS (Ostrom 2007, Hinkel et al. 2014). **RS may thus include several interacting stocks of different kinds of units**.

- The essential difference between RU and RS in our refinement is that the former **is a stock and the latter is a set of processes (or flows) relating the stocks**.

Social, Economic, and Political Setting (S)
S1-Economic development. S2- Demographic trends. S3- Political stability. S4- Government settlement policies. S5- Market incentives. S6- Media organization.

Resource System (RS)	Governance System (GS)
RS1- Sector	GS1- Government organizations
RS2- Clarity of system boundaries	GS2- Non-government organizations
RS3- Size of resource system	GS3- Network structure
RS4- Human-constructed facilities	GS4- Property-rights systems
RS5- Productivity of system	GS5- Operational rules
RS6- Equilibrium properties	GS6- Collective-choice rules
RS7- Predictability of system dynamics	GS7- Constitutional rules
RS8- Storage characteristics	GS8- Monitoring & sanctioning processes
RS9- Location	

Resource Units (RU)	Users (U)
RU1- Resource unit mobility	U1- Number of users
RU2- Growth or replacement rate	U2- Socioeconomic attributes of users
RU3- Interaction among resource units	U3- History of use
RU4- Economic value	U4- Location
RU5- Size	U5- Leadership/entrepreneurship
RU6- Distinctive markings	U6- Norms/social capital
RU7- Spatial & temporal distribution	U7- Knowledge of SES/mental models
	U8- Dependence on resource
	U9- Technology used

Interactions (I) Outcomes (O)	
I1- Harvesting levels of diverse users	O1- Social performance measures (e.g., efficiency, equity, accountability)
I2- Information sharing among users	
I3- Deliberation processes	
I4- Conflicts among users	O2- Ecological performance measures (e.g., overharvested, resilience, diversity)
I5- Investment activities	
I6- Lobbying activities	
	O3- Externalities to other SESs

Related Ecosystems (ECO)
ECO1- Climate patterns. ECO2- Pollution patterns. ECO3- Flows into and out of focal SES.

Diagnostic Procedure

- Social-ecological systems other systems) can only be conceptualized with respect to a research question.

    1. **What is the research question?**

        Ex_1 : Research question: Which social and biophysical properties have enabled **the Taos acequia SES** to historically persist in the face of droughts and general environmental scarcity?

        Ex_2 : Research question: How have the local governance systems of common property **meadows in the Swiss Alps** adapted to deal with societal changes?

        Ex_3 : Research question: Can stocking enhance the sustainability of **recreational fisheries**?

    2. Which **actors (A) obtain which benefits from the SES**? Benefits are understood widely, including instrumental, moral, aesthetic values, current vs. future values, direct vs. indirect values, option values, etc.

        Step 1_Identify what is the resource system in the case study

        Step 2_Identify all actors who use resource and related resources in the resource system

        Step 3_Identify their benefits including the conflict of interest and tradeoff among actors

3. Are any of the collective goods obtained subtractable? If so, an appropriation action situation arises where activities subtract from a stock of resource units (RU). For nonsubtractable goods there is no need to consider the variables of the RU.

	High excludability	Low excludability
High subtractibility (Rivalrous)	Private good	Common-pool resource (Ex. Water, fish, timber)
Low substractibility (Non-rivalrous)	Club goods (Ex. Toll road, satellite television	Public good (Ex. Air, sea water, national channel television)

4. What are the biophysical and/or technological processes involved in the generation of the stock of RU? These will collectively be called the resource system (RS).

5 How do the variables of RS and RU characterize the appropriation-related governance challenges?

6 What kind of institutional arrangements have emerged?

7 Which actors contribute to the provision, maintenance, or improvement of the RS?

8 How do the variables of RS characterize the provisioning action situation related governance challenge?

3. Are any of the collective goods obtained subtractable? If so, an appropriation action situation arises where activities subtract from a stock of resource units (RU). For nonsubtractable goods there is no need to consider the variables of the RU.

5 What are the biophysical and/or technological processes involved in the generation of the stock of RU? These will collectively be called the resource system (RS). Multiple RS may be relevant and several types of RU may be obtained from the same RS.

6 How do the variables of RS and RU characterize the appropriation-related governance challenges? Now that the concepts of RS and RU have been defined for the particular SES studied, the second-tier variables of RS and RU can be applied to further characterize the governance challenges at hand.

7 What kind of institutional arrangements have emerged as a response to the appropriation action situation governance challenge? This question forms the entry point to making A and governance system (GS) variables operational.

8 Which actors contribute to the provision, maintenance, or improvement of the RS and by what input (labor, resources, etc.)? This defines a provision action situation associated with a particular RS. In the case that nonsubtractable collective goods are obtained from the RS, this action situation is the provisioning of a pure public good. This and the following two questions need to be addressed for each RS.

9 How do the variables of RS characterize the provisioning action situation related governance challenge? Similarly to the appropriation action situation, a provisioning action situation may be further characterized by the variables of the RS.

10 What kind of institutional arrangements have emerged as a response to the provisioning action situation governance challenge?