Core concepts

Prof. Doutora Maria do Rosário Partidário

Environment – the conditions that surround someone or something (Merriam-Webster Dict)

Living well, within
the limits of our planet

7th Environment Action Programme

Environment

What do we mean by environment?

-Solid wastes

-Waste water (Sanitation)

-Supply water quality

-Noise

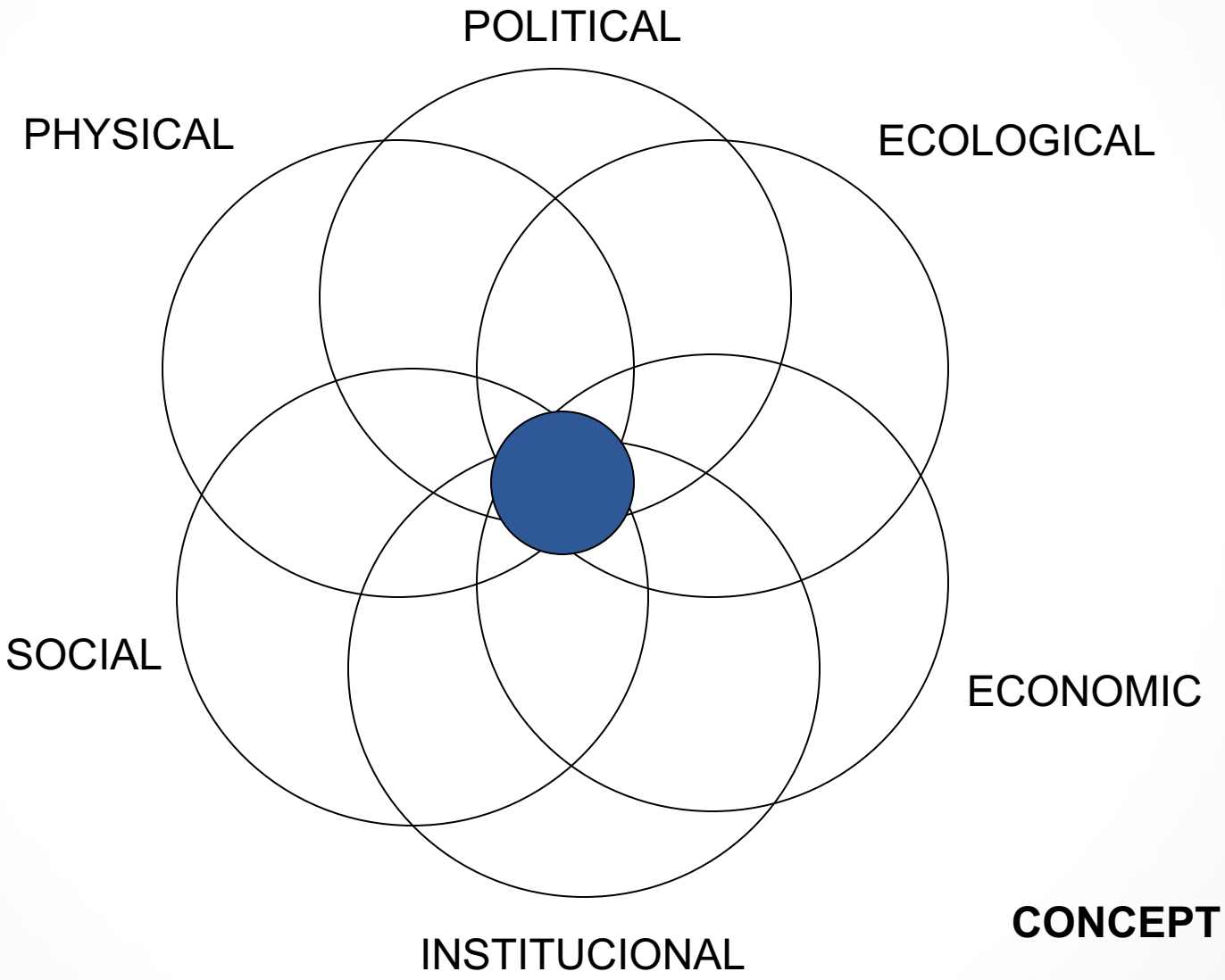
-Air quality

PHYSICAL ENVIRONMENT

….+ resources (energy, soil, water, natural areas, cultural elements, etc), social dimension, image, environmental comfort, territorial atractivity…

CONTEXT ENVIRONMENT

Environmental system – interdependence of different components



CONCEPT OF ENVIRONMENT

TERRITORY

Refers to :

-A spatial area dominated by an animal, a person (or group of people), an organization or an institution.

-Individual or collective appropriation of a geographic area.

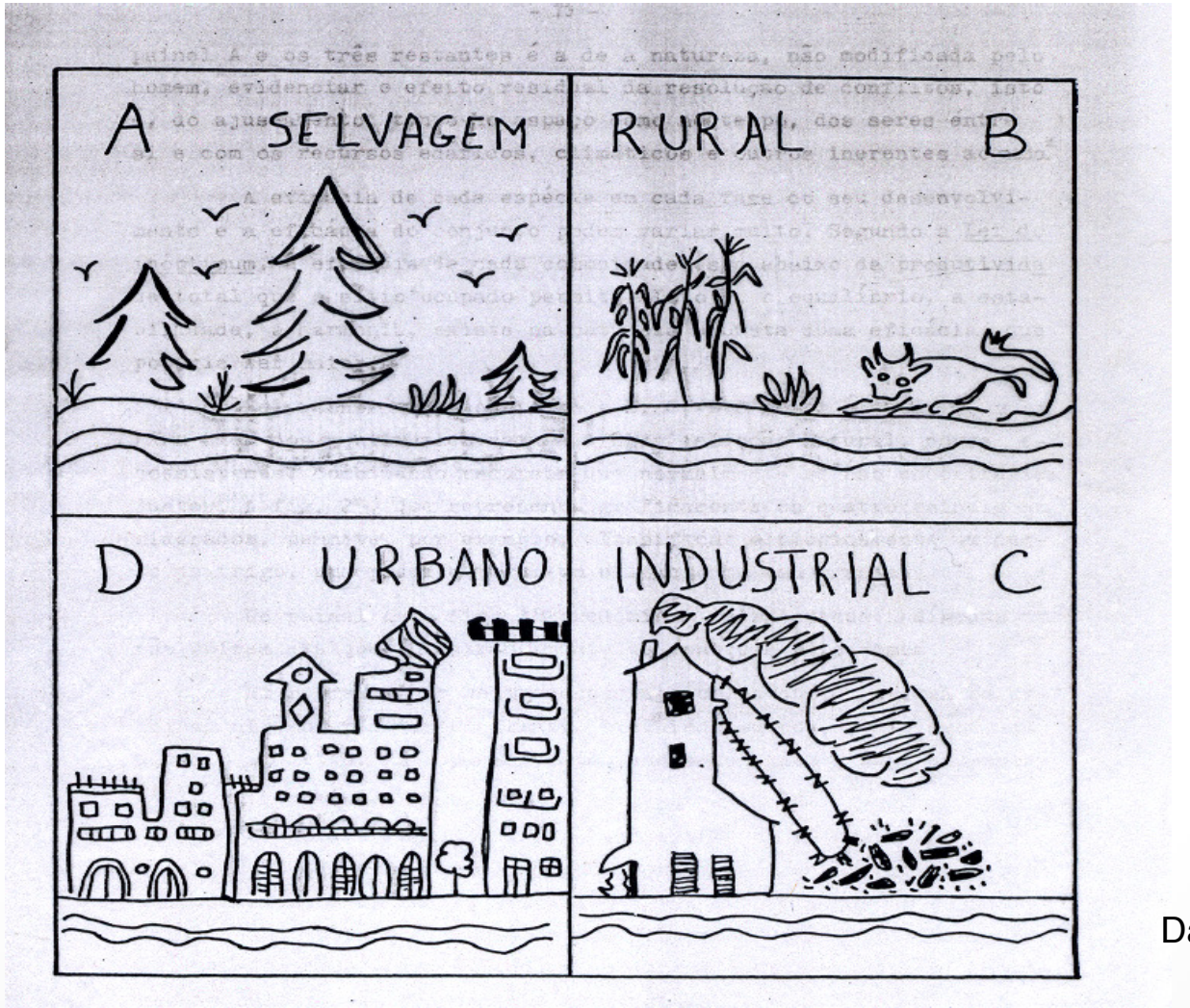
The word is used:

In politics (when reference is made to the State-Nation),

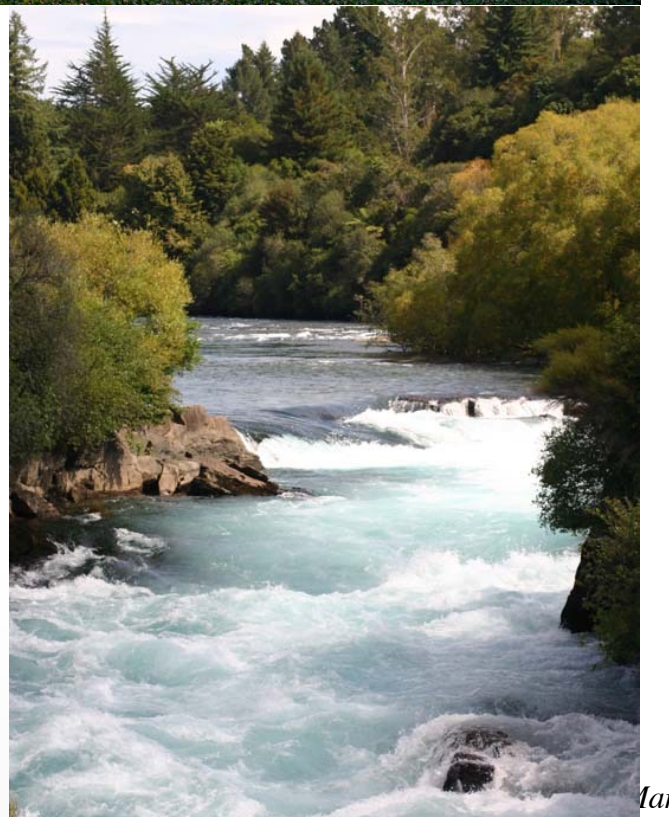
In Biology (space where a certain animal species live) and

In Psychology (actions of animals or individuals for the defense of a certain space)

Types of territories and environment



Dansereau, 1969



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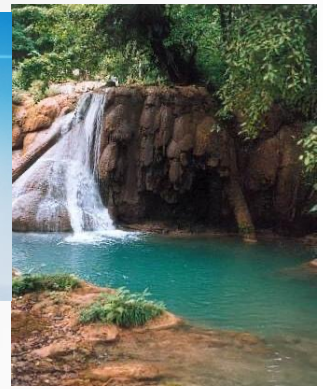
Environment – territory relationship

1. Conditioned spaces, “reserved” spaces, ecological structure
2. Physical environment quality: air, water, waste, noise, energy
3. Natural and Human Resources Capital
4. Passive territorial function
5. Context (cultural, institutional, political, organizational)



RESOURCES

A good that represents an utility to an user in view of a certain objective / aim

Dynamic concept that depends on knowledge on resources, technologies and cultural levels (needs, perception)

Renewable and non-renewable resources - all resources result from natural cycles and are therefore renewable at different temporal scales. Those non renewable at human scale are considered non-renewable

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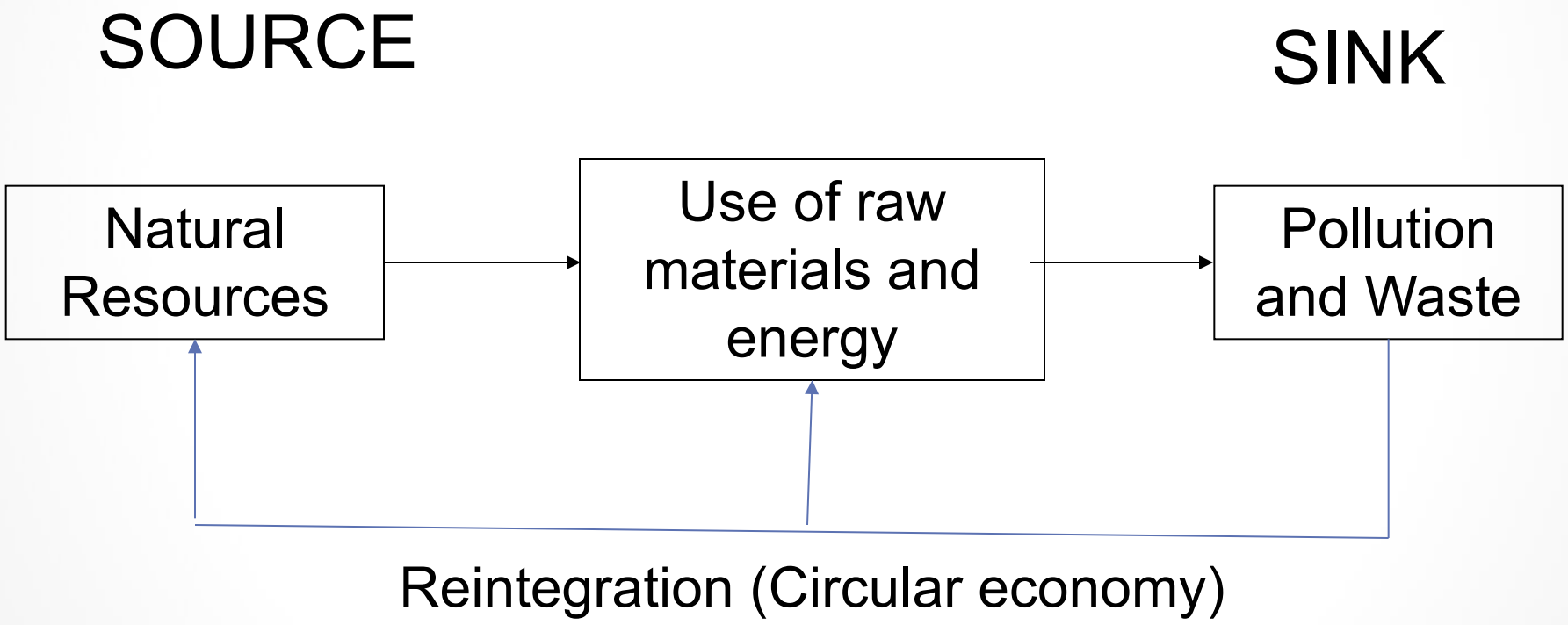
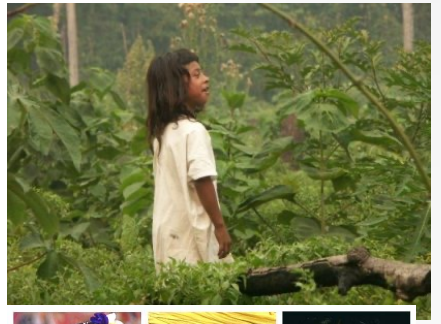
TYPICAL LIFE CYCLE STRUCTURE

1st law of thermodynamics – conservation of energy (total energy is constant)
2nd law of thermodynamics – total entropy increases over time (energy from concentrated to dispersed form)

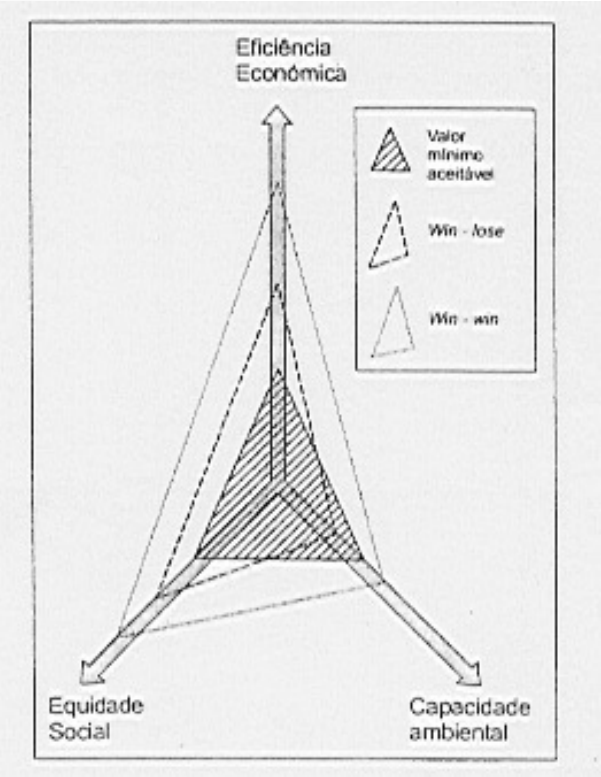


Sustainability - Capital relationship

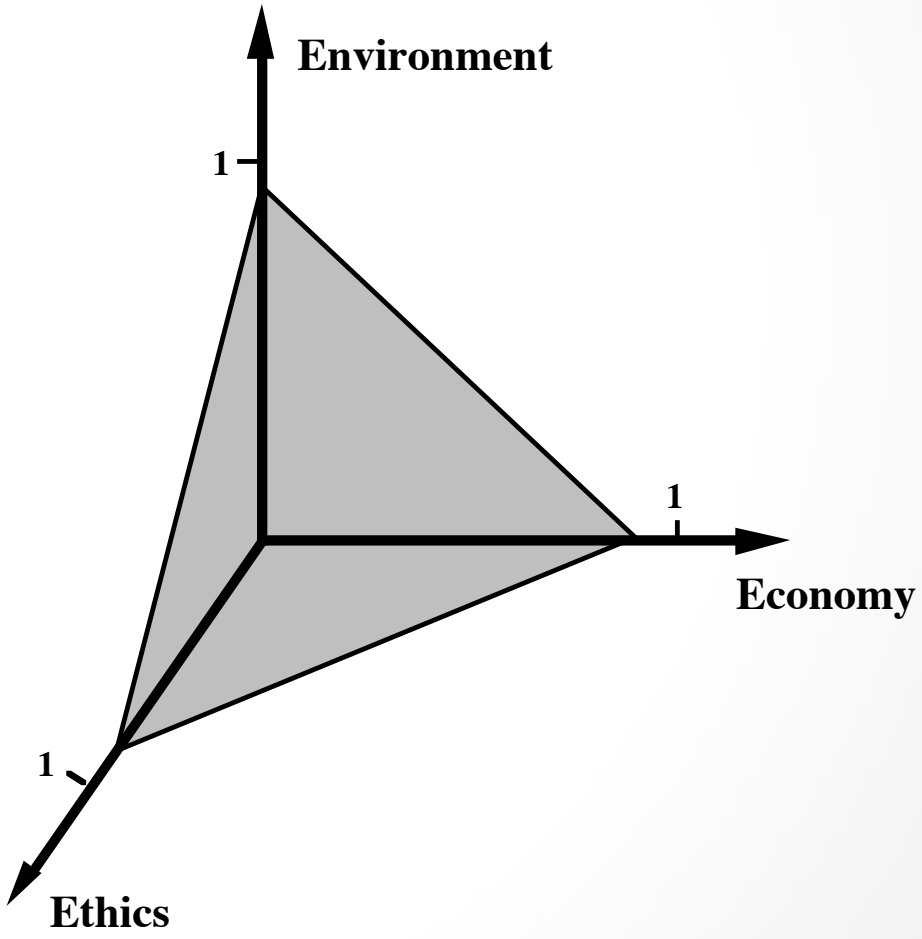
SUSTAINABILITY		CAPITAL
Environmental	→	NATURAL
Social	→	HUMAN
Economic	→	MAN-MADE
GLOBAL	→	Synergistic balance of capital



Sustainable Development main axes



$$DS = E^3$$



Various forms of describing Sustainability / Sustainable Development

Profit, Planet, People

Economic, Environmental, Social

Livelihood, Landscape, Lifestyles

.....

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https://www.un.org/sustainabledevelopment/sustainable-development-goals/

Sustainable Development goals

Goal 1	End poverty in all its forms everywhere
Goal 2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 3	Ensure healthy lives and promote well-being for all at all ages
Goal 4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5	Achieve gender equality and empower all women and girls
Goal 6	Ensure availability and sustainable management of water and sanitation for all
Goal 7	Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10	Reduce inequality within and among countries
Goal 11	Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12	Ensure sustainable consumption and production patterns
Goal 13	Take urgent action to combat climate change and its impacts*
Goal 14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17	Strengthen the means of implementation and revitalize the global partnership for sustainable development

https://sustainabledevelopment.un.org/focussdgs.html

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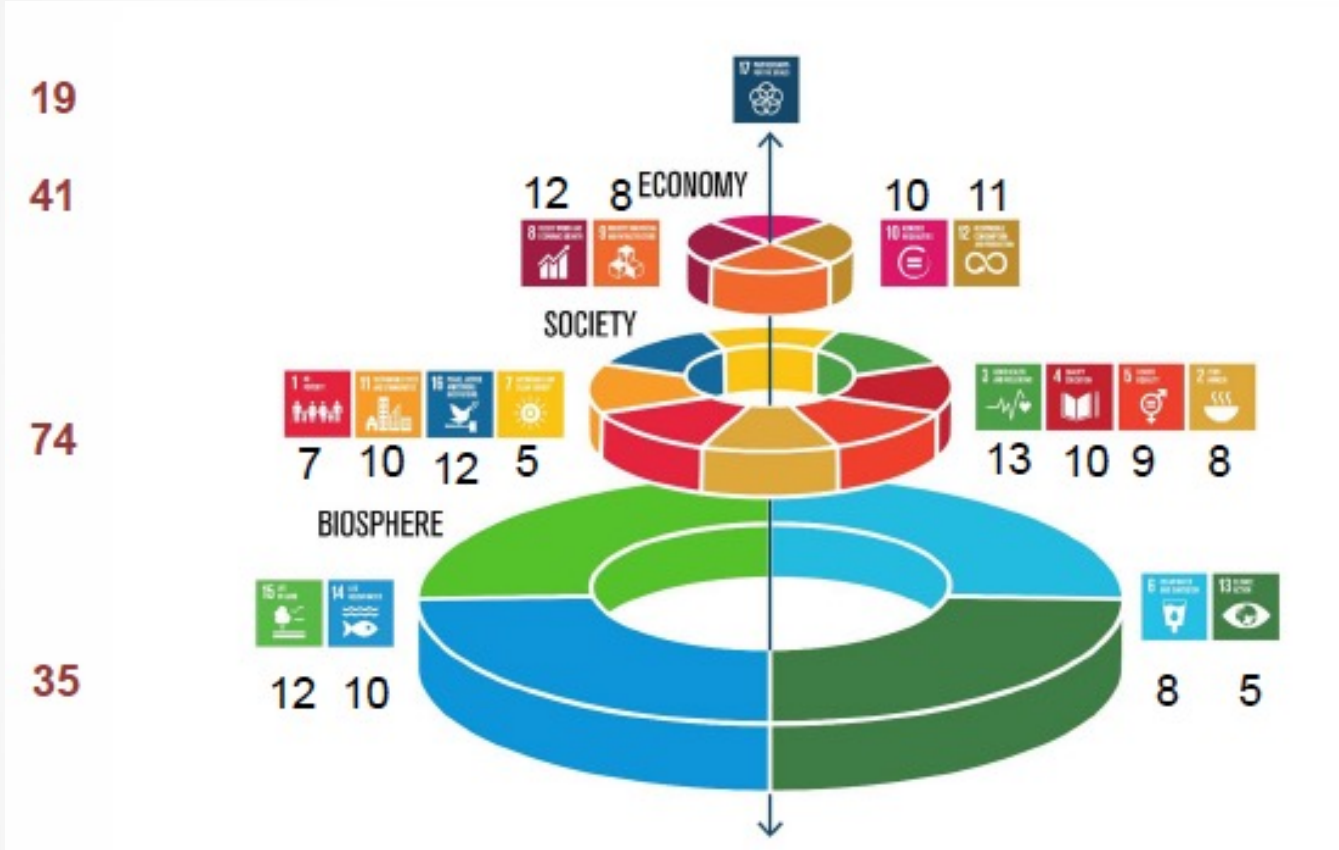
17 SDGs and 169 targets

- People (74 targets, 44%)
- Planet (35 targets, 21%)
- Prosperity (41 targets, 24%)
- Peace – horizontal target
- Partnership (19 targets, 11%)



PLANETARY BOUNDARIES

READ for next lecture:

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Systems thinking, knowledge and action: towards better models and methods

Allan Best and Bev Holmes

PERSPECTIVE

A General Framework for Analyzing Sustainability of Social-Ecological Systems

Elinor Ostrom[1,2]*

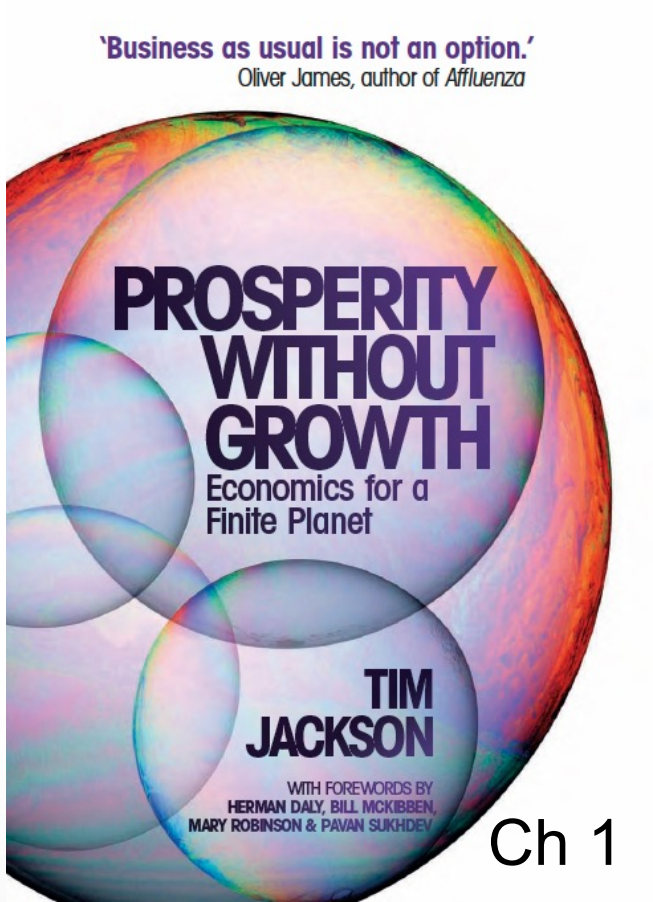
A major problem worldwide is the potential loss of fisheries, forests, and water resources. Understanding of the processes that lead to improvements in or deterioration of natural resources is limited, because scientific disciplines use different concepts and languages to describe and explain complex social-ecological systems (SESs). Without a common framework to organize findings, isolated knowledge does not cumulate. Until recently, accepted theory has assumed that resource users will never self-organize to maintain their resources and that governments must impose solutions. Research in multiple disciplines, however, has found that some government policies accelerate resource destruction, whereas some resource users have invested their time and energy to achieve sustainability. A general framework is used to identify 10 subsystem variables that affect the likelihood of self-organization in efforts to achieve a sustainable SES.

The world is currently threatened by considerable damage to or losses of many natural resources, including fisheries, lakes, and forests, as well as experiencing major reductions in biodiversity and the threat of massive climatic change. All humanly used resources are embedded in complex, social-ecological systems (SESs). SESs are composed of multiple subsystems and internal variables within these subsystems at multiple levels analogous to organisms composed of organs, organs of tissues, tissues of cells, cells of proteins, etc. (*1*). In a complex SES, subsystems such as a resource system (e.g., a coastal fishery), resource units (lobsters), users (fishers), and governance systems (organizations and rules that govern fishing on that coast) are relatively separable but interact to produce outcomes at the SES level, which in turn feed back to affect these subsystems and their components, as well other larger or smaller SESs.

Scientific knowledge is needed to enhance efforts to sustain SESs, but the ecological and social sciences have developed independently and do not combine easily (*2*). Furthermore, scholars have tended to develop simple theoretical models to analyze aspects of resource problems and to prescribe universal solutions. For example, theoretical predictions of the destruction of natural resources due to the lack of recognized property systems have led to one-size-fits-all recommendations to impose particular policy solutions that frequently fail (*3*, *4*).

The prediction of resource collapse is supported in very large, highly valuable, open-access systems when the resource harvesters are diverse, do not communicate, and fail to develop rules and norms for managing the resource (*5*) The dire predictions, however, are not supported under conditions that enable harvesters and local leaders to self-organize effective rules to manage a resource

[1]Workshop in Political Theory and Policy Analysis, Indiana University, Bloomington, IN 47408, USA. [2]Center for the Study of Institutional Diversity, Arizona State University, Tempe, AZ 85287, USA.
*E-mail: ostrom@indiana.edu



Ch 1