

Summary

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21 Oct, 2025

Content

1. Rationale and LOs
2. Quick recap of the themes we treated:
 - Institutional entrepreneurship
 - Responsible Innovation x 2
 - Justice
 - Participation & co-creation
 - Sustainable entrepreneurship
3. Reflection
4. Assessment: portfolio and exam

(Technological) innovation

A moral and political category

- Transformative, beneficial, changing the world
- Full of risks, controversies, ethical dilemmas and highly uncertain



HopEful monStRositiEs

Mokyr, 1990

van den Hoven et al., 2015

Side note on NOBEL for Mokyr

Prerequisites for sustained growth

Long-term economic growth is not automatic or inevitable. It requires:

- **Useful knowledge:** Scientific and theoretical understanding of how things work.
 - **Mechanical competence:** Ability to apply knowledge in practical, technological ways.
 - **Supportive institutions:** Structures that encourage innovation & protect intellectual freedom.
-
- **Historical perspective:** Mokyr used economic history, esp. Europe between 1750 – 1914 to demonstrate how the Enlightenment and the rise of scientific thinking laid the groundwork for the Industrial Revolution and modern sustained growth. He emphasized that **openness to change and disruption** is essential for innovation to flourish.
 - **Cultural and intellectual conditions:** He argued that societies must foster a **culture that tolerates new ideas and challenges existing power structures**. Without this, technological advances remain isolated and fail to generate cumulative progress.

Dilemmas



Onderwijs & Opleidingen
Onderzoek & Resultaten

Home > Wetenschappers zeggen nee tegen Solar Geoengineering >



Why the GMO debate still matters

With the GMO debate far from over, we asked Mark Hughes, President, Anderson Partners Food Ingredient Marketing for an insight into why the conversation still matters...



Fitbit Hack: What Are the Lessons?

Why Wearable Device Makers Need to Get Serious About Privacy

Marianne Kolbasuk McGee | HealthInfoSec | January 11, 2016 | 0 Comments

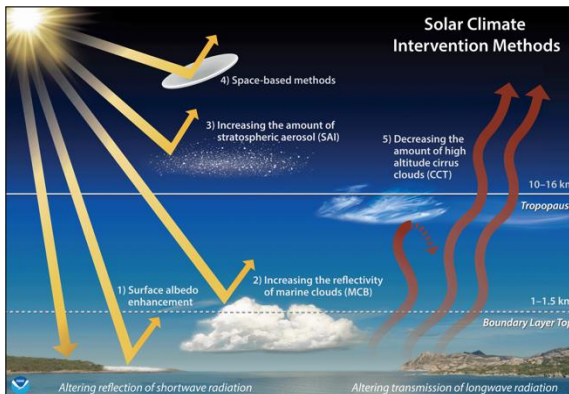
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Chinese Scientist Genetically Altered Twins: Local Reaction

By DAVE LUCAS • NOV 28, 2018

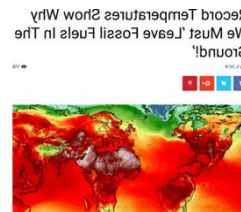
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TU/e

New problems, new responses

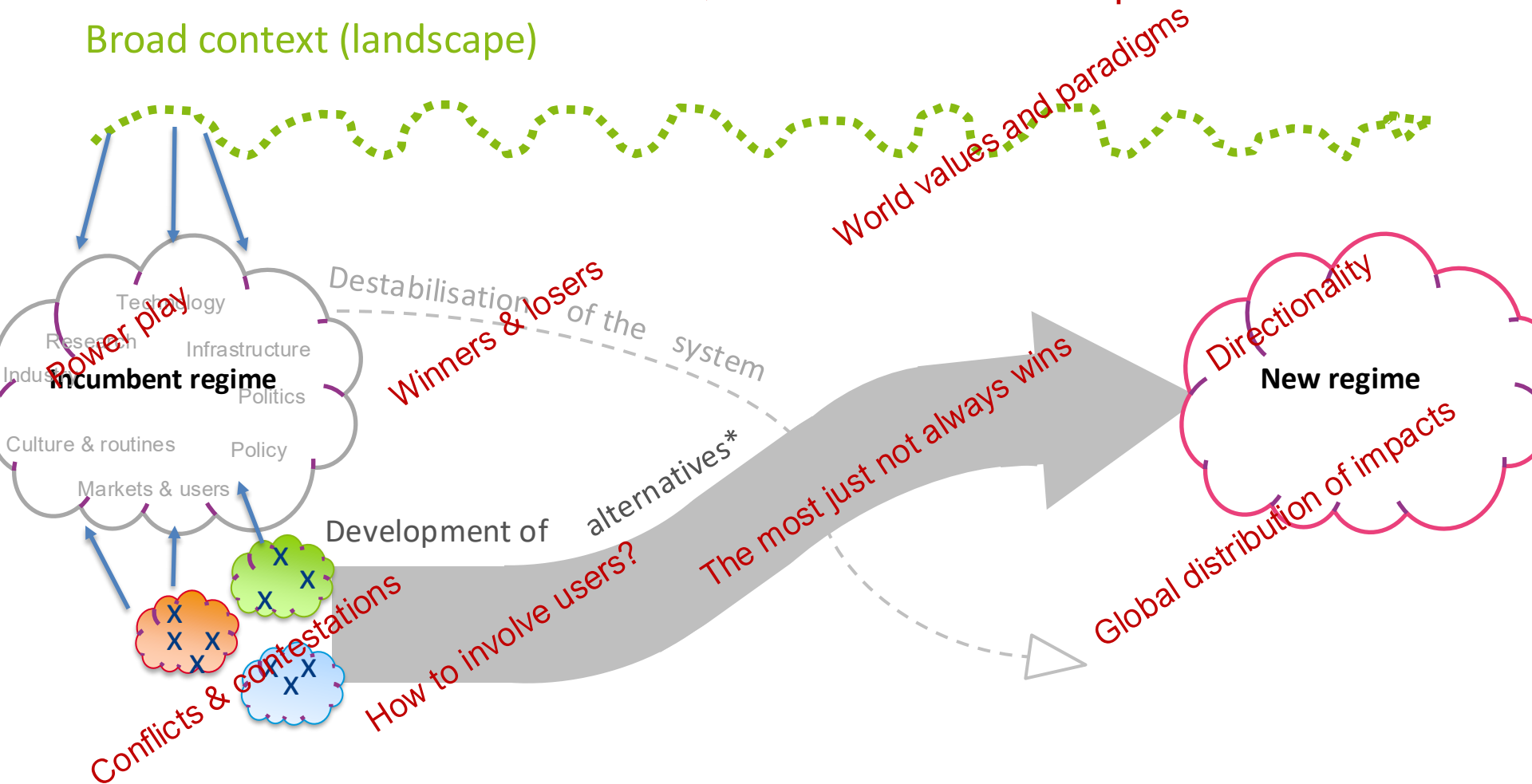
- **Socio-technical** approach:
 - Culture & values, practices, regulations, institutional arrangements, governance, users, markets, etc
- **Dialog** with and **engagement** of society from the outset
- Articulating **purpose of innovation** not only how to innovate product and along which process (normativity, directionality)
- **Anticipate** futures and implications of innovation
- Socio-technical **experimentation**
- **Openness** and **transparency** needed
- Articulation of a broad set of **values and norms**
 - To evaluate tech. & institutional design
 - To expose hidden values
 - To include values as requirements for design & R&D
 - To involve those who will be affected
- **Mind: Collingridge Dilemma**
 - Too early - Too late



System innovations

Are full of controversies, need to be 'responsible'

Broad context (landscape)



Alternatives (niches)

Manders, Wiczorek and Verbong, 2018 based on Geels 2005

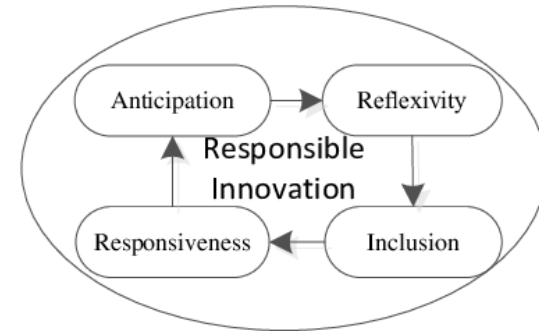
Responsible (system) Innovation

An overarching concept

...refers to reflection, analysis & (public) debate reg. moral acceptability of new technology & innovation (also system innovation)

... it implies posing and answering questions such as:

1. *Are our efforts in applied science, technology and engineering likely to contribute to the solution of the big problems of our age?*
2. *Are we proceeding in a responsible way to arrive at the solutions to our global problems?*
3. *Can technical solutions be shaped so as to accommodate the plurality of moral and societal values and the needs of all parties affected?*



The course...

- Provides an overview of current key sustainability themes
- Reflexively discusses the opportunities & barriers for the development of sustainable innovation from socio-technical & ethical perspectives
- Practices application of relevant theories & perspectives to analysis & evaluation of sustainability transitions (system innovation), responsible innovation, & the relation between them

In this course:

- **Perspectives:**

- Multi- Level Perspective on system innovation MLP
- Strategic Niche Management SNM
- RRI
- Fung
- Goodpaster
- Environmental Justice Framework

- **Key themes**

- Sustainable entrepreneurship
- Participation and co-creation
- Responsible innovation
- Justice
- Institutional entrepreneurship



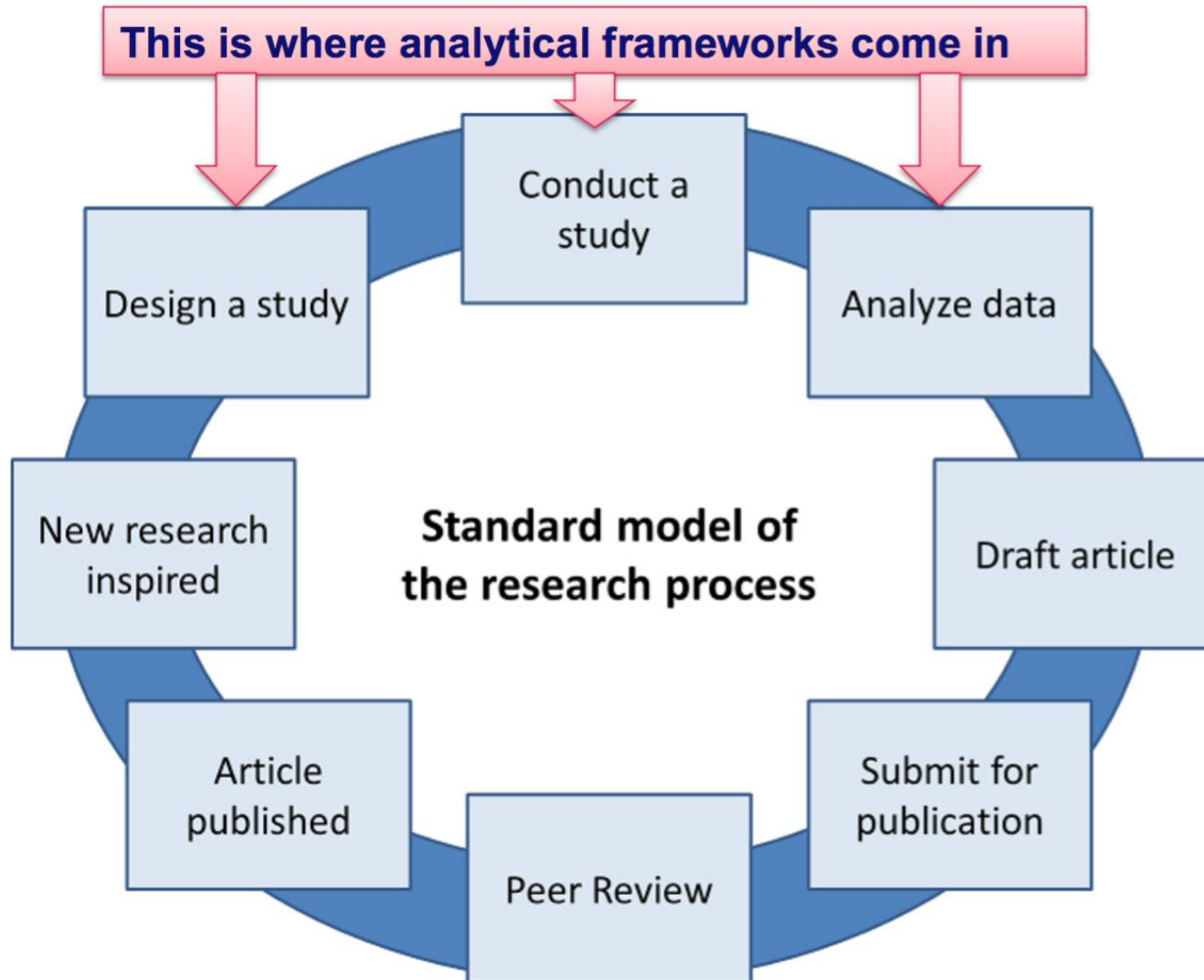
Framework

A filter that emphasizes certain things & de-emphasizes other



Where to best apply frameworks?

The research cycle



The added value



Discussions are about themes

Not frameworks

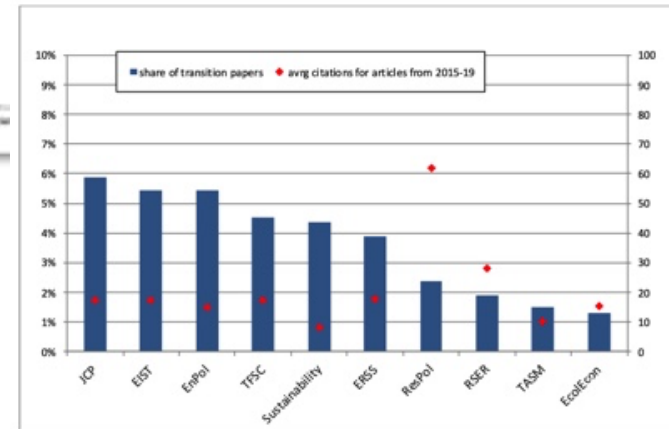
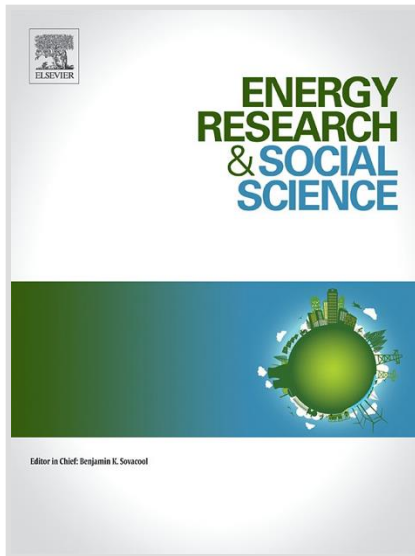
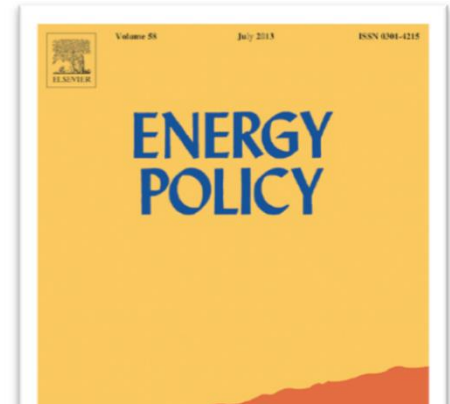
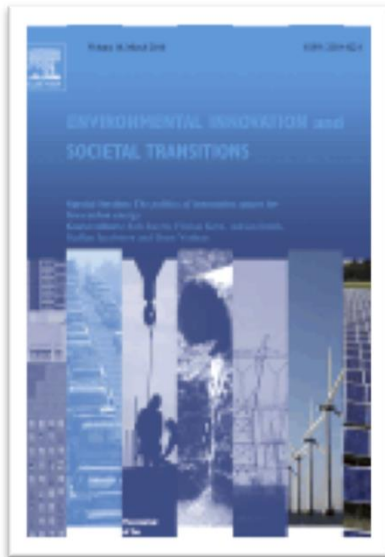


Figure 1: Journals with high shares of papers on sustainability transitions

JCP – Journal of Cleaner Production, EIST – Environmental Innovation and Societal Transitions, EnPol – Energy Policy, TFSC – Technological Forecasting and Social Change, ERSS – Energy Research and Social Science, ResPol – Research Policy, RSER – Renewable and Sustainable Energy Reviews, TASM – Technology Analysis and Strategic Management, EcoEcon – Ecological Economics

Course design

	Institutional entrepreneurship	Participation and co-creation	Responsible innovation	Justice	Sustainable entrepreneurship
MLP (Anna)	x				
SNM (Anna)	x			x	
EJF (Luc)				x	
Business ethics (Andreas)					x
Fung typology (Andreas)		x			
RRI (Johanna)			x		
Guest lecture (Martijn)			x		

Learning objectives

- **Interpret** and describe the dynamics of systemic, radical and responsible innovation for sustainability.
- **Diagnose** the implications of past and unfolding system changes.
- **Evaluate** different theories and frameworks concerning transitions and responsible innovation.
- **Propose** novel approaches to systemic change incorporating ethics and vice versa.
- **Reflect** on how to navigate and accelerate systems change, ethically and responsibly, to address persistent societal problems.

Institutional entrepreneurship

Stability and change

1. Rules, types, what do they do
2. Institutions & institutionalization, logic, complexity, work, implications
3. Regimes, path dependency, momentum
4. Agency, actors, types, ways to exercise
5. Stability and change, structure and agency
6. Deinstitutionalisation, destabilisation, governance of decline
7. Inst. entrepreneurship, entrepreneur - dealing with barriers
8. Intervention points + examples
9. Strategies to deal with barriers
10. MLP, SNM

Responsible Research and Innovation

- RRI is an academic and a policy debate
- Steering science and innovation is a key problem, rationale and question in RRI
- The AIRR framework is a key framework
- RRI & its deepening thoughts



Justice

Environmental Justice Framework

Justice is not only about how people are treated (legal rights), but also how the benefits and burdens of societal activities are distributed (distributive justice) and how this distribution is decided upon (procedural justice)



Justice dimension	Examples of questions in relation to environmental burdens
Distribution	Does a deprived community suffer disproportionately from an environmental burden? Is it particularly vulnerable to the impact of the environmental burden? Is it provided with mitigating measures?
Recognition	Does exposure to an environmental burden result in, or add to, misrecognition for a deprived community or stigmatisation of a deprived area? Is the area perceived as a 'natural' destination for other environmental burdens and does it suffer from their cumulative impact?
Participation	Is a deprived community excluded from decisions about locating, or strategies to mitigate, an environmental burden?
Responsibility	Is a deprived community the least contributor to the cause of the environmental burden to which it is exposed? Is it compensated by the benefits that are attendant on the environmental burden? Can it contribute to mitigation measures?
Capabilities	Does the environmental burden limit the freedom of a deprived community to pursue their valued goals?

EJF

- Students must be able to explain why justice is relevant for sustainability transitions.
- Explain and apply 5 justice dimensions
- Explain how these 5 dimensions relate to each other and come to overarching conclusions / synthesis (rather than ticking the boxes and considering it a fill in exercise)

Sustainable entrepreneurship

Business ethics

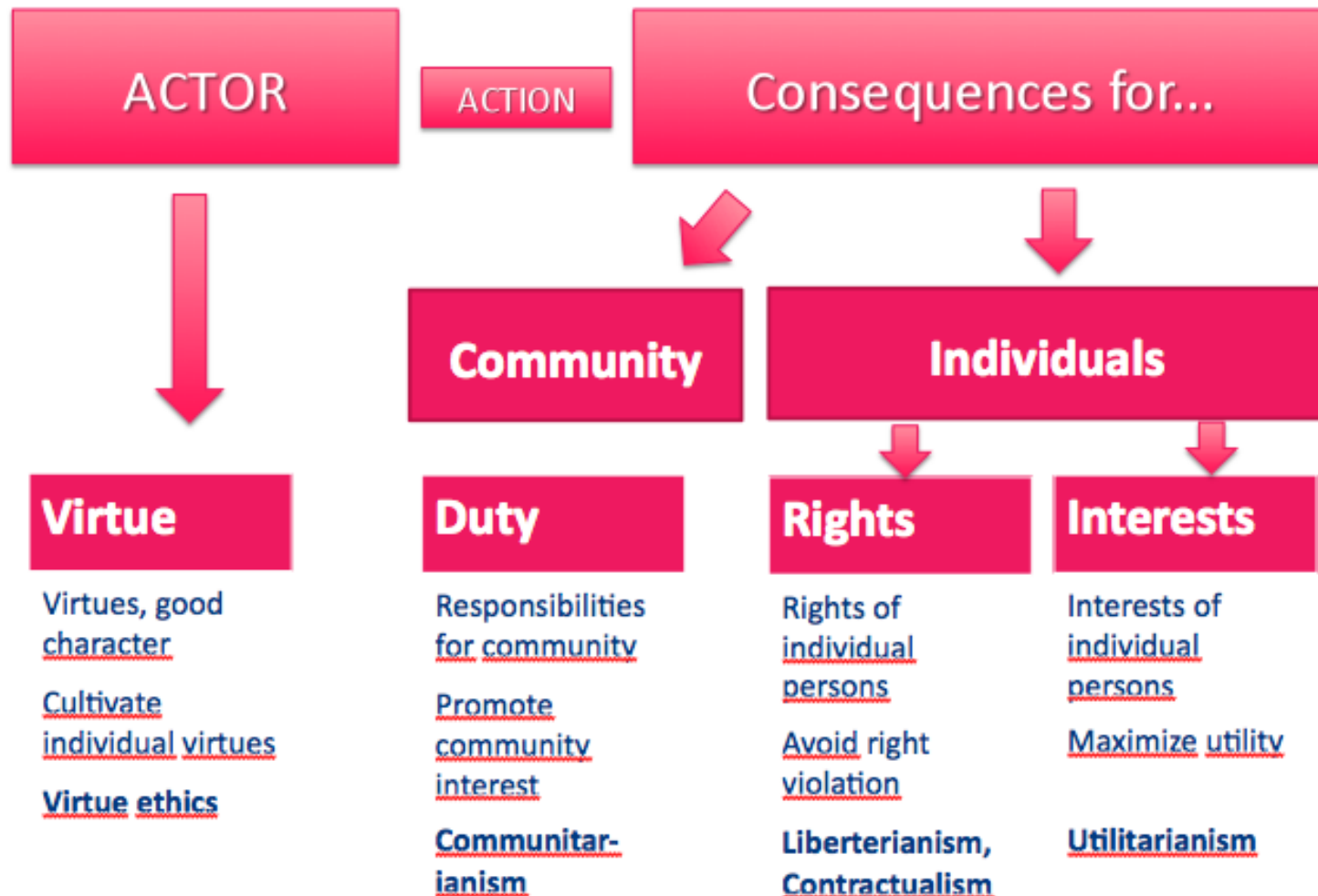
A. Kenneth Goodpaster's typology (in: Conscience as a Mindset: Personal and Organizational)

- Type 1: Conscience as a guide to self-interest
- Type 2: Conscience as a systemic variant: 2a invisible hand pattern, market forces and 2b visible hand pattern, legal constraints
- Type 3: Conscience as an authoritative guide

McMahon, 1981

Sustainable entrepreneurship

Business ethics



Participation & co-creation

Archon Fung: 'Varieties of participation in complex governance' (2006)
"A framework for understanding the range of institutional possibilities for public participation" (p. 66)

1. SCOPE OF PARTICIPATION

Who participates?

- Excluded people? Good representation? Competence?
- Selection process?

2. MODE OF COMMUNICATION AND DECISION

How do participants communicate with one another and make decisions?

- Passive or active participation?
- Consensus? Voting? Negotiation/bargaining?

3. EXTENT OF AUTHORITY

How are discussions linked with policy or public action?

- No influence on decision?
- Advice, consultation?
- Full influence?

Reflection

- Did the combination of frameworks and themes help you understand the case?
- Could you identify barriers and opportunities to sustainable innovation in a responsible way?
- Which theme was most interesting?
- Which framework showed relevant issues?
- What did you miss?
- What was relevant but not uncovered?

Assessment

1. Portfolio (40% of grade)

- Aim:
 - To critically reflect on the use of these theoretical perspectives in analysing the key themes in your selected empirical case;
 - To provide recommendations to relevant stakeholders as to how they can navigate the transformative change of the analysed system in a responsible way
- Form: a conscience academic report on 2+1 selected weekly assignments
- Including reflection part (counting 40% to the portfolio final grade)
- Handed in as a group via Canvas but everyone has to do work, mark it!
- Deadline: 27 Oct, 2025, delays?-> less points

2. Online exam (60% of grade).

- Individual, on campus, own laptop, no use of materials, internet
- Materials: slides, weekly readings,, portfolio, 2 pagers
- Interpret, diagnose, evaluate, propose new, reflect



Assessment – see canvas

Exam 60% individual

- Online (bring your own laptop), on campus (check location)
- NOT an open book exam!
- ANS DELFT (you get a code 5 min before exam)
- 100p spread through 5-6 questions with sub-questions
- Questions: following LOs
- Text to read, questions about readings, slides, your case, 2 pagers
- Basis for assessment: formulation, logic, flow, accuracy of expression and knowledge of the topics and frameworks.
- The following is NOT ALLOWED:
 - Use of any internet sites
 - Use of any AI text generators such as ChatGPT, BingAI, Notion AI, etc.
 - Use of mobile phones
 - Communication via ANY channels such as WHATSAPP, TEAMS, DISCORD
 - Copying answers from the fellow students
- Any use of the above will be reported to the exam committee and you will be expelled from the exam