CONTEXT SESSIONS on

1) Governance & legislation

2) Science + multi- and interdisciplinarity

Marko Keskinen, 16.10.2023

Note: this part of the session
will be recorded over Teams

AGENDA FOR TODAY

GOVERNANCE & LEGISLATION

1) What is governance? What is management?
   → First by you, then by me

2) What is water governance?
   → Key characteristics and definitions

3) Short introduction to the legislation
   → Legislation typically sets the (water) governance context

NOTE: The session provides a general introduction with plenty of information
→ More in specific courses and from the literature listed in MyCourses

SCIENCE & DISCIPLINARITIES

1) What is science?

2) What is multidisciplinarity? And interdisciplinarity?
   → Differing views for problems and solutions

WAT
overnance?

Context Session on water governance & management

Marko Keskinen - 16.10.2023 @ WAT-E1100 course

WHY DOES GOVERNANCE MATTER?

1)

NationalGeographic.com

2)

Sustainability

Entre-preneurship & business

Multi-& inter-disciplinarity

WATER & ENVIRONMENTAL...

Key contents in our field:
global resources, water resources & hydrology,
environmental hydraulics, water & wastewater

Governance & legislation

...ENGINEERING

Key methods in our field:
e.g. statistical analysis, laboratory analysis,
flume, modelling, spatial analysis

Group work skills

Project & planning skills

...IN A BROADER CONTEXT

3)

Draw Central

Lineart by FaceTaiheiyo.deviantart.com
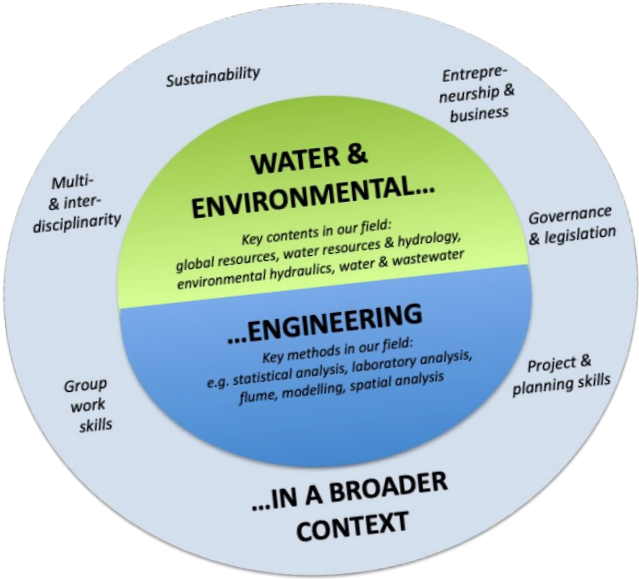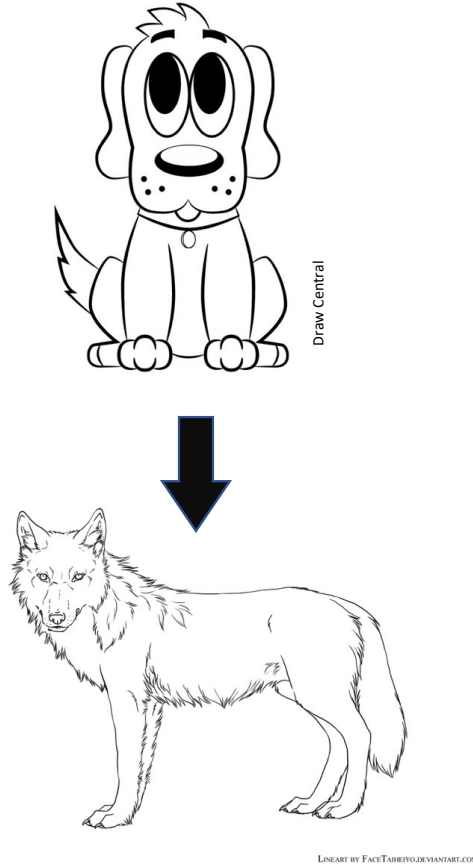
WHY DOES GOVERNANCE MATTER?

1) Because it is the underlying cause for our global challenges

"The scarcity at the heart of the global water crisis is **rooted in power, poverty and inequality**, not [only] in physical availability." The water crisis is a **crisis of governance**."

UN World Water Development Report 2006

…and because our challenges can thus be solved only through governance

2) Because it forms The Context for water and environmental engineering

→ Governance contexts dictate where our field is going and what problems we solve

3) Because engineers must participate in governance

→ If we neglect governance processes, we let others to define the scope of our work
   = engineers become just dogs fetching the sticks that someone else throws

1) What is governance? What is management?

Note: Finnish translations not clear: 'hallinta' and 'hallinto used for both, depending on context

GOVERNANCE vs. MANAGEMENT?

What is the aim of governance?

What about management? How they differ?

What kind of elements they include?

Where they happen, and by whom?

Discuss with a pair

→ Also try to agree a common definition
for both governance and management

GOVERNANCE vs. MANAGEMENT?

GOVERNANCE:
agreeing together on what things to do

MANAGEMENT:
doing agreed things

Marko's simplified definitions for both

"**Governance** is
a social function
centered on steering human groups
toward desired outcomes"

Young 2013

GOVERNANCE

- **Social** refers to the human system
  = us, the people, working and agreeing together

- **Function** refers to joint **actions** performed by us
  = such actions are needed e.g. to frame goals and policies,
  to prevent conflicts, and to manage resources   *(Rosenau, 1992)*
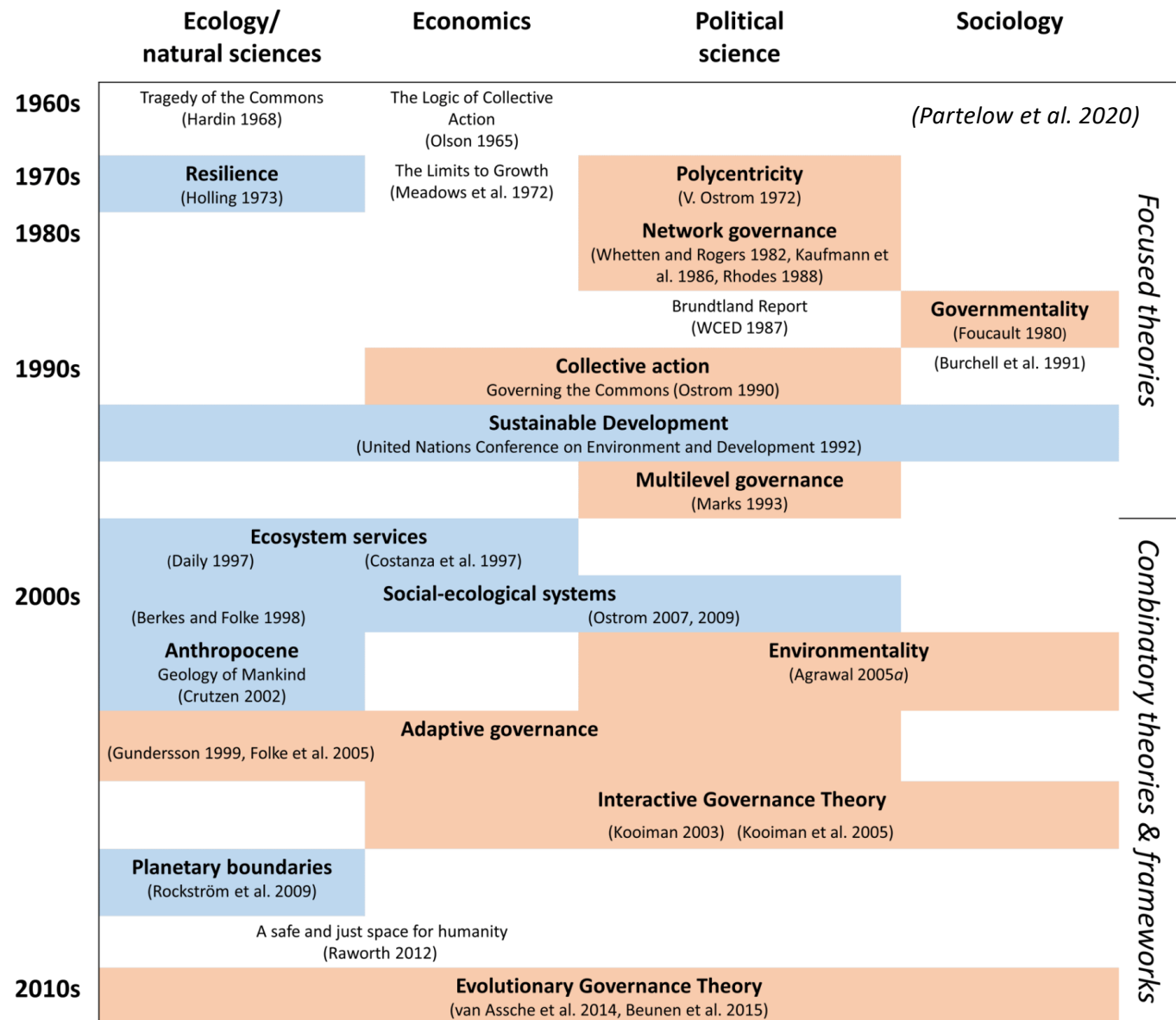
→ Social function = collective action

  …to steer us toward desired outcomes
  and away from undesired ones
  (as defined and agreed together)

Governance is also a theoretical term

Governance theories (in orange in the figure) provide diverse lenses that aim to explain how social (-ecological) systems work

→ Different theories seek to answer different questions

→ Theories also change and evolve over time!

	Ecology/ natural sciences	Economics	Political science	Sociology	
1960s	Tragedy of the Commons (Hardin 1968)	The Logic of Collective Action (Olson 1965)		*(Partelow et al. 2020)*	
1970s	**Resilience** (Holling 1973)	The Limits to Growth (Meadows et al. 1972)	**Polycentricity** (V. Ostrom 1972)		*Focused theories*
1980s			**Network governance** (Whetten and Rogers 1982, Kaufmann et al. 1986, Rhodes 1988)		
			Brundtland Report (WCED 1987)	**Governmentality** (Foucault 1980)	
1990s			**Collective action** Governing the Commons (Ostrom 1990)	(Burchell et al. 1991)	
	Sustainable Development (United Nations Conference on Environment and Development 1992)				
			Multilevel governance (Marks 1993)		
	Ecosystem services (Daily 1997)	(Costanza et al. 1997)			*Combinatory theories & frameworks*
2000s	(Berkes and Folke 1998)	**Social-ecological systems** (Ostrom 2007, 2009)			
	Anthropocene Geology of Mankind (Crutzen 2002)			**Environmentality** (Agrawal 2005*a*)	
		Adaptive governance (Gundersson 1999, Folke et al. 2005)			
			Interactive Governance Theory (Kooiman 2003) (Kooiman et al. 2005)		
	Planetary boundaries (Rockström et al. 2009)				
		A safe and just space for humanity (Raworth 2012)			
2010s		**Evolutionary Governance Theory** (van Assche et al. 2014, Beunen et al. 2015)			

MANAGEMENT

Theoretical definition, for organisations in general

"**Management** consists of
a set of activities that
direct different resources
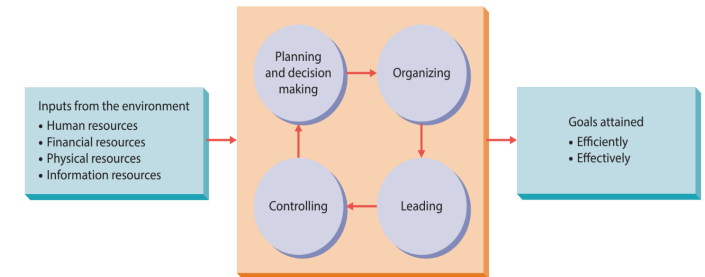to achieve a set of goals
in an efficient and effective manner"

FIGURE 1.1

Management in Organizations

Basic managerial activities include planning and decision making, organizing, leading, and controlling. Managers engage in these activities to combine human, financial, physical, and information resources efficiently and effectively and to work toward achieving the goals of the organization.

Adapted from Griffin 2022

MANAGEMENT

"**Management** consists of a set of activities that direct different resources to achieve a set of goals in an efficient and effective manner"

ACTIVITIES:
Planning
Decision-making
Organising
Leading
Communicating
etc.

RESOURCES:
Human
Financial
Physical
Information
etc.

Adapted from Griffin 2022

MANAGEMENT

"**Management** consists of
a set of activities that
direct different resources
to achieve a set of goals
in an efficient and effective manner"

GOALS?

→ These are the 'desired outcomes'
as defined through governance
(and re-defined, as our priorities change)

Adapted from Griffin 2022

GOVERNANCE ≠ MANAGEMENT

GOVERNANCE is broader

→ Creates a framework for planning, decision-making, **management** and implementation

→ It is not only about policies and their implementation, but also about "the rules of the game" and politics, e.g. how, where and by whom?

→ Includes a broader set of actors than those included in the actual management

→ Governance analysis seeks to understand **why** things are as they are, and how they can be improved

MGT is about operationalisation

→ Takes a certain governance context and its actors & institutions as **given**: starting point for operationalising governance

→ Management is thus often a quite technical task and the realm for engineers: 'making things happen'

→ Yet, successful management should be based on understanding of the governance context

For more, see e.g. Treib et al., 2007; Pahl-Wostl, 2009; Hufty 2011; Young 2013; Keskinen 2010; Sojamo 2016.

GOVERNANCE ≠ MANAGEMENT

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→ It is ~~...~~ heir impl~~...~~ "the~~...~~ics, e.g. ~~...~~

WHY?
we do things

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MGT is about operationalisation

→ Takes a certain governance context and its actors & institutions as **given**: starting point for operationalising governance

→ Mana~~...~~ techn~~...~~ngineers: 'mak~~...~~

HOW?
we do things

→ Yet, successful management should be based on understanding of the governance context

For more, see e.g. Treib et al., 2007; Pahl-Wostl, 2009; Hufty 2011; Young 2013; Keskinen 2010; Sojamo 2016.

ELEMENTS OF GOVERNANCE

One way to make sense of governance
is to divide it into key elements:

- Actors
- Institutions
- Interactions

→ These all then in a certain context

(For more, see e.g. Hufty 2011, Pahl-Wostl 2019)

GOVER-
NANCE?

→ Visualising
three key
elements +
a context

*Institutions =
social arrangements
that shape & regulate
behaviour and persists*

→ *Form the 'rules of the
game' for the actors*

INSTITUTIONS
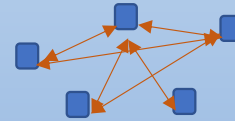
- Formal (laws, agreements, admin structures...)
- Informal (norms, values, customs...)

INTERACTIONS

Within and between institutions and actors
→ e.g. planning processes, meetings...

*Actor = someone having
an interest in and/or
taking action on
a collective problem*

→ *Can also be called
a **stakeholder***

ACTORS

Organisations, groups & individuals:
all with differing roles and interests

THE GOVERNANCE CONTEXT
(e.g. preventing urban flooding, river basin planning, sustainability)

GOVERNANCE: examples

GOVERNANCE CONTEXT

Can be small-scale and clearly defined such as building a dam, or large-scale and broad such as energy policy

→ The context also defines the elements below!

ACTORS
(stakeholders)

DAM: power company, environmental authority, riparian inhabitants…

POLICY: different ministries, energy companies, key NGOs, EU…

INSTITUTIONS

DAM: existing laws, impact assessment guidelines, fishing practices…

POLICY: legislation (EU & FIN), SDGs, current policies…

INTERACTION

DAM: planning meetings, stakeholder workshops, IA process…

POLICY: strategy processes, interest group dialogues…

GOVERNANCE: scales

Governance is thus not dependent on scales,
but can essentially occur in any scale

- **Local governance**: e.g. a small river system or HSY

- **National governance** i.e. state: e.g. implementing water law
  → *Important also for other scales due to legislation*

- **Regional and global governance**: e.g. EU Water Framework Directive or UN Sustainable Development Goals

Questions?
Comments?

AGENDA FOR TODAY

1) What is governance?
   → First by you, then by me

2) What is water governance?
   → Characteristics and key definitions

3) Short intro on key principles of legislation

   → Legislation typically sets the (water) governance context

EXTRA) Some approaches for governance analysis
   → General frameworks + specific methods for stakeholder analysis

2) What is water governance?

WATER GOVERNANCE?

Water governance deals with water and other natural resources = the environment that supports our society

→ In this way the only thing different to general governance is its context = always related to water and natural resources

→ The context then dictates the key elements i.e. key actors, institutions and interactions

INSTITUTIONS

INTERACTIONS

ACTORS
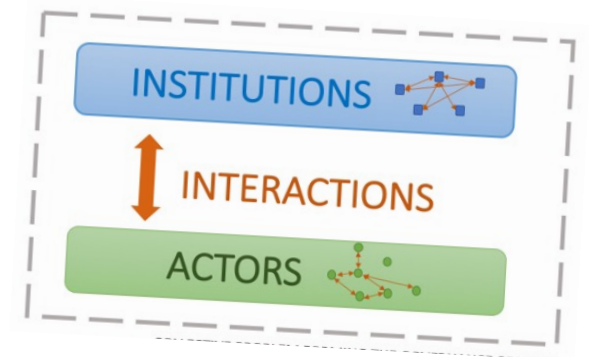
Hence, important to understand the specific characteristics that water and natural resources have

WATER GOVERNANCE: characteristics

Physical characteristics and socio-economic role:

- Natural resources (incl. water) are **not static**, but vary over time and space

- Water may be **scarce** and unevenly distributed – yet has no substitute

- Water and natural resources are **critical** for almost all sectors of society

Various scales and contexts:

- **Water crosses scales**: local, regional, national, international, transnational, global
  → Complex global interdependencies but predominantly local issue

- Various **governance arrangements**: public, private, hybrid; formal, informal

- Multitude of **different contexts**: communities, cities, river basins, nations…

WATER GOVERNANCE: characteristics (2/2)

Water & natural resources = typically **common pool resources**

- Shared between many users, yet finite resource: tragedy of commons
  - → "People following their short term interests produce outcomes
    that are in no one's interest": aiming for a desired outcome to
    some actor may ultimately lead to undesired outcome to all

- Access and ownership often unclear and/or contested:
  governance arrangements vary

Hardin 1968;
Ostrom et al.
1999

Water & natural resources often **governed by public sector actors**

- Water particularly often publicly owned, land areas less so

- Public sector's capacity and willingness to manage competing demands
  and power-asymmetries may be limited: **politics** play often big role

WATER GOVERNANCE: UNDP definition

AIM: "Water governance refers to the political, social, economic and administrative systems in place that **influence water use and management**"

→ Essentially, who gets what water, when and how
  = who has the right to water and related benefits

HOW: "Water governance determines the **equity and efficiency** in water resource and services allocation and distribution, and **balances water use** between socio-economic activities and ecosystems"

→ Governing water includes the formulation, establishment and implementation of **water policies, legislation and institutions**, and clarification of the roles and responsibilities of government, civil society and the private sector in relation water resources & services.

INSTITUTIONS

INTERACTIONS

ACTORS

COLLECTIVE PROBLEM FORMING THE GOVERNANCE CONTEXT

UNDP Water Governance Facility 2015
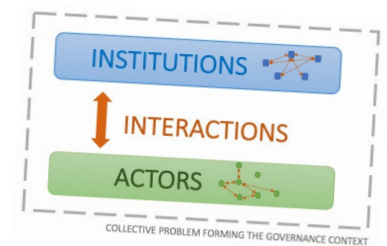
WATER GOVERNANCE: principles

OECD has recognised three categories and 12 principles for water governance

1) EFFECTIVENESS: contribution of governance to define clear sustainable water policy goals and targets at all levels of government, to implement those policy goals, and to meet expected targets

2) EFFICIENCY: relates to the contribution of governance to maximise the benefits of sustainable water management and welfare at the least cost to society

3) TRUST & ENGAGEMENT: relate to the contribution of governance to building public confidence and ensuring inclusiveness of stakeholders through democratic legitimacy and fairness for society at large.

OECD: http://www.oecd.org/env/watergovernanceprogramme.htm

"GOOD GOVERNANCE", that is!
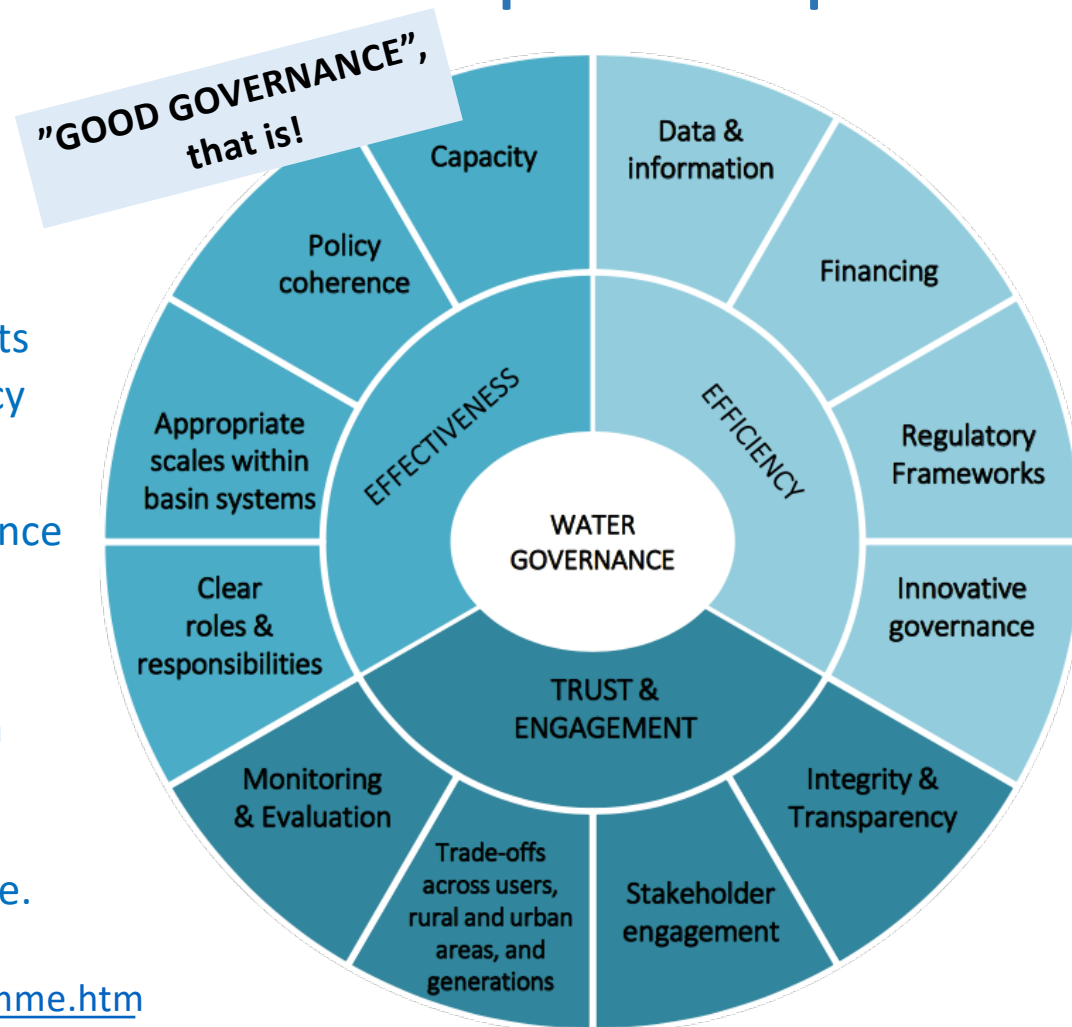
WATER GOVERNANCE: frameworks

In practice water governance is carried out with the help of different governance and management frameworks = provide focus and common terms

→ Currently the most dominant such framework is Integrated Water Resources Management (IWRM)

Recognised also by the SDGs' Target 6.5: "By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate"

Ecological sustainability

Enabling environment
- Policies
- Legislation
- Fora and mechanisms for participation
- International cooperation
- ...

Management instruments
- Allocation
- Regulations
- Economic tools
- ...

Institutional roles
- Level of action
- Management boundaries
- Capacity building
- ...

Economic efficiency

Social equity
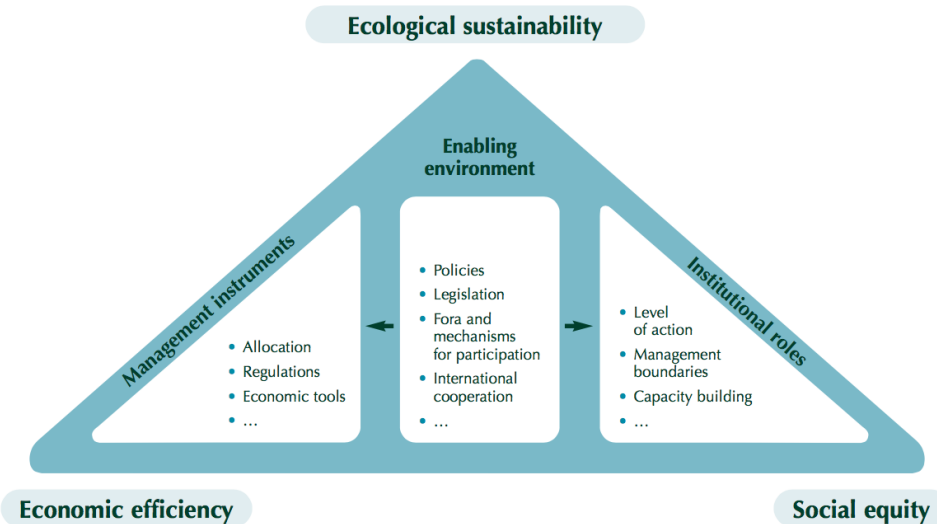
Fig. 4: General framework for IWRM *(GWP 2000)*

"a process which promotes the coordinated development and management
....of water, land and related resources,
...in order to maximize the resultant economic and social welfare in an equitable manner
...without compromising the sustainability of vital ecosystems"

GWP 2000

→ We have done plenty of research on IWRM: wdrg.aalto.fi

WAT GOVERNANCE in Finland?

Key points about our (public) environmental governance

1) Builds on 'trias politica' i.e. separation of powers

- Legislation: EU & national
- Execution: based on hierarchy } *Central government Ministries ELY centers Municipalities*
- Judiciary: Administrative courts

2) Regulation-based = built on water and environmental permitting system and related assessments

3) Environmental governance generally good

But could be better: e.g. Talvivaara

→ Transparency, accountability, clarity
→ Public-private roles clear, while relations often close
→ Makes use of (scientific) information

SOURCE: ymparisto.fi
http://bit.ly/2d2P4Nc

Permit application
↓
Publicising of the application
↓
Statements ← → Complaints and opinions
↓
Written reply of the applicant
↓
Permit consideration
↓
Permit decision — Possible enforcement order
↓
Publicising of the decision
↓
Appellate procedure
↓
Legally valid permit → Compliance monitoring

Questions?

AGENDA FOR TODAY

1) What is governance?
   → First by you, then by me

2) What is water governance?
   → Characteristics and key definitions

3) Short introduction on legislation

   → Legislation typically sets the (water) governance context

EXTRA) Some approaches for governance analysis
   → General frameworks + specific methods for stakeholder analysis

3) Key principles of legislation

Polyvore.com

SEPARATION OF POWERS

- Legal system forms the foundation for the governance of state
  → Laws are key institutions guiding governance

- **Separation of powers i.e. trias politica principle** =
  a basis for the justice system in Finland and other democracies

  - **Legislative powers**
    → *The parliament as the supreme decision-making
      authority = decides on our laws*

  - **Executive powers**
    → *Centralized administration i.e. the government
      and ministries implement the laws*

  - **Judiciary powers**
    → *The courts ensure that the laws are followed*

More: http://bit.ly/2DO1XJi

COMMON vs. CIVIL LAW

- Two key legal traditions globally (can also be mixed)

- **Common law** = uncodified i.e. no comprehensive set of laws but based on judicial decisions
  - → Judges have thus a very strong role
  - → The legal system present in e.g. UK and USA

- **Civil law** = codified i.e. building on a comprehensive and continuously updated laws
  - → Judges' role to establish the facts of the case and to apply the applicable code
  - → The system in continental Europe, incl. Finland

JUDICIAL SYSTEM (courts)

- The independence of the courts is guaranteed by our Constitution: bound only by the law in force

  → Guarantees the separation of powers, as no outside party (not even a president or prime minister) can intervene in the decision-making of the courts

- Two key courts in Finland (plus some special courts)

  – **General Courts** deal with criminal and civil cases:
  District Courts *(käräjäoikeudet),* Courts of Appeal *(hovioikeudet)* + Supreme Court *(korkein oikeus)*

    → *If you mess up with law personally, this is your court* ☺

  – **Administrative Courts** review the decisions of the authorities

    → *Water and environmental issues here!*

More: https://oikeus.fi/tuomioistuimet/en/

ADMINISTRATIVE COURTS

- Any use of public powers must be based on law

  → Anyone dissatisfied with an administrative decision
  can challenge the decision in an administrative court

- Administrative courts: two levels

  – Administrative Courts (hallinto-oikeudet)

  – Supreme Administrative Court (korkein hallinto-oikeus KHO)

- Vaasa administrative court deals with water
  and environmental issues (except for Åland)

  → Thus e.g. the legal process concerning the environmental
  permits of Talvivaara mine originally dealt here

  → If one party appeals, case is taken to Supreme Admin. Court

More: https://oikeus.fi/tuomioistuimet/en/

ENVIRONMENTAL LAW

- The environmental or water legislation in both the EU and in Finland is not under one code, but are covered through several different themes
  (e.g. environmental protection, land use planning, pollution control, chemicals, waste…)

  - PRO: corresponds the crosscutting nature of the environment = part of many different sectors and their respective legislation

  - CONS: can be confusing, as the same case may be interpreted differently depending on the specific law applied

LEGAL SYSTEM: EU vs. national

| CONSTITUTION | ←— Agreement —→ | EU PRIMARY LAW |

ACT (Parliament)

Overriding effect

Regulation

Directive

DECREE (Government)

MUNICIPALITY REGULATION
- e.g. Building ordinace

OTHER
- e.g. Commission regulation
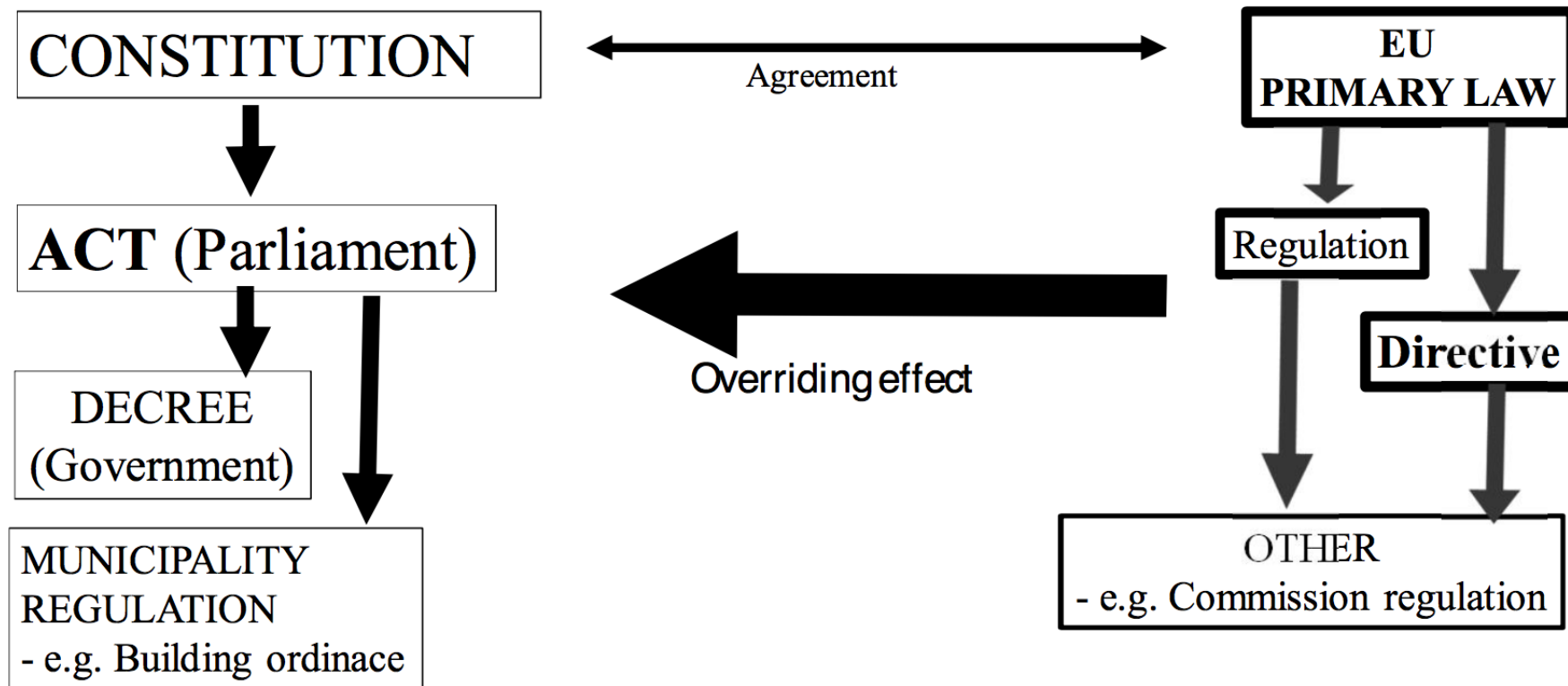
WATER LAW in EU

- Water Protection and Water Resources Management

  - Water Framework Directive (2000/60/EC)

  - Urban Waste Water Directive (91/271/EEC)

  - Industrial Emissions Directive (2010/75/EU)

  - Nitrates Directive (91/676/EEC)

  - Groundwater Directive (2006/118/EC)

- Floods: Floods Directive (2007/60/EC)

- Water and health

  - Drinking water directive (98/83/EC)

  - Bathing water directive (2006/7/EY)

- Marine Protection: Marine Strategy Directive (2008/56/EC)

These directives set a range of goals for Finland and other EU countries that they must meet, through the specific means defined in their national legislation

WATER LEGISLATION: Finland

Env. Protection Act 2014 (ympäristönsuojelulaki)

Water pollution
- UWWT
- Industry
- Peat production
- Agriculture etc.

Water Services Act 2001 (vesihuoltolaki)

Ensuring water supply and sewerage / sanitation for household use

Water Act 2011 (vesilaki)

Use of water resources
– Water abstraction
– Water regulation
– Hydropower
– Construction etc.

Both Water Services Act and Water Act are in the process of renewal

Specific Acts and degrees on

- River Basin Management and Marine Strategy
- Flood risk management
- Water services
- Discharge of nitrates
- Waste water on rural areas etc.

Based on slides by Antton Keto

OTHER POLICY INSTRUMENTS

- Legislation provides clear command & control for governance
  - Builds on a set of permits, plans, prohibitions as well as their supervision & enforcement

- But also other policy instruments that can (strongly) guide the use of water and the environment, including:

  - Economic instruments
    - → *Taxes, charges, subsidies, liability (compensations)…*

  - Informative instruments
    - → *Voluntary and obligatory instruments to e.g. reduce the environmental impact of products (different labels, ISO standards etc.)*

Based on slides by Ari Ekroos

Example of different possibilities to guide and govern water-related governance through a mixture of regulation, economic instruments and other means

Adaptive Governance:
Cumulative and multiple causes of problem
Example: Non-point source pollutants temperature
Mine Tailings | Reservoirs | Agriculture | Development

Property/Markets and Regulated Markets
Example: Commodity, energy pricing; private land ownership

Regulation
Example: Point source pollution

Cosens, Soininen et al. 2021
https://doi.org/10.1073/pnas.2102798118

Questions?
Comments

GOVERNANCE: SUMMARY

Governance is important so good to pay attention to it

1) Start by defining the context for governance
    → Essentially similar to defining your system and its boundaries
    → Often links closely to existing **legislation**

2) Then define the key elements i.e.
   actors, institutions and their interaction

    → These help you to understand the
       key aspects of a governance context

COLLECTIVE PROBLEM FORMING THE GOVERNANCE CONTEXT
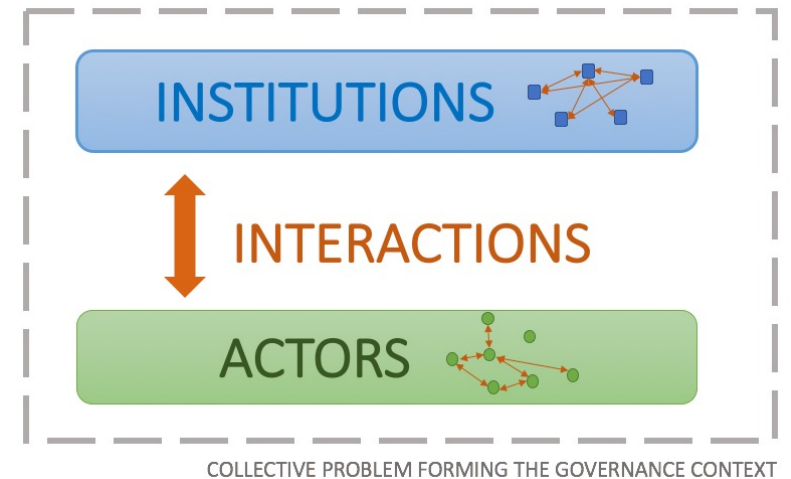
Several good approaches & methods for governance analysis

→ Frameworks help to understand the context, while
methods help e.g. to recognise your stakeholders

→ **More details on these in WAT-E2080 Water & Governance course!**

INSTITUTIONS

↕ INTERACTIONS

ACTORS
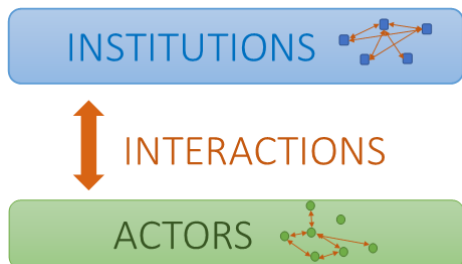
Case: regional /global waters

Case: EU water governance

Case: water governance in Finland

Case: HSY water supply

Governance sets the framework for management and thus also for engineering, as both aim ultimately for

getting things done

...the point is not just to do it, but also to understand why we do it and with whom we actually want to get things done: this is where understanding of governance helps

→ Using just 1% of your time for thinking this already helps!

Our WAT Alumni & Stakeholder Surveys also support this!

WANT TO KNOW MORE?

1) Several researchers at WDRG work
with governance: wdrg.aalto.fi

→ Check e.g. Doctoral Theses by
Amy Fallon (http://bit.ly/AmyThesis),
Suvi Sojamo (http://bit.ly/SuviThesis),
Juho Haapala (http://bit.ly/JuhoThesis)

2) Key literature available in MyCourses

(e.g. Biermann et al 2010, Biermann 2012, Reed et al. 2009)

3) Welcome to our WAT-E2080 Water
& Governance course in Period III

→ More practical view, with cases
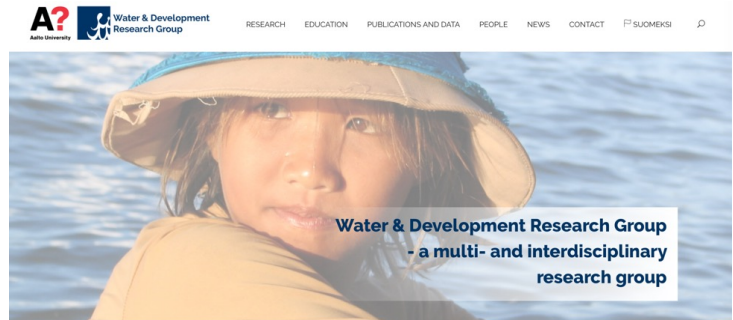
BREAK!

CONTEXT SESSIONS on
1) Governance
& legislation
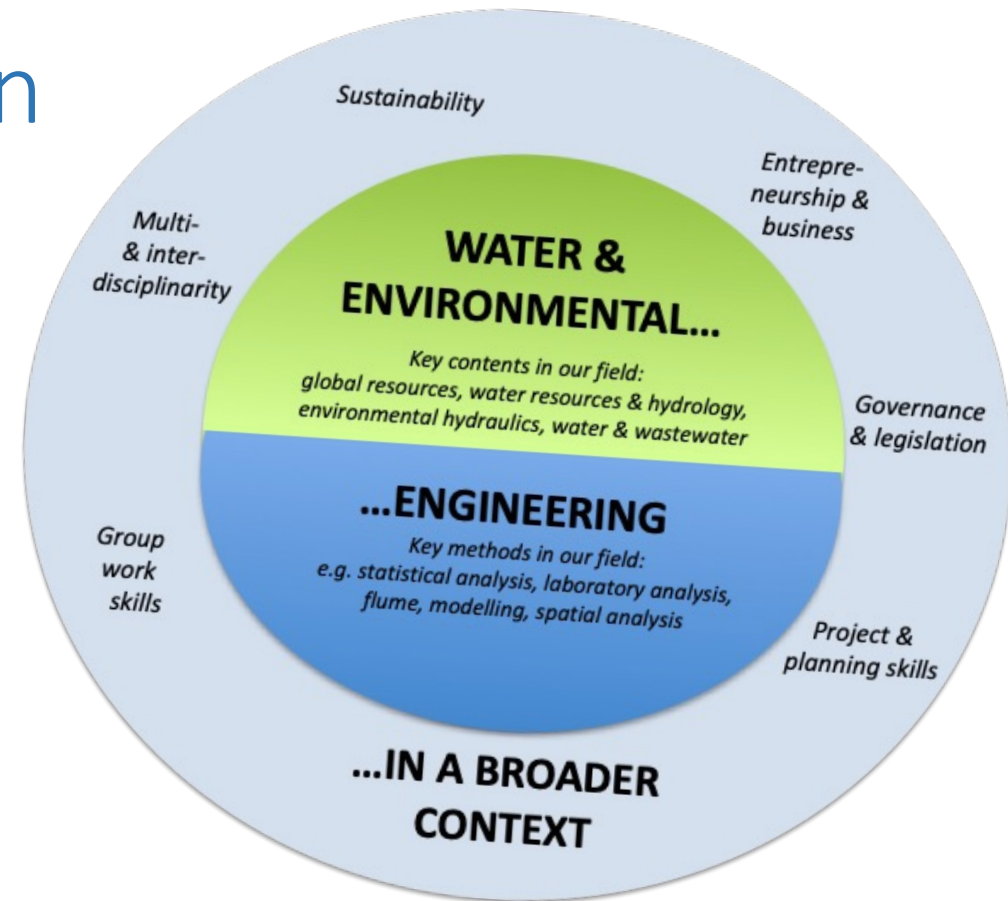
2) Science +
multi- and
interdisciplinarity

Marko Keskinen, 17.10.2022

AGENDA FOR TODAY

GOVERNANCE & LEGISLATION

1) What is governance? What is management?
   → First by you, then by me

2) What is water governance?
   → Key characteristics and definitions

3) Short introduction to the legislation
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SCIENCE & DISCIPLINARITIES

1) What is science?

2) What is multidisciplinarity? And interdisciplinarity?
   → Differing views for problems and solutions

AIMS FOR THIS SESSION on SCIENCE

- Learn and discuss what is science and disciplines

- Understand the key differences between different 'disciplinarities'

  → Cross-, multi-, inter-, trans-

  → Link to common drive for integration

Just an introduction: I warmly recommend you also to check additional reading material in MyCourses

- Use this to reflect what we have learned during this course, and the way we define water & environmental engineering

  → Links to your synthesis work, to be done during this week

  → Also important for your Master's Thesis work!

WHY SCIENCE MATTERS?

1) We are at the university ☺

   → Everything we do is science-based, including our teaching

2) You have a possibility to continue your learning journey also after your Master's with doctoral research

   → A great opportunity to learn a lot and get additional degree!

- Our Master's Programme prepares you for doctoral research as well: can take any combination of advanced courses

   → But good idea to think electives still (e.g. research methods course)

   → More: https://www.aalto.fi/en/study-options/aalto-doctoral-programme-in-engineering
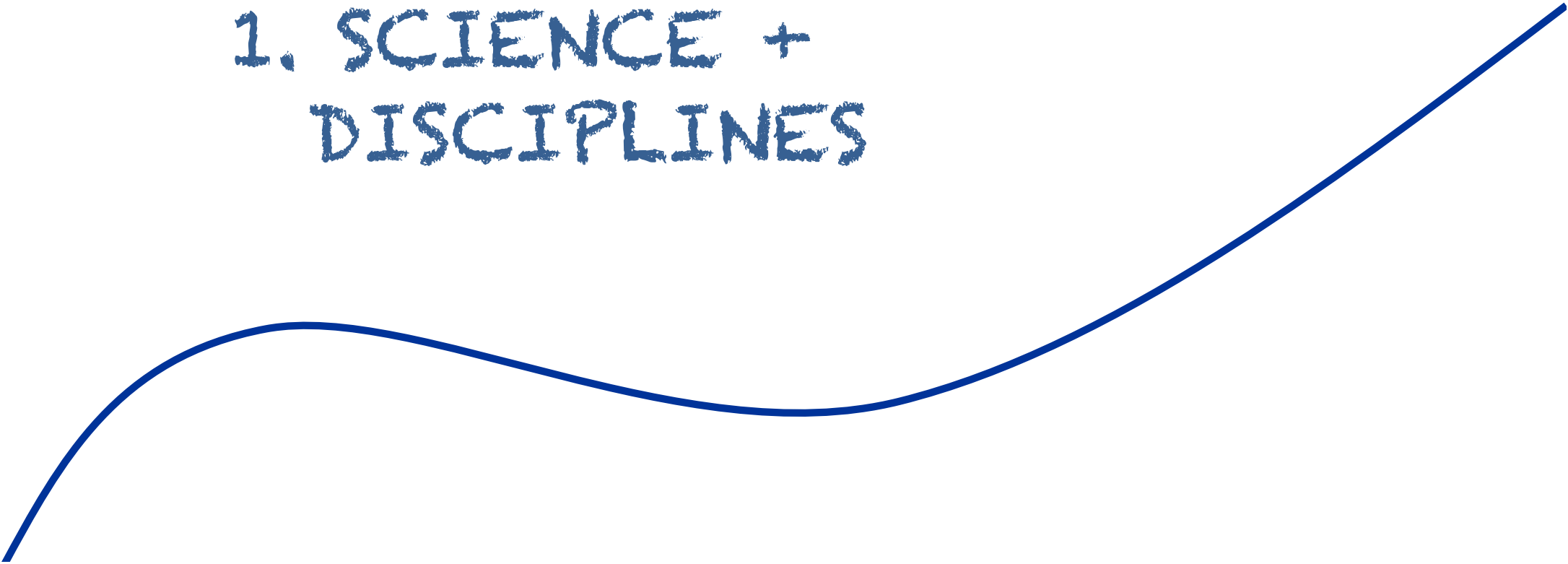
1. SCIENCE + DISCIPLINES

WHAT IS SCIENCE?

"A **systematically** organised body
of knowledge on a particular subject"

"The intellectual and practical activity
-encompassing the **systematic study**
-of the structure and behaviour
-of the physical and natural world
-through observation and experiment
(empirical and measurable evidence)"

Oxford Dictionary

→ "A systematic way to study world"

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Oxford Dictionary

→ "A systematic way to study world"

RESEARCH?

"In natural science and engineering, 'research' can be loosely defined as...

... making **novel** and **significant** contributions to our understanding of the world,

... based on **reproducible observations** and **verifiable results**"

→ Novelty, significance & sound methods
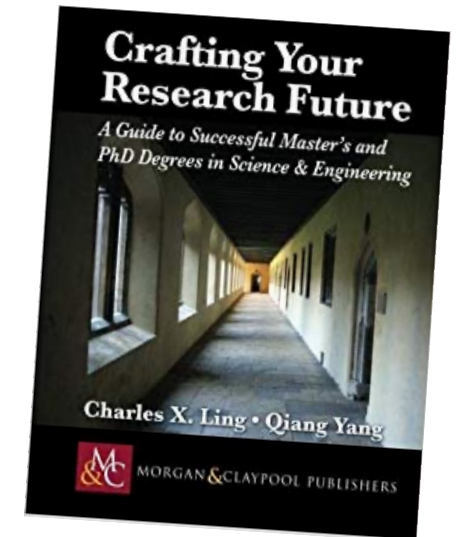
by Ling & Yang 2012

SCIENTIFIC METHOD

- Science is highly variable and creative process, yet some common elements can be recognised

- 'Scientific method': general phases

  - Hypothesis generation
  - Hypothesis testing through experiment
  - Creating new knowledge through analysis (based e.g. on deductive or inductive logic)

Based on Gauch (2012): Scientific Method in Brief

SCIENTIFIC METHOD

- 'Method' has an important role in scientific study

    - Allows the study of phenomena that are
      too complex to understand just by thinking

    - Foundation for systematic inquiry and reproducibility

    - Reduces human biases
      → e.g. fallacious logic and confirmation bias

- We have used variety of methods during this course
  → WAT Programme aims to provide you with a set of
    rigorous methods to be used during your career

DISCIPLINES?

We talk a lot about disciplines at universities

→ Aalto's competitive edge is based on "combining knowledge from different **disciplines**"

→ Our students "capabilities need to be rooted in **disciplinary excellence** augmented by art, creativity, **multidisciplinary collaboration** and entrepreneurship. "

DISCIPLINES?

- But what is a discipline?

  **'a specific field of study that creates
  its own branch of scientific knowledge'**

  → A discipline thus provides a scientist with an identity: 'this is my field'
  → Discipline maintains an institutional order and has its own
     professional standards and publication + education procedures
  → Closely linked to working-life fields & sectors, too!

- Yet, the division of research into separate disciplines is due to
  historical development rather than genuine scientific necessity

  → Challenge: disciplines can lead to overspecialisation, too
     narrowly defined research questions and lack of collaboration

DISCIPLINES: one view with hierarchies

WHAT WE WANT TO DO?

HOW SHOULD WE DO WHAT WE WANT TO DO?

WHAT ARE WE CAPABLE OF DOING?

WHAT EXISTS?
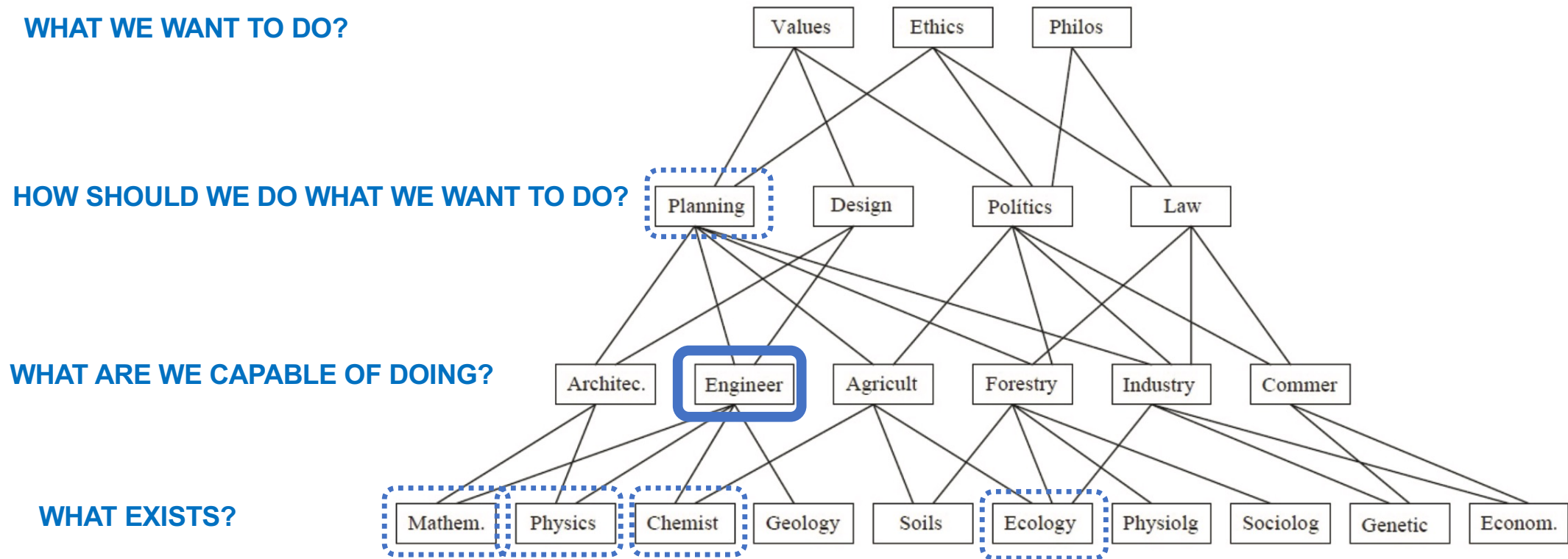
Figure 5 The 'disciplinary pyramid' of Max-Neef (2005), based on the four hierarchical levels of disciplines: empirical (the lowest), pragmatic, normative and value level. Transdisciplinarity is seen to consist of vertical relations including all four levels.

WAT DISCIPLINES?

What is a WAT discipline?

→ Depends from the definition, and also from the level of detail

Example on water supply engineering
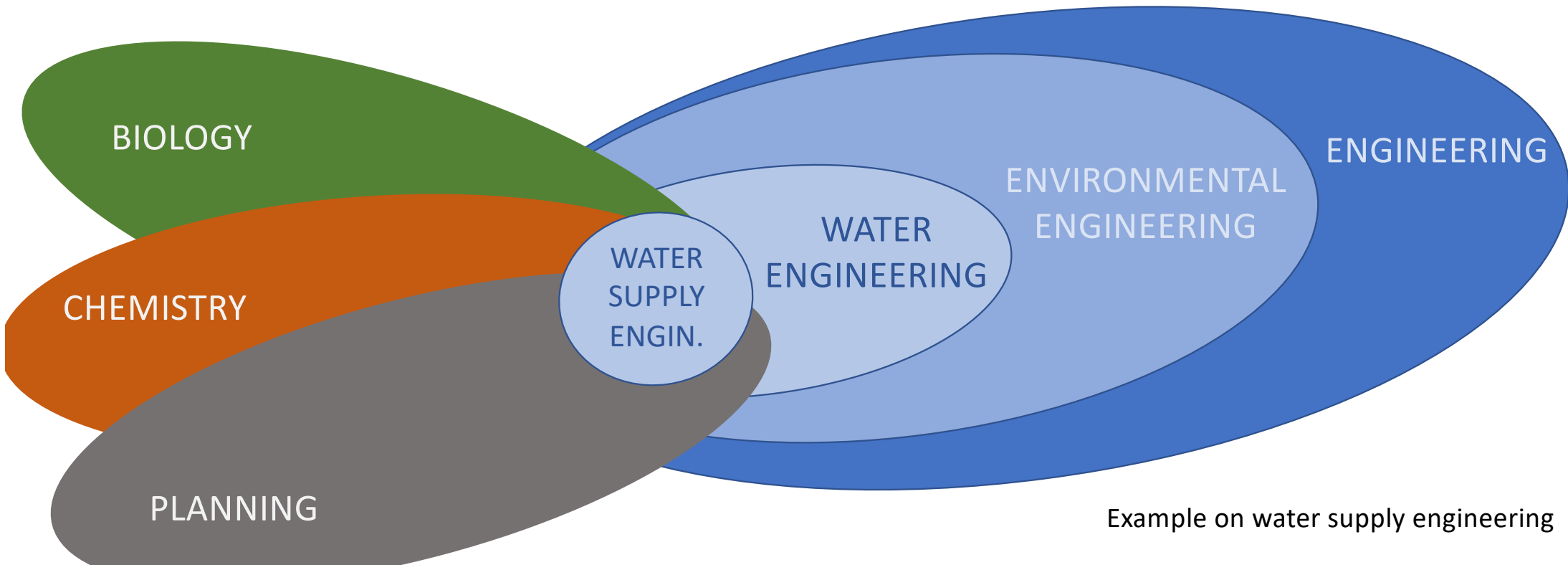
DISCIPLINES?

- There are several different disciplines, but their logic is the same: to contribute to science through a systematic way to study world
  - → This requires specific theories, related analytical frameworks as well as different methods

ECONOMICS:
what is the
monetary value
of apple?

MACRO-
ECONOMICS

INT'L TRADE
FLOW ANALYSIS

STATISTICAL
ANALYSIS ON
TRADE STATISTICS

MICRO-
ECONOMICS

THEORETICAL
BASIS

ANALYTICAL
FRAMEWORKS
/ APPROACHES

METHODS FOR
COLLECTING &
ANALYSING DATA
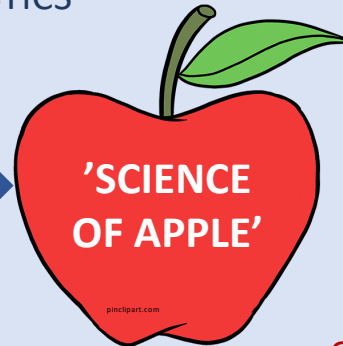
'SCIENCE
OF APPLE'

Note: simplified
example by Marko

GENETICS

GENE
MANIPUL-
ATION

POLYMERASE
CHAIN
REACTION

BIOLOGY:
what is,
actually,
an apple?

EVOLUTIONARY
BIOLOGY

ENGINEERING:
how to make
good juice
out of apple?

BIOPROCESS
ENGINEERING

Effect of mechanical juice extraction method on the quality of
fresh-squeezed apple juice

MECHANICAL
ENGINEERING
+
PHOTONICS

MECHNICAL
JUICING

OPTRONICS-BASED
QUALITY CONTROL
METHOD FOR
JUICE EXTRACTION

CONTENT ANALYSIS
OF BLOG POSTS
ON APPLES

FUNCTIONALISM
(focusing on social structure)

BARTHES'
META-
LANGUAGE

POST-
STRUCTURALISM
(plurality of meaning)

SOCIOLOGY:
how has apple
shaped our
society?

Scientific fields i.e. disciplines may feel separate, but actually do connect!

Featured paper ◇

Arts
Biology
Biomedical research
Chemistry
Clinical medicine
Earth and space
Engineering and technology
Health
Humanities
Mathematics
Physics
Business and management
Psychology
Social sciences

https://www.nature.com/immersive/d41586-019-03165-4/index.html

What discplines
you have studied?
Where does your
competence come from?
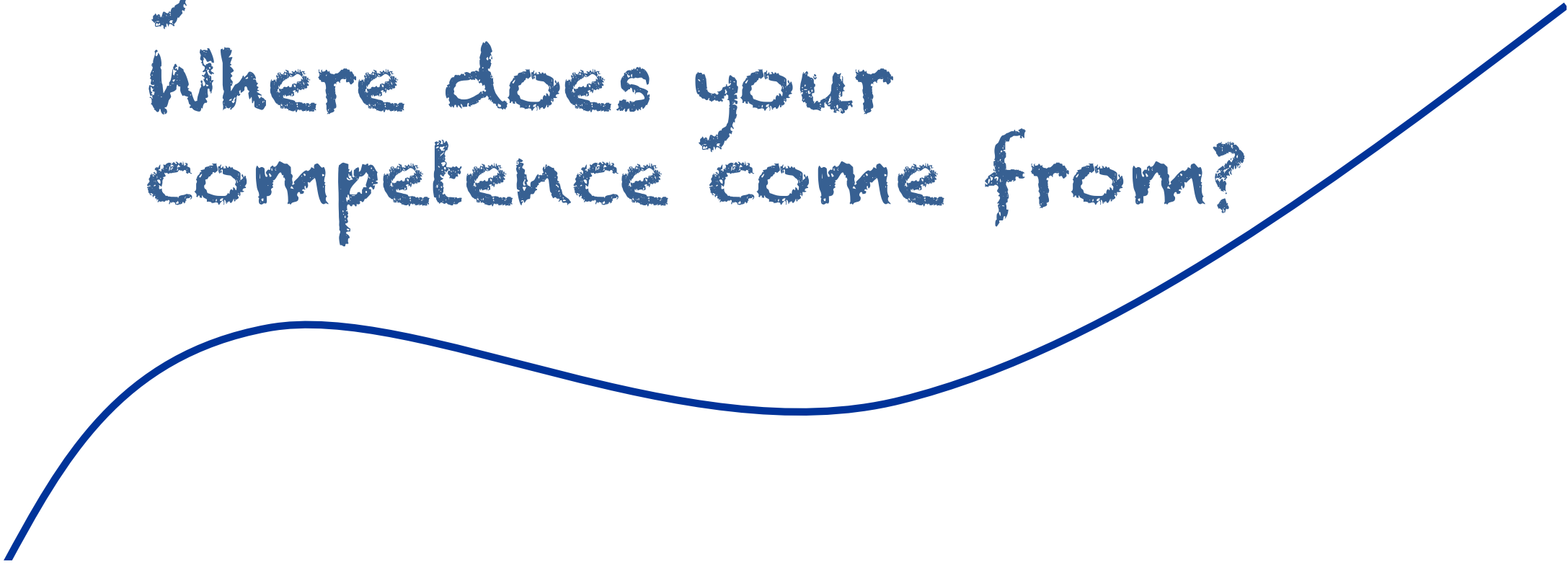
QUESTIONS?
COMMENTS?

2. 'DISCIPLANIRITIES'
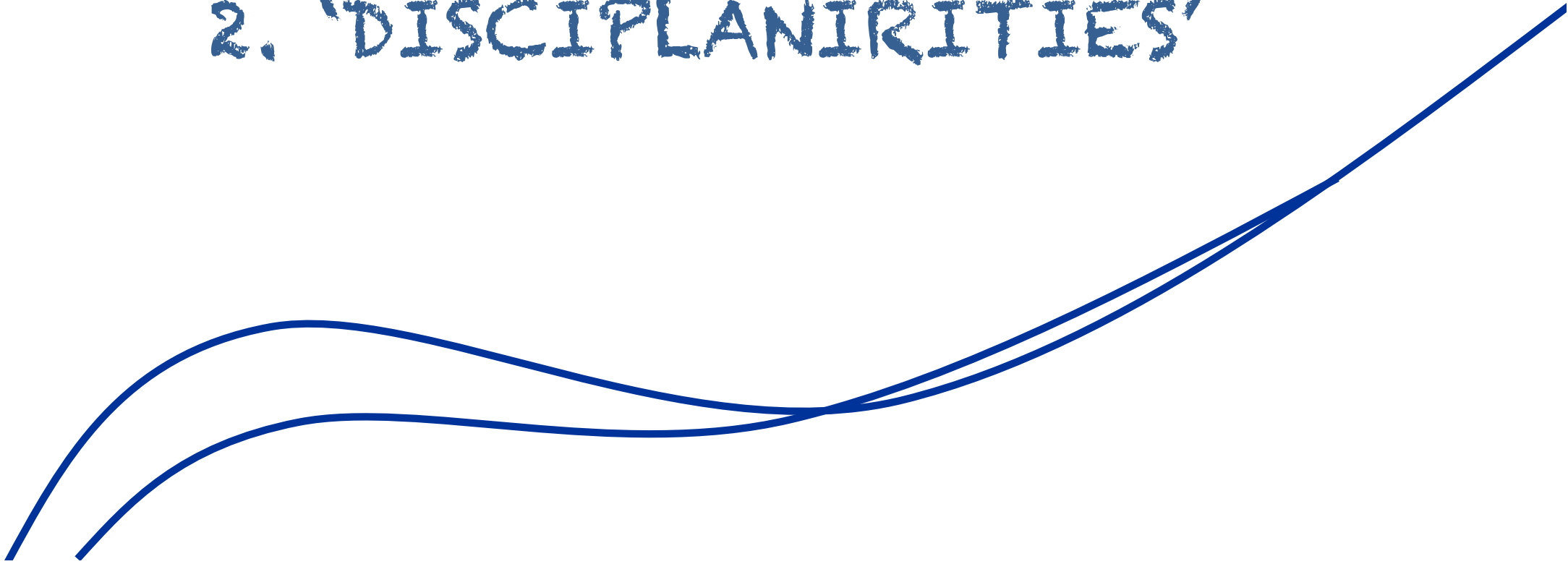
'DISCIPLINARITIES': background

- The drive for disciplinary collaboration links to a broader drive for integration and cross-sectoral cooperation

  → 'Mode 2' of knowledge production: socially distributed, application-oriented and trans-disciplinary (Nowotny et al. 2003)

- Present-day integrated approaches emerged in the 1970s as a response to **sectoral approaches**

  → Failure to consider environment + compartmentalisation

- The concept of **sustainable development** in 1980s emphasised further the need for integration

  → Several themes, diversity of actors

More on integration e.g. in Keskinen (2010)

Already Agenda 21 of Rio1992 called for research to be interdisciplinary and integrated

SOCIAL

Bearable   Equitable

Sustai-
nable

ENVIRON-
MENT   Viable   ECONOMIC
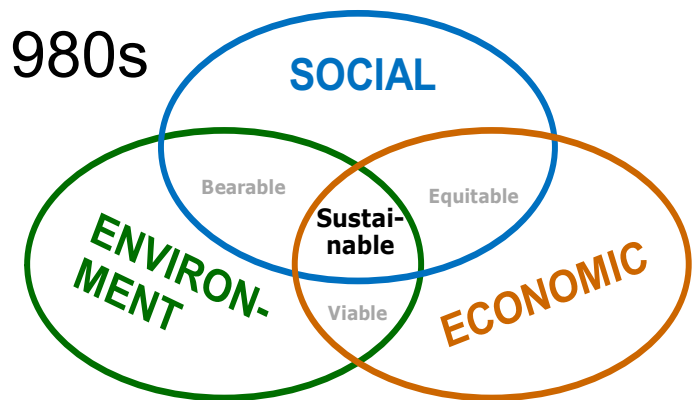
´Society has problems, universities have disciplines'

Adapted from Scholz & Marks (2001)

See also Thomas Kuhn (1962) +
Gibbons, Limoges, Nowotny,
Schwartzman, Scott & Trow (1994) etc.

→ **'Science 2.0' / Mode 2 of
knowledge production**

'DISCIPLINARITIES'

- Disciplines can be connected in different ways: different kinds of 'disciplinarities'

  - Multidisciplinarity ('monitieteisyys')

  - Crossdisciplinarity ('poikkitieteisyys')

  - Interdisciplinarity ('tieteiden välisyys')

  - Transdisciplinarity ('tieteiden ylisyys')

  - Others, too (mono-, pluri-, post-)

  → But how these differ?

MY VIEW (not the definite one)

The four disciplinarities form a kind of sequence:

MULTI → **CROSS** → **INTER** → **TRANS**

INCREASING ROLE OF NOVELTY (new methods & approaches)

INCREASING ROLE OF INTERACTION (within science, and beyond)

INCREASING DIFFICULTY (requires time & will)
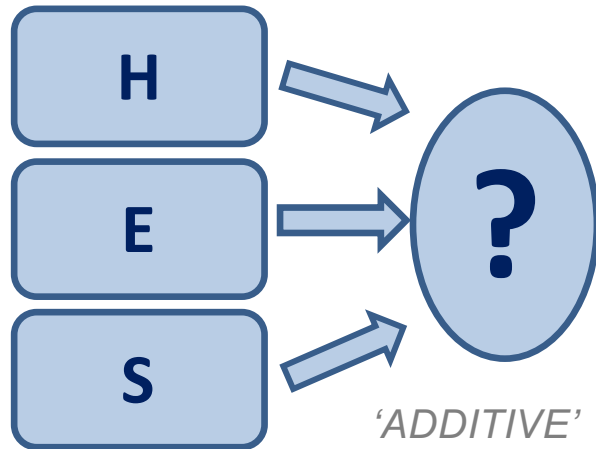
MULTIDISCIPLINARITY
Problem analysed through different disciplines, with experts working as one team but still using their own disciplinary methods

H

E

S

'ADDITIVE'

© Marko Keskinen

MULTIDISCIPLINARITY
Problem analysed through different disciplines, with experts working as one team but still using their own disciplinary methods

'ADDITIVE'
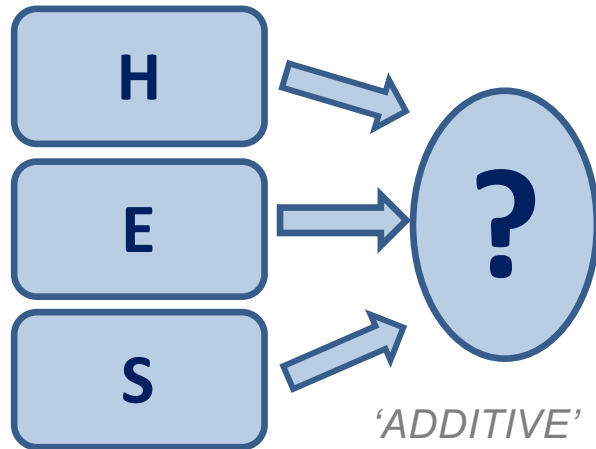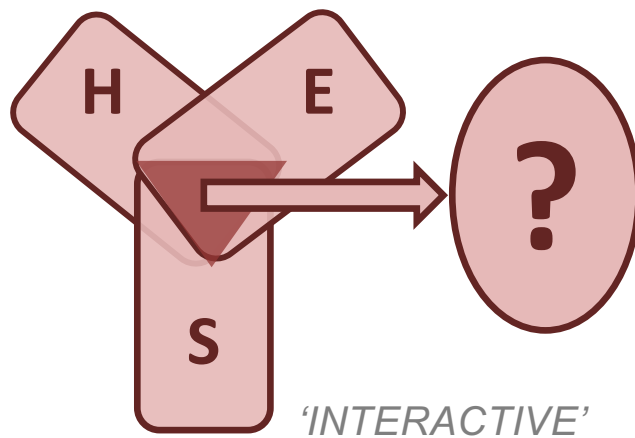
INTERDISCIPLINARITY
Problem analysed with the help of methods developed by the team for this particular problem, integrating knowledge, theories and methods from different disciplines

'INTERACTIVE'

H E S

© Marko Keskinen

TRANSDISCIPLINARITY:

Collaborative, dynamic problem solving approach crossing both disciplinary boundaries & different forms of knowledge production

'HOLISTIC'
→ Beyond disciplines
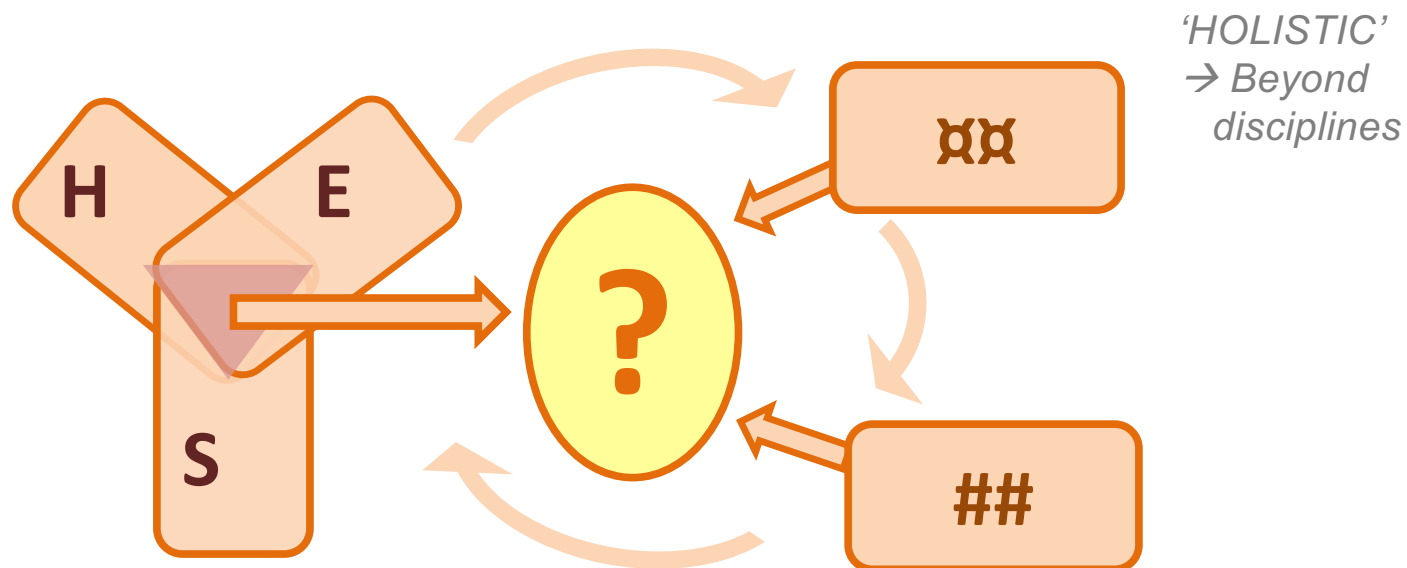
© Marko Keskinen

More information from my Doctoral Thesis: https://aaltodoc.aalto.fi/handle/123456789/4822

VISUALISING 'DISCIPLINARITIES'

Many other ways to visualise these, of course.
→ The main point is to understand they are different!

Intradisciplinary → Multidisciplinary → Crossdisciplinary → Interdisciplinary → Transdisciplinary
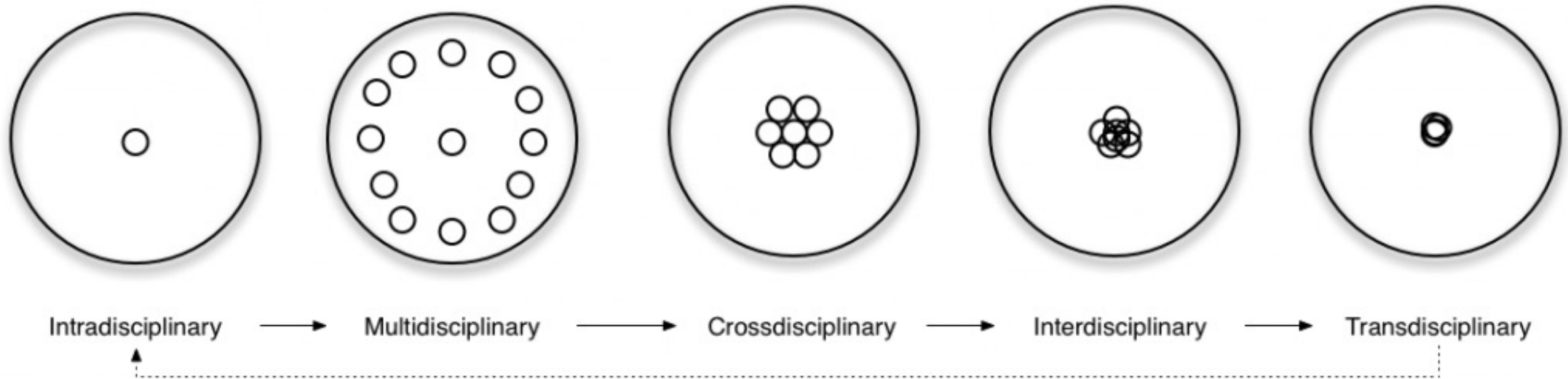
QUESTIONS?
COMMENTS?
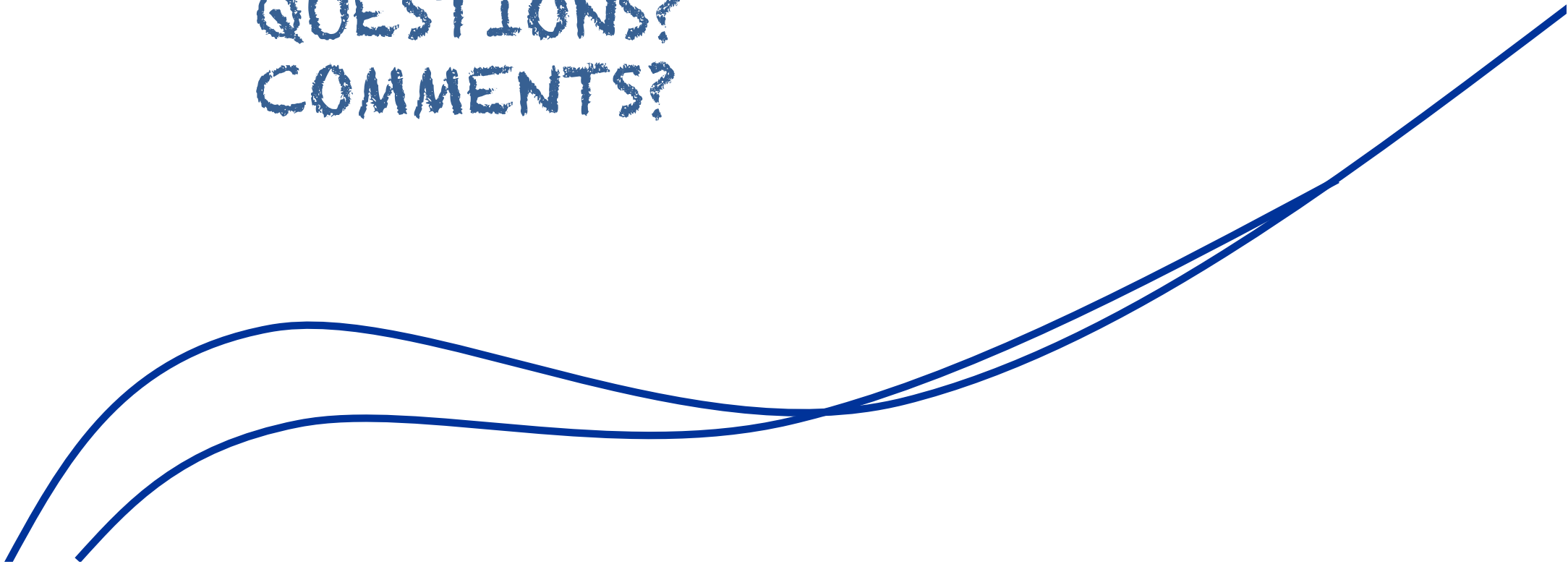
3. SOME CONCLUSIONS

WAT RESEARCH

- Water and environmental research going towards increasing inter- and even transdisciplinarity

  → INTER: not only bringing different disciplines together, but taking a problem-specific view with (new) methods suitable for that specific purpose, using different disciplines in interactive way

  → TRANS: considering also other, non-scientific forms of knowledge (e.g. local knowledge, decision-makers views), and hence engaging in a knowledge-making process with different stakeholders

- These same trends visible in WAT field more generally (i.e. also beyond research)

EXAMPLE:
http://winlandtutkimus.fi

LINK TO THIS COURSE?

- The discussion about multi-disciplinarities is very similar to cooperation between different sectors – and teams with different experts (like yours!)

- Some common elements for both

  - The importance of finding the common ground
    → Research context / collective problem

  - Generalism ('the easier one') vs. holism ('the important one')
    - Generalism: multiple views i.e. multidisciplinary
      → Using existing expertise & methods
    - Holism: comprehensive i.e. interdisciplinary
      → Using new methods and creating new expertise

WAY FORWARD

- Need for multidisciplinary / -sectoral teams with interdisciplinary / -sectoral approaches

  → Team interaction (and related skills) more & more important

- 'Doing more with less': successful in our field may sometimes require less sectoral work and more interaction

  → Slow, long process

- Integration is not a silver bullet

  → Also 'fragmentation' is good and even necessary in some cases

  → Plus integration still builds on a set of specialisations!

HEY YOU T-PEOPLE!

Close links to water and environmental education

→ T-shaped expertise needed!

Combination of:

- In-depth expertise on a specific field/method
  ('the legs that you standing on')

- Capability and willingness to cooperate
  with experts from other disciplines and fields
  ('arms wide open')

→ This is also what WAT course and our
  WAT Master's Programme is about!
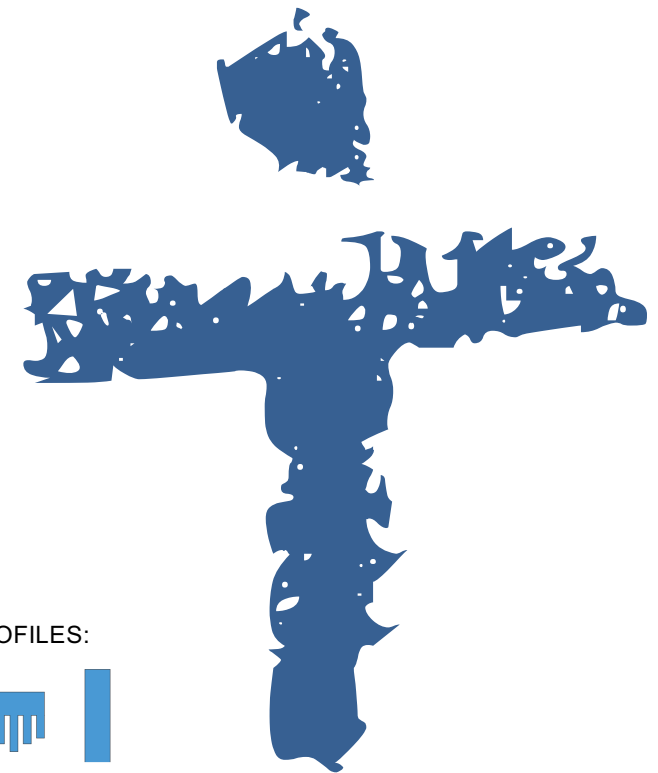
OTHER PROFILES:

Fig. 2. Schematic sketch of the competency profiles of **(a)** T-shaped professionals, **(b)** generalists, and **(c)** I-shaped professionals (adapted from Oskam, 2009, modified).

Uhlenbrook & de Jong 2012

THANK YOU!

QUESTIONS?
COMMENTS?
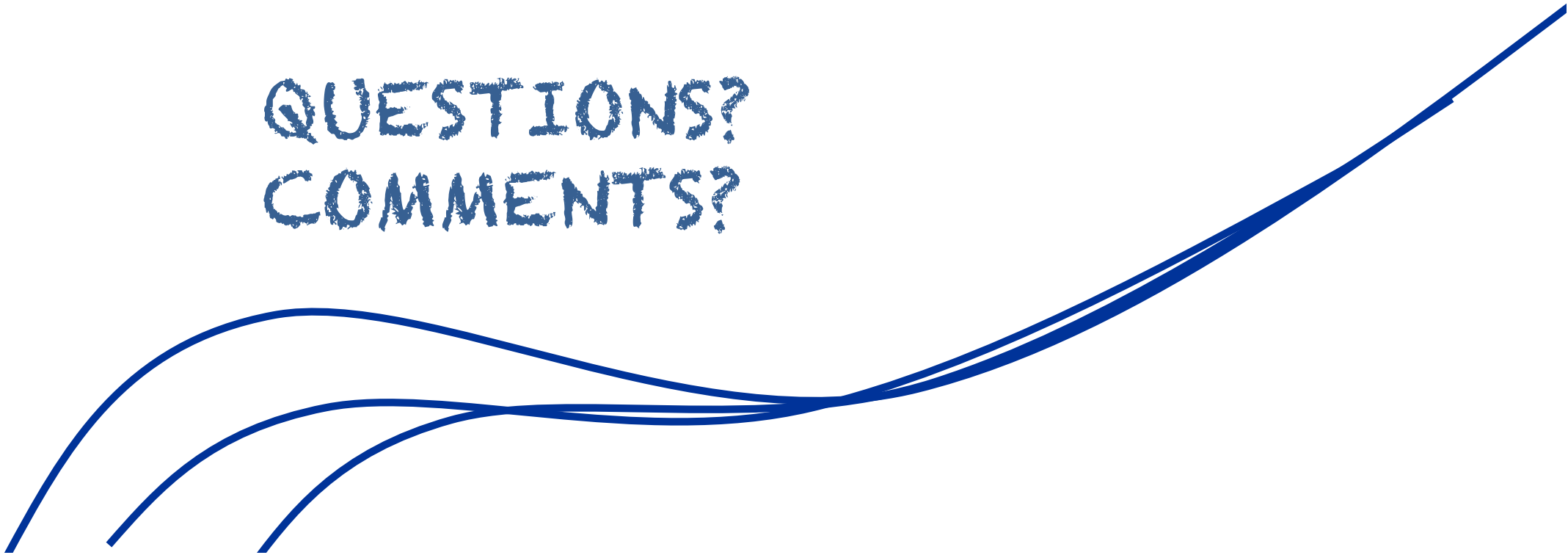
EXTRA)
Some approaches for governance analysis

ANALYSING GOVERNANCE

Ok, now we know what governance is

→ But how to analyse and make sense of it?

Number of different frameworks and methods for governance analysis

→ OECD's inventory lists over 100 approaches: http://www.oecd.org/gov/regional-policy/Inventory.pdf

Finding the most appropriate methods depends on:

1) Purpose of your analysis: why you do it?

2) Context of your analysis: where you do it and what kind of information you have?

3) Your preferences: how you like to do it?

Sounds complicated? Not so!
→ Similar e.g. for doing EIA or flood management plan: you can do them in many ways as well

EXAMPLE OF A FRAMEWORK: IAD

Institutional analysis and development framework i.e. IAD by Elinor Ostrom
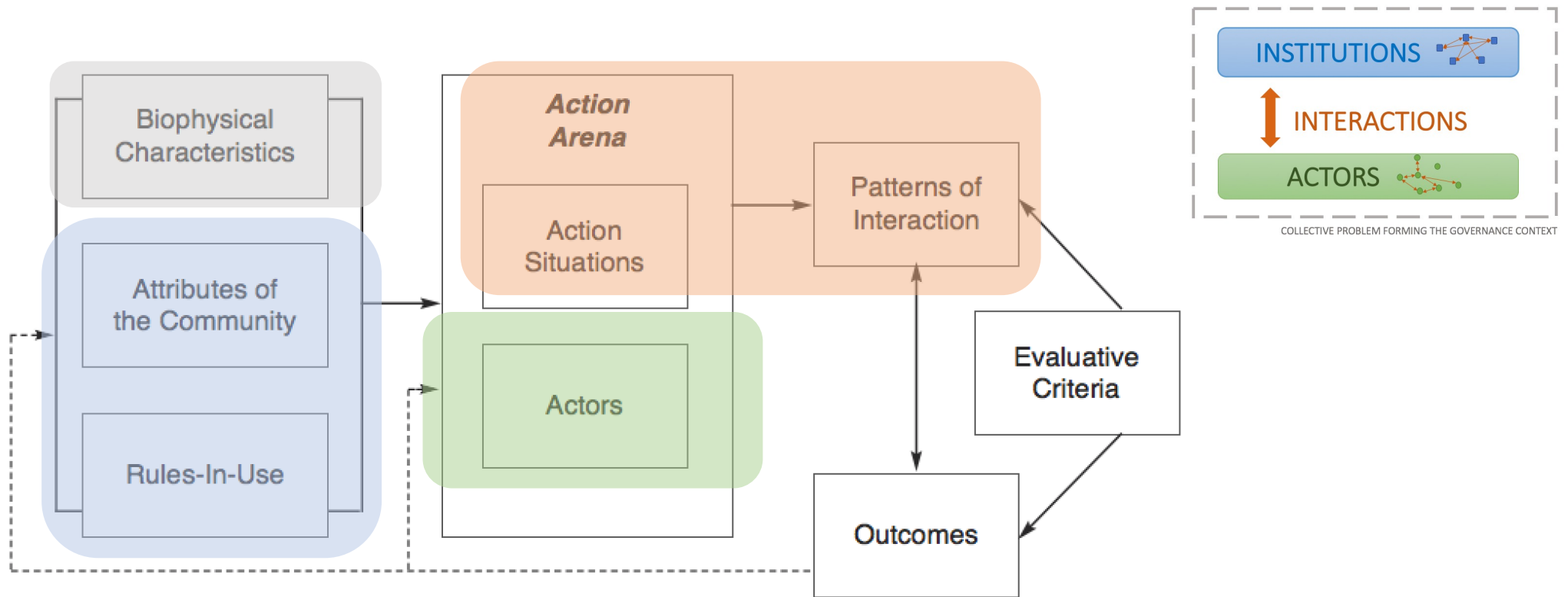
EXAMPLE OF A FRAMEWORK: WGF

Water governance framework by Franks & Cleaver (2007)
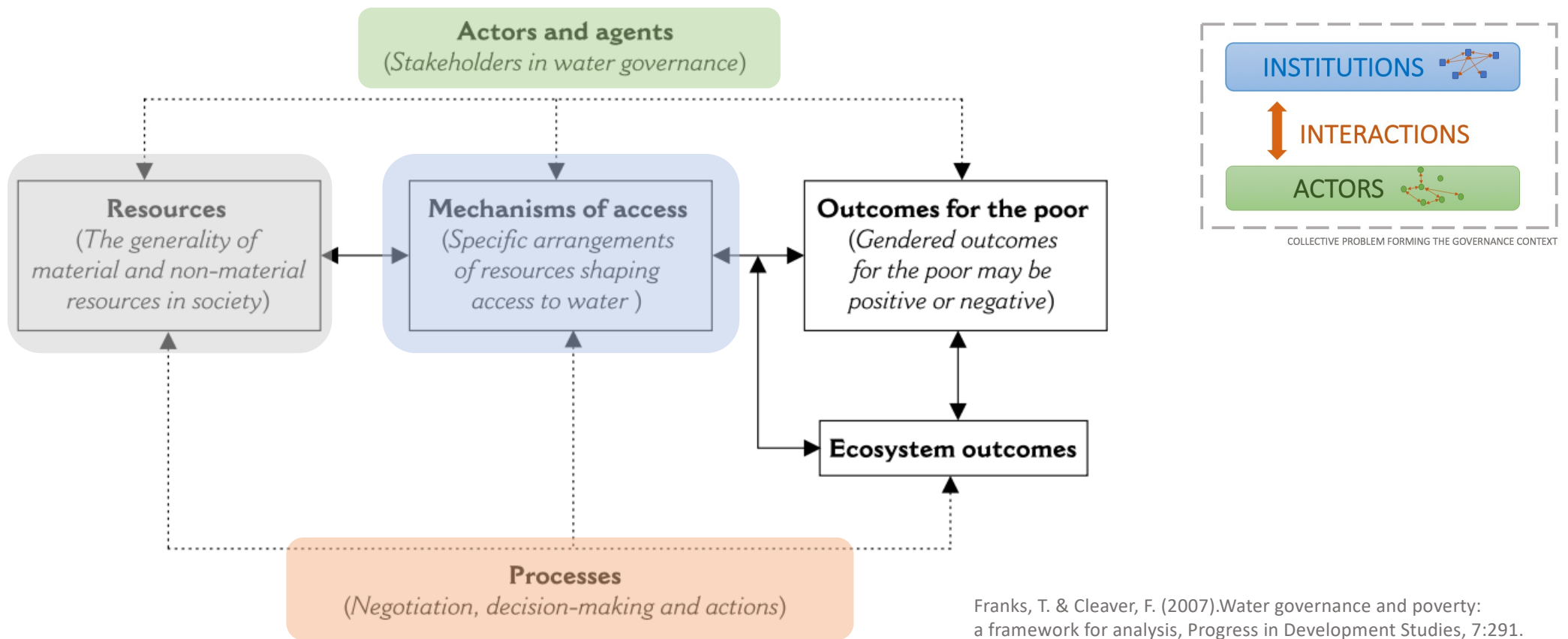
Franks, T. & Cleaver, F. (2007).Water governance and poverty: a framework for analysis, Progress in Development Studies, 7:291.

DEFINING ACTORS/STAKEHOLDERS

- How to recognise who are the key actors
in your governance context?

    → Plenty of good stakeholder analysis methods for this!

- Stakeholders defined as actors (organisation, group, individual)
having a 'stake' on a given **collective problem**

    → Thus essentially the same as 'Actor' discussed above

    → Stakeholders can come from different sectors of
    society, and work at + influence in different scales

PUBLIC SECTOR   PRIVATE SECTOR

GLOBAL / REGIONAL
NATIONAL
LOCAL

CIVIL SOCIETY   ACADEMIA

Keskinen (2016)
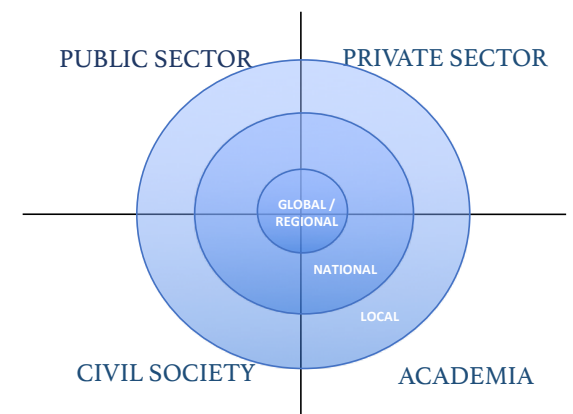
STAKEHOLDER ANALYSIS

Recognising your stakeholders often one of the main parts or even purposes of governance analysis

→ Luckily good approaches exist for stakeholder analysis Article by Reed et al. (2009) worth reading!
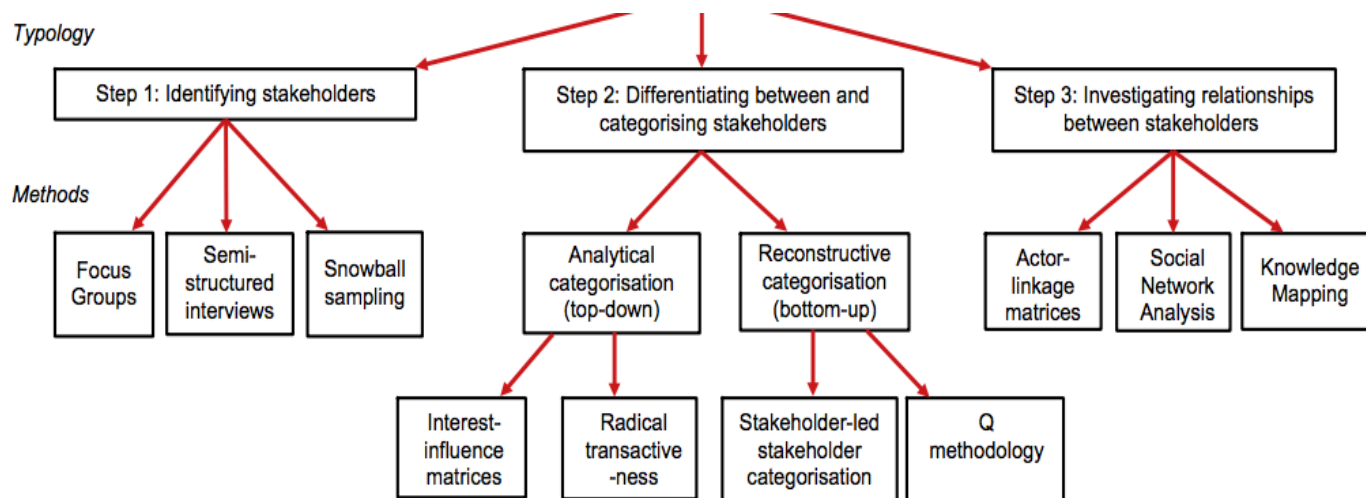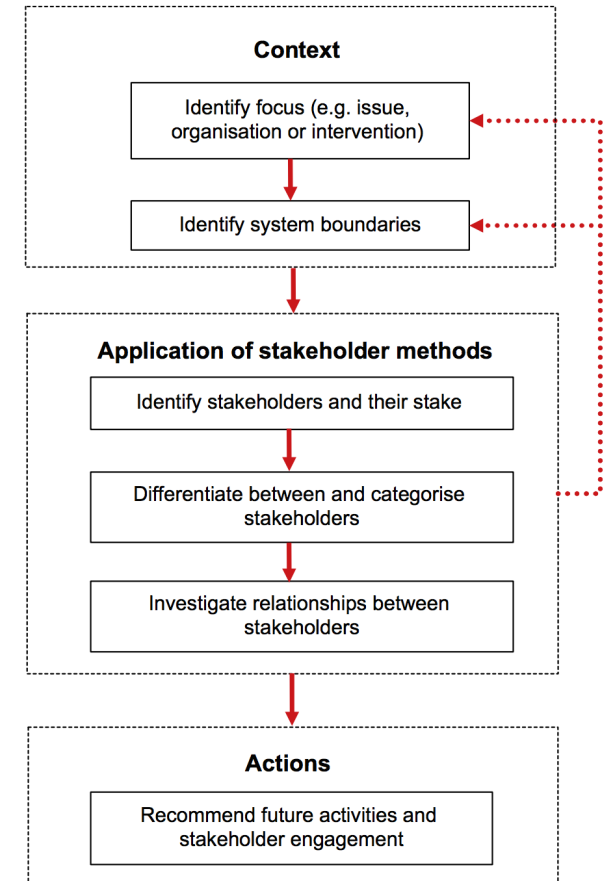
Fig. 5. Schematic representation of key methodological steps necessary for stakeholder analysis.

Reed et al. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. Journal of Environmental Management.

CLASSIFYING STAKEHOLDERS (1/2)

Affecting and Affected

Affecting

Least

Moderately

Most

Affected

Fig. 2. Rainbow diagram for classifying stakeholders according to the degree they can affect or be affected by a problem or action (from: Chevalier and Buckles, 2008).

Reed et al. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. Journal of Environmental Management 90 (2009) 1933–1949.

USEFUL METHOD[1] :
Rainbow diagram with 3 categories and 3 classes

→ Helps to understand who is affecting and affected by Collective Problem (e.g. certain activity or project)

CLASSIFYING STAKEHOLDERS (2/2)
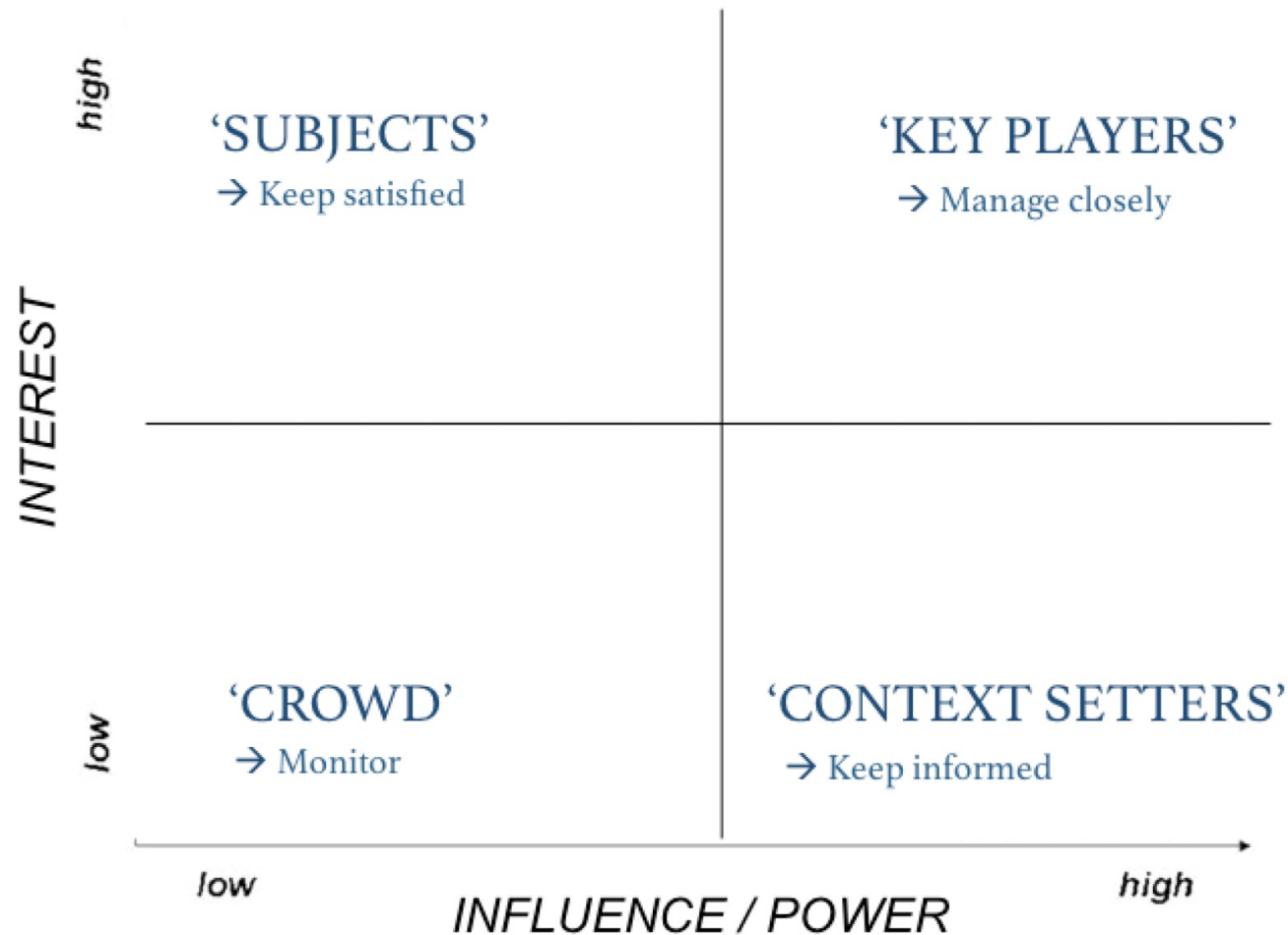
USEFUL METHOD[2]:

Interest/influence matrix with four different groups for stakeholders

→ Helps to categorise your stakeholders

ADDITIONAL SLIDES

GOVERNANCE? Elements

"…processes of **interaction** and decision-making among the **actors** involved in a **collective problem** that lead to the creation, reinforcement, or reproduction of social norms and **institutions**" (Hufty 2011: 405)

So governance is about:

ACTORS
(stakeholders)

organisations

groups

individuals…

…all with differing roles and interests

creating and being influenced by

INSTITUTIONS *through*

FORMAL

legislation

policies & strategies

administrative structures…

INFORMAL

norms

values

traditions

customs…

…creating structure for actors' behaviour (= social order)

= provide the **rules of the game** for interaction (North 1990), and thus for governance

INTERACTION *to solve a*

decision-making & planning processes

assessments

meetings

emails…

…influenced by power relations and actors' differing authority, legitimacy & agency

COLLECTIVE PROBLEM

building a dam

preventing urban floods

policy for circular economy

sustainability

…can be clearly-defined or broad, and defined in different ways (e.g. by one actor, or together by all)

GOVERNANCE? Definitions

Governance is thus very much about different concepts

→ The challenge is that many of these concepts are multifaceted, and regularly used in different and even confusing ways

Three important clarifications on key concepts:

1) Governance vs. management
2) Governance vs. government
3) Institution vs. organisation

GOVERNANCE ≠ government

Shift in focus in political science (and in life generally):
from governing to governance

*From active verb to passive noun
= conceptually more challenging*

Govern = a process to maintain order through rules & regulations
and administrative structures; done e.g. by **governments**
→ Starting from emperors and kings, and their governments
→ Now often task of public sector, from governments to municipalities

Governance = mixed form of governing, with different actors
and their roles across different scales

*Close link
to power
and politics*

→ Public and private sector, civil society & academia;
local, national, regional, international scales
→ Governance has no clear owner or central point

IN SHORT:
**Governance
> government**

INSTITUTION ≠ organisation

Institutions and organisations are often used interchangeably,
but very important to differentiate when talking about governance
→ Often closely related, but not the same as their aims are different

Organisation = "groups of people with shared goals and some level of
formalised patterns of interaction defined in terms of roles"

e.g. Merrey et al. 2007

→ e.g. water user associations, companies, NGOs,
government agencies, river basin organisations...

Institution = "social arrangements that shape and regulate
behaviour and persist"

e.g. North,1990;
Ostrom, 1990, 1992

→ e.g. international law, national water policy, SDGs,
market mechanisms, river basin plans – and Jari Litmanen!

INSTITUTIONS: formal and informal

Two type of institutions i.e. formal and informal: both very strong in shaping and regulating our behaviour – and thus to guide governance!
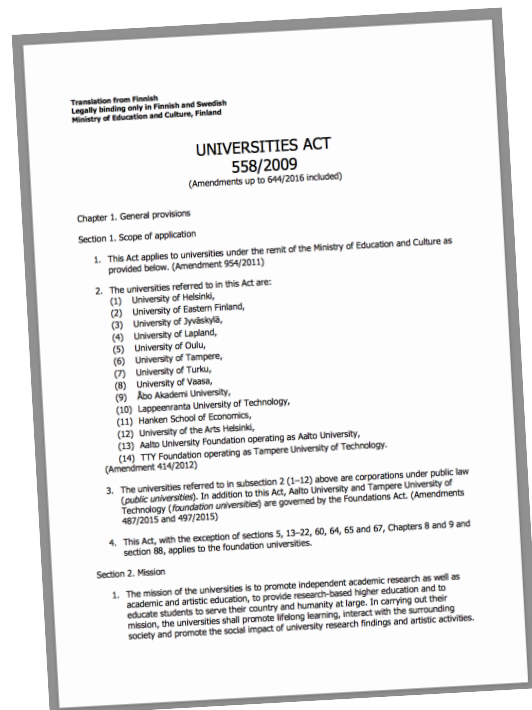
Law
(formal)

VS.

Social norm
(informal)
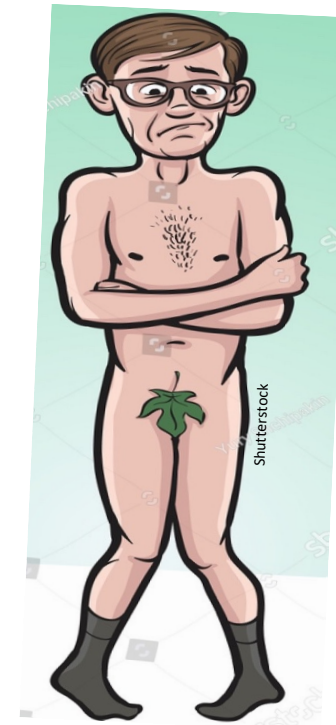
WAT GOVERNANCE: complex

Complexity of natural resources management (NRM)
and governance thus due to many reasons (Mollinga 2010)

1) **Ontological complexity** due to heterogeneity in components
   (human, technical, physical, ecological…) and their relations

2) **Analytical complexity** due to difficulty to understand
   (i.e. being complicated with only partial information available)

3) **Societal complexity** due to different interests on NRM
   and hence due to its fundamentally contested nature

→ These three questions are fundamental, yet often
   neglected by engineers (and others): 'just doing it'

WHY?

WHAT?

FOR
WHOM?

For more: Mollinga 2010

Who are the stakeholders?

STAKEHOLDERS

- Stakeholders defined as actors (organisation, group, individual) having a 'stake' on a given **collective problem**

  → Thus basically same as the **'Actors'** discussed above:
  but as stakeholders have different connotations, we prefer
  to use the term actors when talking about governance in general

- Stakeholders can be recognised in two main ways (Reed et al. 2009)

  - Top-down = stakeholders are defined based on the collective problem, typically by a key actor or 'problem owner' such as ministry or company

    Thus, not all actors see themselves as stakeholders

  - Bottom-up = i.e. stakeholders themselves define who are key stakeholders (and may in the process also re-define the collective problem)

Reed et al. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. Journal of Environmental Management.

…WITH DIFFERING VIEWS

- Stakeholders related to natural resources management have often differing views and needs on the given resource (e.g. water body, wetland)

  → Who has the main access and/or ownership of the resource?
     What kinds of uses and users are preferred?

  → What kinds of impacts are acceptable?
     How to compare impacts that are not comparable
     (e.g. economic benefits vs. loss of ecosystem)?

→ Leads often to disagreements and conflicts

Conflicts are situations of competition and potential disagreement between two or more stakeholder groups over the use of one or more scarce resource.

*A **trade-off** is the process of balancing conflicting objectives: trade-offs thus imply a sacrifice or opportunity cost in terms of benefits foregone.*

Grimble & Wellard 1997

DIFFERENT SOCIETAL SECTORS

- In natural resources management, the key stakeholder setting the context & even defining the other stakeholders comes often from the public sector (e.g. ministry, environmental authority, river basin commission)

  → Links to environmental law and regulations as well as permitting

- But stakeholders can come from all sectors of society

  → Public/private/civil society/academia matrix one way to group stakeholders

  → You can combine it with administrative and geographical scales, from local to highest appropriate scale

PUBLIC SECTOR PRIVATE SECTOR

GLOBAL / REGIONAL

NATIONAL

LOCAL

CIVIL SOCIETY ACADEMIA

Keskinen (2016)
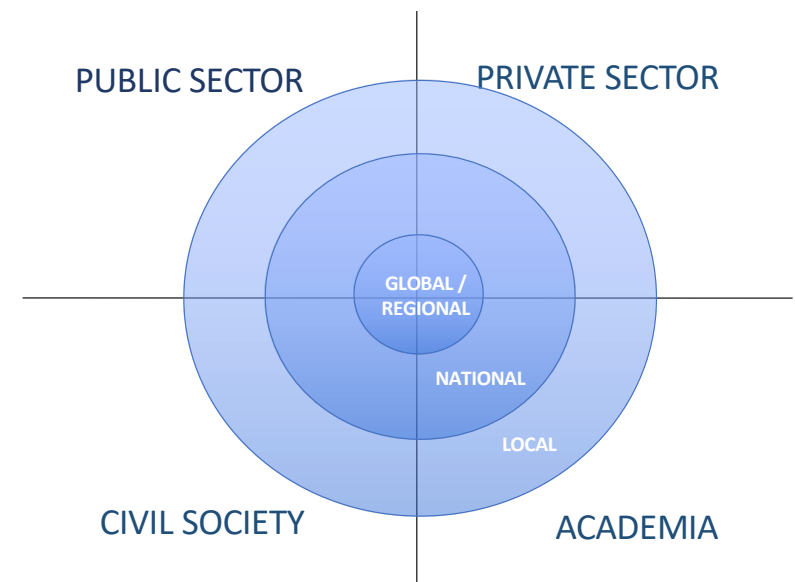
WHAT IS AT STAKE?

- Defining the exact stake (influence) is not always clear

  → Two-way influence:
    each stakeholder can affect
    and/or be affected by the
    common problem

  → The influence can be
    negative or positive

  Rainbow diagram
  one useful tool for this!
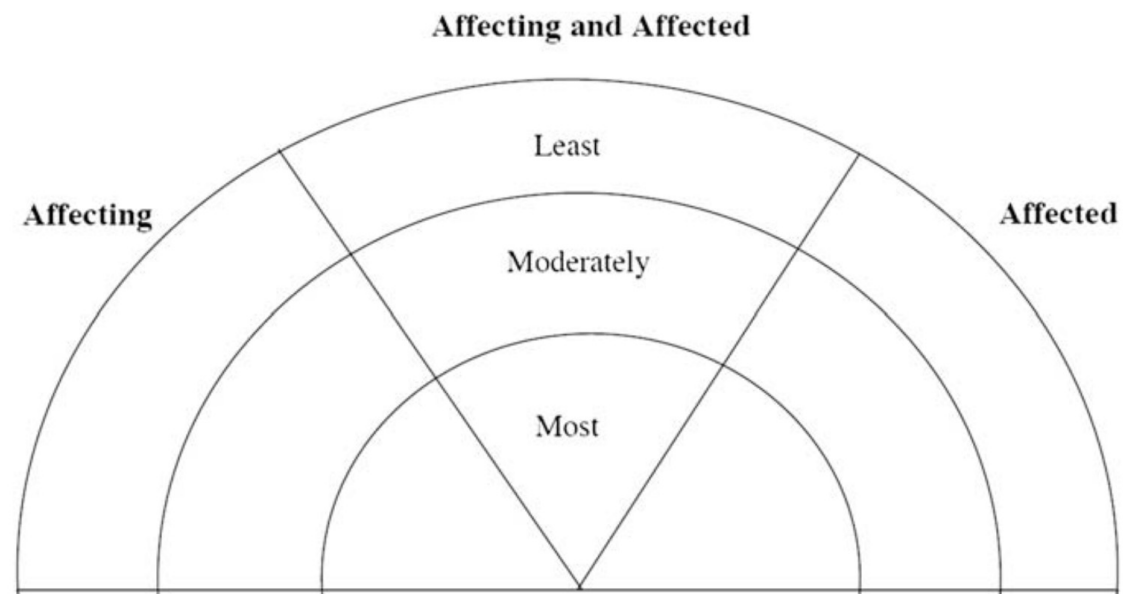
Affecting and Affected

Affecting — Least — Moderately — Most — Affected

Fig. 2. Rainbow diagram for classifying stakeholders according to the degree they can affect or be affected by a problem or action (from: Chevalier and Buckles, 2008).

Reed et al. 2009

Reed et al. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. Journal of Environmental Management.

GOVERNANCE ANALYSIS: PURPOSE

Always start by defining and agreeing with the purpose of your analysis (and remember it while doing your analysis)

Many different purposes, including:

1) Enhancing understanding: e.g. identifying your stakeholders

2) Planning and assessment
   - Improving existing management practices
   - Finding your own niche and/or ways for impact
   - Organisational development: do we do the right thing?

3) Evaluation: looking back to learn and develop

SOURCES OF LAW (Finland)

- Legislation is the strongest, factual source of law, but also other, 'softer' forms exist

  - **Legislation** = Acts (parliament sets) & decrees (government)
    - → All Finnish laws i.e. Acts and decrees available in Finlex, many translated in English (https://www.finlex.fi/en/)

  - **Proposal** of new legislation = bill given to the Parliament: gives information on background for the law

  - **Case law** i.e. jurisprudence = decisions of the highest courts may sometimes be useful (not so strong in civil law system)

  - **Legal literature** = providing broader explanations and interpretations of legislation (weakest source)

Based on slides by Ari Ekroos

WHAT IS GOVERNANCE?

What kind of elements, themes & aims can be used to define it?

ME: Write down your own view
+ also possible questions

WE: Share your views with a pair
and agree a common definition

US: Discussing it together with all

*Btw, this method is called
'me-we-us': handy way to discuss
together almost any theme*
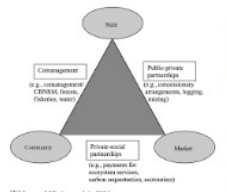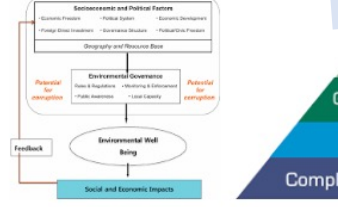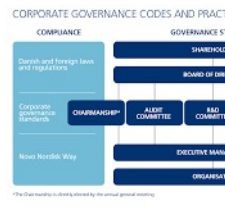
Many different visualisations for (water/environmental) governance

→ Common to most that there are many elements, and that they are connected

Also many different visualisations for (water/environmental) management

→ Common to most that there are many elements, and that they are connected ☺
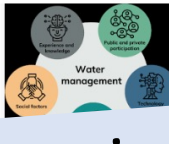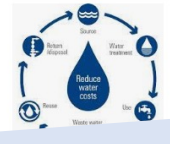
GOVERNANCE? More detailed view

"**processes of interaction and decision-making**
among the **actors** involved in a collective problem
that lead to the creation, reinforcement, or reproduction
of social norms and **institutions**"

(Hufty 2011: 405)

→ "[Earth system governance] is the interrelated and increasingly integrated
system of formal and informal rules, rule-making systems, and actor-networks
at all levels of human society that are set up to steer societies towards
preventing, mitigating, and adapting to global and local environmental change
… within the normative context of sustainable development"

(Biermann et al. 2010: 279)