

27 September 2018

Cross-disciplinary science; why, what, how and when?

Karin Beland Lindahl, associate professor, political science
Luleå University of Technology (LTU)

Crossdisciplinary research is increasingly requested...

- ▶ Why crossdisciplinarity now?
- ▶ What is cross-disciplinarity; different kinds?
- ▶ What to use when?
- ▶ Common pitfalls...and success-factors

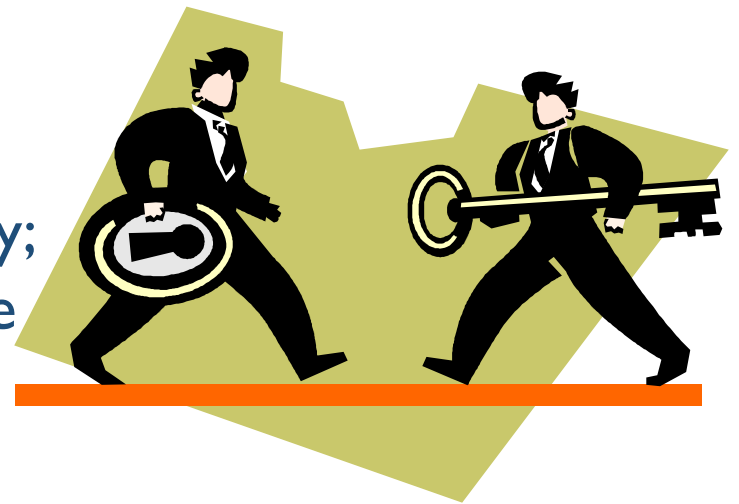


Why crossdisciplinarity now?

- ▶ Long standing concerns with the specialisation and fragmentation of science
- ▶ Increasing demands for applicability and social relevance
- ▶ Growing environmental problems characterised by complexity, non-linearity and uncertainty
- ▶ Uncertain futures



Demands for knowledge vary;
reflect societal needs and the
public debate!



Forests, public debate and research



● **1950:** Forest research: maximize forest production

● **1990**

● **2000**

● **2010**



Forests, public debate and research



1950: Forest research: maximize forest production



2000

1990: Ecological research; maintain biological diversity

2010

Forests, public debate and research



1950: Forest research: maximize forest production



1990: Ecological research; maintain biological diversity



2000: Social science; power, democracy and governance

2010

Forests, public debate and research



1950: Forest research: maximize forest production



1990: Ecological research; maintain biological diversity



2000: Social science; power, democracy and governance

2010: Crossdisciplinary science to handle complex problems

What is crossdisciplinarity

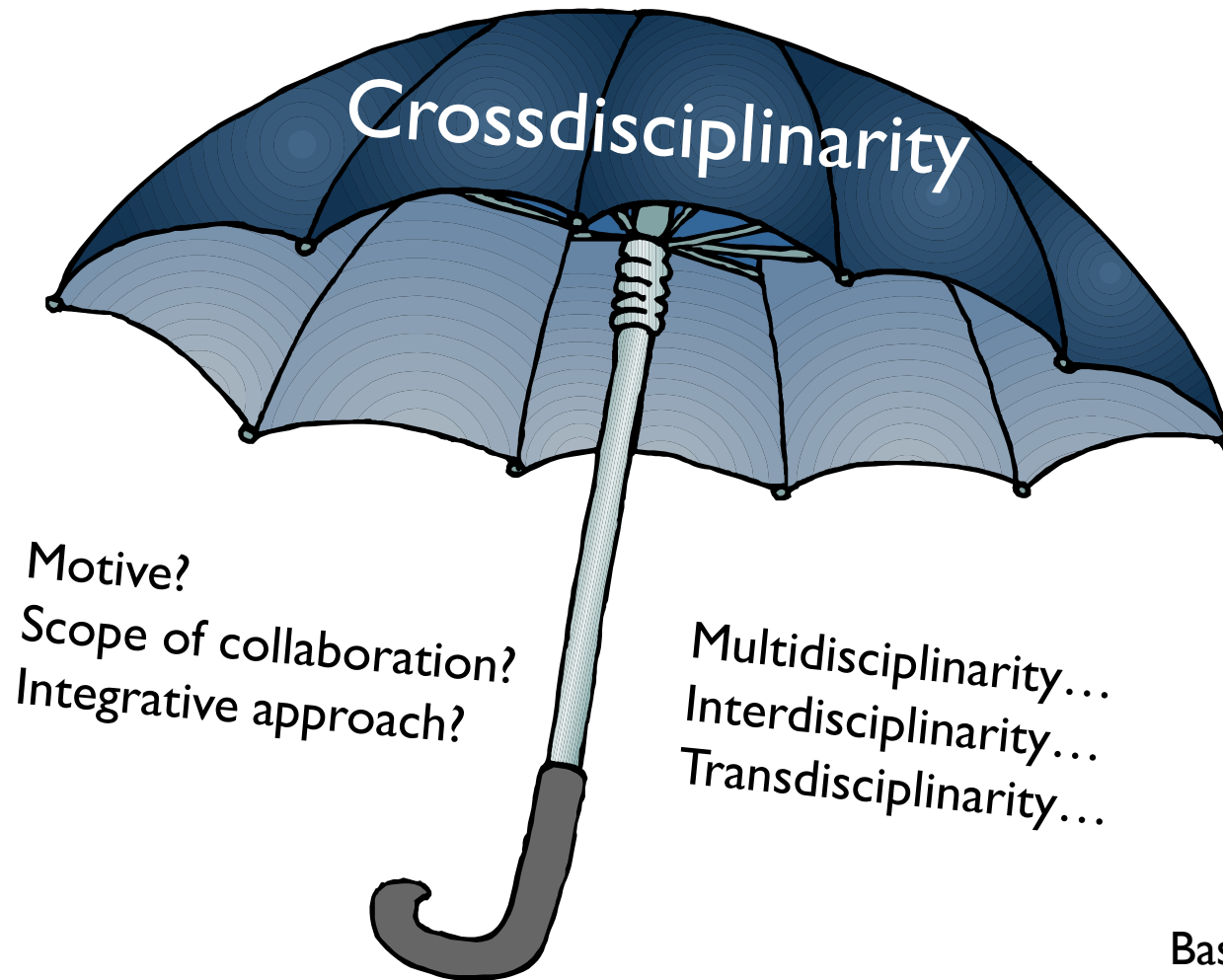
- ▶ Crossdisciplinarity?
 - ▶ Interdisciplinarity?
 - ▶ Multidisciplinarity?
 - ▶ Transdisciplinarity?
- ▶ It is all about crossing disciplinary boundaries - but what is a discipline?
 - Division of labour; different methods, theories, etc.
 - Different organisational, cultural and social settings
 - Formal and informal “rules” exercising control



Crossing disciplinary boundaries involves institutional change, breaking rules and crafting new ones!



Different kinds of crossdisciplinarity



Based on Mobjörk, 2010



Crossdisciplinary approaches

	Multidisciplinarity	Interdisciplinarity	Transdisciplinarity	
Motives	mainly instrumental	both instrumental and critical	Both instrumental and critical	
Collaboration between researchers	between researchers within each discipline	between researchers crossing disciplines	between researchers crossing disciplines	
Collaboration with practitioners	optional	optional	required	
			<i>consultative</i> respond and react	<i>participatory</i> on equal terms
Integration	synthesis across disciplines in the end	throughout the research process; shared problem definition	throughout the research process; shared problem definition	

(Based on Mobjörk, 2010)



How? Integration does not happen automatically...

Boundary concepts

- ▶ Words that function as concepts in various disciplines but with different/'plastic' meanings.
"Sustainable development"

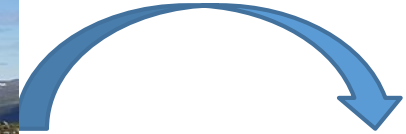
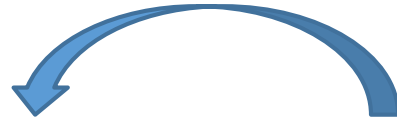
Boundary settings

- ▶ Organisational and institutional conditions that foster development of boundary concepts.
Crossdisciplinary workshops or courses

Integration of concepts, methods and "ways of doing research" cannot be seen in isolation from the organisational structure and the forms of collaboration.



When? What kind of approach is suitable? The research problem decides...



Investigate social and ecological impacts of new management system?

Analyse/synthesise multiple parameters



Multidisciplinary approaches



Analyse accumulated system effects of climate change? Analyse complex problems in integrated ways



Interdisciplinary research approaches

Produce new kinds of knowledge and adaptive management systems? Handle complex problems with uncertain outcomes; link research to practice and context



Transdisciplinary research approaches

Photo: Sarek by Samiland,
Wikimedia Commons



Common pitfalls and success factors



- Conflicting knowledge traditions
- Incompatible motives/goals
- Unbalance



- Personal skills and relationships
- Time
- Leadership



Unbalance?

- ▶ Unbalanced representation of disciplines
- ▶ Unbalanced representation of non-academic actors
- ▶ Unequal roles of different research groups/disciplines
- ▶ Unequal participation...timing...



Important success factors?

- ▶ Personal skills and relationships
- ▶ Time
- ▶ Leadership



Crossdisciplinarity?

- ▶ The potential benefits of successful crossdisciplinarity research are obvious
- ▶ The barriers to realization are not always as apparent
- ▶ Different approaches exist – some are more demanding than others
- ▶ The more far reaching ambitions on integration and collaboration – the more efforts, time and resources are needed.
- ▶ The research question + available time and resources have to guide...



Crossdisciplinarity in practice

- key questions



- ▶ Are all aims compatible?
 - Short term instrumental problem solving vs. 'critical' transdisciplinary knowledge production?
 - ▶ Are the forms of collaboration appropriate?
 - Do they provide necessary boundary settings?
 - Are everybody on board on equal terms?
 - Are roles, interests and influence clarified?
 - ▶ Is conceptual and methodological integration sufficiently supported?
 - Is there sufficient time, resources, intellectual space and leadership?
 - How much integration is appropriate and efficient?
-



Good Luck...and thank you!

