Imperial College London

How to make regional level conservation decisions?

- A case study in Hainan, China

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Background:
Why I did this research

Literature review

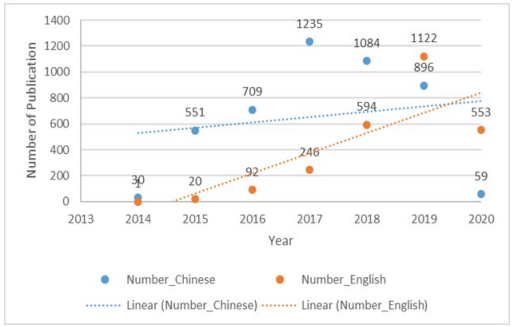
- There is an urgent need for empirical evidence-based conservation recommendations for conservation practitioners (Pullin and Knight 2002; Sutherland et al. 2004; Cook et al. 2013; Baylis et al. 2015; Sutherland and Wordley 2017; Christie et al. 2020).

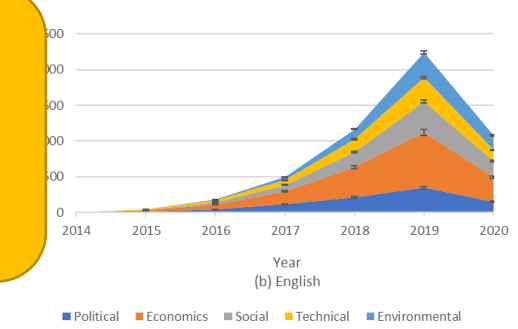
- The value of systematic reviews lies in their ability to combine a variety of information sources (especially scientific evidence), and perform large scale quantitative analysis using systems designed to minimise bias (Scholz et al. 2011).

Tab 1. Bilingual transportation imapct literature topic analysis comparison form

	English				Chinese			
	Stem	Most found Term to Stem	Stem_count	TF Total	Translated Term to Stem	Most found Term to Stem	Stem_count	TF Tota
1	road	road	648	1037	ecological	生态	703	3886
2	protected areas	protected areas	350	548	impact	影响	650	5145
3	speci	species	368	369	road	公路	603	1785
4	national park	national park	2	350	building	建设	483	2446
5	park	park	216	297	highway	高速公路	429	1686
6	wildlif	wildlife	255	256	wetland	湿地	368	3930
7	habitat	habitat						
8	conservation	conservation						
9	impact	impacts						
10	national	national						
11	effect	effects						
12	traffic	traffic						
13	crossing structur	crossing structur						
14	highway	highway						
15	development	development	133	147	ecological environment	生态环境	224	3888
16	population	population	70	130	animal	动物	219	1286
17	management	management	119	120	plant	植物	206	5540
18	road network	road network	2	120	protected areas	保护区	202	518
19	ecological	ecological	120	120	diversity	多样性	191	1385
20	corridor	corridor	64	110	resilience	恢复	191	2206
21	human	human	181	97	railway	铁路	190	4327
22	mortality	mortality	91	91	area	区域	178	3603
23	infrastructur	infrastructure	80	88	development	发展	170	1421
24	local	local	19	87	construction	施工	154	3921
25	movement	movement	20	85	biology	生物	151	3899

Languages are still a major barrier to global scientific synthesis (Amano et al. 2016; Teo et al. 2020).





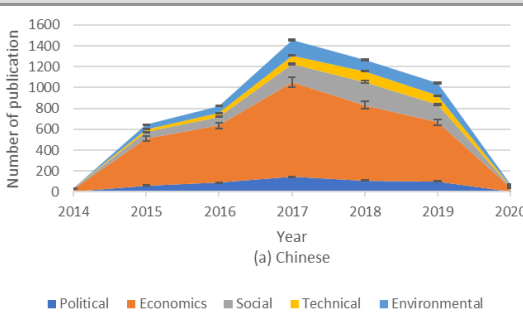
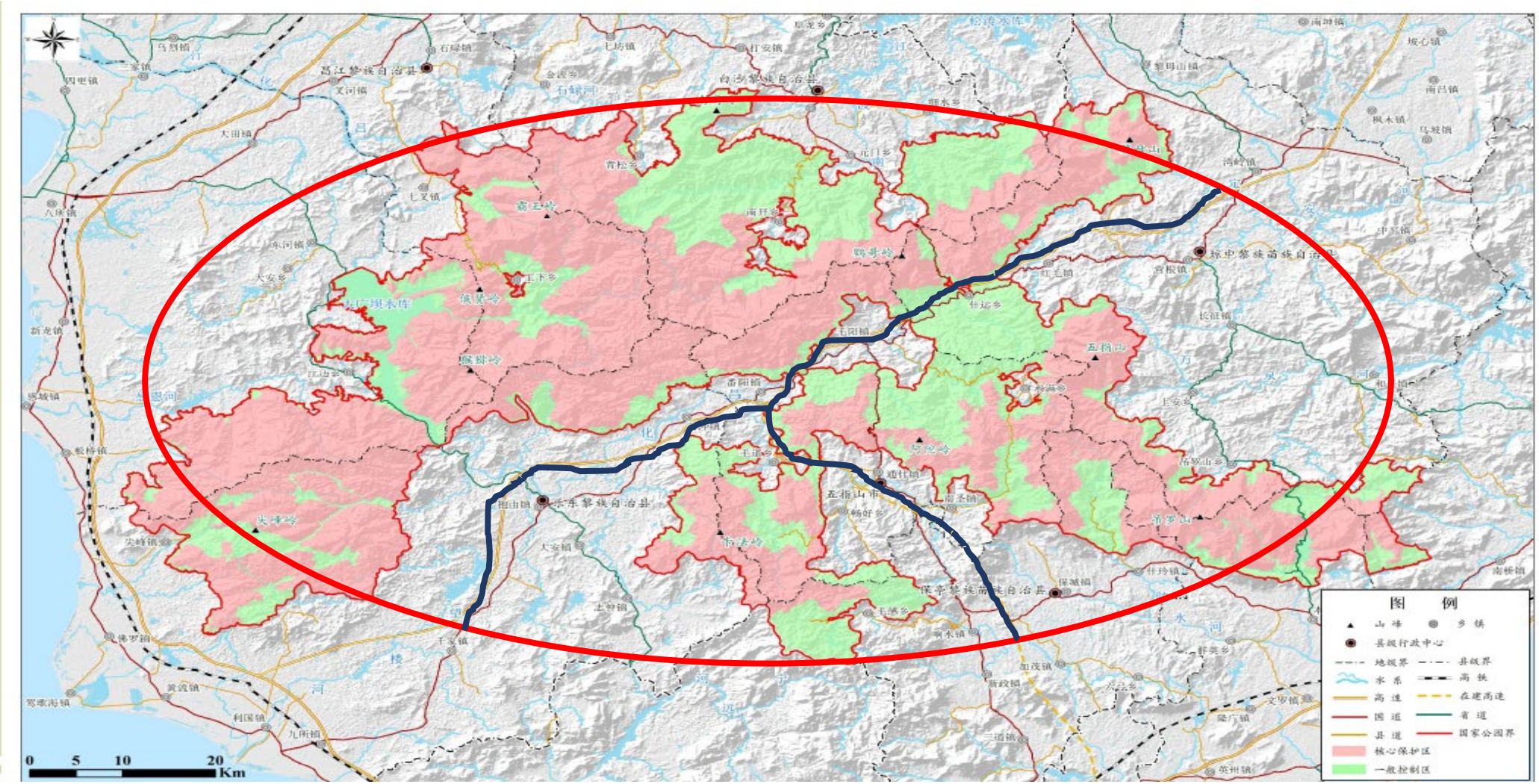


Fig 1. Yearly change of number of publications and topic composition of the BRI impacts

Why Hainan?

- The Hainan Tropical Forest National Park (HTFNP) occupies only **0.046% of China's land area, but boasts 20% of the amphibians, 33% reptiles, 39% of the birds and 20% of the mammals** in the country (HTFNP, 2019).
- **Human activities** in Hainan has posed certain **potential impacts** on the regional environment, HTFNP in particular (IUCN 2019).
- Given that HTFNP was established only in 2019, with very **limited monitoring prior** to this timepoint, it is not feasible to make conservation decisions based solely on scientific research (IUCN 2019).
- Structured conservation decision-making has not been much discussed and tested in **Chinese contexts**, so it would be interesting to see if it is as effective in China as it has been in multiple western contexts.

Why Transportation?



Source: Forestry Department of Hainan Province, China. Hainan National Park Plan 2020, April 2020

Why structured decision-making?

Even with SDM, in which diverse stakeholders are included in the discussion, the sample of stakeholders still largely depends on a modeler's own judgment, leading to relatively narrow construction of options and decision uncertainties (eg. BBC 2020).

Research objectives

- This study aims to **evaluate the potential for application of Structured decision-making (SDM) in Hainan, China**.

- In addition, it aims to evaluate **whether the SDM process can be enhanced** by designing a system in which a broad array of stakeholders can be included in the early stages of conceptual modelling, to widen the scope of the risk assessments and to create a more inclusive, socially responsible and acceptable set of decisions.

- This study then aims to **inspire key decision makers** (especially at regional level) to realize the missing-out factors in their decision-making.

Study design:
How I carried out the study

Methodology

Modellers construct a conceptual framework (CF)

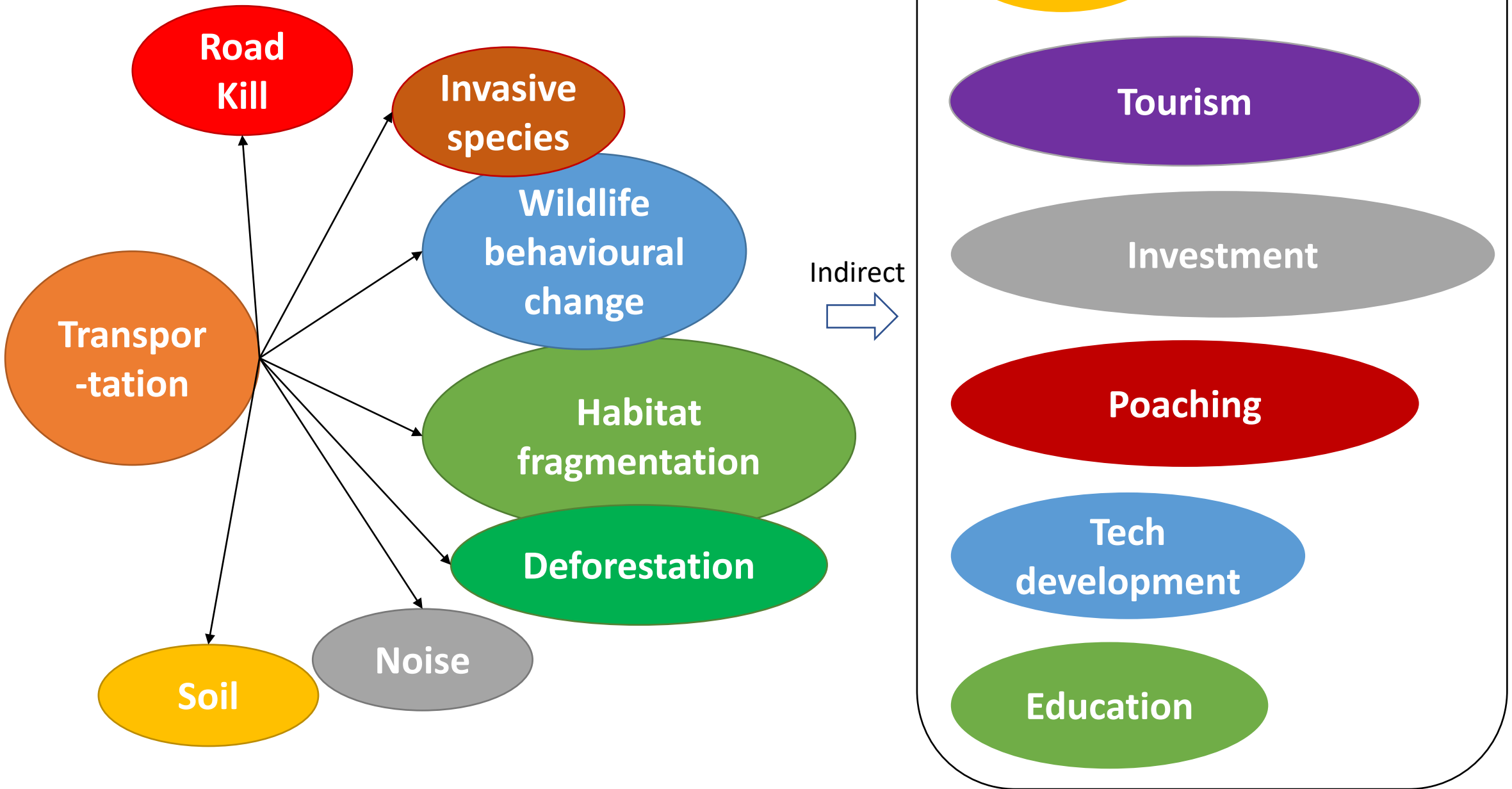
Create a stakeholder map

Invite these stakeholders to construct individual CF

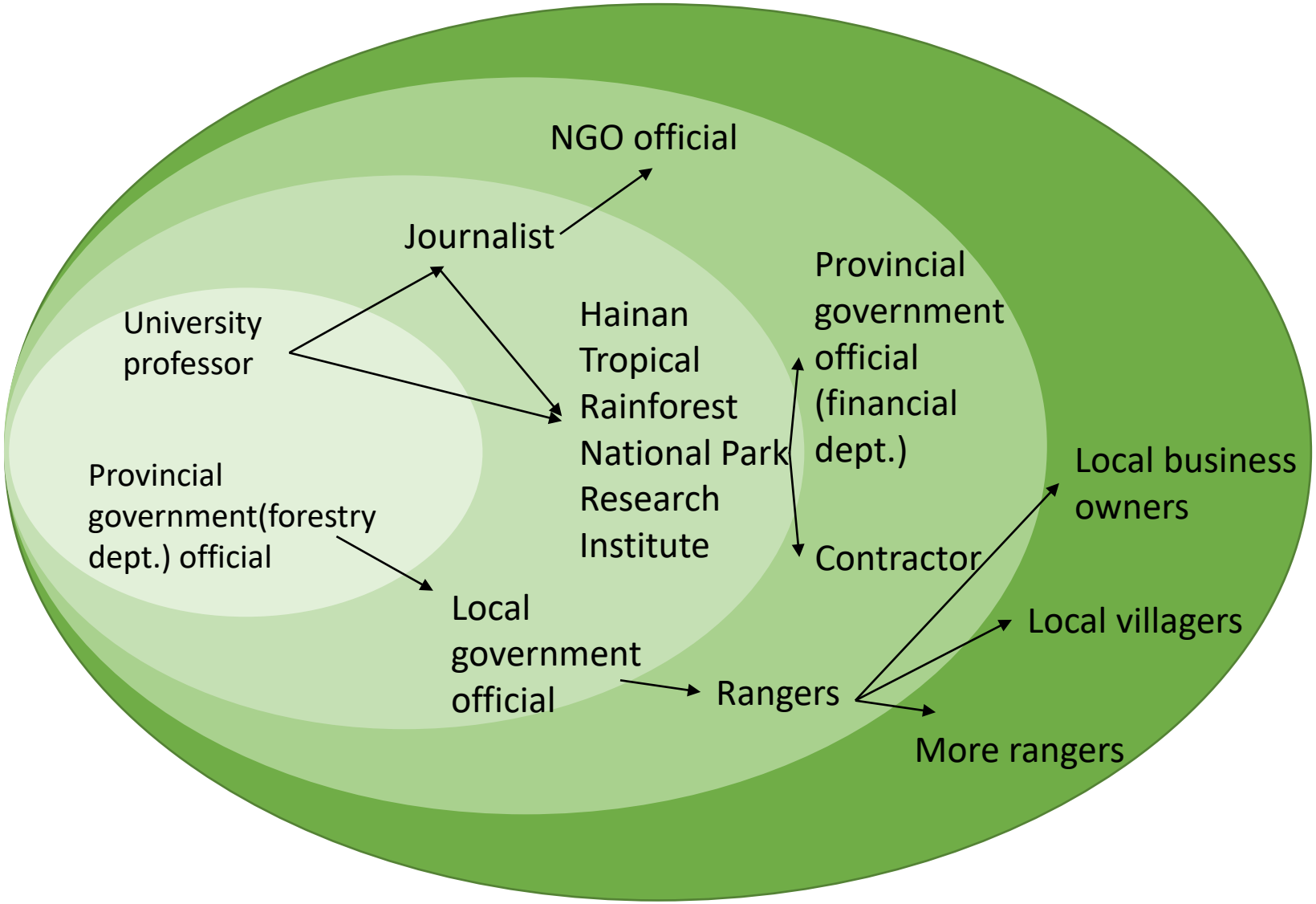
Focus group to gather a collective CF

Results & Discussion

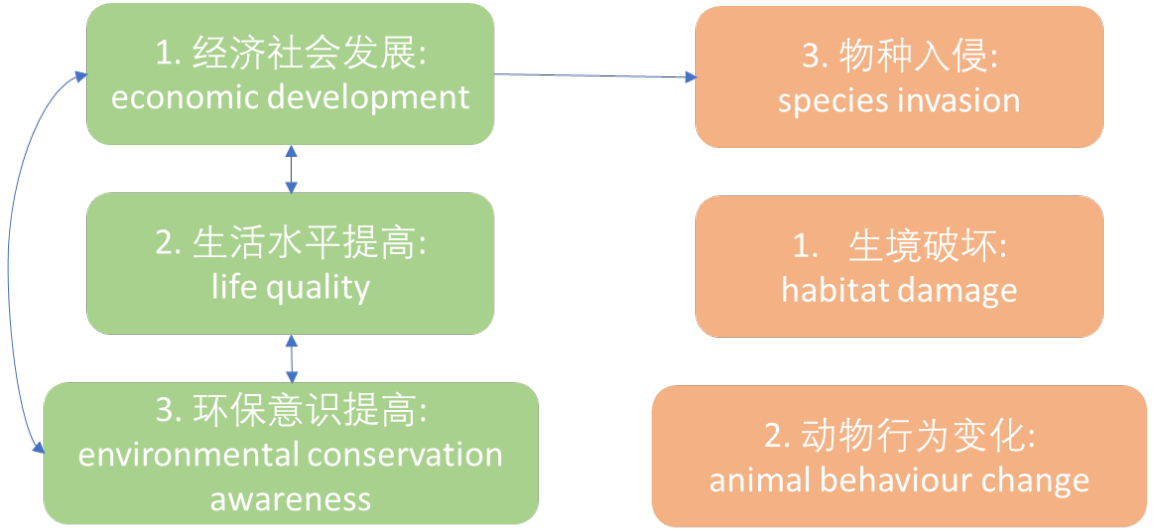
Scientific conceptual model



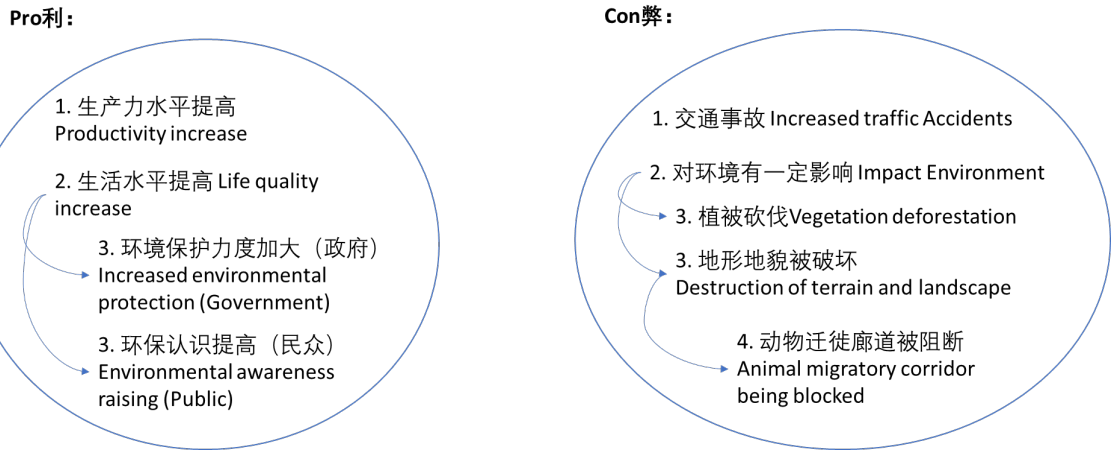
Stakeholder map



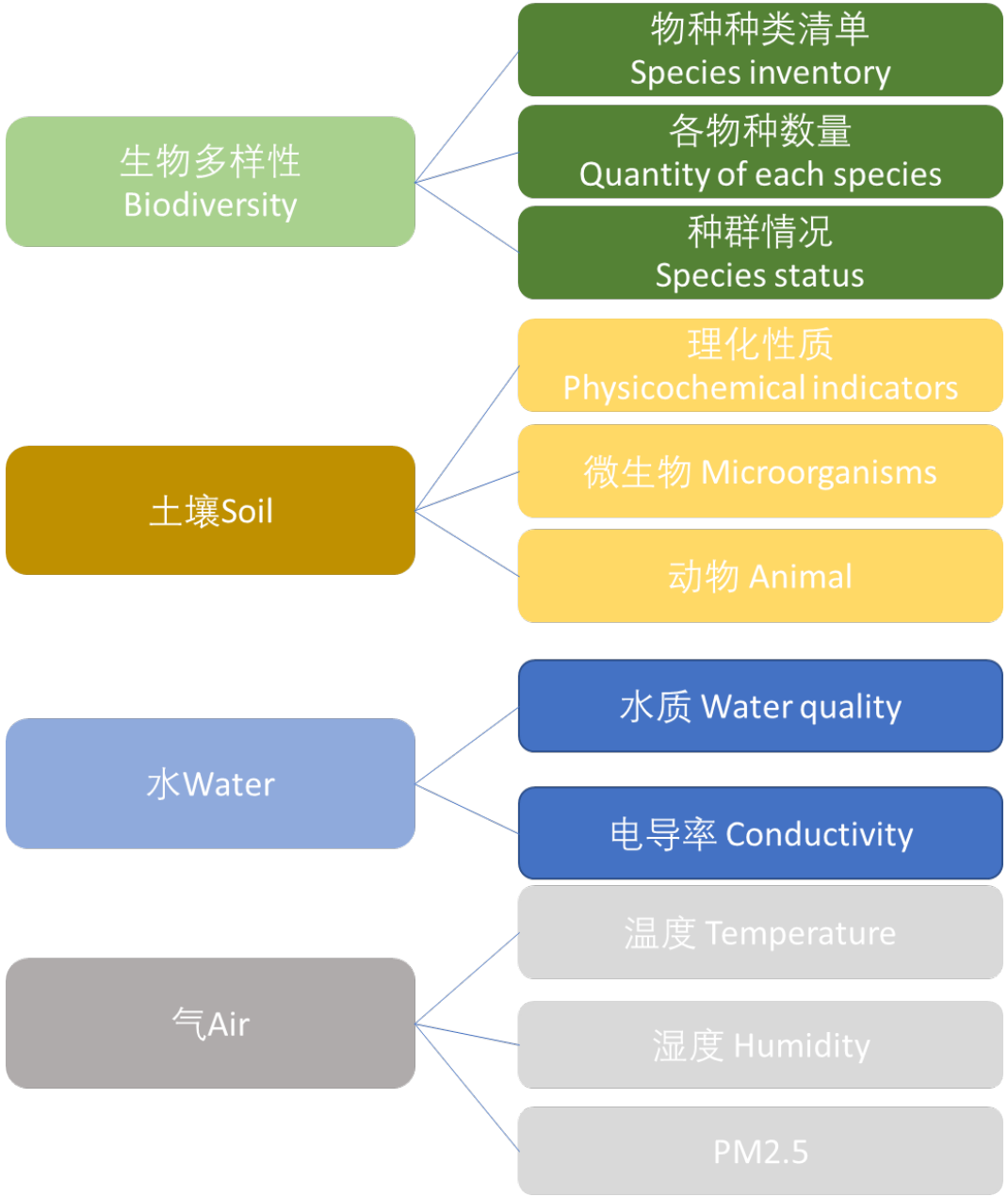
Individual conceptual model



Journalist

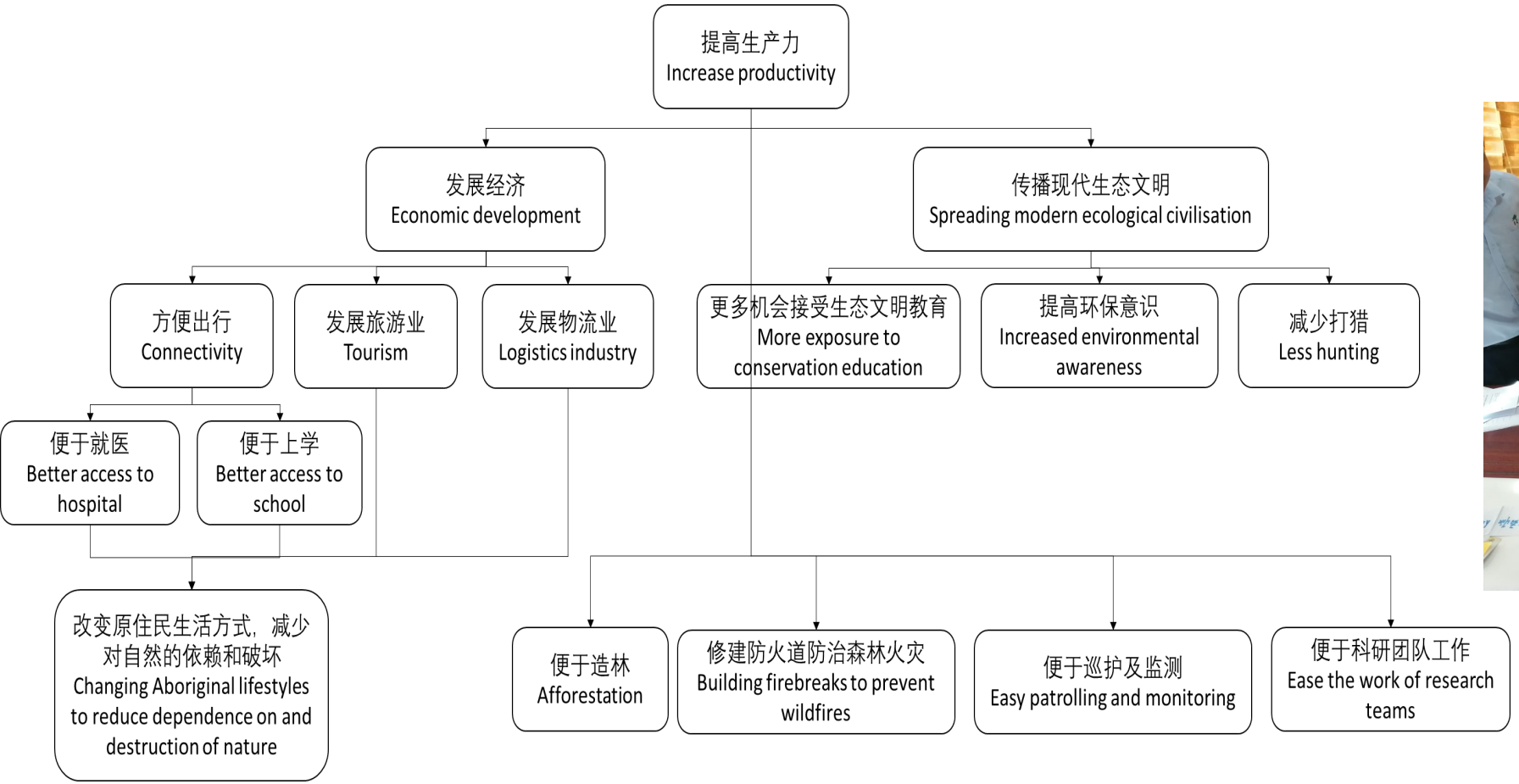


Provincial government official (forestry dept.)



Local government official (forestry dept.)

Collective conceptual model



Future studies: What to do next …

What to do next?

- We will use mental model approach to aggregate all individual models and compare the results.
- Investigate if the SDM method can increase the effectiveness of conservation planning
- The results will presented to conservation managers and government officials who have been conservation decision makers in local conservation.
- Invite more female into the process.
- Construct value hierarchy and create a decision table to integrate scientific evidence and stakeholder feedback
- Test if it can help Structured Equation Modelling process?

Reference

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Thank You!

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Identify value hierarchy in local conservation management