



Power asymmetries in ecosystem services governance: insights from social network analysis

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Power asymmetries in the governance of ES

- ES governance is profoundly linked with issues of power and equity
(Ernstson 2013, Berbés-Blázquez et al. 2016, Chaudhary et al. 2018)
- ES research poorly related to the questions of equity, power and environmental justice
(Ernstson 2013; Felipe-Lucia et al. 2015)
- Methods are needed to better understand inequities and power asymmetries in relation to ES
(Barnaud et al., 2018, Chaudhary et al., 2018, Sikor, 2013)





Power in sociology

- Power is “the ability to affect outcomes or get things done”

(Brass and Burkhardt 1993 p. 441)

- Can be exerted over things or people

(Dahl 1957, Giddens 1979)

→ Relational concept, not inherent to individuals or groups

- Different forms of power
 - Influence (reward, friendship, etc.)
 - Domination (coercive, legitimate, etc.)

(French and Raven 1959, Parsons 1963, Knoke 1994)



Power in sociology

- Typology of the different forms of power:

		INFLUENCE	
		Absent	Present
DOMINATION	Present	Coercive Power	Authoritative Power
	Absent	Egalitarian "Power"	Persuasive Power

Knoke, 1994



Social Network Analysis (SNA) to analyze power asymmetries

- Social network analysis to describe power in organizations

(Cook 1983, Brass 1992, Knoke 1994)

- Network centralities to measure power

(Brass 1992, Knoke 1994, Mills et al. 2014)

- Some applications of SNA to natural resource and ES governance

(Ernstson et al. 2008, Bodin and Crona 2008, Cohen et al. 2012)

→ Not focused on power distribution !

Questions

- How to conceptualize and quantify power using SNA?
- What are the power asymmetries related to the governance of ecosystem services in the real world?
 - Who are the powerful stakeholders?
 - On whom do they exert their power?
 - What are the consequences in terms of conflicts?



Study Site

- Andean watershed (Mariño), Peru
- 284 km²
- Agroforest mosaics
- Presence of a protected area (Ampay Sanctuary)
- Environmental conflicts (water scarcity, urbanization boom, mining activities)



Methods

Workshops

- Selection of ecosystem services
- Identification of stakeholders



Methods

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- Selection of ecosystem services
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52 interviews

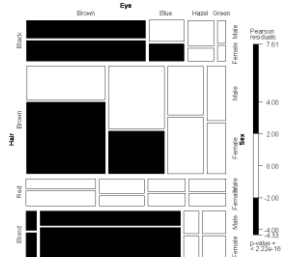
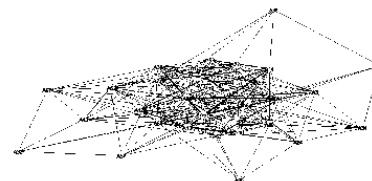
- With who are you exchanging information? Working on common project?
- Who are you supervising ? Controlling?
- With who do you have conflicts?



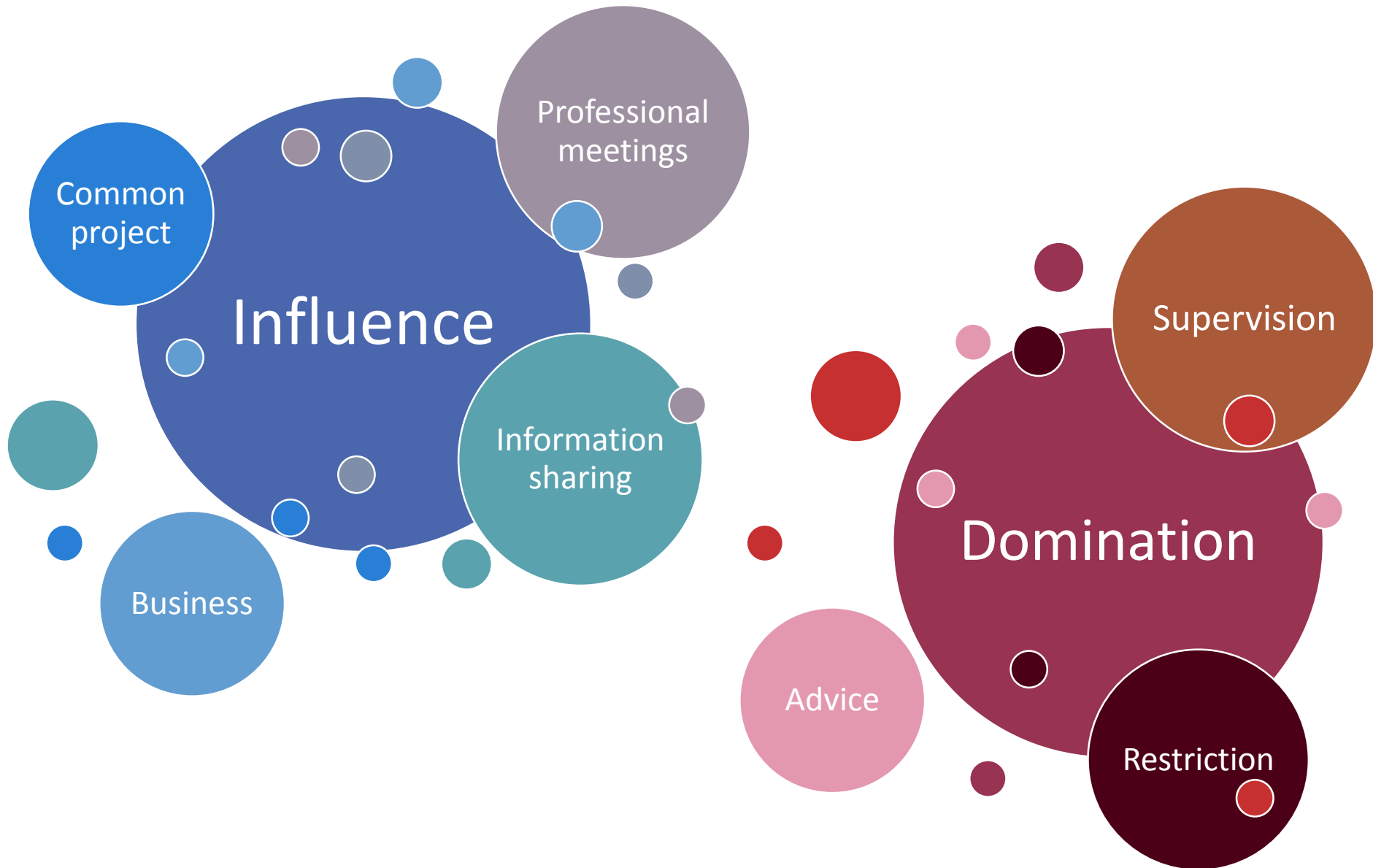
Analysis

- Retranscription and coding of relational information
- Network analysis
- Statistical tests

	A	B	C
A	-	X	X
B	√	-	√
C	√	X	-



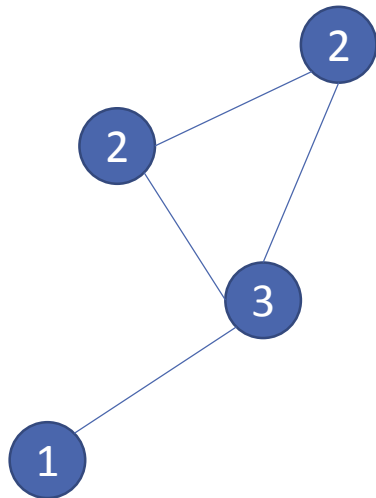
Relationships considered in the analysis



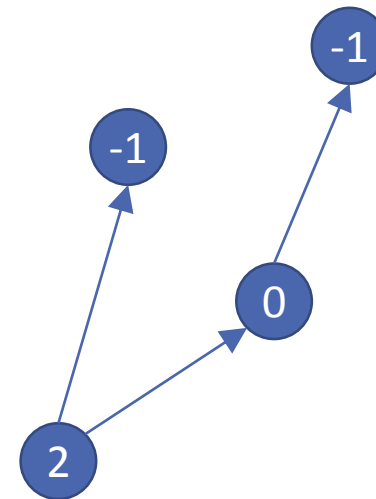
Proxys for influence and domination

Degree centrality: Number of ties that lead into or out of a node. Describes the number of person that can be reached.

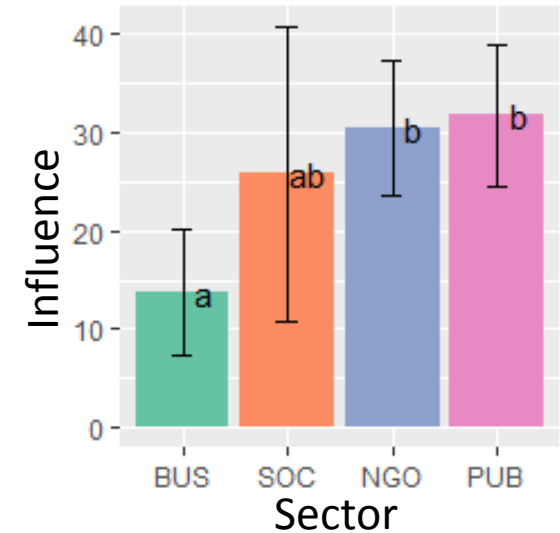
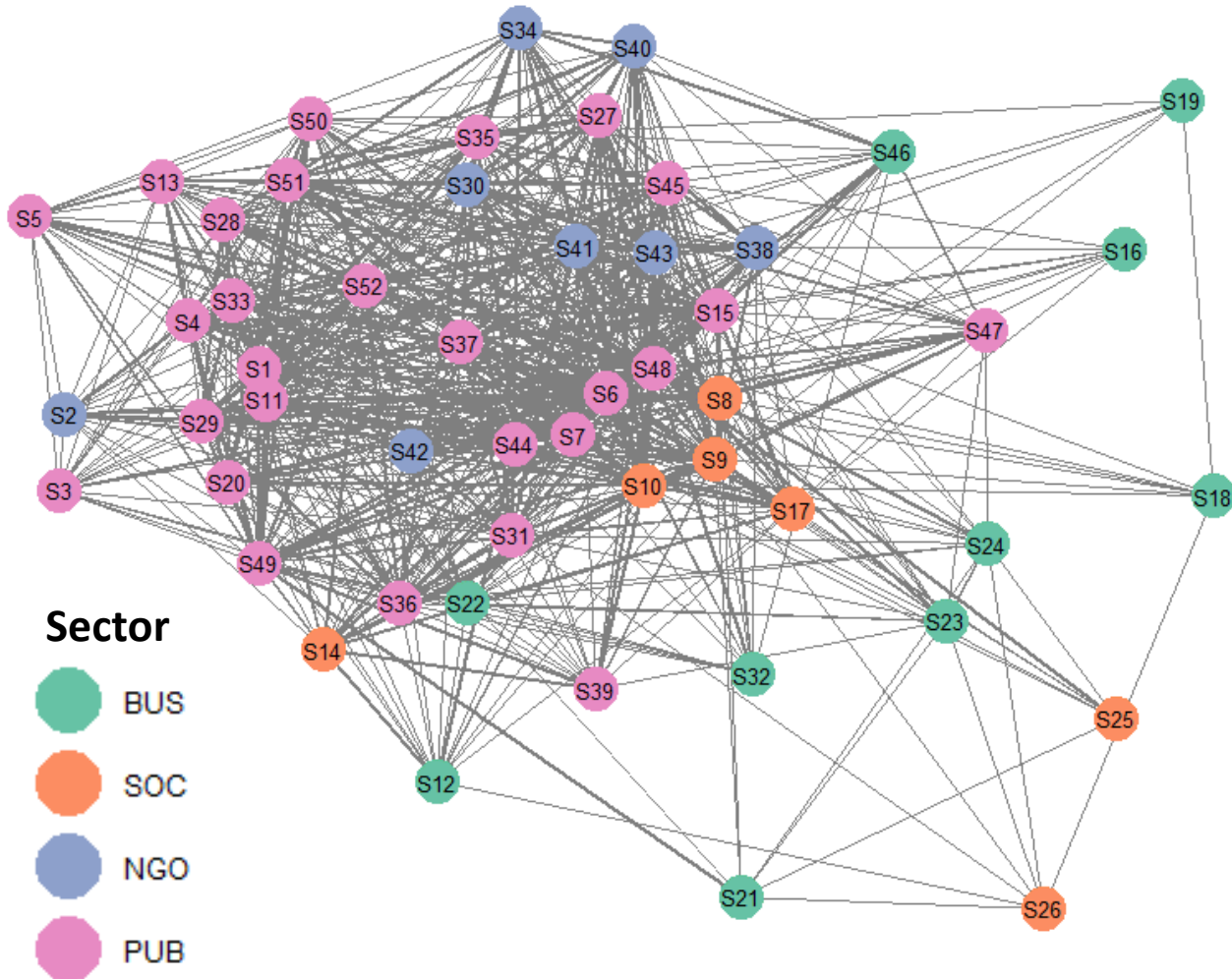
Influence: Degree



Domination: Outdegree-Indegree

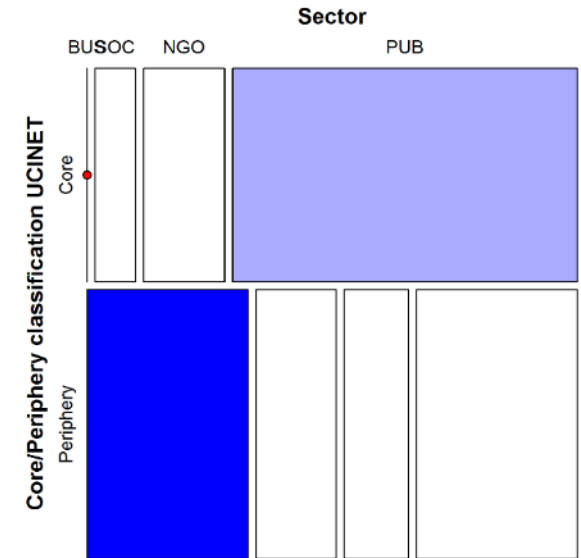
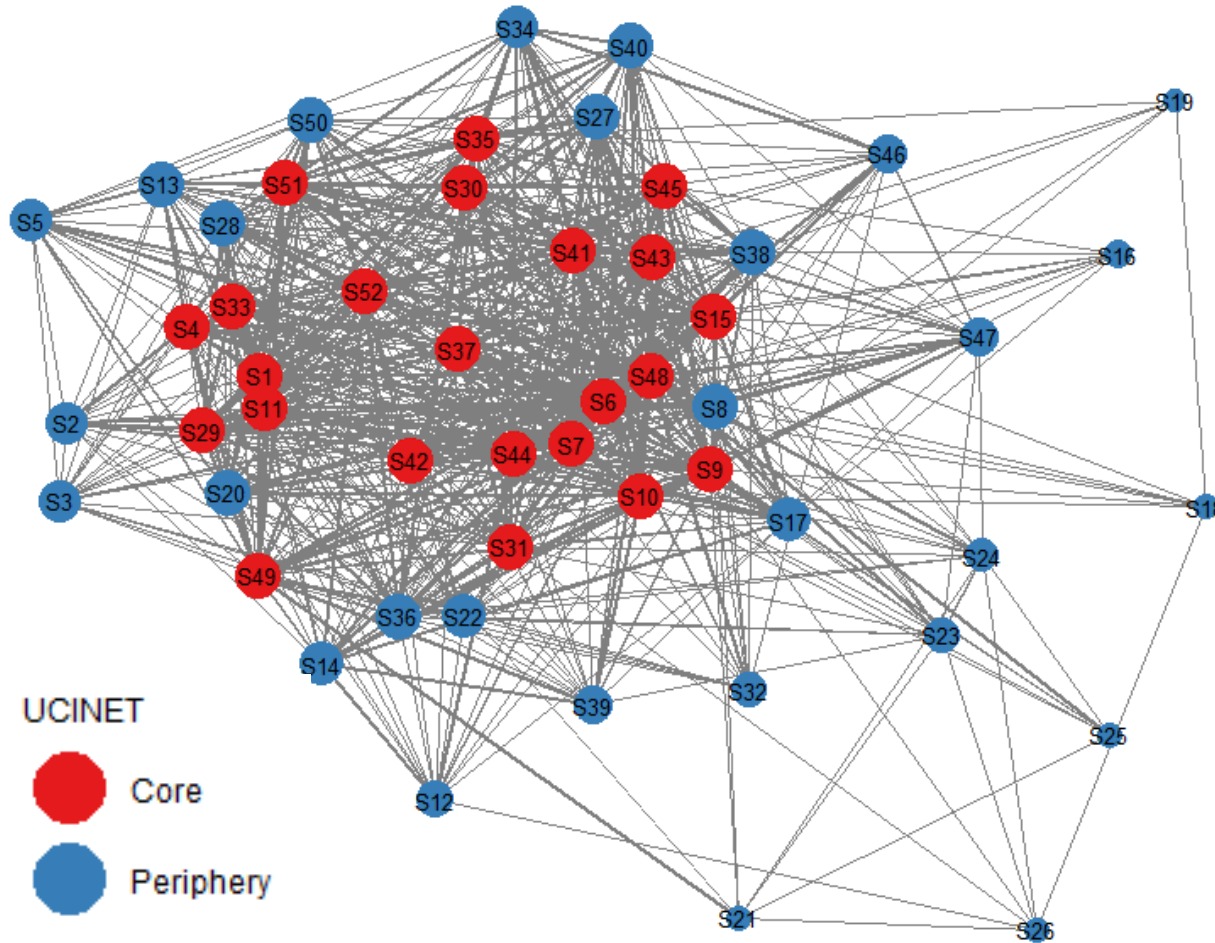


Public sector and NGOs are more influential



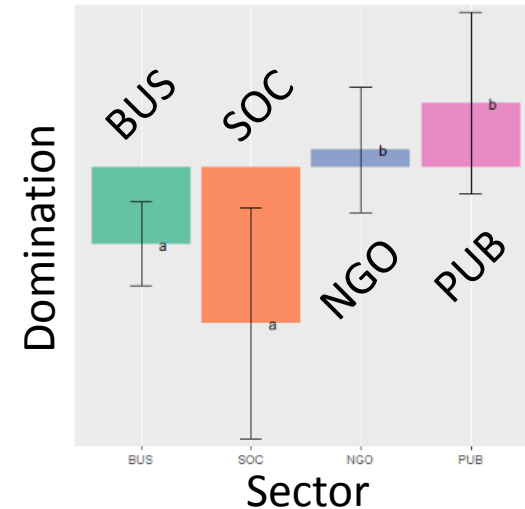
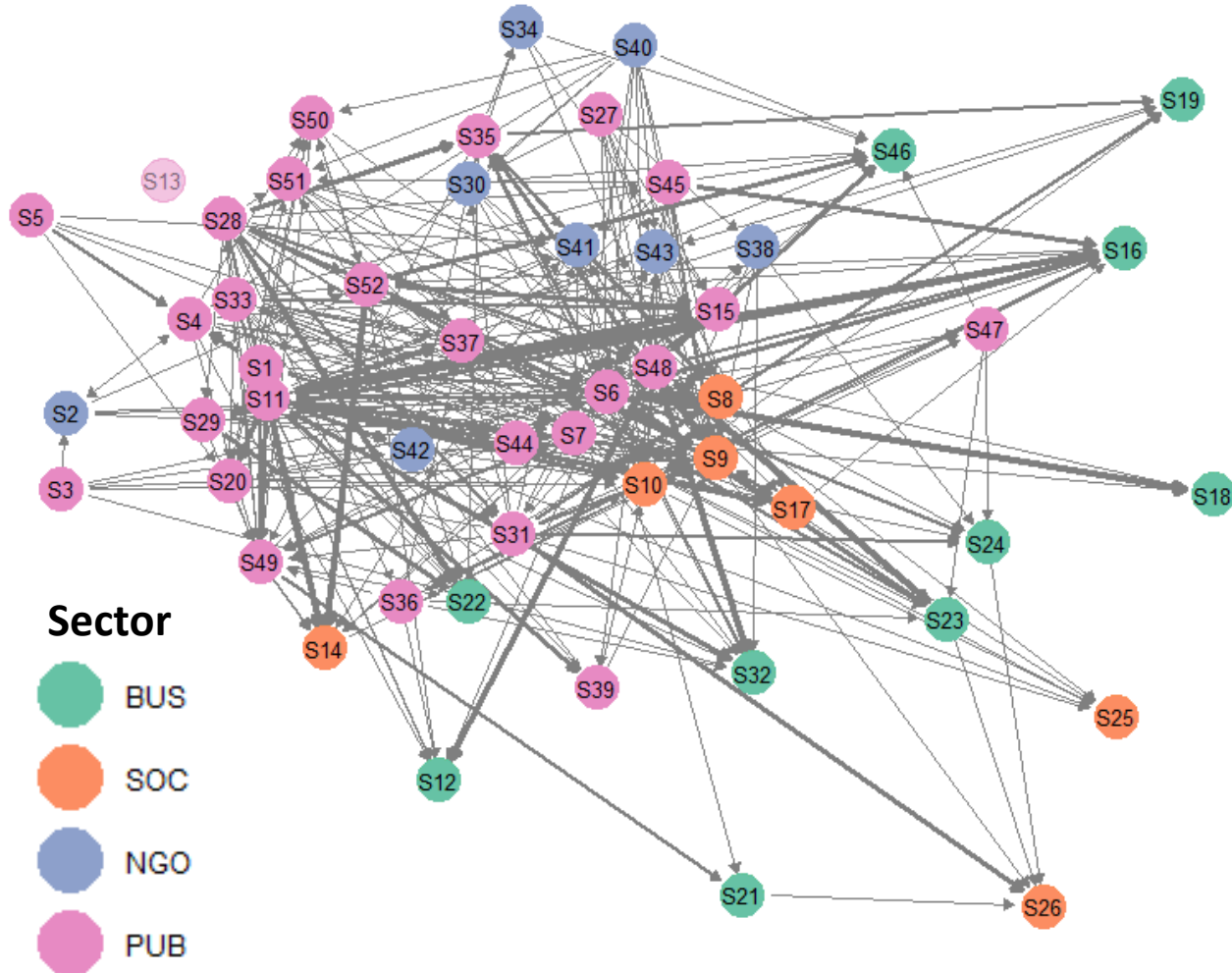
➤ Permutation test, $p < 0.001$

Public sector is in the core of influence network



- Permutation test, $p=0.005$
- Businesses are more likely to be in the periphery, and less in the core

Public sector and NGO are more dominant...



➤ Permutation test, $p < 0.001$

➤ Domination also increases with scale (permutation test, $p < 0.001$)

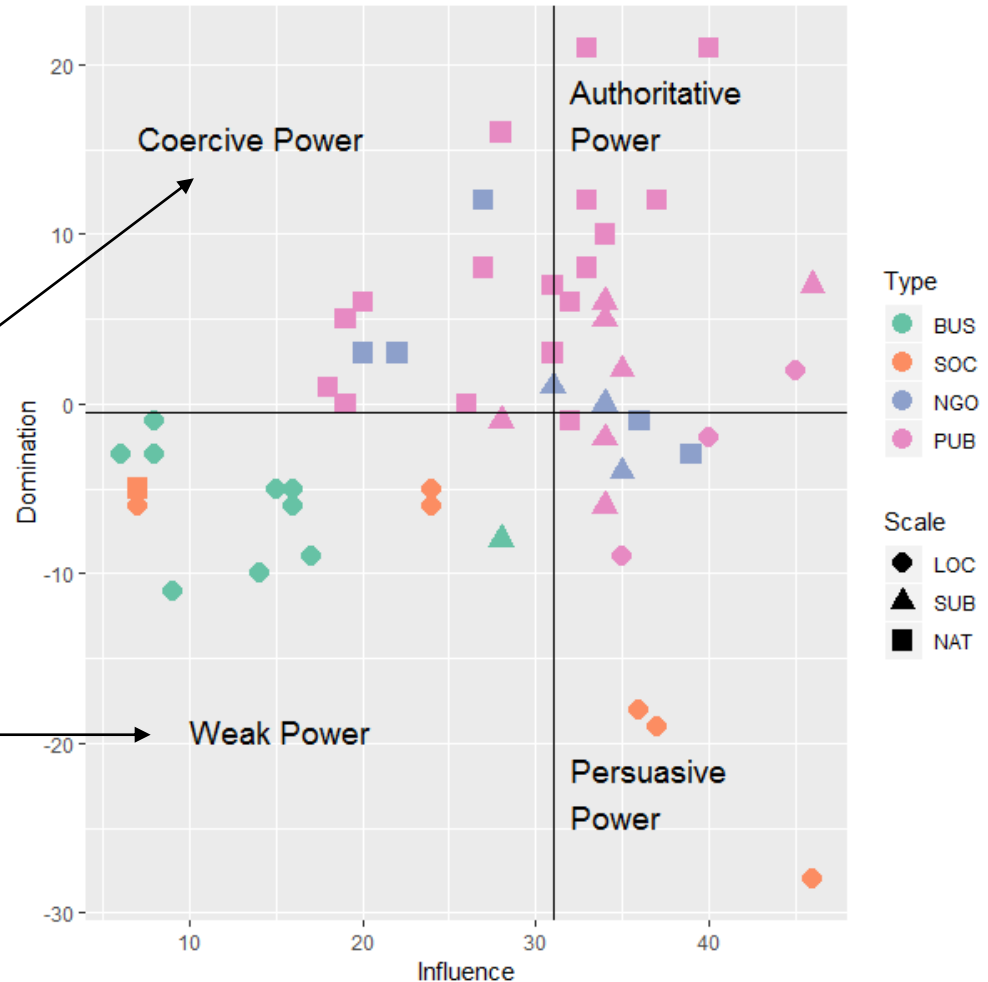
➤ No significant core/periphery patterns

Different forms of power

- Stakeholder characteristics differ among groups (permutation tests, $p < 0.05$)

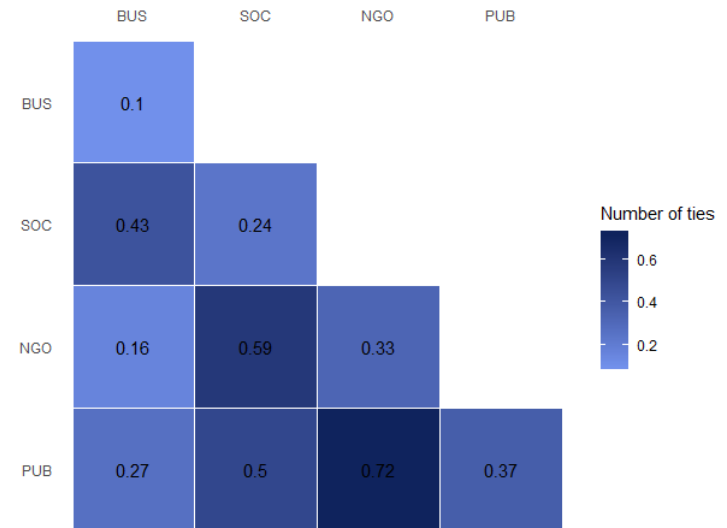
+ national stakeholders
- local ones

+ businesses and civil society;
local stakeholders
- public sector;
national stakeholders



Who exerts power over who?

- Intense influence relationships between:
 - NGO and public sector
 - NGO and civil society
 - Public sector and civil society
- Intense domination happens from:
 - NGO to civil society
 - Public sector to civil society and businesses
- Differences between scales



Power asymmetries lead to conflict

- Logit regressions
- Some types of relationships are more likely to lead to conflicts (p-value <0.05)
- But also differentials in domination
- Good predictive ability

Variable	Estimate	Signif.
Intercept	-2,24	***
Difference in influence	8,2 10 ⁻³	
Difference in domination	4,4 10⁻²	*
Common project	0,41	
Regular professional meetings	2,51 10 ⁻²	
Unregular professional meetings	1,19	**
Information sharing	0,44	
Business	1,60	**
Restriction	1,35	**
Advice	5,4 10 ⁻²	
Supervision	1,11	**

Significance codes ***: 0,001 **: 0,01 *: 0,05

Conclusions

- Social network analysis is an interesting tool to highlight power asymmetries
- Powerful stakeholders are mainly from public sector and national scale
 - Limit the representation of other stakeholders in the governance of ES (equity issue)
 - Reduce the adaptive capacity of the system (adaptation issue)
 - Generate mistrust in institutions that manage natural resources (legitimacy issue)
- Power asymmetries generate conflicts (social unrest issue)
- Some effects will be analyzed more in detail with Exponential Random Graph Models



If you have questions or comments on this presentation:

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