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:

<table>
<thead>
<tr>
<th>DOMINATION</th>
<th>INFLUENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>Present</td>
<td>Absent</td>
</tr>
</tbody>
</table>

- Coercive Power
- Authoritative Power
- Egalitarian "Power"
- Persuasive Power

Knoke, 1994
Social Network Analysis (SNA) to analyze power asymmetries

- Social network analysis to describe power in organizations

- Network centralities to measure power
  (Brass 1992, Knoke 1994, Mills et al. 2014)

- Some applications of SNA to natural resource and ES governance

→ 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

- Selection of ecosystem services
- Identification of stakeholders

Workshops
Methods

Workshops
- Selection of ecosystem services
- Identification of stakeholders

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
Relationships considered in the analysis

Influence
- Common project
- Professional meetings
- Information sharing

Domination
- Supervision
- Advice
- Restriction

Business
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…

- 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

<table>
<thead>
<tr>
<th>Variable</th>
<th>Estimate</th>
<th>Signif.</th>
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</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-2.24</td>
<td>***</td>
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<tr>
<td>Difference in influence</td>
<td>8.2 10^{-3}</td>
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<tr>
<td>Difference in domination</td>
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<tr>
<td>Common project</td>
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<td>Regular professional meetings</td>
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<td>Unregular professional meetings</td>
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<td>Information sharing</td>
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<td>Business</td>
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<td>Restriction</td>
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<tr>
<td>Advice</td>
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<tr>
<td>Supervision</td>
<td>1.11</td>
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</tr>
</tbody>
</table>

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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Thanks for your attention!