Interactions between stakeholders and ecosystem services: social networks and power

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• Stakeholders do not benefit equally from ecosystem services (Howe et al. 2014; Felipe-Lucia et al. 2015)

• Stakeholders play unequal roles in relation with ecosystem services (managers/beneficiaries) (Felipe-Lucia et al. 2015)

• Power asymmetries underpin these inequities

• The concept of ecosystem services is poorly related to the questions of equity, power and environmental justice (Ernstson 2013; Felipe-Lucia et al. 2015)
Social Network Analysis to analyze power asymmetries

- Social network analysis can be used to describe the social dimensions of ecosystem services (Roldán et al. 2015; Ernstson et al. 2008)
- Inequalities are explained by the interactions among stakeholders (Felipe-Lucia et al. 2015)
- The structure of the network captures the nature and the intensity of interactions...
  - Among stakeholders
  - Between stakeholders and ecosystem services
Questions

• What are the power asymmetries related to the benefits from and management of ecosystem services?
  • Are beneficiaries also managers?
  • Are beneficiaries and managers well integrated in the network?
• Which stakeholders facilitate interactions in the network?
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

Interviews (n=28)

- What services benefit each stakeholder?
- What services do stakeholders manage?
- How do stakeholders relate?

- Clustering of stakeholders based on benefits and management
- Network analysis (connections, key stakeholders, homophily)
Ecosystem services

• Selection of 8 services

- Agricultural production
- Medicinal plants
- Purification of water
- Water flow regulation
- Sheet erosion
- Mass erosion
- Regulation of global climate
- Scenic beauty and recreation
Stakeholders – Ecosystem Services networks

Management

Benefits

- Public institutions
- Private sector
- Civil society
- Ecosystem services
Hierarchical clustering of stakeholders

- Different types of stakeholders are found in the different clusters (Chi-Square Test, p=0.013)

- Beneficiaries are mostly from private sector or civil society

- Managers are mostly from public institutions or civil society
Beneficiaries are in periphery

- Stakeholders have different roles in the core and periphery of the network (Chi-Square Test, p-value=0.0427)
- Managers are in the core of the network
- Municipalities are the two stakeholders (10%) with largest brokerage role
Beneficiaries are less connected

- All indicators of network connectivity show differences among stakeholders
  - Beneficiaries have lower connectivity
  - Most managers are well connected, but others are not
Interactions among groups of stakeholders

- Institutions interact mainly among themselves
- Private actors and civil society interact with other stakeholders
Conclusions

• Beneficiaries of ecosystem services are not managers (and vice versa)

• Power of managing ecosystem services is centralized among a few public institutions
  → Limit the representation of other stakeholders (equity issue)
  → Reduce the adaptive capacity of the system (adaptation issue)

• There is a gap between beneficiaries and managers of ecosystem services
  • Beneficiaries are less connected to other stakeholders
  • Institutions interact mostly between themselves
  → Generate mistrust in institutions that manage natural resources (legitimacy issue)
  → Create and enhance conflicts (social unrest issue)
Thanks for your attention!

If you have questions or comments on this presentation:
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