



PECS 2015 CONFERENCE

Social-ecological dynamics in the Anthropocene

3 - 5 November 2015

Spier | Stellenbosch | South Africa

Ecosystem services flows: why stakeholders' power relationships matter

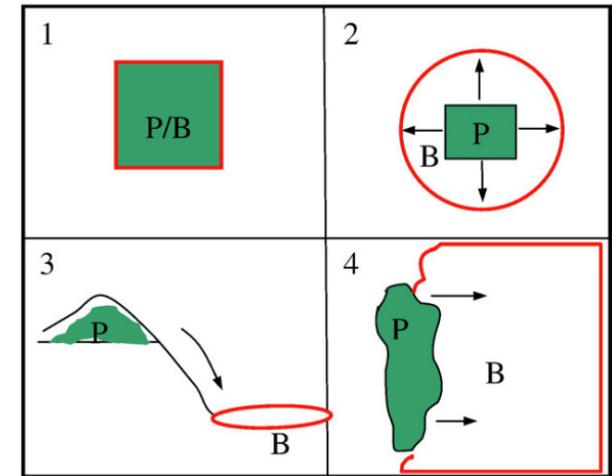
María Felipe-Lucia, Berta Martín-López, Sandra Lavorel, Luis Berraquero-Díaz, Javier Escalera-Reyes, and Francisco Comín. 2015. *PLOS ONE* 10(7).



Ecosystem services (ES) flows



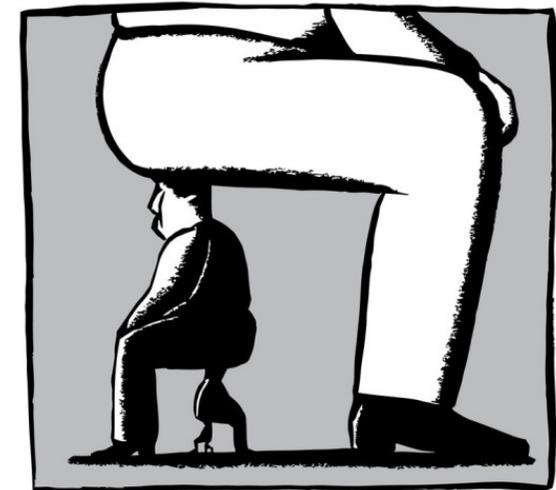
Evaluación de los Ecosistemas del Milenio de España



Fisher et al. 2009. *Ecol Econ*
Hein et al. 2006. *Ecol Econ*

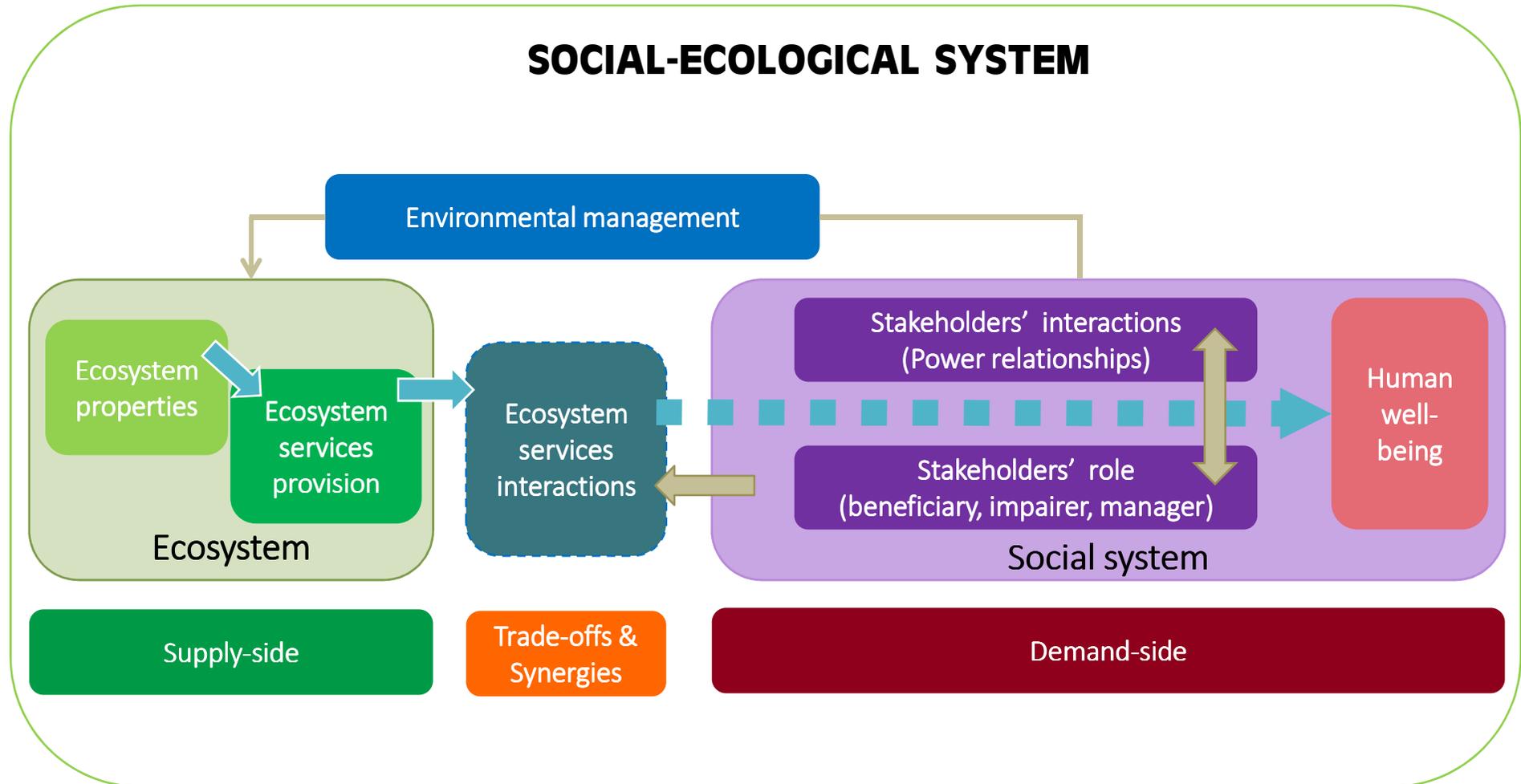


- Reveal the role of *power relationships* that mediate ES flows from the supply by the ecosystems to the users
- Integrate the analysis of *ecological interactions* among ES and of *power asymmetries* among stakeholders
- *Case study*: River Piedra floodplain in NE Spain



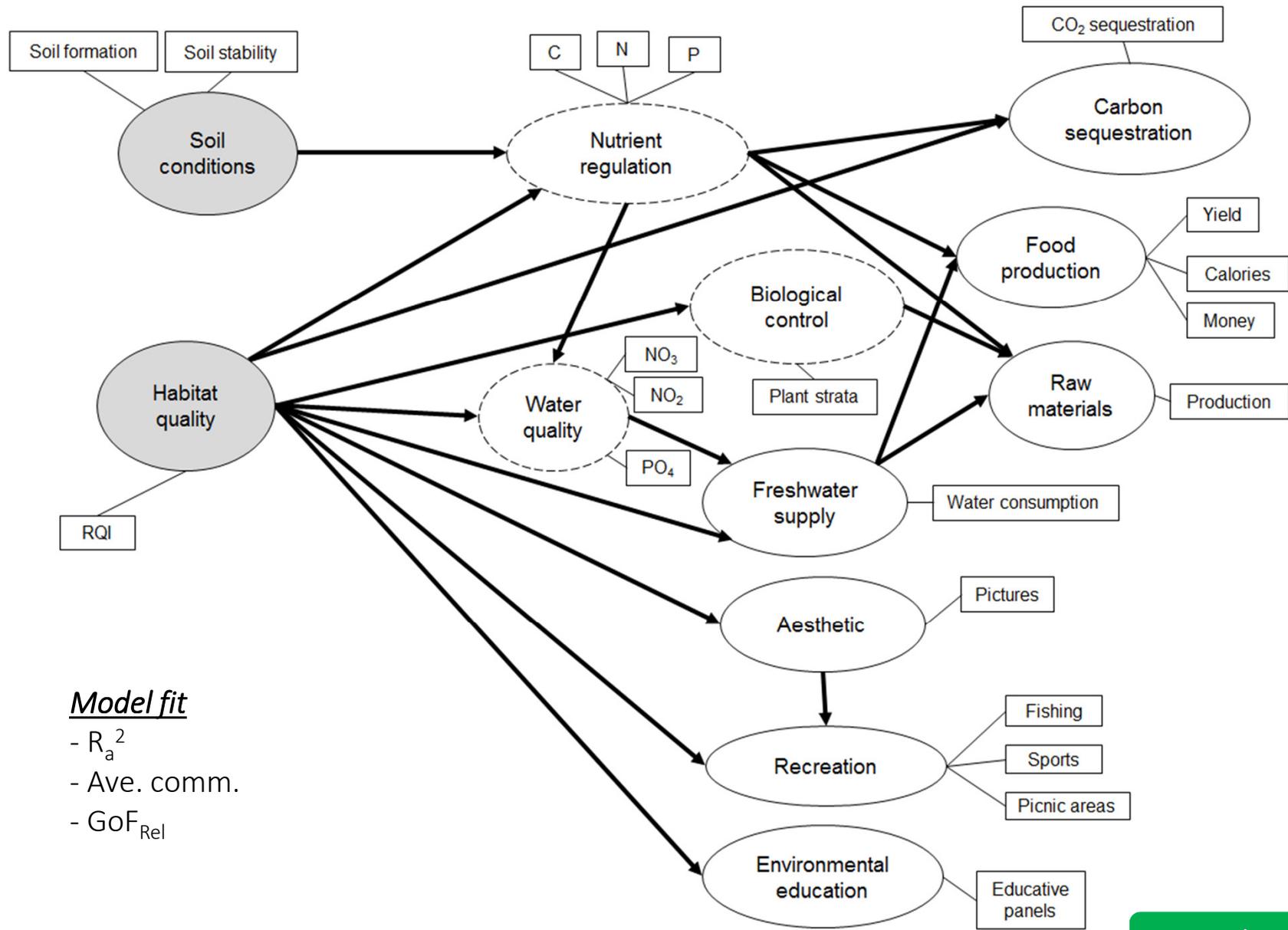
estepais.com
Bagstad et al. 2014 *Ecol Soc*
Plieninger et al. 2015 *Ecol Soc*

Conceptual framework



(Inspired from Haines-Young and Potschin 2010, Martín-López et al. 2014, Spangenberg et al. 2014).

SEM (Structural Equation Modelling)

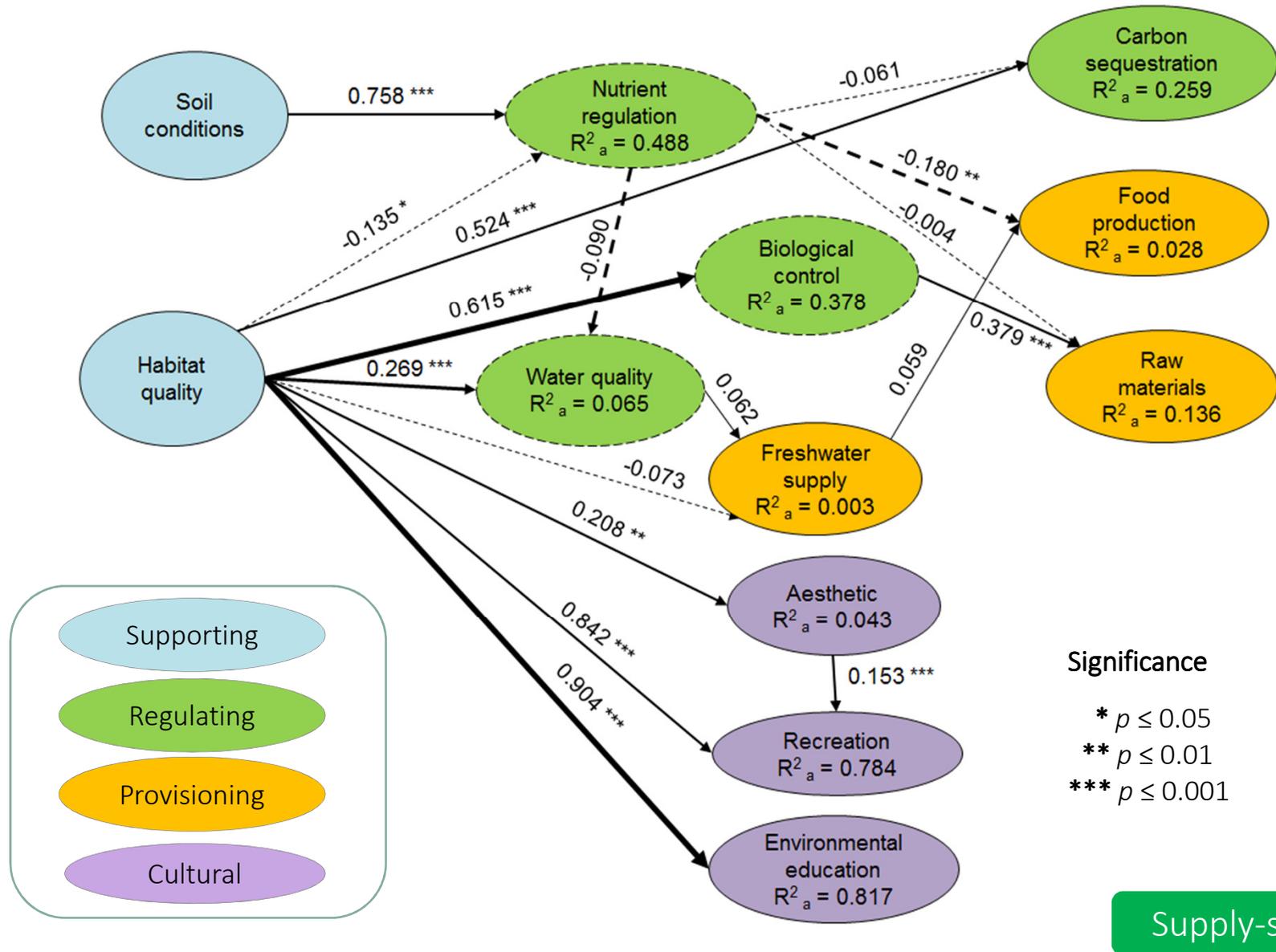


Model fit

- R_a^2
- Ave. comm.
- GoF_{Rel}

Supply-side

ES dependence



Stakeholders' groups

| Group | Name | n | Description |
|-------|-------------------|----|--|
| 1 | Primary sector | 16 | Farmers, shepherds, and workers at a fish farm. |
| 2 | Recreation sector | 13 | Owners or workers at restaurants, hotels, lodges, nature tour operators, adventure enterprises, and at the Monasterio de Piedra (i.e., a regional touristic site). |
| 3 | Leisure | 26 | Retired residents, visitors, hikers, bikers, fishermen, etc. |
| 4 | Institutions | 16 | Local councils. Governmental decision-makers. Scientific and educational institutions. River restoration practitioners. |

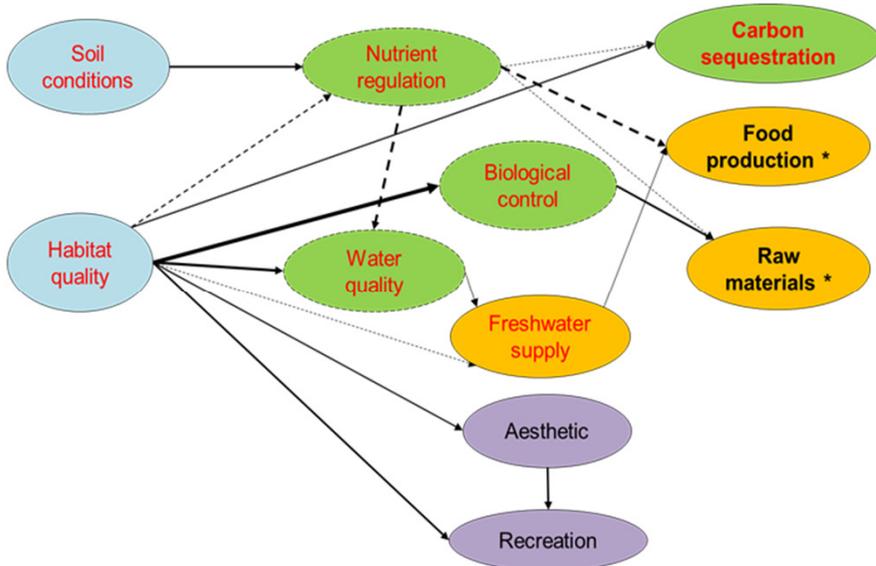


Demand-side

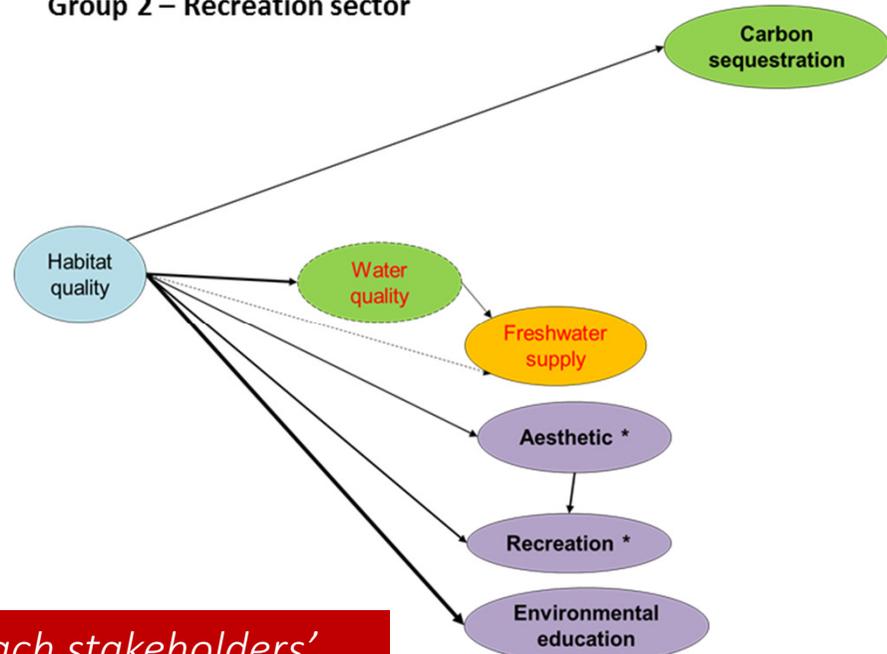
Interviews' analyses

| Ecosystem service | Stakeholder group | Co-produced by | Used by | Impaired by |
|------------------------|-------------------|--|---|---|
| Soil conditions | 1- Primary sector | | <p>Famers use soil properties to growth their crops. For instance, they benefit from organic matter content and layer's thickness.</p> <p style="border: 1px solid blue; padding: 2px;"><i>"Soil is the most important, when it is flooded gives 25% more yield the next year. It is good for farming because the sediments are good" (3_1)</i></p> | <p>Farmers' practices (e.g., tillage) erode soils by oxidizing the organic matter and breaking soils' structure.</p> <p style="border: 1px solid red; padding: 2px;"><i>"Now they [the farmers] use herbicides. They say everything is cleaner, but it breaks riverbanks and the land crumbles" (1_2)</i></p> |
| | 4-Institutions | <p>Scientists, technicians and the government contribute to enhancing this service by ecological restoration projects. "... yes, protection of the aquifer, and the landscape is possible and it has to come from the CHE and the MMA" (3_2)</p> | <p>[Used indirectly]</p> | <p>Usually farmers prefer clear riverbanks to avoid shading diminishing crops yield. In consequence, they used to cut trees and avoid new planting.</p> <p style="border: 1px solid red; padding: 2px;"><i>"We used to clean the riverbanks, we cut tree branches and the grass" (1_3)</i></p> |

Group 1 – Primary sector

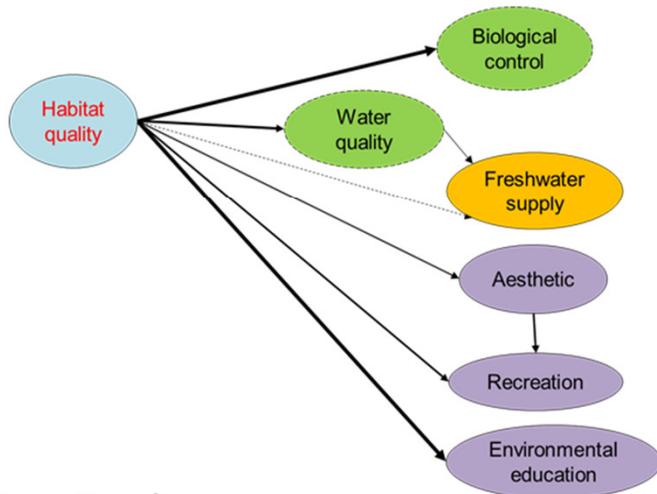


Group 2 – Recreation sector

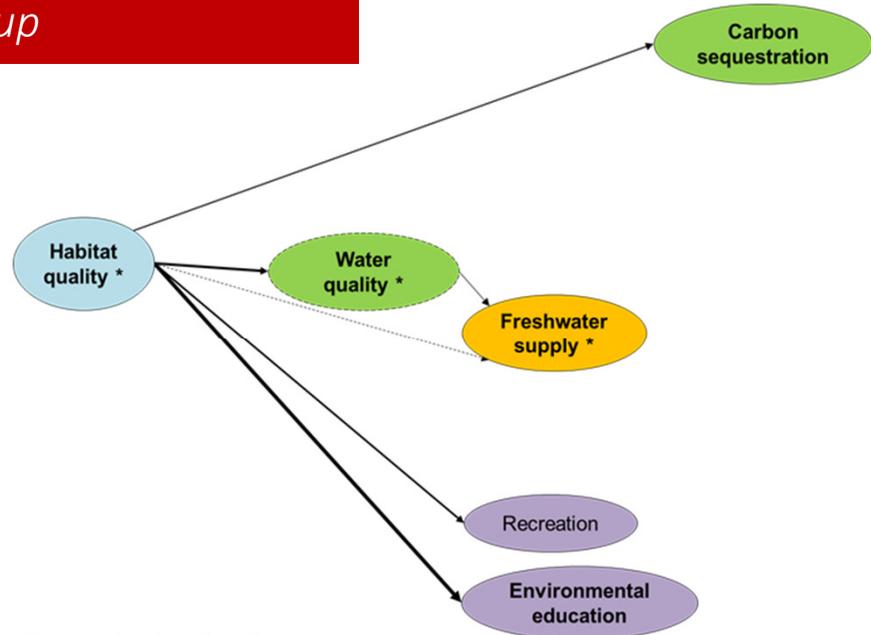


ES related to each stakeholders' group

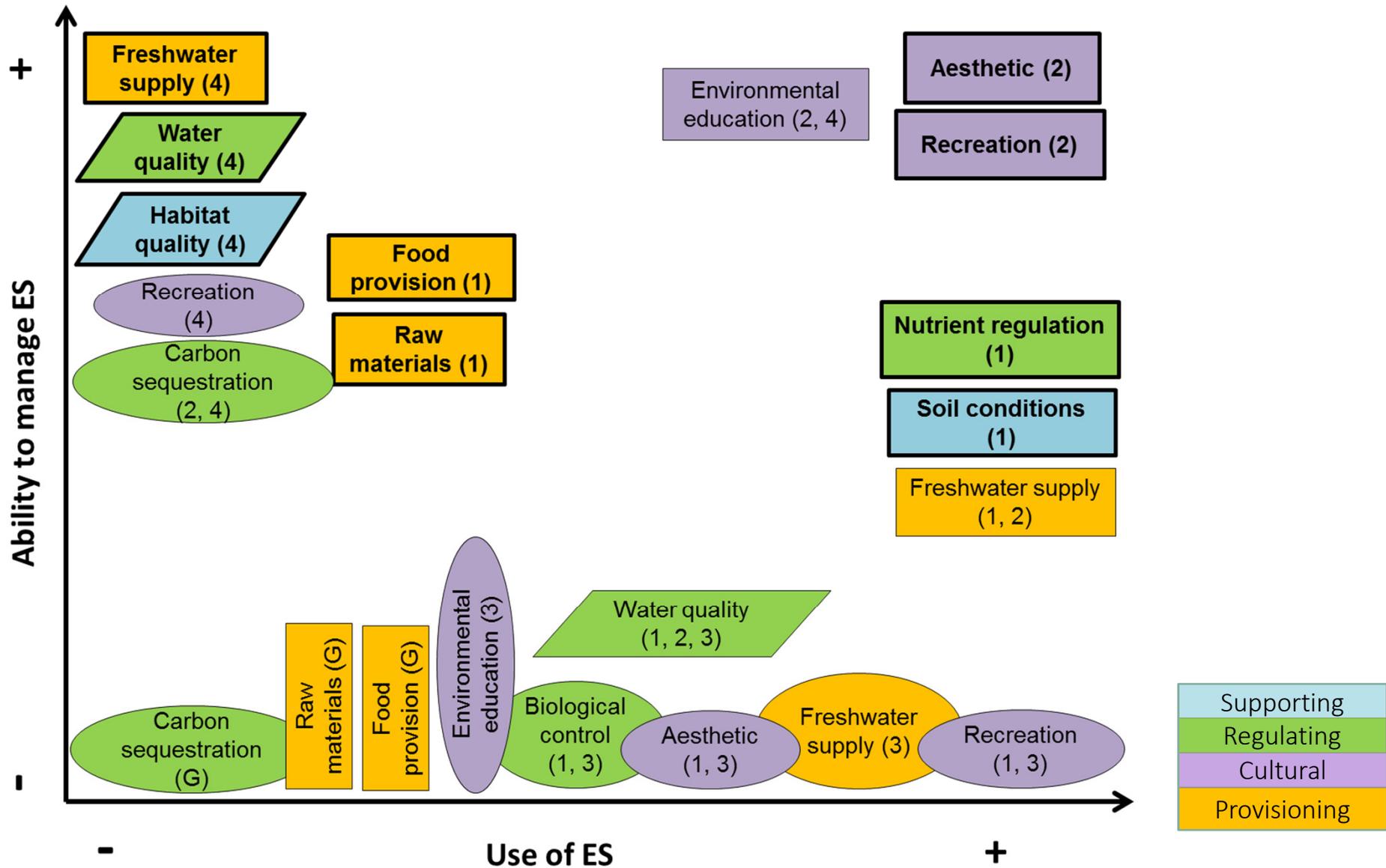
Group 3 – Leisure



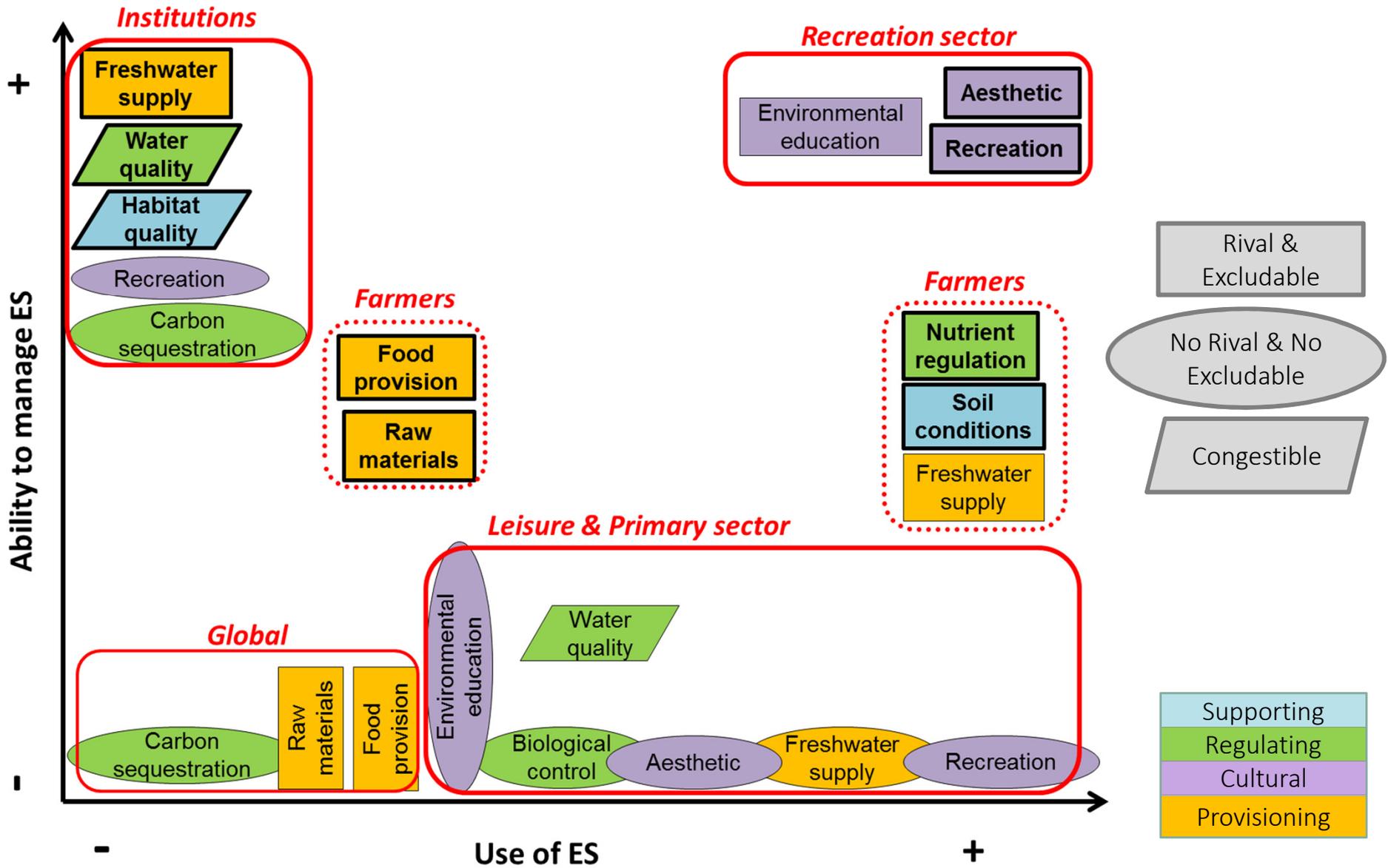
Group 4 – Institutions



Stakeholders mediate ES access



Stakeholders mediate ES access



Key messages

- Dependence relationships among ES → importance of management and use of key ES
 - Supporting and Regulating services →→ Cultural services
 - Provisioning: + disconnected because of external inputs dependence
- Formal power relationships identified: capacity to access and manage ES → ES flow
- Land stewardship, access rights, and governance → critical to determinate ES status
- Most powerful stakeholders:
 - Unique managers → control access and use of ES
 - Control key ES:
 - affect other stakeholders
 - capacity of ecosystem to provide ES
- + equitable access:
 - ES interactions
 - ES governance
 - Stakeholders' role regarding each ES
 - Power relationships among them

Thank you
for your attention!

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