

Measuring the impact of a public research organization on environment:

A methodology based on case studies and an expert panel

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Our research

- Assessment of socio-environmental impacts of agricultural research at the level of a PRO
- A generic metric built by a panel of experts using a collection of case-studies
- That can be used to by the PRO for the assessment of new case-studies

Asirpa approach for ex post impact

- Case studies with standardized set of tools
- Information about impact dimensions given by stakeholders
- Impact radars to visualize impacts at the level of institution
- How guarantee that radars are comparable?
- Need for generic metric: robust and transparent evaluation across cases
- Our proposal: having an expert panel build a rating grid to be used for self-rating of all cases that will be produced



Outline

- Review of literature: environmental impact of science and expert panels
- Design of the metric, using an expert panel
- Discussion: interest and limitation

Literature on environmental impact of science

- Environment is a grand challenge (Ferraro et al 2015)
 - Issues are **complex** (not discrete problems), intertwined, impossible to glimpse the entire system;
 - Issues are **uncertain**: impossible to problematize both future consequence of actions and future preferences of actors
- **Evaluative** problems: actors have different philosophies about nature of problem and acceptable solution
 - No consensus on a unified framework
 - Need for an ad-hoc method recognizing problems

Literature on expert panels to assess research impact

- Expert panels used for societal impact evaluation
- Recommendations :
 - provide synthesis of data (Ruegg and Feller, 2003)
 - ensure composition with overlaps in competences (Arnold et al. 2005)
 - Panels involving stakeholders and end-users with experience in the exploitation of research (Bornmann 2013)
 - Experts' rationale and criteria for judgment should be explicit for more transparent evaluation (Arnold et al. 2005)

Our framework of analysis

- Practice often disentangle impact into localized effects, global effects, and pressure on resources .
- Local or national impact related to pollutions and destruction of ecological compartments
- Global impact related to issues with international commitments: biodiversity and climate change.
- Impact on resources consumption for the production of goods
- Systemic features of solution provided by research

Consultation of our expert panel

- Upfront preparation for 32 case studies: for each case evidence of environmental impact by stakeholder's collected and analysed in four dimensions of our framework
- Expert panel composition: experts in stakeholders' institution, research to policy or foresight division
- 1st stage: experts note each case along 4 subdimension, expliciting evaluation criteria
- Meeting of experts, confront evaluation criteria, discuss and compare values expressed by criteria, build evaluation grid.

Results

- Four subdimensions accepted by the expert panels :
 - pollutions and destruction of ecological compartments, biodiversity, climate change, resources consumption, search for systemic solution
- For each **thematic sub-dimensions** following criteria selected by experts:
 - Importance/gravity of problem at stakes
 - Originality and quality of research outputs for thematic dimension
 - Geographical scale of adoption/ potential perimeter
 - specific impacts
 - Negative impacts and potential long-term impacts

Results

- contribution to a **systemic approach**, experts consider:
 - scientific originality of the solution /systemic challenges,
 - absolute scale of diffusion
 - contribution to the emerging of a more sustainable system

Agregating to a single mark?

- Challenges: interferences between subdimensions, loss of information
- Two options:
 - algorithm to compute weighted average of the subdimensions marks. (must not penalize “specialised cases”, nor “polyvalent cases”)
 - invoking an integrative concept, related to PRO mission (e.g. sustainable development, ecosystemic services defined by the Millenium Assessment Goals)

Next steps

- Rescoring all 42 cases available to date to test robustness
- Explore learning potential
- Convening new expert panel regularly to refine criteria for scoring on dimensions if new usages appear.

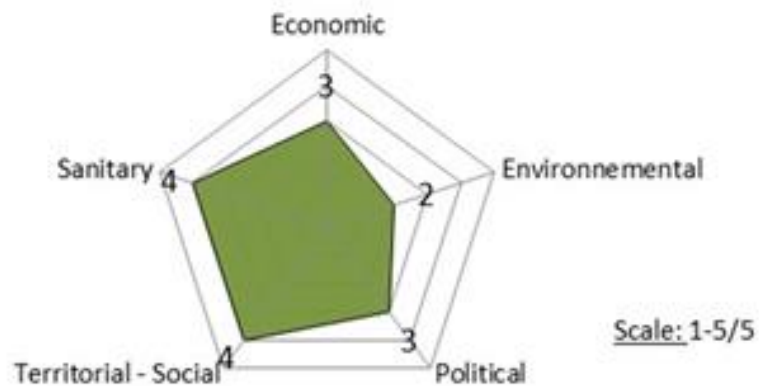
Thank you for your attention

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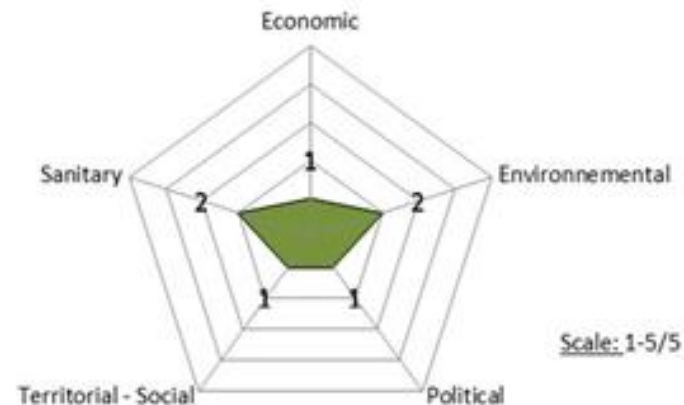
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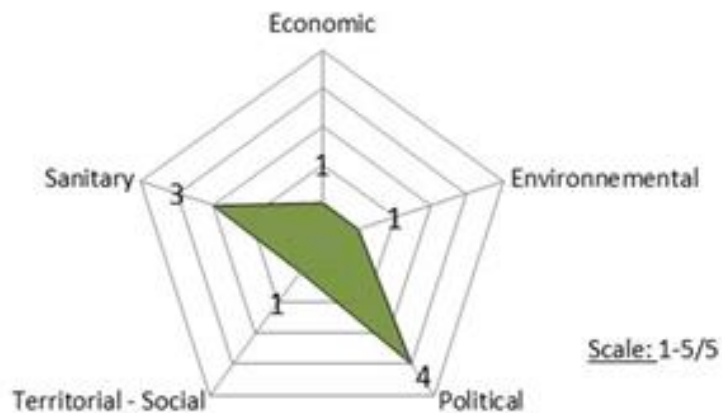
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