



International cooperation on Earth Observation in the course of GEOSS

An evaluation based on game theoretic and economic concepts.

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Objectives of the study

- ❖ Identifying challenges in managing and implementing GEOSS as a public good.
- ❖ Examining how these problems are discussed in economic and game theoretical literature.
- ❖ Examining problems concerning the user integration of GEOSS.

PROBLEM STATEMENT

GEOSS as a public good:

- ❖ GEOSS shall be made accessible freely or at a very low cost
- ❖ Earth Observation is the basis for improved environmental policy making. Improved environment is non-rival and no-exclusive



LEADING QUESTIONS

1. If contribution to GEOSS is voluntary, what are the consequences for the provision of GEOSS?
2. What could be the implications of insufficient information exchange between GEOSS participants?
3. How can technological/data standards emerge in a self-organizing process and in the absence of a binding data sharing agreement.
4. What are the considerations when integrating private providers to GEOSS?

1. Voluntary participation

- Socially optimal size for an agreement to provide a public good is full cooperation.
- Fraction of members to an agreement decreases with the number of affected countries.
- Tradeoff between breadth and depths of an agreement. Agreements tend to codify actions which agents were already undertaken
- External institution to induce cooperation

2. Asymmetrically distributed Information

- Asymmetrically distributed information lead to
adverse selection
moral hazard
- Informational asymmetries can lower outcome in situations of cooperation.
- External monitoring institutions can have a positive effect on information disclosure

3. Standard setting and the role of a technological leader

How can standards emerge in a self-organizing process?

- Network effects and increased benefits (direct network effects, indirect network effects).
- Agents often delay the private provision to a network.
- Agents fear to be stranded with a technology or standard which no one else uses.

4. Public-Private Partnerships

- ❖ Provision of a public good requires different inputs: possibility for partnerships to exploit the comparative advantage in production, and relative project valuation.
- ❖ Private sector is usually motivated by profits and might give insufficient weight to quality or safety issues.
- ❖ Both partners will have risks involved.

User Integration

- ❖ User integration should not only focus on how the end-users can access GEOSS, but also on how users can be integrated in the process of designing and implementing GEOSS.
- ❖ Strengthen visibility of GEOSS in the general public.
- ❖ Is the GEO Web portal sufficient to address all users? Could the integration of social scientists as a bridge between natural scientists and users help?

Conclusion

- ❖ Game theoretic and economic concepts offer explanations for possible trends and scenarios concerning the provision of a public good.
- ❖ The provision of a public good demands an **external institution** as coordinator. The GEO secretariat might fulfill this role by providing guidance for the GEOSS components, establishing a framework for cooperation, and fostering political approval for the tasks.
- ❖ Similarly, optimal standard setting and achieving interoperability can be jeopardized without guidance of an **external institution**.
- ❖ Asymmetrically distributed information and insufficient communication might be a major barrier to the establishment of GEOSS. An **external institutions** could focus on setting incentives to foster revelation of information and communication.