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The Hydrosocial Cycle approach to deepen on socio-ecological systems analysis and water management

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adapting by learning



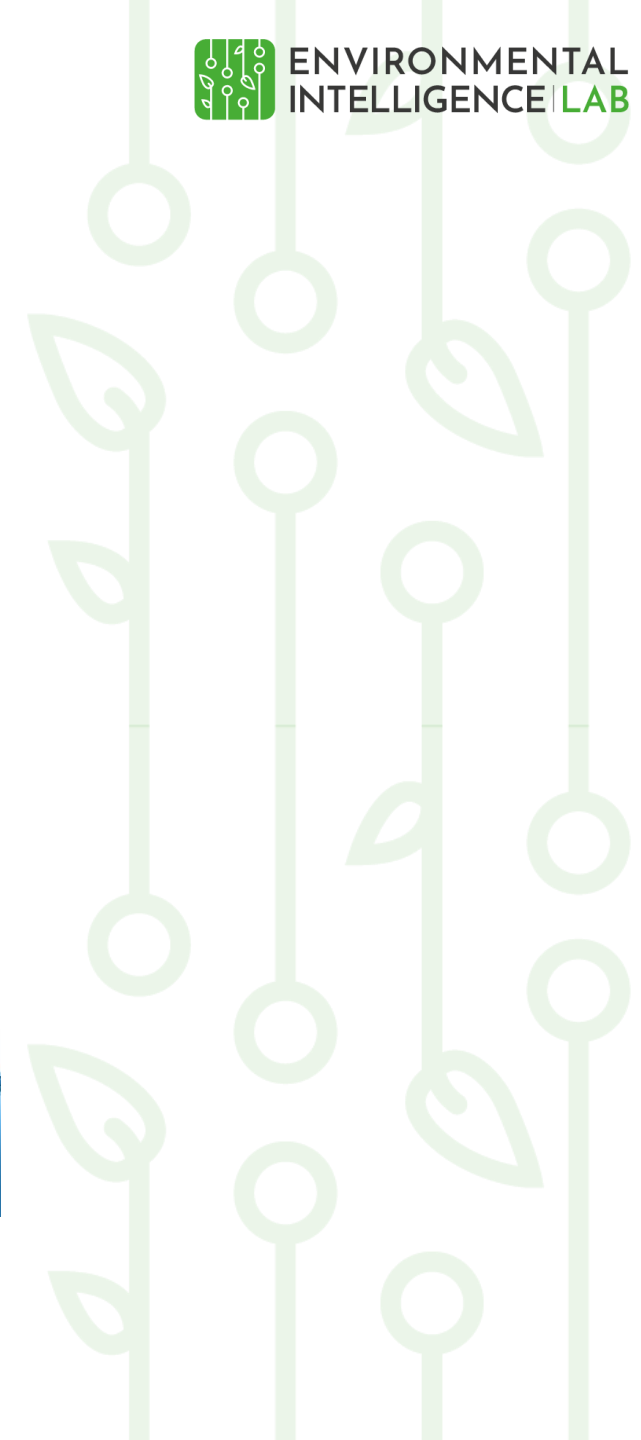
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HYDROSOCIAL: WATER AS SOCIAL RESOURCE

Water is both a biophysical and a social resource, because water and society are (re)making each other.

Social conflict over water resource allocation affects the resource, while the hydrological features of water resources affect who has access to water, when, where, and at what cost.

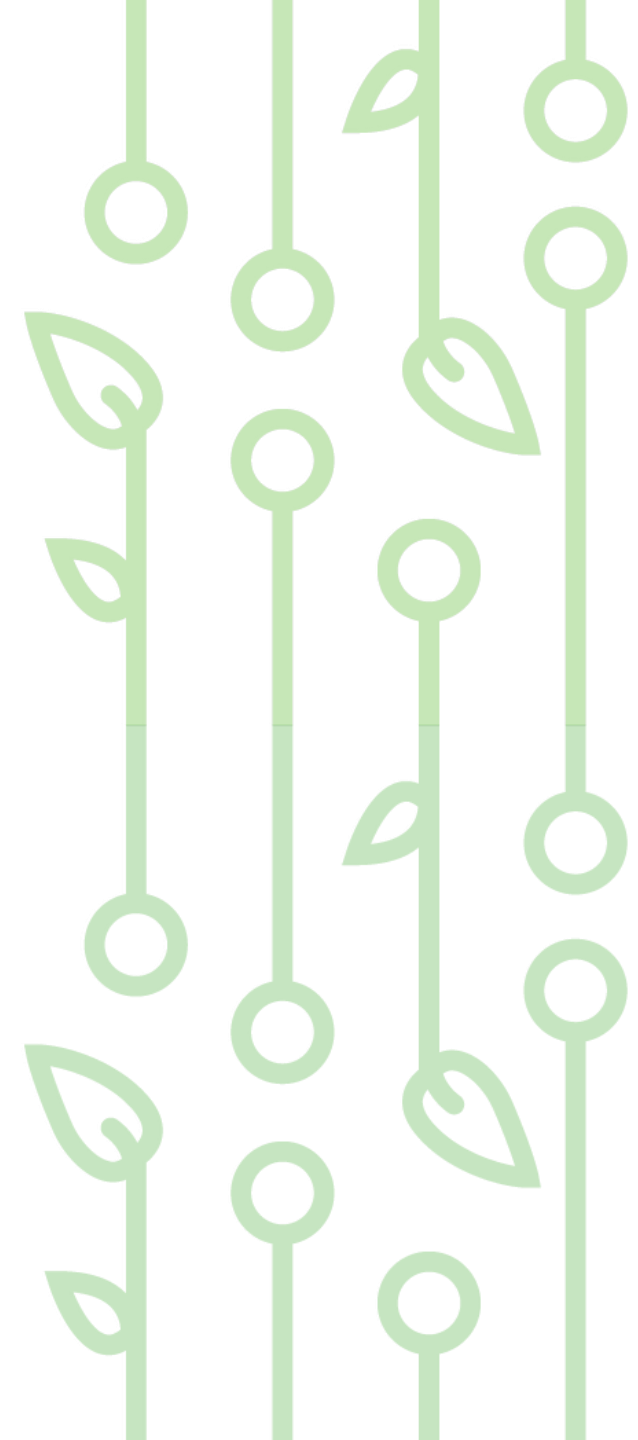
Stakeholders' competing objectives affect the management and governance of socio-ecological systems (SES).



Research question

HOW TO ENSURE STAKEHOLDERS' ENGAGEMENT IN DECISION-MAKING PROCESSES FROM SOCIAL LEARNING?

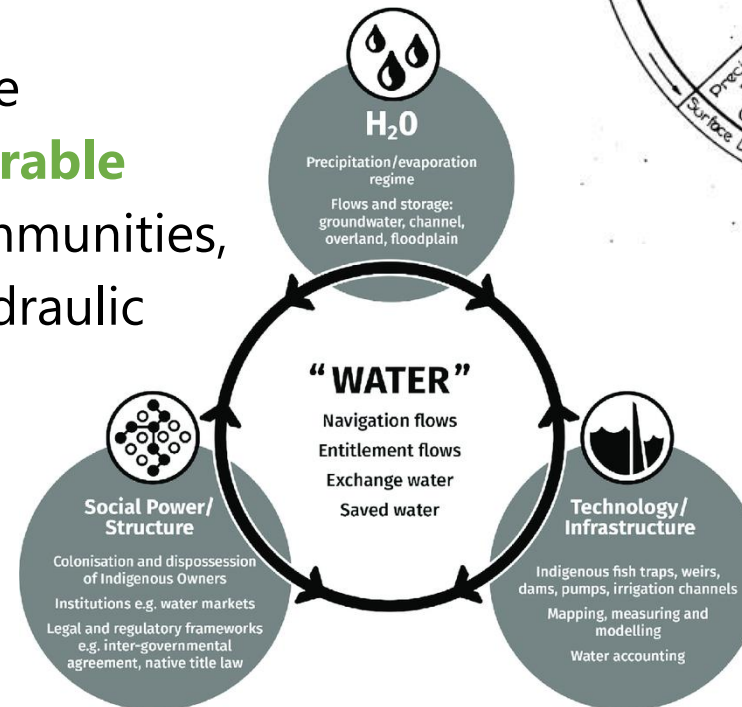
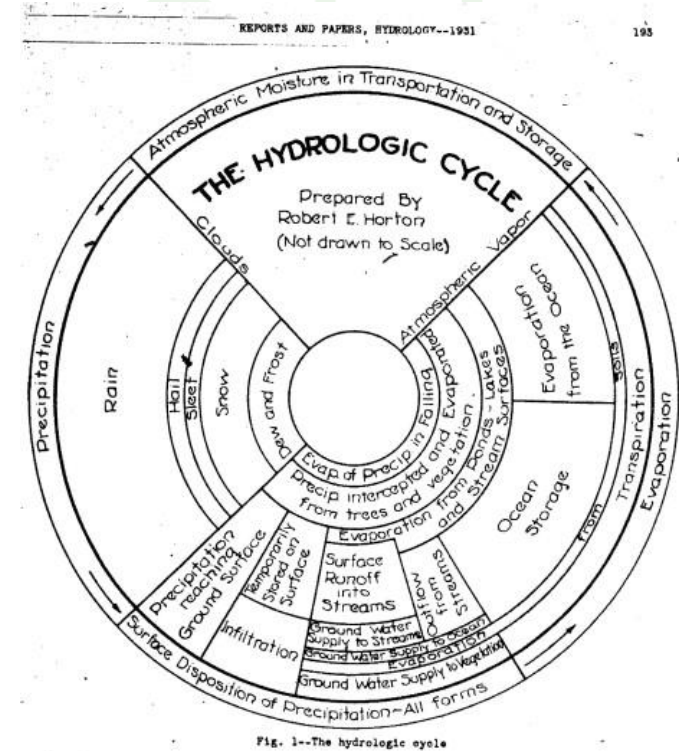
- How stakeholders (including society) behaviour influence water management?
- Is the participation process fair and legitimate?
- Does social-learning occur early and regularly during the decision-making process?
- Is learning a reason for or a result of the participation process?



THE HYDROSOCIAL CYCLE

The **HydroSocial Cycle (HSC)** framework has been used to evaluate **the impact of unequal power relations** from a social, political, economic, cultural and territorial point of view in relation to the use and management of water, the **role of infrastructures** and the **discourses over water** which produces **unequal benefits and impacts**.

This framework has been usually applied to analyze **environmental justice** conflicts which affect **vulnerable populations** (informal settlements, indigenous communities, popular movements against the construction of hydraulic infrastructures).



Stakeholder analysis, Governance Model Approach and data triangulation (to identify **asymmetric information** across stakeholders) may complement **Hydrosocial Cycle** with **new tools** and **analytical approaches**.

Stakeholder analysis:

- Analysis of conflicting interests, taking into account all parties' interests and demands → Building of stakeholder (SH) profiles through interviews and/or questionnaires results

Governance model approach:

- Analysis of relationships (interconnections, interactions and influences) to identify affinities/rivalries among stakeholders → Social Network Analysis

THE HYDROSOCIAL CYCLE AIM

The HSC claims for **social-learning** and **mutual understanding** between water users, managers, and society.

It is essential to check and compare **SHs roles** and their expectations and perceptions on how SES management is running and how it should run in the near future.

- Uncovering **power relations** between stakeholders
- Defining **stakeholders relationships** and **interactions**
- **Interpreting** and proposing **solutions** to the main **challenges** and **threats**

THE HYDROSOCIAL CYCLE METHOD

Data collection —→ Questionnaire

11 qualitative questions
Closed-ended and multi-choice
Likert scale

Data analysis —→ Descriptive statistics and matrices

6 issues

- **Relevance:** Power/interest, and actions developed by each SH
- **Representativeness:** Involvement and participation of each SH
- **Recognition:** Bilateral valuation and importance between SH
- **Performance:** Bilateral under/overvalued assessment between SH
- **Knowledge:** Bilateral (lack of) background on SH' role and actions
- **Collaboration:** Current and potential agreements between SH

THE HYDROSOCIAL CYCLE METHOD

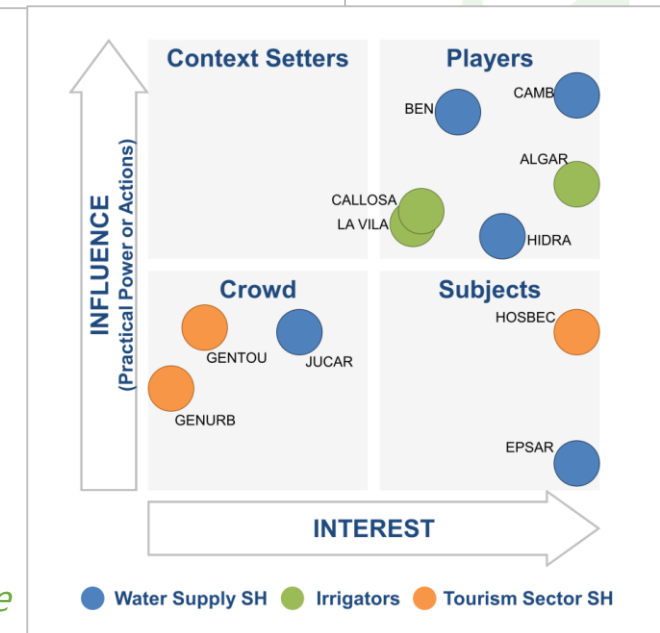
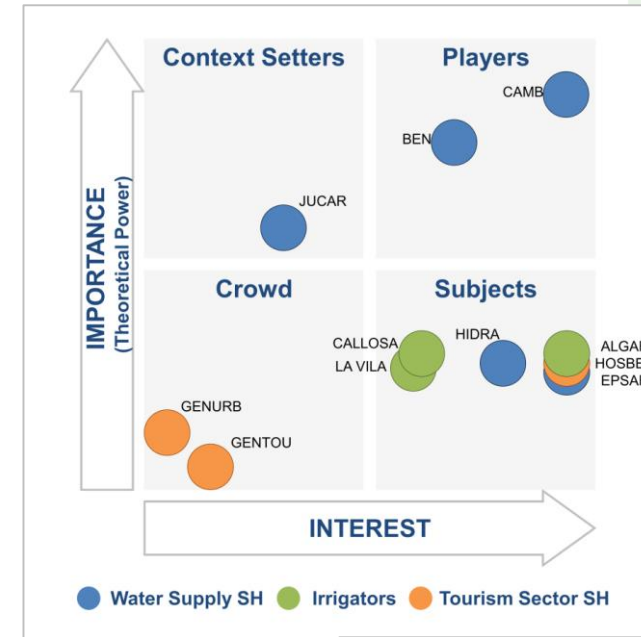
Relevance

Goal: To identify the role and relevance of stakeholders through the analysis of the relation between interest and influence/power.

- Power: *the ability to influence others*
- Interest: *the total of values and desires that an actor finds important, regardless of the specific situation*

Representation: 3 different matrix

- Theoretical Power-Interest matrix
- Practical Power-Interest matrix
- Importance-Influence/Recognition matrix (Theoretical – Practical power)



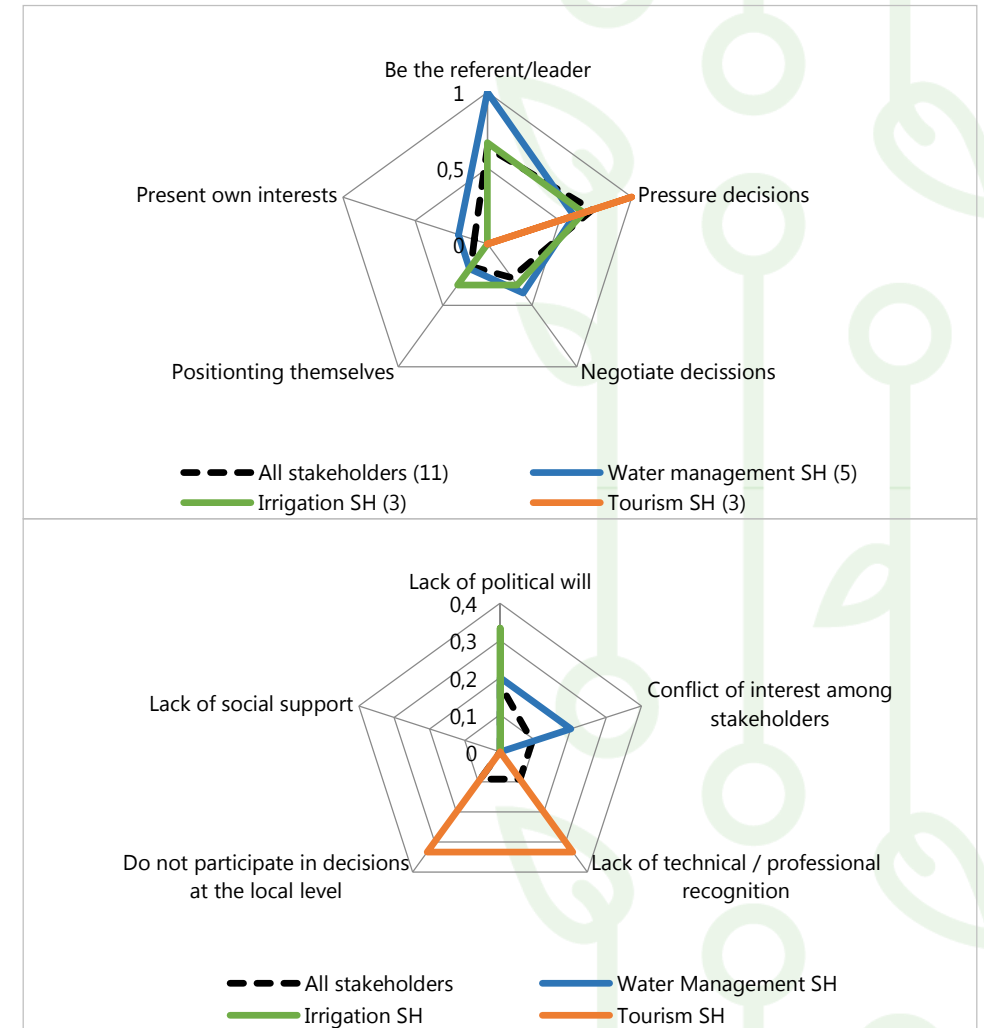
Water-tourist nexus example

Representativeness

Goal: To understand the stakeholder' interpretation of being part of the water system, as well as the level, meanings, and reasons for being (or not) represented or involved in it.

Representation: Likert scale responses coded to numerical values. There have been analyzed three issues:

- Representativeness (or lack of)
- Perception of what is to feel represented
- Reasons to not feel represented



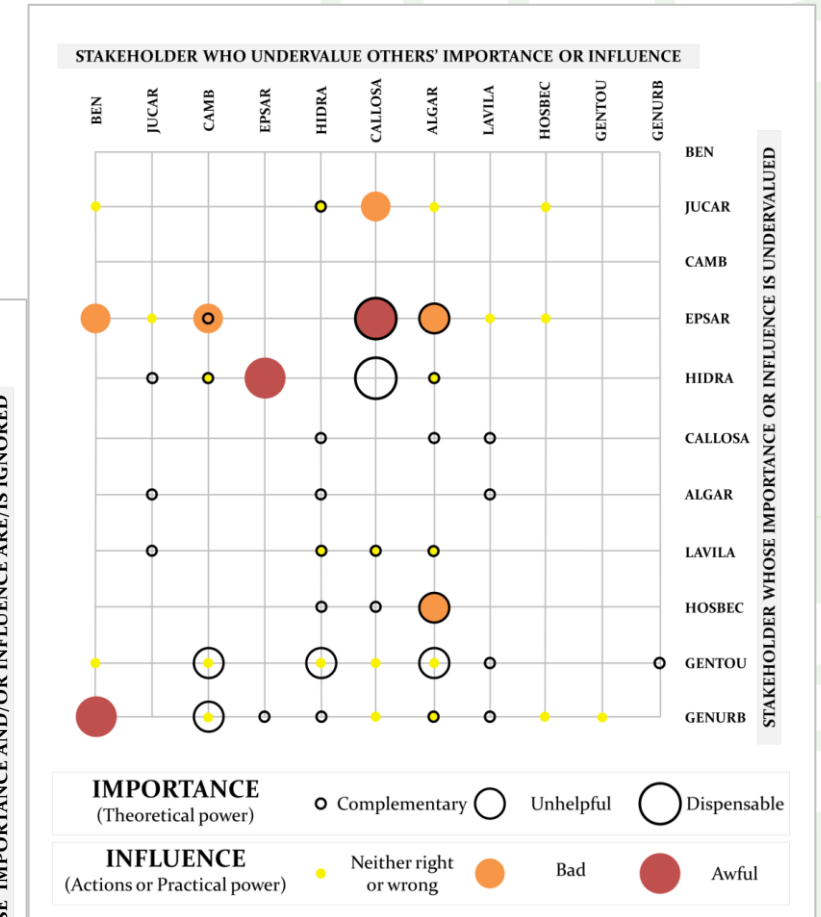
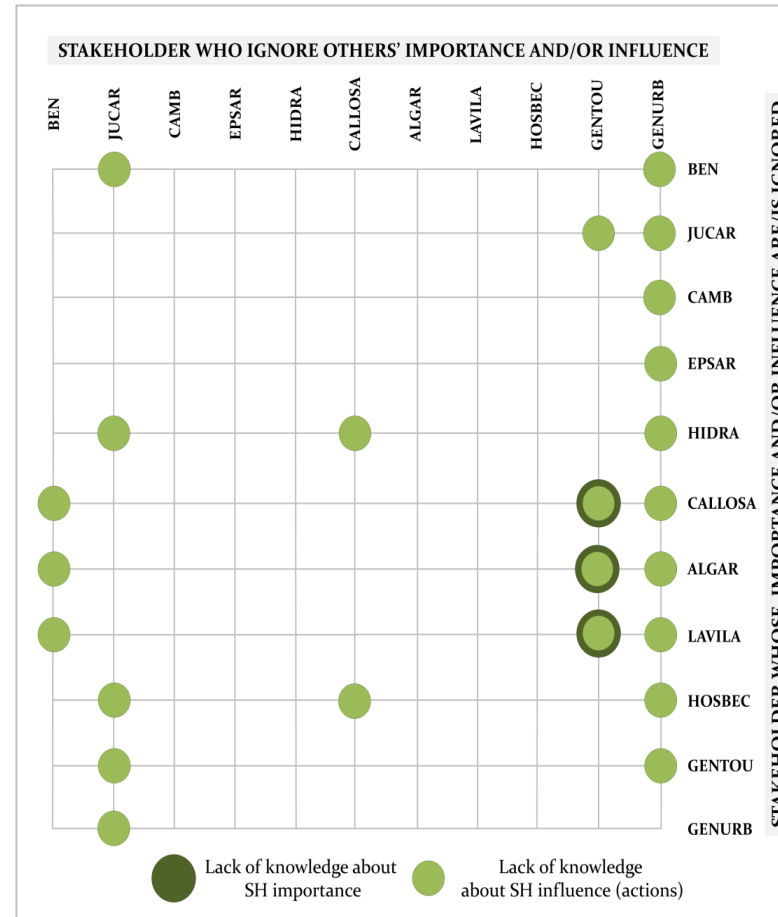
THE HYDROSOCIAL CYCLE METHOD

Recognition

Goal: To identify bilateral importance, information, and influence between stakeholders, and current or potential conflicts.

Representation:

Stakeholders' position matrix



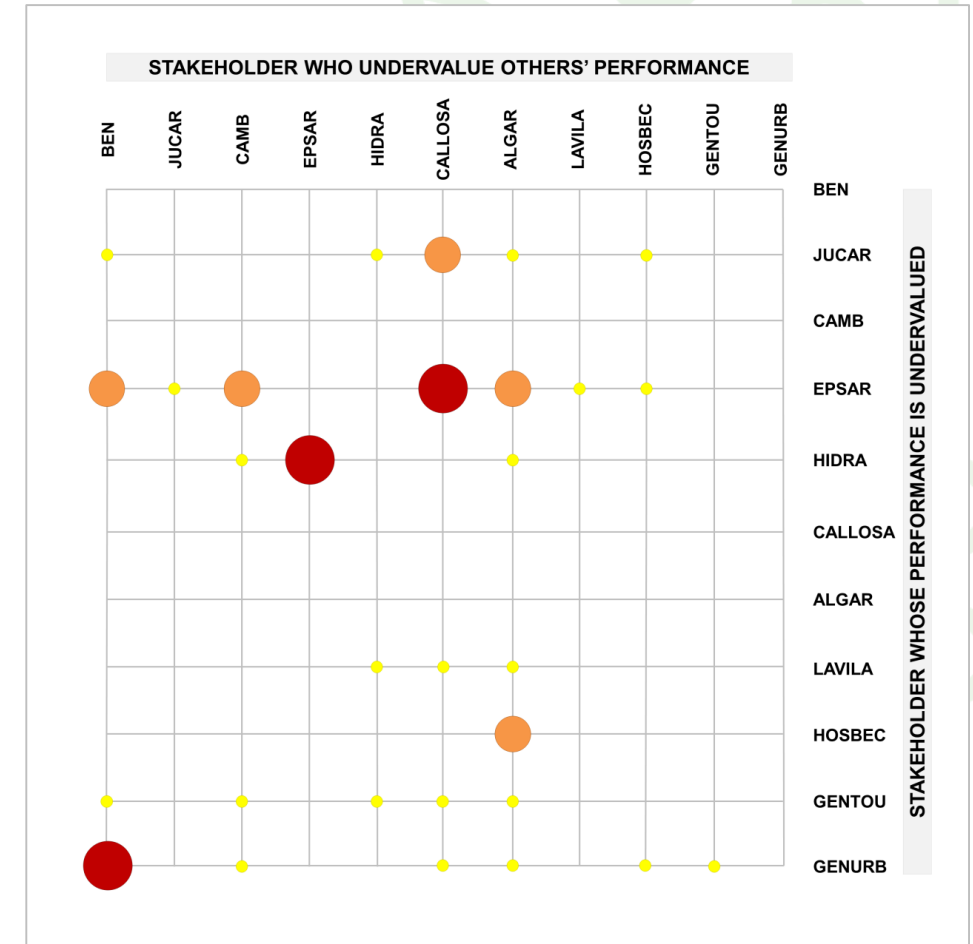
THE HYDROSOCIAL CYCLE METHOD

Performance

Goal: To identify bilateral performance assessment valuation among stakeholders as may be related with current or potential conflicts in the water-tourist management system, and define in some way the relationships between SH.

Representation:

Stakeholders' assessment matrix



Medium and low values marked by each SH related to the actions carried out by other stakeholders are represented.
[Neither right or wrong (in yellow), Bad (in orange), and Awful (in red)].

THE HYDROSOCIAL CYCLE METHOD

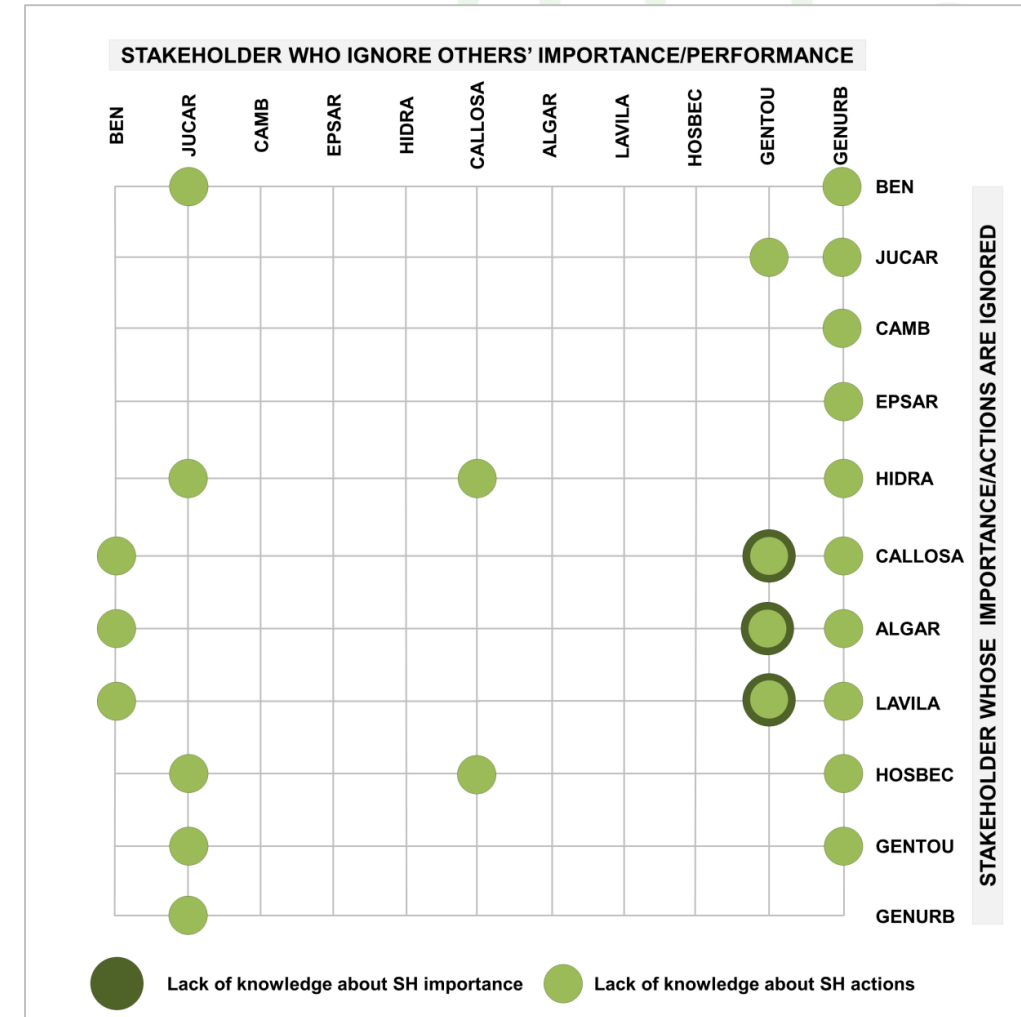
Knowledge

Goal: To identify the bilateral lack of knowledge that each stakeholder has of the others' importance in the system and its performance.

Representation:

Stakeholders' disconnection matrix

Lack of knowledge of the importance (Dark Green) and actions (Light Green) developed by some stakeholders are represented. This information should help to interpret the stakeholders' scale of action and knowledge of the study area, as well as the (im)possibility of reaching agreements and solving current or potential conflicts.



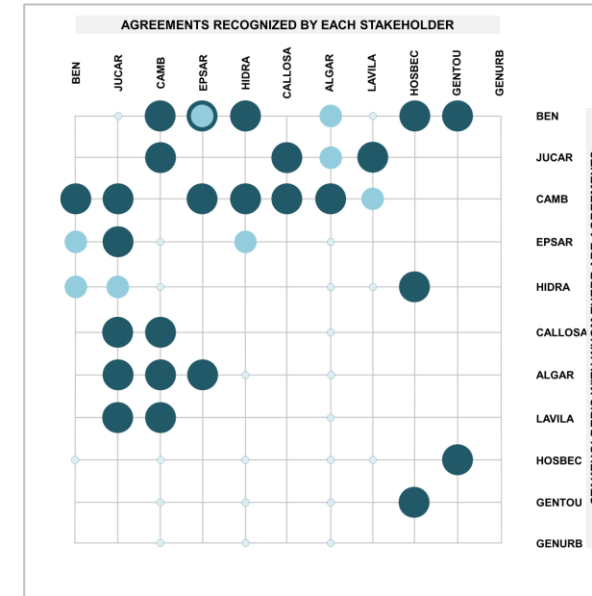
THE HYDROSOCIAL CYCLE METHOD

Collaboration

Goal: To identify bilateral current and potential agreements between stakeholders as well as factors which may benefit-difficult these agreements. These results may be used as a guide to plan workshops and collaborative water governance.

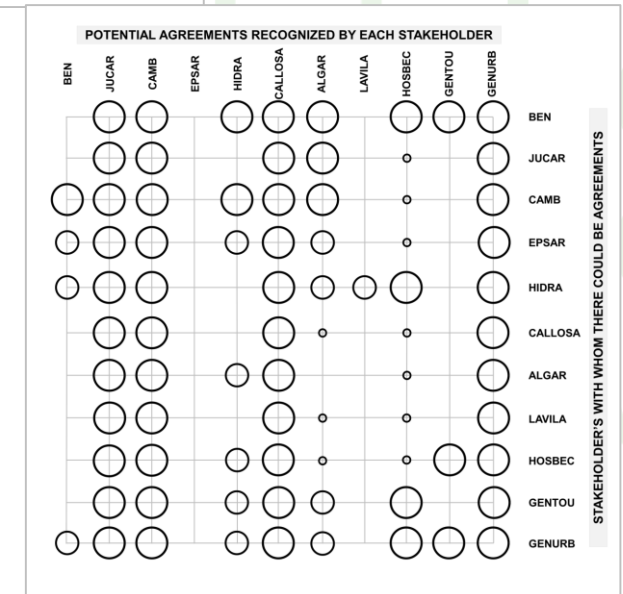
Representation: 4 different matrix

- Current agreements
- Potential agreements
- Reasons to prioritize agreements
- Reasons for lack of agreement



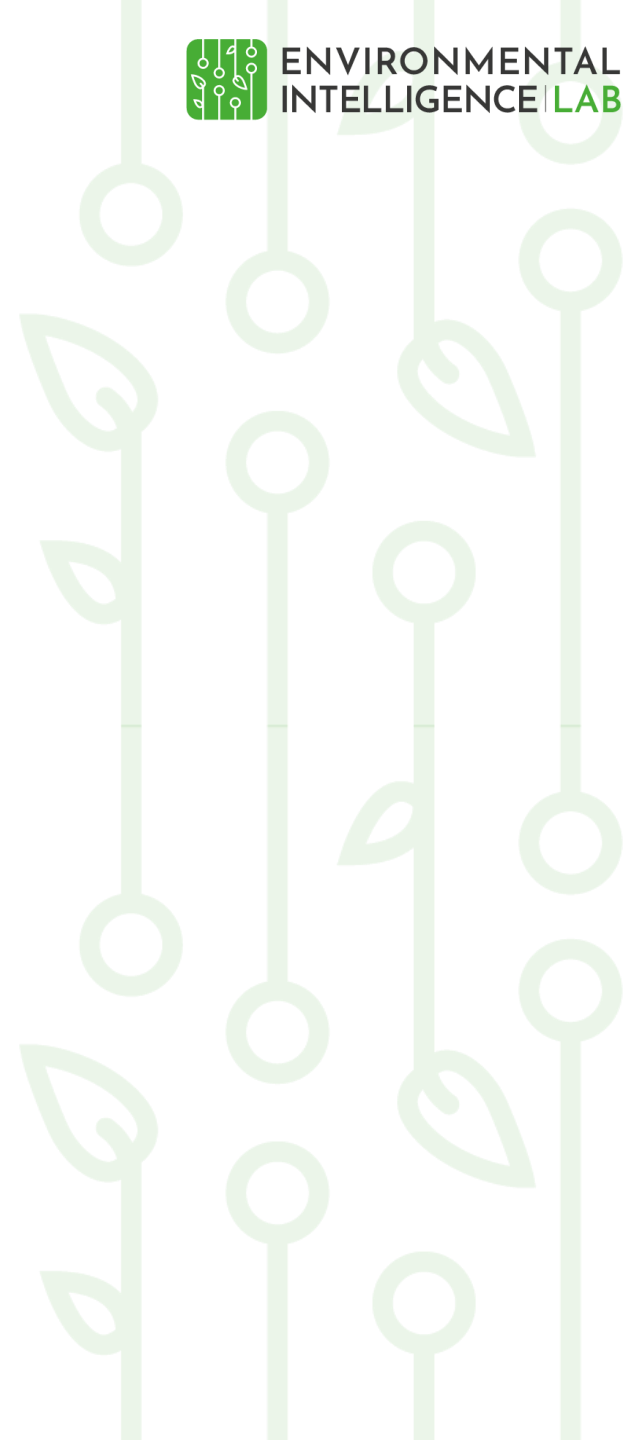
Matrix representing the existing agreements according to its type [Permanent agreement (big circle dark blue); Periodic agreement (medium circle light blue); and Timely agreement (small circle light blue)].

Matrix representing the willing to establish collaboration and agreements between stakeholders according to the type of agreement [Permanent agreement (big circle); Periodic agreement (medium circle); and Timely agreement (small circle)].



THE HYDROSOCIAL CYCLE ADDED-VALUE

- Easy to apply and learn from
- It provides direct information about current and real-time contexts, and maybe most important
- It can be replicated periodically to check SHs behaviour change if:
 - implementing new policy interventions
 - new SHs could be included in the SES management





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