The ecosystem services stakeholder matrix

Introduction

The ecosystem services (ESS) stakeholder matrix can be used to identify which stakeholders are linked to which ESS for an area in a relatively quick and realistic way. The information for the matrix is gathered by using a combination of open interviews and a structured card game.

Using the framework of ecosystem service (ESS), we can state that each ESS has an influence on and/or is influenced by one or more stakeholders, and each stakeholder is involved in one or more ESS. According to the relation to the ESS, the stakeholders can be divided in five categories: Owners of a piece of land or water body delivering an ESS, managers of an ecosystem delivering ESS, users of ESS, those who are hampered by ESS and those who influence the rules for the delivery and use of ESS.

Keywords

The ecosystem services stakeholder matrix; stakeholder identification

Why would I choose this approach?

The application of this method will help to get a better view on the parties involved in a changing supply or use of ecosystem services (ESS). The method can identify a wide range of stakeholders, including institutions, individual citizens, associations, representatives of citizens or sectors etc. The ESS-stakeholder matrix can be applied in a range of geographical scales, from very local to international. In local studies, the information about stakeholders and ESS in the area will be more detailed and place specific than in studies conducted at a larger geographical scale.

A few examples in which this method can be used:

- **A cost-benefit analysis (CBA)** gives an overview of all costs and benefits of an investment/project for the entire society, taking into account all effects that influence human wellbeing. The ESS-stakeholder matrix creates valuable information on the distribution of costs and benefits among different stakeholders.
- **Payment for Ecosystem/Environmental Services (PES)**(Tacconi et al., 2011): It is essential to identify all parties involved in order to use a PES scheme in a transparent way.
- **Development of a regional vision**: When a new future vision for an area is developed, this translates to a new configuration of land use. However, there are important consequences for the supply of ESS, as well for individuals and groups who will experience benefits or disadvantages. The ESS-stakeholder matrix can be used to identify these aspects.

What are the main advantages of the approach?

- Identifies opinions about the link between ESS and stakeholders of different users/groups
- Stimulates stakeholders to think within the framework of ESS
- Gathers information about the relation between different ESS and stakeholders from the viewpoint of the respondents

What are the constraints/limitations of the approach?

- Time investment to conduct the interviews
- Different types of stakeholders for the same ESS can identify potential synergies or conflicts. Whether this really is the case, can only be deducted from the information collected during the interviews. Therefore, it is necessary that this matrix is also supported by a text which indicates and explains (potential) synergies and conflicts.

What types of value can the approach help me understand?

The ESS-stakeholder matrix creates information on the distribution of costs and benefits among different stakeholders related to ecosystem services.

How does the approach address uncertainty?

The identification of stakeholders is not a static delineated fact, but a starting point. For instance, it can help to invite an initial group of stakeholders for a starting workshop of a project.

How do I apply the approach?

The information to fill in an ESS-stakeholder matrix is collected during interviews with stakeholders. In these interviews a "card game" is used, with each card representing one ESS. These cards can easily be combined with the stakeholder classes of the matrix with questions about who is involved in dynamics related to each ESS.

Step 1 Preparation

In the first step, it is important to refine the aim of the exercise. The questions below can help in this process:

- To what extent will you actively involve the stakeholders in the exercise?
- What is the relevant delineation of the study area? The most important stakeholders who have influence or are impacted by a change in land use or ESS within the study area should at least be involved. However, it is possible that important ESS managers, who have an important influence on the delivery of ESS within the focus area, are situated outside the study area. At the same time ESS users from outside the focus area can be impacted by what is happening in the area. In that case it is useful to take these in account in the analysis as well.
- Do all ESS in the study area have to be identified? For regional planning or a Cost-Benefit Analysis, it is essential to take into account all relevant ESS.
- Do you want to identify the actual, potential, future and/or desired stakeholders? This choice can give very different results.

Step 2: Completing and using the matrix

Step 2.1: Collection of information through document analysis

The first step in the identification of stakeholders and relevant ESS in a certain area is a research about the availability of relevant information on the focus area. Possible sources of information are: Literature and reports, interviews from other studies, land user's map of the area, newspaper articles, online information/websites etc.

Each source of information has its own viewpoint. Therefore, it is recommended to compare different sources of information to obtain a more reliable result (triangulation). This research can already provide interesting information about the most important stakeholders and ESS in the focus area, and can reveal possible conflicts or synergies. In the exceptional situation that all relevant information is already available, the research can be stopped after step 2.1. However, in most cases this will not be sufficient.

After this first step, you fill out the ESS-stakeholder matrix with the new information in order to be able to ask more direct/specific questions about remarkable elements in step 2.2.

Step 2.2: Collecting information with interviews

In the initial step of the interview, interviewees are asked some open questions. Interesting questions can be:

- How are you involved in the area?
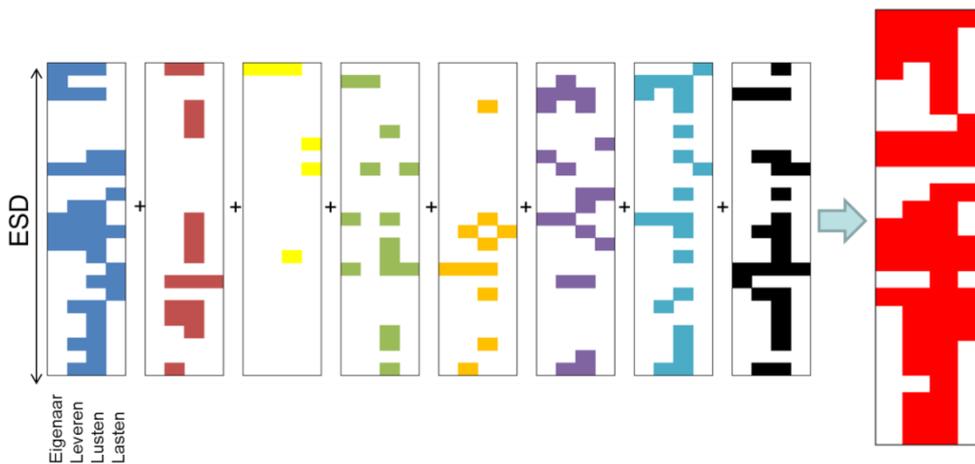- Who are the most important stakeholders in this area?

- Which groups are working together?

In the second step, a card game is used (Simoens and Demeyer, 2013). During this card game, the respondent is asked to mainly talk about the stakeholders who are involved with certain ESS in different ways, rather than focusing on the identification of ESS. Ask specifically for these players, eg. Not "the population" but who? A specific street? A certain age category?

The choice of respondents to be interviewed has a big influence on the results of the stakeholder-ESS identification. Therefore, it is essential to select a **well-balanced mixture of people with different opinions and expertise.** If you only have limited time, you can focus on a few key **'Key informants'** (persons with a specific knowledge on the focus area) with a **"helicopter view".** In this way, you can collect a fair amount of information with a limited number of interviews. These persons are preferable located on 'nodes of social networks', eg. people who receive many different perceptions and thus have an oversight on what's going on in certain groups.

Figure 1: Visual representation of the collected information per stakeholder
Each interview gives different pieces of information. The rectangles (on the left of the arrow) represent 8 individual interviews. Each colored cell represents a piece of information concerning the link between an ESS and a stakeholder. The big rectangle (on the right of the arrow) shows the compilation of the information.

Requirements

Requirements		Comments
Data	Data is available x Need to collect some new data (e.g. participatory valuation) Need to collect lots of new data (e.g. valuation based on surveys)	Document analysis, stakeholder interviews
Type of data	Quantitative x Qualitative	
Expertise and production of knowledge	Working with researchers within your own field Working with researchers from other fields x Working with non-academic stakeholders	One person can do the preparation, the interviews and the analysis. When focus groups are used, it is interesting (but not necessary) to work with two persons: one moderator to guide the discussions, and one assistant to manage practical issues (taking notes, technical aid, …)
Software	x Freely available License required Advanced software knowledge required	
Time resources	x Short-term (less than 1	

	year) Medium-term (1-2 years) Long-term (more than 2 years)	
Economic resources	x Low-demanding (less than 6 PMs) Medium-demanding (6-12 PMs) High-demanding (more than 12 PMs)	2-5 days for the entire analysis, depending on the number of stakeholders, number of relevant ESS and depth of the desired analysis
Other requirements	Required material o Recording device to record the interview o Map of the area (optional) o Cards with pictures of the different ESS o Post-it papers, pen	

Where do I go for more information?

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