Improving Decisions with Biodiversity and Ecosystem Services Information

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Technical Background Paper

Improving Decisions with Biodiversity and Ecosystem Services Information:
A Theory-based Practical Context Diagnostic for Conservation

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Executive summary

The Millennium Ecosystem Assessment – the most comprehensive assessment to date of the status and trends of Earth's ecological systems – warned us that 60% of the benefits nature provides to people ('ecosystem services') are being degraded or used unsustainably. This triggered widespread efforts, by research groups, conservation organizations and think tanks, to design and use ecosystem services assessments and tools around the world. These efforts aim to integrate the 'value of nature' in decision-making, policies, business operations and ultimately to change society's development trajectory to be sustainable.

Yet, recent studies point out that not all new tools and scientific knowledge on ecosystem services are effectively used as a basis for decision and action leading to positive social and environmental outcomes. To create change, new scientific and expert knowledge, even when worrying, robust and empirically grounded, is not enough. It needs to be mobilized by leaders and change agents – researchers, conservation NGO practitioners, motivated policy makers or business – who use the information systems and knowledge as part of a strategy of communication, advocacy and action.

Context matters. A good understanding of the context for biodiversity and ecosystem services approaches often determines whether a project has impact or not. Such understanding can be gathered quickly and easily using 'context diagnostic[1]' tools. These can be used by practitioners who are agents of change in real world situations.

This report introduces such a context diagnostic tool for conservation and Biodiversity and Ecosystem Services Assessment and Valuation (BESAV) practitioners. The tool includes five approaches based on well-established social science theories. Each approach gives a contrasting perspective and raises a set of thought-provoking questions on social, organizational, institutional and political aspects of context. The tool is illustrated throughout by examples inspired by real-world case studies, gathered through interviews and participatory workshops. The tool can be used at different stages of BESAV projects (scoping, implementation, evaluation and debriefing).

We have grounded this context diagnostic method on well-established social science theory to build on their rich insights and empirical studies. The five theories were chosen for their relevance to the management of ecosystems:

- institutionalizing treatment of new environmental issues
- strategic analysis and strategy development
- knowledge and innovation as a lever of change
- the mobilization and articulation of multiple values
- the well-being of local communities who use the natural environment and the role of institutions and rules in enabling them to do so

These theoretical frameworks can enrich the way practitioners reflect on and understand the dynamics of change that they are part of.

[1] Other examples of 'context diagnostic' methods include 'Rapid Rural Appraisals' in the farming sector, 'context studies'

CONTENTS

1. Towards a strong theory of change

Section 1 Key Messages

- Context is critical for achieving impact with biodiversity and ecosystem services assessment and valuation (BESAV).
- The contexts in which BESAV is used are complex and diverse.
- Diagnosis of the complex organizational, political, institutional and social dimensions of a context can help to create and adapt strategies for mainstreaming BESAV into decisions.
- Context diagnosis can include the formal institutional, policy and legal processes, and social and economic setting, but should also address the underlying dynamics of action.
- The audience for this background paper is; (1)practitioners trying to use BESAV knowledge to create change. Such practitioners always face challenges navigating the social, political, institutional and organizational dynamics to create the change they seek; (2) researchers in conservation and social sciences.
- The overall objectives of this background paper are to: (1) introduce the context diagnostic tool and (2) contribute to a shared culture in the natural capital community of context evaluation, adaptive management, and debriefing on lessons, successes and challenges.
- The context diagnostic tool derives from five social science theories. The theories were chosen for their relevance to address management of ecosystems. On the basis of each theory, we have designed a diagram and a check-list of questions for reflection.
- The diagrams are not meant to create prescriptive 'blue prints'. Rather, they aim to enrich how practitioners reflect on, engage with and communicate the situations that they aim to transform.

1.1. Why a context diagnostic method for biodiversity and ecosystem services conservation?

Since the publication of the Millennium Ecosystem Assessment (MA, 2005), increasing efforts to design, apply and spread Biodiversity and Ecosystem Services Assessment and Valuation (BESAV) tools and practices around the world (Bagstad et al. 2013; WBCSD 2013; Berghöfer et al. 2016; Waage and Kester 2015; Waage and Kester 2013; Kareiva et al. 2011; Berghöfer et al. 2015; Peh et al. 2013) BESAV tools and practices are developed to influence decision and policy-making processes in ways that improve outcomes for biodiversity and human wellbeing (see Boxes 1 and 2) (Daily et al. 2011; Daily et al. 2009; Tallis and Polasky 2009; Ruckelshaus et al. 2015). In general terms, the natural capital community of practice has a theory of change that assumes that:

- *By* (1) developing BESAV science and tools to make information and knowledge easily accessible for decision-making;
- *And by* (2) engaging with leaders and institutions around the world to build a collaborative community of BESAV practitioners;
- *Then* decision-making, policies, regulations and investments will increasingly be based on BES knowledge
- *So that* improved social, economic and-environmental outcomes are achieved.

However, recent studies point out that many of these new tools and scientific knowledge on ecosystem services are in reality not used for decision and action, and ultimately do not generate better outcomes (Laurans and Mermet 2014; Laurans et al. 2013; Mermet, Laurans, and Leménager 2014; McKenzie et al. 2014; Primmer and Furman 2012; Jeantil, Recuero Virto, and Weber 2016).This highlights the need to keep refining and elaborating a more nuanced and sophisticated theory of change for natural capital approaches. It also begs important questions that

the natural capital community needs to explore: What could increase operationalization and mainstreaming of ecosystem services knowledge in decisions, policy and management? How can existing tools and approaches better fit the needs and realities of decision-makers? How to use BESAV in practical situations? (Rosenthal et al. 2014; Berghöfer et al. 2016; Guerry et al. 2015)

Box 1: ***Biodiversity and Ecosystem Services Assessment and Valuation: A diverse field of research and practice***

We define 'Biodiversity and Ecosystem Services Assessment and Valuation' (BESAV)**to be any form of production and communication of knowledge and evaluative information on the state, quality, quantity, value, and trends of biodiversity and ecosystem services, that aims to influence decisions or guide action.**

BESAV can involve biophysical modeling of ecological processes, economic valuation, social valuation and qualitative methods for value articulation, mapping, trade-off analysis, cost benefit analysis and natural capital and ecological accounting methods.[2] It can produce biophysical metrics, and qualitative, quantitative and monetary metrics of value[3]. The various methods, tools and approaches involved in BESAV can be used by conservation practitioners, researchers, knowledge-brokers, expert consultants, policy-makers, private sector managers, land-use planners, and others.

In developing this context diagnostic tool, we have engaged with two communities that have developed complementary BESAV toolkits and approaches:

(1) Natural Capital Project approach and toolkit

The Natural Capital Project[4] has designed integrated BESAV tools for use in different decision contexts. Since the partnership began in 2005, the Natural Capital Project has developed:

- an open-source toolbox called 'InVEST' (*Integrated Valuation of Ecosystem Services and Tradeoffs*) The InVEST toolbox produces maps, quantitative biophysical outputs and in some cases monetary estimates of the provision of multiple ecosystem services on landscapes and seascapes.
- OPAL (*Offset Portfolio Analyzer and Locator*) for quantifying the impacts of development and the value of potential protection or restoration activities
- RIOS (*Resource Investment Optimization System*) to help design cost-effective investments in watershed services.

These tools have been applied, tested and refined in more than 30 decision contexts around the world (Arkema et al. 2013; Bhagabati et al. 2012; Cabral et al., 2016; Feger et al. 2015; Goldstein et al. 2012; Guerry et al. 2012; Nelson et al. 2009; Ruckelshaus et al. 2015). This experience has helped to develop a general natural capital 'approach' for using BESAV tools to change decisions effectively including, for example, iterative science-policy engagement, scenario development, stakeholder engagement and capacity building (Rosenthal *et al*., 2014, Ruckelshaus *et al.,* 2015).

(2) TESSA approach and toolkit

The Toolkit for Ecosystem Service Site-based Assessment (TESSA) was developed through a collaboration of six institutions part of the Cambridge Conservation Initiative (see http://tessa.tools). TESSA provides guidance on low-cost methods (household surveys, participatory mapping, simple modeling software, etc.) to evaluate the benefits people receive from nature at sites to influence decision making[5]. The toolkit is primarily aimed at conservation practitioners working on specific sites but can also be used by land-use planners, development organizations or the private sector (Peh et al.

[2] This choice is consistent with Bhergöfer et al., 2016
[3] See Natural Capital Protocol.
[4] http://www.naturalcapitalproject.org
[5] See : http://www.birdlife.org/worldwide/science/assessing-ecosystem-services-tessa

2013; Peh et al. 2014). The approach includes key concepts on ecosystem services, guidance on conducting scoping appraisals for sites, decision trees and flow charts to choose appropriate methods, valuation methods and participatory scenario generation, and guidance on the use of knowledge produced in decisions. TESSA methods and approaches have been used in more than 20 sites around the world (Birch et al. 2014; Peh et al. 2014; Peh et al. 2013; Muoria et al. 2015).

Box 2: The Natural Capital Project theory of change[6]

If:

- Robust evidence of the feasibility and benefits of ecosystem service-based policy change is created around high-profile issues in places of importance,
- Practical and useful ecosystem-service science and tools are made widely available, and
- Powerful leaders at all levels are engaged, nurtured and their decision-making needs met, and a robust and collaborative community of practitioners is developed,

Then, through an iterative process:

- There will be increasing interest and willingness to test and implement ecosystem service approaches at progressively greater geographic and institutional levels;
- Influential institutions and players will alter their decision-making practices, policies, and regulations to use ecosystem service approaches, persuading other institutions and decision-makers across the world to follow suit; and
- A critical mass of evidence and ecosystem service users/supporters will emerge,

So that, eventually:

- Investment in biodiversity, sustainable management of ecosystems, and human well-being rise dramatically, and
- The state of biodiversity and nature's life-support systems for humans demonstrably improve

The theory of change for natural capital approaches has already been refined and further developed based on lessons in the field. Researchers and practitioners have increasingly integrated BESAV tools in participatory and interactive stakeholder engagement processes. They have also developed collaborative scenario development methods and tools (Rosenthal et al. 2014; McKenzie et al. 2012; Koschke et al. 2014)[7]. The natural capital community has also started looking back, to take stock and assess whether and how the production and communication of new information on the value of ecosystems has been used and influenced decision-making (McKenzie et al. 2014; Ruckelshaus et al. 2015; Rosenthal et al. 2014; Berghöfer et al. 2015; Booth et al. 2012; Laurans et al. 2013; Christie et al. 2012). Enabling conditions have been identified under which BESAV is more likely to generate change, such as the perceived legitimacy of information, strong leadership, clearly defined authorities or decision-making pathways and demonstrated interest in using such information in decisions (Posner et al. 2016; Posner, McKenzie, and Ricketts 2016; Ruckelshaus et al. 2015).

Yet, the contexts in which BESAV is used are complex and diverse, involving multiple stakeholders. Decision contexts include: spatial planning; development planning and permitting; protected area management and financing; payments for ecosystem services; adaptation to climate

[6] See : http://www.naturalcapitalproject.org/wp-content/uploads/2016/03/Strategic-Plan-FINAL-03.14.2016.pdf
[7] Specific tools have also been developed to help stakeholders develop scenarios in participatory ways : Scenario Hub : http://scenariohub.net/ ; Scenario Generator : http://www.naturalcapitalproject.org/software/

change; REDD+; ecological restoration; creating sustainable cities; private sector decisions and sustainable supply chains. BESAV is used in different geographies, at different scales. The organizational, political, institutional and social challenges that BESAV practitioners face are hugely contrasting. In most cases, these contexts demand much more than simply adding new knowledge to a clear, well-bounded and formally organized decision or policy process.

Although some useful general recommendations exist (Posner, McKenzie, and Ricketts 2016; Rosenthal et al. 2014), there are many ways to use BESAV to change decisions and success factors are often highly context dependent. The way different stakeholders mobilize new knowledge in a change process is context specific. And so are the value systems and goals that underpin peoples' decisions and behavior.

Mainstreaming BES into decisions therefore requires diagnosis of the organizational, political, institutional and social aspects of a project's context. This includes analysis of the formal institutional, policy and legal processes, and general socio-economic setting (VNCST, 2017). But it also requires analysis of the deeper underlying dynamics of action. This is because BESAV projects often (1) challenge the existing practices and choices of stakeholders to operate in totally new ways, and (2) deal with difficult trade-offs (conservation vs development outcomes, long-term vs. short-term benefits; public good vs. private profit; different ecosystem services, etc.). We expect that understanding and reflecting on these underlying dynamics of change more explicitly can help BESAV practitioners design and implement their interventions and be more effective.

1.2. Who is the audience for this background paper? What is included and how should it be used?

This technical background paper was developed primarily with and for people working with environmental NGOs (e.g. WWF, The Nature Conservancy (TNC), Birdlife, RSPB, applied researchers at the Natural Capital Project). Specifically, it targets those who are responsible for the design and implementation of real-world interventions in which BESAV plays a key role. The wider target audience for this background paper is practitioners or 'policy brokers', particularly in the conservation and development sector (e.g. development bank managers working on biodiversity protection projects), who commission and apply BESAV approaches. Conservation and social science researchers represent another audience for this technical background paper, which can provide an entry point for more in-depth social science based analysis of biodiversity and ecosystem services complex governance contexts.

The primary purpose of the context diagnostic tool is to support efforts in developing influential strategies for using BESAV, by considering how to engage in essentially political discussions with decision-makers and stakeholders.

The context diagnostic can help elaborate the context of any BESAV project at different phases:

- In the scoping or early phases, to help a team assess and create the conditions that enable success, identify what specific changes can reasonably be expected from the project and determine appropriate metrics of success.
- During a project, to reflect on how the context has evolved since the project started, and how to adapt.
- At the end of a project, to debrief, discuss, analyze and compare successful and less successful outcomes, reflecting on questions like: What can we call 'success'? Where and how did BES information lead to effective commitments or actions? What role did others and we play?.

The overall objective of this background paper is to contribute to the development of a shared academic and professional culture in the natural capital community of context evaluation, adaptive management, debriefing, and sharing of lessons, successes and challenges. The background paper introduces:

- New vocabulary and concepts for practitioners who seek ways to create change more effectively and communicate that change in compelling ways
- diagrams and check-lists of questions to guide practitioners as they think through their situation
- fictionalized examples inspired by real-world case studies
- a guidance section (Section 7) that suggests different ways the context diagnostic tool can be used and integrated in training and capacity building

The context diagnostic is complementary to social science field methods for collecting information such as interviews, surveys, stakeholder mapping, observation, secondary data, etc. Using the context diagnostic may generate ideas for additional field-work to investigate specific issues (see Section 7).

1.3. Strong foundations in social science theory

Generally speaking, context diagnostic tools use social science methods (questionnaires, stakeholder and issue mapping, interviews, surveys, focus groups, secondary data, cross-checking information from different sources, direct observation, etc.). These methods can be used to obtain and discuss relevant contextual information in a short time and at low cost. Different communities and sectors have developed and used context diagnostic methods for decades. For most businesses that operate in complex environments and deal with multiple stakeholders, such as utility or infrastructure companies, context diagnostic assessments are a fundamental part of their strategy design. Similar methods are used in the business world to create space for discussion by management teams, to develop shared visions, and reflect on projects, strategies, responsibilities and goals[8].

In the farming and development sectors, 'Rapid Rural Appraisals' are commonly used by project teams to obtain new information, formulate new hypotheses, and adapt interventions[9]. In the field of social development, diagnostic assessments are a crucial step in helping project teams to select and prioritize their strategic initiatives[10]. Closer to our issue area, the World Resource Institute developed a context diagnostic tool to support forest restoration initiatives (Hanson et al., 2015). The WRI 'Restoration Diagnostic' is 'a structured method for identifying which success factors for landscape restoration are already in place, which are partially in place and which are missing within a country and landscape that has restoration opportunities' (Hanson et al. 2015). The working paper published by the ValuES project in April 2016, *Increasing the Policy Impact of Ecosystem Service Assessments and Valuations*, insists on the importance of scoping, framing, thinking about the engagement process, and considering context in the natural capital community (Berghöfer et al., 2016)[11].

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[8] See for instance the work on business Balance Scorecards as exploration, reflexivity, sense-making and innovation devices by Busco et Quattrone, 2015.

[9] See for instance : http://www.fao.org/docrep/w3241e/w3241e09.htm

[10] https://saeguide.worldbank.org/diagnostic-tools-assess-context and "A Question-Set to Guide Context Analysis for the Design of Social Accountability Interventions," Working Draft Paper, January 2012, Social Development Department, World Bank.

[11] Also, the Topic Guide produced by Evidence on Demand (Nunan, 2016) looks at the complexity of decentralised and multi-level governance of natural resources and proposes, among other approaches, that practitioners map the institutional context through political economy analysis.

Inspired by these approaches, this background paper provides biodiversity and ecosystem services practitioners with a context diagnostic method that can help them be more effective agents of change using BESAV. It bridges (1) powerful insights and coherent sets of questions from well-established social science theories, which are particularly relevant and useful for the analysis of social, organizational, institutional and political dimensions of the management of ecological issues; and (2) real world case studies and empirical experience applying BESAV in practice[12].

The method essentially consists in examining a field situation, the biodiversity and ecosystem services issue to be addressed (e.g. deforestation, watershed protection, establishment of an ecological corridor, etc.), and the BESAV intervention project that aims at addressing it, from these five distinct, clearly identified perspectives, each rooted in a specific, deeper theoretical background.

Some of the approaches introduced here relate to tools that are widely used to assist in strategic planning (e.g. actor and power mapping tools and barrier analysis). The five theories mobilized in this context diagnostic tool have been chosen for practical relevance but also for their rich conceptual background, and their strong foundations on empirical studies. We believe that this context diagnostic tool can:

- enrich the way practitioners reflect on, understand and communicate their contexts
- stimulate further development of BESAV tools and deeper analysis of their impact.
- encourage further expansion of biodiversity and ecosystem services research to include new social science domains and mobilize researchers from new disciplines.

The following table gives a snapshot of the five perspectives in the context diagnostic:

[12] Our approach originates from, and builds on: (1) the work of Mermet, Laurans and Leménager in *Tools for what trade?* (2014), where five social science theories are mobilized to discuss in depth issues related to the utilisation of economic instruments and valuations in biodiversity management; (2) the work of Feger (2016) and Feger and Mermet (2017) on accounting for the collective management of ecosystems, that suggests ways to better connect 'evaluative information systems for conservation' (that includes BESAV, ecological indicators, Red Lists etc.) with the negotiation and institutionalization of environmental accountabilities at multiple scales; (3) current efforts by the natural capital community who actively work towards improving the impact of their tools and approaches on decision-making and policy (McKenzie et al., 2014; Ruckelshaus et al., 2015; Rosenthal et al., 2014; Posner et al., 2016);

Social science theory mobilized	***Dimension of the intervention context that it can help analyze***	***Dimension of the intervention design that it can help reflect on***
Politics of Nature: How to Bring the Science into Democracy? (Latour, 2004)	The social and political maturity of the biodiversity and ecosystem services (BES) issue the intervention intends to address	How to adapt the design and use of BES activities and assessment tools to different stages in the institutionalization of the issue
Strategic Environmental Management Analysis (Mermet, 2011; Mermet et al., 2014; Leroy, 2006)	The power relationships between the coalition of actors backing the intervention's environmental goals, and other actors who prioritize other purposes	How to improve the strategic use of BES assessment tools to obtain changes from others
Sociology of Translation (and beyond, Actor-Network-Theory) (Callon, 1986)	The extent to which the BES solutions and innovations promoted by the intervention are/can be compelling for other stakeholders	How to make BES activities and tools a 'compelling passage point', i.e. a useful solution for other stakeholders to reach their goals
***Economies of Worth* (*Theory of Justification*)** (Boltanski and Thévenot, 2006)	The values used by various stakeholders to justify their behaviors, proposals and actions when dealing with the BES issue addressed by the intervention	How to frame BES assessments, activities and associated discourses to gain traction among stakeholders who hold multiple contradictory values
Environmental Entitlements Framework (Leach, Mearns and Scoons, 1999) and ***Common-Pool Resources theory*** (Ostrom, 1990)	How (formal and informal) institutions and available infrastructures condition local communities' access to an control on natural resources for livelihoods	The institutional and infrastructural changes that the BES intervention might introduce and their effects on local communities' livelihoods

Table 1 : *Dimensions included in the context diagnostic*

The context diagnostic is not meant to be prescriptive. Teams of BESAV researchers and practitioners can use the visual diagrams and check-lists of questions to:

- explore the contexts they are engaging in
- gain insights on future steps to be taken
- reflect on and assess past work

1.4. How the context diagnostic method was developed

The context diagnostic was informed by interviews and workshops with BESAV researchers and practitioners working for conservation organizations and part of the Natural Capital Project and TESSA networks. Workshops were also held with InVEST and TESSA practitioners. Participants discussed challenges and success factors when trying to create change with BESAV, based on participants' experiences. Early versions of the context diagnostic were presented and served as a basis of discussion for the participants' case studies. This input has informed the context diagnostic and provided useful case studies.

The context diagnostic tool is a first prototype. It has been tested in the Philippines and in Indonesia. We welcome and encourage further road-testing to improve it further.

The rest of the background paper (Sections 2 to 6) introduces the five context diagnostic perspectives. Each section (1) briefly introduces the theory; (2) describes and explains a fictional example; (3) provides a diagram and suggests ways to use it for team discussion, reflection and context analysis. Section 7 concludes with ways in which the context diagnostic can be tested in real world situations.

2. Adapting to different stages of maturity in the change process

Section 2 Key Messages

- The insights from this perspective can help practitioners reflect on the following aspects of context: (1) the stage of social and political maturity stakeholders and decision-makers are at in dealing with an ecological issue; (2) the role BESAV activities can play; (3) the best way to get to the next stage.
- This is based on the *Politics of Nature* which is a political philosophy for the collective social and political treatment of ecological issues
- It distinguishes between four stages in dealing with a new ecological issue: Perplexity, Consultation, Hierarchization, Institutionalization
- At every stage, BESAV teams can play a crucial role by providing, communicating and using BES knowledge
- At each stage, BES knowledge serves a different purpose, such as detection of problems, advocacy of critical issues, facilitating negotiation, on-going monitoring, etc. Its content and communication therefore need to be adapted to the stage and meet the objectives facing stakeholders and decision-makers at that stage.

2.1. A short introduction to Politics of Nature (Latour, 2004)

From the moment an ecological issue is first identified to the time it is eventually addressed, there is a long and complex process of social and political deliberation, negotiation and sometimes confrontation. In *Politics of Nature*, Latour (2004) describes this process following four stages.

Latour defines politics as the exploration and composition of a 'common world' by the 'collective'. The 'collective' is a community of people (humans), but also animals, plants, technologies, ecosystem functioning, social institutions, etc. (non-humans). From this perspective, ecological issues are questions about what ecological entity (e.g. a forest, a species, an ecosystem service) becomes a member of the 'collective'.

Latour proposes a four stage process in which facts and values are always discussed conjointly. The two first stages *Perplexity* and *Consultation*, belong to what Latour refers to as the 'Upper house'. They are designed to answer the questions: *Who/what is in the 'collective'?* and *Who/what should be taken into account?* A real world example would be questions such as: Is there really a problem with the smaller African elephant populations? Do we want to live with African elephants? Should we take them into account in our decisions, compared to other issues? The two next stages, *Hierarchization* and *Institutionalization* belong to what Latour calls the 'Lower house'. They are designed to answer the questions *Can we live together?* and *What is the place of each new member of the 'collective' relative to other established members*? To continue our real world example: On what conditions, at what cost, and how do we want to live with African elephants? How much space are we ready to give to the African elephants?

It is through this four stage process that the 'collective' can detect, negotiate and gradually deal with each ecological issue, before institutionalizing its 'treatment'. If the collective fails to treat the issue, it risks that it will return. Stages in the process cannot be short-cut, otherwise crucial aspects are left unsolved.

The collective can follow this four stage process for any new ecological issue, thanks to the joint efforts of 'scientists', 'economists', 'moralists', 'politicians' and others. Each group specializes in certain skills and provides a complementary contribution, alongside others, at all stages of the process.

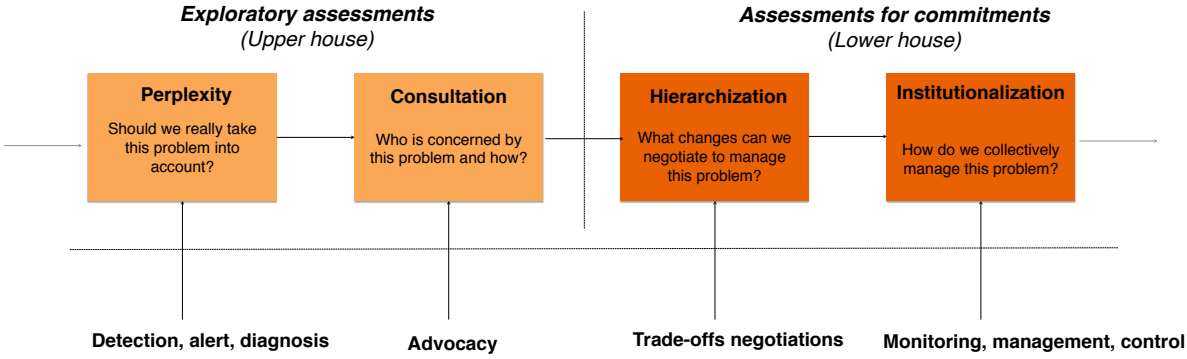
In light of this theory, BESAV practitioners can think of themselves as a specific group that gives visibility and standing to non-humans that are valuable and/or useful to humans. They can reflect on the skills and the role they play at each stage of the political treatment of new ecological issues.

2.2. Applying to BESAV projects: what stage are we at in the political process?

BESAV teams can use this perspective to identify the stage of treatment of the ecological issue in their context. At different stages in the process, different types of BESAV information, communication and engagement will be more effective to generate change. Case Study 1 provides an illustration, inspired by a real-world case study:

Case Study 1: *Implementing Payments for Watershed Services (PWS)*
In a South American country, an environmental NGO has worked for 5 years towards the implementation of PWS to protect the watershed of a major city. The project team has been working to communicate the importance of protecting the hydrological services of the watershed, to establish good working relationships with relevant stakeholders and engage them in developing a watershed protection scheme. They have used different BESAV tools at different phases of the project and for different purposes: ecological investment assessment, ecological modeling, indicators and cost-benefit analysis. Today, funding has been secured and a project portfolio – in terms of watershed protection activities in specific locations - has been developed. The project team and public and private sector partners are about to start implementing watershed protection actions.

How can I adapt my use of ecosystem services assessments to different stages in the process of change?
Insipired by Politics of Nature (Latour 2004)



The diagram distinguishes between two major uses of BESAV: (1) '**Exploratory assessments**' to explore and advocate for ecosystem services issues so they are recognised and taken into account; (2) '**Assessments for commitments**' to contribute to the negotiation and implementation of commitments by stakeholders to deal with the ecological issue.

Each stage is associated with a core question that stakeholders have to address e.g. should we really take this problem into account?'; 'who is concerned by this problem and how?' The diagram suggests different BESAV activities for each stage e.g. detection, alert, diagnosis; advocacy; negotiating trade-offs; monitoring, management and control. Filling out the diagram and using it to reflect on the project context can help the team to identify what BESAV tools, outputs and activities will be most relevant and useful. Ecosystem services monitoring in a context where the level of awareness about ecosystem service degradation is still low and few stakeholders feel concerned is likely to be premature and less impactful than awareness raising and campaigning. Conversely, exploratory assessments will not be useful when stakeholders are already in the process of negotiating trade-offs and about to implement management plans.

At the **Perplexity stage**, the central question is: should we really take this problem into account? It relates to the existence and meaning of the ecological issue (e.g. is there really a problem with deforestation? How big is the problem?). Biophysical indicators, monetary valuations and spatially explicit mapping of ecosystem services can be used to show trends or changes in BES under likely future scenarios. This can raise attention to issues that are going unrecognized. BESAV output and activities can be tailored to alert people to worrying trends and threats to biodiversity and ecosystem services, with a focus on how it is likely to affect them.

Case Study 1.1:
In the first year of the PWS project, the problem of watershed degradation was not yet well known by local communities. The municipality was not aware of it. The board of the local water utility chose largely to ignore the issue, as they could not see how they were concerned now the benefits of participating in watershed protection. Exploratory assessments that the BESAV team conducted on the watershed provided data and ecological indicators showing rapid degradation of water quality and quantity in multiple areas. This gave visibility to the problem and made it an unavoidable topic for stakeholders to address. More groups became involved in water management.

At the **Consultation stage**, there is prevailing agreement that a biodiversity or ecosystem service issue exists and is significant. The central questions are: Who is concerned by this issue and in what way?' The collective now needs to consult widely and find out who is affected by the issue, and how would they be affected by possible solutions. Teams can use BESAV to highlight issues and advocate for solutions. Maps and indicators, particularly those that differentiate impacts on particular groups or stakeholders such as serviceshed assessments, distributional and beneficiary analysis can be used to explore and represent how stakeholders depend on and impact biodiversity and ecosystem services, and how they would be affected by possible solutions, such as plans or policies.

Case Study 1.2:
During the next three years of the PWS project, the BESAV team used hydrological modeling tools and indicators to understand how hydrological flows would be affected by different scenarios for protection of the watershed. The team engaged different stakeholders (municipality, Ministry of Agriculture, Ministry of Economy and Finance, private companies, other NGOs) through workshops where ecosystem services maps and indicators were presented and discussed. The process was helpful to advocate for protection of the watershed to secure a reliable, clean water supply, and to convince the local water utility of the importance of their role. The exploratory ecosystem service assessment

also helped to identify how local communities' agricultural practices traditional farming techniques affect the watershed and water quality.

At the **Hierarchization stage**, the core question is: what changes can we negotiate to manage this problem? Everyone now needs to negotiate and decide how to address the issue. The negotiations involve exchanging moral, scientific, economic and other arguments. Diverse trade-offs will affect each member of the collective. Implementing the chosen solution will change priorities and have costs for some actors. Questions include: How dealing with this issue affects different actors? Who are the winners and losers? The BESAV team can help address these questions with concepts, language and quantitative and qualitative methods to assess and compare the consequences of different solutions, such as management plans. They can encourage new commitments to deal with the BES issue by providing information about the costs and benefits of different options to each stakeholder.

Case Study 1.3:
In the past year, the team used an ecological investment assessment tool to identify and rank the different areas of the watershed for their importance in the regulation of water quality and quantity. On the basis of this information, they developed a watershed conservation project portfolio. The team discovered two other actors concerned by watershed protection: the Ministry of Housing and the national regulatory body in charge of establishing water tariffs. Their involvement triggered the development of a new water tariff regulation in which part of water distribution financial revenues is invested in watershed conservation projects. The team helped the regulatory body, the Ministry of Housing and the local water utility negotiate water tariffs to internalize the cost of conserving water resources, as well as compensatory payments for the local communities, with analyses of the full cost of water.

At the Institutionalization stage, after the heated struggles and negotiations, a deal has been struck on how to deal with the ecological issue, widely recognized by all. The collective now needs to develop and implement routine practices and procedures for this deal to become institutionalized. At this stage, the core question is: 'How do we collectively manage this problem?' Teams can use BESAV tools and activities to help by monitoring the status and trends of biodiversity and ecosystem services and by accounting for the various commitments stakeholders have made to contribute to ecosystem management.

Case Study 1.4:
The Ministry of Housing and the regulatory body agreed that 1% of the local water utility's revenues from water services be allocated to the watershed's protection. Additionally, they agreed on a financial mechanism that would invest these revenues into the watershed conservation projects and control their appropriate use over time. The BESAV team has chosen five watershed protection pilot projects to start the scheme's implementation, based on their high ecological return on investment. The local communities will gradually change their farming practices over the next three years in exchange for financial compensation. The BESAV team proposed hydrological monitoring tools to ensure that the scheme produces the expected effects over time and works closely with local communities on improving the water availability and quality.

2.3. Using the diagram

This diagram can be used to reflect on how to adapt BES knowledge production, communication and use, and related activities like stakeholder engagement, to different stages in the process.

- Use the grey area below the four boxes to write down key elements of the context that relate to the four stages and associated questions (in orange and red), and guided by the types of BESAV activities that can help to address them (see example below). Sequence

the discussion by: (1) identifying the stage your context is at; (2) reflecting on how your team can best contribute to this stage with BESAV tools and activities (3) reflecting on how your team can help push forward to the next stage.

- Reflect on the following questions, using the diagram where helpful:

(1) What stage are we at now? Which questions are stakeholders currently trying to answer? Do we still have activities ongoing relevant to the previous stage?

(2) What stages has the collective already been through? What is proving challenging in attempting to get to the next stage? What could help the collective to get to the next stage?

(3) In Perplexity, what is the current level of awareness among stakeholders about the importance of BES issues? How can we design our BESAV process to increase the visibility of these issues? How can we increase our capacity to detect BES issues and alert others?

(4) In Consultation, who (stakeholders) and what (non-humans) have we consulted on their relationship with the BES issue? Who and what should we consult further? How can we help to synthesize and make visible to others their specific connections to BES and their position on how to deal with it? What BES information and process could trigger meaningful and productive negotiations?

(5) In Hierarchization, what could help members of the collective to compare their visions, negotiate the associated trade-offs, and get closer to a decision? Can we propose new solutions or compare existing alternative plans for future management of the issue?

(6) In Institutionalization, what BESAV tools and activities can we propose to help implement the chosen plan? Are their ecological processes and objectives that need long-term monitoring? Can we position ourselves as a trusted intermediary that controls and accounts for how changes and agreed new practices are put in place and made routine? Are there any other BES issues that have recently emerged that we now need to take into account (getting back to Perplexity)?

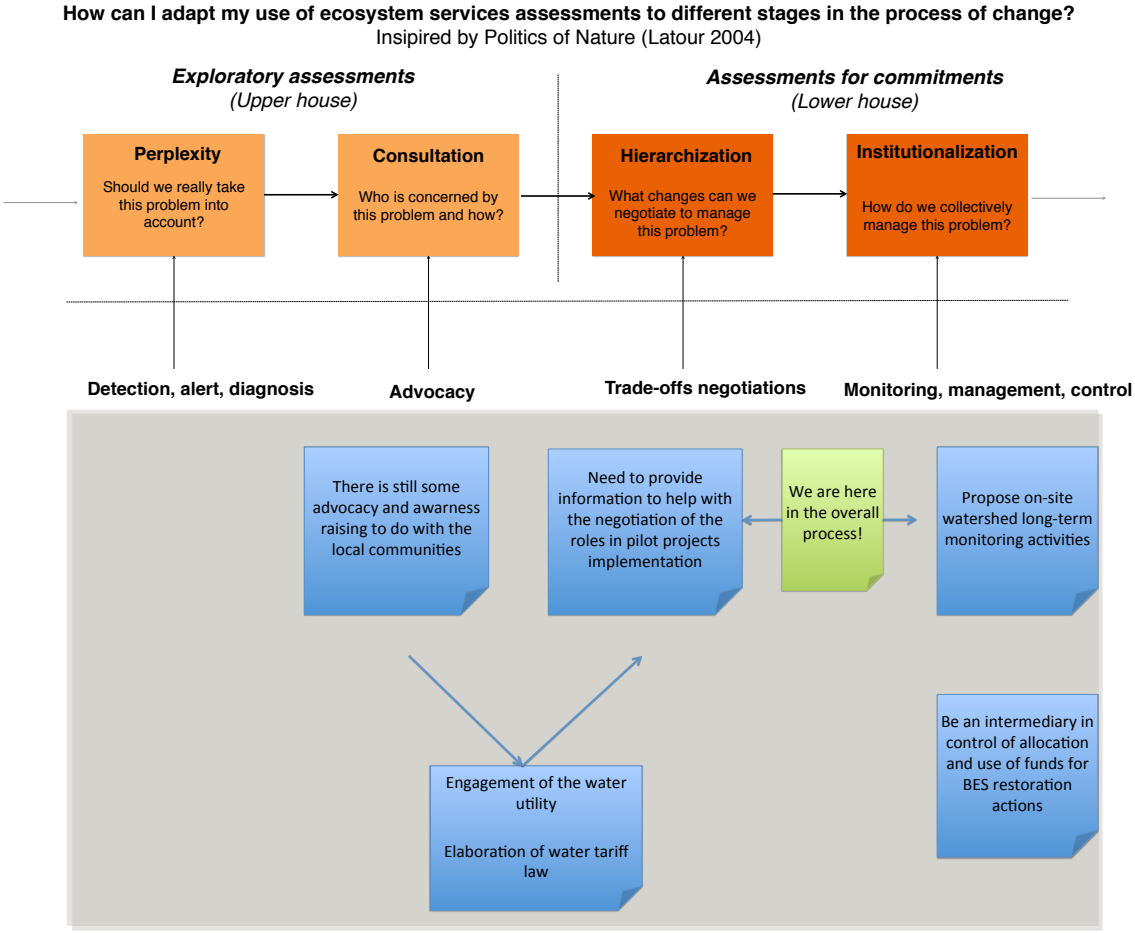
Case Study 1.5:
In the fifth year of the PWS project, the team organizes a workshop to reflect on their current situation, look back on the progress made and identify next steps.

The team first discusses at what stage they are in They are now involved in negotiations on implementation of the PWS scheme. The team agrees the collective is now towards the end of the Hierarchization stage in its treatment of the watershed quality issue. For some aspects of the project, they are possibly already in Institutionalization. Indeed, the BESAV team has been helping with water tariff negotiations for the past year, for example by undertaking cost-benefit analysis and developing a project portfolio with priority areas for ES restoration action.

The member of the team in charge of work with local communities points out that there is still much advocacy work to be done with those communities to convince them of the importance of watershed protection, meaning further Consultation is needed. More BES knowledge on how new farming practices could increase local water availability and quality in specific areas would be useful to make progress in Consultation with local communities.

Looking back, they identify two factors that were key to make the big step that lies between Consultation and Hierarchization, and that could be useful to have in mind in future similar projects: (1) their ability to convince the water company of the importance of watershed protection was thanks in part to the use of a BESAV tool that provided tailored data and maps of where to implement projects with the highest returns on investment for hydrological gains (quantity, quality and availability of water); (2) the strong working relationship with the regulatory body, whose new water tariff law for watershed protection accelerated negotiations about how, where and who to implement better watershed protection.

The team then discusses future challenges. To make the final step towards institutionalization, they admit that the collective still has to negotiate and decide who will lead implementation. What will be the roles of other partners? On what time scale? As BESAV experts, the team can contribute to these negotiations by proposing relevant monitoring tools and activities to track and measure ecological gains over time. They can also provide capacity to local communities and advise on the effective allocation and use of the funds.



3. Contributing to a strategy for conservation

Section 3 Key Messages

- The insights from this perspective can help practitioners reflect on key aspects of context that affect the most strategic use of BESAV to achieve conservation and development outcomes. It can help BESAV teams reflect on which strategic paths are most likely to generate change from others.
- *Strategic Environmental Management Analysis* (SEMA) helps to analyse and elaborate strategies to obtain ecological objectives
- SEMA acknowledges that many development activities detrimental to BES are organized by sector, involving multiple actors who share similar interests (mining, farming, fisheries, infrastructure development, etc.)
- It distinguishes between three categories of actor: (1) environmental players who act for environmental improvements; (2) productive sector players who pursue core interests that are antagonistic to environmental objectives; and, (3) high-level decision-makers and regulatory actors who arbitrate between environmental, social, and economic goals

3.1. A short introduction to Strategic Environmental Management Analysis (Mermet, 2011; Mermet and Leménager, 2015; Leroy 2006)

Strategic Environmental Management Analysis (SEMA) has been developed since the 1990s to address who takes what action to achieve environmental goals. (Mermet et Leménager, 2015). SEMA adopts the point of view of those who are determined to reach ambitious biodiversity and ecological objectives and make it their core focus and priority.

The approach invites conservation practitioners to analyze the action system they are part of. They can use this analysis todevelop their own strategy to address a clearly defined biodiversity and/or ecosystem services concern.

In SEMA's world view, the future of an ecological system depends on the interplay between two types of ecosystem management: (1) actual ecosystem management defined as all human actions that influence ecological conditions, which may be unintentional or unrecognized and (2) intentional ecosystem management defined as "*the set of actions that have as their main and explicit aim to reach expected environmental performance*" (Mermet et al., 2014, p.288).

A fundamental question is who drives intentional management of the environment? Who are 'the environmental players'? This requires a rigorous analysis of who is strategically and consistently working for the BES issue by initiating action and driving it forward.

SEMA acknowledges that economic and human development is organized by large productive sectors with significant impacts on ecological systems: industrial farming, forest plantation, infrastructure building and transportation, mining, etc. Taking action to address environmental issue requires not only dealing with individuals and local communities, but sector-based large-scale systems of organization and their respective strategies.

The relations between productive sector and environmental players are often balanced by 'high-level decision-makers and regulatory players'. These are actors or institutions with power to arbitrate between competing interests. For them, environmental concerns are only one set of issues that needs to be integrated along with many other public and sectoral concerns (e.g. agriculture, forestry, mining, infrastructures, etc.).

SEMA focuses on a central element of strategy: for every project that an environmental player tries to develop and implement, there will be deliberate resistance. This resistance comes from those for whom the environmental issue is not a priority. Their strategy is to make part or all of this project fail. Not every context can be reduced to a set of confrontational relationships. But SEMA's perspective calls for a serious analysis of the opponents to a project of change. What are their respective goals and strategies of action? Their resources and power? How do their positions change relative to other players as the situation evolves? What level of confrontation can be expected and in what form?

The SEMA perspective is particularly useful to inform teams on: (1) the design and use of BESAV as advocacy tools for BES protection in adversarial contexts; and, (2) strategy to negotiate, pressure for change and to make others accountable for their impacts and commitments.

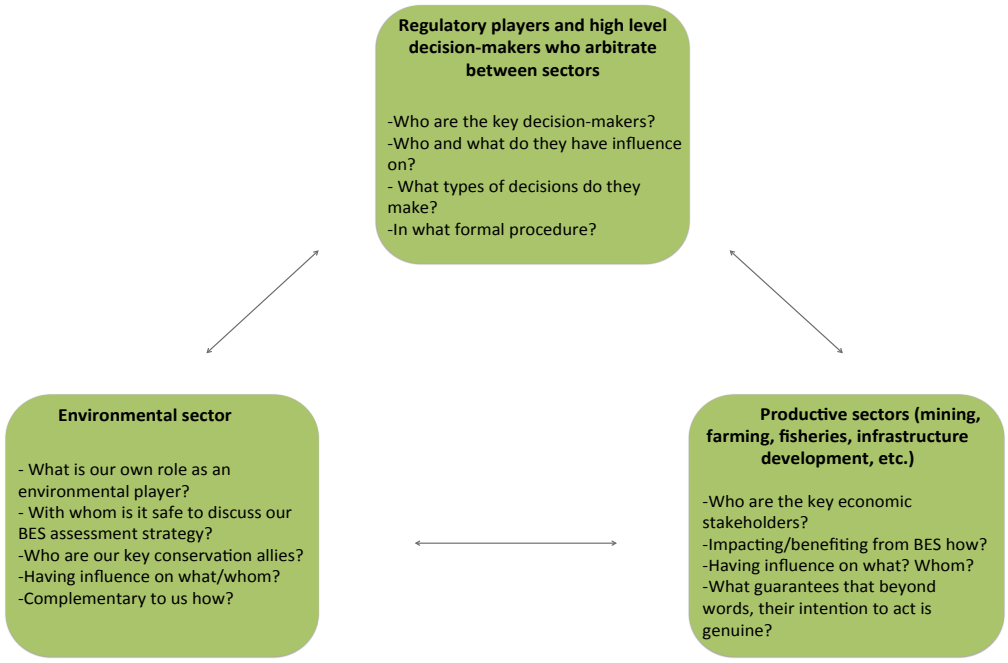
3.2. Applying to BESAV projects: who are the potential allies and opponents?

BESAV teams can use this perspective to discuss the strategic use of the information they provide and related activities. With whom and for whom do we work? Against whom and what?

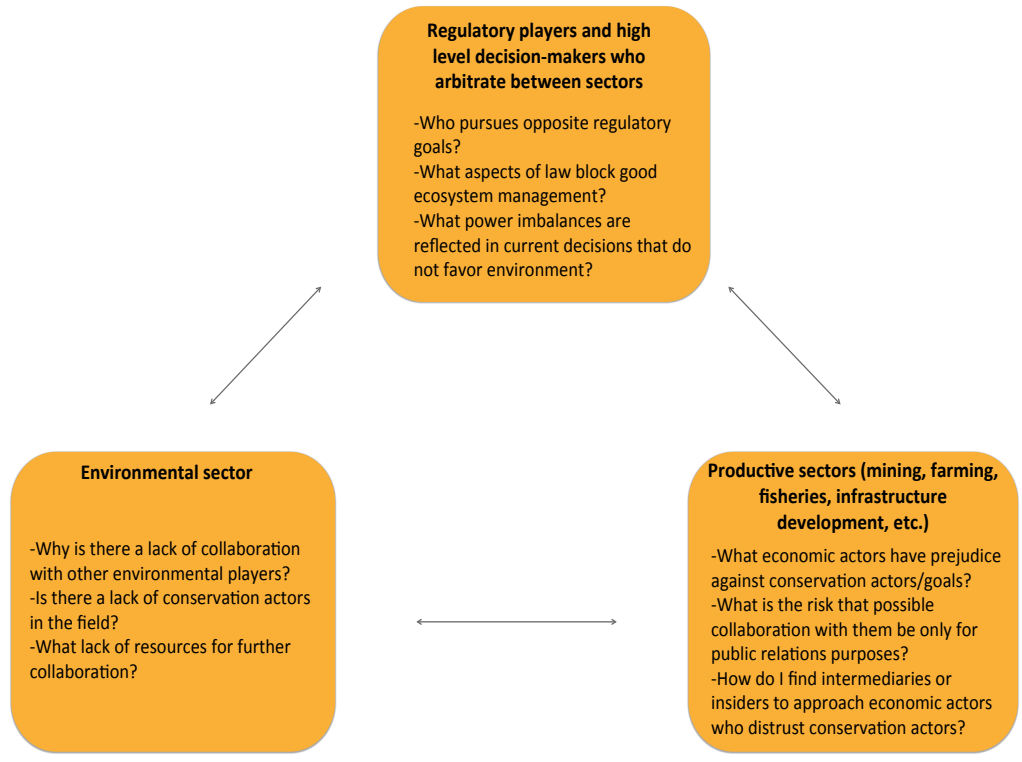
There are two versions of the diagram representing different categories of players in strategic interactions. To illustrate, we use a fictionalized example, inspired by a real-world case study:

Case Study 2: ***Integrating BES in land use and development decisions***
Two years ago, an environmental NGO launched a BESAV project in a South East Asian country at the Provincial level. The project aims to influence the government's spatial planning and public policy making. The team also works toward the creation of sustainable financing mechanisms to support the implementation of spatial plans and green economy investment plans. The BESAV team also collaborates with local stakeholders, including the private sector, to encourage them to take ecosystem services into account in their development planning. Six ecosystem services were mapped and valued (carbon storage, non-timber forest products, habitat quality for wildlife, water yield, sediment retention and nutrient retention). Several collaborative workshops were organized with the local University and Provincial government officials.

How can I improve the strategic use of ecosystem services assessments to obtain change from others?
Allies and decision-makers: with whom and for whom do we work?
Inspired by Strategic Environmental Management Analysis (Mermet, 2011; Mermet and Leménager, 2014; Leroy, 2006)



How can I improve the strategic use of ecosystem services assessments to obtain change from others?
Inertia and resistance: against what and whom do we work?
Inspired by Strategic Environmental Management Analysis (Mermet, 2011; Mermet and Leménager, 2014; Leroy, 2006)



- First reflect in your context on three categories of players and their strategic interactions: (1) environmental players who actively work for the improvement of ecological outcomes; (2) productive sector players, whose activities impact ecosystems; and, (3) authorities and high-level government decision-makers who arbitrate between sectoral interests.
- Note that actors can fit in categories that are counter-intuitive. Each actor's stated intentions, past and current actions, and working relationships should be used to determine which category they fit in. For example, an environmental NGO may not really be an environmental player if they consistently prioritize unsustainable farming practices. Government institutions may not be true high-level decision makers and regulatory players if they only serve the interests of a productive sector like agriculture. A private water company's technical department may be an environmental player if it has a strong interest in watershed protection.
- It may also be helpful to assess how each sectoral actor's activities impact BES and what actions/interventions they conduct to mitigate these impacts, or restore or enhance natural capital.

Case Study 2.1:
In the South East Asian Country where the BESAV team operates, two key actors are 'regulatory players': the Provincial Administration in charge of the provincial spatial planning process; and, high-level national decision-makers, who are developing a new Environmental Code and Green Economy Policy Framework.

The 'productive sector players' who contribute to deforestation are: mining and logging companies with concessions to operate within protected areas; rubber plantations; the Ministry of Agriculture, who gives land concessions and supports timber trade and intensive rubber farming; infrastructure development companies and their investors; and poachers.

'Environmental players' include: another big international environmental NGO; a variety of local NGOs who specialize in different conservation issues; the local University environmental department who supports the BESAV team and hosts the workshops; and the Ministry of Environment in charge of enforcing and managing protected areas, fighting deforestation and developing sustainable financing mechanisms.

BESAV teams can use this diagram to reflect on a crucial distinction between (1) those with whom and for whom the team works to create change ('allies'), and (2) the actors and factors against whom they work, who create inertia or who resist the change they want to create ('opponents'). Although this distinction can appear arbitrary in contexts where all actors usually play ambiguous roles, it is a useful way to discuss and reflect on the strategic dimension of the action system. This is not about excluding certain actors or having moral judgments on their actions or intentions. It is about thinking in a more explicit way about how an environmental player using BESAV might act with and on others to obtain changes towards greater BES protection. It can help reflect on questions like: What productive sector player can help drive forward the change that the BESAV team wants to achieve? Whose interests is the BESAV team itself allied with? What productive sector player is actively resisting change and why? Should the team try to obtain change from a productive sector player by directly cooperating, or given the situation, should they work with regulatory players to change the rules of the game? Can the BESAV team strengthen their position, voice and resources for action by working with other environmental sector actors? What factors make cooperation in the environmental sector difficult? Should the team try to overcome them? How?

Case Study 2.2:
At the time of the analysis, the Provincial Administration is mostly an ally, as the BESAV team convinced them of the importance of BES for the Provincial Administration's objectives: development, economic prosperity and the wellbeing of local communities. The Provincial Administration now supports detailed BES mapping by the BESAV team. The national level decision-makers publicly support the work, but are reluctant to provide data of forest cover at the national level. Discussions suggest that their current priority is infrastructure development. There are risks that they might not approve the provincial spatial plan if it does not fit this priority.

Most productive sector actors are degrading BES, with the tacit support of the relevant public authorities who benefit from these economic activities. There is possibly some corruption and illegal logging. However, the BESAV team has worked well with two rubber plantation companies who were interested and came to the BESAV workshops. They have become 'allies'. The team has shown them the effects of unsustainable production on water quality and quantity which rubber production depends on. They agreed to work together on the development of watershed protection plans.

The BESAV team does not coordinate well with other local NGOs. There is competition for funding from the government and international institutions. In addition, some NGOs have concerns about the risks of using a 'natural capital approach' and collaborating with the private sector.

The BESAV team is an environmental player who uses BESAV to obtain changes with and from other players. This raises a set of important questions that the BESAV team can reflect on: If the members of the team are indeed an environmental player, who are 'they' and who is part of the team? How much do they share the same environmental goals? With whom can they engage in a discussion on their strategy without undermining or weakening their intentions and future action? Can they adapt their objectives and strategy to achieve it?

Answering these questions can complement the analysis of others' strategies and positions. Although these questions can be introspective and touch on sensitive issues, they can provide crucial insights for strategy, through reflecting on questions, such as: How clear are our goals? How strong is our position and collective identity? How shared and well understood are our role and goals in using BESAV?

Case Study 2.3:
The BESAV team is connected to an NGO that is often stereotyped as 'opposing economic development' by public authorities and the private sector. The team's objective is to use BESAV tools to show that environmental protection supports the social and economic development national objectives. They hope that these arguments will lead to redirecting public and private development investments toward ecosystem protection. The team often encounters difficulties convincing others about the tangibility of natural capital value compared to direct revenues from productive activities such as rubber plantations. The team finds it challenging to speak about these challenges within their own organization, as they are afraid it could undermine internal support for their work.

3.3. Using the diagram

A BESAV team can use this diagram to reflect on their strategic situation as it evolves.

- Use the areas around the boxes and arrows to write down the names of actors, enabling or challenging factors associated with their actions, and their relationships and interactions.

Use the questions in the boxes to guide discussions.We suggest sequencing discussions to reflect on: (1) who, beyond the BESAV team, should participate in the strategic diagnosis exercise and why; (2) the different players, their relations, their roles and their power; (3) the next steps to take to obtain the change the team seeks.

- Reflect on the following questions, using the diagram where helpful:

  (1) Who are 'we', and what goals are we trying to achieve? Who can/should we share our reflections on the strategic situation with?

  (2) Who can we consider, at this time to be 'allies' in the change we want to create? How do we work with them? How do they work with one another?

  (3) Who can we consider at this time as 'opponents' who create inertia or resist the change we want to create? Have we tried to work with them directly? Why was it (not) a success?

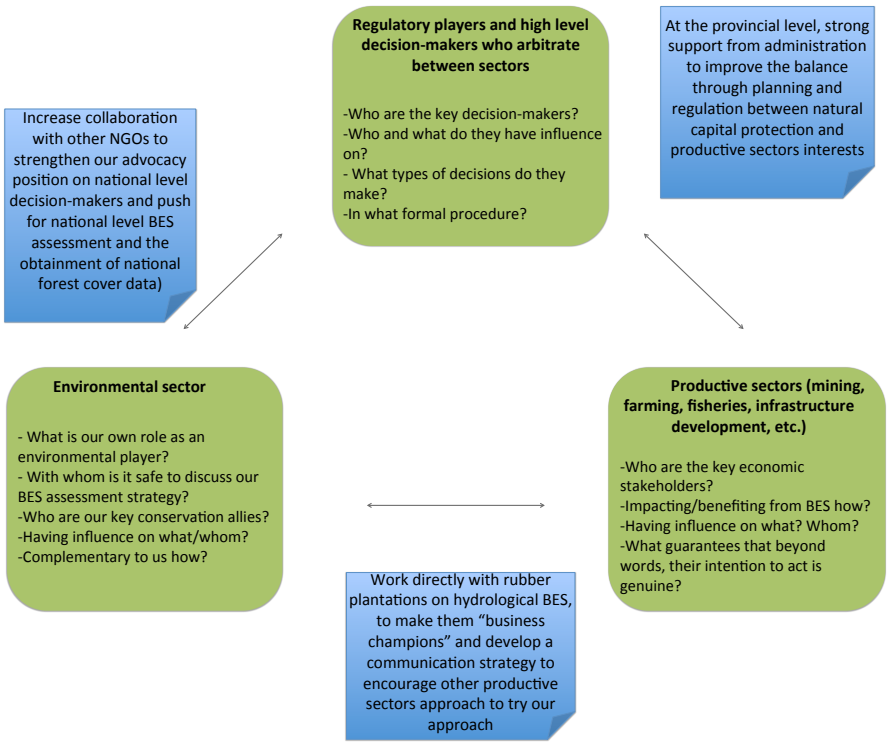
  (4) What are the productive sector players' strategies and what are their respective relationships with high-level decision-makers and players? How do they influence them? Does it undermine our push for environmental goals? Do they act in a way that puts our project and goals at risk?

  (5) How can we make the situation evolve to achieve our goals? Who should we try to engage with directly in the productive sector or among the high-level decision-makers regulatory players? Who should we collaborate and coordinate our actions with among other environmental players to consolidate our position? How can we use BES knowledge, tools and activities?

Case Study 2:
As the team reflects, several strategic insights emerge: (1) most of the productive sector players (especially the mining and logging businesses) are not motivated by environmental and biodiversity concerns and have limited interest in the project. They are strongly supported by the Ministry of Agriculture. They are also supported by decision makers at the national level who, although they publicly support the BESAV project, have consistently decided in favor of natural resources exploitation and infrastructure development. (2) The team has good working relationships with the Provincial Administration who fully endorses the BESAV project. They recognise the need to balance development and conservation in spatial planning. However, the Provincial Administration needs approval of spatial plans from national government who are not prioritizing ecosystem protection in comparison to production and development concerns. National government are refusing to provide needed forest cover data. They also demand proof that natural capital protection will provide tangible revenue, as a pre-condition for project support. (3) Local and international environmental NGOs compete, and the BESAV team cannot collaborate with these NGOs to put greater pressure on national decision-makers.

Based on this context analysis, the team agrees several actions to address these challenges:
(1) Continue to engage directly with the two rubber plantation businesses who have shown interest in integrating BES in their development plans. Cultivate them as private sector 'champions'. Build capacity for more engagement by productive sector players. Develop a strong communication strategy to identify publicly those businesses who do not engage.
(2) Continue to maintain a strong and trusting relationship with the Provincial Administration. Improve coordination with other local and international environmental NGOs to obtain needed forest cover data from the national government.
(3) Accelerate work with the Ministry of Environment to develop sustainable finance mechanisms that would provide revenues for natural capital protection. Request support from the European Union, UNDP, and private investors who use green standards for technical advice and funding.

How can I improve the strategic use of ecosystem services assessments to obtain change from others?
Allies and decision-makers: with whom and for whom do we work?
Inspired by Strategic Environmental Management Analysis (Mermet, 2011; Mermet and Leménager, 2014; Leroy, 2006)



How can I improve the strategic use of ecosystem services assessments to obtain change from others?
Inertia and resistance: against what and whom do we work?
Inspired by Strategic Environmental Management Analysis (Mermet, 2011; Mermet and Leménager, 2014; Leroy, 2006)

4. Helping others reach their own goals through innovative solutions

Section 4 Key messages

- The insights from this perspective can help a BESAV team to (1) listen and reflect on other actors' identities, needs and obstacles; and, (2) adapt BESAV interventions in ways that make them likely to become widely adopted.
- *Sociology of Translation* is useful to analyse how an innovation can reshape actors' identities, relationships, interests and behaviour.
- In this theory, researchers who introduce an innovation are positioned as the main agent of change.
- For an innovation to make a difference for ecosystem management, it has to be viewed by each actor that needs to adopt it as a better solution for each actor to achieve their own goals. If so, they will adopt it (as a 'compelling passage point')

4.1. A short introduction to the Sociology of Translation (Callon, 1986)

Callon's article is a seminal contribution to 'actor-network theory'. It focuses on how scientific knowledge, technology, and the natural and social worlds co-evolve and shape each other. Callon uses the term 'translation' to describe the process through which an innovation leads to changes in identities, interests, relationships and alliances between humans and non-humans. He positions innovators as the main agents of change.

Callon shows that for an innovation to transform a situation, it has to be widely adopted. People will adopt the innovation only if it meets their practical needs and priorities *better* than their current situation. Callon calls an innovation with this potential a **'compelling passage point'** i.e. a route that actors prefer to travel to reach their goals. Callon distinguishes four stages of 'translation':

(1) **Problematization** – Researchers seek to make their innovation indispensable. They describe the problems facing other actors (humans and non-humans), and propose adoption of their innovation as a solution to these problems.
(2) **Interessement** – The actors express interest to test the innovation. New research funding, data and participation enable testing to proceed. New connections and relationships are built among actors, as they experiment and organize together.
(3) **Enrolment** –Researchers seek to create new roles for different actors, based on the innovation. The actors can accept, modify or reject those roles. The situation is unpredictable and unstable. The innovation and new roles required may not work for everyone.
(4) **Mobilization** – For the innovation to have significant impact, many more actors will ultimately have to adopt it. This requires that those involved in the innovation process were representative of their 'group' (e.g. were the farmers involved in the experiment representative of all farmers that will have to use the innovation in practice? Was the watershed studied representative of other watersheds where the innovation will be implemented?).

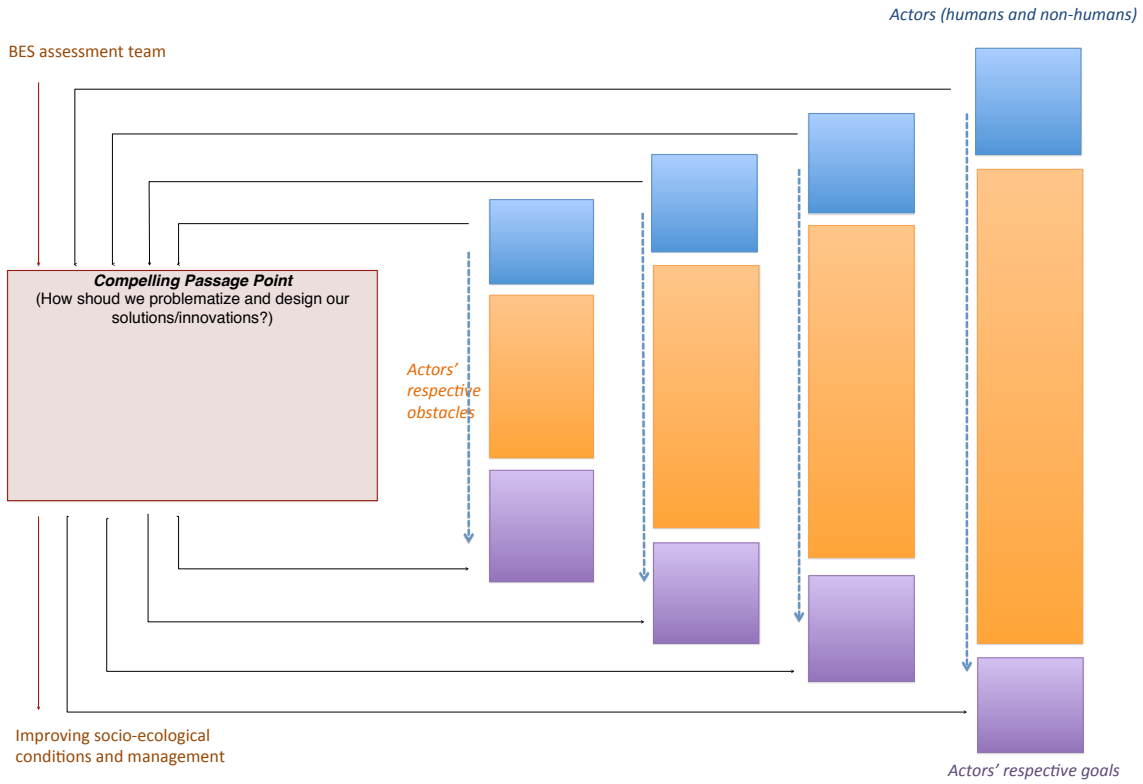
This perspective can be useful to analyze how far BESAV can be made feasible, and compelling to fundamentally change roles and relationships of key actors affecting BES outcomes.

4.2. **Applying to BESAV projects: how to make our solutions compelling for other stakeholders?**

BESAV teams can use this perspective to reflect on their role as innovators and what it will take to get their innovations widely adopted. To illustrate this perspective[13], we use a fictionalized example inspired by a real-world case study:

Case Study 3: ***Developing an integrated Green Economy management plan***
A BESAV team are working with the national government in a coastal African country to develop and implement a Green Economy plan. This plan aims to enhance the protection of natural capital and provision of ecosystem services across the country. The team wants to use BESAV to make the country's capital city a model example for the integration of BES in city planning. Climate change and sea level rise threaten the city's coastal neighborhoods. There are environmental and economic pressures on communities' livelihoods. Ecosystem degradation has led to declining water quality, while prices rise.

How can I make ecosystem services assessments an 'obligatory passage point' i.e a compelling solution for other stakeholders to reach their own goals?
Inspired by Sociology of Translation (Callon, 1986)



The left side of the diagram represents the BESAV team, their own objective and the innovations and sets of solutions that they propose to others. The BESAV team is not an impartial observer. They are one actor, among others, who aim to improve social and ecological outcomes. To achieve that goal, they offer BESAV innovations (new tools and information on BES, innovative

[13] The diagram is directly derived from Figure 2 in Callon (1986).

biodiversity friendly production techniques such as agroforestry, facilitation of a stakeholder engagement process through iterative workshops and scenarios, etc.). They propose that BESAV innovations can reshape interactions to be more sustainable. However, success depends on understanding what it will take for others to adopt it.

Case Study 3.1:
The BESAV team wants to improve mangrove protection along the city's coast to increase resilience against sea level rise and secure coastal water quality. The team also wants to increase protection of the city's watershed to secure a clean, reliable water supply. They believe that framing environmental problems in terms of how nature benefits people (ecosystem services) and using cost-benefit analysis and mapping tools they will encourage adoption of BESAV results in city and land-use planning. Specifically, they believe that BESAV will: (1) provide the city with convincing arguments and data for financial support from the national government for conservation; (2) make coastal communities aware of the value of mangroves for their long term livelihoods and galvanize action to stop mangrove degradation; and, (3) convince the water authority to invest in nature protection. Eventually, they hope that the city can provide lessons and inspiration for national scale BESAV.

The right part of the diagram represents other actors. To create the change the BESAV team seeks, these actors need to be on board in a common 'alliance' and to adopt the innovations and solutions proposed. The BESAV team therefore has to understand each actor's identity, goals, obstacles and needs. Each actor has its own perspective and reasoning about the situation and proposed innovation. The boxes on the right side of the diagram can be used to reflect on other actors' identities and worldviews, practical needs and goals, and the obstacles/problems they encounter to achieve them.

Case Study 3.2:
The other actors that the BESAV team needs to engage are: (1) the municipality, in close association with the national government. They want to have a good reputation and fame in order to be re-elected. For that, they need to overcome their current difficulties in delivering security, water and food; (2) the city water authority who wants to deliver water at low cost while limiting new investments. Their obstacle is the falling quality of water due to watershed and mangrove degradation; (3) the coastal communities, who want to avoid inundation and flooding during tropical storms and sea level rise. They also need fish for food, which is an important source of local nutrition. Their obstacle is the city's growing population and the competition for limited resources, which encourages overexploitation; (4) the city's remaining mangroves (non-human actor) want to survive and perpetuate themselves. Their main obstacle is local communities' use of their wood for charcoal.

For this innovation to be adopted and create change, the BESAV innovations will have to address each actor's needs and provide a better solution to their problems than the usual way they operate. The BESAV team needs to 'translate' the innovations in a way that resonates with other actors' needs. This generally happens through iterative discussions between the BESAV team and the other actors and changes made to the innovations proposed. The diagram can help to reflect on ways to reformulate or communicate the innovation in ways that get to the heart of addressing other actors' problems.

Case Study 3.3:
To make BESAV tools transformative, the team reflects on opportunities to: (1) meet with city and national government officials to show them ecosystem service maps and data that demonstrate how protecting remaining mangroves will significantly reduce the risk of flooding and inundation, improve livelihoods of poor communities, and increase the security of coastal areas; (2) meet with the water authority to develop a portfolio of projects that increase water quality cost effectively; (3) consult with local community leaders to discuss the role of mangroves as fish nurseries and in storm protection, propose a plan for mangrove protection and replanting that could provide employment for local people and help lower resource competition; and, (4) study carefully the local mangrove

species' ecology to determine a sustainable level of fuel wood harvesting and co-develop sustainable mangrove harvesting techniques with local communities.

4.3. Using the diagram

A BESAV team can use this diagram to reflect on their role as innovators and what it will take to get BESAV solutions widely adopted and mainstreamed in decisions.

- In the boxes on the right, write down:
  (1) details about relevant actors including their identities. Include both people and non-human actors
  (2) each actor's current goals, practical needs and priorities
  (3) the obstacles facing each actor to achieve their goals and needs
  (4) ways the BESAV team 'translate' the BESAV approach to address each actor's needs and obstacles to encourage adoption

- The diagram can be used iteratively as a BESAV project evolves. Use the diagram iteratively, moving from left to right. Sequence team discussions to: (1) reflect on the outcomes the BESAV team wants to achieve and their current hypothesis for how BESAV tools and activities will help achieve these goals; (2) identify the actors they need to interest and adopt the innovations; identify their goals, needs and obstacles; (3) reflect on ways to reformulate the BESAV hypothesis and adapt the BESAV innovation to fit other actors' needs and encourage adoption.

- It may help to reflect on these questions as you work through the diagram**:**

  (1) What are the BESAV innovatiosn (tools, activities, technical solution, engagement process, etc.) that we want to introduce? What is our initial hypothesis about how these innovations will create the change we seek? Why do we think our BESAV innovations can become indispensable and adopted by key actors?

  (2) Who are the actors (e.g. an individual, a local community, an organization, an institution, a watershed, a species.) concerned by our innovation and by the questions we formulate? Who do we need to adopt the solution we propose (e.g. approach, assessment or monitoring tools, management plan.)? What do we know about these actors' identities, their own interpretation of the problems they face, their needs, challenges and obstacles? How does it challenge our initial hypothesis about how our BESAV innovation can create change?

  (3) How can our BESAV innovation help key actors overcome obstacles and achieve their goals? How can we design and adapt what the team does to fit their needs and get them engaged? How can we gradually form an 'alliance' with actors around our solutions? Are there needs we will not be able to fulfill?

  (4) Are the actors we are negotiating with representative of others in their group/sector? Will our innovation eventually be mobilized by everyone we need to adopt it?

Case Study 3.4:
As the team discusses, they agree the following:
(1) The team's initial hypothesis was that BES maps and data would be used by the municipality in their land-use planning. However, as the project progresses, the municipality's officials seem

unwilling or unable to change the current land-use plan. They are not interested in the initial offerings of the BESAV team. They would prefer to take more visible action that addresses an urgent security issue in the city. The BESAV team therefore decides to focus on mangrove protection because of the clear and immediate link to the security of local communities in the face of storm surge, inundation, sea level rise and natural hazards. Recent cyclone damage means this is at the top of people's minds.

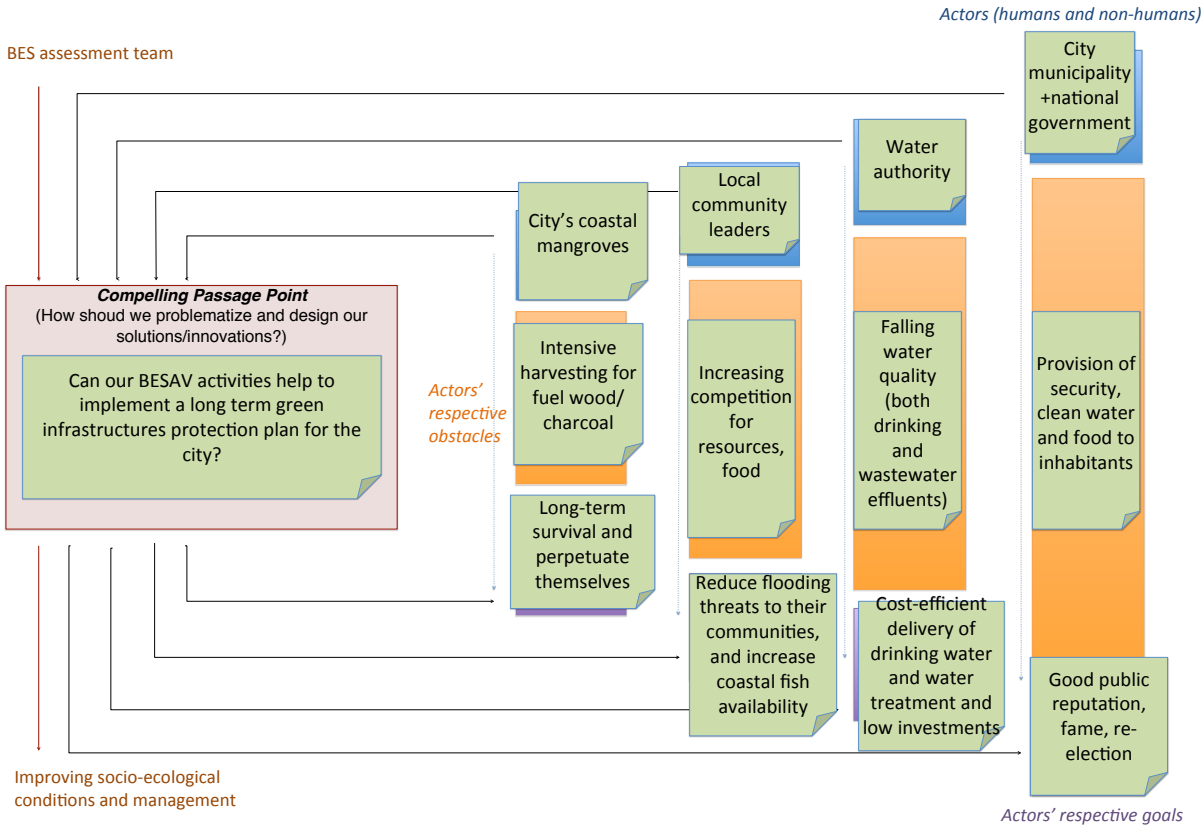
(2) The water authority agrees to use BES modeling tools to identify priority mangroves and watersheds for protection. They agree to redirect investments from grey to green infrastructure, if there is a clear case to make to their board of directors that it effectively improves water quality within five years. The BESAV team therefore needs to provide information on how watersheds purify drinking water mangroves filter wastewater and sewage effluents (this also falls under the responsibility of the water authority).

(3) After discussing with the BESAV team, the local community leaders agree to develop a mangrove protection plan, as they acknowledge it would help reduce flooding, increase fish populations, and provide employment. The BESAV team wonders however if the leaders are truly representative of local people: when it comes to implementation. Will everyone be 'mobilized'? Will they agree not to use the mangroves as their prime source of fuel wood along the entire coastal area of the city? These questions prompt the team to survey the local population to understand their position better.

(4) The team does not know yet if the mangroves can be sustainably harvested and still provide flood protection and fish habitat. The team now needs to wait and see if the mangroves will react to sustainable harvesting in the way their BES tools and models predict. If not, the project is likely to fail.

How can I make ecosystem services assessments an 'obligatory passage point' i.e a compelling solution for other stakeholders to reach their own goals?

Inspired by Sociology of Translation (Callon, 1986)



5. Navigating multiple coexisting and contradictory orders of values

Section 5 Key Messages

- This perspective can help BESAV teams to reflect on (1) the multiple 'orders of value' that they have to deal with when they exchange information, arguments, and justifications with others; (2) how to overcome clashes of values among stakeholders.
- The *Economies of Worth* theory is useful to recognize and analyse the spectrum of contradictory and coexisting orders of values that people mobilize on a regular basis to justify their claims, positions, behaviours, and decisions to others.
- Boltanski and Thévenot introduce 6 prevailing orders of value (inspiration, civic, industrial, market, domestic, fame). Each rests on a 'shared common principle' on which the value of a behaviour, decision, or claim is assessed.
- Although many behaviours and decisions concerning the environment are justified in terms of these six orders of value, other authors debate the existence of an 'environmental order of value' that rests solely on the principle of 'care for nature'.
- *Economies of Worth* is set in the context of stakeholders seeking cooperation. Other situations are best addressed by studies on strategic argumentation, rhetoric, or power relations (for example, see Section 4 of this background paper).

5.1. A short introduction to the Economies of Worth (Boltanski and Thévenot, 2006)

Boltanski and Thévenot's work on the *Economies of Worth*, also known as *Justification Theory*, describes different commonly held normative logics ('orders of worth' or 'orders of value') that people use to justify behavior and decisions. It focuses on ethical, rather than rational or strategic, dimensions of decision-making. The authors propose an analytical framework for observing and understanding how people justify their behaviors, proposals, claims, decisions and actions in real-life situations and when dealing with public issues. The theory refers to **six 'orders of worth'** or value: ways people judge worth and legitimacy. Each rests on ideas about what contributes to the common good, which the authors call 'shared common principles' (e.g. efficiency, aesthetic beauty, fame, respect of law and procedures, respect of traditions, etc.). It is important to point out that these six orders of value coexist and partly contradict one another (e.g. what is most effective may disturb traditional arrangements, etc.). There is thus no overarching order of value.

Something has value and moral standing if:

Order of value	***Shared common principle***
Order of inspiration	It contributes to **creativity, spirituality or aesthetic beauty**.
Civil order	It contributes to **public common interest through law and democratic procedures.**
Industrial order	It promises to be **successful and effective in solving a practical issue**
Market order	It makes participants more **prosperous through active involvement in mutually advantageous trade and economic competition**
Domestic order	It is based on the **respect of traditional values, familiar practices and hierarchies**
Order of fame	It increases **attention from others and contributes to increased reputation and media visibility**

Environmental order	It increases **the care taken for nature**, prioritizing natural processes and non-human[14].

Table 2 : The six 'orders of value', Boltanski and Thévenot

5.2. Applying to BESAV projects: how do we and others justify our claims, behaviors and actions?

This perspective can be useful for BESAV teams to:

- strengthen justifications and arguments for the value of protecting, restoring or enhancing biodiversity and ecosystem services.
- identify and sort out the heterogeneous value orders that stakeholders mobilize when they react to BES-based claims and actions or justify their own behavior when dealing with the ecological issue.
- reflect on ways to help actors articulate and consolidate new value compromises.

Case Study 4 illustrates with a fictionalized example inspired by a real-world case study:

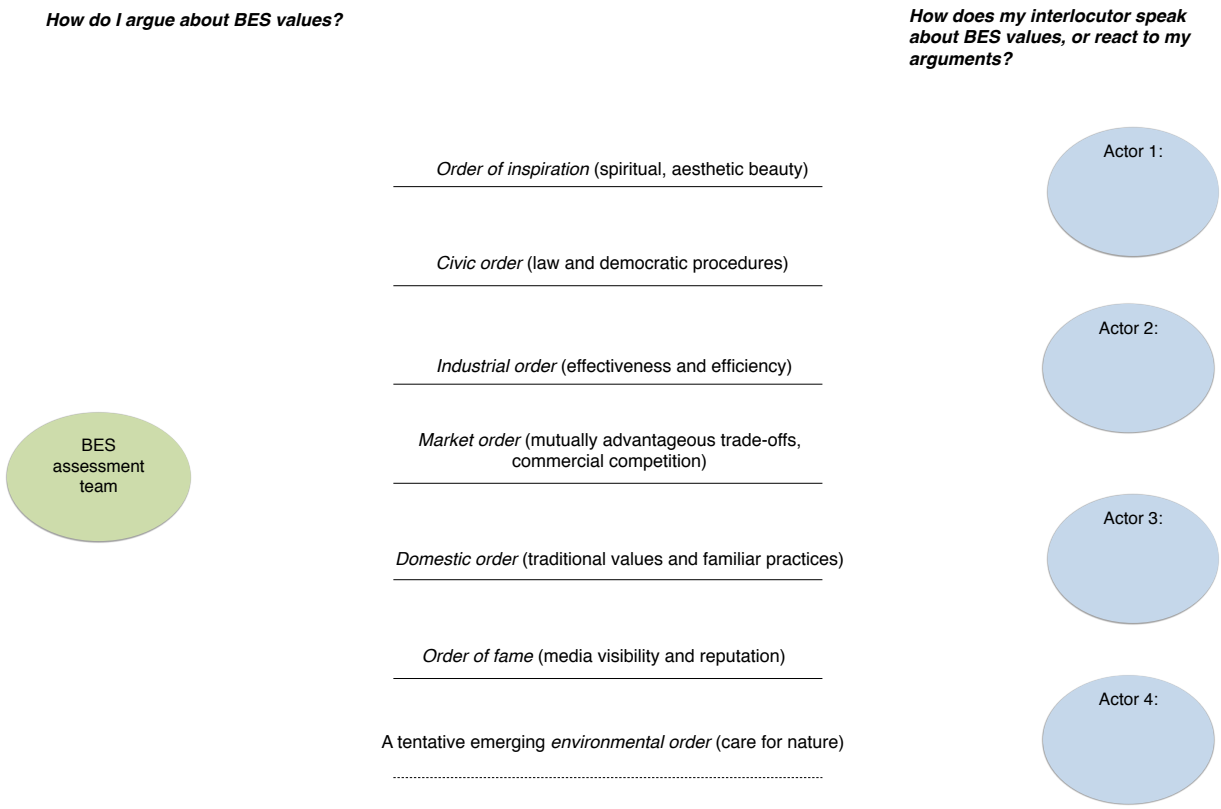
Example 4: ***Negotiating a regional action plan for protection of coral reefs and fisheries***
A BESAV team is helping three NGOs create a co-management plan for a large marine area that is home to one of the highest density of coral reefs in the world. The reproduction of key fisheries, such as tuna, depends on these reefs. The team needs to provide relevant BES knowledge and participate as experts in the intense negotiations between 6 neighboring countries and other stakeholders.

The left part of the diagram represents the BESAV team and the different ways they have so far used, or plan to use, BES concepts and knowledge to argue for the importance of taking ecosystems and biodiversity into account in decision-making. It is important to clarify here that the theory does not invite BESAV team or other stakeholders to 'betray' their core beliefs (i.e. the intrinsic value of care for nature held by many conservation practitioners) by replacing them tactically with other orders of value in their discourses and deliberations in an argumentative struggle. The theory does not deal with issues related to the strategic or deceitful use of values by different actors. It rather recognizes and puts forward that the treatment of issues in open, democratic societies is based on the coexistence of equally important but contradicting orders of value, and on managing the tensions between them, for instance by finding value compromises.

[14] This 'environmental order of value' is not included in Economies of Worth, but advocated by others – see (Mermet 2007; Mermet, Laurans, and Leménager 2014, 240–243; Thévenot, Moody, and Lafaye 2000). Whether the environmental order meets the conditions to become a stand-alone order of value is debated – see (Godard 2004; Lafaye and Thevenot, 1993; Latour, 1998)

How can I frame ecosystem services assessment to gain traction among stakeholders who hold multiple contradictory orders of value?

Inspired by the Economies of Worth (Boltanski and Thévenot, 2006)



Some tips about using this diagram:

- Do not classify people or organizations in pre-assigned categories. Every type of actor and individual can use different orders of value depending on the situation. For example, in a company, on the same day, a manager can use the market order to ask for support for a project from the board of directors and the domestic order to request holidays with his family. Hence, a BESAV team does not always have to argue only in terms of the environmental order's 'care for nature'.
- In the course of a project, a team can use BES knowledge in different orders of value in their arguments, with different champions to push for change. For example, different orders of worth may be used in a participatory workshop with stakeholders, a high-level bilateral meeting with government officials, a written report to donors, or a field visit with local communities.

Case Study 4.1:

The BESAV team has used various orders of value advocate for a marine BES management plan.

(1) The BESAV team is motivated by the 'environmental order: a desire to protect this important place for marine biodiversity. This motivation is expressed in the team's work plan, shared with the three NGOs who support the project.

(2) To launch the project, the team used the 'order of fame' to garner support from the six national governments. At high-level international meetings on sustainable economic development the team spoke directly to countries' leaders about increasing their reputation and visibility by engaging in the management plan to protect coral reefs.

(3) To obtain the support of the World Bank and the European Union, the team highlighted in a report the recreational and tourism values of coral reefs and the need to preserve their aesthetic beauty, mobilizing primarily the 'order of inspiration' but also the market values of tourism.

(4) Since fishing in this nursery area threatens the ability of tuna to reproduce and grow, the team engaged with the large tuna fisheries. They used essentially 'market order' justifications showing the economic risk of tuna population collapse if coral reefs are significantly degraded. They used BES modeling and mapping to define marine zones that protect tuna nurseries and ensure sustainable fisheries revenues.

The right hand side of the diagram represents other actors (partners, stakeholders, local community representatives, government officials, funders, etc.). The diagram can describe how each actor justifies their positions, behaviors and decisions when deliberating in good faith. All actors can use multiple orders of value. For example, a mining company may predictably mobilize the market or industrial orders of value but may also justify behavior using the domestic order, for example, by arguing that their activities support traditional livelihoods. Using this diagram can help BESAV teams to pay attention to: (1) the orders of value embedded in actors' justifications and claims about the BES issue; (2) how others react to the BESAV team's arguments and presentations; and, (3) how other actors speak to each other about the issue.

Case Study 4.2:
The large fisheries companies reacted positively to arguments based on 'market order' and agreed to help develop the management plan. However, the team started to receive requests to meet with local NGOs and syndicates representing small-scale community fisheries. They felt that (1) discussions about the management plan had only happened at a very high level and (2) the role of coral reefs in supporting local, subsistence and small-scale commercial fishing had been overlooked. The BESAV team started to focus on local fisheries in their assessments and consult with local community fisheries representatives.

What can a BESAV team do to resolve disagreements or clashes of value? This perspective highlights two possibilities:

(1) When a conflict arises between two people that share the same 'order of value', the conflict can be resolved by applying an appropriate 'test' to the situation. For instance, a conflict between two individuals who both refer to the 'industrial order' when debating protection of a watershed, can likely be resolved through data, and indicators, that evaluate the most efficient level of protection. The BESAV team can provide knowledge to help solve such a disagreement.

(2) When there is a conflict over which order of value to use to judge a situation or make a decision, the BESAV team can help stakeholders build compromises. Compromises can be hybrids where different orders of value are articulated together (e.g. "this project must not only respect the beauty of the landscape (order of inspiration), it must also provide economic revenue to the company that provides jobs to local people (market order)").

Case Study 4.3:
The World Bank and the European Union agreed to support the marine management plan initiative. They were convinced by evidence in the report on the aesthetic values of the coral reefs ('order of inspiration') and the potential to support sustainable tourism. Yet they disagree on the financial support to provide. They contest the methods used to estimate the monetary value of cultural ecosystem services (cultural heritage value, recreation and tourism value and aesthetic values), on which the funding request was based. Using a different methodology, they reach a lower value estimate. On this basis, they have decided on lower funding for the project. Given this conflict was based on the same order of value, the team proposed an independent expert be asked for a third opinion.

The 6 countries reacted positively and all decided to help develop a management plan, judging that it would improve their regional and international reputation and visibility. During the project, the team began discussions with the countries. During the meetings, they presented different BES maps of the marine/coral reef zone highlighting areas that need protection.One country developed a confrontational position, threatening the overall negotiation process, based on the 'civic order'. The country's officials said that the definition of zones of ecological importance and the roles of each country should take into account maritime political borders (which are disputed in the region).

5.3. Using the diagram

A BESAV team can use this diagram to reflect on how to convey messages and arguments on the value of biodiversity and ecosystem services in ways that resonate.
Use the diagram to:

- Connect the BESAV team to the orders of values already used, or that the team intends to use to justify their claims, their activities, or future plans.
- Connect actors that the team is in discussion with, to the orders of value they use to justify their own actions, decisions and behaviors.

This diagram can be used iteratively, from left to right. Sequence the team discussions to reflect on:

(1) orders of value used in the project so far with specific actors (on the left side of the visual);
(2) orders of values expressed by other actors about the BES issue at hand, or in reaction to the team's arguments and claims;
(3) new ways the team could advocate for BES activities using the order of value that matters most to other actors;
(4) current clashes of values and ways to resolve them.

It may help to reflect on the following questions when using the diagram:

(1) What orders of value have we used to argue for protecting biodiversity and ecosystem services and to make the case for our solutions? With whom have we used each order of value, in what situation?

(2) As we listen to other actor, what orders of value can we identify? On what 'shared common principle' do they seem to base their decisions, or justify their actions?

(3) How have others reacted when we made our arguments about BES? Did they use the same order of value as us? If they used another one, can we reformulate our claims on the basis of that order of value?

(4) Are disagreements among stakeholders based on the same or different order of value?

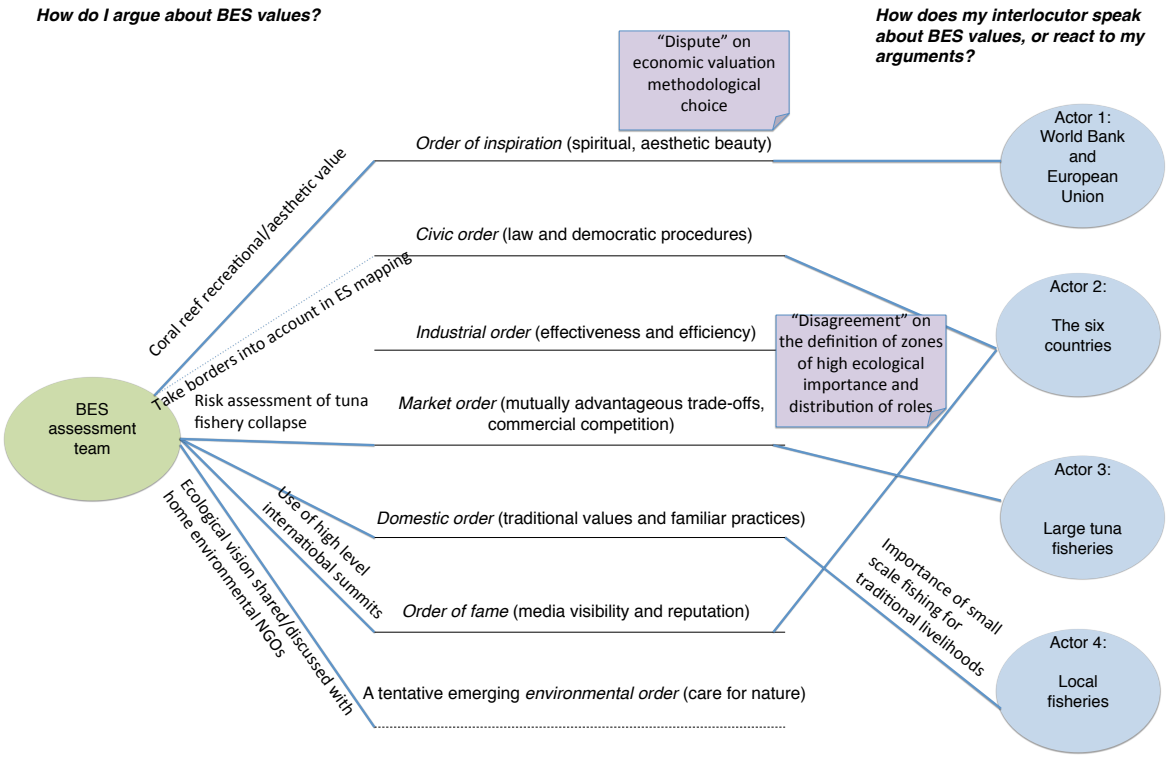
(5) If it is a disagreement based on the same order of value ('a dispute'), can we help resolve it using BES tools and methods?

(6) If it is a 'disagreement' on *which* order of value, can BES assessment tools and activities help find workable compromises?

Case Study 4.4:
The BESAV team reflected that:

(1) They still need to use the 'environmental order' in discussions with partner environmental NGOs.
(2) They have mobilized 'order of inspiration' arguments in their negotiations for support from the EU and World Bank. However, a 'dispute' emerged about the methods and criteria used to quantify the aesthetic and the cultural service values of the coral reefs in monetary terms. It is therefore logical to seek the help of an expert in economic valuation to review the methods and help reach agreement.
(3) Use of the 'market order' and 'domestic order' with large fisheries and local community fisheries has proved so far effective in discussions.
(3) Discussions with the national governments have been driven forward by motivation to improve reputation and gain visibility ('order of fame'). The countries were close to an agreement on co-managing the marine area without consideration of borders. This cooperation is now threatened by one country that invoked the 'civil order' to question the legality of the management plan on the issue of national maritime political borders. To solve this 'disagreement', the team needs to reach a 'compromise' that articulates the 'order of fame' and the 'civic order'. One option is that participation and contribution of each country be adjusted based on the proportion of areas of high ecological importance within the boundaries of its legal national maritime zone. This would not undermine the visibility and reputation of the management plan for excellent multilateral cooperation on an important environmental question. It may also address the concern raised about national maritime borders.

How can I frame ecosystem services assessment to gain traction among stakeholders who hold multiple contradictory orders of value?
Inspired by the Economies of Worth (Boltanski and Thévenot, 2006)



6. Improving human well-being by renegotiating institutions

Section 6 Key Messages

- Institutional approaches to local ecosystem use can be useful to analyse how, a local community or group of individuals uses its surrounding natural environment for its own well-being.
- These institutional approaches can be useful for BESAV teams to reflect on how their BES knowledge and activities affect institutions and rules to benefit local communities' ability to use their natural environment for their well-being.
- The *Environmental Entitlements Framework* from Leach, Mearns and Scoones suggests that individuals transform environmental goods and services into 'capabilities' (specific component of well-being) through a process of 'endowment' and 'entitlement'. Institutions (formal and informal, macro and micro) mediate each step of this process.
- Ostrom's *Common-Pool Resources* theory focuses on analysis of the rules and infrastructures that condition access of individuals to resources and the benefits they provide.

6.1. A short introduction to the Environmental Entitlement Framework and Common-Pool Resources theory

The Environment Entitlements Framework (Leach, Mearns and Scoones, 1999) focuses on the ability of people and local communities to improve their well-being through use of natural resources. The theory builds on critiques of community-based natural resource management that local communities are not static or homogeneous and the local environment is dynamic. The analytical framework can be used to examine how institutions at different scales, both formal (e.g. legal systems and rules) and informal (e.g.customary property rights, social conventions and norms, local codes of behavior), influence the way local people gain access to and control over environmental goods and services, and how they use them to achieve well-being. It is grounded in 'entitlement analysis' (Sen, 1981) to understand how individuals and groups improve their well-being.

The Environment Entitlement Framework helps identify: (1) different components of people's well-being such as health, nutrition, shelter, education, knowledge, sociability, clothing, emotions ('capabilities'); and, (2) how people achieve these components of well-being through access and control over environmental goods and services. Individuals and local communities convert environmental goods and services into 'capabilities' through :

- *Endowments*: actors' rights and resources such as land, capital, easy access, labor, skills, that they can mobilize to gain access and control over environmental goods and services.
- *Entitlements***:** utilities that people derive from environmental goods and services such as direct use of water, food, fuel resources, market value, ecosystem services such as landslide risk mitigation or pollution treatment, etc.)

Ostrom's 'Common-Pool Resources' theory also focused on the role of institutions and infrastructure, such as irrigation systems and roads. This theory shows that if multiple users of a shared ecological resource (a forest, a fishery, a watershed, etc.) want to avoid overuse and ecological degradation, they need to establish systems of rules and control to coordinate behaviour (Ostrom, 1990; Ostrom *et al*., 1994). The theory insists on rules and infrastructure that (1) affect access to resources and (2) regulate how benefits from resource use are shared among individuals of a given community, and between the community and other external actors (e.g. a public institution, a private sector player).

BESAV practitioners often want not only to improve environmental outcomes, but also human well-being. The Environment Entitlement Framework and Common-Resources Pool theory can help BESAV teams to analyze how institutions, rules and infrastructure affect how local people can use resources for their livelihoods. It helps reflect on two key questions: (1) how will institutional and infrastructural changes recommended through a BESAV project affect local communities' well-being? (2) (how) can BESAV information be used to renegotiate institutions and rules in ways that improve both ecosystem management and people's well-being?

6.2. Applying to BESAV projects: how do existing institutions affect ecosystem management and human wellbeing?

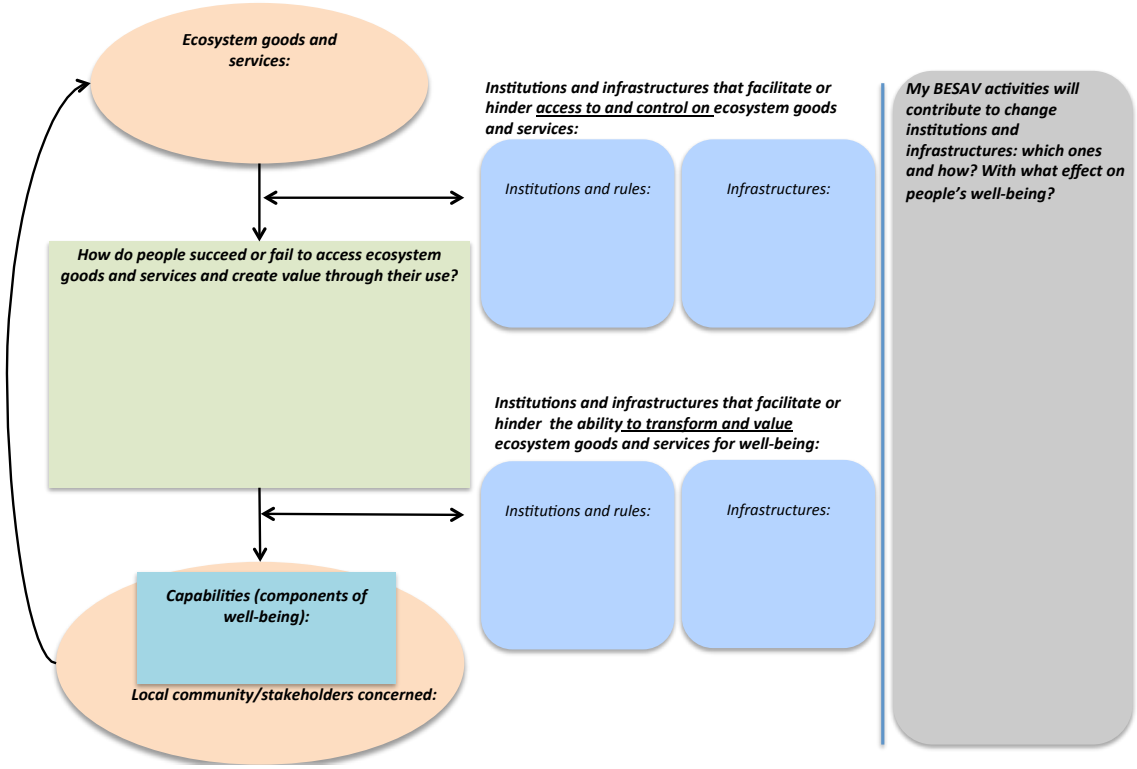
This diagram[15] can help BESAV teams reflect on how their tools and activities can be used to re-negotiate institutions, rules and infrastructure in ways that improve people's well-being and livelihoods. Case 5 illustrates, inspired by a real-world case study.

Case Study 5: ***Co-developing a land use plan for a large system of lakes and swamps***
The Paya Swamp is a 30,000 hectare system of wetlands located on the shores of a large African lake. The Swamp is one of the richest biodiversity areas in the country and provides many ecosystem services: productive soils, water purification and regulation, small scale and large scale food production, papyrus products, carbon sink and climate regulation, tourism and recreational services, etc. The Swamp is also the poorest area of the country, home to more than 100,000 residents who directly depend on it for some part of their livelihood (subsistence farming, fishing, grazing, etc.). The area is under pressure as the Swamp has been subject to rapid land use change (drainage, urban development, water extraction and river canalization). These changes threaten its ecology and increase the risk of conflicts among local stakeholders over the management and use of the land. In addition, an intensive large-scale American rice farm has drained about 6,000 hectares, increasing tensions among local. A BESAV team has been working with a national NGO to develop a land use plan for the Paya Swamp. To do this they assess and value the BES the Swamp supports and engage in a participatory learning and planning process.

[15] The diagram is directly inspired from Figure 1 in Leach, Mearns and Scoones (1999).

How can ecosystem services assessments help to renegotiate institutions and rules in a way favorable to local communities' well-being?

Inspired by the Environmental Entitlements Framework and Common-Pool Resources theory (Leach, Mearns and Scoones, 1999; Ostrom, 1990)



The left hand side of the diagram represents the process through which a community can transform an environmental good or service into 'capabilities' (i.e. components of their well-being). They can do this by acquiring legitimate and effective command over environmental goods and services ('endowments') and by deriving from them different forms of utilities ('entitlements') that will contribute to their well-being. In the diagram, the endowment and entitlement concepts are merged in the question: 'how do people/the local community concerned by the analysis succeed or fail to access ecosystem goods and services and create value through their use for themselves and for others?' Different communities living in the same area might have very different ways to access, control and use the local ecosystems for their well-being.

Case Study 5.2:
The community of people living around the Swamp, uses it for subsistence agriculture and wild papyrus harvesting. The villagers can access the Swamp because they live close to it, have limited rights to land and can use their own labor. They use the products for their subsistence and they sell the surplus for cash income. They use the papyrus for their own use (baskets, furniture, etc.) but sell most of it. They use the revenue to invest in children's schooling and new farming tools. This contributes to their capabilities (nutrition, education, shelter) and well-being.

The blue boxes in the middle of the diagram can be used to identify the institutions and infrastructure that facilitate the ability of a community to: (1) access an ecosystem good or service, or use their capital, skills, labor or rights to obtain effective control over it; (2) transform and use ecosystem goods and services to improve their well-being. These institutions can be formal (e.g. rules and legal frameworks, international and national market rules and prices, a land-use management plan adopted by a public agency, a protected area, etc.) or informal (e.g. local conventions, village hierarchy, gender division, cooperative work groups, informal trading networks, etc.).

Case Study 5.3:
Both formal and informal institutions and infrastructure mediate villagers' ability to access and control areas of the swamp suitable for farming, including: (1) land leases issued by the County government that allow the large scale rice farm to access and drain part of the land. This reduces villagers' access; (2) protected areas run by the country's wildlife service that exclude agriculture from within their boundaries; (3) cultural land tenure of the village hierarchy. This land tenure is not in law, but defines how land is allocated among families in the village and what they can do with it (crop cultivation, grazing, etc.); (4) fences built by the rice farm limit people from using the land for subsistence farming.

The institutions and infrastructure that mediate the ability of villagers to use the Swamp's ecosystems goods and services are: (1) local markets for food and papyrus products; (2) the drainage regime of the rice farm that affects the water level in the Swamp and available land for farming; (3) the Corporate Social Responsibility policy of the rice farm that sets out who can access their land and helps local villagers fund schooling; (4) intra-household bargaining on the allocation of food and papyrus for personal use commercial sale.).

The grey box on the right side of the diagram represents the BESAV team's intervention and its current or anticipated effects on institutions and infrastructure. The team can reflect on how the BESAV intervention currently affects or could help change the existing institutions and infrastructure to benefit people's well-being (see Case Study 5.4).

6.3. Using the diagram

A BESAV team can use this context diagnostic diagram to reflect on their role in changing the local institutions, rules and infrastructure that affect the well-being of people and local communities. The diagram can be populated with information about local communities, the institutions that govern them, and their relationship with the environment.

Complete the diagram by filling out the different boxes for one specific community or group of individuals and for one specific relation with an ecosystem good or service. It may help to:

(1) Choose the local community and ecosystem good or service to focus on;
(2) Reflect on how people gain access and control over ecosystem goods and services, to derive value. Write down the different components of well-being affected.
(3) Identify the formal and informal institutions and infrastructure that affect transformation of ecosystem goods and services into components of well-being.
(4) Reflect how the BESAV project has changed institutions and infrastructure, and how they would be affected by future project plans. Reflect on whether or not it is ultimately empowering the local community to achieve well-being.

These questions may be helpful in reflections:

(1) How do local people and communities use ecosystems for their livelihoods? What ecosystem good or service contributes to what component of their well-being? Do our BESAV tools and activities consider local livelihoods and how local people use ecosystem goods and services?

(2) How do local people and communities access and control these ecosystem goods and services? What formal/informal institutions and infrastructure affect access to, and control over, an ecosystem good or service? Where and by whom are these institutions negotiated or changed? How do/will our BESAV tools and activities

affect the evolution of these institutions? What can we do to ensure our BESAV tools and activities change these institutions and rules to have positive impacts on local communities' well-being?

(3) What value do local people and communities derive from their access and control over an ecosystem good or service? What formal/informal institutions and infrastructure facilitate or hinder their ability to derive these values? What component of well-being do these values contribute to? Where and by whom are these institutions negotiated or changed? How do/will our BESAV tools and activities affect the evolution of these institutions? Can our BESAV tools and activities help to re-negotiate and change these institutions rules in a way favorable to local communities' well-being?

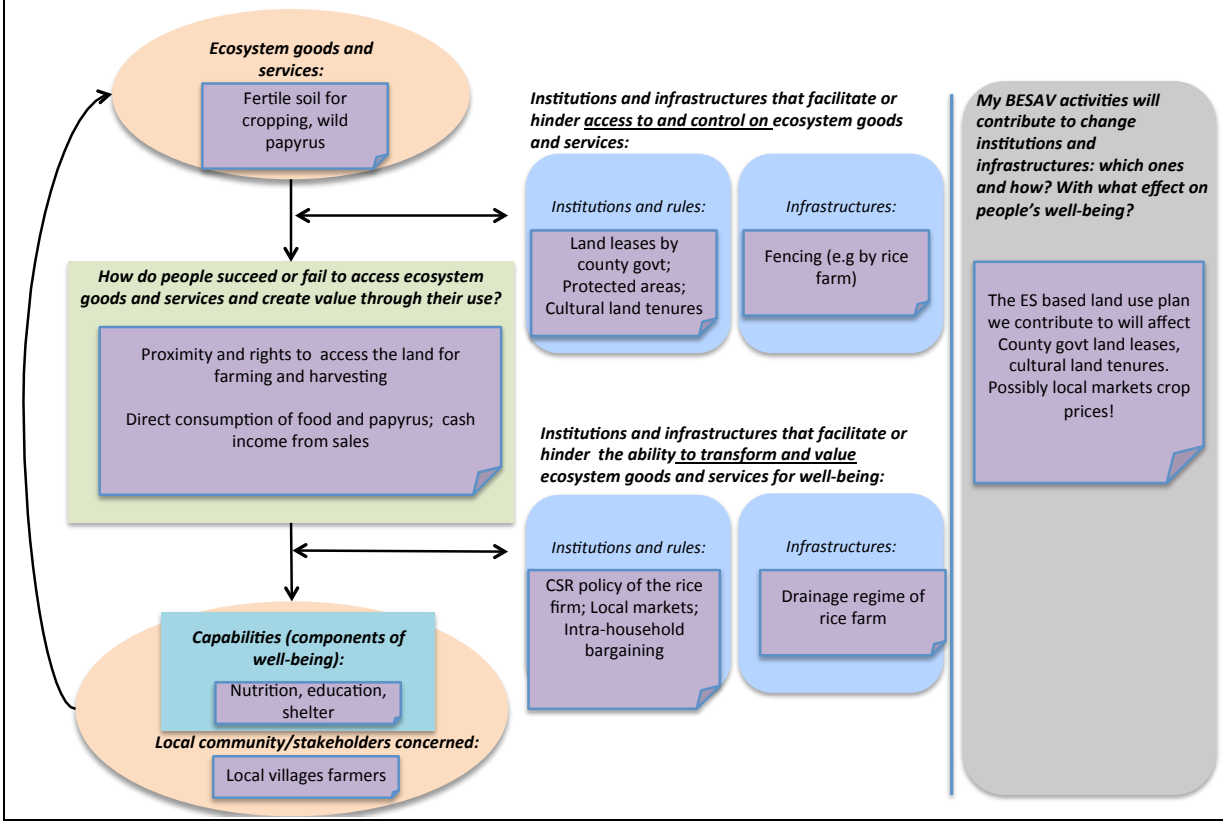
Case Study 5.4:
The BESAV team reflects on how the use of site-specific BES tools to map the Paya Swamp ecosystem services as well as the stakeholder engagement process that they want to put in place would affect the local institutions, rules and infrastructures. They also consider how these activities and outputs could help the local communities who practice subsistence farming to re-negotiate these institutions and rules in ways that improve their wellbeing.

If the ecosystem services maps inform the design of a new land use plan, this would have a major influence on people's endowments and access to the Swamp's goods and services. It would replace the current County government lease to the rice farm, and make more land available to local communities. It could also destabilize the cultural land tenure of the villagers, as certain areas now used for subsistence farming would be put aside for biodiversity and ecosystem service protection. The team agrees to be focus on the increase in land accessible to community's for farming. They agree that discussions should be conducted with village leaders to obtain a more precise map of the current informal land tenure, to avoid potential conflicts between local farmers. The team also reflects on the possible effect of the new land use plan on the local market price of crops. If prices were to rise, the team conceives of financial compensation during the first ten years of implementation of the land use plan. Finally, the team agrees that their engagement process with local stakeholders should contribute to capacity building and education as well as creating strong social connections among stakeholders that would not usually interact.

The team decides to repeat the reflection exercise for the communities and villages that are located closer to the lakes of the Swamp, and for whom fishing appears to be important for well-being.

How can ecosystem services assessments help to renegotiate institutions and rules in a way favorable to local communities' well-being?

Inspired by the Environmental Entitlements Framework and Common-Pool Resources theory (Leach, Mearns and Scoones, 1999; Ostrom, 1990)



7. Guidance section: how to use the context diagnostic tool in practice

A tool is not useful until it is put in practice and used. This section describes some practical ways to use the context diagnostic tool. The tool has been used in various ways in while tested in the field in the Philippines and Indonesia:

- One day work session
- 2 week expert mission
- In extended collaborative discussions
- For social science research

This is suggestive and not exhaustive list. Each of these options can be adapted or combined to fill specific needs.

7.1. One day work session

- **1-2 day work session among the core members of a BESAV team (typically 5-10 team members).**
- **Useful for rapid, context analysis**

The tool is used as a basis for discussion to explore as a team the context for a project and get an overview of the main issues that may affect strategy or planning. This may be helpful for example:

- When a conservation or development NGO develops a new strategy and intends to use BESAV tools. In this case, the context diagnostic tool can be used to critique and improve the strategy and theory of action based on what is known about the context at this early stage. They can identify crucial elements that need to be anticipated or dealt with for the intervention project to succeed.

- When a BESAV project is met with unanticipated or difficult challenges that slow down or block change. In this case, the context diagnostic tool can help the team to take a step back and reflect on challenges that need to be analysed in more depth to re-orient the intervention strategy.

- As part of project evaluation and monitoring processes. In this case, the team can mobilize the tool as a way to step back and reflect on the intervention that they are conducting, analysing and reporting progress, and identifying new challenges.

It may be helpful to:

1. Organize a work session focused on analysing the context for a strategy or project that a team intends to conduct or are currently conducting.
2. Produce a document describing the current state of knowledge on the context and the specific intervention project in advance of the work session.
3. Require participants to read this background paper and learn about it through the related training material and videos.
4. During the work session, focus on those worksheet diagrams that seem most relevant to the participants.
5. Discuss potential solutions and agree next steps to address issues raised.
6. Draft a brief note at the end of the work session recapitulating the main points of the discussion.

7. Design a work plan for the core team members to explore further the feasibility and relevance of potential solutions and next steps.

7.2. 2 weeks expert mission

- **Use the context diagnostic tool in a 1-2 week field mission**
- **Can help to evaluate a BESAV intervention project and/or challenge its theory of action.**

In this set-up, 2-5 members of the team or external consultants may conduct the context diagnosis to explore institutional, social and political dimensions. This may require input from or involvement of local specialists or consultants who have knowledge of the context, primary research such as interviews and field visits, and discussion of the results with project team and partners. The goals may be to raise attention to contextual issues in the project design and to produce recommendations for how to make the project succeed.

It may be helpful to:

1. Gather background information on the context, the BESAV project and its vision and objectives for achieving social and environmental change. This may include reports, project feasibility studies, and expert consultations.
2. Spend the first few days of the trip having in-depth discussions with local experts or consultants individually or in small groups. The local context can be discussed generally and using the context diagnostic to facilitate discussions. These consultations should identify salient and challenging social, political or institutional issues affecting the BESAV project's theory of action.
3. Conduct interviews with key stakeholders who play an important role or will be involved in the BESAV project.
4. Organize field visits to see where the project will be implemented, meet with local communities and experts with interviews and/or informal discussions.
5. At the end of the short mission, deliver the results of the analysis to the project team, manager and/or partners. We recommend presenting results with little or no reference to the five theories used in the context diagnostic, and focusing on practical insights and recommendations.

The context diagnostic tool has been used in this way in the South of the Philippines, where the French Development Agency and its Filipino institutional partners are developing a new project to fight deforestation on mountain ranges. The project will involve working with local indigenous groups to promote community-based agroforestry and forest restoration, and halt slash-and-burn practices that degrade primary forest cover. The context diagnostic tool was used to discuss the project's theory of action with the local project team and to inform field visits and interviews with project stakeholders and partners. The tool helped identify crucial elements for success (Mermet and Feger, 2016).

7.3. Extended collaborative discussions

- **Use the context diagnostic tool as a basis for dialogue**
- **Hold a series of workshops with key stakeholders involved a BESAV project.**

Here, the context analysis may be undertaken with stakeholders involved in designing a BESAV project (e.g. businesses, farmers, local communities representatives, local government representative, national policy-makers). Dialogue among stakeholders can illuminate current or possible future issues related to the project context. In this way, the team can build a shared

understanding of the social, political and institutional issues stakeholder agreement about how the project can effectively create environmental and social change. The consultative nature can increase collaboration, share perspectives and build trust. But it may weaken focus on ecological objectives, take significant time and resources and reinforce existing power structures unless well facilitated.

It may help to:

1. Organize workshops or focus group discussions with different groups of stakeholders involved in the BESAV project.
2. Prepare a document describing the current state of knowledge on the context and BESAV project for workshop participants.
3. Prepare a summary of the context diagnostic approach and preliminary questionnaire for workshop participants based on the question check-lists in this report.
4. Use professional facilitators to facilitate workshops using both plenary and small group discussions to discuss, analyse and exchange perspectives.
5. The exercise can be repeated with different groups of stakeholders and in different locations.
6. Based on these workshops, a report can summarize key insights and recommendations from the group discussions.
7. The team designing the BESAV project can then use these key insights to run their own analysis based on the context diagnostic tool.

This context diagnostic tool was used this way in Papua and in Sumatra, Indonesia, by WWF to inform the design, assessment and implementation of two ecological corridors (Wasur-Bupul-Bian and RIMBA) (Barano *et al*., 2016). Five focus group discussions with different groups of stakeholders (businesses, forest management units, local communities, etc.) were organized using the context diagnostic tool as a basis for analysis, exchange of perspectives and dialogue.

7.4. For social science research project

- **Use context diagnostic tool for in-depth research on ecosystem governance.**

Here, the context diagnostic method is used by social science researchers who specialize in environmental management and seek to draw on the theoretical frameworks. This could involve working sessions with the BESAV team, interviews, field visits, in-depth analysis etc. The research results can provide recommendations to the BESAV project but may also contribute to academic debate about ecosystem management and governance.

It may help to:

1. Organize a working session between social science researchers and the BESAV team interested in improving their intervention design and implementation. A first exploration of the context can be conducted with the BESAV team.
2. Social science researchers can then conduct interviews and field-visits to collect first-hand information on the context.
3. A report with key recommendations can be drafted to support the BESAV team's intervention. Longer pieces (background paper, academic article, book, etc.) may contribute to academic discussion and debates.

	What for?	Who?	How much time and resources?
1-2 day work session for rapid context analysis	Rapid context diagnosis for a BESAV project	Core members of BESAV team	Low
2 week expert mission to inform intervention design and adaptation	Appraisal of a BESAV project to design or improve its theory of action	Core members of a BESAV team, supported by a small team of experts/consultants	Medium
Extended collaborative discussions	Dialogue, exchange, exploration and shared analysis among all stakeholders in a BESAV project	BESAV team, stakeholders, professional facilitators	High
Social science research	In-depth analysis of a context to derive recommendations for a BESAV project and contribute to academic discussion	BESAV team and social science researchers	High

Table 3 : *Summary of different ways the context diagnostic tool can be used*

8. Concluding thoughts

This background paper begins to transform well-established social science theories into a practical context diagnostic tool to support BESAV practitioners understand the political, social and institutional dimensions of context, in ways that enable them to be more effective in changing decisions and catalyzing action for better ecosystem management.

We are aware that no theory, method or tool will ever replace the energy, knowledge, know-how and real-world experience of those working on the ground. However, we hope that this context diagnostic tool can support the efforts of those who are on the front-line, leading BESAV projects to create change. The resources can help teams to systematically analyze their context and disentangle the complexity.

The next steps are in your hands**.** We welcome and encourage others to apply the context diagnostic tool in different places, provide feedback on the tool, provide case studies of application, develop further training materials, dig deeper into social science literature to further develop the tool and compare and assess results from different contexts.

9. Further Reading

The anchoring of the tool in on-going social science academic debates opens perspectives to dig deeper into this literature to further develop the tool and to further enrich the discussions and analysis of contexts that the tool arouses. The present report presents very briefly the social science theories it builds on, with the hope to make them more accessible, through the development of the diagrams and lists of questions, to practitioners for their own analysis. Eventually, the depth and the efficacy of these methods will depend on the time devoted by some BESAV practitioners to acquire the conceptual vocabulary and theoretical knowledge they rely on. This can be done by attending training sessions, or by developing new partnerships with social science researchers. It can also be done by self-learning: we indicate below relevant entry-points references in the literature associated with each approach, as well as the relevant chapters in the book *Tools for What Trade* from Mermet, Laurans and Leménager (2014) that applies some of the theories presented here to the question of economic tools for biodiversity. Ultimately, results from the use of this context diagnostic method in different contexts will have to be assessed and compared, both in terms of the concrete recommendations it helped its users to formulate for their intervention projects but also in terms of its contribution to the on-going academic conversation on ecosystem services governance.

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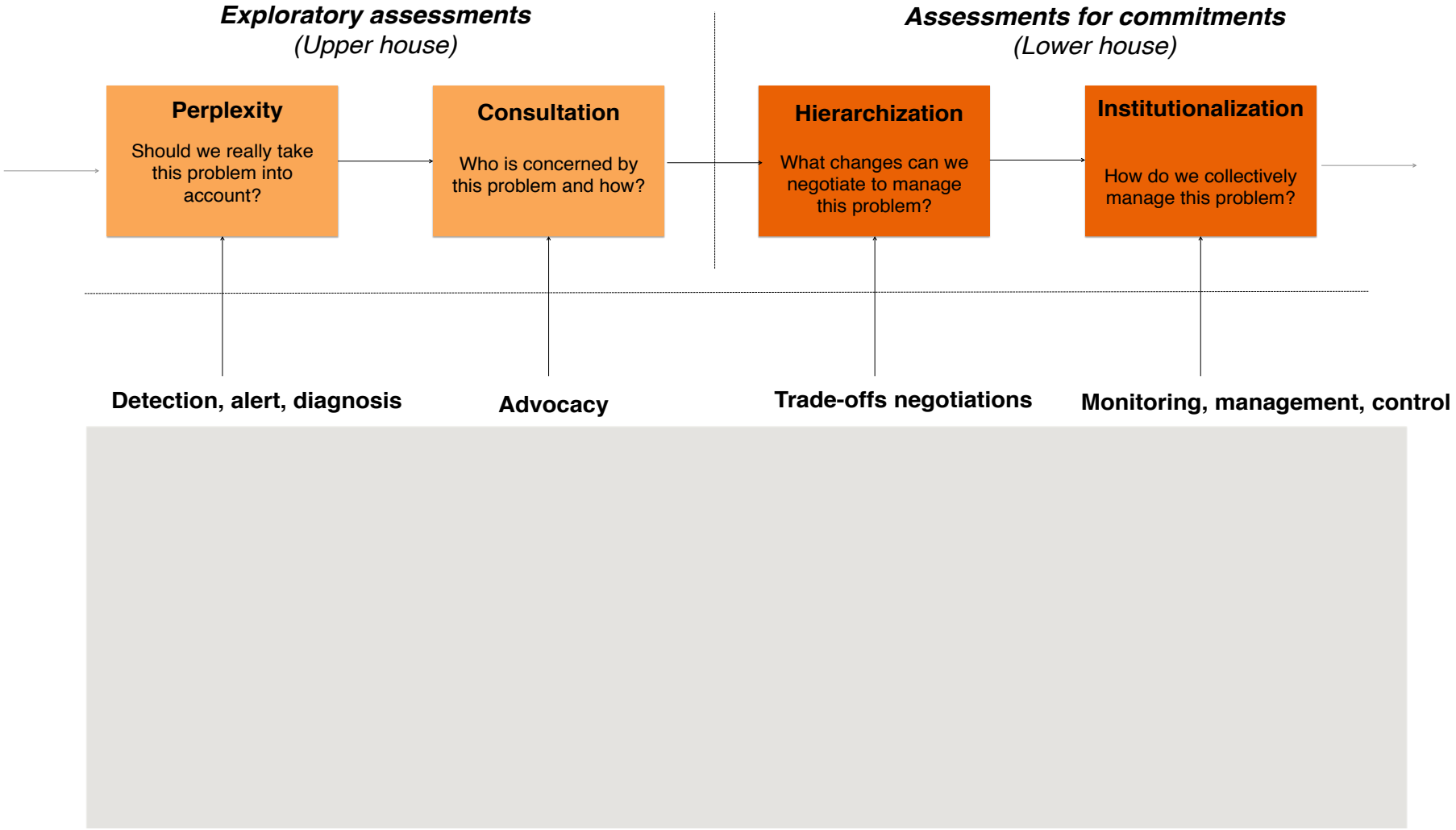
Annexes: the diagrams

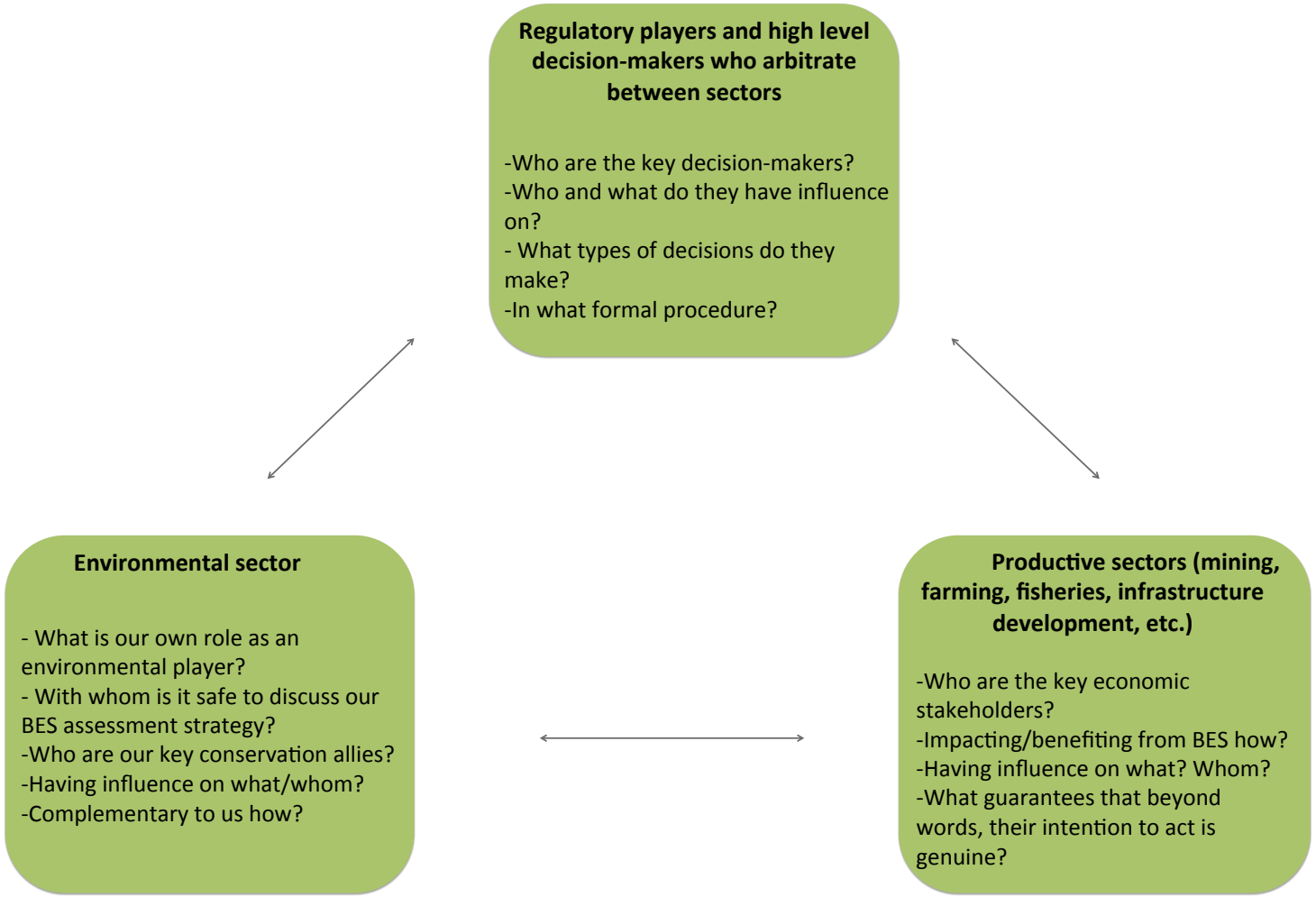
How can I adapt my use of ecosystem services assessments to different stages in the process of change?

Insipired by Politics of Nature (Latour 2004)

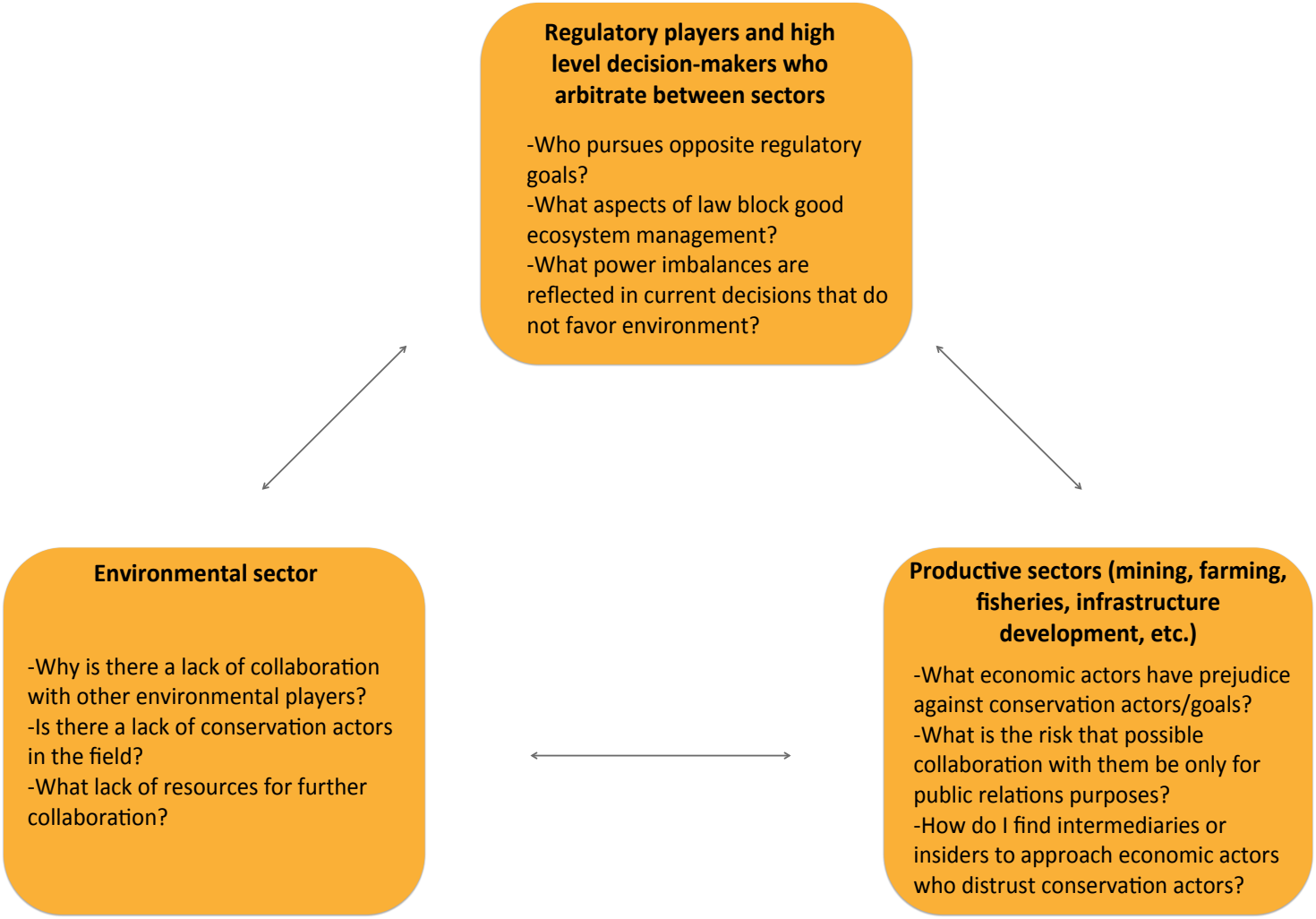


How can I improve the strategic use of ecosystem services assessments to obtain change from others?
Allies and decision-makers: with whom and for whom do we work?

Inspired by Strategic Environmental Management Analysis (Mermet, 2011; Mermet and Leménager, 2014; Leroy, 2006)

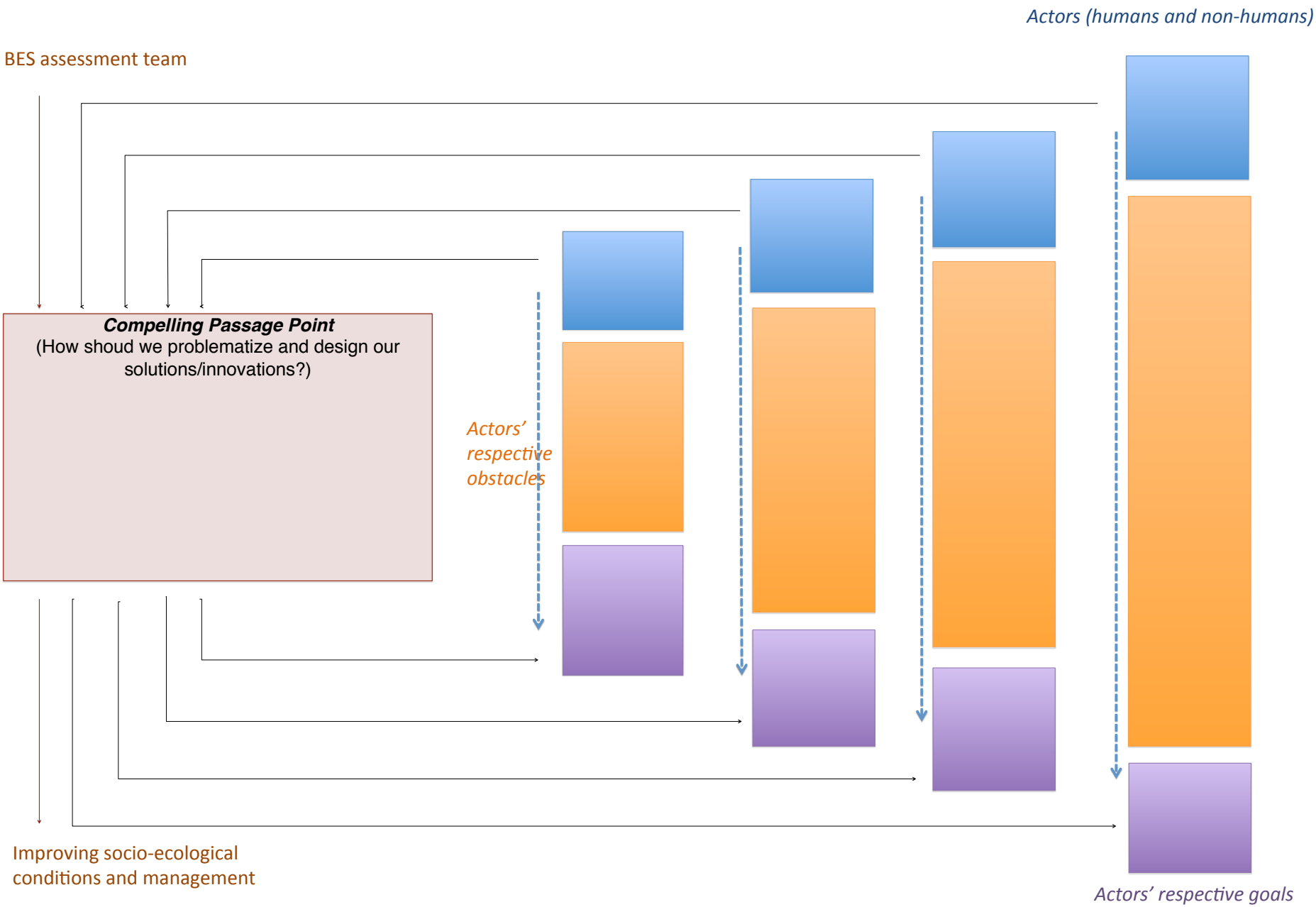


How can I improve the strategic use of ecosystem services assessments to obtain change from others?
Inertia and resistance: against what and whom do we work?
Inspired by Strategic Environmental Management Analysis (Mermet, 2011; Mermet and Leménager, 2014; Leroy, 2006)



How can I make ecosystem services assessments an 'obligatory passage point' i.e a compelling solution for other stakeholders to reach their own goals?

Inspired by Sociology of Translation (Callon, 1986)



How can I frame ecosystem services assessment to gain traction among stakeholders who hold multiple contradictory orders of value?

Inspired by the Economies of Worth (Boltanski and Thévenot, 2006)

How do I argue about BES values?

How does my interlocutor speak about BES values, or react to my arguments?

BES assessment team

Order of inspiration (spiritual, aesthetic beauty)

Civic order (law and democratic procedures)

Industrial order (effectiveness and efficiency)

Market order (mutually advantageous trade-offs, commercial competition)

Domestic order (traditional values and familiar practices)

Order of fame (media visibility and reputation)

A tentative emerging *environmental order* (care for nature)

Actor 1:

Actor 2:

Actor 3:

Actor 4:

How can ecosystem services assessments help to renegotiate institutions and rules in a way favorable to local communities' well-being?

Inspired by the Environmental Entitlements Framework and Common-Pool Resources theory (Leach, Mearns and Scoones, 1999; Ostrom, 1990)