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Integrating Ecosystem Services values for sustainability? Evidence from the Belgium Ecosystem Services community of practice

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1 **TITLE**

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3 Integrating Ecosystem Services values for sustainability?
4 Evidence from the Belgium Ecosystem Services community of practice.

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ABSTRACT

Through a reflexive study, we performed a reality check of how Ecosystem Services valuation is performed compared to what could be referred to as a “theoretical ideal” of the BElgium Ecosystem Services (BEES) community of practice, reflecting the salient recent international literature on integrated valuation. By surveying the most recent case studies doing valuation, our results highlight that stakeholders are always included, a variety of values are generally accounted for using a diversity of methods, and increasingly transdisciplinary approaches. However, the main findings that 1) impacts on decision-making remain unclear, 2) real transdisciplinary studies, co-constructed by scientists and stakeholders are yet to be undertaken, and 3) sustainability issues (thresholds & fairness) are largely ignored, call for further research on how to conduct integrated and inclusive ES valuations. We argue that community of practice such as BEES are appropriate arenas to foster such transdisciplinary studies, by facilitating the inclusion of a broad range of values and actors. We call for a broader review of best practices for ES integrated valuation, to identify factors of success, and guide further scientific research that aims at improving ES practice for decision-making.

Highlights

- Communities of practice on ecosystem services foster science-policy practice collaboration
- Impacts of Belgian ecosystem services practice on decision-making remain unclear
- Real co-constructed transdisciplinary studies are yet to be undertaken
- Sustainability issues in ecosystem services assessments are largely ignored
- Further research should review best practice to guide decision-making

1 **KEYWORDS**

2

3 Integrated valuation, decision-making, community of practice, stakeholders, best practices

4

5 **1. INTRODUCTION**

6

7 Throughout Europe, several communities of practice (CoP) on ecosystem services have
8 spontaneously emerged in response to the need for closer science-policy practice
9 collaboration and communication. These communities abide, in several cases without
10 structural funding, because they provide a double service: they inform decision-making but
11 also constitute a forum of interaction for policy-relevant research on ecosystem services and
12 their values.

13

14 Several authors have shown that professionals sharing similar concerns and wishing to
15 improve their practice efficiently and effectively collaborate through “communities of practice”
16 (Lave and Wenger 1991, Brown and Duguid 2000). According to Lave and Wenger (1991), a
17 community of practice is a group of people who share a craft and/or a profession. The group
18 can evolve naturally or can be created specifically. It is through the process of sharing
19 information and experiences that the members learn from each other, and have an
20 opportunity to develop themselves personally and professionally. Communities of practice
21 support situated learning i.e. a process through which knowledge is co-constructed, in order
22 to improve participants’ skills, but also to reinforce the meaning of their action. Since the
23 concept was coined in the 1990’s, CoP have proven to be effective to stimulate learning and
24 foster innovation among practitioners in various sectors, including private business,
25 education, health, and ecological restoration.

26

27 The BElgium Ecosystem Services (BEES) CoP is an open and flexible network that
28 interfaces between different societal actors (e.g. scientists, policy-makers, businesses,

1 NGOs). One of its main aims is to bridge the gap between science and practice and improve
2 the societal relevance of scientific work on ecosystem services. BEES functions as an
3 informal network based on voluntary participation, knowledge sharing and exchange of good
4 practices. Although there is a coordination team in charge of facilitating BEES work or
5 initiating new activities, the network activity is to some degree self-regulated. Activities are
6 constantly adjusted depending on the interests and availability of active participants, as well
7 as broader policy developments (e.g. Ecosystem Service Partnership, IPBES). One
8 illustrative activity of BEES, that has been organized for the last three years, is the so-called
9 'BEES Christmas market' bringing together academics, ES projects, civil society and
10 businesses. The market reinforces the atmosphere of conviviality at the heart of BEES by
11 facilitating open exchanges, ranging from short presentations by researchers to food stands
12 with organic products and to ES turn-based games. It is not only an opportunity to meet
13 people across various domains, both scientific and extra-scientific, but also an experiment in
14 transdisciplinary communication, where an academic, a local environmental activist and a
15 corporate social responsibility manager can find themselves discussing value pluralism or
16 stakeholder empowerment.

17
18 Among the issues discussed by such communities of practice, ES valuation seems to be a
19 prominent and cross-cutting theme discussed by researchers, administrations and "on the
20 ground" practitioners. This is for example illustrated in Jacobs et al. (2013a), published by the
21 BEES community and comprising contributions from over 80 authors that are not only
22 scientists but also policy makers and ES practitioners, e.g. NGOs who apply the ES concept
23 in their daily work. Notably, the last part of the book contains a broad overview of
24 perspectives on ecosystem service practice, realizations, expectations, possible future
25 developments, and needs, all written by policy makers, practitioners, and NGOs from
26 different geographical scales. Most actors spontaneously reflect upon the complex issue of
27 ES valuation.

28

1 As Keune et al. (2015) demonstrate, there is a general trend towards inclusive valuation in
2 Belgian ES research and practice. It is inclusive in the sense that a diversity of ES valuation
3 aspects are taken into account: diversity of expression of value(s) (expressed both
4 quantitatively and qualitatively), and a diversity of valuers (i.e. actors whose values are
5 accounted for) by way of favouring more inclusive, bottom-up approaches. However,
6 inclusive valuation creates a new challenge of value integration (Jacobs et al., 2016). For the
7 purpose of this paper we refer to 'value integration' as combining diverse and sometimes
8 incommensurable values rather than « translating » all values into a single unit. Both value
9 pluralism and methodological pluralism are at stake here. Value pluralism is based on the
10 assumption that many valuation contexts present us with a diversity of values, value
11 expressions and valuation languages, which may be comparable to a certain degree, but
12 often incommensurable on a single measurement scale. Methodological pluralism assumes
13 that a rich, non-reductionist account of value pluralism can only be offered through the use of
14 multiple methods, which may - depending on the case - combine quantitative and qualitative
15 approaches, different methods of data collection (e.g. questionnaire, observation, document
16 analysis), research designs (case study, experiment, longitudinal vs cross-sectional) and
17 paradigms (e.g. neopositivist, interpretativist, constructivist, pragmatist) (Popa et al., 2015).
18 Several members of the BEES community also specifically point to the necessity to account
19 for environmental thresholds and ecological values, to consider socio-ethical values, and to
20 deal with uncertainty, ambiguity, and complexity in decisions and actions for sustainable land
21 and resource use and management (Jacobs et al. 2013b).

22

23 This thinking is in line with the most salient theoretical development from the international
24 research community on integrated valuation. The IPBES framework for example proposes a
25 conceptual framework to connect nature and people which requires the consideration of
26 multiple value systems, that must reflect those embedded in the institutions of the involved
27 stakeholders (Diaz et al., 2015). According to Jacobs et al. (2016), the dust is settling on the
28 nature valuation debate. There is a need for combining disciplines and methods to represent

1 diverse values of nature, and to further explore how combining various valuation tools can
2 support decision-making. As Jacobs et al. (2017) further highlight in their reflexive study,
3 different valuation methods lead to different value types. They also point out that performing
4 integrated valuation does not necessarily require more resources than using single value
5 methods. Ultimately, valuation of nature should lead to socially fair and sustainable strategies
6 (Jacobs et al. 2016). This can be perceived as a theoretical ideal: the perfect framework for
7 integrated valuation can and needs perhaps be drafted on paper. Several scholars recently
8 provided useful contributions in that direction (e.g. Boeraeve et al., 2014, Dendoncker et al.,
9 2013, Martin-Lopez et al. 2014, Diaz et al. 2015, Jacobs et al., 2016, Jacobs et al. 2017).
10 However, how does it actually happen in the reality of ES practice today?

11
12 As Jacobs et al. (2016) argue, there is a lack of reflexivity practice in the research on ES
13 valuation. Mainstreaming a new culture of valuation can only be achieved by learning from
14 real world applications. There is also a need for organizational and personal learned lessons
15 (Blackstock et al. 2007, Triste et al. 2014, Hassenforder et al. 2016). Following this aim, this
16 paper evaluates the methodology implemented by stakeholder-inclusive ES studies, all fitting
17 within 'real-life' ES-based natural resource management projects in Belgium. We examine
18 the case studies in a reflexive way, i.e. an explicit self-analysis that allows researchers to
19 situate themselves in the research process and make them aware about their implicit
20 assumptions and normative orientations that shape their decisions in implementing
21 integrated valuations (Finlay 2002, Jacobs et al. 2016), hence taking a post-normal scientific
22 posture (Funtowicz and Ravetz, 1994, Barnaud and Antona, 2014, Raymond et al. 2014).
23 We aim at giving an honest account of our own experiences and findings, which -although
24 they are subjective per se- can advance the scientific field.

25
26 By taking Belgium as an example, the general aim of the paper is to assess whether the
27 BEES community is on the right track according to its self-claimed theoretical ideal: i.e. is the
28 way practitioners are doing valuation accounting for thresholds, limits to use, fairness and

1 distribution issues, combine different types of values, and target sustainability? If not, why?
2 What are the main challenges remaining? Starting from practice, this paper specifically
3 attempts to perform a reality-check of stakeholders' practice in order to facilitate social
4 learning and potentially improve the relevance of ES practice for improved decision-making.
5 Rather than going into a full-fledged evaluation of how current practice relates to a desirable
6 model of stakeholder involvement and co-development of knowledge, this paper is intended
7 as a preliminary mapping of challenges, on the basis of which relevant issues for further
8 research, both within BEES and in the broader international ES community, can be
9 proposed.

10

11 **2. DATA AND METHODS**

12

13 2.1 Case studies selection

14

15 Considering the aim of the paper, the heterogeneity of BEES participants and practices and
16 the lack of systematic data on value integration in ecosystem services, we have chosen a
17 case study analysis based on purposive sampling. We gathered empirical evidence by
18 surveying nine case studies across Belgium. Within BEES, several thematic working groups
19 (WG) focus on specific topics, and meet regularly to discuss them. One WG is specifically
20 concerned with integrated valuation. The idea of this paper emerged from this WG. The case
21 studies were selected by asking participants of this WG if they participated in or knew of a
22 study case that claimed to have implemented some form of ES value integration. All case
23 studies included some form of participation and stakeholder involvement, though this was not
24 a prerequisite for selection. Table 1 provides a brief description of the nine cases. These
25 include research projects, community initiatives, or informal collaboration between scientists
26 and practitioners. This selection is not aiming for exhaustiveness or statistical power; rather
27 the focus is on the diversity and richness of the data, through an exploratory analysis of
28 current BEES practice. As in Jacobs et al. (2017), the only selection criterion was availability

1 of eligible and responsive valuation experts with hands-on experience in the method. We
 2 aimed to identify recurring themes, trends, as well as anomalies and outliers. The selected
 3 cases are briefly presented on « the BEES map »
 4 (<http://www.beescommunity.be/en/projects/>). As can be seen from this map, the selected
 5 cases give a good overview of the recent initiatives related to valuing ES in Belgium.

6 Hence, we are confident that insights from this study reflect the current state of integrated
 7 ES valuation in Belgium.

8

9 Researchers of the case studies are co-authors of this paper. This fits with the reflexive
 10 strategy of the paper. The lead author followed an iterative writing procedure, integrating
 11 feedback from co-authors throughout the writing process. By co-authoring, the experts who
 12 filled in the surveys and share their experiences can validate interpretations and findings
 13 based on it. Previous reflexive studies followed a similar procedure (e.g. Jacobs et al. 2017).
 14 This study results from the collaborative and interdisciplinary research practice and self-
 15 reflection by the authors and their broader network.

16

17 Arguably, there is a personal influence (both related to our personal and disciplinary
 18 backgrounds) of each author on the results. However, it was not the aim of this paper to
 19 reflect on themselves and their influence on valuation results (though it would be interesting
 20 to do so) and this would require a different methodology with researchers external to the
 21 subjects.

22

23

Case study	Main objective	Location	Type of study	Reference
1. Green vs. grey Infrastructure	Test green infrastructure as an alternative to technological solutions	Dijle Valley, Leuven	Research-led. Commissioned by the Agency of Nature & Forest	Demeyer and Turkelboom, 2013
2. Nature Value Explorer	Develop a tool to quantify and	Generic tool; can be applied	Research-led. Commissioned	Liekens et al. 2013

	value ES in monetary terms	around Flanders region	by Flemish Government	
3. VOTES	Perform an integrated assessment of ES at the municipality level	Four municipalities in Brabant, Central Belgium	Research-led. Commissioned by the Belgian Science Policy Platform.	Fontaine et al. 2013
4. GIFT-T	Improving benefits of green infrastructure	Brussels-Airport area, De Kempen	Led by a land-use agency INTERREG-funded.	Lord-Tarte and Devillet 2014
5. Participatory ES-mapping	Mapping perceived ES supply	Four municipalities in Brabant, Central Belgium	Research-led. Commissioned by the Belgian Science Policy Platform.	De Vreese et al. 2016
6. Global trade: multi-scale valuation of ES	Assess ES that benefit Belgium but are produced outside Belgium in a Belgian ES assessment	Belgium, and countries from which ES are imported to Belgium	Research-led. Commissioned by the Belgian Science Policy Platform.	Boerema et al. 2016
7. BIOMOT	Elicit stakeholders' values with regards to ES	Across Belgium	Research-led. EC-funded research (FP7).	Dedeurwaerdere et al. 2016
8. De Wijers	Develop a vision for a region in Limburg province based on ES framework	Seven municipalities in the province of Limburg	Co-production of Land-use organisation and research. Commissioned by the Governor of Limburg Province	Ulenaers et al., 2014
9. De Cirkel	Social valuation of desired landscape values for nature development in an agricultural area	Mombeek stream, three municipalities in Limburg Province	Researcher-led. Commissioned by Flemish Land Agency	Demeyer, 2014

- 1 Table 1. Case studies' description
- 2
- 3 2.2. Challenges for inclusive valuation
- 4

1 Based on a literature study about strengths and weaknesses (SWOT) of monetary vs non-
2 monetary valuation (Demeyer et al., 2014) we extracted nine challenges for inclusive ES
3 valuation, that we formulated as questions and asked to the contact author of each of the
4 case studies:

5

- 6 1. Were different types of values integrated? How?
- 7 2. Were values ignored? How was this dealt with?
- 8 3. How much is known about the diversity of values among stakeholder groups?
- 9 4. What are the motivations, beliefs, and vision behind the values? Which tools allow
10 assessing these?
- 11 5. How were stakeholders involved and how much ownership of the project did they
12 get? How transparent to users was the method for obtaining the final values?
- 13 6. Were trade-offs between ESS explicitly addressed?
- 14 7. Were sustainability aspects addressed (e.g. maximum sustainable use, thresholds)?
- 15 8. What are the assumptions and uncertainties behind the obtained values?
- 16 9. How did the values influence decision-making?

17

18 Using a written survey, we asked authors to provide written feedback so as to give them time
19 to gather relevant information. Surveyed authors used (albeit not in systematic way) other
20 sources of data to formulate their answers. For example, in several surveyed cases, there
21 has been workshop-evaluation with the participants (where you can find some indications of
22 social learning). We asked the authors to first provide some general information about their
23 project case (e.g. scope, general objectives, means...) and then to answer all questions
24 above that they deemed relevant for their case. Values and value diversity can hold different
25 meanings, but we remained (purposely) vague on the definition of value diversity, e.g. one
26 may refer to it as:

- 27 - diverse value expressions e.g. non-monetary, monetary, qualitative, quantitative
- 28 - diverse methods for integration, e.g. expert based, deliberative multi-criteria analysis...

1 - diverse value fields, aspects or topics e.g. ecological, social, economic, religious...

2

3 Remaining vague about value diversity was a conscious choice. As mentioned in Jacobs et
4 al. (2016), each valuation school has its own perception of what values can be. We left this
5 open as we were gauging for all types of values, and wanted to assess how diverse and
6 broad responses would be, rather than restricting the definition of value. Though identifying
7 different interpretations of value and valuation was not an objective of the paper per se, we
8 will briefly reflect upon this in the discussion of the results.

9

10 **3. RESULTS**

11

12 In this section we present the most relevant outcomes with regard to our stated objectives,
13 based on a simple content analysis of the provided answers.

14

15 3.1 Were different types of values integrated? How?

16

17 All nine cases include at least several types of values, though a couple of cases tend to use
18 the term “values” as synonymous to “monetary values”. Authors interpret “types of values”
19 differently: some (2, 4; cf. Table 1 for case study numbers) refer to value and valuation
20 expressions (e.g. qualitative, quantitative, monetary), others (3, 9) refer to value fields or
21 domains (e.g. social, biophysical, economic; Martin-Lopez et al. 2014). Several cases (e.g. 3,
22 5, 8, 9) mention that by including various stakeholders different types of values are de facto
23 included. Interestingly, no case study seems to have done a scoping analysis of the different
24 values that should be included to fulfil their case’s objectives.

25

26 Several authors also reported on the methods they use to account for plural values. Some
27 opt for letting the stakeholders describe their diversity of values without imposing any
28 predefined value framework. Others argue that by scaling up the study, more stakeholders

1 hence more values can be included: for example, if beneficiaries or people impacted by ES
2 change are outside the study area, some argue that these stakeholders' values should be
3 included. Authors remain rather vague on how exactly were the different values ultimately
4 integrated (if at all). One study decided to feedback results to stakeholders in a simple
5 double entry table listing ES in lines and broad value types in columns, assuming that this
6 would give equal weight to different value types (Fontaine et al. 2013; Table 1).

7

8 3.2 Were values ignored? How was this dealt with?

9

10 It is clear that no single study claims to have accounted for all value expressions and/or
11 fields, or to have attempted to make an exhaustive list of value fields. But some authors
12 would have wished to include more stakeholders in their study. As indicated above, authors
13 assume that a greater diversity of stakeholders will lead to a greater diversity of values.
14 Some sectors or stakeholders are claimed to be hard to involve: in particular, the poorest and
15 least informed ones and, on the other hand, the business sector. This de facto leads to some
16 values being excluded. Practitioners admit not knowing how to reach these absent
17 stakeholders and this is perceived as an issue.

18

19 Moreover, even stakeholders that participated in the study cases do not necessarily mention
20 all ecosystem services hence values provided in the study area. This could be problematic
21 as some regulating ES playing an important role in ecosystems functioning could be ignored
22 from the analysis, if further valuation steps are based on stakeholders' claimed values only.
23 In several studies conducting ES ranking exercises, many regulating ES (though not all of
24 them) are often ranked lower than cultural ES. Carbon sequestration is the classic example,
25 but other ES related to soils are often absent from stakeholders' reporting.

26

27 In order to ensure that a broad list of ES and values are included, some authors suggest
28 facilitating the process with pre-defined lists of ES (such as for ranking exercises). Others

1 find it important to complement stakeholders' valuation with « expert » based valuation by
2 scientists or key local informants, though the question of how these valuations should be
3 combined remains unsolved.

4

5 Authors mainly using monetary valuation techniques (in our survey, these were always
6 designed to include stakeholders' participation) acknowledge that some ES cannot easily be
7 translated into money, and hence could be given qualitative scores or be quantified
8 otherwise (ton C, health indicators...) instead, in order not to leave them out of the picture.

9

10 It is widely acknowledged that no silver bullet solution exists to ensure that all relevant ES
11 and related values are included. Some authors recommend that at least the case study
12 investigator be transparent about which values are potentially overlooked, and that
13 consequential biases are discussed in a participatory fashion. In sum, there is a general
14 agreement that a broad range of stakeholders should be engaged in valuation exercises, to
15 ensure that a broad range of values are included to improve the societal relevance and
16 legitimacy of decision-making.

17

18 3.3. How much is known about the diversity of values among stakeholders groups?

19

20 This question complements the previous one, and was aimed to check whether stakeholders
21 were differentiated and whether case study investigators assessed the respective values of
22 these stakeholders. As it turns out, only a couple of studies were designed to identify values
23 of different stakeholders groups, so we collected little information on this topic.

24

25 One study (8) assessed the diversity of values among stakeholders by individual scoring first,
26 then the scores where discussed in groups. The author claims that results will vary
27 depending on how you divide your stakeholders groups in discussions. Different ways are
28 suggested: e.g. land/resource-use groups; social groups (e.g. local versus immigrants);

1 demographic or socio-economic characteristics (e.g. age, income, gender...); groups in
2 function of their relation with ES (e.g. ecosystem services owners, producers, users,
3 impacted group). How these groupings might affect values expressed was not
4 tested/explored.

5

6 3.4 What are the motivations, beliefs, and vision behind the values? Which tools allow
7 assessing these?

8

9 A series of tools have been implemented to understand the motivations, beliefs and vision
10 behind the values expressed. These range from face-to-face interviews, focus groups, small
11 group discussions, Q-methodology, choice experiments or even games (e.g. the ES card
12 game, Figure 1). Participants are generally questioned about their uses of and behaviours
13 towards the environment.

14

15 Rather than listing all the reasons expressed, we present here some findings that were
16 shared by several authors:

- 17 • Generally speaking, highly valued ES are among the most visible in the landscape
18 and are actively and purposely used.
- 19 • Giving the opportunity to express values across a broad scale resulted in a significant
20 diversity in the results: the more open the question, the more people feel free about
21 expressing their values.
- 22 • Motivations behind values generally stem from a mix of individual well-being and
23 collective interest. Even when stakeholders are being interrogated individually, they
24 already think about their community.
- 25 • Regular contradiction in discourse was observed, e.g. people wish for more
26 affordable accommodation but also want to limit urban sprawl

- 1
- For further use in planning contexts, making explicit motivations and reasons behind
- 2 the values can be at least as important as the scoring. Also some misunderstandings
- 3 in scoring could be clarified during the discussion.
- Socio-demographic, cultural and local living conditions (such as access to nature)
- 4 play a role in how people value ecosystems.
- 5
- 6



7

8 Figure 1. The ES Card Game – An individual is requested to rank the cards (each

9 representing one ES) in terms of occurrence/usefulness/desirability and asked to explain

10 the reasons for their ranking.

11

12

13 3.5 How much participation and ownership was there from the involved stakeholders? How

14 transparent to users was the method for obtaining the final values?

15

16 With regard to participation, authors reported a broad range of methods, used in various

17 combinations: e.g. individual interviews, workshops or focus groups at the beginning of the

18 evaluation process, with no feedback or with collective feedback given to stakeholders on the

19 results of the assessment. Only a couple of cases (3, 8) argued that they aimed at a co-

20 construction of ES values with stakeholders throughout the process.

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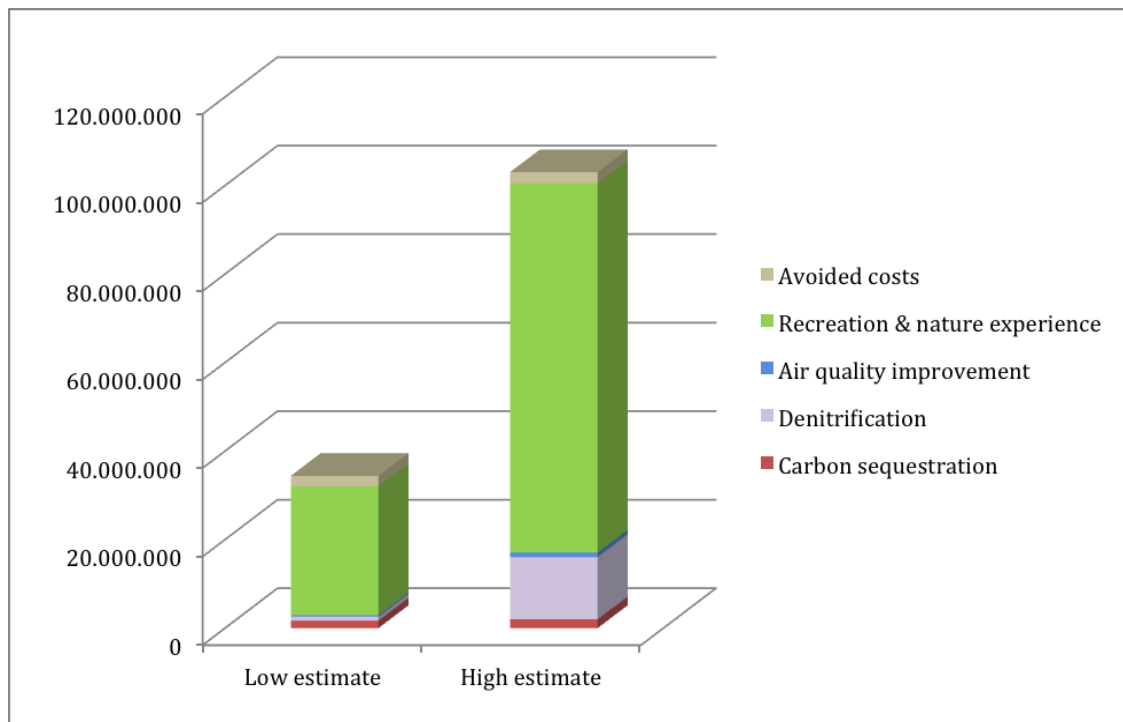
Authors reported little information in terms of the transparency of their valuation process. Some argue that transparency is directly related to the level of participation and how you explain your methods to stakeholders. A couple of them argue that deliberative exercises allow full transparency, building consensual visions, and increase legitimacy of the process.

For cases using more quantitative methods (e.g. nature value explorer, 2), the way the values are obtained is clearly explained to users of the tool. The use of numbers and functions in the tool are explained and illustrated in a separate manual. The manual bundles the methods and functions to quantify and value ecosystem services, and is transparent about the assumptions made. Although the methods were put forward by scientists, potential users were involved from the start from the project.

3.6 Were trade-offs between ES explicitly addressed?

Several projects did not account for trade-offs at all. Among those which did, trade-offs have been identified using various methods. Some authors mention that stakeholders spontaneously came up with trade-offs and conflicts between ES while discussing reasons for a ranking of a value (e.g. during card game). Another participatory method used was a “hierarchy exercise”, aiming at collectively assigning a hierarchy to ES associated with a specific land-use type (which ES should be provided first, second etc.). This allows for relationships between ES to be made explicit and understood by stakeholders.

Others calculated or modelled trade-offs via e.g. cost-benefit analyses under different scenarios of land use and/or ES change. Trade-offs can then be visually assessed by comparing ES spider webs or other types of diagrams showing how present ES values evolve under different scenarios (Figure 2).



1

2

3 Figure 2. Flood control in Dijle valley - The monetary gains (in euros) of the nature
 4 development ('green') scenario compared to the holding basin ('grey') scenario for a 30
 5 year period. Left is the low estimate and right the high estimate. (Demeyer and
 6 Turkelboom, 2013)

7

8 3.7 Were sustainability aspects addressed (e.g. maximum sustainable use, thresholds)?

9

10 While most studies claim to strive for sustainable ecosystem use when performing ES
 11 valuation, not all of them accounted for values belonging to the three main value domains,
 12 i.e. environmental, social and economic (a so-called "three-pillars" valuation). Perhaps more
 13 importantly, none of the sampled studies seems to have accounted for or even discussed
 14 issues such as ecosystems' thresholds, limits to use, fairness, or distribution issues.

15

16 3.8 What are the assumptions and uncertainties behind the obtained values?

17

1 Several authors point out that given that their sample of stakeholders is small, there is no
2 pretention of representativeness, but the focus is on the quality, diversity (e.g. in opinions)
3 and richness of data gathered. With regards to stakeholders, it is generally assumed that
4 their engagement is genuine and that they understand the methods and are aware of
5 potential biases.

6

7 However, some authors question the representativeness of the involved stakeholders, which
8 may affect the legitimacy of the results. As the number of respondents is sometimes quite
9 low, there is a risk of “collectivization” of individual perceptions about ES supply, trade-offs
10 and synergies, meaning that an individually perceived risk to ES/trade-off between ES is
11 presented as the result of collaborative work.

12

13 Other authors consider that there can be a risk of framing effects and socially desirable
14 responding. These risks can be minimized by combining methods (triangulation, validation)
15 and paying extra attention to questionnaire design and interview protocol.

16

17 3.9 How did the values influence decision-making?

18

19 While helping improve decision-making is sometimes used as a vindication for the valuation
20 exercise, case studies usually finish with a presentation of the main results to stakeholders.

21 At least, authors do not report on how valuation results have or have not influenced decision-
22 making. This confirms results by Laurans et al. (2014) who found out that very few studies
23 claiming to do monetary ES valuation to influence decision-making actually reported on
24 whether they achieved that aim. Only one study (8) stresses that valuation results were used
25 to draft a shared vision for managing the study area’s landscape. Sometimes valuation is
26 also used a posteriori to advocate specific policies. Some authors argue that while scientists
27 make a substantial effort at engaging stakeholders in the scientific process, scientists should

1 also engage or be engaged in the policy process, in order to bridge the science-practice or
2 science-policy gap.

3

4 **4. DISCUSSION: IS BEES ON TRACK?**

5

6 As stated earlier, the BEES community refers to inclusive valuation as a valuation that
7 « accounts for environmental thresholds, ecological values, socio-ethical values and deals
8 with uncertainty, ambiguity and complexity in decisions and actions » (Jacobs et al., 2013b).

9 Is the way practitioners are doing valuation complying with these requirements? The answer
10 is rather nuanced. We start by highlighting insight showing that the above-mentioned
11 theoretical statement is already being translated into practice, then focus on what should still
12 be improved, the role of the BEES community of practice to foster integrated ES valuation,
13 and the main challenges remaining.

14

15 4.1. Evidence of inclusive valuation

16

17 *4.1.1 Participation does happen*

18

19 We found a broad consensus on the need for bottom-up participatory valuation. This is
20 reflected by a general acknowledgement that there needs to be a shift from top-down to
21 bottom-up when valuing ES. This belief is translated into practice as all studies did include
22 stakeholders in their valuation exercise, though not necessarily throughout the whole
23 project's duration. Moreover, it is generally assumed that a greater diversity of stakeholders
24 will allow capturing a greater hence more representative diversity of values.

25

26 *4.1.2 From interviews to focus groups or serious game: A diversity of tools for a diversity of*
27 *values.*

28

1 The diversity of values is captured by a diversity of tools, ranging from individual interviews to
2 collective debates, or even card games. Generally speaking, practitioners feel that
3 stakeholders should be given the opportunity to express their values across a broad open
4 scale, rather than under a predefined scheme, which may constrain and/or bias their
5 thinking.

6

7 *4.1.3 Values are scale dependent*

8

9 Researchers and practitioners argue that depending the scale (in terms of extent) of the
10 study area, different ES might be assessed, different stakeholders might be involved, and
11 hence different values captured. In line with that, some argue that impacted areas outside
12 the pre-defined study area should be considered as well. This implicitly calls for a multi-scale
13 approach for inclusive valuation.

14

15 *4.1.4 Money is not enough*

16

17 Whilst values are often associated to money, most researchers and practitioners admit that
18 in addition, or instead, other values expression should be used to support decision-making,
19 especially at the local level. These range from other quantitative expressions of ES (e.g.
20 rankings, indicators), to diversity of opinions, motivations and qualitative expressions of
21 trade-offs or synergies between ES.

22

23 4.2 Remaining challenges and issues for further research

24

25 *4.2.1 Impacts on decision making remain unclear*

26

27 Apart from one study (8) that led to the design of a « vision plan » for the management of a
28 semi-natural area, no practitioner reports on how their attempt to perform inclusive valuation

1 impacted on decision-making. In fact, it is unclear whether there has been any measurable
2 impact at all. It can be concluded that even if awareness of ES is increasingly gaining
3 practitioners and political attention in Belgium impact on practice still needs to be proven. We
4 argue that studies should not only report on that impact but also ensure that this impact is
5 monitored, at least in a synthetic way, as positive examples may trigger new initiatives.

6 7 *4.2.2 Disciplinary biased transdisciplinarity*

8
9 ES inclusive valuation in Belgium is transdisciplinary in the sense that it includes knowledge
10 from different sectors to solve a collective issue, and that it does so by bringing together
11 scientists, decision-makers and members of the civil society, including NGOs and concerned
12 citizens. However, for most cases, we notice that the scientists who led the valuation
13 exercise seem to strongly influence the methodological framework followed. For example,
14 economists tend to start and focus on monetary valuation though they remain open to
15 account for other value fields and expressions, while social scientists focus more on the
16 participatory aspects of valuation in order to include local stakeholders' values. This evidence
17 of a disciplinary bias in studies claiming to perform integrated ES valuation calls for a better
18 anticipation of this bias in future alike studies. As shown by et Jacobs et al. (2017) only a
19 combination of methods stemming from a range of disciplines can capture the diversity of
20 value dimensions required in integrated ES assessments.

21 22 *4.2.3 Sustainability: a theoretical leitmotiv or a cornerstone for action?*

23
24 While the BEES community explicitly acknowledge that the ultimate aim of inclusive ES
25 valuation is to sustainably increase well-being, and hence should consider limits to use and
26 thresholds, trade-offs and synergies, fairness and distribution issues, this is presently not
27 reflected in current practice.

1 Several elements might explain this. First, accounting for sustainability is arguably the most
2 difficult challenge of inclusive valuation. From a biophysical perspective, identifying limits to
3 use and thresholds in ES supply is seldom attempted, and perhaps even less at a local or
4 regional scale. This can require long lasting studies not compatible with timeframes of local
5 collective action. More fundamental research is probably needed, but most importantly, we
6 believe that more biologists and ecologists could be engaged in inclusive valuation exercises
7 that seem to mobilize mostly economists or social scientists with an interest in ecology.

8

9 From a social and governance perspective, sustainability is also a major challenge as it
10 relates to issues of equality and power. It is perhaps no surprise that the lower social classes
11 (from lack of information?, other priorities?) and the most powerful (from lack of interest?, no
12 incentive to participate?) do not generally participate in ES valuation studies, as
13 acknowledged by Belgian practitioners. As we know, situations where all parties 'win' seldom
14 occur; and if inclusive valuation of ES is used to foster change, there will always be winners
15 and losers. To make sure that 'who wins what' and 'who loses what' is a legitimate
16 collective decision; substantial efforts should be done to engage with all stakeholders
17 concerned (whether they know it or not) with the issues at stake. As Jacobs et al. (2017)
18 state, engaging with a broad variety of stakeholders is an issue that requires further scientific
19 attention. However, Garmendia and Pascual (2013) suggest that this at least requires
20 multiple data collection strategies using multiple valuation methods.

21

22 4.3 Role of the BEES Community of Practice to foster integrated ES valuation

23

24 In terms of dissemination of the surveyed projects' results, experiences of both the workshop
25 process and outcomes are in many cases well documented (e.g. cases 8 and 9, Table
26 1). Several training workshops have been organised for interested parties addressed at
27 government and non-governmental agents. Apart from this 'dissemination' perspective, the
28 researchers have taken an active role in the projects, intensively discussing theory and

1 practice with local expert and practitioners, hereby validating theoretical frameworks and
2 findings with real life situations and concerns. In other words, science-policy interface
3 through the BEES community is not only channelled in designated publications and single
4 facilitated events, but is realized through building capacity and contacts in a network, a
5 community of practice.

6

7 Capacity and knowledge building is a key mission of CoP. In this respect, many
8 communication means are being used to share, discuss and disseminate results. For
9 example, we periodically write newsletters and policy brief about ES, reflect on what is being
10 done in Belgium in international networks and projects (e.g. MAES, IPBES, ESMERALDA),
11 and organize special events like the BEES market, that we describe above. Several case
12 studies analysed in this paper have been presented at the BEES market. More specifically,
13 the BEES market is also a way to communicate on ES valuation and its difficulties to a broad
14 range of potentially interested people. Through workshops and role-playing games, decision-
15 makers, members of public administrations and the civil society have the opportunity to
16 engage in valuation exercises, which allows them to grasp the complexity of these issues,
17 and understand the necessity to include a broad range of values. Researchers of the
18 surveyed case studies have received several on-going requests to support/facilitate
19 workshops for multistakeholders vision development for certain areas of Belgium. Some
20 cases have been used as exemplary material to show and discuss the approaches during
21 training sessions. This contributes to improving the relevance of ES practice for decision-
22 making.

23

24 4.4 Limitations

25

26 Main limitations of this study relate to the methods used and the limited amount of case
27 studies surveyed. We chose to ask for written responses rather than conducting personal
28 interviews of case studies' representatives or a collective workshop in order to give time for

1 respondents to formulate their answers. Opting for one of these options, or, for conducting
2 oral interviews after having received the written feedback, would arguably have allowed us to
3 get a more precise picture of the investigated topic, though the iterative writing process with
4 all co-authors allowed to clarify some ambiguities that remained in the written responses.

5

6 With regards to the limited amount of cases, we used the BEES community of practice to
7 select case studies, and may have missed out important cases outside this community. The
8 limited sample size does not allow generalizing our findings to the whole of Belgium, and
9 even less to the international community dealing with ES valuation. However, we do believe
10 that the findings broadly reflect the current state of ES valuation in Belgium. The small
11 number of cases is also a reflection that the concept of ES and ES valuation in particular has
12 not percolated into mainstream practice dealing with ecosystem management in Belgium

13

14 **5. CONCLUSION AND PERSPECTIVES**

15

16 The study allows us to conclude on how the BEES community's theoretical ideal for ES
17 valuation is actually reflected in practice. On the positive side, practice seems to have
18 matched theoretical expectations of transitions: 1) from top-down to bottom-up; the necessity
19 to include a diversity of stakeholders is widely recognized and applied by practitioners doing
20 ES valuation; 2) from a focus on monetary values to recognition of the necessity to base
21 decision support on a diversity of values (both quantitative and qualitative) and perceptions,
22 revealed by a diversity of methods; and 3) from sectorial and disciplinary to (more)
23 transdisciplinary perspectives: multiple actors and sectors are involved, even if the
24 coordinating scientists still pose the main methodological choices.

25

26 However, the main findings include 1) that impacts on decision-making remain unclear, 2)
27 that real trans-disciplinary studies, co-constructed by scientists and stakeholders are yet to
28 be undertaken, and 3) that sustainability issues (thresholds & fairness) are largely ignored.

1 These findings call for further research on how to conduct integrated and inclusive ES
2 valuations. One idea would be to join practitioners from the BEES community in a case study
3 comparison exercise, in order to learn from each other's experiences. Integrated valuation as
4 such is arguably a too theoretical concept to reach practice, and solutions for value
5 integration will emerge from on the ground experiences. Meanwhile, it seems urgent that a
6 broader review of best practices for ES integrated valuation be undertaken, to identify factors
7 of success, and guide further scientific research that aims at improving ES practice for
8 decision-making.

9

10 BEES researchers are continuously engaged in local practice, connecting earlier
11 experiences as well as people from different case studies, in order to build capacity and
12 advance theory as well as practice. This goes further than dissemination activities, and
13 inscribes in a tradition of action-research or applied research. The fact that the CoP has now
14 brought together researchers, practitioners and decision-makers for several years
15 contributes to creating a climate of mutual respect and trust that is a prerequisite to ensure
16 stakeholders' involvement in ES valuation studies

17

18 Not all discussions and learning took/take place within the BEES community. Direct
19 interactions among ES professionals are probably as important as the interactions within the
20 BEES community. Moreover, the impact/contribution of the BEES community is difficult to
21 quantify. However, the BEES evaluation survey outcomes that all respondents judge BEES
22 to be very useful and providing a service which is lacking in the current science-policy
23 interface. This attests of a significant contribution of BEES to this science-policy interface.

24

25 As a result of these interactions, integrated valuation has become mainstream among ES
26 practitioners in Belgium. The initial monetary interpretation of valuation is widely accepted as
27 insufficient to inform real life decisions, and practitioners as well as policy makers are actively
28 looking for more integrated ways of valuation, as a result of sharing experiences and debate.

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