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Capabilities, ecosystem services, and strong sustainability through SMCE: The case of Haren (Belgium)

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Abstract

The goal of this article is to develop further the promising theoretical framework that cross ecosystem services and capability approach developed by Pelenc and Ballet (2015) in a strong sustainability perspective. Given the multidimensional and deliberative aspect of Pelenc and Ballet's (2015) framework, the social multi-criteria evaluation (SMCE) methodology seems relevant to advance the operationalization of the former. Indeed, SMCE is a support tool used in decision-making processes for complex socio-ecological systems. This operationalization is conducted through a participatory action-research with the social movement opposing a mega-prison project in Haren, Brussels (Belgium). Our empirical and methodological results show the richness and limitations of using such a scientific apparatus to conduct action-research with social movement.

Keywords: capabilities, strong sustainability, social critical natural capital, ecosystem services, social multi-criteria evaluation.

1. Introduction

In a recent paper Pelenc and Ballet (2015) have proposed an original framework to improve our understanding and assessment of human–nature relationships in a strong sustainability perspective by bringing together the capability approach (CA) and ecosystem services (ES) understood as proxies to identify critical natural capital (CNC). One of the major advantages of the framework is to draw a space for taking into account the multidimensionality of both the environment and human well-being. The goal of this methodological article is to advance further the operationalization of their framework through the use of “social multi-criteria evaluation” (SMCE) (Munda, 2004, 2008). Indeed, SMCE offers the ability to compare different scenarios against multiple criteria. Moreover, SMCE operationalized through the Novel Approach to Imprecise Assessment and Decision Environments (NAIADE) aggregation method allows us to respect the strong sustainability standard, i.e. limited compensation between values (dimensions). In contrast to weak sustainability, strong sustainability assumes substitutability between natural capital and other forms of capital is limited (Pelenc and Ballet, 2015). Strong sustainability approach holds that certain elements of natural capital are “critical” due to their unique contribution to human well-being (Ekins et al., 2003; Dedeurwaerdere, 2014). These potentially “critical” elements to human existence and well-being can be conceptualized as ES provided by natural capital (Brand, 2009). ES, including provisioning, regulating, and cultural services, help to understand the multiple contributions that the natural environment offers for human flourishing (see MEA, 2005).

Indeed, one of the major features of the CA is its multidimensional conception of well-being (Pelenc and Ballet, 2015). Capabilities are composed of a bundle of achievable functionings. Functionings can be elementary, i.e. related to nutrition, health, and life expectancy, or more complex, such as taking part in the life of a community and having self-respect (Sen, 1999). Hence the CA, and more generally, human development, is multidimensional, with a focus on the intrinsic importance of various aspects of quality of life rather than the accumulation of goods (see among others Sen, 1999; Alkire, 2002; Robeyns, 2005).

Pelenc and Ballet (2015) explain that the cross-relationships among CNC, ES, and the CA can form both the normative basis and informational basis for a deliberative approach to human development. The normative basis concerns the improvement in people’s capabilities, while accounting for the biophysical constraints of the ecosphere. The informative basis for tackling

issues of human well-being is represented by the actual distribution of ES and related capabilities. Additionally, deliberative democracy acts as a conceptual framework whose methods could be adapted for a participatory identification of a set of critical ES and related “valuable” capabilities. This last aspect is particularly important because criticality cannot be considered as an absolute category (Arias-Maldonado, 2013). Indeed, the definition of the criticality of ES and so of natural capital requires both a scientific understanding of the functioning of a particular socio-ecological system and a wide-ranging debate about the values, goals, and objectives of the various groups of stakeholders belonging to this system. This entails a complex interrelationship between normative values on one side and factual knowledge on the other (Dedeurwaerdere, 2014). As long as there are multiple value judgments involved in the definition of critical ES, and given the irreducible uncertainties that characterise complex socio-ecological systems, public confrontation and stakeholder participation (Van den Hove, 2000) seem to be required if we are to define the criticality of natural capital (De Groot et al., 2003; Dedeurwaerdere, 2014). As it is explained later on, in this article, we focus on the public confrontation aspect by analysing a land use conflict (see section 3.1).

Therefore, given the multidimensional and deliberative aspect of Pelenc and Ballet’s (2015) framework, the SMCE methodology seems relevant to advance the operationalization of the former. Indeed, SMCE is a support tool used in decision-making processes for complex socio-ecological systems. The methodological basis of SMCE is distinguished by incorporating the *incommensurability of values* (Munda, 2004). According to the principle of weak comparability, the absence of a common valuation unit between plural values facilitates the inclusion of the disputed values. So SMCE includes both public participation in its evaluation process and the use of different types of knowledge (e.g. social actors, public managers, experts) and information (e.g. qualitative data). This inclusive and participative perspective encompasses the search for compromise solutions for complex situations, e.g. those related to the management of natural resources or land planning. A second argument supporting the use of SMCE in this case study is the assumption of the strong sustainability principle. This methodological framework does not impose any limitations in this regard, and therefore it permits the use of aggregation methods that include this possibility. Therefore, the NAIAD (JCR, 1996) aggregation method has been selected since, in contrast to other aggregation

methods (Polatidis et al., 2006; Buchholz et al., 2009), it allows us to: (i) investigate both weak and strong sustainability, through variations of particular parameters, (ii) aggregate all of the evaluation criteria with the same relative importance, and according to our theoretical framework of reference, all of the ES should be of equal importance (Pelenc and Ballet, 2015), and (iii) allows a social evaluation through the use of an equity matrix (EM), a tool that has been used during both the participative process as well as In conflict analysis.

It should be noted that SMCE is a robust methodological framework whose usefulness has been demonstrated many times in real-world cases, including land planning (Pearson et al., 2010; Etxano et al., 2015; Etxano et al., 2018), within the framework of ES (Oikonomou et al., 2011; Martínez-Sastre et al., 2017), and cases that collectively consider the CA and payments for environmental services (Kolinjivadi et al., 2015).

We consider our case study to be novel as it combines land planning, the ES framework, and CA. We apply the SMCE methodology to a land use conflict in Brussels, Belgium. The conflict is articulated around a mega-prison project that would destroy one of the last and largest remaining natural spaces in the north of Brussels. In the next section we describe the conflict (our case study) through the lens of the social definition of CNC (Section 2). Section 3 presents our methodological framework in detail, and Section 4 presents the results. We discuss the key lessons we draw from this first operationalization of Pelenc and Ballet's framework through SMCE in Section 5.

2. Social definition of CNC and mobilization against the mega-prison project in Haren, Brussels (Belgium)

2.1. The Haren neighbourhood and the Keelbeek site

The mega-prison project (1,190 prisoners) is planned to be built in the Haren neighbourhood (Brussels' region¹) on a natural site named the Keelbeek. The mega-prison project is led by the Federal Ministry of Justice and the Federal Real State Agency of Belgium but also involves Brussels' regional government and Brussels' municipality (to which the Haren neighbourhood belongs). The project is financed through a public–private partnership that involves several transnational companies. The Keelbeek space provides a wide array of ES to local residents and more largely to the city of Brussels. The project and its consequences represent a typical

¹ Brussels is both a municipality and a region. The region of Brussels comprises 19 municipalities, amongst which is the municipality of Brussels.

environmental injustice (Schlosberg, 2009) case where the distribution of costs and benefits is unfair, the participation of residents and local NGOs is severely limited, and the diverse socio-ecological values are not recognized (see below). The Haren neighbourhood is located in the north of the Brussels region on the Flemish border. It is still considered a semi-rural area. According to the inhabitants involved in the resistance against this project, Haren is a “sacrifice zone” (Lerner, 2010), considered to be the “garbage dump” of Brussels because of the numerous polluting infrastructures that have been built in this peripheral area, far from the city centre and far from the rich neighbourhoods to the South. The residents feel “enclosed” because of the numerous infrastructures that surround them (ring road, regional and international trains, international airport of Brussels, several dangerous industrial sites, bus depot, railway marshalling yard, etc.) and lack of public transportation and services. The Keelbeek natural site represents a mosaic of ecosystems for a superficies of around 20 hectares, which include a green park, cropland, natural areas with small wetland, and a few protected animals and vegetal species. The Keelbeek comprises many land properties belonging to different private owners, including individuals and businesses. The land has been bought by the Federal state of Belgium through its public real estate agency (*La régie des batiments*).

2.2. The resistance movement

From 2008 to 2011, the local residents of Haren heard that a prison would be built in their area. At that time, a prison of “regular” size (400 prisoners) was supposed to be built on an already urbanized site (an ancient warehouse nearby the Keelbeek). The residents had no problem with this first project. They discovered at the beginning of 2012 in a press release that it would be a mega-prison of 1,190 prisoners and that it would be built on the Keelbeek, destroying the entire green space. This is the feeling of being fooled by the authorities that triggered mobilization. Together with other NGOs, the Haren inhabitants committee started to organize various actions to protest but also to inform the population on the fallacies of the project. Activists also discovered that many actors from the justice sector (magistrates, lawyers, human rights representatives, observatories of prisons, criminologists, et al.) were also protesting against this project, and in 2013 a colloquium was organized at the Université Libre de Bruxelles where academics, actors of the justice system, NGOs, and local inhabitants met. The 17th of April 2014 was a turning point when 400 environmental activists claiming

food sovereignty came to Haren and started illegally planting potatoes on the Keelbeek prison site. At the harvesting time, some activists decided to start a permanent occupation of the site (August 2014). From autumn 2014 to August 2018 the land was intermittently occupied because the occupiers were twice evicted by the police. During the occupation periods, activists, with some of the inhabitants of the neighbourhood, started an orchard, vegetable garden, wooden houses (cabins), and a small farm with chickens and goats, organized many debates, and a festival. In early spring 2015, the “platform against prison disaster” was created to bring together all the associations involved in the resistance, along with the residents. The platform gathered anti-prison and pro-human rights NGOs, as well as environmental ones. The platform represented, to some extent, a convergence of the struggle between the anti-prison movement and the environmental movement, but the occupiers did not participate. The platform has been inactive since 2017. From 2015 to 2019 a judicial battle has been engaged on different aspects of the projects and against the repression of the movement. The environmental and construction permits have been attacked several times against different Belgian jurisdictions. Presently the construction work has started and the land has been destroyed, and the judicial battle led to a major defeat when the highest court of Belgium (*Conseil d’Etat*) rejected the appeal against the permits. To sum up, four types of actors have been involved in this resistance movement against the mega-prison project including: i) some inhabitants of the Haren neighbourhood, particularly those participating in the Inhabitants Committee; ii) local or national NGOs from the human rights/justice sector and from the environmental sectors (e.g. NGOs advocating for participatory planning, degrowth, urban agriculture, food sovereignty, etc.); iii) activists who do not live permanently on the occupied site and who do not belong to an NGO; and iv) activists who live permanently on the site (let’s call them “occupiers”).

Objections to the mega-prison project itself range from the cost and the size of this project to a radical critique of imprisonment policy. Perhaps one of the most powerful arguments brought since the mobilization is the fact mega-prisons (about 1,200 prisoners in this case) like all prisons fail to reduce criminality (see Appendix for more details). The resistance movement has also offered many arguments regarding the environmental impacts of the project. First, the loss of the Keelbeek is not acceptable to the members of the mobilization, because of all the ecological services it provides (such as reducing the noise when planes take

off, regulating air quality, and water filtration), and the loss of biodiversity is also very painful for the people involved (some protected species of orchids and mammals have been identified on the site, trees and small wetlands offer space for bird migration and amphibian reproduction, etc.). A second line of argument deals with the loss of local identity, landscape, and sense of belonging, because Haren is one of the last “semi-rural” places in Brussels. By qualifying the neighbourhood as “semi-rural”, the residents refer to a certain way of life under pressure because of real-estate and infrastructure development in the area. Last but not least, it is unacceptable for the people involved in the mobilization to lose a potential arable site of 20 hectares that could foster urban agriculture in order to improve food sovereignty. In a nutshell, given that there is no real argument from the government to demonstrate how this project will improve the prison/justice sector, the environmental destruction it entails appears absurd and incoherent with the regional, national, and global discourses about sustainability (biodiversity loss, sustainable and inclusive cities, climate change adaptation, urban agriculture, etc.). This case illustrates well the accumulation of social and environmental inequalities that prisons entail. Indeed, as has been demonstrated by the US Environmental Protection Agency, prisons are often located in polluted or degraded areas, and prisons also have strong negative environmental impacts (Pellow, 2017)².

To sum, the description of the mobilization illustrates that the CNC threshold is, in this case, strongly socially defined. The destruction of a 20-hectare “non-urban” green space within a metropolis such as Brussels has triggered a mobilization even if the site is not pristine in nature. It is worth noting that the local inhabitants would have accepted a regular-size prison on an already urbanized site. It is the fact that the infrastructure was planned on the non-urbanized green space that triggered the mobilization and because of the feeling of having being fooled by the authorities.

3. SMCE in practice: Evaluation process

3.1. Participatory process

In an action-research perspective (Kindon et al., 2008), we have clearly decided to work with the opponents of the project and not with the promoters of the mega-prison (the Belgian state and transnational companies). Thus the latter were not consulted. We consider that

² For further details see the “Prison Ecology Project”: <https://nationinside.org/campaign/prison-ecology> [last visit on December 3, 2019].

there is a political conflict between these two parties and that in a radical democracy perspective (Rancière, 1999, 2010; Mouffe, 2005, 2013) it is healthy for democracy that two radically different political views can confront themselves in the public arena. Two so-called “public hearings” regarding the issuance of the environmental and construction permits for the mega-prison took place, in 2015 and 2016, but these procedures were considered by the opponents as authoritarian mechanisms to foster social acceptance and not as an arena for partisan debate. The occupation of the Keelbeek and more largely the social movement opposing the mega-prison project has functioned as a proper “oppositional public space” (Negt, 2007). This space ties together the opponents through the “NO” against the mega-project, but at the same time, and given the diversity of the opponents, it offers a space where different alternative propositions of land planning are discussed. Thus it offers a space where not only the different political views but also the different practices have confronted each other among the four types of actors involved in the resistance (inhabitants of Haren, NGO activists, activists not belonging to NGOs, and occupiers).

The participant observations were carried out over two years (October 2015 to October 2017), a period in which the social actors of the movement were very active. In November 2015 at the first collective workshop was conducted with some opponents to identify the ES provided by the Keelbeek site. From the first months of participant observations we identified different alternative scenarios that were discussed within the resistance movement. Consequently, it is important to note that they are not just a collective of protesters but also a collective that is capable of developing counter-proposals to the mega-prison. Notably thanks to the alternative practices developed through the occupation of the site, different alternative scenarios have emerged. Five alternative scenarios can be outlined as follows:

- Leaving the Keelbeek as it is, i.e. a space where humans and non-humans can interact freely without any management procedures.
- Making the Keelbeek a natural reserve with the proper judicial status (state property) and corresponding management plan.
- Creating an “open farm” (with rehabilitation of prisoners).
- Creating social housing.
- Creating an alternative prison house (*Huizen project*)—a small institution with a small number of prisoners.

Even if these scenarios emerged from cross-learning and confrontation of arguments, there was no consensus about which one to defend as a united collective. From January 2016 to March 2017, a total of 22 semi-structured interviews were carried out with actors from the four categories previously mentioned: local residents (n = 6); local and national NGO members (n = 7); activists (n = 5); and occupiers (n = 4). It is important to note the broad diversity of the actors represented in the group of NGOs, whose areas of action and objectives vary considerably³. The interviews, which were recorded, were divided into four main parts: motivations, involvement in the collective action, capabilities, and perception and practice regarding the Keelbeek site. Following the interviews, the participants completed a questionnaire in which they scored the different alternative scenarios we had identified through the participant observations. Of note, the material used here and the results are part of a larger study that analyses other aspects of this social movement. In addition to the interviews, a participatory workshop was conducted (June 2016) to discuss with the inhabitants of Haren who were involved in the resistance movement a participatory map of their “dreamed” neighbourhood, including the Keelbeek.

Our first idea was to help participants choose among the different scenarios⁴ in order to improve their political agency by speaking with one voice instead of several, to back up their choice with data, and to improve cooperation instead of conflicts within the resistance movement. In the end, it was not possible for us to achieve such goals for different reasons, including tensions inside the movement, the departure of some actors, and the time lag between the slow scientific research process and the rapidly evolving agenda of the movement. We also questioned our starting point: Is it really necessary to forge a collective to support one scenario? Does it really strengthen the collective? Will the process of choosing one scenario over another foster conflicts rather than strengthening the collective? Is it the role of researchers to do so? We take these ethical questions very seriously, acknowledging the social responsibility of the researchers in action research regarding the issues at stake for the actors on the ground. Consequently, our involvement in the action research was

³ In this group we find the following NGOs: RESPIRE (ecological NGO, in favour of degrowth); InterEnvironment Bruxelles, IEB (regional NGO for territorial and environmental planning); Réseau de Soutien à l’Agriculture Paysanne, RESAP (in support of rural agriculture); l’Association des Magistrats, ASM (judges in favour of improving the judicial system); Centre d’Action Laïque, CAL (promoting human rights); the Belgian division of l’Observatoire International des Prisons (in favour of respecting human dignity in the penitentiary system); and Lawyers for Democracy (association in favour of progressive actions).

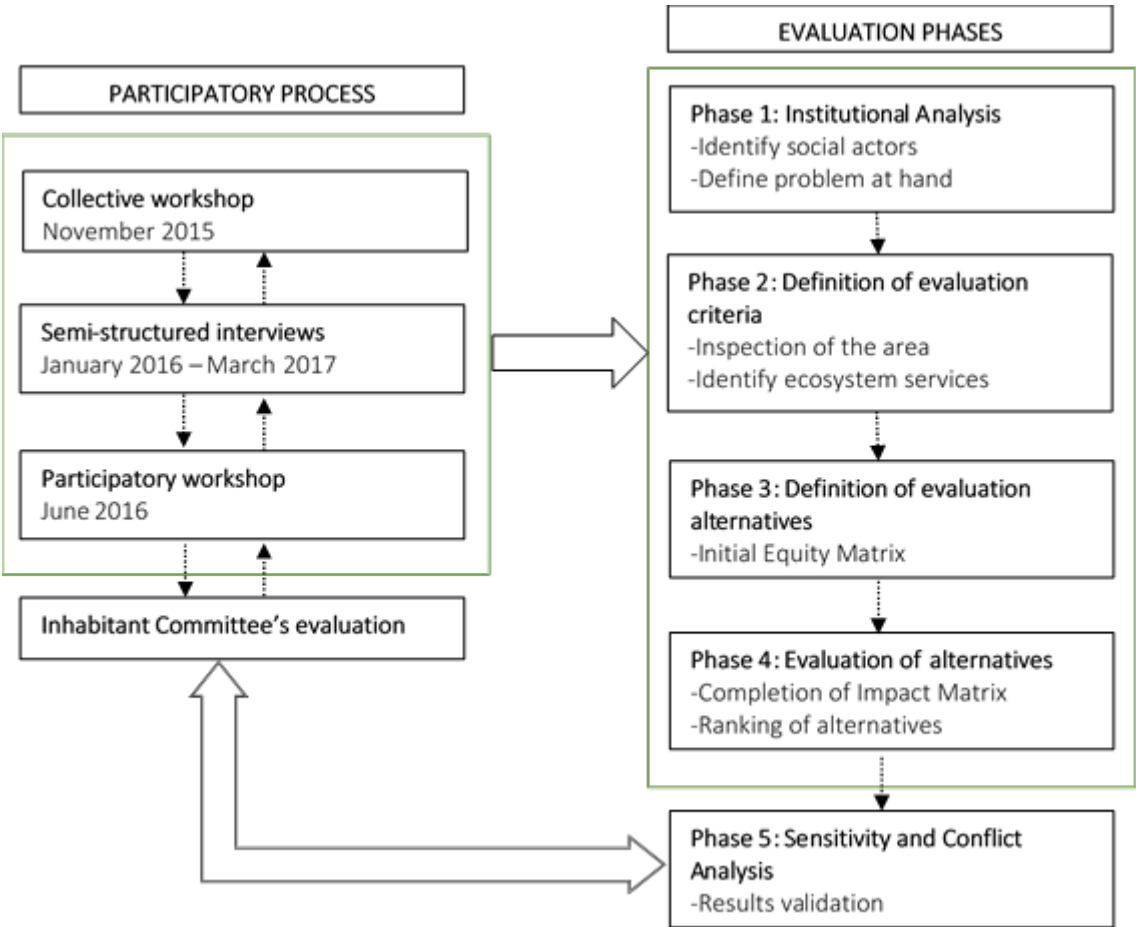
⁴ We did not intervene in the creation of scenarios; they already existed when we arrived.

redirected, and we did not organize a collective workshop with the aim of selecting one scenario over another. Nonetheless, we still think that it is worth sharing the innovative methodological developments we have realized for this study within the SMCE framework.

3.2. Our use of the SMCE and the selection of evaluation criteria

The evaluation process undertaken in this case study consists of five phases (Diagram 1): 1) institutional analysis, in which the problem is defined and the involved social actors are identified; 2) identification of the ES of the area to be considered as evaluation criteria; 3) definition of the evaluation alternatives through the initial EM; 4) completion of the impact matrix (IM) and evaluation of the alternatives, so as to obtain the ranking of alternatives; and 5) sensitivity and conflict analysis to verify whether the results are technically and socially robust. All of these phases included the participation of the social actors and were carried out iteratively, thus permitting feedback in terms of information and decision making throughout the process.

Diagram 1. Evaluation process.



Unlike the usual SMCE process where the EM tends to be used only for conflict analysis, in this case an initial EM was used to definitively establish the alternatives to be evaluated. The EM is an effective tool when it comes to integrating the actors' positions with respect to the problem at hand, and thereby in this case contributes to the final definition of the evaluation alternatives. This may have influenced the final result, but we should not forget that problem formulation is just as important as the technical evaluation of the alternatives (choice problem) within decision aiding (Roy, 2005). Together with this, the selection of the aggregation method (NAIADE) was made at the start of the process and not after the IM was completed, in contrast to the order used in other cases.

Pelenc and Ballet (2015) explain that a suitable starting point could be the preparation of a list of ES and the identification of their impact on a predefined or co-constructed list of valuable capabilities. It is then possible to see which functionings and categories of capability benefit from ES. This approach would help to define the criticality of natural capital because it would highlight the role CNC plays in the generation of functionings and capabilities through ES delivery. In the assessment of well-being, Sen (2004) advocates a purely deliberative approach for identifying the list of capabilities that should be valued for each context. However, other scholars have proposed different lists of fundamental capabilities that should be fulfilled by every human beings in order to enjoy well-being. Here we use the list of capabilities proposed by Pelenc (2017). His list is inspired by Max-Neef (1991) and embarks on 10 dimensions of fundamental capabilities (subsistence, protection, affection, understanding, participation, idleness, identity, creation, spirituality, and freedom).

Regarding the identification of the existing ES the site, this task was carried out through an inspection of the land and the contributions of the social actors. Thus, the evaluation criteria were extracted in accordance with the theoretical framework of Pelenc and Ballet (2015) and were refined by the interests and needs of the social actors, as well as the inspection of the land. In this way, the ES serve as evaluation criteria within the framework of the SMCE. Through this process, 17 ES evaluation criteria were considered and grouped: five as provisioning services (garden, goats and chickens, fruit-bearing trees, collection of mushrooms and flowers, water supply), eight as regulating services (air quality, local climate regulation, soil fertility, erosion control, flood control, biodiversity habitat, pollination, noise

reduction), and four as cultural services (landscape quality, natural heritage, social relations site, recreation site).

3.3. Building the initial Equity Matrix

In the third phase the evaluation alternatives were defined after being scrutinised by social actors. First, discourses of the social actors (i.e. interviews and questionnaires) were analysed, and in parallel documents of laws and projects were also peer reviewed. Therefore, the broad spectrum of options existing in the Keelbeek was covered in a reliable manner, and from the initial five scenarios identified through participant observation 11 alternatives were defined: A1, Business as usual (BAU); A2, Natural reserve; A3, Open farm; A4, Open farm with reinsertion; A5, Mega-prison; A6, Mega-prison in another location; A7, Prison; A8, Huizen project; A9, Huizen project but not in Keelbeek; A10, Social housing in already artificialized land; and A11, Social housing in non-artificialized land.

Second, an initial EM was created that included the positions of social actors (in favour or against) with regards to the 11 alternatives (Table 1).

Table 1. Initial Equity Matrix with 11 alternatives.

ALTERNATIVES											
SOCIAL ACTORS	A1. Business as usual	A2. Natural reserve	A3. Open farm	A4. Open farm with reinsertion	A5. Mega-prison	A6. Mega-prison in another site	A7. Prison	A8. Huizen project	A9. Huizen project but not in Keelbeek	A10. Social housing on the already artificialized land	A11. Social housing in non-artificialized land
Syndicate of Magistrates (G1)	More or less bad	Extremely good	Extremely good	Extremely good	Extremely bad	Extremely bad	Neither good nor bad	Extremely good	Very good	Extremely good	Very good
SAC (G2)	More or less good	More or less good	Very good	Extremely good	Extremely bad	Extremely bad	Very bad	Extremely good	Very good	Bad	Neither good nor bad
Respire (G3)	Extremely good	Extremely good	Very good	Very good	Extremely bad	Very bad	Bad	Very bad	Good	Neither good nor bad	Bad
IEB (G4)	Extremely good	More or less bad	Good	Neither good nor bad	Extremely bad	Extremely bad	Bad	Neither good nor bad	Neither good nor bad	Extremely bad	Extremely bad
RESAP (G5)	Good	More or less good	Extremely good	Extremely good	Extremely bad	Extremely bad	Extremely bad	Neither good nor bad	Neither good nor bad	More or less good	Very bad
Inhabitant Committee (G6)	Good	Good	Very good	Extremely good	Extremely bad	Extremely bad	Very bad	More or less bad	More or less good	Neither good nor bad	Very bad
Occupiers (G7)	Extremely good	More or less good	Very good	More or less good	Extremely bad	Very bad	Very bad	Very bad	Neither good nor bad	More or less bad	Extremely bad
Activists (G8)	Neither good nor bad	Good	Good	Good	Extremely bad	Extremely bad	Very bad	Neither good nor bad	More or less bad	More or less good	Very bad
Lawyers for democracy (G9)	Neither good nor bad	Neither good nor bad	Very good	Extremely good	Extremely bad	Extremely bad	Extremely bad	Neither good nor bad	Neither good nor bad	More or less good	Neither good nor bad
Prison observatory (G10)	Neither good nor bad	Neither good nor bad	Neither good nor bad	Very good	Extremely bad	Extremely bad	Extremely bad	More or less bad	More or less bad	Neither good nor bad	Neither good nor bad

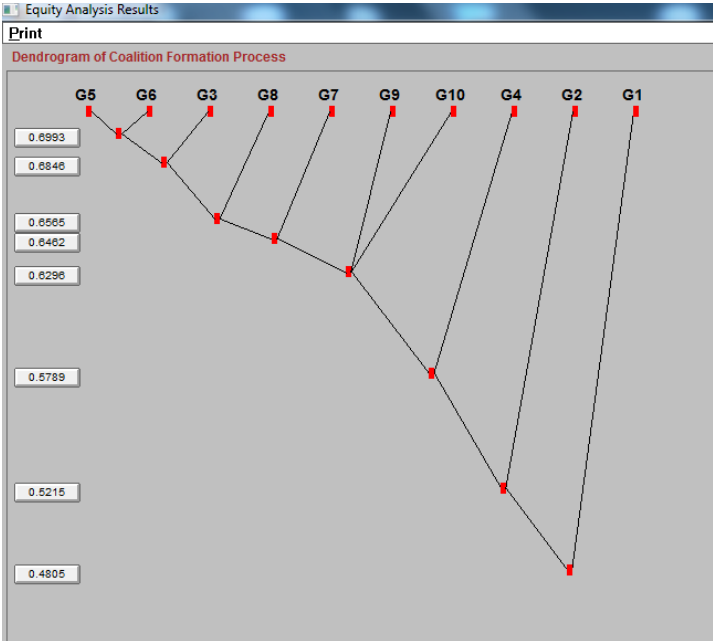
Note: Valuation is based on social actors' view according to a scale from 1 to 9, as follows: 1, extremely bad; 2, very bad; 3, bad; 4, more or less bad; 5, neither good nor bad; 6, more or less good; 7, good; 8, very good; 9, extremely good.

Note: Average value has been introduced in the following groups of social actors: Respire, Inhabitant Committee, Occupiers, Activists.

Based on this information, the NAIADE creates a coalitions dendrogram visualizing how close or far in terms of agreement these coalitions of actors are from the considered alternatives (Figure 1). Coalitions depend on the similarity index applied, the higher the index the greater the number of coalitions, and vice versa (Figure 1, left column). For our analysis, we considered the lowest degree of the similarity index (Figure 1, left column, value 0.4805), i.e. one unique coalition of actors (Figure 2). This helped us to determine the sequence of

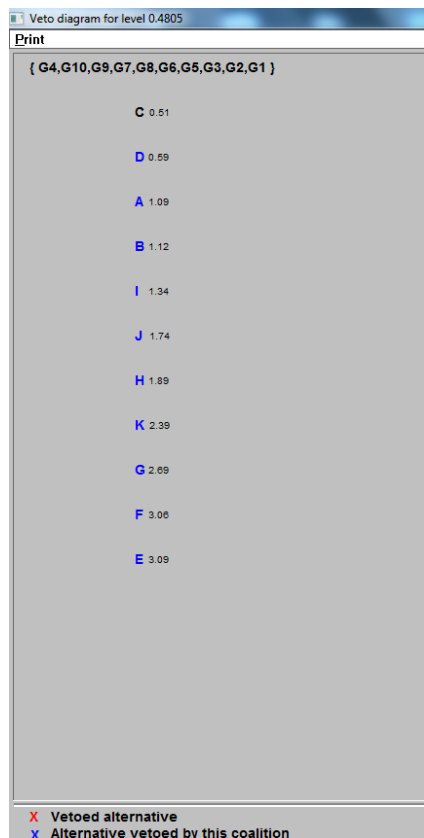
alternatives from the most desired to the least desired by the set of all actors. This analysis shows that only one alternative was not vetoed by the set of all actors (A3, Open farm). Therefore, we can also conclude that this collective positioning suggests that the creation of a mega-prison (alternative 5) in the Keelbeek is not a particular case of NIMBY (not in my backyard), since the vetoed alternatives are multiple and diverse, and seeing how alternative 6 (Mega-prison in another site) was also vetoed.

Figure 1. Coalitions dendrogram.



Note: Social actors are as follows: G1: Syndicate of Magistrates; G2: SAC; G3: Respire; G4: IEB, G5: RESAP; G6: Inhabitant Committee; G7: Occupiers; G8: Activists; G9: Lawyers for democracy; G10: Prison observatory.

Figure 2. Coalition of actors with lowest similarity index (0.4805).



Note: Social actors are as follows: G1: Syndicate of Magistrates; G2: SAC; G3: Respire; G4: IEB, G5: RESAP; G6: Inhabitant Committee; G7: Occupiers; G8: Activists; G9: Lawyers for democracy; G10: Prison observatory.

Note: Alternatives are as follows: A: A1. Business as usual; B: A2. Natural reserve; C: A3. Open farm; D: A4. Open farm with reinsertion; E: A5. Mega-prison; F: A6. Mega-prison in another site; G: A7. Prison; H: A8. Huizen project; I: A9. Huizen project but not in Keelbeek; J: A10. Social housing on the already artificialized land; K: A11. Social housing in non- artificialized land.

In analysis as similarity index is increased four alternatives are considered and not vetoed including: Together with A3, Open farm they are (i) A1, BAU; (ii) A2, Natural reserve; and (iii) A4, Open farm with reinsertion. Those four alternatives may be placed into two groups according to the changes in land uses with respect to the current situation: open farm and natural reserve. In fact, alternatives 3 and 4 are differentiated in the application of social measures for reinsertion, but not from the point of view of land use. So alternative 4 is discarded, although the reinsertion measures are taken into account for their potential application. On the other hand, the construction of the mega-prison (alternative 5) deserves separate consideration, first because it implies land planning that is completely distinct from current uses, and second because this is the option that was made by the government (top-down) and the decision which entailed the resistance movement.

Given all of this, the evaluation alternatives to be definitively considered were A1, BAU; A2, Natural reserve; A3, Open farm; and A5, Mega-prison. Each alternative implies distinct land planning (Table 2), which influences the provision of ES and, ultimately, its valuation with regards to the capabilities.

Table 2. Main features of the evaluation alternatives.

<p>A1. Business as usual (BAU) Represents the current land uses. Maintenance of the current dynamics without substantial changes in the Keelbeek or in its land uses.</p>
<p>A2. Natural reserve Consists of largely continuing with the site but with some management measures. Although it is not an extremely protected site, it encompasses management measures to be well conserved, which comprise public-private co-management with participation of the local actors.</p>
<p>A3. Open farm Creation of an ecological farm with activities for the public. The farm includes the development of diverse activities, such as vegetable gardens, care of livestock, recreational and education spaces, and direct sale of products.</p>
<p>A5. Mega-prison This is the federal government’s program, consisting of a mega-prison for circa 1,200 prisoners and meaning the destruction of a natural area of some 20 ha in the Keelbeek.</p>

3.4. Building the Impact Matrix

The IM includes the impact assessment for each alternative through the selected evaluation criteria (Table 3). This information structuring allows making quick comparisons between alternatives in accordance with each criterion, and at the same time facilitates the visualization of the diverse impacts in each alternative.

Table 3. Multi-criteria Impact Matrix.

Dimensions	CRITERIA	ALTERNATIVES			
		A1. Business as usual	A2. Natural reserve	A3. Open farm	A5. Mega- prison
Provisioning	Garden	6 (7)	2 (1)	8 (9)	1 (1)
	Goats and chickens	5 (7)	2 (1)	6 (9)	1 (1)
	Fruit-bearing trees	5 (7)	4 (1)	6 (9)	1 (1)
	Collection of mushrooms and flowers	5 (6)	6 (9)	3 (7)	1 (1)
	Water supply	5 (6)	4 (1)	6 (6)	1 (1)
Regulation	Air quality	8 (8)	9 (9)	6 (8)	2 (3)
	Local climate regulation	7 (8)	9 (9)	5 (8)	2 (1)
	Soil fertility	8 (7)	8 (7)	9 (9)	1 (3)
	Erosion control	6 (7)	8 (9)	6 (8)	1 (5)
	Flood control	7 (9)	8 (9)	6 (9)	1 (3)
	Biodiversity habitat	7 (6)	8 (9)	7 (8)	2 (3)
	Pollination	6 (7)	7 (9)	8 (9)	1 (3)
	Noise reduction	8 (8)	9 (9)	7 (8)	1 (1)
Cultural	Landscape quality	7 (7)	7 (9)	7 (9)	1 (1)
	Natural heritage	6 (7)	7 (9)	6 (8)	1 (2)
	Social relations site	7 (8)	5 (6)	8 (9)	1 (1)
	Recreation site	6 (8)	6 (8)	6 (9)	1 (2)

Note: Valuations of impacts are measured according to a scale from 1 (lowest impact) to 9 (highest impact).

Note: Valuations of impacts in brackets correspond to those made by the president of the Inhabitant Committee.

Devising the IM was undertaken within the participation observation context. The valuations of the IM were completed by means of an inspection of the area, information gathered from social actors (interviews, questionnaires), and the experience of researchers (“expert eye”). From a methodological point of view, the way of reaching the impact assessments is novel, being an experimental and exploratory evaluation. The IM building process entailed several steps, as follows.

First, the ES-Capabilities (ES-Cap) matrix was created, crossing the 17 ES that are considered to be evaluation criteria with the axiological capabilities. The intended objective has clearly been the main goal of this case study, i.e. estimating the contribution of the ES to human well-being, measured through the impact in the axiological capabilities. That is, an estimation

of the local population well-being was carried out by means of the impact of the ES on their capabilities.

As noted, there are 10 axiological capabilities, as defined by Max-Neef (1991), of which freedom was discarded since it is understood that in the CA freedom is inherently included, being considered a general category⁵ (Pelenc, 2017). Therefore, here we considered nine axiological capabilities (Table 4). In addition, our target public is the local population, given that the capabilities of the population are those impacting the ES. So impact valuations are contextual to the study, since both the ES existing in the site and the capabilities of the local population are contextual to the Keelbeek.

Table 4. Axiological capabilities.

Subsistence	Protection	Affect	Understanding	Participation	Leisure	Creation	Identity	Spirituality
Essential functioning to survive	Essential functioning to feel safe	Essential functioning to feel loved	Essential functioning to understand others and nature	Essential functioning to be able to participate in society	Essential functioning for pleasant entertainment	Essential functioning to create and give life to things	Essential functioning for existing as a person, to belong to the human community and the Earth	Essential functioning for spiritual development

Source: Pelenc (2017).

Thus, for each evaluation alternative (A1, A2, A3, and A5) the impacts of the ES on the capabilities were assigned values, and this information was included in other ES-Cap matrices, i.e. four matrices of 17x9 (see Table 5 for A1, BAU ES-Cap matrix, and see Tables 6 to 8, for remaining ES-Cap matrices). The numeric valuation of these impacts was made in accordance with a scale from 1 (lowest impact) to 9 (highest possible impact)⁶.

Second, based on these values, the arithmetic mean was calculated for each evaluation criterion for each of the alternatives, displayed in the last column of the ES-Cap matrix (Table 5). The arithmetic mean weighs each axiological capability equally, being consistent with our theoretical framework of reference (Pelenc & Ballet, 2015), i.e. the nine capabilities are equally important. The mean value of each criterion is that which subsequently was introduced in the IM for each alternative (Table 3).

⁵ Freedom is understood in this framework as the essential functioning necessary to have options and responsibilities.

⁶ The 1–9 numeric scale coincides with that of the NAIADE, thus facilitating the subsequent introduction of the information in this aggregation method.

Given the biases that may have been produced by the researchers in this process, these estimates were examined through an evaluation exercise by the president of the Inhabitant Committee (see Table 3). In this comparison, although the values granted by the committee representative were generally higher than those reached through the researchers' analysis, they were largely similar (for example, A5 was clearly the least valued in both cases). So we considered that the values derived from the evaluation process were in agreement with the local reality.

Table 5. A1, BAU: Ecosystem services and axiological capabilities (ES-Cap) matrix.

DIMENSIONS	CRITERIA	CAPABILITY									VALUE
		Subsistence	Protection	Affect	Understanding	Participation	Leisure	Creation	Identity	Spirituality	
Provisioning	Garden	6	5	4	6	6	4	7	7	5	6
	Goats and chickens	6	5	4	6	6	4	5	6	5	5
	Fruit-bearing trees	6	5	3	5	5	5	5	5	4	5
	Collection of mushrooms and flowers	6	6	4	6	5	6	5	5	4	5
	Water supply	6	4	n/a	5	4	4	5	5	4	5
Regulation	Air quality	8	8	n/a	9	n/a	6	n/a	n/a	n/a	8
	Local climate regulation	8	8	n/a	8	n/a	4	n/a	n/a	n/a	7
	Soil fertility	7	8	n/a	8	n/a	n/a	n/a	n/a	n/a	8
	Erosion control	6	6	n/a	6	n/a	n/a	n/a	n/a	n/a	6
	Flood control	8	7	n/a	8	n/a	3	n/a	n/a	n/a	7
	Biodiversity habitat	7	5	n/a	9	n/a	5	n/a	n/a	n/a	7
	Pollination	7	5	n/a	6	n/a	n/a	n/a	n/a	n/a	6
	Noise reduction	7	7	n/a	9	n/a	8	n/a	n/a	n/a	8
Cultural	Landscape quality	2	3	9	7	4	8	8	9	9	7
	Natural heritage	2	3	7	7	4	7	6	9	8	6
	Social relations site	4	5	8	8	8	7	7	8	7	7
	Recreation site	3	2	7	6	8	8	6	7	6	6

Note: "n/a" (not available) has a contextual meaning. For example, Affect involves the relation between humans and other living beings. Because water is not a living being, the impact of Water supply on Affect is n/a.

Note: Impact values are measured according to a scale from 1 (lowest impact) to 9 (highest impact).

Note: The "value" column figures the arithmetic mean of values for each evaluation criterion.

Table 6. A2. Natural reserve: Ecosystem services and axiological capabilities (ES-Cap) matrix.

DIMENSIONS	CRITERIA	CAPABILITY									VALUE
		Subsistence	Protection	Affect	Understanding	Participation	Leisure	Creation	Identity	Spirituality	
Provisioning	Garden	2	2	2	2	2	2	2	2	2	2
	Goats and chickens	2	2	2	2	2	2	2	2	2	2
	Fruit-bearing trees	3	3	3	5	5	5	4	4	3	4
	Collection of mushrooms and flowers	8	6	5	7	6	7	7	7	5	6
	Water supply	2	2	n/a	7	6	6	3	5	4	4
Regulation	Air quality	9	9	n/a	9	n/a	7	n/a	n/a	n/a	9
	Local climate regulation	9	9	n/a	9	n/a	7	n/a	n/a	n/a	9
	Soil fertility	8	9	n/a	8	n/a	n/a	n/a	n/a	n/a	8
	Erosion control	8	8	n/a	8	n/a	n/a	n/a	n/a	n/a	8
	Flood control	9	8	n/a	8	n/a	6	n/a	n/a	n/a	8
	Biodiversity habitat	8	8	n/a	9	n/a	8	n/a	n/a	n/a	8
	Pollination	8	7	n/a	7	n/a	n/a	n/a	n/a	n/a	7
	Noise reduction	9	8	n/a	9	n/a	9	n/a	n/a	n/a	9
Cultural	Landscape quality	2	4	9	8	3	9	8	9	9	7
	Natural heritage	2	4	8	9	3	9	7	9	9	7
	Social relations site	2	3	6	6	6	6	5	6	6	5
	Recreation site	4	2	7	7	7	9	6	8	7	6

Note: "n/a" (not available) has a contextual meaning. For example, Affect involves the relation between humans and other living beings. Because water is not a living being, the impact of Water supply on Affect is n/a.

Note: Impact values are measured according to a scale from 1 (lowest impact) to 9 (highest impact).

Note: The "value" column figures the arithmetic mean of values for each evaluation criterion.

Table 7. A3. Open farm: Ecosystem services and axiological capabilities (ES-Cap) matrix.

DIMENSIONS	CRITERIA	CAPABILITY									VALUE
		Subsistence	Protection	Affect	Understanding	Participation	Leisure	Creation	Identity	Spirituality	
Provisioning	Garden	9	8	6	9	9	5	9	9	6	8
	Goats and chickens	7	6	6	8	7	5	6	7	6	6
	Fruit-bearing trees	8	6	5	7	6	6	6	6	5	6
	Collection of mushrooms and flowers	3	2	2	2	2	4	3	3	2	3
	Water supply	8	6	n/a	6	7	5	6	5	5	6
Regulation	Air quality	6	6	n/a	6	n/a	5	n/a	n/a	n/a	6
	Local climate regulation	6	6	n/a	6	n/a	3	n/a	n/a	n/a	5
	Soil fertility	9	9	n/a	9	n/a	n/a	n/a	n/a	n/a	9
	Erosion control	6	6	n/a	7	n/a	n/a	n/a	n/a	n/a	6
	Flood control	6	6	n/a	8	n/a	3	n/a	n/a	n/a	6
	Biodiversity habitat	8	6	n/a	9	n/a	6	n/a	n/a	n/a	7
	Pollination	9	7	n/a	8	n/a	n/a	n/a	n/a	n/a	8
	Noise reduction	6	5	n/a	9	n/a	6	n/a	n/a	n/a	7
Cultural	Landscape quality	2	4	9	8	6	9	8	9	9	7
	Natural heritage	2	4	7	6	6	6	5	7	7	6
	Social relations site	5	7	9	9	9	8	6	9	8	8
	Recreation site	4	2	6	6	7	7	6	6	6	6

Note: "n/a" (not available) has a contextual meaning. For example, Affect involves the relation between humans and other living beings. Because water is not a living being, the impact of Water supply on Affect is n/a.

Note: Impact values are measured according to a scale from 1 (lowest impact) to 9 (highest impact).

Note: The "value" column figures the arithmetic mean of valuations for each evaluation criterion.

Table 8. A5. Mega-prison: Ecosystem services and axiological capabilities (ES-Cap) matrix.

DIMENSIONS	CRITERIA	CAPABILITY									VALUE
		Subsistence	Protection	Affect	Understanding	Participation	Leisure	Creation	Identity	Spirituality	
Provisioning	Garden	1	1	1	1	1	1	1	1	1	1
	Goats and chickens	1	1	1	1	1	1	1	1	1	1
	Fruit-bearing trees	1	1	1	1	1	1	1	1	1	1
	Collection of mushrooms and flowers	1	1	1	1	1	1	1	1	1	1
	Water supply	1	1	n/a	1	1	1	1	1	1	1
Regulation	Air quality	2	2	n/a	1	n/a	1	n/a	n/a	n/a	2
	Local climate regulation	2	2	n/a	1	n/a	1	n/a	n/a	n/a	2
	Soil fertility	1	1	n/a	1	n/a	n/a	n/a	n/a	n/a	1
	Erosion control	1	1	n/a	1	n/a	n/a	n/a	n/a	n/a	1
	Flood control	1	1	n/a	1	n/a	1	n/a	n/a	n/a	1
	Biodiversity habitat	2	2	n/a	1	n/a	1	n/a	n/a	n/a	2
	Pollination	1	1	n/a	1	n/a	n/a	n/a	n/a	n/a	1
	Noise reduction	1	1	n/a	1	n/a	1	n/a	n/a	n/a	1
Cultural	Landscape quality	1	1	1	1	1	1	1	1	1	1
	Natural heritage	1	1	1	1	1	1	1	1	1	1
	Social relations site	1	1	1	1	1	2	1	1	1	1
	Recreation site	2	1	2	1	1	2	1	1	1	1

Note: "n/a" (not available) has a contextual meaning. For example, Affect involves the relation between humans and other living beings. Because water is not a living being, the impact of Water supply on Affect is n/a.

Note: Impact values are measured according to a scale from 1 (lowest impact) to 9 (highest impact).

Note: The "value" column figures the arithmetic mean of valuations for each evaluation criterion

In operational terms, the NAIADÉ is an outranking method whose procedure demands defining certain parameters (for details see JRC, 1996). First, the thresholds of indifference and preference establish the distances between two values of the same criterion⁷, and that is automatically established by the NAIADÉ when criteria are assessed through linguistic variables, as in this study⁸. Second, a very important aspect for determining sustainability is the degree of compensation⁹. So the NAIADÉ allows the use of two parameters: the “Zimmermann Zysno operator” (γ) allows a certain degree of compensation from its values of 0.0 (minimal compensation) to 1.0 (maximum compensation); but the use of the “minimum operator” entails no compensation between one high value of a specific criterion and a low value of another. So according to the principle of strong sustainability, which we adopted here, minimum operator has been applied. Finally, the credibility index (α)¹⁰ value was 0.5, per recent applications (Vallejo et al., 2015; Martínez-Sastre et al., 2017).

4. Results

4.1. Main results

According to the analysis, A3, Open farm is the most suitable, as shown in the “Intersection” column¹¹ of Figure 3. Next, at the same preference level, are A1, BAU and A2, Natural reserve. A5, Mega-prison ranks last. According to the indices $\phi+$ and $\phi-$ (Figure 3, respective columns)¹², the distances between A3, A1, and A2 are small, whereas that of A5 is quite large.

⁷ The *indifference threshold* is the maximum difference between the values of the same criterion for two different alternatives that does not establish any differences between both (under this criterion). The *preference threshold* is the minimum difference between the values of the same criterion for two different alternatives that makes one of these alternatives be preferred over the other (according to this criterion) (Munda, 1995).

⁸ NAIADÉ establishes four thresholds, which in the case of linguistic variables respond to the following relations of preference: indifference ($\mu = 0.01$), weak indifference ($\mu \approx 0.30$), preference/rejection ($\mu > ; \mu < = 0.65$) and strong preference/strong rejection ($\mu > > ; \mu < < = 0.50$). The linguistic variables are treated as fuzzy sets, favouring their consideration in situations of uncertainty (Munda, 1995; JCR, 1996).

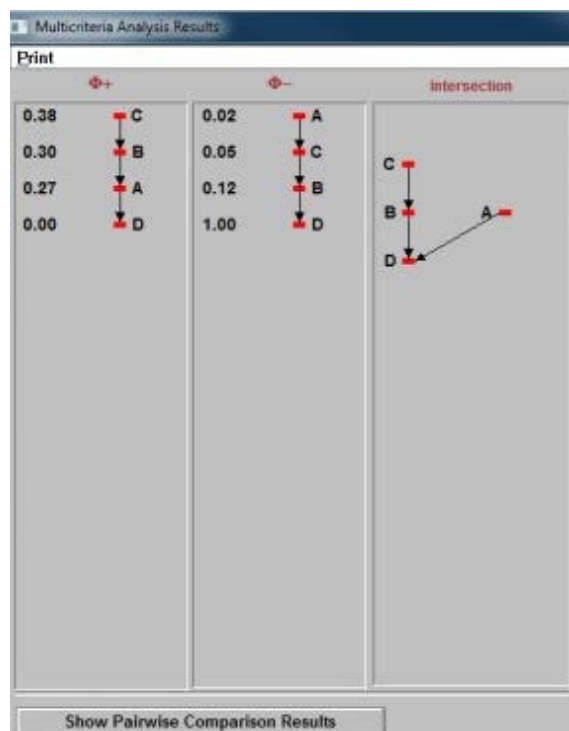
⁹ Compensability refers to the *trade-offs*, i.e. to the possibility of compensating for a disadvantage in some criteria with an advantage that is sufficiently large in another criterion, whereas smaller advantages would not compensate for them (Munda, 2008).

¹⁰ The credibility index establishes the minimal difference required for criteria so that they may be considered in the aggregation, i.e. it establishes a higher or lower intensity of preference or distance between valuations.

¹¹ Intersection is interpreted as a ranking of alternatives, from the most to the least suitable.

¹² Indices $\phi+$ and $\phi-$ indicate how much better and how much worse, respectively, a specific alternative is with respect to the others.

Figure 3. Ranking of alternatives. Indices ϕ_+ and ϕ_- and their intersection.



Note: Alternatives are as follows: A: A1. Business as usual; B: A2. Natural reserve; C: A3. Open farm; D: A5. Mega-prison.

General results indicate that alternative A3 would substantially improve the capabilities of the local population in accordance with the provision of ES which the Keelbeek would have. Always under the principle of strong sustainability, A3 generates the greatest well-being in the local population, derived from its positive impact on the capabilities of the population. In the same way, A1 and A2 do not generate as much well-being, and A5 generates considerably less.

Finally, to check the robustness of the results, a sensitivity analysis was performed. Variations were introduced in the initial parameters to reflect the uncertainty and risk in this complex socio-ecological system. Specifically, the credibility index (α) was modified, following previous research (Cavallaro & Ciraolo, 2005; Benetto et al., 2008; Shmelev & Rodríguez-Labajos, 2009). But the minimum operator remained invariable, given that our theoretical framework of reference stands up for strong sustainability (Pelenc & Ballet, 2015). Upon introducing the variations, the results did not vary (A3 always ranking first and A5 ranking last), so the obtained results are robust (Table 9).

Table 9. Sensitivity analysis. Combinations of minimum operator and α .

	$\alpha = 0.1$	$\alpha = 0.3$	$\alpha = 0.4$	$\alpha = 0.5$	$\alpha = 0.7$	$\alpha = 0.9$
Minimum operator	A3 A1 A2 A5	A3 A1 A2 A5	A3 A1 A2 A5	A3 A1 A2 A5	A3 A1 A2 A5	A3 A1 A2 A5

The ranking of alternatives derived from the IM undertaken by the president of the Inhabitant Committee (see Table 3) also suggests that the most suitable alternative is A3 and that A5 is the least¹³. So this corroborates the robustness of the results.

4.2. Results of the social evaluation

As mentioned, the EM reflects the positioning of the social actors with regards to the evaluation alternatives. This information, along with the analysis carried out through the coalitions dendrogram, serves as a basis for the conflict analysis (Munda, 1995). In our case the EM includes the assessments of the 10 groups of social actors for the four evaluated alternatives (Table 10).

¹³ Information regarding this analysis can be provided upon request.

Table 10. Equity Matrix.

SOCIAL ACTORS	ALTERNATIVES			
	A1. Business as usual	A2. Natural reserve	A3. Open farm	A5. Mega-prison
Syndicate of Magistrates (G1)	More or less bad	Extremely good	Extremely good	Extremely bad
SAC (G2)	More or less good	More or less good	Very good	Extremely bad
Respire (G3)	Extremely good	Extremely good	Very good	Extremely bad
IEB (G4)	Extremely good	More or less bad	Good	Extremely bad
RESAP (G5)	Good	More or less good	Extremely good	Extremely bad
Inhabitant Committee (G6)	Good	Good	Very good	Extremely bad
Occupiers (G7)	Extremely good	More or less good	Very good	Extremely bad
Activists (G8)	Neither good nor bad	Good	Good	Extremely bad
Lawyers for democracy (G9)	Neither good nor bad	Neither good nor bad	Very good	Extremely bad
Prison observatory (G10)	Neither good nor bad	Neither good nor bad	Neither good nor bad	Extremely bad

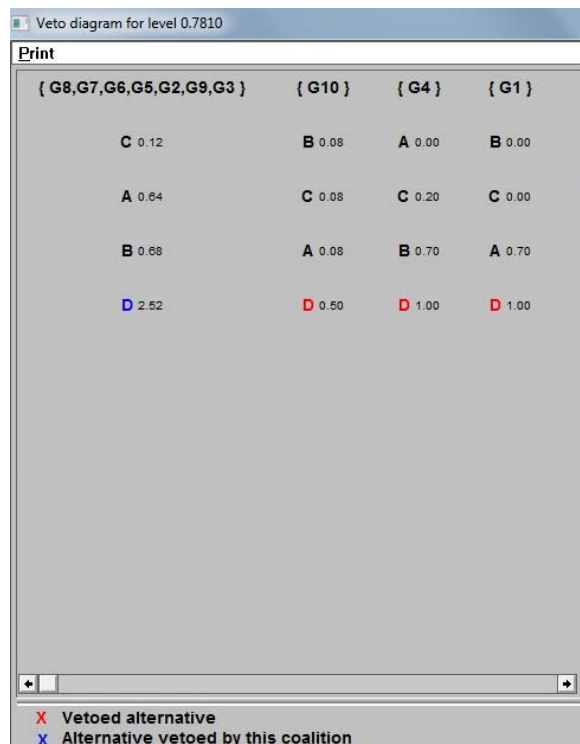
Note: Valuation is based on social actors' view according to a scale from 1 to 9, as follows: 1, extremely bad; 2, very bad; 3, bad; 4, more or less bad; 5, neither good nor bad; 6, more or less good; 7, good; 8, very good; 9, extremely good.

Note: Average value has been introduced in the following groups of social actors: Respire, Inhabitant Committee, Occupiers, Activists.

The coalitions dendrogram (per the NAIADE) has been calculated for a similarity index of 0.7810, which is considered to be adequate according to other case studies¹⁴. The preferences of the actors or their coalitions with respect to the evaluated alternatives are shown in Figure 4. The results of this social evaluation indicate that a main coalition of actors (Secular Action Center, Respire, RESAP, committee of local residents, occupants, activists, and lawyers for democracy) prefer alternative A3, selecting A1 as the next best option and vetoing A5. On the other hand, actors such as the prison observatory and the syndicate of magistrates prefer option A2, whereas the IEB prefers A1. However, these three actors coincide in that their second most preferred option is A3 and their least desired alternative is A5.

¹⁴ For conflict analysis, various empirical studies situate an acceptable degree of similarity at 0.70 (Gamboa and Munda, 2007; Garmendia et al., 2010; Etxano et al., 2015).

Figure 4. Coalition of actors with a similarity index of 0.7810.



Note: Social actors are as follows: G1: Syndicate of Magistrates; G2: SAC; G3: Respire; G4: IEB, G5: RESAP; G6: Inhabitant Committee; G7: Occupiers; G8: Activists; G9: Lawyers for democracy; G10: Prison observatory.
 Note: Alternatives are as follows: A: A1. Business as usual; B: A2. Natural reserve; C: A3. Open farm; D: A5. Mega-prison.

This analysis can be summarized as follows. A3 is the most desired alternative given that it is the first option of the main coalition and the second option for the other three actors. A1 and A2 vie for second place: A1 is the second choice of the main coalition and the first of the IEB, whereas A2 is the most preferred for the prison observatory and the syndicate of magistrates, but it is the third choice for the main coalition. A5 is vetoed by the main coalition and is the least desired choice of the rest of the social actors.

These results aligned with those obtained from the previous analysis of the initial EM. Therefore the results from the social evaluation corroborate the results of the technical analysis (A3 and A5 as most and least desired) and from the initial analysis of the EM. In conclusion, the conflict between the social actors is less salient than the opposition of all actors to A5.

5. Discussion and conclusions

This case study has followed the theoretical framework defined by Pelenc and Ballet (2015). It corroborates the importance of ES for the planning and well-being of the urban areas (Gómez-Bagghetun & Barton, 2013), according to the specificities of the ES provided by the land uses of the Keelbeek, and to the local population as direct beneficiaries and the surroundings (Brussels) as indirect beneficiaries. Additionally, as proposals for (re-)making the place are pursued by social actors, it can also be understood as a case in which urban environmental justice is redirected towards better health and environment for local communities (Anguelovski, 2013). But more importantly, we have tried to operationalize the fact that thresholds of CNC are above all socially defined. As a reminder, at first glance the Haren inhabitants would have accepted a regular-size prison on an already urbanized site, so they were not against the prison in itself; there was no NIMBY attitude. They always articulated the fight against the destruction of the Keelbeek land to the imprisonment issue, and they proposed alternative scenarios.

The process and steps taken in this study attempted to advance on the operationalization of a theoretical framework to experimental use. According to a framework in which multi-criteria decision analysis (MCDA) is a valuable tool for an integrated valuation of ES and land planning (Langemeyer et al., 2016; Saarikoski et al., 2016), in our study the most significant aspect is most likely the means of reaching the impact assessments and steps taken in the creation of the ES-Cap matrix. As an exploratory line of work, however, this study demands greater investigation in the future. Yet there are reasons that strengthen our choice of method. First, this ES-Cap matrix reflects a way of evaluating the contribution of the ES to well-being through a social assessment, in addition to an ecological or economic one. For example, in the future it would be interesting to complete our evaluation with an ecological analysis of ES. From this point of view, it may serve as an example for subsequent proposals of integral assessment that combine different dimensions. On the other hand, the IM created by the researchers has been examined through an assessment by the president of the Inhabitant Committee, further validating the results.

Contrary to sustainable development, which puts forward the notion of trade-off between the different dimensions (social, ecological, economic), in a perspective of socio-ecological transition, this study aimed to advance a conception of sustainability characterized as

different ES synergetically fulfilling different human needs. According to Couvet et al. (2016: 152): “we are talking about trade-offs between ecosystem services if an improvement of service A can only be achieved by reducing service B. On the other hand, we are talking about synergy between services when two services are improved simultaneously”. According to these authors, the approach in terms of trade-off leads to a separation of functions in space (for example food production and conservation), while the approach in terms of synergy leads to their interweaving (of which agroecology is a good example). In this regard, Martínez-Sastre et al. (2017) deals with trade-offs and synergies of ES and reveal that a synergetic alternative may be well-ranked both biophysically and socially. Additionally, as far as human needs are concerned, according to Max-Neef (1991), synergetic satisfactions are those which, by aiming at the satisfaction of a particular need, simultaneously stimulate and contribute to the satisfaction of other needs. Max-Neef explains that it is a question of moving from the logic of efficiency to that of synergy. Indeed, the logic of efficiency in general leads to the maximization of one single dimension of well-being to the detriment of others.

Second, this case study is based on a conceptual framework that clearly orients the evaluation towards human well-being and creates a synergy between ES and capabilities. Thus, *a priori*, the synergetic alternatives are more adequate as compared to the non-synergetic ones. Despite the consideration of disparate alternatives, those having synergetic features prevail over the rest. However, this is still a good case of exemplification, where diverse alternatives compete with one another. And, above all, the most relevant is likely to be the assumption of these synergetic features, given that it is an attempt to advance in a new way of thinking about land planning, more directed towards the search for synergy than based on functional distributions of land. So this study reflects an attempt to surpass the compensatory paradigm in which a discussion about strong and weak sustainability is encompassed, and to move towards a synergetic search instead of a compensatory one. In fact, one of the work streams to be expanded upon is the creation of a detailed map as a synergetic scenario and territorial embodiment of the theoretical framework of reference.

Finally, this case study suggests that innovation has taken place in the SMCE process. The use of an initial EM, as part of the participative process, to attempt to reach a series of core alternatives, based on a higher number of alternatives valued at the onset, fits well with the philosophy and operative framework of SMCE. We are aware that this element may have

influenced the result of the technical evaluation by reducing the number of alternatives evaluated. However, we consider in this case that the *problematic envisaging* (Roy, 2005) prevails over the technical results, as decision aiding and MCDA in particular must not be envisaged solely in the perspective of solving a problem of choice, but as a process in which social actors co-participate. Therefore, the initial EM really contributed to the decision aiding in helping to scrutinize the evaluation alternatives.

On the other hand, methodological challenges have also arisen. In the creation of the ES-Cap matrix, the impossibility of assessing the impact of the regulation ES on the capabilities in several cases (leading to numerous “n/a” in the matrices; Tables 5 to 8), is a limitation of our study. This being said, and given the apparently limited relationship between the regulation ES and their impact on the capabilities, new research and alternative ways of evaluating should be considered.

As for the evaluation of the alternatives, the results reveal that A3, Open farm was the most suitable alternative, while A5, Mega-prison the least suitable one. These results were corroborated by the social evaluation, whereby A3 was the most widely accepted alternative and A5 was rejected by the majority of the social actors. These results suggest the utility of urban planning alternatives that are based on land use that is devoted in larger part to the provision of ES, discarding the mega-prison project. A3 would therefore substantially improve the capabilities of the local population, while also receiving the approval of most of the relevant social actors. The generalized rejection of the mega-prison is interpreted in terms of opposition shown by the mobilization against it. This resistance movement also contributed to establish the social CNC, as social actors did not allow trespass the “critical” level of natural capital during the mobilization period against the mega-prison.

This study, in short, should serve to assess the existing alternatives to the construction of the mega-prison. Our analysis has served to channel the demands and claims of the local population and to assess them in a pre-defined way. It articulates the empowerment of social actors, and exemplifies the existence of real alternatives created from the bottom-up. On the contrary, the authoritarianism of the institutions promoting the mega-prison, with a top-down view, is far from a dialogue attitude. So the unbalanced power relations between the two political parties prevents a well-founded real debate where options are confronted. Therefore, unless a true democratic and public debate is not established, it will be difficult for

alternative proposals such as those outlined in this study to come to be considered. However, this does not rule out the goodness of these proposals based on values of democracy, well-being and sustainability, insofar as such values should prevail over others.

We conclude on a methodological and theoretical remark; if the tools we used (namely the SMCE, and Pelenc and Ballet's framework) have been forged in the realm of deliberative democracy, we have used them in this study rather in a radical democracy perspective, i.e. in order to try to empower a resistance movement thus taking a side in the conflict. Consequently, we have not included all the stakeholders (the promoters were not included) in order to "compensate" power imbalances. In addition, this action-oriented goal has raised some ethical questions regarding the role of the researcher in relation to social movement and the need to adopt a humble attitude regarding how research can (or cannot) inform social movements.

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Appendix. Detailed arguments against the mega-prison

The resistance movement offered many arguments against the mega-prison project, ranging from cost and size to a radical critique of imprisonment policy. Perhaps one of the most powerful arguments brought by the mobilization is the fact that mega-prisons (about 1,200 prisoners in this case) and prisons in general have demonstrated failure. The militants explain that imprisonment is relatively inefficient compared to rehabilitation and prevention to reduce criminality. So the main argument of the federal government to justify the project—Belgium needs more prisons to end prison overpopulation—is a fallacious one. Indeed, studies have demonstrated that the more you build prisons, the more you crowd them¹⁵. Belgium is currently renting prison cells in the Netherlands, where prisons are underpopulated because of prevention and rehabilitation policies. “The Netherlands are literally closing their prisons while we are building new ones”, a member of the resistance explained. More radically, a certain part of the mobilization argues that imprisonment in itself, and all associated procedures, should be abolished, as well as the justice system that protects the rich and imprisons the poor. Indeed, on average, prisoners are less educated and poorer than the average population. Another line of argument is geared towards denunciation of the privatization and industrialization of the prison system, which was previously a “public service”. Indeed, the construction and the management of the mega-prison will be operated through a public–private partnership with an international private consortium. The cost of the construction and management is estimated to be €3 billion over 25 years. This cost is estimated to be higher than if the project were funded and operated by public bodies. This will have a serious impact on the budget of the ministry of justice in a period of austerity. It is €3 billion for bricks and mortar and nothing for prevention/rehabilitation of prisoners. The most shocking aspect is the fact that imprisonment is becoming a business¹⁶, i.e. private companies will make money from the process. Moreover, there is also suspicion of corruption regarding public procurement procedures, and the “*La regie des batiments* (federal real estate agency)” has already been accused of corruption in recent years. The resistance movement has also urged the government to prioritize the renovation of existing prisons rather than building a new one

¹⁵ For further details see <http://inegalites.be/Toujours-plus-de-prisons-toujours> [last visit on December 3, 2019].

¹⁶ Though it will be the first mega-prison in Belgium to be built and operated through a public–private partnership, privately operated prisons have long been in existence in the USA.

and to study alternative imprisonment facilities like small houses of detention inserted in the social fabric. Last but not least, the displacement of the Brussels prison from the city centre to a peripheral zone is criticized. Indeed, Haren is far from the city centre and far from the Brussels court. Consequently, compared to the location of existing prisons, access for prisoners' families and lawyers and for magistrates will be much more complicated, rendering the daily functioning of justice to be more difficult. The Keelbeek site is located near the Brussels international airport, meaning that the level of noise will be very painful for the prisoners (above World Health Organization recommendations). Finally, the mobilization has shown some evidence that the transfer of the prison to Haren would be part of a gentrification process whereby existing prisons in the city centre would be transformed into fancy apartments, hotels, and services.