

## **Appendix 1: description of case studies**

### **CASE STUDY 1 – The contribution of agroecological farming systems to the delivery of ecosystem services**

#### *Context*

In the western part of the Hainaut Province in Belgium, a dynamic network of farmers is applying innovative agroecological practices with the purpose to reach more resilience and autonomy. While it is often attested in literature that agroecological farming practices offer greater opportunities for ES delivery, this fact is seldom quantified (e.g. Kremen et al. 2012).

#### *Objective an scope of the project*

A research project of Gembloux Agro-Bio Tech entitled ‘FarmsForFuture’ focuses on these real-life examples of ‘agroecologization’ and aims at quantifying the contribution of agroecological systems to the delivery of multiple ES.

#### *The rationale for a participatory approach*

As the research is restricted to a small locality, applying scientific lists ES may prove to be poorly relevant. Indeed, some ES, though relevant to agriculture in theory, may not be relevant for the selected farms according to the field characteristics or the values stakeholders attribute to them (Altieri 1999, Lyon et al. 2011, Plieninger et al. 2015). Hence, a local actors’ consultation was intended to help prioritize relevant ES for local conditions and for local actors.

#### *The process of the participatory exercise*

To carry out this participatory selection, participants were first asked to identify ES provided within their locality. From there, participants modified the list of pre-identified ES by scientists. Next, participants ranked the five most important (from 1 to 5) ES based on the final list. The ranking methodology was inspired from the ‘face-to-face Delphi’ approach in which participants are given an opportunity to re-evaluate their original positions based upon discussions about each other’s response (Linstone and Turoff 2002). Hence, after a first round of ranking, results were shared to the group and discussed. Participants could at last adjust their initial ranks.

#### *Outcomes of application*

The results of the ES identification and selection participatory exercise helped to focus the ES assessment towards ES relevant for the studied area and stakeholders. The participatory ES identification added two ‘ES’ to the ES pre-identified by scientists and attributed importance to other ES than those mainly studied in scientific literature.

## **CASE STUDY 2 – Optimizing ES delivery through land consolidation**

### *Context*

The new ‘Walloon Code of Agriculture’ requires that land-consolidation plans consider the multifunctionality of rural landscapes. The Walloon administration called for a research project to define a methodology for impact assessment of land-consolidation plans based on an integrated ES assessment.

### *Objective and scope of the project*

The project objective is to design a replicable methodology based on hands-on experience in a case study, located in Forville, Belgium. The methodology includes an expert-based assessment of ES supply (ES mapping and quantification) and a social ES valuation (stakeholder mapping, participatory ES selection, participatory validation of the expert-based mapped ES and participatory mapping of ES demand).

### *Rationale for a participatory approach*

While classical impact assessment studies merely inform local stakeholders on their results, this case study moved from informing to *involving* stakeholders in developing land consolidation plans. The participatory approach was meant to raise awareness on the issues at stake, increase a sense of ownership and legitimacy of the project’s results in the eyes of the involved stakeholders, and for the research team who co-designed and implemented the collectively approved management options.

### *The process of the participatory exercise*

To familiarize the participants with the ES notion, they were asked to individually draft a list of 10 ES, that were then briefly discussed in plenary. Subsequently, a locally adjusted CICES classification was presented to the group. Participants had the opportunity to suggest amendments to this locally adapted CICES list. Based on this list, participants individually ranked the five most important ES from 1 to 5. Afterwards, results were discussed in small sub-groups so everyone could raise concerns. One person per sub-group then shared the results in plenary.

### *Outcomes of application*

The plenary discussion that followed led to consent on 5 ES groups, which is the final result of the participatory exercise. Only these ES were to be quantified further in the study.

## **CASE STUDY 3 – development of an inclusive vision for multifunctional landscape in a rural river valley**

### *Context*

The Maarkebeek is a rural river valley in the hilly region in the province of East Flanders. Low river valleys are generally used as forest and pastures, fertile hilltops are typically open cropland and villages are on the slopes. Increasing inhabitation and agriculture, combined with modifications of the streams during the last centuries, have increased flooding events and

cropland erosion. Combined with increasing drought and rainfall events, climate adaptation measures are being planned in the valley.

#### *Objective and scope of the project*

The objective was to inventory the diverse values and uses of the valley, their relative importance to diverse stakeholders and interest groups, as well as potential synergies and trade-offs originating from differences in assigned values. This provided input to the detailed description for a public tender calling for a full-fledged participatory vision development and detailed design of a series of infrastructures.

#### *Rationale for a participatory approach*

As the climate adaptation measures (e.g. water storage infrastructures, erosion regulations) have direct implications on the landscape and different stakeholders (farmers, inhabitants, housing), a full overview of the issues at stake is a requirement for such a vision to be legitimate and credible. Without such credibility and legitimacy, a development vision will not be accepted and foreseen infrastructure works risk to be faced with legal, political and physical obstruction at the local scale.

#### *The process of the participatory exercise*

Based on a series of interviews, and an open citizens workshop with participatory mapping and open questions, a first list of ecosystem services was identified. This list was amended and validated in a focus group with (representatives of) all relevant stakeholders and experts from multiple disciplines involved. Consequently, an individual valuation score, a group valuation score and a trade-off analysis was conducted in this focus group.

#### *Outcomes of application*

The result of this valuation has informed the project development of the participatory planning and vision project. In close cooperation with the planning consultant and the stakeholders, the technical designs and vision for the valley are being evaluated with the ecosystem services and relative values as a benchmark, allowing for adaptive design or mitigating actions.

## **CASE STUDY 4 – Multi-stakeholder vision development for a mixed landscape with high natural values**

#### *Context*

‘De Wijers’ covers 20.000 ha and is spread out over 7 municipalities in north-east Belgium. The most dominant land-uses are fish ponds, marshes, forests, heathland, grassland, residential areas and industry. The area has a big potential in terms of biodiversity, tourism, residential living, and business; but due to fragmented initiatives in the past, this potential was not fully utilized.

#### *Objective and scope of the project*

Therefore, the Provincial Government asked the Flemish Land Agency (VLM) to develop – together with all relevant stakeholders - a coherent and supported vision.

### *Rationale for a participatory approach*

VLM (referred to as project coordinators hereunder) adopted an ES approach as a guiding framework to develop a vision for several reasons: it was felt that ES stimulate positive thinking, it was expected to enable multi-sectoral thinking, and it was considered as a suitable vehicle to achieve resilient and multi-functional landscapes. The main strategy to build a broadly-supported vision was a series of interactive participatory exercises. In total 200 people participated (mainly project partners, government agencies and NGO's). INBO was asked to support this process by providing conceptual guidance on ES and to assist in the process design.

### *The process of the participatory exercise*

The participatory exercise was organized under the following steps: 1) Elicitation about the importance of De Wijers for the each participants, 2) based on this input, relevant ecosystems were identified by the project coordinators 3) the ES list of step 2 was compared with the CICES-Be classification (Turkelboom et al. 2014) to identify possible missing ES (by the researchers), 4) the resulting draft ES list was checked and improved with the input of project coordinators and later by the participants (during the workshop), 5) participants scored the desirability of each ES for the future (2030) for 4 different ecosystems, 6) individual scores were summarized and used as a basis for small-group discussions (esp. to find the reasons for divergent opinions), 7) a general hierarchy of ES per ecosystem was agreed upon in small groups, 8) in a second round, the hierarchy of ES per ecosystem was validated by interested participants of other groups. In a next participatory exercise, spatial plans were made based on win-win suggestions suggested by the participants.

### *Outcomes of application*

Environmental, tourism and fishery sector were well represented among participants, whereas it was much more difficult to mobilise representatives from industry, agriculture and the social sector. From the participatory exercise, a set of priority ES for the 4 major ecosystems of De Wijers was identified together with the rationale for each of these ES. The participatory exercise stimulated social learning among partners, increased understanding for other positions, enabled networking, and contributed to higher trust between stakeholders.

## **CASE STUDY 5 - Exploring ES in the green-blue artery of the Stiemerbeek Valley**

### *Context*

The valley of the river Stiemerbeek, in the city centre of the city of Genk, can help to reach the sustainable aim of the city council by interweaving green zones with built-up areas. The Stiemerbeek has the potential to be developed as a strong green-blue artery with a soft recreational network, which can provide links between the various strategic sites of the town and to increase the recreational and life-quality of Genk.

### *Objectives and scope of the project*

The municipal environmental service of Genk had 4 overall goals in mind at the start of the project: (1) to search for common ground for the project in general amongst multiple sectoral administrations in Genk (e.g. spatial planning, sustainable development and environment, urban green management, social issues, sport, tourism and cultural issues, mobility, etc.); (2) to get support for the development of a shared vision for the further development of the Stiemerbeek-valley; (3) to get more concrete ES-related input (that needed to be integrated in the project definition of the “Open Call”-procedure that was initiated by the Flemish Government Architect); and (4) to start up capacity-building (in terms of increasing local knowledge regarding ES). In a first stage, these 4 goals needed to be dealt with mainly at the level of the city administrations, together with some of the major stakeholders involved, thereby hoping to establish a stronger interdisciplinary approach. In upcoming months, also the local citizens will become actively involved (during the further implementation of the next steps of the Open Call).

### *Rationale for a participatory approach*

An ES approach was used as a guiding framework to underpin the development of a shared vision for a multi-functional river valley. In order to take into account the different needs and specific sectoral goals of the involved city administrations and other organizations, while at the same time stimulating stakeholders to think about the valley in an interdisciplinary way (which was also the overarching goal for the environmental administration of the city that initiated this initiative), a participatory approach was embedded in the process.

### *The process of the participatory exercise*

In order to identify the most relevant ES for further discussion, a bicycle trip was organized through the valley. City administrations were invited to take part in the field trip, together with some other major stakeholders (for example NGO's as external partners in nature development). Throughout the bicycle tour, various participants were asked to explain the challenges faced or to talk about sub-projects at different halting-places. These short intermezzos were recorded and were analyzed later on by two researchers in order to identify a first list of ES. Three weeks later, a second participatory exercise was organized to prioritize these ES (with mainly the same participants). This was done in two steps. First, an individual scoring exercise took place. Based on these results, there was a second scoring exercise in small discussion groups (especially focusing the debate on those ES that had the highest variance in the individual scoring round). During this second phase, participants were also asked for their arguments. Based on these discussions and scores, the most relevant building blocks for vision-building were defined.

### *Outcomes of application*

Most of the participants indicated that, due to both the field trip and the workshop, they became more familiar with the project area and the challenges for other stakeholders involved and that they gained insight in the multi-functionality of the river valley in particular or in other relevant topic case studies. All participants also found it important to stay actively

involved in the further development of a shared vision for this project area. The results of the consultation were appended to the Open Call for the design and realization of a Green- Blue Public Park in Genk (organized in April 2015 by the Flemish Government Architect).