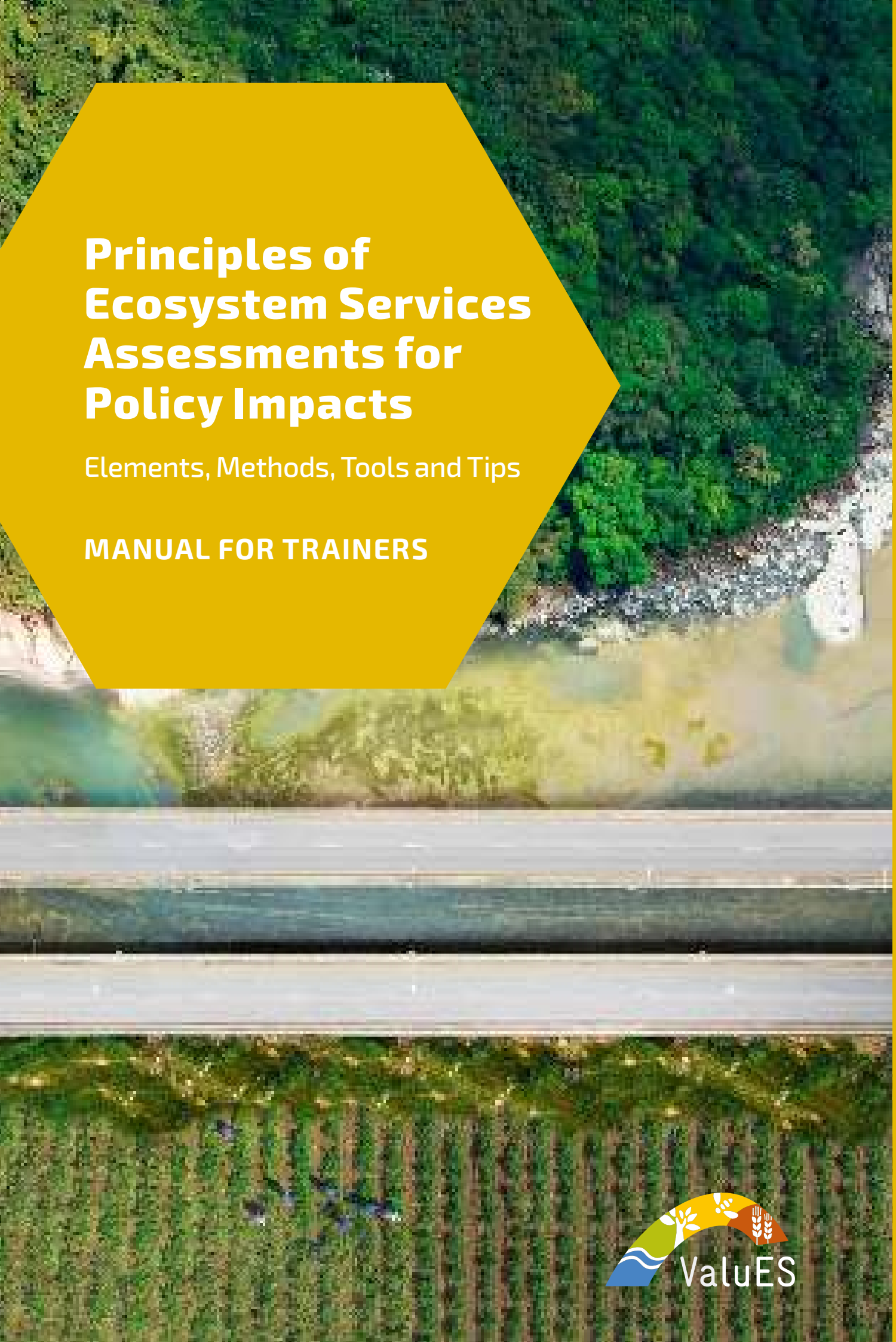

Principles of Ecosystem Services Assessments for Policy Impacts

Elements, Methods, Tools and Tips

MANUAL FOR TRAINERS

ValuES

PRINCIPLES of Ecosystem Services Assessments for Policy Impacts.

ValuES

Development and the well-being of human societies are invariably linked to ecosystems and the services they provide. By recognizing the correlation between development and ecosystem services, development practitioners will have identified an important success factor for development planning. Ecosystem service assessments are useful for identifying key ecosystem services and determining the state of ecosystems now and in the future. Such assessments allow policy makers to make better-informed decisions and to devise management and policy strategies for addressing development and environmental issues. Ecosystem management to sustain the flow of ecosystem services can provide immediate economic benefits and can strengthen the resilience of nature and society, especially in the face of climate change.

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IMPRINT

As a federally owned enterprise, GIZ supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

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On behalf of the BMU and as part of IKI, the project "ValuES: Integrating ecosystem services into policy, planning and practice" is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in close collaboration with the Helmholtz Centre for Environmental Research (UFZ) and the Conservation Strategy Fund (CSF).

Since 2012 the project provides practitioners and decision makers in partner countries with the skills to select and effectively use methods and instruments to identify, prioritize, assess, value and integrate ecosystem services into national and local policies and strategies. Additionally, since 2015 ValuES has been supporting the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) on its concept of multiple values of nature and benefits, on the catalogue of policy support tools and methodologies, and on its capacity building programme.

www.aboutvalues.net

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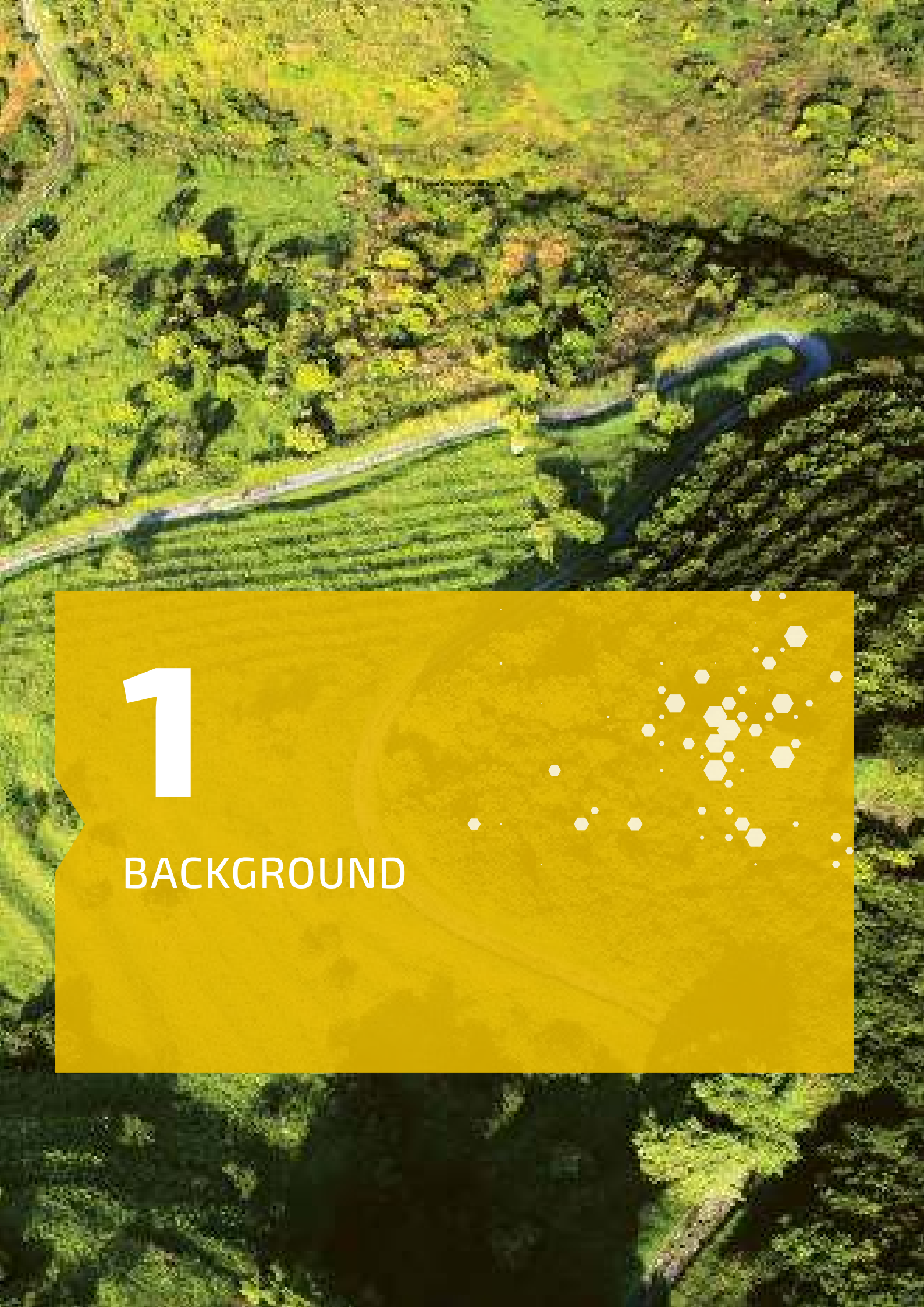


1

BACKGROUND

1.1 INTRODUCTION

Since the completion of the Millennium Ecosystem Assessment (2005) and the communication of commitments within the *Convention on Biological Diversity* (CBD) Strategic Plan 2011-2020 and its Aichi Biodiversity targets, practitioners working in the fields of biodiversity and environmental management, as well as policymakers, are frequently confronted with a set of multifaceted challenges related with the identification, assessment, valuation, integration and reporting of *ecosystem services* (ES) within different management contexts and sectoral strategies. By recognizing the links between ES and human well-being, development and economic activities can become more environmentally sustainable. The primary goal of *ecosystem services assessments and valuation* (ESAVs) is to understand these relations and communicate the importance of ecosystem services to relevant stakeholders.

ESAVs provide the ability to identify, assess, value and describe the benefits of ecosystem services. The results can help decision-makers to better understand how their actions depend on and might change the natural environment and provide the necessary information to consider potential trade-offs among different options and needs from different stakeholders. Ultimately, ESAVs enable decision-makers to choose policies that contribute to the maintenance, restoration and sustainable use of ecosystems. *The Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) developed a guide for development planners and policymakers on the topic of integrating ecosystem services into development planning. This guide advocates a stepwise approach *(Six-Step Approach, www.aboutvalues.net/six-steps)* through which it is possible to recognize, demonstrate and capture the value of biodiversity and ecosystem services for development planning. Based on this approach, the GIZ developed a manual and a training course that is titled *Integrating Ecosystem Services into Development Planning* (IES), which aims at building capacities for the application of the IES six-step approach in development planning. As more and more countries implement the IES approach, demand is rising for a better understanding of basic concepts, methods and tools — specifically for conducting ESAVs and integrating their results into decision-making.

The training course *Principles of Ecosystem Services Assessments for Policy Impacts*, covered in this manual, builds on concepts that were introduced in the IES manual and training. The current training delves deeper into the ways in which ESAVs can be tailored to achieve greater policy impacts. Specifically, the training focuses on the appropriate conception and design of ESAVs by providing hands-on tools to tailor policy and research questions, perform initial scoping, identify suitable assessment and valuation methods, design ES indicators and communicate effectively with stakeholders and target audiences. Additionally, this training course seeks to support the work of the *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (IPBES) by providing insights into policy oriented assessment endeavors.

1.2 THE IDEA

The assessment and valuation of ecosystem services are both considered critical steps for increasing awareness and delivering evidence-based arguments in favor of protecting the environment. Oftentimes, however, the results of ESAVs are not adequately taken into consideration when management strategies or policy options are being discussed. This training aims to increase the utility of ESAVs by building capacities to support assessment and valuation processes that are relevant, legitimate and purpose-oriented.

1.3 SPECIFIC TRAINING OBJECTIVES

1. Understand the main characteristics of ecosystem services, including spatial and temporal dynamics, aspects of joint production, connectivity, impacts, dependencies and trade-offs.
2. Learn how to design, conduct and use the results of ESAVs and become familiar with some important challenges that may arise at different stages.
3. Get an overview of international ESAV processes and products in the Framework of IPBES and the Strategic Plan 2011-2020 of the CBD.
4. Learn about basic principles and elements for the construction of ES indicators and for ecosystem services mapping.
5. Reflect on how ESAVs could be integrated into a policy-advisory process and explore how different methods are related to specific decision-making situations and policy contexts.
6. Review crucial elements for effectively communicating the importance of ES and the results of ESAVs.
7. Acquire skills for influencing decision-making and policy.

1.4 CONTENT

1. Introduction to basic ecosystem services concepts (spatial and temporal dynamics, aspects of rivalry and excludability, joint production, connectivity, dependencies, impacts and trade-offs).
2. Overview of some basics elements and properties of ESAVs (steps, analysis, use and application of results).
3. Crucial elements for understanding and framing policy issues.
4. Discussion on main elements for designing and conducting ESAVs: identification of entry points, determination of policy and research questions, establishment of purpose and adequate design to integrate the ESAV into the policy framework.
5. Basic elements and principles of ecosystem services indicators.
6. Basic elements and principles of ecosystem services mapping.
7. Overview of different ecosystem services assessment methods, tools and case studies.
8. Identification and discussion of some ecosystem services assessment methods and tools specifically tailored for policy purposes.
9. Elements for effectively communicating the importance of ES and the results of ESAVs and acquiring skills for influencing decision-making and policy.

1.5 METHODOLOGY

The training is composed of input lectures, interactive group exercises and reflections in plenary discussions. The exercises are based on the Harvard Case Methodology, which conveys teaching messages mainly through interactive practical work by participants. The training exercises are based in the province of Exportul in the fictitious country of Bakul, which is designed to mirror conditions and challenges that can be found in many real scenarios.

All modules follow a similar sequence, including the following crucial elements:

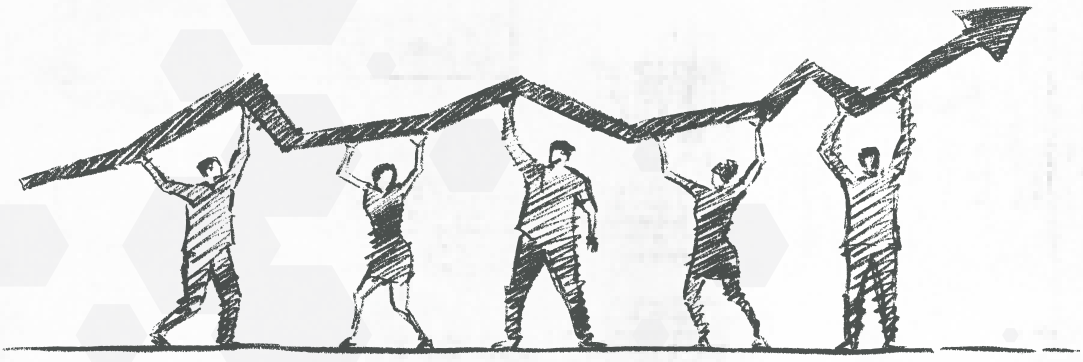
1. The *introduction to the module*, given by the trainer with the help of a power-point presentation or other visual aids, covers the *theoretical background* of the module and introduces participants to the case work and the exercises.
2. The *exercises* give participants the opportunity to work through different aspects highlighted in the theoretical background. During the exercises, participants typically work in groups and adopt the role of 'case work experts' or involved stakeholders in charge of a specific task.
3. In the *presentation of results*, work groups present their findings to the plenary. Trainers ask probing questions and can offer alternatives and corrections when necessary.
4. During the *reflection*, participants reassume their own real-life position. They reflect on their experiences during the exercise and link them to their own work and context.

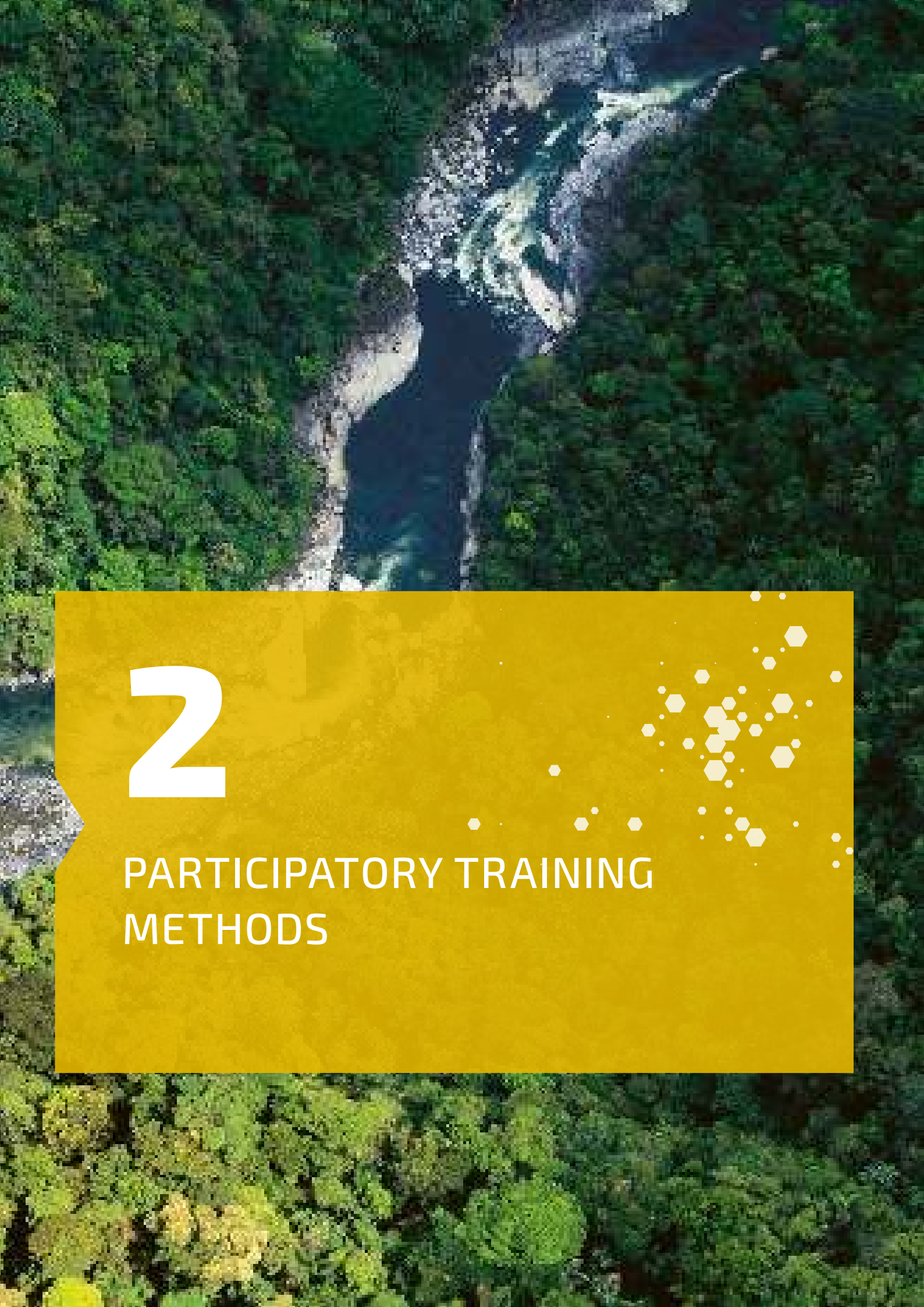
1.6 PARTICIPANTS

- Technical staff from GIZ projects and programmes.
- National and local government planners, policy-makers and decision-makers from both *conservation* and *development* sectors.
- Researchers and academics from universities and research institutes.
- Practitioners from the field of environment and development with some experience with ecosystem services.
- A maximum number of 20 to 25 participants is recommended for each training.

1.7 DURATION OF TRAINING COURSE

The training can last from two to five days. The longer the training, the more topics can be covered.





2

PARTICIPATORY TRAINING METHODS

2.1 GENERAL TIPS AND HINTS FOR INTERACTIVE TRAININGS

The responsibility to deliver a successful training course falls in large-part on the trainer. Trainers' tasks are manifold and participants generally expect them to guide them through the course, be clear when giving instructions and concise when delivering inputs. Trainers need to ensure that discussions are balanced, while maintaining the attention and interest of all of the participants. **The trainer's energy and attitude can set the tone for the whole group.** Many training styles exist, and no one type is better than another. Here are some tips and tricks for succeeding as trainer:

- As a trainer, attempt to talk only when necessary. Apply the **10:60:30 time rule:** 10% of time spent with theoretical inputs, 60% of active interaction / case work / working groups, and 30% devoted to discussion, reflection, conclusion and transfer to participants' reality.
- **Mobilize participants' creative energy and knowledge,** and allow for active interaction of all participants. Take your adult participants seriously. Nobody knows everything (including yourself), but everybody knows something. Participants usually have relevant experience and want to share their views with others.
- **Facilitate** the exchange of information and problem-solving **by means of dialogue** between you and the participants, and among the participants themselves. Adults can learn well - and much - from dialogue with peers. Do not force your view onto the participants.
- **Motivate by means of questions** that stimulate curiosity and exploration. Formulate questions for group work carefully and precisely. If possible, pretest them among the members of the training team.
- **Visualize questions for group work** on a board or flipchart, explain them carefully and ask whether further clarifications are necessary.
- **Set an appropriate level of difficulty/complexity.** The degree of difficulty/complexity should be set high enough to challenge participants but not to frustrate them. The instructions should motivate participation.
- **Listen before you talk** in order to fully grasp the socio-cultural and professional backgrounds, the working situations, and the questions of your participants.
- As often as possible **pass on subject matter or methodological questions** directed at the trainer to the plenary or a resource person. The same applies if the participants call on the trainer to solve a problem.
  He or she may want to refer to the rule of thumb: **If somebody has a problem he/she should take the responsibility to solve it.**
- **Do not argue for your case,** but be self-critical in the use of moderation techniques and in the evaluation of your own roles and responsibilities.
- Always **allocate precise and sufficient time frames for group work** or other tasks, and avoid using breaks for work.
- From time to time, certainly every morning, **provide an overview on where you are in the training programme.** Recall the last topics or last steps in the learning process, and provide a look ahead to the day's programme.
- **Always provide time and space for working groups** to present and discuss their results in plenary. Respect the efforts they have invested. Ask the groups to be concise, encourage them to present their main findings or summarize their results.
- **Mix methods and create a good workshop flow** through proper sequencing. For example, have a phase of intensive group work followed by a plenary session to reflect on the group work. It also means mixing intellectual (cognitive), emotional and physical impulses. A day full of lectures and **always-the-same-style-working-groups** can be painful for both sides. Mix input/lecture, group work, discussion, brain-storming, mind-maps, buzz groups, games, role plays, among other techniques. But keep in mind: **form follows function**, which means that you should first think about the learning objectives and adapt appropriate methods to reach them.
- Use **buzz-groups** to encourage participants to interact with each other, reflect on lessons learnt from a particular session, answer a question or collect ideas. A plenary session can be broken into sub-

groups of 2–4 members – just by moving the chairs – to discuss briefly a particular question. The room soon fills with noise as each sub-group 'buzzes' in discussion. Ask the sub-groups to agree upon two or three highlights and to report back briefly to the plenary.

- **Watch out for group dynamics.** Not everybody feels comfortable with participatory processes. Workshop participants may come from an organisational culture where participatory dynamics are avoided rather than embraced. A potentially participatory process in a working group can be distorted when a dominant person imposes his or her views and attempts to steer discussions. How to intervene in such a situation depends on the trainer's judgment. It is often good to stimulate groups' self-regulation, but there are moments where direct intervention from the trainer may be required.
- **Keep a bin list.** When participants raise issues, which are outside the scope of the current topics or require more time than you have available, jot them down on a **bin** or **unfinished business** list. You may come back to these issues as the training progresses, or you can schedule time to return to these questions at a later moment.
- **Do a review at the end of every training day** or at least in the middle of the training. Schedule time to do a quick review of your process to go through the most important learning highlights and take suggestions for improving the next days (e.g. pose two questions: What was good and helpful today? What should we do differently tomorrow?). Schedule the review for the last ten to fifteen minutes of the day to avoid using too much time.
- Do a **photo-documentation** and hand it out to the participants with the presentations, flipcharts and boards generated by the trainer and the group. At the beginning of the training let them know that you will provide this information, so that they can focus on the discussion rather than taking notes. Naturally, taking notes should not be discouraged as it may be part of the learning process but at least people can have the option not to take notes. Keep track of the many flipcharts and boards generated throughout the training. Take pictures in every break, at least at the end of every training day.
- **Be flexible and open for positive surprises.** Trainers have a leading role regarding the steering of the workshop process. But they should observe carefully if their assumptions regarding the application of a certain method, as part of a certain sequence of working steps, are right. If the assumptions on the work plan do not generate the desired results, trainers should be flexible enough to adapt and change plans. Being flexible also means throwing the ball back to the participants in order to reflect on the best way forward together.
- If possible, **work in a team of trainers.** Trainers have different personal characteristics, which are perceived, accepted and appreciated differently by participants. Being a trainer is very demanding and intensive. It requires phases of rest and reflection. While one trainer guides the group process, the other may reflect on the program details or the group dynamics and prepare the next steps. Trainers need feedback on performance. Often, new materials are needed, cards have to be distributed or collected, discussion items need to be written down or several working groups be supervised. If you cannot have a co-trainer, insist on having at least an event assistant who supports you throughout the entire training.

2.2 METHOD TYPES AND USES

There are many different methods for delivering participatory training courses. Below is a list of some of the most common methods and tools. Successful participatory training courses typically draw upon a combination of various methods.

METHOD	KEY CHARACTERISTICS AND USE
Group work	• Consists of small groups receiving a specific task or problem that they need to solve or accomplish. • Highly participatory; all group members share knowledge and delve into the subject matter in greater depth. Advisable to let group members assume different roles during group work (moderator, time-keeper and presenter) to ensure a smooth process. • Useful for drawing out participants' knowledge on certain topics and to promote interactive exchange.
Expert lecture	• Consists of a traditional classroom-type lecture where audience assumes a passive role and listens to presenter. • Top-down technique, useful for leveling the knowledge base among participants and delivering information that may not be well-known among participants. • Can be made interactive by asking questions or inviting participants to pose own questions.
Guided discussion	• Consists of a debate or dialogue guided by questions from the facilitator that are answered by the audience. • Typically, at least one question is developed for each specific learning objective. • Useful for drawing on the knowledge of the audience and for exploring new subjects.
Role play	• Consists of single participants or small groups assuming a given role and then interacting with other *actors* in a given, pre-defined fictitious setting. • Enables participants to become aware/be sensitized of actorś different positions and interests in discussions or negotiations. • Useful for learning to generate arguments and defend positions during discussions.
Brainstorming	• Consists of a relatively unstructured collection of ideas and insights on given topics. • A facilitator moderates the discussion and writes down participants' inputs. • Useful for gaining new insights and viewpoints that can then be used to deepen discussions/reflections.
Case study	• Consists of participants applying learned content and insights to solve problems based on a specific situation, which can be real or fictitious. • Enables participants to understand and apply knowledge in a dynamic setting. • Useful to draw attention to and analyze specific topics. • Fictitious cases aid in generating non-emotional engagement with real life-like situations.
Games and dynamics	• Consists of a wide array of group and individual tasks in a relaxed and potentially highly active atmosphere. Usually, groups or individuals get a task that they need to solve or represent. • Useful as ice breakers or energizers when interest or energy is dwindling, or to gain insights and lessons learned on specific issues. • Should be used appropriately and at the right times (when, for instance, energy is low such as after the lunch break): too many games can cause the event to lose seriousness and credibility, while not enough games may result in distraction and boredom.

2.3 HOW ADULTS LEARN

Part of being an effective trainer involves understanding how adults learn best. Compared to children and teenagers, adults have special needs and requirements as learners.

- *Adults already know a lot.* Adults have accumulated life experiences and knowledge that may include work-related activities, family responsibilities, and previous education and training. In order to ensure that they retain and use the new information, they need to be able to integrate new ideas with what they already know. The trainer's job is to mobilize the participant's knowledge first, before adding new information, and subsequently to provide opportunities to discuss and reflect on new knowledge and insights, and to adapt it to individual circumstances.
- *As with all learners, adults need to be shown respect.* Trainers must acknowledge the wealth of experiences that adult participants bring to the training. These adults should be treated as equals in experience and knowledge, and should be allowed to voice their opinions freely in the group.
- *Adults are autonomous and self-directed.* They need to be free to direct themselves. Trainers have to act as facilitators, guiding participants to explore their own knowledge rather than supplying them with ready-made facts. They must facilitate the participants' own learning process and actively integrate the interests of the participants in the design of the training. They should allow participants to assume responsibility for presentations and group leadership.
- *Adults are goal-oriented.* Upon enrolling in a training course, adults usually know what goal they want to attain. Therefore, they appreciate a learning programme that is well organised and has clearly defined objectives and elements. Trainers must show participants how the training will help them to attain their goals. This classification of goals and course objectives must be done early on in the training.
- *Adults are relevancy-oriented.* They must see a reason for learning something. Learning has to be applicable to their work or other responsibilities to be of value to them. They may not be interested in knowledge for its own sake. Therefore, trainers need a sound understanding of the participants' motivations and must continuously try to harmonize training content and design with the life and work context of the participants. They should make participants think about the practical application of the newly acquired knowledge at his/her work place, including potential benefits of the new knowledge, as well as pre-conditions, difficulties, or barriers to applying the new knowledge and how to deal with them.

2.4 WHAT WE REMEMBER

What we hear – we forget
What we see – we remember
What we do – we understand

Adults remember only about 10% of what they *read* (e.g. in newspapers, in power point slides - if information is not presented in a spoken manner as well). They remember twice as much when they *hear*, but still only about 20%. Half of the things that are *said and shown* will be remembered. That is one reason why trainers should talk about the issues and use visual aids as much as possible. Additionally, adults remember 70% of what they *say* themselves. For example, ask participants to turn to their neighbour after a lecture and let them talk about what they remember, and they will absorb a much higher percentage of the new information!

Finally, adults remember best what they *say and do!* As a consequence, instead of giving a lecture about ecosystem services and how to integrate them into development planning, let participants work in groups; let them talk about the issue themselves, and let them recognize, demonstrate and capture the value of ecosystem services with the help of a fictitious case or, if possible, let them work with and plan their own cases and projects. Hearing and seeing should be complemented and enhanced by speaking and doing.

2.5 ROLES AND SKILLS OF A TRAINER

(TEACHER, EXPERT OR FACILITATOR?)

Trainers conducting the Principles of Ecosystem Services Assessment for Policy Impacts training course need to have substantial knowledge about ESAVs and about political decision- and advisory processes. Apart from their topical knowledge, trainers need specific facilitation skills. The success of a training course greatly depends on skillful and creative facilitation. Good facilitators bring a group together by developing and balancing the group's potential without dominating the discussion. They are knowledgeable about the issues being discussed but do not force this knowledge on participants. The ability to formulate and ask the right questions at the right time and active listening are two of the most important skills of effective and successful facilitators.

Trainers master a variety of techniques to enhance group dynamics and organize plenary sessions as well as group work in a well-planned and scripted way. Some of the most important trainer skills are summarized below.

Interactive skills:
Ensure effective communication and focused work in a relaxed and friendly atmosphere, thereby creating an environment for effective problem solving. Trainers should turn recipients, who passively consume inputs, into participants who interactively share their ideas and insights with others. Instead of preaching about the effectiveness of a particular method, trainers should persuade participants that the method is effective by encouraging them to apply and reflect on it.

Presentation skills:
Ease general understanding and learning of new information through the use of well-honed rhetorical skills and through the design of learning-oriented *power point* presentations.Visualisation skills:
Possess drawing and good handwriting skills, as well as a sense for arranging space, structure, colours and other moderation or presentation elements to create an attractive learning environment.

Participation skills:
Attempt to bring out the best in a group by means of cumulative learning, which is generated through the contribution of all the participants. Good trainers make participants feel that *nobody knows everything but everybody knows something*. They set the tone of the event, trust in other people's intellectual and creative potential, avoid a sense of winners and losers in a group, and respect the ideas and opinions of others.

Flexibility and dramaturgic skills:
Arrange an event to alternate between suspense and thrill, group and plenary sessions, experience-sharing and reflection. Trainers need to be able to adapt and modify sequences of steps, moderation and visualization methods according to the group's dynamics and needs, time, space, and other conditions that influence the training design.

In a nutshell: We see the trainer less as a teacher or expert and more as a *facilitator of a learning process.* This fits very well with the trainer sharing his/her knowledge and experiences (e.g. through presentations and insights) as part of an interactive learning design and not in a way that places the trainer's knowledge and experience in the spotlight.

2.6 QUESTIONS: KEY TO UNLOCKING NEW DOORS

For your information, I would like to ask you a question. (Levine)

Asking good, precise and intelligent questions that help participants discover new things and reflect on a situation is a manifestation of an effective trainer. Asking questions is a skill that every trainer should develop and master.

Experience and knowledge are made explicit through questions. During training courses, the group learning process should be encouraged by asking carefully formulated questions. It is advisable to test the questions and potential answers amongst the trainer team beforehand.

2.6.1 Types of questions

Basically, there are two types of questions: *closed-ended* and *open-ended questions*.

Closed-ended questions are designed to recall factual information. These questions are usually answered with short sentences, or a yes or no. Closed-ended questions usually start with *Is*, *Are*, *Can*, *Do*, *Does*, and modal verbs such as *Would*, *Could*, and *Should*.

Open-ended questions are designed to elicit more ideas and more elaboration from the person responding. It may seek to reflect or draw a conclusion. This is a preferred type of question to be asked when initiating a discussion or for promoting team spirit. Open-ended questions allow for a deeper understanding of the group's objectives and draw out a person's knowledge level. They usually start with *What*, *Why* and *How*.

An effective facilitator does not just stop to ask effective questions. Proper timing and accurate delivery are also important. For good and effective question asking, the *APPLE technique* might be useful. APPLE is the acronym for:

- **A** sking the question,
- **P** ausing to allow the participants to comprehend the question and think of an answer,
- **P** icking a member to provide an answer,
- **L** istening to the answer provided, and
- **E** xpanding or elaborating on the answers provided.

Examples of types of questions[1]

TYPE OF QUESTION	USE	EXAMPLE
Question about the context	• Give information on facts and figures regarding a particular situation.	• How many people work in your department? • How often do you facilitate training workshops?

1 Adapted from: Integrating Climate Change Adaptation into Development Cooperation - A Practice-Oriented Training Based on the OECD Policy Guidance. Trainer Handbook. GIZ 2011.

TYPE OF QUESTION	USE	EXAMPLE
Differentiating questions	• To clarify a vague response. • To clearly state differences.	• For whom is the problem greater? • On a scale of 0 – 100, how big is XXX?
Questions for probing reasons and evidence	• Test the validity of a reason. • Put evidence on solid ground.	• Why is that happening? • Are these reasons good enough? • What do you thing causes XXX? • What evidence is there to support what you are saying?
Questions for probing implications and consequences	• To discover unexpected effects. • To discover alternatives that were possibly overlooked.	• What are the consequences of that assumption? • What are the implications for XXX? • How does XXX fit with what we have learned before?
Hypothetical questions	• To think about given boundaries. • To think outside of the box. • To explore possible consequences.	• If we speculate: If you were to do XXX, what would be the effects? • If you wanted to change the training approach in your organisation, how could this be possible?
Questions about the future	• Open the mind to look beyond what the situation is like today.	• What are your intentions once this difficult situation is over? • Where would you like to be two years from now?
Circular questions	• Change the perspective. • Introduce other perspectives.	• If I asked your colleagues about what made the situation so difficult, what would they say? • What are some alternative ways of looking at this? • If you had invited a representative from civil society to your meeting, what would have been different?
Questions about behaviour	• Help to understand what is happening without passing judgment. • Gain a more detailed perception about the behaviour of others and reframe. • Clarify your own contributions to a situation.	· What does Mr. Miller do exactly, when he is making you impatient? · What exactly happens, when nobody takes responsibility for XXX? · How exactly do you react when the team XXX?
Assessment questions	• To step back and use hindsight. • To draw lessons from a particular experience.	• What have you learnt from XXX? • What was encouraging for you? • If you started again, what would you do differently?

2.7 ACTIVE LISTENING - FIVE KEY ELEMENTS

Listening is one of the most important skills of a trainer. How well he or she listens has a major impact on the training effectiveness, and on the quality of the interaction and relationship with the participants. There are five key elements to active listening. They all help trainers ensure that they hear the other person, and that the other person knows that what they are saying is being heard.

1. Pay attention
Give the speaker your undivided attention, and acknowledge the message. Recognize that non-verbal communication also *speaks* loudly.

- Look at the speaker directly.
- Avoid being distracted by environmental factors, such as background noises or people moving.
- Pay attention to the speaker's body language.
- Refrain from side conversations when listening; give the speaker your undivided attention.

2. Show that you are listening
- Use your own body language and gestures to convey your attention.
- Nod occasionally.
- Smile and use other facial expressions.
- Note your posture and make sure it is open and inviting.
- Encourage the speaker to continue with small verbal comments like *yes* and *uh huh.*

3. Provide feedback
Our personal filters, assumptions, judgments, and beliefs can distort what we hear. As a listener and facilitator, your role is to understand what is being said and reflect on it. This may require you to ask certain questions for clarification.
- Reflect what has been said by paraphrasing. *What I'm hearing is ...* and *Sounds like you are saying ...* are great ways to reflect back.
- Ask questions to clarify certain points. *What do you mean when you say ... Is this xyz what you mean?*
- Summarize the speaker's comments periodically.

4. Defer judgment
Interrupting is a waste of time. It frustrates the speaker and limits full understanding of the message.

- Allow the speaker to finish.
- Do not interrupt with counter arguments.

5. Respond appropriately
Active listening is a model for respect and understanding. You are gaining information and perspective. You add nothing by attacking the speaker or otherwise putting him or her down.

- Be candid, open, and honest in your response.
- Assert your opinions respectfully.
- Treat the other person as you would want to be treated.

2.8 VISUALIZATION

A picture says more than 1,000 words.

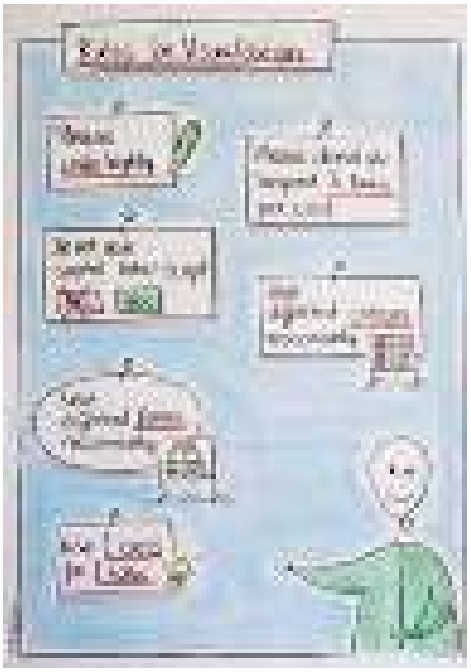
Visualization is a key aspect of participatory training courses. When delivering presentations, a power-point or a few flip-chart papers with key information may aid the learning process. When moderating discussions, jotting down the main ideas on a flip-chart may assist further discussion. Future group exercises should aim at generating a visual product, be it a matrix, a picture, a graph or simply some bullet points.

Visualized information…

- is easier to remember *(What I hear, I forget. What I see, I remember.)*,
- helps to create common understanding and leads to more precise discussions,
- forces the presenter to focus on significant points,
- supports the explanation of complicated ideas,
- serves as an external memory *(minutes of meeting)*,
- and helps participants identify with the results.

Rules of visualization

- Use key words and key phrases – visualization supplements explanation and does not replace it.
- Structure and message must be clear and understandable.
- When using moderation cards, observe writing rules:
  - print words; do not use cursive
  - write big enough so that the content can be read from a distance
  - be creative in using colours, sizes and shapes of cards
  - one idea per card jotted down in no more than three lines
  - use the fat end of the marker



Source: Britta Heine

3

THE HARVARD CASE METHOD[2]

2 Adapted from: Integrating Climate Change Adaptation into Development Cooperation - A Practice-Oriented Training Based on the OECD Policy Guidance. Trainer Handbook. GIZ 2011.

A large amount of the GIZ Principles of Ecosystem Services Assessments for Policy Impacts training course is based on the Harvard Case Method, which mainly conveys teaching messages through interactive practical work by participants.

3.1 BACKGROUND

The Harvard Case Method is a tested approach for practice-oriented, interactive learning. It was developed in the context of university teaching, where it is largely based on the intensive exploration and discussion of a particular case relevant to the teaching objectives. The Case Method stimulates the trainee's active exploration and conclusion development, rather than providing ready-made teaching messages.

THE FIVE GOLDEN RULES FOR A HARVARD CASE TEACHER

Rule 1: Do not 'explain' the message of the case directly. Let the trainees find the conclusions themselves. Guide tahem through the questions.

Rule 2: Provide enough time for the wrap-up phase, where the messages and conclusions are intensively discussed by the participants.

Rule 3: Be precise with your instructions for the case work. The trainees should start the case work with a clear vision of what they have to do.

Rule 4: Limit presentations. Do not talk for more than 15 minutes (except the introductory lecture).
If necessary, split lectures into several shorter inputs.

Rule 5: Always invite the trainees to reflect on how the lessons learnt relate to their day-to-day work or to what extent the training approaches need to be adjusted.

The Case Method has been adapted to the particular requirements of this training programme, which means that compared to the university teaching context, trainees will play an even more active role, while the role of trainers is less dominant. Trainees will, for example, explore the case study in a group work format while trainers assist, as needed, with guiding questions – in the university context, the teacher guides his/her students through the case with the help of questions.

3.1.1 Materials, preparation and other prerequisites

The Case Method requires intensive preparation prior to the course/training workshop. In particular, case/training materials have to be developed and handed out to the trainees before the course/training workshop.

The materials usually are comprised of the following:

- Introduction to the case: baseline situation, problems faced, challenges arising,
- Working material: data and specific information, partly introduced through, for instance, lists, charts and maps, which can be attached as so-called exhibits,
- Possible information on institutional set-up and other relevant background information, as well as clear instructions on the main tasks of trainees.

The application of the following standards is very important for the case work:

- Clearly define the goal of the case work. Organize the entire case work in such a way that this goal comes through.
- Make yourself familiar with the expectations, needs and aspirations of the trainees. Conduct the case work in such a way that you understand where the trainees stand.
- Reflect on the practical experiences and the type of work that the trainees are exposed to in their day-to-day work.
- Do not include complex data if the trainees are usually not confronted with such information, but are involved in more operational work. You may provide larger amounts of information if the trainees are used to screening comprehensive sources for relevant information.
- Restrict yourself to the information that is relevant for the case.
- The case work should stimulate discussion and active examination of the subject.
- All relevant training material for this training course has been developed as part of a long process, including test and pilot phases. The different training package items are well synchronized. Please be careful when changing single elements.

Fictitious or real case?

The particular value of having a fictitious case study is that everybody can relate easily and everybody has the same knowledge. Bakul has most of the relevant features needed in order to simulate the whole process from recognizing, demonstrating and capturing the value of ecosystem services for development and integrating them into policy making.

One could argue that real-world cases would be better, as they are real challenges that training participants could realistically face. The tricky thing, however, is that there are no 'neutral cases' and participants may be biased or hampered in one way or another by learning in this manner. Real cases may also provoke unproductive discussions about the reliability of data being used.

Furthermore, it is important to make clear that even in a real case, we would never have all the information we would like to have, and dealing with logically drawn assumptions is part of planning for change.

3.1.2 Agenda of case work

All modules for the Principles of Ecosystem Services Assessments for Policy Impacts training follow the same *training sequence*, including the following crucial elements:

The *introduction* is given by the trainer. The introduction provides the necessary theoretical background and explains the case work. After the introduction, the case work groups should be able to conduct their work independently. There are module introductory slides in the PowerPoint library that align with the training manual and handouts. Their basic message should not be changed, but it can be extended with, for instance, regional case examples that participants can understand.

The *case work* is carried out in working groups by the participants themselves. During case work, participants assume the roles of 'case work experts' or stakeholders in charge of specific tasks. They use the matrices or other visualization aids to systematically work through the different tasks. After the trainer's introduction, supported by the detailed task descriptions in the Training Manual, the expert working groups should be able to organise their work independently. They should assign a time-keeper, moderator and presenter(s). The trainers should be ready and prepared to offer support and guidance.

After the case work, the 'case work experts' *present their results* to the plenary. The presentation should highlight major findings and/or questions from the case work. It is important that this step is introduced as a chance to share experiences and for mutual learning and not as a 'test'. The trainers should be appreciative of the work done and give feedback on the results; they should only offer alternatives and amendments if necessary.

In the final reflection, the participants leave their 'case work experts' roles and reassume their own real-life position. Back in their own position, they reflect on their case work experiences and on how it could be implemented in their own work. This step is necessary to 'materialise' the experiences gained from the case work, i.e. make them tangible and accessible and, in the end, applicable in a different situation. Trainers facilitate this step through guiding questions.

3.2 GROUP WORK: DIFFERENT SETTINGS AND FORMATS

Group work is an indispensable feature in participatory training workshops. Group work will have different functions according to a particular sequence: generating ideas, reflecting on particular issues, working-out solutions, preparing a plan, among others. Compared to plenary sessions, group work provides much more room for participants to be active.

3.2.1 Main features

Working in small groups provides room for intensive dialogue and reflection. Ideally, all group members contribute, which would not be possible in a plenary session. Group members only mobilize their energy if they have a clear common understanding of why they need to work together and where this will lead them. Working in small groups provides an opportunity for the participants to test their self-regulatory abilities. This will start with the designation of a facilitator and somebody to present the results. But depending to the setting, small groups (3-5 members) may even be able to proceed without a facilitator.

Source: Britta Heine

3.2.2 Settings for group work

- Participants remain in plenary session so they do not need to move around, e.g. 'buzz groups' (see previous section).
- When groups need to have quiet time for reflection or space for discussion without disturbing others, they may be better off in separate rooms.
- Rotating groups (in one room) is a particularly interesting setting, allowing all participants to contribute to what each group is doing: A certain number of complementary tasks are assigned to different groups. Each group starts with a particular task and then moves on to the next task for commenting and complementing what the previous group has done. According to the number of participants, it may be useful to give the same task to two different groups and ask them to merge their findings into one presentation at the end.

3.2.3 Practical tips

In preparing for group work there are a number of questions the trainers need to ask themselves:

- What are the expected results from group work?
- How many groups should be formed?
- How should the groups be formed?
- Should the groups work on the same topic or on different issues?
- What should the group assignments look like?
- How should the group work results be shared and discussed in a plenary session?

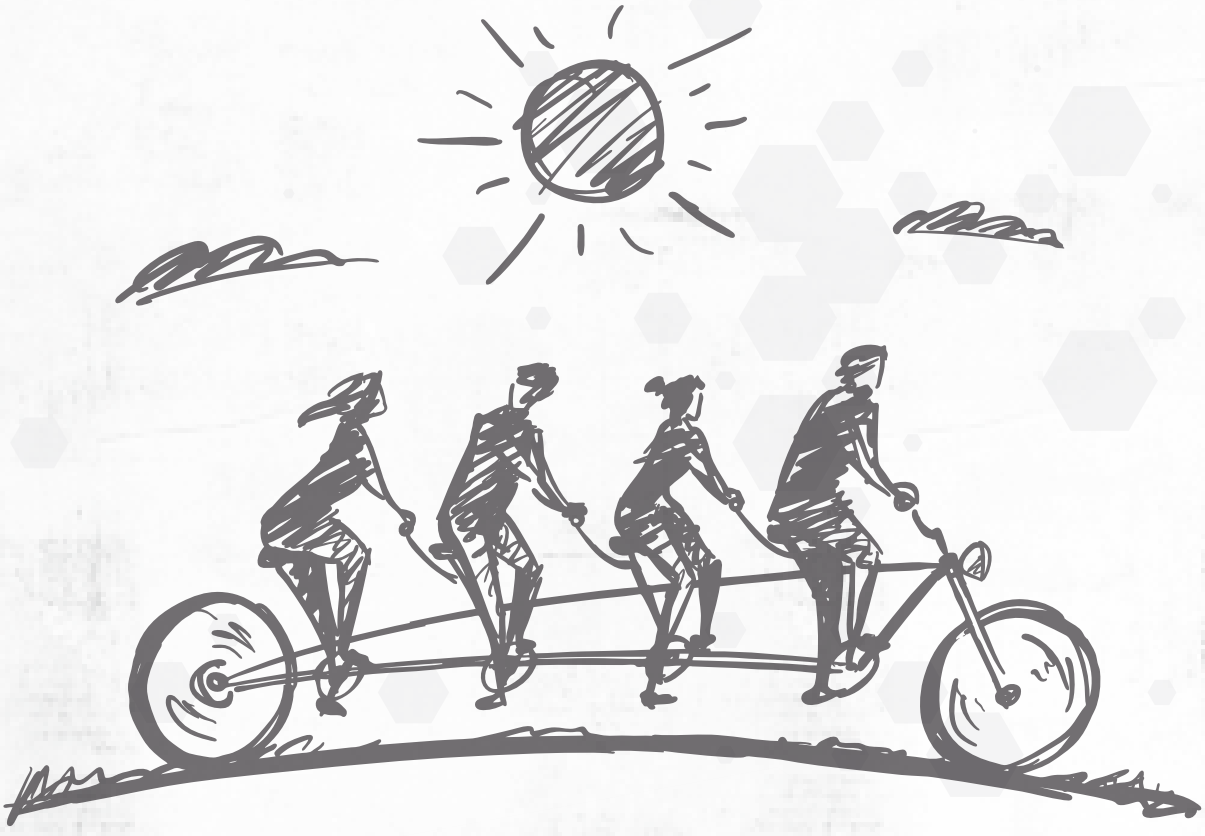
There are some rules of thumb for trainers/ facilitators for successful group work:

- Provide detailed, written instructions for group work.
- Provide a time budget of at least 40 minutes and make the rules explicit about how groups can get additional working time if needed.
- Do not compromise on the necessity of a visualized presentation of group work results.

There are a variety of *ways to form groups*. Counting *1-2-3* is the quickest way of forming groups and also ensures a random selection of group members. The most participatory way is to let the group decide on the criteria of group formation at the first instance and then form groups accordingly.

3.2.4 Support group work

Even if the trainers trust the self-regulatory abilities of a group, they should check from time to time to see if things are going smoothly. Groups may get stuck for some reason, such as lack of clarity about the task or difficult group dynamics, and will welcome a well-targeted intervention from the trainer. But for the sake of enhancing self-regulation, the trainers may introduce the rule that they will only intervene on request.



4

DESIGNING A TRAINING PROGRAMME[3]

3 Adapted from GIZ TRAINER HANDBOOK Integrating Climate Change Adaptation into Development Cooperation - A Practice-Oriented Training Based on the OECD Policy Guidance

This chapter provides an overview of what needs to be taken into consideration when designing a training programme. Regardless of training course complexity, a thorough and deliberate preparation and design are indispensable.

Even if this training manual focuses on the role and use of ESAVs in a political decision-making process, we would like to present this chapter in such a way that it can also be helpful in designing training programmes and workshops in other fields. Training design is to be seen as a cross-cutting endeavour, i.e. that certain steps and tasks are relevant for whatever content the training programme or workshop might focus on.

4.1 CLARIFY OBJECTIVES AND MAJOR THEMES AND TOPICS

We assume that an institution takes the initiative to conduct a training programme and asks an internal or an external trainer - or a team of trainers – to prepare it. The first question the trainers must raise is regarding the objectives that the institution wants to achieve with the training. Discussing the *objectives* should also include a clarification on the expected outcomes and the desired impact of a training programme. And asking the client about objectives also clarifies their expectations of the trainers. Trying to understand these objectives goes hand-in-hand with the exploration of underlying assumptions.

The trainers and the client-institution also need to agree on the approach. It will be fairly difficult to find a good compromise if the client wants an input and content-driven training, while the trainers are in favour of a participatory training approach. Regarding the 'approach', it is also necessary to discuss with the client-institution how the training programme should be structured. The following questions are helpful in this respect:

- Will training workshops consisting of a single event be sufficient or are there any follow-up modules necessary?
- Should a modular approach be given priority, which means organising the training process as a series of workshops, team and/or individual coaching?
- Based on the agreement on the participatory orientation of the training programme, what approach will be taken for the training process to be adopted, e.g. case method?
- On which levels should the training workshops take place, e.g. country, regional, sub- regional, supra-regional?

By clarifying the previous points, the trainers should ensure that a training programme is the right way to achieve the client's objectives. Eventually, the trainers may suggest other capacity-building measures going beyond the trainers' mandate, such as peer-to-peer coaching, network creation or technical advice.

4.2 LEARN ABOUT PARTICIPANTS AND THEIR NEEDS

The discussion with the client-institution will already have provided information on the participants in the training process. But as the planning of the training programme unfolds, the answer to the question 'Who needs to participate?' will become more concrete. Criteria are indispensable in order to make a proper selection of participants.

If, for instance, *train-the-trainer* (ToT) workshops are part of the training programme, you need to define what is required from the trainers in terms of background and experiences in order to be adept in delivering a ToT. In defining criteria, the organisational context needs to be taken into consideration: will the participants be in a position to use their newly acquired capacities and competencies in a way that the expected outcome and impact can be achieved? There are other questions that have to be taken into consideration when selecting participants for a training programme:

- How many participants do you want to have in a training workshop? What is the maximum and minimum number?
- What mix do you want to have in the group in terms of experience, professional backgrounds and institutional affiliations?
- How can you make the group gender-balanced?
- What are your assumptions about the participants' openness towards a participatory training approach?

Once the participants are selected, they need to be asked what they expect from the training programme. The trainers will certainly have assumptions about the participants' needs and expectations, and these need to be cross-checked with their actual expectations.

There is sufficient evidence that it is useful to provide future participants with an opportunity to indicate what they want to happen during the training workshop in order for them to see it as a success. One could also pose the corresponding questions on what should not happen. This feedback is valuable for helping the trainers in designing a training programme or a training workshop. And potential participants can eventually be involved in the design process.

4.3 DEFINE LEARNING OBJECTIVES

In order to define learning objectives, it is helpful to go to the very end of the learning process by answering the following question: *What should participants be able to do differently/better after the training course?*

4.3.1 Formulation of learning objectives

Formulating learning objectives is a key step to preparing a training workshop. It is the embodiment of what participants will take home from a training workshop in terms of newly acquired abilities and skills. The objectives will set the stage for how participants will ultimately achieve the expected outcome and impact of the training programme/workshop.

4.3.2 Arrangements for learning transfer

It might seem premature to talk about learning transfer at this stage. But preparing for learning transfer starts with the selection of participants. Conditions are favourable for learning transfer if a participant is mandated from within his organisation, i.e. his/her section or his/her department. Ideally, the superior defines his/her objectives for what he/she expects the staff member to take home from this training programme. The client organisation should do this as soon as possible.

Assigning a participant to attend a training workshop may include a participant bringing his/her case/project to the training workshop. Maybe there are already initiatives taken in his/her organisation on designing particular training programmes and the trainee has now the mandate to use the training workshop to get input and ideas for this internal design process to move forward.

The more an organisation shows interest in and support for one of its members to participate in a training workshop, the more likely it is that learning transfer will be effective.

4.3.3 Draw the line between ideal and minimal objectives

At this stage of the training module preparation, there are still a lot of variables, which can only be partly influenced. With this level of uncertainty, it is useful to make the distinction between ideal and minimal objectives. These could be sketched in 3 scenarios. With these scenarios the trainers are well prepared for a situation where they need to say: *Do we go for it or not?* If the client organisation suddenly faces unexpected budget restrictions and wants to do the training workshop in 2 instead of 5 days, it might be necessary for the trainers to say that they cannot reach the minimal objectives with such a reduced time budget. It might then be wise for you to reconsider the whole assignment and to possibly refrain from carrying out the training.

4.4 CLARIFY BUDGET AND LOGISTICS

This is a decisive milestone in the design process because it entails negotiations with the client-organisation about the budget and what is needed to reach the training programme's objectives. In most cases, this is a difficult balancing act. The client-organisation might push for increasing the number of participants per training workshop while you as trainers need to explain that you cannot reach certain learning objectives when you have a group of 30 instead of 15 participants.

Another critical parameter is 'duration'. The normal reaction of a client organisation with a tight budget is to cut down on the days for a training event and to increase the number of participants. It is crucial for trainers at this stage not to accept responsibility for achieving certain learning objectives if the duration and number of trainees are not adjusted in such a way that these learning objectives can be achieved.

Trainers need to be prepared at this point to put *convincing methodological arguments* on the table regarding the two key parameters: duration and number of participants. Location is also an important issue. Choosing a location can be tricky. Being in a windowless room in a hotel close to an airport may seem like a good idea with respect to costs and transport, but it may backfire. It is, therefore, important for trainers to lobby for a suitable venue. A good venue provides working rooms with sufficient light and space, away from the daily life of busy organisations, but not too remote.

If they are unfamiliar with the selected venue, trainers should check whether it is suitable for a participatory workshop. Things to consider are:

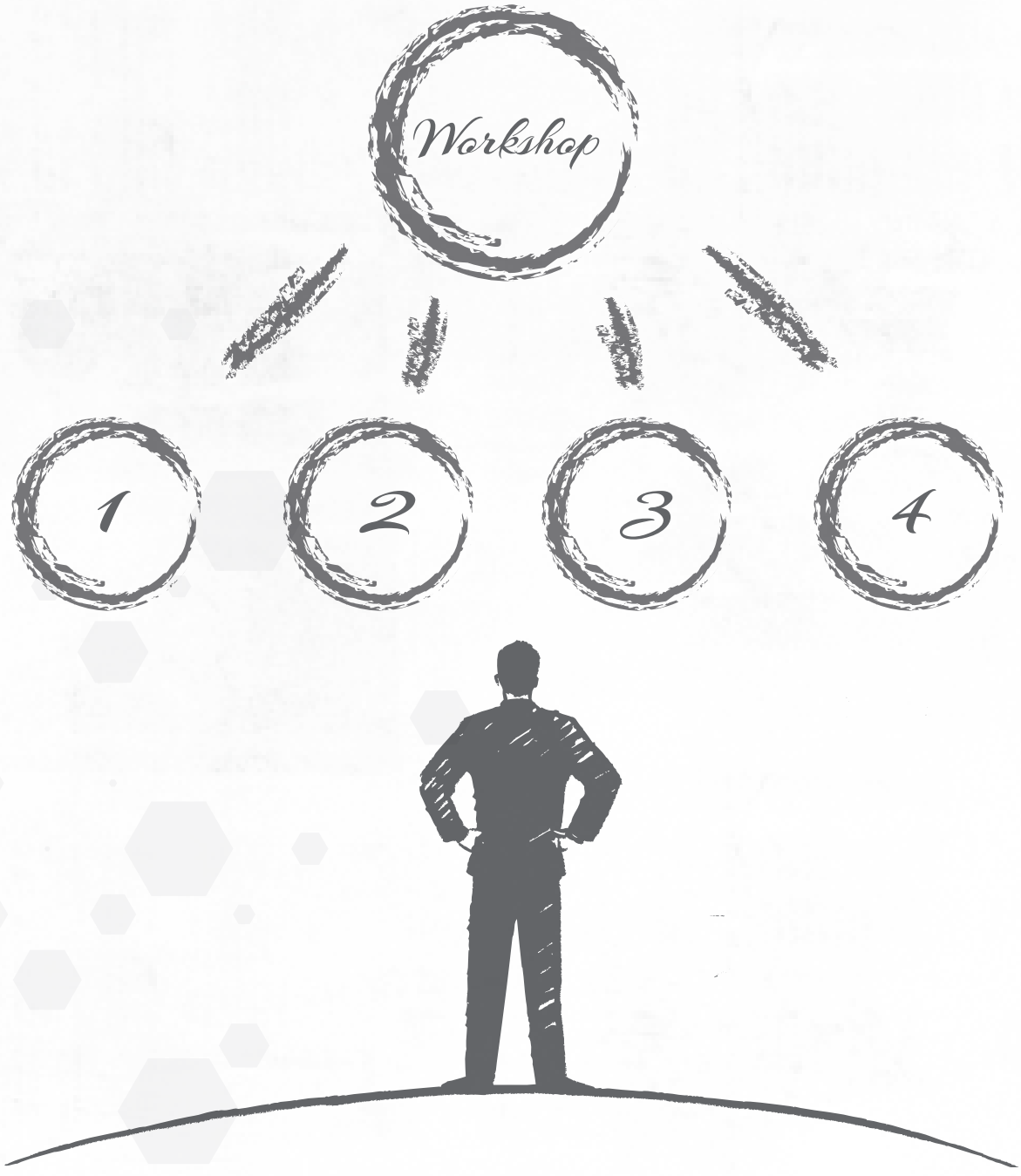
- What is the flexibility in terms of seating arrangements?
- Is there enough space to practice the mobile visualization and to work in different arrangements?
- Is it possible to present visualization results on walls? How big is the seminar room and is it shaped? Are there obstructive pillars in the room?

It is a good practice to take a look at the room or rooms where the training programme will take place before the course begins. Trainers should aim to arrive at least the day before all participants arrive so that they have enough time to check the venue, make adjustments and prepare the room(s).

4.5 PREPARE WORKSHOP STRUCTURE

Based on the learning objectives, it is possible to make a draft of the workshop flow. Using a mind map may be useful at this stage. The workshop flow depicts the order of working steps from the opening and introduction, to the evaluation and closing of the training workshop. It should aid the trainers in developing an *exciting and effective collection of milestones for the whole learning process.* The workshop flow is like a map of how the workshop process is supposed to unfold. How it will really unfold is, of course, not predictable because this depends in large part on what the participants will or will not do.

The draft of the workshop flow will serve as a starting point for developing the training workshop scenario (see next page). It will also help the trainers on the first day because it is better to explain the main working steps in this manner than in a detailed programme, where the participants are unlikely to grasp immediately what to expect.



4.5.1 Develop a scenario or script of the training workshop: content, methods, process

Based on the workshop structure, the trainers will get together to work out a detailed day-to-day scenario or script for the workshop process. Working on such a script enables you to get a feeling of what is feasible with a particular group of participants in a limited time. Introducing the notion of 'time' can make certain methodological options more or less feasible.

However, it is not recommended to overdo it in the sense of starting the scenario development with the question: what should we do on the first day at 9 o'clock? Instead, start with the content and the methods, and at some point check how you can bring it into a meaningful timeline. There is no best practice for the structure of the scenario or script. Of course, you need to say something about the what (= content) and the how (= methods), but if you want to add, for example, a column labelled 'material needed' you are free to do so. A script may be structured as a table with the following information.

Time	Activity	Methods / Techniques	Materials needed / Observations	Responsible Trainer

The main task in scenario or script development is to combine certain content with particular methods in such a way that a dynamic process of joint learning can unfold. Of course, the flow chart of the workshop process already sketches out much of the plot, but the real dramaturgic work happens in scenario development.

Making use of a broad methodological repertoire is crucial at this stage. Methodological variability helps to keep the learning process dynamic through participants taking an active role, which they will not be willing to take if certain methods are overdone – e.g. lectures, brainstorming, group work. Even group work can be overdone if participants get the impression that they are being sent again and again to group work sessions without proper sharing, analysis and synthesising during the plenary sessions.

4.5.2 Clarify documentation and reporting

Trainers need to decide beforehand, in consultation with the client organisation, how the results and the process of the training workshop are to be documented. The scope of documentation, i.e. if it is done 'only' for the participants or if the documentation should be made available, possibly in a more elaborated form (report, handbook), to a wider audience, is a point that trainers and clients need to clarify ahead of time.

At this stage, the trainers also need to decide what they want to offer participants — in addition to the workshop documentation — in order to support their learning transfer. This support might include handouts, technical articles, case studies or a handbook, just to give a few examples.¬

4.5.3 Operational planning

Finally, the team of trainers will divide the tasks and responsibilities amongst themselves according to the training structure and the developed scenario. An action plan will highlight what needs to be done by whom and the corresponding level of importance. This plan will facilitate the preparation work of the team prior to the training workshop. It will include the preliminary agenda for the final planning meeting, which the trainers will have on the day before the participants arrive.

5

TRAINING STRUCTURE

The Principles of Ecosystem Services Assessments for Policy Impacts training course consists of five modules and twelve exercises, which are presented in detail in Chapter 5. In addition to the lecture presentations and the exercises, there are some other elements, which should be included in the agenda:

- Welcoming and introduction of trainees and trainers
- Introduction to the training course (objectives and methodology of the training, working rules, participants' expectations)
- Presentations of real-life examples or technical concepts by external experts or by the trainees
- Conclusions and closing remarks at the end of the day
- Course evaluation

The time needed for taking notes and pictures for documentation needs to be considered as well, but not necessarily reflected on the agenda as this is something that the trainers should be aware of but is irrelevant for the participants.

The general time frame depends on the amount of working groups, the time spent on the lecture slides and the presentation and discussion of exercise results. You will probably have to adjust the training to the general framework, the audience and the time available for the course. The overall time required for the whole course can vary between 2 and 5 days. Be aware that you may have to omit some exercises to deliver the training in less than five days.

Example: Agenda for 5 days. →

L	FIRST DAY	SECOND DAY	THIRD DAY	FOURTH DAY	FIFTH DAY
8:30-10:00	Welcome and participants introduction Introduction to the training **Module 0:** Refresh Basic Terms and Concepts (PPT)	10 min: wrap up of previous day **Module 2:** Integrating ESAV into Policy Planning (PPT)	10 min: wrap up of previous day **Module 3:** Getting started with ESAV (PPT) *Exercise 6*	10 min wrap up of previous day **Module 4:** Running an ESAV cont. (PPT) *Exercise 9*	10 min wrap up of previous day **Module 5**: Communication and Influencing Skills (PPT)
10:00-10:30	Break	Break	Break	Break	Break
10:30-12:00	**Module 0:** Refresh Basic Terms and Concepts cont. (PPT) *Exercise 1 (PPT)*	*Exercise 4*	*Exercise 6 (continued)* **Module 3:** Getting started with ESAV cont. (PPT)	**Module 4:** Running an ESAV cont. (PPT) *Exercise 10*	**Module 5:** Communication and Influencing Skills cont. (PPT) *Exercise 12*
12:00-13:00	Break	Break	Break	Break	Break
13:00-15:00	**Module 1:** Main Characteristics of Ecosystem Services (PPT) *Exercise 2*	**Module 2:** Integrating ESAV into Policy Planning cont. (PPT) *Exercise 5*	*Exercise 7*	*Exercise 10* (continued)	*Planning next steps* Closing and evaluation
15:00-15:30	Break	Break	Break	Break	Break
15:30-18:00	**Module 1:** Main Characteristics of Ecosystem Services cont. (PPT) *Exercise 3*	*Exercise 5* (continued) Blitz evaluation	**Module 4:** Running an ESAV (PPT) *Exercise 8*	**Module 4:** Running an ESAV cont. (PPT) *Exercise 11*	

5.1 WELCOME AND INTRODUCTION OF TRAINEES AND TRAINERS

Welcome the participants to the training and start with an introductory round. There are several ways of introducing each other to the group. The easiest way is just to ask the participants to introduce themselves one by one.

A more dynamic way of doing it is to ask the participants to stand in a circle. Then take a ball (or something similar), start by introducing yourself and throw it to one of the trainees. Ask this participant to introduce him or herself (name, institution/ background, what their interest in learning about ESAVs is or why they are here) and then to throw the ball to the next one. Continue doing this until everyone has introduced himself/herself to the group.

Another interesting and time-effective way for introductions is to ask participants to stand up and cluster around different topics. You can ask them to form groups according to educational background (typically social and natural sciences, engineering and law). After this, you can ask them to imagine that the room is a country or world map and ask them to stand on the country, city or region where they come from or where they work. You can also ask them to form a line according to their experience with ecosystem service, with *no experience* on one end and the *experts* on another end. Be sure to walk around and ask some of the participants why they are standing where they are. By using this method you also get a good idea of the group composition in terms of technical background and expertise.

5.2 INTRODUCTION TO THE COURSE

After the welcoming round and introduction of trainees and trainers, give an overview of the training content. This includes: objectives and methodology of the training, working rules, expectations of participants and logistical information. If you decided to prepare a documentation of the training, announce it during the introduction. This way the participants will not feel compelled to take notes of everything that is said during the course.

You may visualize the objectives in an abbreviated form on a flipchart.

Objectives of the training:

- Understand the main characteristics of ecosystem services and how *Ecosystem Services Assessments and Valuations* (ESAV) can help inform policy decisions.
- Learn how to design policy-oriented ESAVs: policy interface, asking the right questions, application and implementation of results and communication.
- Generate capacities on method selection and on how to interpret and communicate results.
- Understand how ESAVs can influence policy and political processes and develop effective communication skills to achieve change.

5.2.1 Working rules

When introducing the training course, clarify the working rules together with the participants. Write them on a flipchart as they come up during the discussion. For example:

- Listen to each other and learn from each other (horizontal learning)
- Work on the basis of assumptions
- Participate in an active way
- Ask whenever there is something we do not understand
- You can go fishing 3 times (This means that the participant can be mentally absent and instead of making up excuses can just say: *I went fishing)*
- We do not use laptops or mobile phones during the sessions.
- Be on time
- Have fun

5.2.2 Expectations of participants

Asking the participants about their expectations is a good way to adapt the training at least to some extent to their needs. Reacting to expectations increases the training's value. Prepare a board for collecting the expectations. Explain that they are allowed to add expectations during the whole training.

Expectations of the workshop in the Ajloun Forest Reserve, Jordan and in Hanoi, Vietnam (IES Training)

5.3 RECAP OF THE PREVIOUS DAY

At the start of each day, participants should attempt to recall the most important aspects and lessons learnt of the previous day. Ask them, for example, *What was good and important for you yesterday?* and *What questions are still unanswered and should be considered?*. Another way of doing this would be to assign two participants each day to present the recap of the previous day to the entire group. It is left to the creativity of participants on how they will structure this recap. They can, for example, use the flipcharts to visually summarize some of the key concepts of the previous day, or they could hold a quiz where they ask the other participants about some of the most important aspects of the previous day. Essentially, the participants that have to present can come up with their own creative way of doing so.

5.4 COURSE EVALUATION

At the end of the training, conduct a course evaluation. There are different ways of doing this. You can do a verbal evaluation in the plenary, where you ask the participants what they learned and liked or what they missed and disliked. You can refer back to the participants' expectations collected on a board during the training and discuss whether they have been fulfilled. Additionally, or instead of the verbal feedback, you can conduct a simple query using a smiley-face matrix, where the trainees can evaluate different components of the training. Prepare a blank matrix, with the components to be evaluated, and the various levels of satisfaction. The components can include: presentations/theoretical inputs, case work, facilitation, time management, location, logistics, atmosphere, etc. Use 3 to 5 smiley faces for the evaluation. The components can be evaluated by the trainees according to whether they were very happy, happy, satisfied, unhappy, very unhappy.

Explain the meaning of the smiley faces to the trainees. Then turn the matrix away from the group so that participants can vote privately. Give each participant one voting dot per component to be evaluated or give them a marker. Ask participants to vote one by one.

Necessary materials: Flip-chart or board, one sheet of flip-chart paper or large sheet of brown paper, markers or adhesive voting dots for each participant (one for each component).

Example of the evaluation from an IES Training in Quezon Province, Philippines (2015)

5.5 DOCUMENTATION

It is recommended to provide a documentation or proceedings of the training. Ideally, this should be sent to the trainees not later than two weeks after the course. The documentation consists of:

- A short summary of the content of the theoretical inputs and exercises
- A summary of the discussions in the plenary (main statements)
- Photos of the visualized material (definitions, illustrations, exercise results)
- Photos of the participants (including a group photo)
- A list of participants with their contact information
- An agenda of training
- All presentations in pdf-format

If possible, try to have somebody help you in taking notes during the plenary discussions. Also, take pictures of important things you visualized during the training, especially the exercise results and the evaluation, but also of the participants while they are working. Consider taking a group photo, which can be put on the cover sheet of the documentation. People will always prefer to go through the documentation if pictures of the group are included. Include the agenda of the training and the list of participants. When sending the document, add all presentations that were given during the course in pdf-format.

5.6 WORKING MATERIAL

5.6.1 Handouts for participants

All handouts can be found in the Training Material supplement. Consider either giving out folders, in which participants can collect all handouts that they will receive during the training, or one consolidated file with all hand-outs. Start by distributing the folders at the end of the introduction to the training course. The folders should already include the *list of ecosystem services*, the *article on Bakul and Exportul* and the *map of Bakul*. Explain that the Bykipedia article and the map are thought to provide a general overview of the main characteristics of Bakul and Exportul and are needed in later exercises. Be aware that if you do not choose to provide a consolidated file with all exercises and materials, you need to distribute the hand-outs before each exercise.

The exercise descriptions and the Training Material supplement contain detailed instructions on when to distribute the handouts. When choosing to present exemplary results, make sure to clarify that these results are only examples and are not the only possible outcomes.

You can also provide a booklet with all presentations that will be given during the training (print the slides as a document with no less than 6 slides per page, back and forth) beforehand.

5.6.2 Material for visualization

The following material is needed for the whole training course:

- 2 flip-charts
- Paper for flip-charts
- 4 - 8 pin boards (depending on the number of groups)
- Brown paper for pin boards
- Moderation cards in different colours and sizes
- Markers
- Pins
- Dot stickers
- Adhesive tape
- Scissors
- Glue stick

If possible, try to have a facilitator toolbox with you.

6

MODULE 0 – REFRESH BASIC TERMS AND CONCEPTS

6.1 SETTING THE CONTEXT FOR ESAV

Objective

- Set the stage for assessment and valuation
- Contextualize the training and clarify the link with the training *Integrating Ecosystem Services into Development Planning (IES)*

DISCUSSION - IES SIX STEP APPROACH						
Time consideration (min)	Presenta-tion	Reading Time	Group Work	Presentation of Results	Discussion IES Six Step Approach	Total
	25 – 30	0	0	0	20-30	45-60

Overview	• **PPT: Module 0 – Refresh Basic Terms and Concepts**
	  • **PPT 0.1** Setting the Context for ESAV
	• **Discussion** (alternative 1): IES Six Step Approach
	• **Exercise 0** (alternative 2): IES Six Step Approach
	• **Content:**
	  - Context of the training
	  - Overview of the development of the ES concept: Millennium Ecosystem Assessment, TEEB study, IPBES
	  - The IES concept and the Six Step Approach
	  - The relevance of the global project ValuES					

Preparation	• Presentation. • Prepare a flip chart to note down important aspects of the discussion. • The review on the IES Six Step Approach can be undertaken through a plenary discussion (alternative 1) or an exercise (alternative 2).					
Materials	**Alternative 1 (plenary discussion):** • 1 flip chart, 1 piece of flip-chart paper, 1-2 boards, 1-2 sets of cards in different colours, markers, pins. • Six Step Approach – Framework and Symbols (included in Annex 1). **Alternative 2 (exercise):** • Six Step Approach – Framework and Symbols • Printed IES Steps illustrations (included in Annex 1) • Short description on each one of the steps in separate sheets of paper (taken from the IES manual) (included in Annex 1) • Markers					

Handouts	**Alternative 1 (plenary discussion):** None **Alternative 2 (exercise):** Hand to each one of the six working groups one of the illustrations of the IES steps and its associated description, with two cards (same colour) and markers.
Methods	**Alternative 1. Discussion in plenary facilitated by the trainer.** Question and answer session regarding the IES 6-Step Approach. *Instructions:* Distribute the IES symbols among the participants. Ask the participants questions regarding each of the six steps and to define the steps in their own words. *Recommendations for the discussion:* The role and function of the ValuES project should also be included in the discussion. Ensure that participants understand that ValuES is a global project that aids decision-makers in partner countries in recognizing and integrating ecosystem services into policy making, planning and implementation of specific projects. The project therefore creates a bridge between the science and policy interface and promotes knowledge-sharing via regional workshops and participation in global discussion forums. ValuES develops instruments and training courses that provide technical advice and facilitate planning and decision-making processes. **Alternative 2. Group work.** Optional exercise to review the IES steps. Before starting the exercise, quickly explain the objectives and the instructions. Give some time for clarification questions. *Objectives:* a) Make a recap on the IES step approach; and b) clarify the links between the IES training and the principles of ESAV training. *Instructions:* Ask the participants to make 6 groups, mixing the participants who have taken the IES training and those who have not. For organizing the groups, you can ask the participants that have taken the IES to number from 1 to 6, and then ask the same to the participants who have not. Each one of the groups will receive an IES step description (from step 1 to 6) and must read and discuss the content within the members of the team. They must write down the key ideas of each one of the steps on two cards. They should also select a person from the work group, who will present the results in plenary. *Recommendations for running the exercise.* It is recommended to apply the optional exercise to review the IES approach instead of presenting the approach itself. In general, learning experience improves when the participants have done the exercise, presented their results and discussed the key messages on the IES instead of when the trainer makes a presentation.

Presentation of results	**Alternative 1 (discussion):** None **Alternative 2 (exercise):** As each group presents the key messages and questions of each step, place the IES illustrations and the cards on the pin board. After the presentation, ask the participants if they would like to add anything to the presentation. Afterwards, make a short review of each of the IES steps and finalize with a review of the steps altogether.
Reflection	Open up a discussion in the plenary. Encourage participants to contribute to the discussion with their knowledge. Write important points, ideas, and questions on flip charts or on cards.
Key messages	· Know the main initiatives that are working on linking ecosystems and biodiversity, with development and well-being. · Understand that commitments associated to CDB involve integrating the value of ecosystems and biodiversity in the policies related to development. · Understand that the ES concept is crucial to achieving the commitments associated with the CBD. · Different initiatives provide frameworks to link and integrate ES in decision- making and policy impact. · However, the integration of ES in decision-making and policy impact is still weak. · The IES approach, promoted by the ValuES project, seeks to generate impacts on decision-making and policy. · This training focuses on the first three steps of the IES approach.

6.1.1 Setting the Context for ESAV (Theoretical Input)

The different initiatives on assessing ecosystem services are mostly related to the commitments that more than 150 countries (or parties) made in the framework of the *Convention on Biological Diversity* (CBD). The CBD was inspired by a growing global commitment to more sustainable development. It represents a dramatic step forward in the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from the use of genetic resources. The CBD and its members are committed to implementing the Strategic Plan for Biodiversity 2011–2020 and contribute to reaching its Biodiversity Aichi Goals and Targets. The parties are also committed to reporting their contributions through the delivery of information on the state and trends of their ecosystems, their efforts, progress and challenges related to the assessment of ecosystems. Accountability and reporting are two important tasks of the membership countries of the CBD and for those that would like to join it. They are also important conditions to mobilize resources and gain reputation for their performance. At the same time and at a national level, different types of ESAVs offer the opportunity to obtain evidence and to enable the building of strong arguments for the environmental sector to mobilize its efforts and resources to protect ecosystems. Among others, ESAVs offer the possibility to show a link between

nature and society, bring ecosystems and biodiversity into the policy agenda and show how our economy and well-being depend on nature.

While the term *ecosystem* had been coined and used centuries ago, the concept of ecosystem services, as used today, is still relatively new. The concept started to appear in scientific articles in the 1980s, but it was not until the 1990s that the concept of ecosystem services was broadly accepted and became the focus of many articles (e.g. de Groot, 1992 ; Costanza et al., 1997 ; Daily, 1997). The *Millennium Ecosystem Assessment* Report in 2005 (MEA, 2005) defined different service categories and ultimately became a guidepost for the conservation community (de Groot et al., 2010).
The report originated from the stated need of many countries to perform a global ecosystem assessment. Work began in 2001 with more than 1300 contributors from 95 different countries (MEA, 2005). The assessment concluded that humans are highly dependent on ecosystems and are overusing natural resources at an alarming rate. As a result of this exploitation, future generations' welfare is threatened (MEA, 2005). Because of the scale of the assessment and the importance of its findings, the MEA contributed immensely to mainstreaming the concept of ecosystem services.

Since then, scientists have been busy fine-tuning service definitions, assessment frameworks and methods for how to best conduct ecosystem service assessments. Another important publication was the TEEB study in 2010 titled *The Economics of Ecosystems and Biodiversity: The Ecological and Economic Foundations*, which provided further clarification on the ecosystem service assessment framework (de Groot et al., 2010). The primary goal of the TEEB study is to recognize, demonstrate and capture the value of ecosystems and biodiversity and to examine potential actions to respond to losses in biodiversity and degradation of ecosystems. The TEEB Initiative was launched by Germany and the European Commission in 2007 in response to the G8+5 meeting in Potsdam in that year. Led by the *United Nations Environment Programme* (UNEP), the report was finalized and released in 2010 (TEEB, 2010).

In the years following the MEA and the launching of the TEEB initiative, the use of assessments for examining trends and conditions of ecosystem services have increased rapidly and, to some extent, ESAVs are gaining importance and are used as an informative and awareness raising tool for decision-makers.
A further result of these developments has been the creation of the *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (IPBES).

IPBES is an independent, intergovernmental body, established under the auspices of UNEP, FAO, UNESCO and UNDP in 2012. The main mandate of IPBES is to compile, systematize and disseminate the latest scientific and other knowledge on biodiversity, ecosystems and their services, to identify tools and methods to protect and conserve them, and to derive different courses of action from this. IPBES recommendations should equally benefit national governments, local and regional stakeholders, as well as international biodiversity policy processes, such as the CBD.

To address its four functions, namely (1) assessments, (2) policy tools and methodologies, (3) capacity building, and (4) knowledge generation, IPBES has set up its first work programme for 2014-2018 .
(see Fig. 1, next page). →

IPBES WORK PROGRAMME 2014 – 2018:

OBJECTIVES AND ASSOCIATED DELIVERABLES

Objective 1

Strengthen the capacity and knowledge foundations of the science-policy interface to implement key functions of the Platform:

a. Priority capacity-building needs to implement the Platform's work programme matched with resources through catalysing financial and in-kind support

b. Capacities needed to implement the Platform work programme developed

c. Procedures, approaches for participatory processes for working with indigenous and local knowledge systems developed

d. Priority knowledge and data needs for policymaking addressed through catalysing efforts to generate new knowledge and networking

Objective 2

Strengthen the science-policy interface on biodiversity and ecosystem services at and across subregional, regional and global levels:

a. Guide on production and integration of assessments from and across all scales

b. Regional/subregional assessments on biodiversity, ecosystem services

c. Global assessment on biodiversity and ecosystem services

Objective 3

Strengthen the science-policy interface on biodiversity and ecosystem services with regard to thematic and methodological issues:

a. One fast-track thematic assessment of pollinators, pollination and food production

b. Three thematic assessments: land degradation and restoration; invasive alien species; and sustainable use and conservation of biodiversity and strengthening capacities/tools

c. Policy support tools and methodologies for scenario analysis and modelling of biodiversity and ecosystem services based on a fast-track assessment and a guide

d. Policy support tools and methodologies regarding the diverse conceptualization of values of biodiversity and nature's benefits to people including ecosystem services based on an assessment and a guide

Objective 4

Communicate and evaluate Platform activities, deliverables and findings:

a. Catalogue of relevant assessments

b. Development of an information and data management plan

c. Catalogue of policy support tools and methodologies

d. Set of communication, outreach and engagement strategies, products and processes

e. Reviews of the effectiveness of guidance, procedures, methods and approaches to inform future development of the Platform

The first IPBES work programme for 2014-2018. Prepared by the German IPBES coordination office and NeFo (2014). (Source: IPBES/2/17.)

The core of this programme is comprised of four regional biodiversity assessments for Africa, the Americas, Asia-Pacific, and Europe/Central Asia, and one global assessment. In addition, four thematic assessments (pollination and food production, land degradation and restoration, invasive alien species, and sustainable use of wild species) and two methodological ones (scenarios and models, and diverse values of nature's benefits) are foreseen. Other deliverables address cross-cutting issues such as the need for capacity building to implement the work programme, the inclusion of different knowledge systems (e.g. indigenous and local knowledge) into the assessments, and a catalogue of policy support tools, amongst others.

As illustrated before, efforts are being made to better manage ecosystems by assessing their value and by better integrating them in political frameworks. However, often the way ESAVs are planned, designed and commissioned can restrict their usefulness to policy. Studies have shown that only a small fraction of assessments have an actual policy impact. Laurans and Mermet (2014) concluded that only 10 out of 335 revised assessments had a direct policy impact.
The ecosystem services concept is a promising approach which has clearly influenced international debates. Its potential for improved decision-making is plausible - but its practical application and corresponding policy impact is still modest. During this training, we would like to offer participants a deeper overview of how to design and manage ESAVs in a way that can result in stronger policy impacts. We are going to concentrate on some parts of the ESAV process and we are going to gain a better overview of some elements and tools that can help to better embed ESAVs in the policy arena.

Practitioners and researchers are often confronted with a set of multifaceted challenges while bringing environmental and ecosystem issues into policies and planning processes. Projects and policies intended to meet development goals often go forward unwittingly at the expense of nature. For instance, a national plan to expand agriculture to increase food production may increase deforestation leading to soil erosion and flooding and may put colonies of pollinator populations in jeopardy. Recognizing the links between ecosystem services and development goals can mean the difference between a successful long-term strategy and one that fails because of an unexamined consequence for ecosystem services. A better ability to assess, describe and value benefits of ecosystem services might help decision-makers to better understand how their actions depend on and might change these services, consider the trade-offs among different options, and promote policies that sustain such services.

The *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) developed a guide for development planners and policymakers on integrating ecosystem services into development planning. It advocates a step-wise approach, the Six-Step Approach *(www.aboutvalues.net/six-steps)*, through which it is possible to recognize, demonstrate and capture the value of biodiversity and ecosystem services for development planning. The development of the guide was based on the findings of the TEEB study and existing manuals (particularly WRI 2008 and WBSCD 2011) and the practical experience of the GIZ.

We will quickly summarize the main elements of the IES *(Integrating ecosystem services into development planning)* approach. The following overview is largely taken from the information booklet for the IES training (GIZ, 2012 and 2018). The six steps are:

1. Defining the Scope
Step 1 involves undertaking the groundwork that is required to get the IES process started. The main tasks are: defining the objective(s), outlining the scope of work and identifying main stakeholders to be involved. At the end of Step 1, the design and next steps in the IES process should be defined, including the division of tasks and responsibilities. The availability of the necessary human and financial resources and other inputs should also be clarified as far as possible.

2. Screening and Prioritizing
Step 2 helps prioritize the most relevant ecosystem services that are related with the development plan. At the end of Step 2 priority ecosystem services will have been identified. The main task is to screen the development plan so as to identify risks and opportunities related with the impacts and dependence of different development activities on ecosystem services and the key beneficiaries or affected stakeholders.

3. Identifying conditions, trends and trade-offs
Step 3 looks at the cause-and-effect relationships that operate between ecosystem services and the development plan. The status and main trends in the supply and demand for ecosystem services are analysed. Drivers of ecosystem change and key stakeholders are also identified. A particular concern is to identify where there may be synergies and trade-offs between the between different groups, goals or services.

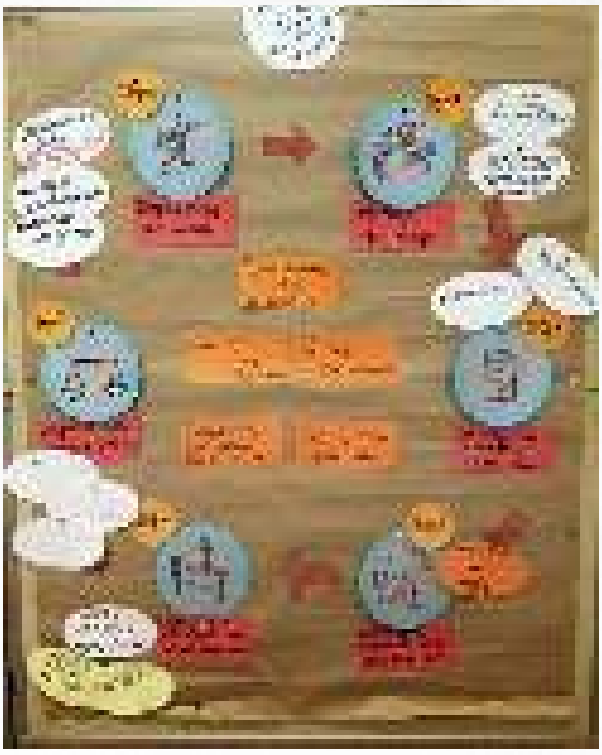
4. Appraising the cultural and institutional framework
Step 4 complements the information that has been gathered in Step 3. It appraises institutional, policy, legal and cultural characteristics, and identifies the resulting incentive structures in relation to ecosystem services and the development plan. These factors mediate and influence how people manage, use and impact on ecosystems and their services, and may act as drivers of either positive or negative ecosystem change.

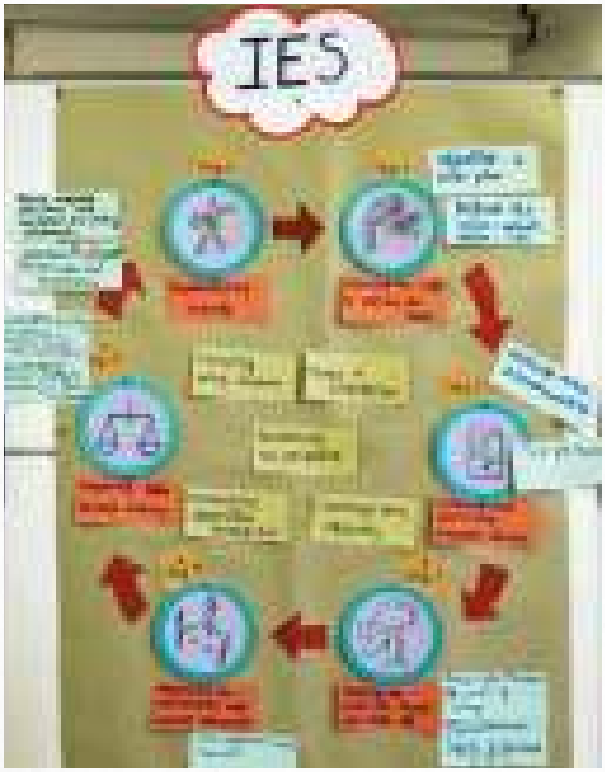
5. Preparing for better decision-making
Step 5 summarises and analyses the information that has been gathered in the previous steps. Based on this information, risks and opportunities for the development plan are investigated. It suggests policy options which can serve to maintain or increase the flow of ecosystem services, and identifies suitable entry-points for guiding or influencing decision-making.

6. Implementing change
Step 6 involves developing a strategy to operationalise the policy recommendations generated in step 5. It involves preparing a work plan, as well as a stakeholder engagement and communication strategy for the implementation of concrete measures to integrate ecosystem services into the development plan.

The purpose of the IES approach is to recognize linkages between ecosystem services and development and to provide tools and mechanisms to better integrate ecosystem services into development planning. The IES approach can serve as an orientation to guide and structure the ESAV process. It tries to simplify complexity and give a general overview of what is required in order to identify, assess, value and integrate ecosystem services into policy and decision-making. The new training course *Principles of Ecosystem Services Assessments for Policy Impacts* delves deeper in the different IES Steps, particularly the first three steps, and provides an overview of elements, methods, tools and tips for ESAVs in specific policy frameworks. The training also stresses the importance of active communication and addresses how assessments should be designed, implemented and used in order to support policies and decisions to integrate ecosystem services into policy practice and planning measures.

6.1.2 Visualization examples for exercise 0





6.2 ECOSYSTEMS AND ASSESSMENTS

Objective

- Clarify the terms ecosystem, ecosystem services, ecosystem services assessment and valuation.
- Set the stage for ES assessments and valuations.
- Bring all participants on the same level of knowledge about underlying concepts.

EXERCISE – ECOSYSTEMS AND ASSESSMENTS						
Time consideration (min)	Presentation	Reading Time	Group Work	Presentation of Results	Discussion	Total
	~30	0	0	~30		~60

Overview	• **PPT: Module 0 – Refresh Basic Framework and Concepts**
	  • **PPT 0.2** Ecosystems and Assessments
	
	• **Exercise 1:** Ecosystems and Assessments
	
	• **Content:**
	  - Highlight and understand basic concepts (biodiversity, ecosystem services, assessments, valuation, ...).
	  - Understand the links between ecosystem services and biodiversity, the connection between biodiversity and human well-being, and the links between biodiversity and social/economic development.
	  - Set the stage for ESAV.					

Preparation	• Presentation. • Prepare a flip chart to note important aspects of the discussion. • Handouts for participants: exercise 1 (Ecosystems and Assessments). • Exercise 1 can be undertaken through a plenary discussion (alternative 1) or an exercise (alternative 2). • Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.					
Materials	**Alternative 1 (plenary discussion):** • Handouts for participants: exercise 1 (Ecosystems and Assessments). • 1 flip chart, 1 piece of flip-chart paper, 1-2 boards, 1-2 pieces of cards in different colours, markers, pins. **Alternative 2 (exercise):** • Handouts for participants: exercise 1 (Ecosystems and Assessments). • Four sheets of paper with the four different basic concepts (ecosystems, ecosystem services, ecosystem services assessments and valuations). • Four flip chart sheets and markers.					

Handouts	**Alternative 1 (plenary discussion):** · Handouts for participants: exercise 1 (Ecosystems and Assessments) **Alternative 2 (exercise):** Hand a sheet of paper with the four different basic concepts (ecosystems, ecosystem services, ecosystem services assessments and valuations) to each of the four working groups. Also, distribute flip charts, cards and markers to the groups to visually represent their group's work. After the exercise, also distribute the handout of exercise 1 (Ecosystems and Assessments).
Methods	**Alternative 1 (plenary discussion)** Question and answer session regarding the concepts: ecosystems, ecosystem services, ecosystem services assessments and valuations. *Instructions:* Distribute the exercise 1 printouts, and give participants around 5 minutes to think of their answers. Next, encourage a plenary discussion for each one of the answers. Answers can be discussed and reinforced with the use of the slides of the presentation PPT 0.2. *Recommendations for the discussion:* Make sure to highlight the importance of ecosystems for human well-being, and how ecosystems are continually influenced by humans and their activities. Also, make sure participants understand why ecosystem services could be assessed and valued. Give approximately 5 minutes of discussion for each question or aspect. You can use some slides on these topics to illustrate or you can write the most relevant aspects of the discussion on flip charts and then hang them up on the walls so that these terms are visible to everybody throughout the training. **Alternative 2 (group work)** Optional exercise to review the basic concepts. Before starting the exercise, quickly explain the objectives and the instructions. Give some time for clarification questions. *Objectives:* a) clarify the terms ecosystems, ES, ES assessments and ES valuation; b) set the stage for ES assessment and valuation; and c) bring all participants up to the same level of knowledge about underlying concepts. *Instructions:* Ask the participants to make 4 groups, mixing the participants who have taken the IES training and those who haven't. Each one of the four groups will receive a sheet of paper with one of the four concepts (ecosystem, ES, ES assessments and ES valuation) and its definition. They must read the definition in the group and make a drawing or a scheme that represents the concept. They should also select a person from the work group who will present the results in plenary. *Recommendations for running the exercise.* When applying the optional exercise on basic concepts it is recommended not to give the presentation PPT 0.2. In any case, consider using the slides of the presentation to reinforce information and concepts that participants have not discussed in the presentation of their results, for example, the classification of ecosystem services, or the ecosystem services cascade, etc.

Presentation of results	**Alternative 1 (plenary discussion):** None **Alternative 2 (exercise):** As each group presents its drawings or schemes, make sure to reinforce the definition of each concept. You can support additional characteristics and elements of each concept with the slides on the presentation (for example, after the participants present the concept of ES, you can provide more information by explaining its relation to well-being and its classification with the charts and figures in the slides).
Reflection	· Open discussion in plenary. · Encourage participants to contribute with their knowledge to the discussion. · Write important points, ideas, and questions on flip charts or on cards. · As a trainer, use the exemplary answers of the exercise to encourage discussion on different results and to ask questions that have not been raised during the reflection. **Possible guiding questions for reflection:** · Have you had prior working experience with ecosystem services? · What are some advantages and disadvantages when working with the concept of ES? · When do you think an ecosystem service assessment and valuation should be undertaken, and when would it not be necessary? · What do you think is the main asset that ecosystem service assessments and valuations can provide? What would you say is their most important attribute?
Key messages	· Ecosystems are areas or spaces where living organisms and the non-living environment interact in complex and dynamic ways. · Ecosystem functions are the result of these interactions which become services when they provide benefits to society. · Ecosystem services provide a range of benefits for humans, but their benefits (value) is usually not considered in decision-making. · Clarify the differences between assessment and valuation of ecosystem services. - An ecosystem services assessment is a scientific exercise, as well as a social process, through which the findings of science concerning the causes of change to ecosystems and ecosystem services, the consequences of these changes for human well-being, and the management and policy options, are brought to bear on decision-makers (adapted from MEA). - An ecosystem service valuation is *the process of expressing a value (or importance) for a particular good or service in a certain context, usually in terms of something that can be counted (often money), but also through methods and measures from other disciplines (sociology, ecology, etc.).* (TEEB) · Assessing and valuing ecosystem services is a helpful tool to better highlight and understand the importance of ecosystem services for economic and social development of a society living in or near the ecosystems in question.

6.2.1 Ecosystems and Assessments (Theoretical Input)

At this stage, we will take a step back and quickly define a number of terms related to ecosystem service assessments. First, and most importantly, we will have to clarify what an ecosystem actually is. In a nutshell, an ecosystem is a *dynamic complex of plant, animal, and microorganism communities and their non-living environment interacting as a functional unit* (MEA, 2005). Ecosystems can relate to many different scales. Even a small puddle of water in a garden can be an ecosystem. Essentially, an ecosystem encompasses a certain area in which many different organisms live, and these organisms interact with each other and their environment. Ecosystems can be terrestrial or aquatic or have elements of both. As a result of these interactions, a certain biophysical structure is generated. This structure can be understood as an existing component of an ecosystem, such as the vegetation cover, amount of water reserves or the amount of primary production. These biophysical properties then allow for specific ecosystem processes and functions to take place. Ecosystem functions can be defined as the biological, geochemical and physical processes occurring in an ecosystem and interacting with each other and with those processes of other ecosystems. Ecosystem functions are thus the result of specific ecosystem interactions based on various ecosystem processes. An example of an ecosystem function would be the retention of water, the production and maintenance of soil nutrients or pollination.

Ultimately, the existence of ecosystem functions is required for services to be generated. Services were defined in the TEEB study (2010) as the *direct and indirect contributions of ecosystems to human well-being*. A service is the direct link between ecosystems and biodiversity on the one hand, and human well-being on the other hand. It should be noted here that ecosystem services can be divided into four different categories, as was determined in the MEA (2005) and the TEEB study (2010).

These categories are:

- **Provisioning Services**
- **Regulating Services**
- **Cultural Services**
- **Supporting or Habitat Services**

Provisioning Services are goods and services which are of direct use for humans. Examples include the provision of food, water or raw materials. Regulating services are those services that are of an indirect use to humans. These services regulate and maintain important functions that provide a benefit to society but are less tangible than provisioning services. Examples include water regulation, erosion control, pollination or climate regulation. Cultural services are closely linked to a culturé s appreciation of nature, are usually non-materialistic and can include aspects such as recreation, awareness and spirituality related to nature or undisturbed places. Supporting or Habitat services are so-called *life-support* systems that are needed if an ecosystem is to preserve itself and its functionality over a long period of time. Examples here are the formation of soil, nutrient cycling and species habitat. The term *Supporting services* was coined by the MEA (2005), whereas *Habitat services* are used in the TEEB study (2010). While habitat and supporting services are largely synonymous, a distinction between the two is that habitat services can be seen as a subset of supporting services. They derive their importance through providing benefits in terms of nursery services (habitats for species) and gene-pool protection (genetic diversity).

Ultimately, all benefits that humans receive from ecosystems, directly or indirectly, can be placed into one of the four categories. On the next page is an overview of some ecosystem services that can be commonly provided by any given ecosystem to a greater or lesser extent. Keep in mind that this list can differ based on what kind of ecosystem is examined.

ECOSYSTEM SERVICE	DESCRIPTION OF SERVICE
PROVISIONING SERVICES	PROVISION OF…
Presentation of results	agricultural crops, fish, game, wild food
Raw Materials	lumber, fertilizer, fuel wood, wool, fodder, organic matter, skins, biofuels, plant oils
Fresh Water	water for irrigation or for domestic and industrial purposes
Medicinal Resources	medicinal plants, raw material for pharmaceutical use
Genetic Resources	genes for crop improvement genes, genetic vitality of cultivated or wild plants and animals
Ornamental Resources	handcrafts, decoration, souvenirs

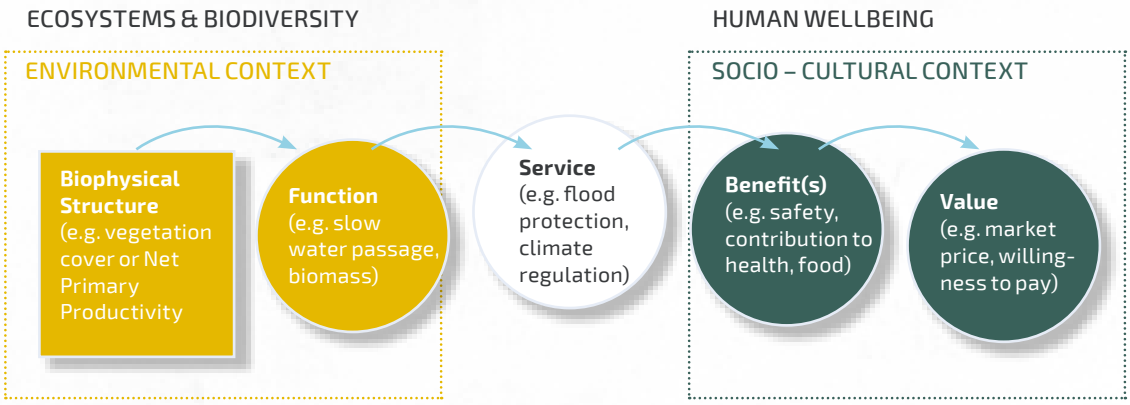
REGULATING SERVICES	REGULATION OF…
Climate Regulation	atmospheric processes, weather patterns, micro-climate, greenhouse gases, temperature, precipitation
Air Quality Regulation	air pollutants, chemical composition of air, dust particles
Carbon Sequestration and Storage	CO_2 concentration in the atmosphere, amount of carbon stored in plants and trees
Moderation of Extreme Events	landslides, flooding, fires, droughts, storm
Waste-Water Treatment	waste removal, pollution
Erosion Control	soil retention, land degradation
Maintenance of Nutrient Cycling and Soil Fertility	transport, storage, recycling, availability of nutrients
Water Regulation Ability	runoff, water resources, water storage capacity
Pollination	pollinator abundance, pollinator effectiveness, pollinator distribution

CULTURAL SERVICES	INFLUENCE ON…
Ecotourism and Recreational Value	tourism, leisure time, sports, hunting, fishing, hiking, physical and mental health
Aesthetic and Spiritual Value	aesthetic enjoyment, cultural- and religious heritage, sense of belonging, motivation
Cultural Diversity and Social Relations	social diversity , accepted values and norms , interactions within society
Inspirational Value	Art, folklore, architecture
Educational Value	formal and informal education
Knowledge Systems	types, use, transmission, retention, maintenance of knowledge

HABITAT SERVICES	PROVISION OF…
Nursery Service	habitat suited for lifecycle of animals and plants
Maintenance of Genetic Diversity	genetic diversity

Each ecosystem service has some benefit for humans. This benefit can be direct (e.g. extraction of water) or indirect (improved health through cleaner water) and can be of a use (e.g. selling timber for monetary profits) or non-use (e.g. appreciating that a certain species exists) value. This fact already implies the importance, and difficulty, of assessing and valuing ecosystem services, which we will address in greater detail shortly. The figure below represents a visual summary of what has been discussed so far:

CASCADE FRAMEWORK LINKING ECOSYSTEMS AND HUMAN WELL-BEING



(Source: adapted from Haines-Young and Potschin, 2010).

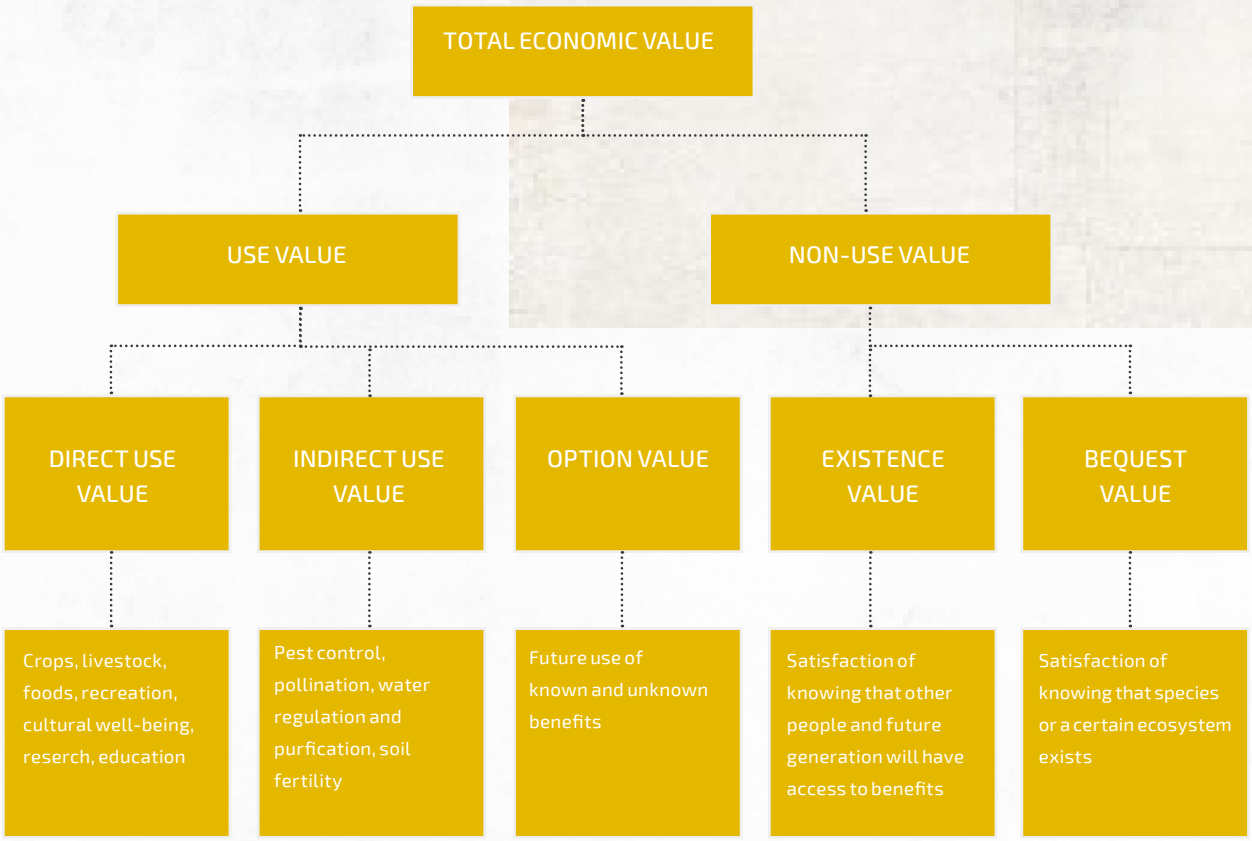
In a nutshell, the biophysical structure of an ecosystem (elements, structures and processes) generates functions that in turn become services when they provide benefits to society in one way or another. The benefits that people get from ecosystems are socio-economically important, and therefore are valuable (not only monetarily).

As mentioned before, the mainstreaming of ecosystem services has paved the way for *ecosystem service assessments* (ESA) as the building block for examining the current state and future trends of ecosystem services. The MEA (2005) defines ecosystem service assessments as *a social process through which the findings of science concerning the causes of ecosystem and ecosystem service change, their consequences for human well-being, and management and policy options, are brought to bear on the needs of decision-makers.* Ecosystem service valuation, in contrast, refers to the process of expressing a value of a particular good or service usually in terms of something that can be counted, such as money, but also via other measurements from other disciplines, such as anthropology, sociology or ecology *(www.teebweb.org).* Both methods aim to assess and examine the state, trends and trade-offs of ecosystems and their services, and how they benefit or affect users in different ways. The difference lies in that while an ES assessment provides a holistic view of ecosystem services, focusing primarily on the interplay of different processes and functions and their connections with society, an ES valuation places values on those processes and functions, generating data to determine the relative social costs and benefits of services. Throughout this manual we will be using the term ESAV *(Ecosystem Service Assessment and Valuation)*, since the tools, methods, tips and hints for integrating ES analysis into decision-making apply to both assessments and valuations. Both methods should provide useful tools for decision-makers (on all levels) to make informed decisions (de Groot et al., 2010).

The assessment of ecosystems is generally conducted in an integrated way, whereby social and natural sciences are combined to examine the state of a given ecosystem and determine the effects on and impacts of socio-economic dynamics. As such, ESAVs should act as a bridge between socio-economic development on the one hand, and environmental sustainability on the other hand, and should help to identify key relationships between the two. ESAVs can be carried out in many different ways, and essentially their results rely to a large extent on the scope, employed methods and target audiences.

The benefits of ecosystem services differ spatially, temporally, economically and socially. Valuing ecosystem services is therefore an important tool to better highlight the importance of ecosystems for humans (TEEB, 2010, Chapter 5). A value can exist in many different forms and is made up of different components. Values are closely connected to preferences and actorś perspectives, but also to the relative position that actors have in society regarding their roles, functions and possibilities. Valuations are subjective exercises, since the preferences of those conducting a valuation or assessment may be different to those who depend on or impact ES, or to those who may commission a study. The values that different actors give to certain things are always related to a given cultural setting, a political and social system where such actors interact, and are therefore related to a specific place and moment. Essentially, value can be expressed as the importance that an individual or a group of individuals places on something. Thus, it is more than just *economic worth*, which many might first think of when they hear the word *value*. While the price of an item is an indicator of its value, the real value of an item is certainly made up of more than just the price and includes social and personal preferences, perspectives and priorities.

Total economic value as a concept refers to the value that people derive from an environmental asset. It includes different measures of value, which are related to the use or non-use of a particular environmental good or service. The graph at right shows the different types of values included in the concept of *total economic value.*



- **Direct Use Value:** A value that results out of the direct utilization of a service. An example would be the selling of timber at market price, or the extraction of water for drinking or irrigation purposes.

- **Indirect Use Value:** A value that results out of the positive externalities of a service. An example would be that a farmer would benefit from bees pollinating orchards and thus harvest yields would increase.

- **Option Value:** A value that results out of the possibility of using a service in the future. An example would be the existence of plants, organisms or minerals that might serve an important function in the future.

- **Existence Value:** A value that results out of the existence of a service or ecosystem. An example would be the existence of a specific animal species and the appreciation that humans have for it, simply because it exists.

- **Bequest Value:** A value that results from the benefits that future generations may obtain from a service. An example would be the ability of trees to store CO_2 from the atmosphere and thereby reduce the effects of climate change in the future.

Of these, the most common (and perhaps most tangible) form of value is the direct use value, which is generally expressed in terms of monetary benefits. Showing *how much* a bundle of ecosystem services is worth in monetary terms (and therefore how much an entire ecosystem could be worth) could be immensely helpful when deciding on land management activities or in choosing between different development options. Many studies have focused on valuing provisioning services, as these are generally the most tangible and easy to (monetarily) quantify. Provisioning services usually have a market value (e.g. price for timber, price for food, price for minerals), and thus their monetary value can be easily determined. However, only quantifying provisioning services in monetary terms means that the benefits of regulating, cultural and habitat/supporting services are not necessarily accounted for, and thus

the value assigned to an ecosystem may be *too low*. Hence, an ideal economic valuation of an ecosystem should also capture the value of these other services. This, however, is difficult to do, as most non-provisioning services (particularly regulating and cultural services) do not have a market value. ESAVs have been criticized in the past for attempting to capture the monetary value of non-provisioning services, as the methods used were perceived as producing unreliable results. Nonetheless, robust methods that can approximate the value of non-marketable services do exist. Common valuation methods include:

- **Direct market methods:** assigns value to an ecosystem service by examining market prices for those goods and services or close substitutes. Usually used to value provisioning services.
- **Hedonic pricing methods:** Estimates economic value by using, for instance, housing prices based on proximity to or availability of different natural amenities.
- **Travel cost methods:** Estimates economic value by examining how much money was spent by tourists to travel to an area in order to enjoy an ecosystem service (usually recreational/aesthetic services).
- **Stated preference methods:** Estimates economic value by asking people about their willingness to pay for an ecosystem service or a bundle of services.

A number of other methods exist and each can be used to place an economic value on ecosystem services that do not have a market value. These methods, however, are not undisputed, as many think that trying to put a price tag on, for instance, the inspiration that people get from nature, is impossible and thus imprecise, or that the methods themselves are not accurate enough (e.g. Sagoff, 2008; Goméz-Baggethun and Ruiz-Pérez, 2011). Nonetheless, by doing so, the results of such approximation efforts may provide decision-makers with a more comprehensive information base, which could prove helpful in conducting cost-benefit analysis — even if the value of some services can only be expressed as estimates. Valuing ecosystem services, if done well, could provide decision-makers with additional information to make an informed decision (Schröter et al., 2014). For more detailed information on the various economic valuation methods, please refer to the ValuES methods inventory *(www.aboutvalues.net/method_database).*

6.3 EXERCISE 1 (PLENARY DISCUSSION): ECOSYSTEMS AND ASSESSMENTS

Participate in a plenary discussion regarding the following questions:

1. What is an ecosystem?

What do you think are the defining elements of an ecosystem?

2. What are ecosystem services?

Think about the difference between a service and a function. What do you think is the main purpose of ecosystem services and how are they related to human activities and human well-being?

3. What is an ecosystem service assessment?

Name some of the crucial elements and objectives of an ecosystem service assessment.

4. What is an ecosystem service valuation?

Consider the concept of "values" and think of monetary and non-monetary values. Why do you think is it important to value ecosystem services?

5. What is the difference between an ecosystem service assessment and an ecosystem service valuation?

In your own words, what do you think is the main difference between an ecosystem service assessment and valuation? How are the two related to each other and in what way do they differ?

6.3.1 Exemplary answers for Exercise 1 (plenary discussion): Ecosystems and assessments

1. What is an ecosystem?

A dynamic complex of plant, animal, and micro-organism communities and their non-living environment, interacting as a functional unit (Millennium Ecosystem Assessment, 2005).

Examples: A forest, a wetland, a rainforest, a pond.

2. What are ecosystem services?

The direct and indirect contributions of ecosystems to human well-being (The Economics of Ecosystems and Biodiversity, 2010).

Examples: Timber that can be extracted and sold on the market, fresh water flowing from the mountains, pollination, protection against extreme events.

3. What is an ecosystem service assessment?

A scientific exercise, but also a social process, through which the findings of science concerning the causes of ecosystem and ecosystem service change, their consequences for human well-being, and management and policy options, are brought to bear on the needs of decision-makers (adapted from Millennium Ecosystem Assessment, 2005).

4. What is an ecosystem service valuation?

The process of expressing a value for a particular good or service in a certain context, usually in terms of something that can be counted (often money), but also through methods and measures from other disciplines (sociology, ecology, biology, etc.).
(The Economics of Ecosystems and Biodiversity, 2010).

5. What is the difference between an ecosystem service assessment and its valuation?

Both aim to assess and examine the state, trends and trade-offs of ecosystems and their services, and how they benefit or affect users in different ways. They seek to link providers and users and can provide information for decision-making.

While an ES assessment provides a holistic view of ecosystem services, focusing primarily on the interplay of different processes and functions, an ES valuation places values on those processes and functions, generating data to determine the relative social costs and benefits of services. *Ecosystem Service Assessment and Valuation* (ESAV) is a holistic term that includes all types of assessments, from biophysical to social to economic valuation.

7

MODULE 1 – MAIN CHARACTERISTICS OF ECOSYSTEM SERVICES

7.1 MAIN CHARACTERISTICS OF ES AND CHALLENGES

Objectives

- Understand main characteristics of ES.
- Understand assessment and management challenges derived from ES characteristics.
- Reflect about possible ways to overcome such challenges.
- Understand that the selection of the most appropriate ES classification depends on the context (time, space, social, economic, political).

EXERCISE – MAIN CHARACTERISTICS OF ES AND CHALLENGES						
Time consideration (min)	Presentation PPT1	Reading Time	Group Work	Presentation of Results	Discussion	Total
	~45	5	20	30		~100

Overview	• **Module 1 – Main Characteristics of Ecosystem Services**
	  • **PPT 1.1** Main Characteristics of ES and Challenges
	
	• **Exercise 2:**
	  • Main Characteristics of ES and Challenges
	  • Show figure of Fisher et al. (2009) → Spatial Dynamics
	  • Exercise objectives
	  • Time frame for this exercise
	  • Explain the task to participants
	
	• **Content:**
	  - Ecosystem services as a cross-sectoral issue.
	  - Spatial and Temporal Dynamics
	  - Aspects of Public vs. Private Goods and Services
	  - Benefit Dependence and Multiple Benefits/Impacts
	  - Complexities and Challenges					

Preparation	• Presentation. • Write the exercise objectives and questions on a flip chart. • Prepare a flip chart to write down important and interesting notions that are raised in the discussion. • Handouts for participants: exercise 2 (main characteristics of ES and challenges) and list of ecosystem services with a short description of each service (included in Annex 2). • In a flip chart, draw the *ES spatial dynamics* diagram, and place it in a panel. This will be useful for the presentation of exercise 2 (main characteristics of ES and challenges): as each one of the teams present an example of each spatial dynamic, the trainer can place the cards with their results accordingly. • Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.					

Materials	· 1-2 flip charts, 1-2 pieces of flip-chart paper, cards in different colours, markers, pins. · 1 pin board or flip chart with the *ES spatial dynamics* diagram. · Handouts for participants: exercise 2 (main characteristics of ES and challenges) and list of ecosystem services with a short description of each service (included in Annex 2).
Handouts	· Exercise 2 (main characteristics of ES and challenges). · List of ecosystem services with a short description of each service (included in Annex 2). · Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.
Methods	**Group work** Before starting the exercise, quickly explain the objectives and the instructions. Give some time for clarification questions. *Objectives:* a) understand the basic characteristics of ES; b) understand the assessment and management challenges derived from ES characteristics; c) reflect about possible ways to overcome such challenges; and d) understand that the selection of the most appropriate ES classification depends on the context (time, space, social, economic, political). *Instructions:* Ask the participants to make 3-4 groups, mixing the participants who have taken the IES training and those who haven't. Then, give the instructions to the exercise. *Recommendations for running the exercise.* The exercise can be done either at the end of the theoretical inputs on ES characteristics or straight after presenting the matrix on spatial dynamics (PPT 1.1 Main Characteristics of ES and Challenges). In the second case, leave results visible throughout the rest of the theoretical input session and add to these at the end with comments from the final discussion that you may write on a flip chart. Depending on the time available, you can do this exercise as a brainstorm or using cards and placing them next to the *ES spatial dynamics* diagram on a pin board. When giving the introductory presentation on the exercise, make sure to mention how ecosystem services provide benefits in different ways and for different beneficiaries. During the exercise, keep in mind that many participants have probably already worked or dealt with ecosystem services. Be sure to explain any questions that participants may have regarding definitions of ecosystem services.
Presentation of results	As each group presents their answers, place their cards on the flip chart with the *ES spatial dynamics* chart accordingly.

Reflection	· Open discussion in plenary. · Encourage participants to contribute with their knowledge to the discussion. · Write important points, ideas, and questions on flip charts or on cards. · As a trainer, use the exemplary answers of the exercise to encourage discussion on different results and to ask questions that have not been raised during the reflection. **Possible guiding questions for reflection:** · What kind of management challenges are you familiar with or could you identify with regard to the four spatial dynamics? · How did you overcome such challenges? · Which of the four spatial dynamics would you say is the most difficult to manage when it comes to decision-making? · How would you attempt to control and regulate the service flow for each of the four spatial dynamics? · Have you faced other challenges related to the other characteristics of ES (temporal mismatch, aspects of rivalry and excludability in goods and services, multiple benefits, multiple impacts and benefit dependence)? · How did you overcome such challenges?
Key messages	· Ecosystem services are heterogeneous and operate on different scales. Some services provide benefits in a different area than where they are produced. · Some services can be identified on multiple scales. · Ecosystem services change spatially in three ways: · Biophysical processes change across a landscape or seascape · Benefit and beneficiaries change across a landscape or seascape · Cost of provision can change across a landscape or seascape · Ecosystem services are dynamic and change over time because of three reasons: · Ecological conditions and processes change over time. · Societal preferences and needs change over time. · Individuals prefer benefits to be provided sooner than later. · Complexity regarding how ecosystem services and their benefits fit into the concept of public-private goods is related to societal decisions regarding their use, ownership and an awareness about their importance. · In some cases, joint ecosystem services can provide final ecosystem services. The beneficiaries of such ecosystem services can change depending on their use. · Ecosystem services are often connected to each other; a change in one service can result in changes in another service · Characteristics of ES are important when thinking about the distribution of benefits and costs, especially if trying to design effective instruments and regulations.

7.1.1 Main Characteristics of ES and Challenges (Theoretical Input)

7.1.1.1 Spatial and Temporal Dynamics

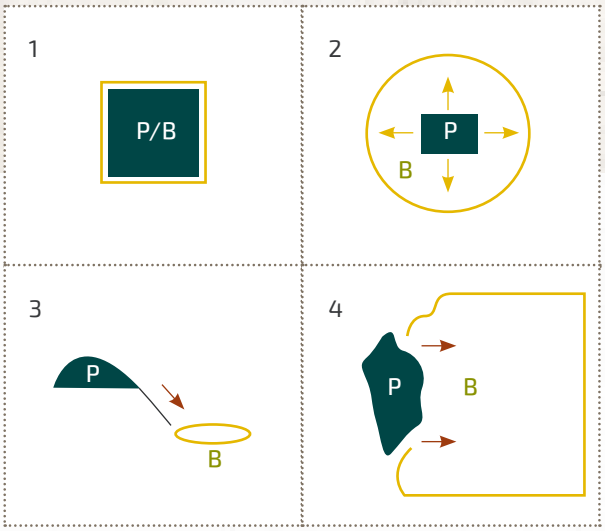
Most ecosystem services are not stationary and reflect a spatial dynamic both in terms of the provision of the service and the enjoyment of benefits. Spatial dynamics reflect the flow of ecosystem services from one point to another and aim to assess how the provision of services and their enjoyment may vary geographically. As such, there are four essential spatial dynamics to consider. These are shown in the figure on the right (Fisher et al., 2009).

In category 1 (top left corner), the provision and benefit occur at the same location. For instance, soil fertility is provided and used at the same location. Category 2 (top right corner) describes a service that is produced in a certain location, but the benefits are gained in a surrounding area or even beyond that area. An example of this would be the storage of CO_2, which changes the atmospheric composition and thus affects regional and global climatic trends. In category 3 (bottom left corner), downstream or downslope users benefit from a service that is provided upslope or upstream. An example would be water that originates in the mountains and then flows into a valley where it can be used for domestic, industrial or agricultural purposes. In category 4 (bottom right corner), a specific area provides a service, which flows in one direction and provides benefits for another area. An example here would be the existence of coastal wetlands, which reduce the impacts of storms and floods for human settlements that lie behind the wetlands.

Following this categorization of Fisher et al. (2009), we can determine that there are three different categories of spatial dynamics:

- In situ (Provision of service and benefit occurring at the same location) (Panel 1)
- Omni-directional (Provision of service in a specific location, but benefit can be enjoyed in a surrounding area) (Panel 2)
- Directional (Provision of service occurs in a specific location and provides a benefit in a specific direction for another location) (Panels 3 and 4)

SPATIAL DYNAMICS OF ECOSYSTEM SERVICES NACH DER GRAFIK:



(Source: Fisher et al., 2009)

Understanding spatial dynamics and knowing which service provides benefits for which area is important to know for land management decisions, as it enables the development of better development and zoning plans. Especially for services that have a *spatial mismatch* (i.e. benefits are enjoyed in a different location from where the service is produced), management decisions can have severe unintended consequences if spatial dynamics are not considered.

Ecosystem services are not only affected by spatial dynamics but by temporal dynamics as well. Some services provide benefits almost immediately (e.g. fresh water, protection against extreme events or pollination), others in a foreseeable timeframe (e.g. food, timber). There are also services that provide long-term benefits, which are not necessarily perceived straight away or in a tangible form (e.g. the maintenance of soil fertility or habitats for species). Furthermore, the quantity of the service that is provided is not always constant. Temporal variations occur in almost all services: the amount of timber that can be harvested can change from year to year; the amount of water that is supplied and stored can be affected by climatic conditions, human interventions and many other aspects. Thus, all ecosystem services are subject to temporal fluctuations. Broadly speaking, there are three primary reasons as to why ecosystem services vary across time (Fisher et al., 2009):

- **Ecological conditions or processes change over time.**

  An expanding forest can absorb more carbon each year, as more trees are growing until a certain threshold is reached and the forest cover remains more or less constant and so does the stored carbon stock. Thus, the future quantity of a service can be determined by its current condition and state.

- **Preferences of societies can change over time**

  Humans, and therefore their societies, are constantly changing. Especially with the addition of new information and knowledge, humans can change their perception, preferences and values of a given service. Before climate change became a hot topic in science and society, the storage of carbon and its sequestration had not been a widely discussed. This has changed, and nowadays there are many efforts and international initiatives (such as REDD+, forest-landscape restoration, reforestation) that aim to improve the carbon storage potential of ecosystems.

- **Humans prefer to have benefits sooner rather than later.**

  Most humans would prefer to receive a benefit now or in the near future, rather than many years from today. That is, the longer we have to wait to enjoy a benefit, the less worth that benefit may be for us in terms of present-day value. Thus, ecosystem services are valued differently today than in the future, which means that the incentives to use it now or in the future will not be the same. This is captured in the concept of discounting, which states that future values should be discounted at a given rate to show their value today.

There is much discussion about the use of discount rates to better represent the benefits (and costs) from the future today (e.g. Farber et al., 2006; Carpenter et al., 2007). For instance, most people would prefer to receive 100 € today rather than in 1 year, as they can theoretically put those 100 € in the bank, spend it now or simply because the world could end in one year. Thus, in order to adequately capture the present day value of the 100 € one year from now, discounting is applied. That means that a certain discount rate would be applied to the 100 € in one year's time, meaning its value today would be slightly lower. A good example would be to use interest rates as a discount rate.

Without going into the mathematics involved, it follows that by applying a given interest rate to the 100 € in one year's time, we can determine its present day value. Assuming, for example, a discount/interest rate of 3 %, the 100 € in one year's time would be worth 97.09 € today, meaning humans would have (theoretically) no clear preference in either choosing to receive 97.09 € today or 100 € in one year's time (since putting 97.09 € into the bank at an interest rate of 3 % would yield them 100 € in one year).

This concept of discounting is also applied for measuring the benefits of ecosystem services. What this means is that by using a positive discount rate, the present day future value of ecosystem services is judged to be lower than their actual value today. What this also means is that future generations are in a less favourable position (since the benefits from services in, say, 50 years are worth *less* to today's society than immediate benefits). The topic of discounting and ecosystem services has become controversial, as the use and choice of discount rates is heavily contested. The reason for the controversy is that many believe that future generations will likely depend more on ecosystem services, as the manufactured production of goods, as well as food is still increasing despite a general decline in ecosystem services. This means that ecosystem services may be less available despite an increasing demand for their benefits. Therefore, there is a debate as to what discount rate should be applied when attempting to value ecosystem services (Gowdy et al., 2010). Some believe that no discount rate should be used, which means that future benefits are just as valuable as todaý s. Others argue for a negative discount for ecosystem services as demand rises and supply declines (meaning that future benefits are worth more), whereas some believe that a positive discount rate is correct, when operating under the assumption that there will always be growth in the long term, as this would mean that future generations would be richer and better equipped to deal with environmental issues.

Keeping the above in mind, it is obvious that human activities can directly tamper with the condition of services and can thus have lasting impacts on the provision of a service over time. To summarize, we have seen that ecosystem services are heterogeneous and vary both in time and space. In order to decide on successful land management activities and interventions, both temporal and spatial dynamics need to be taken into account. It is, however, not necessary to discuss this concept extensively in the context of this

training, but it should be kept in mind for different ecosystem service assessment methods (especially when conducting an ecosystem service valuation, the choice of a discount rate and discount function can have an important effect on the assessment's outcome).

7.1.1.2 Four types of Goods and Services

A further layer of complexity is added if we consider that people will have different ways of accessing or benefitting from ecosystem service flows across a landscape or seascape. This will largely determine both how much people are able to benefit from a given service, to what extent it can be degraded from overuse and how difficult or easy it is to manage. Some people by virtue of, say, not having access to land, may not be able to benefit from a given ecosystem service the same way as others who may have secured access by owning land. So the spatial and temporal biophysical dynamics of ecosystem services have to be understood within a wider, socio-economic context, which largely determines the governance surrounding access and benefit accrual of ecosystem services (Fisher et al., 2009), as well as the risk of degradation. If a good is considered a rival good, it means that the use of it reduces its availability for others. Rival goods are thus being *used* up or are limited to a certain number, whereas non-rival goods do not have a limit (at least not one that could realistically be exceeded). The term excludability refers to the fact that others can be prevented from using the good (either by restricting their access or by the good being used up in advance). The figure below shows a comprehensive overview of these categories. Ostrom´s (1994) classification of environmental goods[4] into high/low subtractability and difficult/easy exclusion is concomitant with this approach.

GOODS AND SERVICES PROVIDED BY ECOSYSTEMS CAN BE CHARACTERIZED AS RIVAL OR NON-RIVAL AND EXCLUDABLE TO NON-EXCLUDABLE.

	Excludable	Non-Excludable
Rival	**Private goods** • Food • Timber • Fish … 	**Common use goods** • Climate stability • Water • Fisheries • Pastures … 
Non-Rival	**Club goods** • National park • Private beach • Game reserve … 	**Public goods** • Oxygen • Mountains /forests / public beach • Public Parks … 

(Source: Adapted from GTZ, 2004)

4 Here we are going to use the terms of goods and services in a synonymous form, since the economic theory often does not consider the current terminology of ecosystem services as proposed by the Millennium Ecosystem Assessment Report (2005), in which there is a distinction between goods and services. Moreover, we will use the terms *excludable/non-excludable and rival/non-rival* as a means of distinguishing among the four different types of goods and services. These terms can be seen as synonymous with Ostrom's classification of goods into high/low subtractability and difficult/easy exclusion (1994). In her book *Rules, games and common-pool resources*, Ostrom highlights that each type differs from the others and that substantial variability exists even within each type.

This classification is important when developing different policy and market instruments for regulating and managing ecosystem services, since the biophysical characteristic of the service will give some orientation as to the inherent level of difficulty in regulating its use and access. Public goods or services, for example, are much more difficult and costly to regulate — if sometimes not close to impossible — than common goods.

Goods that are rival and excludable (i.e. goods that are limited and to which the access of others can be restricted) are called *private goods* (or services). This term could refer to either individual private goods, or also communal goods (whereby communal good is used by more than one individual – not to be confused with *common goods*, which are accessible to everyone but can also be used individually). An example of an ecosystem service that can be classified as a private good could be a fruit orchard located on a private property.

If access to a good cannot be restricted, many public good services are considered non-excludable. This is the case of, for instance, fisheries, which would be considered a common good (rival and non-excludable) if they are open-access fisheries. Similarly, services can be non-rival goods at low usage, but can move towards being rival goods at high usage. An example here would again be fisheries. If only a few fish are harvested, then it would be considered non-rival as there are more than enough fish available. However, if harvest levels rise, then this service could shift towards being a rival good, as different fishers would compete for the same fish and fish populations might not be large enough to cover demand.

Club goods are those services that are non-rival (at least to some extent) but excludable. An example would be a national park: The use of it is (generally speaking) non-rival (I can look and enjoy the scenery just as well as the people before or after me), but the access to it can be restricted (through an entrance fee, for example).

Public goods are those services that are non-rival and non-excludable, and an example would be air or sunshine. The use of the service (breathing of air) does not deplete the resource and others cannot be excluded from enjoying the sun or breathing the air.

We have learned now that ecosystem services often cannot simply be placed into one of the four categories. It often depends on their usage and their geographically limited availability if the service is actually rival/non-rival and excludable/non-excludable. Hence, ecosystem services always fall within a spectrum of these characteristics (Fisher et al., 2009). It is important to understand this concept as it directly relates to management decisions. Regulations and policy instruments can influence certain aspects (for example, regulations on fish harvests can help to reduce overfishing) and can shape an ecosystem service (if a service is considered a public, private, common or club good). It is therefore not only the inherent biophysical characteristics of an ecosystem service that define it, but also the governance and management that can have an influence. Socio-economic development and preference-changes over time can also play an important role in complicating the management of a natural resource (Fisher et al., 2009). It is much easier to regulate a service that is excludable than a service that is non-excludable.

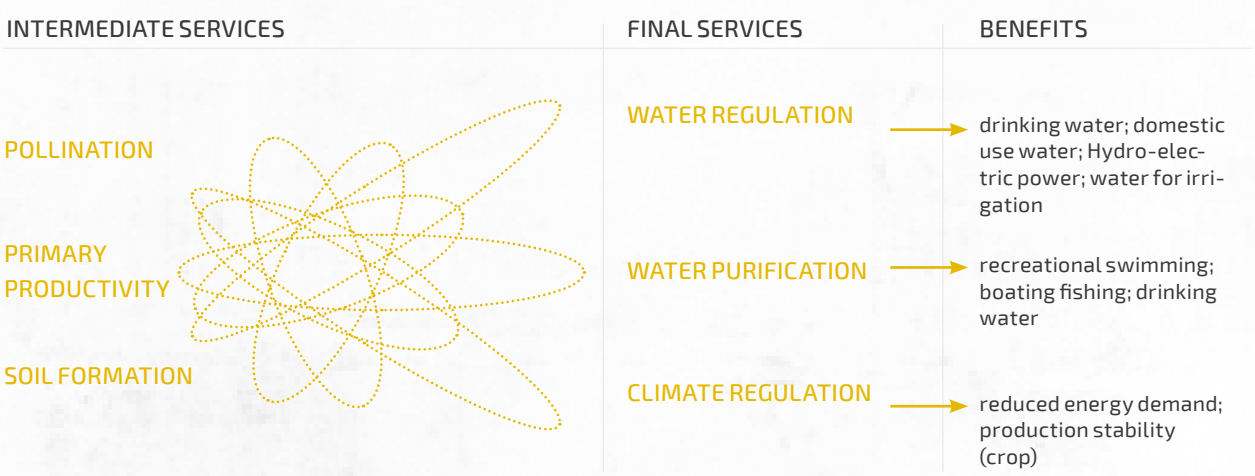
A good example to illustrate how an ecosystem service has changed throughout history, and has now become increasingly difficult to manage, is oceanic fishing. Before widespread industrialization took place in the industry, the capacity of oceans to sustain coastal communities was non-rival, as the fish stocks in the ocean were much too big to be reduced by small-scale fishing. Nowadays however, with millions of industrialized fishing vessels and searching the ocean, many fish have become a rival good, in the sense that its stocks are not large enough to service its demand anymore.

Summing up, the degree to which an ecosystem service can be considered rival/non-rival or excludable/non-excludable is not simply determined by ecological factors. Different social and institutional systems (for instance, government regulations, market dynamics, land use) interact with these services. These social systems are also highly dynamic and complex, and should thus be taken into account when attempting to devise sensible management decisions.

7.1.1.3 Multiple Benefits: Joint Production

In the last section we have determined that ecosystems provide a variety of ecosystem services and that their benefits can be enjoyed by different actors in different locations at different times. At the same time those services provide multiple benefits. Services that behave in this way are termed *joint products* (Daily, 1997) or joint production (Fisher et al., 2009). The figure below serves to illustrate this concept. Services can be placed into two different states: being an intermediate service or a final service. An intermediate service is considered a prerequisite or facilitator for a final service and different intermediate services together can produce a final service. Moreover, an intermediate service can support the provision of different final services. For instance, the maintenance of nutrient cycling enables the provision of food, improves soil fertility and provides nutrients for different animal species. Keep in mind that what is considered a final and intermediate service often depends on human perceptions of the utility of that service.

INTERACTIONS AMONGST SERVERAL INTERMEDIATE SERVICES CAN PRODUCE DIFFERENT FINAL SERVICES.



(Source: Fisher et al., 2009)

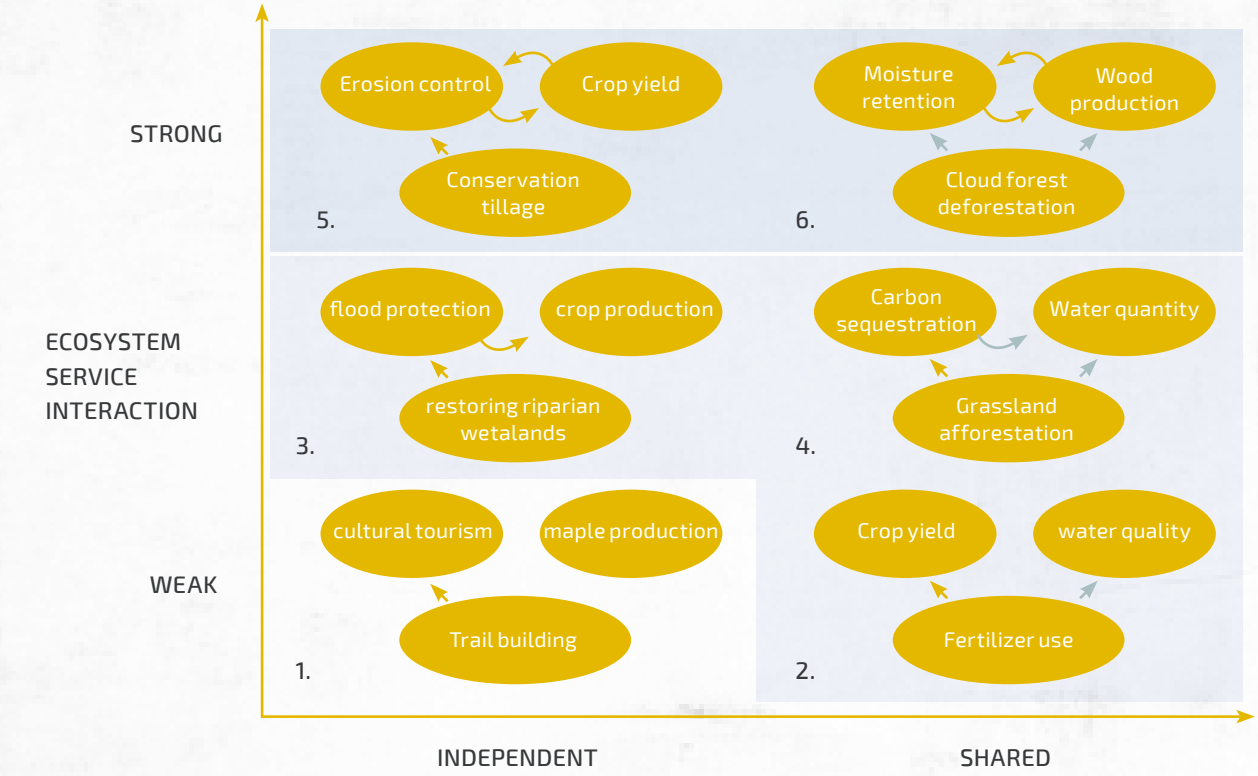
As an example, an ecosystem's ability to regulate and manage water flows improves the supply of water, leading to benefits in the form of drinking water for human settlements and also dependable sources of water from natural storage systems. These differing benefits can generate service-use conflicts, as say, recreational users of a reservoir may be at odds with urban water distribution facilities. Acknowledging that services depend on each other and can yield multiple benefits to different groups of people adds another layer of complexity to management decisions. Accounting and classification schemes can help to address this complexity and can help in the decision-making process (Fisher et al., 2009).

7.1.1.4 Multiple Impacts: Connectivity

Similar to the joint production concept, different socio-economic activities can have an impact on services. The distinction from joint production is that in this case, one (human-made) change can *ripple* through an ecosystem and have different impacts. Essentially, the concept of connectivity expands upon the concept of joint production by highlighting how human-made changes can affect services in different ways. The figure below (Bennett et al., 2009) provides an overview of this concept. Black arrows indicate a positive effect, whereas grey arrows denote a negative effect. The absence of an arrow implies that the activity is unrelated to the provision of a service.

What kind of impact an activity (the driver) has on multiple ecosystem services is shown on the x-axis. On the left side, an activity has an independent impact. Hence, an activity only directly influences one ecosystem service. On the right side, the activity influences different ecosystems (in different ways). The y-axis gives an indication of how strong an interaction between ecosystem services can be. It shows how much a change in a service through an activity affects another service. In sector 3, for example (mid-left box), the driver of change is the restoration of riparian wetlands. This improves the ecosystem's ability to prevent and mitigate floods, which in turn improves the production of crops.

IMPACTS ON AN ECOSYSTEM CAN IMPACT THE PROVISION OF SERVICES DIFFERENTLY



(Source: Bennett et al, 2009).

Key messages to keep in mind are the following:

1. Activities (drivers) impact ecosystem services (either positively or negatively).
2. Ecosystem services are often connected to each other; a change in one service can result in changes in another service.

In sum, it is important to consider that a land management decision can cause an impact on multiple services, and that as ecosystem services are often interconnected, a change in a service can have consequences for other services.

7.1.1.5 Benefit Dependence

Another important concept to grasp in managing ecosystem services is benefit dependence. According to Boyd and Banzhaf (2007), ecosystem services are often determined by the benefits that humans hope to receive from them. Fisher et al. (2009) use the example of water regulation. If the intended benefit is better water quality, then the ecosystem service, water regulation, is directly impacting water quality and would thus be considered a *final service*. If, however, one would like to improve the production of fish, then water regulation (leading to better water quality and thus better living conditions for fish populations) would only be considered an intermediate service, as it does not directly result in higher fish harvests, but rather enables fish populations to grow more easily. Similarly, it is also important to consider the beneficiaries. If fishers are the intended beneficiaries, then the chain would end there, but if consumers were to be considered the beneficiaries, then again the production of more fish would be one of the factors contributing to consumer satisfaction; fish quality and cleanliness (for instance, amount of bacteria and heavy metals found in muscle tissue) would also be important. Thus, the benefits that services provide, and if a service can be considered an intermediate or final service, are often dependent on what is being valued and monitored, and who is considered to be the beneficiary (Fisher et al., 2009).

The role of beneficiaries can be very important for resource management, as different beneficiaries value ecosystems for different reasons (Fisher et al., 2009). Local communities might perceive the production of fuel wood and timber for construction as the most important benefits of a forest, whereas research institutes might value the existence of rare and endemic species. Moreover, intermediate services that enable the provision of other services are often valuable for more than one benefit or more than one beneficiary. An ecosystem's ability to regulate climate will, for example, allow the growing of certain fruits in an area, but at the same time also contribute to the stabilization of the global climate.Mediating between these different benefits and the different perceptions of the value of a service may generate conflicts and render management more complex. Taking into account benefit dependence in ESAVs is important, as it allows to correctly identify all types benefits and allows placing them in a regional, national and global context. This information is important for decision-makers as it enables them to better perceive impacts of management decisions.

7.1.1.6 Complexity

Much of what we have already discussed so far has been related with complexity. We now understand that ecosystem services are affected by spatial and temporal dynamics. Access to ES and the capacity to regulate this access is largely determined by how easy or difficult it is to exclude others from enjoying the service and the extent to which there exists a consumption rivalry. One ecosystem can produce many services from which different benefits can be derived. Ecosystems are connected and drivers can affect more than one service. In other words, ecosystem services are not stationary units that function homogeneously throughout the entire system. The quantity, quality, accessibility and manageability of the service and derived benefits differ throughout spatial and temporal scales. Ecosystems are complex and defined by feedbacks, interactions and time lags within themselves (Limburg et al., 2002). Expanding on this, that, which is at present understood as a service is defined by humans, based on given preferences and information that we have analysed in a specific way. However, there are also services that we cannot clearly define or quantify. While it is possible to measure net primary productivity, it is impossible to correctly measure and determine the amount of waste that an ecosystem absorbs and neutralizes based on its productivity (Fisher et al., 2009). Hence, humans cannot always adequately measure and value a service. For example, in payment for ecosystem service schemes, oftentimes landowners are paid to preserve forests in order to uphold carbon storage. However, as it is not possible to directly measure the amount of carbon that is stored (especially when compared to a scenario where no action would be taken), these payment schemes often have to rely on proxy indicators. In this example, farmers would most likely receive payment based on how many hectares of forest are conserved (Fisher et al., 2009). This may lead to an inaccurate representation of the service.

Similarly, while the necessity of biodiversity is commonly agreed upon to be of vital importance for ecosystem stability and resilience, it is impossible to determine *how much* biodiversity and how many individuals of a given species are needed to uphold a sustainable and effective level of ecosystem service provision. All ecosystems can tolerate a certain amount of species loss, but it is unknown when exactly a threshold value could be reached after which a collapse of the ecosystem could follow (Hooper et al., 2005). Not surprisingly, this threshold also differs between and within ecosystems.

7.1.2 Exercise 2 (group work): Main characteristics of ecosystem services and challenges

* *Supplementary information for exercise 2, a list of ecosystem services is included in Annex 2.*

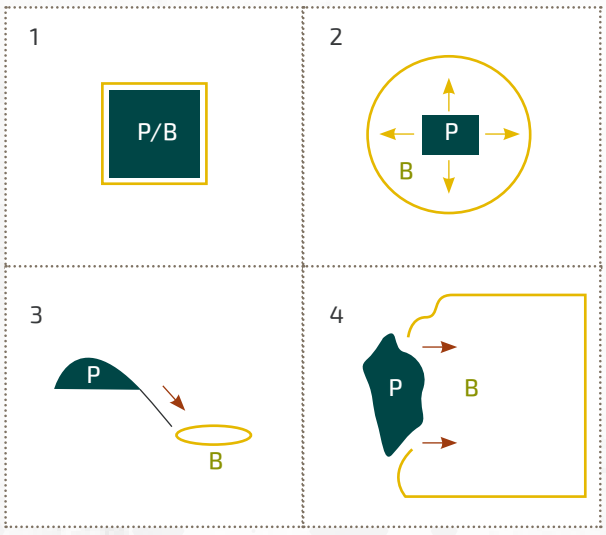
Discuss and answer the following questions within your work group. Select one of the team members to present your findings in plenary.

1. **Identify one real-life example of an ecosystem service (ES) for each of the spatial dynamics shown in the figure below.**

2. **For each example, identify two potential beneficiaries of the provision of the ecosystem service.**

Make use of your own work experience and personal knowledge when answering the questions. Use cards of different colors to write down your answers (one color for ES examples and another one for beneficiaries) and pin them next to each one of the squares.

SPATIAL DYNAMICS OF ECOSYSTEM SERVICES:



(Source: Fisher et al., 2009)

In panel 1, both ES provision and benefit occur at the same location. In panel 2, the ES provision occurs in one place and the benefits are received in the surrounding landscape. Panels 3 and 4 illustrate ES that have specific directional benefits. In panel 3, down slope areas benefit from ES provided in uphill areas, whereas in panel 4, the ES is provided for an outside area, in a specific direction (adapted from Fisher et al. 2009).

7.1.3 Exemplary answers for Exercise 2

PART 1
Provision of service and benefit occur at the same location

- Service
  - Beneficiary

- Raw Materials (e.g. timber, skins, fuel wood)
  - Local communities
  - Large scale industries
- Soil Formation and Retention
  - Local farmers
  - Water Industry
- Biochemicals and Natural Medicines
  - Research and Technology Institutes
  - Large scale industries
- Food Products
  - Farmers
  - Fisheries/fishers
- Ornamental Resources
  - Local communities
  - Tourists
- Maintenance of Nutrient Cycling
  - Farmers
  - Nature conservationists
- Inspirational, Aesthetic and Spiritual Value
  - Local and regional communities
  - Tourists
- Ecotourism and Recreation
  - Local tourist industries
  - Tourists
- Cultural Diversity and Social Relations
  - Local communities
  - Tourists

PART 2
Service provision is radiated out and benefits the surrounding area

- Service
  - Beneficiary

- Genetic Resources
  - Research and Technology Institutes
  - Farmers
- Pollination
  - Agriculture
  - Beekeepers
- Air Quality
  - Local communities
  - Tourists
- Climate Regulation
  - National and global communities
  - Agriculture
- Carbon Sequestration and Storage
  - Regional communities
  - Global communities
- Biological Control
  - Subsistence farmer
  - Nature conservationists
- Cultural Diversity and Social Relations
  - Local communities
  - Tourists
- Knowledge Systems
  - Local and regional communities
  - Youth and future generations
  - Scientists
- Nursery Services (Provision of Habitat)
  - Nature conservationists
  - Research institutes

PART 3
Down slope units benefit from services provided in uphill areas

- Service
  - Beneficiary

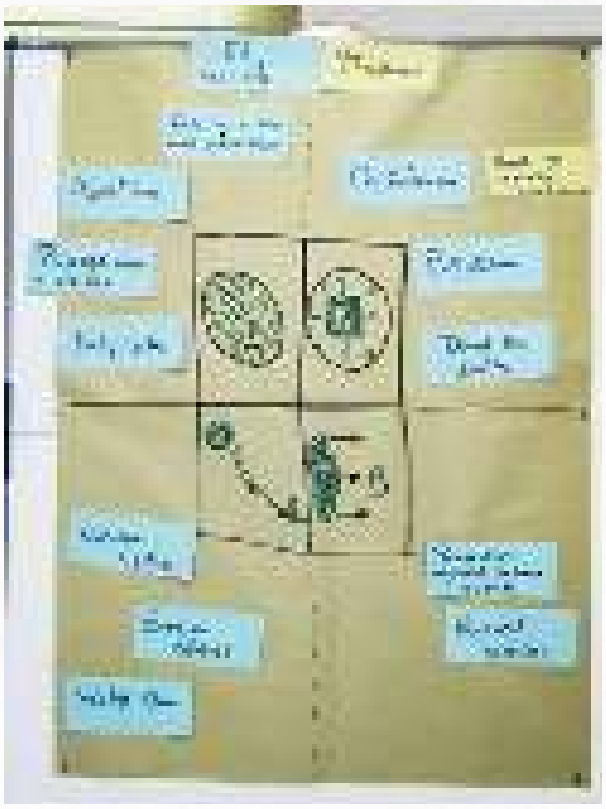
- Water Regulation
  - Municipality
  - Local communities
- Provision of Fresh Water
  - Municipality
  - Industries
- Waste-Water Treatment
  - Local communities
  - Industries
- Erosion Control
  - Landowners
  - Farmers·

PART 3
Service provision units provides a service for an area based on a specific direction

- Service
  - Beneficiary

- Moderation of Extreme Events by coastal wetlands
  - Farmers and industries
  - Human settlements
- Waste-Water Treatment (e.g. wetlands)
  - Local communities
  - Nature conservationists
  - Urban dwellers
- Habitat (cosatal and marine ecosystems
  - Local fishers

7.1.4 Visualization examples for Exercise 2



7.2 TRADE OFFS

Objectives

- Understand the meaning and importance of trade-offs.
- Learn how to identify different types of trade-offs.
- Understand socio-economic implications of trade-offs for different actors.
- Identify possible instruments and mechanisms to minimize adverse effects of trade-offs.

EXERCISE – TRADE-OFFS						
Time consideration (min)	Presentation	Reading Time	Group Work	Presentation of Results	Discussion	Total
	~25	10	40	50		~125

Overview	• **Module 1 – Main Characteristics of Ecosystem Services**
	  • **PPT 1.2** Trade-offs
	
	• **Exercise 3:** Trade-offs
	  • Exercise objectives
	  • Time frame for this exercise
	  • Explain the task to participants
	
	• **Content:**
	  - Definition of trade-offs
	  - Importance of trade-offs
	  - Different types of trade-offs
	  - Synergies vs trade-offs					

Preparation	• Presentation • Write the exercise objectives and questions on a flip chart. • Prepare a flip chart to write down important and interesting notions that are raised in the discussion. • Handouts for participants: exercise 3 (trade-offs). • Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.					
Materials	• 1-2 flip charts, 1-2 pieces of flip-chart paper, cards in different colours, markers, pins. • 1 pin board • Handouts for participants: exercise 3 (trade-offs).					
Handouts	• Handouts for participants: exercise 3 (trade-offs). • Distribute cards and markers for groups to take notes and visually represent their group work.					

Methods	**Group work** Before starting the exercise, quickly explain the objectives and the instructions. Give some time for clarification questions. *Objectives:* a) Understand the meaning and importance of trade-offs; b) learn how to identify types of trade-offs; c) understand socio-economic implications of trade-offs for different actors; and d) identify possible instruments and mechanisms to minimize adverse effects of trade-offs. *Instructions:* Ask the participants to make 3-4 groups, mixing the participants who have taken the IES training and those who have not. *Recommendations for running exercise.* In case there is limited time in the agenda, exercise 3 (trade-offs) can be solved in plenary instead of working groups. After going through the objectives of the exercise and allowing the participants to read the questions, go through the answers in plenary. Ask the other trainer to help you writing down and organizing the results in a panel or flip chart.
Presentation of results	Each group must choose a participant to present their group work in plenary. After presentation, other groups can ask questions and provide feedback.
Reflection	· Open discussion in plenary. · Encourage participants to contribute with their knowledge to the discussion. · Write important points, ideas, and questions on flip charts or on cards. · As a trainer, use the exemplary answers of the exercise to encourage discussion on different results and to make questions that has not been raised during the reflection. **Possible guiding questions for reflection:** · Can you describe an example of trade-off you have experienced in your own work? · Can you think of ways to compensate those who *lose* in a trade-off scenario without compromising the winners? · What is required to be able to *manage* trade-offs? · What steps do you think are required in identifying possible win-win scenarios? · What other challenges can you think of when addressing trade-offs (think about rival and non-rival goods and excludability and non-excludability)?

Key messages	· Ecosystem service trade-offs are the consequence of management choices made by people, which can change the provision of many ecosystem services. Trade-offs occur when a choice is made that involves losing some quality or quantity of one ES in return for gaining another ES's quality or quantity. · Trade-offs have an impact on current and future provision of ES, and therefore in development and well-being. Identifying trade-offs provide information on which incentives and decisions need to change in order to decrease ES impacts. · Trade-offs can be spatial (choosing a bundle of ES in one area affects the provision of ES in the same area), temporal (enjoying a set of ES today may jeopardize their availability in the future) and between ecosystem services, and they generate different costs/benefits for various stakeholders. · Trade-offs can be reduced through different land uses and management practices that consider more than one ES. · Trade-offs have distributional effects on different beneficiaries and stakeholders. Consider not only the issue of availability but also of accessibility. · Optimizing ES bundles for stakeholders under a certain scenario A can imply losses of vital ES for stakeholders in a different scenario B. Hence, looking only at overall quantity/availability can imply ignoring shifts in distribution between scenarios A and B.

7.2.1 Trade-Offs (Theoretical Input)

We will now turn our attention to the concept of trade-offs, which was to some extent touched upon in section 2.4 (Multiple Impacts: Connectivity). Understanding what trade-offs are and what they entail when making decisions surrounding ecosystem services are key to improving the design and implementation of ESAVs, as well as in implementing policy. We now know that ecosystem services provide a range of benefits for humans and that different actors perceive those benefits differently. Ecosystem services are interdependent and interactions among them can change over time (Heal et al., 2001; van Jaarsveld et al., 2005). Thus, ecosystem services have different biophysical characteristics and service dynamics are deeply intertwined with economic and social factors. Different sectors in society require different benefits from a specific ecosystem service (Howe et al., 2014). Multiple needs exist among different sectors and also among stakeholders. For instance, farmers will likely be more interested in increasing harvest yields, for which they require more water. At the same time, municipalities might need this water for domestic purposes. Hence, it is often unlikely that different needs can be satisfied at the same time, although in some cases achieving synergies might be possible whereby a stakeholder agreement or a management action may enable different stakeholders to enjoy service benefits. In other words, it frequently occurs that improving access/availability of a service reduces its availability in a different place or in the future. It is essentially impossible to maximize the benefits of all ecosystem services at the same time. This is the underlying concept behind the existence of trade-offs.

Trade-offs can be defined as a choice to increase the quantity or quality of one ecosystem service at the expense of another service. Trade-offs primarily arise from management decisions made by humans designed to influence a service or set of services (Rodriguez et al., 2006). An example of a trade-off would be the decision to use more pesticides to increase the production of fruit, which would simultaneously cause pollution in water bodies and may affect other ecosystems in different locations.

Acknowledging and considering trade-offs when making decisions on land or resource management is crucial for a number of reasons:

1. Trade-offs have an impact on the current and future provision of services.

2. The existence of trade-offs can lead to unknown and unintended consequences when implementing a decision that changes the quality or quantity of one or more services.

3. Acknowledging that trade-offs exist and understanding how they happen (which service is reduced, which is increased, and why) allows for better planning and helps to identify management solutions that may lead to win-win situations.

Types of trade-offs include:

a. Types of services
(e.g. between regulating and provisioning services)
b. Time
(e.g. present and future generations)
c. Space
(e.g. the use of a service in point A decreases its availability in point B)

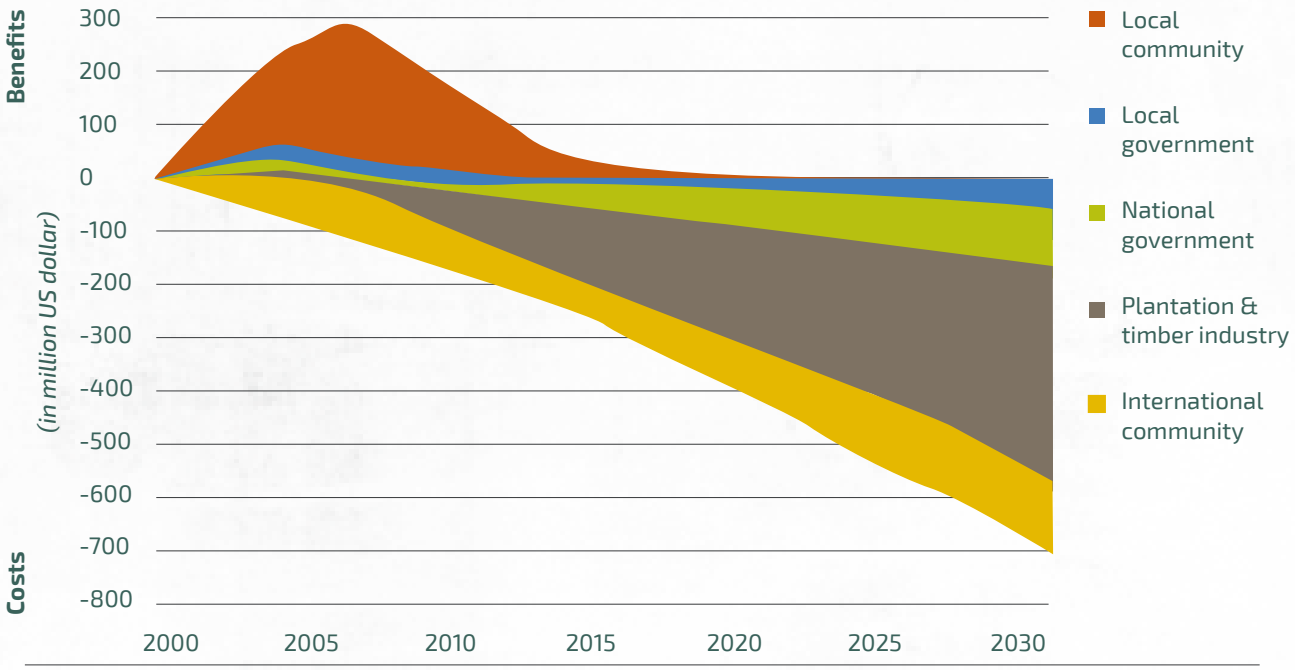
All trade-offs that occur in an ecosystem due to human interventions or natural phenomena (such as extreme events) can be placed into one of those three categories. Under a type 'a' trade-off, one service increases at the expense of another. The increase of one service can also generate a decrease in more than one service, but can at the same time enhance the quality of another service (e.g., storing water in a dam improves the accessibility of water during shortages and allows for hydropower to be generated, but at the same time reduces availability and water regulatory functions further downstream). Trade-offs in time (type 'b') means that the increase of a service in the present leads to a reduction in the future. If we consume natural resources now there is less left to use for future generations. Similarly, trade-offs also exist in spatial dimensions (type 'c'). If much of the water in a river is stored and used upstream, there is less left for downstream users.

Much of the scientific literature has so far focused on trade-offs between regulating and provisioning services (Rodriguez et al., 2006). The reason for that is that on the one hand, trade-offs between those two categories of ecosystem services are the most tangible and easiest to measure and quantify, and, on the other hand, the majority of land use management decisions are aimed at improving the condition of provisioning services (as these often have a direct market value attached to them). As such, spatial and temporal trade-offs are often not considered in many decision-making processes. This is one of the reasons why many policies aimed at improving provisioning services have had unintended consequences on other services. An example of this would be the recent European biofuel policy, which only targeted improvements for a single provisioning service but ignored spatial and temporal trade-offs, as well as other services. In that case, the proponents of the European policy on biofuels argued that the resource was environmentally friendly and would help reduce GHG *(greenhouse gas)* emissions globally (e.g. Farrell et al., 2006 and EC, 2006). However, these studies only accounted for carbon benefits and failed to include the (carbon) costs of using the land. When converting natural landscape to crop production for biofuels, a certain amount of carbon storage and sequestration, alongside other important services, are lost. When the demand for biofuels increases, more land is needed to accommodate an increase in production, thereby resulting in additional land conversion and loss of ecosystem services (Murnaghan, 2017). Additionally, land conversion can release previously stored carbon in soils and biomass back into the atmosphere, further exacerbating the issue of climate change. According to Farigone et al., 2008, the loss of native habitat to accommodate crops destined for biofuels can oftentimes create a *carbon debt*. As an example, the carbon debt from producing soybeans in the Brazilian Amazon for biodiesel would require approximately 320 years to pay back compared with GHG emissions from petroleum diesel (Murnaghan, 2017). This is an example of a trade-off in which an increase in one service (production of biofuels) can have many unintended negative consequences.

Ultimately, trade-offs affect stakeholders, as the quality and quantity of a service changes with management decisions. For instance, if timber is extracted from forests, timber companies and consumers will benefit, but fruit farmers may experience a decline in production as insects, that provide pollination services, may decline since forests are no longer there to sustain their populations. Hence, trade-offs can cause different impacts among stakeholders because costs and benefits are distributed unevenly (e.g. one stakeholder receiving the benefits and another receiving the *cost*).

See the figure below for an example.

RESULTS OF A TOTAL ECONOMIC VALUE (TEV) STUDY CONDUCTED AT THE LEUSER ECOSYSTEM IN NORTHERN INDONESIA



(Source: van Beukering and Cesar, 2003).

The figure above shows an overview of the results of a *Total Economic Value* (TEV) study in the Leuser ecosystem in Indonesia, one of the largest tropical rain forests in Southeast Asia. The main objective of the study was to determine the consequences of ongoing deforestation on different sectors and stakeholders (van Beukering and Cesar, 2003). There are immediate short-term benefits for plantation and timber industries and small benefits for the government and communities. However, after a relatively short time frame, costs tended to increase, which were primarily felt by local communities whose livelihoods are dependent on a functioning forest in their vicinity, but also by the government and global communities due to dwindling revenues. At the same time, plantations' and timber industries' income is reduced in the future due to an over-harvesting of the resources.

One of the main goals of an ESAV is to identify the existence of trade-offs, provide an overview of the changes in qualities and quantities of a service, gain an overview of the distribution of costs and benefits amongst stakeholders, and consider different options to deal with trade-offs, which are then communicated to decision-makers. There are different methods to identify trade-offs. Mapping ecosystem services and quantifying the flow of services help to obtain a clearer picture about whom or what is affected where,

and by how much. Luck et al. (2003; 2009) also devised the concept of *service-providing units* (SPU), which attempts to quantify aspects of ecosystem services. In the words of Elmqvist et al., 2011:

> *[A]n SPU might comprise all those organisms contributing to pollination of a single orchard, or all those organisms contributing to water purification in a given catchment area (Luck et al. 2003; 2009). One of the major challenges in applying the SPU concept is to translate the unit into tangible and ideally mappable units of ecosystems and landscape/seascape, but the concept potentially offers an approach that focuses on multiple services and where changes to key species or population characteristics have direct implications for service provision.*

Additionally, ESAVs can examine different management scenarios in a specific landscape by considering different options and impacts over time and space. Such assessments provide a way to overcome the challenges that trade-offs represent for many decision-makers and to identify possible win-win scenarios. For example, by conducting ESAVs, it was shown that the incorporation of legume cover crops into row-cropping systems can provide sufficient nitrogen to maintain crop yields while simultaneously reducing soil erosion and increasing carbon sequestration (Robertson et al., 2000). Another example can be found in the UK, where the Westcountry Rivers Trust has been working with farmers and landowners in the Taw/Torridge catchment on integrated farm management plans. An environmental and economic assessment of the situation has shown that these efforts have resulted in biodiversity benefits as well as a net direct benefit of 2,700 British pounds per farm per year (Bragg et al., 2005).

7.2.2 Exercise 3 (group work): Trade offs

Discuss and answer the following questions within your work group. Select one of the team members to present your findings in plenary.

1. **According to your experiences: Give an example for each type of trade off that was presented and identify management challenges associated with each type.**

Consider the different types of trade-offs that have been presented and discussed by the trainers (trade-offs in time, space, and ES). Draw from your own life and work experiences and identify at least one example per type of trade off. Identify the reasons why it is difficult to effectively manage that trade off.

2. **How are different groups of people affected by trade-offs?**

Choose one of the trade-offs from the previous question and identify the key stakeholders involved. Describe how benefits and costs are distributed among the different groups. Keep in mind that trade-offs can have positive effects on one group and negative effects on another. Think about distributional issues (social, economic and ecological).

3. **What types of economic activities or policies may lead to the three different types of trade-offs? What kind of incentives would be needed to address the different types of trade-offs? Give an example of each one.**

Based on your life and work experience, reflect on economic activities and policies that affect the spatial and temporal provision of services. Also, think about incentives or other ways to address the different types of trade-offs. For example, what can policy makers do to shift from a less sustainable to a more sustainable path?

7.2.3 Exemplary answers for exercise 3 (group work): Trade offs

1. According to your experiences: Give an example for each type of trade-off that was presented and identify management challenges attached to each type.

An example of a trade-off between ecosystem services could be the extraction of timber from a forest in order to sell or export it at the expense of the ecosystem's ability to take up CO_2 from the atmosphere or regulate hydrological cycles. Management challenges for this type of trade-off could be to determine how much a provisioning service could be exploited before the benefits from that service are outweighed by negative consequences in other (regulating) services.
An example of a spatial trade-off could be the extraction of water from a river upstream, which could lead to less water availability downstream. Management challenges here might include managing the distribution or availability of water in downstream and upstream communities.

An example of a temporal trade-off could be an expansion of agriculture at the expense of natural vegetation. For a time, the human-made pastures will generate more income and harvest, but it could happen that regulating services decline over time, leading to a long-term loss of soil quality. Management challenges in this case might be to define a sustainable level of resource use so its availability in the future is not decreased.

2. How are different groups of people affected by trade-offs?

A trade-off scenario usually consists of a win-lose situation, where a benefit is accompanied by a loss. Examples could include:

- The dumping of chemical waste into the ocean could be a cheap way of disposing of industrial waste, but can lead to diseases and reduced fish stocks with global repercussions (global scale trade-off).
- Stricter environmental laws that prohibit the intensive use of fertilizer and chemicals would result in cleaner water and a larger presence of pollinators, but could reduce agricultural production (at least in the short term) (national and regional scale trade-off).
- Declaring a specific natural area as protected would improve ecosystem stability, but could negatively affect local rural communities that depend on raw materials, such as firewood or land clearing, for agriculture as part of their livelihood strategies (regional and local scale trade-off).

3. What types of policies or economic activities may lead to the three different types of trade-offs? What kinds of incentives would be needed to shift between the different types? Give one example for each one.

Primary production-oriented policies (i.e. subsidizing the agricultural sector) would likely result in rapid and short-term increases in production at the expense of regulating services. This is an example of a trade-off between ecosystem services.

A development plan could target both temporal and spatial trade-offs. Land management decisions could be made to improve service distribution. Furthermore, issues of sustainability could be addressed that would ensure the supply of a service for future generations.

8

MODULE 2 – INTEGRATING ESAV INTO POLICY PLANNING

8.1 INTRODUCTION & UNDERSTANDING AND FRAMING POLICY ISSUES

Objectives

- Understand the link between ecosystem services and policy making.
- Get familiar with the fictitious case: province of Exportul in the county of Bakul.
- Get an overview of the policy context in Exportul.
- Identify, understand and frame policy issues.

EXERCISE – MAIN CHARACTERISTICS OF ES AND CHALLENGES							
Time consideration (min)	Presentation		Reading Time	Group Work	Presentation of Results	Discussion	Total
	PPT 2.1	PPT 2.2					
	15	30	15	45	30		~135

Overview	• **Module 2 – Integrating ESAV into Policy Planning**
	  • **PPT 2.1** Introduction
	  • **PPT 2.2** Understanding and Framing Policy Issues
	
	• **Exercise 4:** Understanding and framing policy issues
	  • Exercise objectives
	  • Time frame for this exercise
	  • Explain the task to participants
	
	• **Content:**
	  - Relevance of Ecosystem Service Assessments in Policy Decision-Making
	  - Policy Instruments
	  - Decision-Making Models
	  - Entry Points
	  - The Policy Cycle						

Preparation	• Presentation. • Write the exercise objectives and questions on a flip chart. • Prepare a flip chart to write down important and interesting notions that are raised in the discussion. • Handouts for participants: exercise 2 (main characteristics of ES and challenges) and list of ecosystem services with a short description of each service (included in Annex 2). • In a flip chart, draw the *ES spatial dynamics* diagram, and place it in a panel. This will be useful for the presentation of exercise 2 (main characteristics of ES and challenges): as each one of the teams present an example of each spatial dynamic, the trainer can place the cards with their results accordingly. • Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.						

Materials	· Handouts for participants: exercise 4 (Understanding and framing policy issues in Exportul) and Bykipedia of the country Bakul (included in Annex 3). · 5 Panels for solving the exercise in *world café/carousel* method. · Map of Bakul. · 1-2 flip charts, 1-2 pieces of flip-chart paper, cards in different colours, markers, pins. · Flip chart or pin board with the policy cycle and a short description of each step in the policy cycle.
Handouts	· Exercise 4 (Understanding and framing policy issues in Exportul). · Bykipedia of the country Bakul (included in Annex 3). · Distribute flip charts, cards and markers for groups to take notes and visually represent their group work..
Methods	**Group Work (world café/carousel method)** Before starting the exercise, quickly explain the objectives and the instructions. Give some time for clarification questions. Emphasize that this is the first exercise that will be applied to a fictitious case. Also, give a quick introduction to the case study, the country of Bakul, and specifically, the province of Exportul. Provide some general information about the country and the province, and give some hints on the policy and environmental issues and trade-offs. You can use the map of Bakul to illustrate your description. In order to introduce the fictitious case, you can ask participants that already took the IES training to describe Bakul and its general features. *Objectives:* a) Understand the links between ES and policy making; b) get familiar with the fictitious case: province of Exportul; c) Get an overview of the policy context in Exportul; and d) identify, understand and frame policy issues. *Instructions.* Ask the participants to read through the description of the country Bakul and its province Exportul (included in Annex 3). Then, organize them into five groups, mixing the participants who have taken the IES training and those who haven't. Also, try to make groups with equal number of participants. Each of the groups will answer one of the questions from the exercise and write down their findings on a flip chart or panel. The groups will have 10 minutes to answer the question, then, each group will rotate and complement/discuss the answers of the next group regarding the next question (10 minutes per group). All groups will complement/discuss all questions. They must select one person in the group who will explain the findings to the other groups, and who will present the results in plenary. Also, they must choose a moderator and time keeper. *Recommendations for running the exercise.* While participants are working, try to identify the links between each one of the questions in order to bring them up during the discussion: links between policy and environmental issues, policy instruments, policy cycles and entry points.
Presentation of results	· The selected participants in each one of the groups should synthesize the findings for each of the questions, including the comments and observations that the other teams made previously.

Reflection	· Open discussion in plenary. · Encourage participants to contribute with their knowledge to the discussion. · Write important points, ideas, and questions on flip charts or on cards. · As a trainer, use the exemplary answers for the exercise to encourage discussion on different results and to ask questions that have not been raised during the discussion. · Moderate a plenary discussion based on the answers that the participants have written. · Make sure that during the discussion it is clear why is important to understand the context before starting with the design of an ESAV (which will be discussed in the following chapters). · Clarify why the concept of ecosystem services is helpful to link policy and environmental issues, and to address the current political conflicts. · Also, use the discussion as a way of familiarizing participants with Bakul and the region of Exportul. Write down the most relevant aspects of the discussion on flip charts. · Consider preparing an overview of the different policy instruments and an overview of the policy cycle on a flip chart, or showing them in a powerpoint during the discussion, so participants can remember the elements of each. **Possible guiding questions for reflection:** · How are the policy issues linked with the environmental issues? Why is this link important? · Can you think of other plans or policy instruments that could be effective in Exportul but are not yet being considered or applied? · What do you think are the main hurdles that the government in Exportul has to deal with concerning the implementation of successful policies and measures? · After having identified entry points, what would your next steps be? (i.e. How would you attempt to use an entry point to place an issue on the political agenda?)
Key messages	· Introduction to Bakul and the province of Exportul. · A lack of integration of ES in policy results in decision-making that ignores nature and, therefore, may end up degrading ES, as well as jeopardizing development and well-being in the long-run. In order to integrate ES in decision-making, one needs to understand the political and policy context. · Discrepancies amongst studies and their outcomes for decision-making reflect an inadequate use of ESAV within the organizational and political dimensions of decision-making. · Closing the gap between those who commission/conduct ESAVs and those who make decisions will allow for the design and implementation of ESAVs that address needed changes to policies and decision-making. To design and implement ESAVs for policy impact, we need to better understand the policy process. · Identifying the right policy instruments and entry points in the policy cycle, are of critical importance for initiating effective ESAVs. · In theory, there is a linear relation between stages in the policy cycle. However, in reality the policy cycle is much more complex and political influence may play a deciding role regardless of a scientifically sound definition of the problem.

8.1.1 Introduction & Understanding and Framing Policy Issues (Theoretical Input)

8.1.1.1 Introduction

Why do we want to link ESAVs with policy? The concept of ES links nature with society by showing how people both depend and impact ecosystem services. However, ES are often under-emphasized or ignored in policy making, which results in the short-term degradation of ecosystems and subsequent loss of benefits (such as food sources, quality of life, health, etc.) and a decline of societal well-being in the long term. Decisions that affect ecosystem services have consequences on peoplé s livelihoods and well-being, and are therefore of political importance. The ecosystem services concept may provide ways for connecting different stakeholders and linking them with ecosystems. Any positive or negative change in ecosystem services will directly or indirectly affect different groups of people by changing the pool of nature-derived benefits.

For governments, adopting a focus on ecosystem services can help them identify complex issues, such as sustainable development opportunities, potential public cost savings or identification of causes of environmental conflict. The concept has also been used to justify budget allocations or to reach well-informed investment decisions. In many policy areas, ESAVs can play a supporting role, such as for regional planning, agriculture & forestry, disaster risk reduction, urban management or conservation.

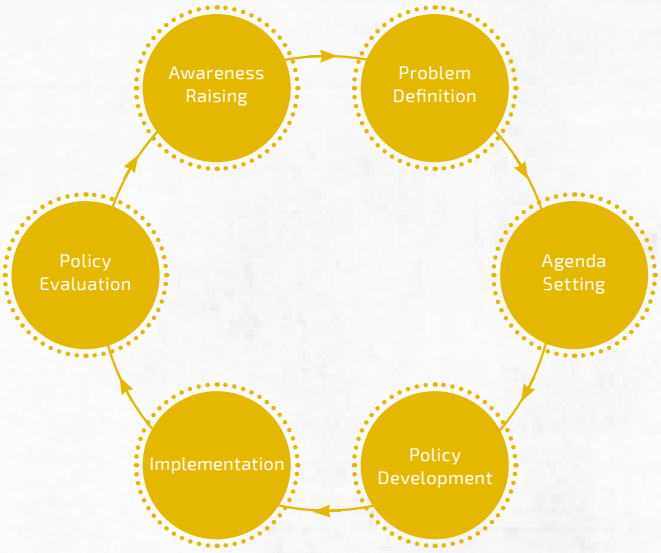
By making the links between nature and society visible and tangible, ESAVs can help steer planning and decision-making in different sectors into more sustainable directions. ESAVs are widely acknowledged as a means to change the perception of nature since they can convey the importance of functioning ecosystems for all sectors of society. We depend on functioning ecosystems in many different ways: for food, income, health, culture, and protection against natural hazards. However, ESAVs have not yet reached their full potential. While they have existed for some time now and have, arguably, become a well-accepted part of conservation planning, they are yet to be integrated into mainstream development efforts, in which ecosystem services are still largely ignored. As a consequence, ecosystem impacts tend to continue to be left out of the equation when policies, planning frameworks, market and price arrangements are formulated and implemented. Such neglect results in key economic and development opportunities being missed and substantial costs and losses being incurred.

ESAVs not only require sound technical capacity, but also skillful management. Assessments need to be designed and conducted in ways which are appropriate for the policy context that they are intended to support. Credibility, legitimacy and relevance are key requirements for an ESAV to generate trustworthy, scientifically robust, and useful information that should be used to guide decisions. Credibility can be defined as the trustworthiness of an assessment's results and the expertise of those conducting it. Legitimacy refers to the perceived fairness and stakeholder inclusion in the assessment process, whereas relevance refers to successfully addressing important and pressing issues.

ESAVs are generally more effective when nested within wider policy processes. The assessment itself can therefore be understood as a social process, which can advance knowledge and shape the values and perspectives of stakeholders. Furthermore, the assessment process should strategically interact with policy making.

There is not one standard approach to ESAVs, but rather a huge diversity of study questions, methods and assessment approaches. In order to obtain useful outcomes, those commissioning an ESAV should work to design the assessment to be in line with their intended purposes.

OVERVIEW OF THE DIFFERENT STEPS/ DIMENSIONS OF THE POLICY CYCLE.



8.1.1.2 Understanding and Framing Policy Issues

Discrepancy among ESAVs and their impacts on policy reflect an inadequate adaptation of studies to the organizational and political dimensions of decision-making. For the initial scoping and to adequately frame the study, we should start with understanding the policy arena. To do this, we are going to take a look at different components, such as the policy cycle, decision-making models, policy instruments and entry points.

Policy Cycle

The policy cycle is a visual representation of the steps that are included in the development of a policy (see figure above).

Keep in mind that the policy cycle is a linear approximation of how a policy can be conceived, and does not necessarily represent reality. Usually, the policy-making process is much less linear, as politics, influence, available solutions, expert opinions, decision-makerś willingness to change, among other factors, shape the different stages of the policy's development. Nevertheless, the policy cycle serves as a rule of thumb and includes the crucial steps that are most commonly involved in the creation and implementation of a policy.

A logical first step would be when an issue becomes relevant in society. During this initial step, a topic becomes important either by being researched, observed, discussed in the media or by being endorsed by an actor (e.g. an industry association or business). Consider a fictitious example in which the quality of agricultural harvests in a region has been fluctuating in recent decades. Harvests have been increasingly of poor quality or harvest yields were not as high as expected. This fact was then observed and has received attention from citizens and the media.
The next step would be the definition of a problem situation. In this step, a specific issue is identified, and the reasons for that issué s existence are examined and explained. Building on our earlier example, it was perhaps determined via expert studies and opinion that the intensive use of chemicals has reduced nature's ability to control pests and has weakened the resistance of certain crop species.

The next step would be to place this issue on the policy-making agenda. For this, entry points such as development plans or existing government programmes of the affected sector(s) should be identified. In our example, an entry point for our problem situation could be the sectoŕ s development plan for raising agricultural production in the future. Using this, the problem situation can be made relevant and brought to the attention of decision-makers and made relevant (see next pages for a detailed explanation on entry points).

Once the problem has been placed on the policy agenda, different options and alternatives have to be examined and designed in order to address the problem. The legal framework has to be considered and the consequences and effects of different measures and instruments have to be weighed, as well as the effec-

tiveness and institutional capacity to implement a certain policy alternative. In our example, the government could look into different options, such as further subsidizing the sector, consider restricting the use of certain chemicals or attempt to find substitutes that are less harmful to the environment.

Once a decision has been identified on how to approach the issue, the new policy instruments should be implemented. This requires assistance from many different actors in order to allow for a smooth and successful implementation. For our example, assume that the government decided to forbid the use of certain harmful chemicals and have provided subsidies for farmers to apply new chemicals with less harmful effects on the environment. This decision will have a ripple-effect both on farmer incomes as well as market prices and long-term market development for certain agrochemicals, generating winners and losers and hence, support or resistance to the given policy alternative.

The next step in the policy cycle would consist of an evaluation of the policy after it has been implemented. Thus, effects and changes are monitored over a given time to determine the effectiveness of the new policy. In the previous example above, perhaps the new policy has indeed helped to stabilize harvests and agricultural production may be rising, but suppliers of certain agrochemicals might be facing reduced market demand and therefore jobs might be at risk.

It is important to note that the policy cycle is not necessarily closed and linear. Perhaps the implementation of a new policy has had consequences elsewhere, or has created a new problem. For example, perhaps the new chemical that is being promoted is harmful to bees. As such, over time, bee populations decline and a dearth of pollination might be the result. This could once again threaten harvests. The result would be a new problem for pollination that would have to be addressed.

ESAVs can play a role in all steps in the policy cycle. During awareness-raising, ESAVs can help to mainstream an issue by showing data or explaining potential consequences of a phenomenon. For problem definition, ESAVs can explore an existing issue and can attempt to explain and clarify what the problem situation is, what causes it, and what the consequences are (environmental, social and economic). During agenda setting, ESAVs can be used to generate information and lend credibility and legitimacy to an issue. During policy development, ESAVs can help to explore different options and scenarios. The assessment could compare options and highlight advantages and disadvantages of a proposed policy. It can also identify unintended consequences or give an estimate on the social costs and benefits. During the implementation, ESAVs could provide guidance on how and where to implement measures, and they could provide information about where adjustments could be made. For the last step, the evaluation of the policy, ESAVs could monitor and measure the effects that the policy had on the problem situation. They can provide an objective overview and determine if the policy was successful or not.

Policy Instruments

Policy instruments are the means of implementing policies. They comprise different forms of intervention to achieve specific sector goals and solve specific problems (see table below). The implementation of policy instruments is directly linked with what a specific policy aims to achieve.

VARIOUS TYPES OF POLICY INSTRUMENTS

Command and control instruments
Planning instruments
Economic and fiscal instruments
Informative measures
Cooperative / Voluntary measures

Command and control instruments refer to *the direct regulation of an industry or activity by legislation that states what is permitted and what is illega* (McManus, 2009). It provides the government with a direct *control* to enforce a goal, and non-compliance with the regulations may be punishable. *Command* means that certain activities or industries have to adhere to quality standards or targets which are set by the government or other qualified organizations, such as industry chambers and associations. Examples would be the issuing of laws, regulations, restrictions, sanctions, prohibitions and permits, as well as standard-setting and the implementation of various other non-market-mechanisms. The benefits of command and control instruments are that they allow for quick responses to issues and that specific targets can be

set and enforced. Drawbacks are that it is often costly to monitor and enforce regulations, sensible and appropriate rules and standards are often difficult to determine, and it can lead to discontent amongst people and industries because command and control instruments may be perceived as arbitrary or unfair (Baldwin et al., 2012).

Planning instruments are efforts of the government or other sectors to devise a strategy on how to better regulate or influence an activity in the future. They also determine which areas or sectors efforts are to focus on. Examples include development plans, sector programs, spatial planning, national budgets, integrated ecosystem management plans, protected area planning or *strategic environmental assessments* (SEA). While these instruments do not directly influence activities linked to ecosystem management, they are nevertheless important tools to facilitate actions that can influence them.

Economic and fiscal instruments also enable the government to regulate and influence activities. However, unlike command and control instruments, fiscal instruments attempt to steer activities, markets or industries in a direction by providing economic incentives for doing so. Examples could include exemptions from taxes, charges or fees for using less of a resource or for making efforts to use a resource in a sustainable manner. Other examples are market-based incentives, subsidies or compensations, payments for ecosystem services, access and benefit-sharing, biodiversity offsets, performance bonds or revenue sharing. In contrast to command and control instruments, fiscal instruments need longer time periods before they actively contribute to changing a situation, and are thus *slower*. Subsidies, permits and other measures also allow companies or organizations to better adjust to a more sustainable path. Furthermore, fiscal instruments are perceived as being *fairer* and are thus more acceptable to industries, as they provide *benefits* when adhered to. Disadvantages, however, include the difficulties in reaching specific targets, as there is no direct control that ensures certain goals are reached.

Informative measures are similar to planning instruments in the sense that they do not directly influence a problem situation, but rather help to raise awareness on specific issues. Examples would be environmental education programs, extension programs, green accounting or reports on the state of the environment. These instruments allow government to better identify available options in order to address an issue in the future.

Lastly, **cooperative / voluntary measures** are those instruments that are either created from mutual cooperation or through voluntary agreements. Examples would be voluntary environmental agreements, international standards, quality seals and protocols developed by NGOs or a supranational government. ESAVs need to relate to these instruments if decision-makers are to use the assessment to make informed decisions. Different instruments can help in solving different environmental issues, which is why careful scoping and assessment framing is essential. During the initial scoping and framing phase, ESAVs have to consider the aforementioned policy instruments to guarantee an assessment process that will allow for policy integration. What good is a well-executed ESAV that carries meaningful messages, if these messages are separated from any political framework and cannot be integrated into ongoing political processes?

Hence, during the initial phase of an ESAV, the usability, availability and barriers related to each policy instrument should be analysed. If it becomes clear that a specific policy instrument has certain advantages over another (which is highly dependent on each national, regional or local context), the ESAV process can be adjusted and aligned to this information.
An example of this integration of policy instruments into the scoping of an ESAV can be seen in Ecuador. The government of Ecuador decided to extend the existing *Socio Bosque* programme to mangroves (an incentive-based governmental program in Ecuador to protect forest ecosystems). The main question was to identify what the protection of mangrove ecosystems should look like and which incentives would need to be provided to ensure a more sustainable use of the various ecosystem services provided by these coastal ecosystems. To this end, an ESAV was carried out that took into account the existing political framework. The ESAV was able to provide an in-depth analysis of how communities use mangrove ecosystems and identify which policy instruments could be used for creating incentives for improved mangrove protection.

Decision – Making Models
There are many different theoretical strands to analyse decision-making. Almost everything that human beings do involves choosing among different alternatives. An analysis of decision-making thus involves different aspects of how individuals make choices,

how they value alternatives and possibilities inside a specific context in which they move and act. There are two different ways to analyse how decisions are made. The first theory is normative or prescriptive, where the analysis centres on how people should ideally make decisions. The second one is positive –or descriptive– regarding how decisions are actually made.

A normative or prescriptive decision-making theory is concerned with identifying the best decision to make, assuming an ideal situation in which decision-makers are fully informed and able to act in societý s best interest. In other words, normative decision theory is about rational decision-making. In practice, however, there are situations in which *the best decision* does not necessarily lead to individual utility maximization. In contrast, positive or descriptive decision-making theory is concerned with describing observed behaviours under the assumption that the decision-making agents are behaving under some consistent rules. The new prescriptions or predictions about behaviour that positive decision theory produce allow for further tests of the kind of decision-making that occurs in practice. In recent decades, there has been increasing interest in what is sometimes called *behavioural decision theory* and this has contributed to a re-evaluation of what rational decision-making requires.
This is important to consider while planning and running policy-oriented ESAVs, as it allows ESAVs to better take into account the needs of the intended target audience. Management decisions, especially in the realm of environmental management, usually face a great deal of uncertainty as the casual connections in ecosystems and ecosystem services are complex and dynamic. Thus, compromises need to be found and decisions need to be made based on certain decision-making principles (see list below) (Harding, 1998). We can distinguish three types of conceptual frameworks that can be applied to political decision-making, namely:

1. **Rational,** based on the logic of *optimal choice*. Underlying values are made explicit through analysing and evaluating different options in an attempt to identify a *collective optimum*.

2. **Organizational,** based on the logic of *satisfaction*. Decisions are being made by organizations with the goal of finding acceptable solutions to their respective needs. Different organizations have different purposes, structures, procedures and cultures – and therefore may propose different solutions.

3. **Political,** based on the logic of *compromise* and *decentralization*. Decisions are the result of a power play between coalitions. The multiplicity of goals and interests in a given context is highlighted. Timing of an issue is of crucial importance as well (e.g. is it election time and hence has an issue become relevant again?).

One common trait to all decision-making models is to inform about the consequences of alternative conditions of ES: what are the economic effects of certain changes in ES and who is affected by these changes? How can various strategies be compared in terms of economic demands and consequences? Who uses this information for what purpose and for what actions? However, the three principles differ in their assumptions. Rational choice refers to the fact that there exists a *perfect* choice, one that is inherently better than others. The logic of this principle is to attempt to identify this choice. The organizational principle, however, rests on the assumption that many solutions are acceptable and that a choice is highly dependent on the purpose, structure, procedure and culture of the implementing agent. The third principle, the principle of the political process, stresses that decisions are a compromise between different power players.
As such, they are the product of coalitions and the current political context and agenda. The alignment to routines and norms is analyzed via the organizational model, while the struggles for advocacy and power are in the realm of the political model.

These two basic models of decision-making– organizational and political– share one trait that is essential to understand an ESAV's effectiveness in influencing decision-making and which addresses the limits of the rational model. Since it is not assumed that a single rational actor makes the decisions, the role of information and expertise that an ESAV can provide is centered on influencing perceptions, values, norms and appropriateness. In a political process, effective ESAVs are those that address concerns within public opinion and present a strong challenge to certain existing interests (Laurans and Mermet, 2014).

It is important to note that all three principles or types of decision-making logic are always at play in any policy decision. Decisions are never only made based on rational choice, which is why ESAVs which ignore the organizational and political context may not be as successful in influencing decisions. Ultimately, ESAVs need to find a balance between providing scientifically sound information and adapting to a situational, polit-

ical and organizational context. In general, the contribution of ESAVs to decision-making relies both on their ability to produce robust results and on their procedural qualities as a persuasive resource that can be used for advocacy and justification. Thus, the usefulness of ESAVs cannot be enhanced alone by their rigorous, scientifically-based approach or by the way they are carried out (including the participation of relevant stakeholders, addressing relevant policy issues, among others). For ESAVs to have policy influence, both process orientation and the quality of the science behind it should be addressed.

Entry Points

We have so far discussed the instruments that are available for decision-makers to achieve change, the features of such instruments and how decisions may be crafted. Politicians and decision-makers in general cannot always tackle every problem that exists immediately. In order to receive the attention of decision-makers, environmental practitioners can use so-called entry points. Entry points are windows of opportunity that allow us to place an issue on the political agenda. Entry points can occur at all levels of governance and their primary purpose is to be able to get a certain issue on the negotiating table or into the political arena. There are multiple ways to achieve this, and there is no clear structure or process involved in identifying and using entry points. Entry points simply relate to any process, be it circumstantial or programmatic, which creates an opportunity to influence decision-makers. Entry points can be split into two different categories, namely *processes* and *situations*.

Processes are pre-existing and ongoing structures and frameworks that can be used in order to make an appeal to or persuade decision-makers. For example, national development plans or economic subsidies for a sector can act as an entry point if a proposal that fits into these processes is developed. In general, there are four categories of entry points that relate to processes. These are national and subnational policies, economic and fiscal incentives, sector policies, and governance (Ash et al., 2010).

Situations, on the other hand, can be *mere* opportunities, as they do not necessarily persist in the future or have a plan or programme behind them. They provide a clear yet time-limited opportunity to get an issue onto the political agenda. An example of an entry point that relates to a situation would be a widespread public concern about nuclear energy after the Fukushima catastrophe in 2011. This momentum can be used as an entry point to influence decisions regarding (nuclear) energy. In Germany, the Fukushima catastrophe reverberated to an extent that Angela Merkel, the chancellor, was politically pressured to make a decision and establish a plan to phase out nuclear energy. Other situations that can serve as entry points could be a change in government, elections, media attention, scientific findings, among others. It is important to keep in mind when attempting to use situations as an entry point that it can only be considered an entry point if the situation relates to an issue of political or public concern.

Ecosystem service assessments either can use an entry point to obtain political relevancy or can also act as one, since they provide knowledge, which can be used to base decisions on. Assessments can *discover* a new issue that decision-makers were not previously aware of, or they can highlight or explain certain aspects of an existing issue. They can inform and mobilize citizens and they can examine different options or scenarios to deal with an issue. Let us assume that a research institute plans to conduct an ecosystem service assessment with the intention of convincing policy-makers to devise new policies in order to better protect ecosystems. An entry point for such an assessment could be current development goals of a government. Development (social and economic) is closely tied to ecosystem services. Thus, if ecosystem services were to change, development goals could be negatively affected. This then presents an entry point, since an assessment can help policy-makers understand the importance of ecosystems to attain the desired development goals (WRI, 2008).

8.1.1.3 Role of ESAVs in the policy arena

Discrepancy among ESAVs and their impacts on policy reflect an inadequate adaptation of studies to the organizational and political dimensions of decision-making. For the initial scoping and to adequately frame the study, we should start with understanding the policy arena. To do this, we are going to take a look at different components, such as the policy cycle, decision-making models, policy instruments and entry points.

We now understand that ESAVs can provide relevant and persuasive information about an issue. Assessments are able to shed light on issues in different ways and are able to discern underlying causes. They thus allow policy-makers to see a bigger picture and allow for the identification of key areas that need to be addressed. They can highlight the importance of ecosystem services and clearly show the benefits that these services provide.

But ESAVs are not only useful to objectively examine an issue and provide a comprehensive overview. They can also discover and identify a problem situation in the first place. What this means is that ESAVs can provide an explanation to a situation that was previously not well known or not known at all. Moreover, ESAVs can be tailored to each specific decision-making process, as they are flexible and can make use of a multitude of different methods. Decision-makers also have the option to guide the assessments by providing clear policy questions that can then be formulated into research questions. Hence, ESAVs can be a tool for policy-makers to find answers to important policy questions.

Additionally, ESAVs are comparatively cheap (compared to, for instance, implementing a policy and monitoring its result afterwards) and can be done quickly if needed. They can thus be aligned to the decision-making process and can help to explore different policy options and scenarios during the process. Once a measure or policy has been implemented, ESAVs can serve to monitor and evaluate the effectiveness of a policy.

Despite these advantages however, it should be noted that ESAVs are a *supporting* tool. They deliver important and relevant information in a format that can be appealing to a decision-maker. However, how that information is applied and what the end-result will be is beyond the reach of the ESAV. Thus, ESAVs facilitate but do not guarantee sustainability-oriented decision-making.

For many, it has remained unclear how to carry out ESAVs in ways that will actually enable them to reach their practical potential. Most writings on ecosystem services discuss this concept from an academic perspective, advancing ESAV methodologies and their underlying science but not necessarily thinking about the politics of ESAVs.

Furthermore, there are some common beliefs about ESAVs, which pose challenges to those who are interested in employing this concept in practice. For example:

- ESAVs are considered to be neutral and to deliver objective information – yet often they are commissioned to advance certain (green) agendas and interests.
- ESAVs are thought to favour conservation, but ESAV results can likewise argue for other solutions, such as green infrastructure, eliminating subsidies or introducing tariffs and fees.
- ESAVs are thought to be useful and applicable in most circumstances because of their focus on aspects of nature which are of societal relevance – yet sometimes ESAVs are unnecessary (only re-stating the obvious), inappropriate (for not capturing the essence of an issue), or even counterproductive (leading debates into the wrong direction).

ESAVs not only require sound technical capacity, but skillful management and political savviness. Assessments need to be designed and conducted in ways that are appropriate for the policy context which they are intended to support. Otherwise they may remain irrelevant or can even backfire.

Neither methodological advances on assessment instruments nor exchanges about the ethics and meaning of ecosystem services can resolve this particular issue. However, with a growing number of assessments for different purposes and in diverse policy contexts, there are lessons to be drawn from practical experience. Oftentimes, the way an ESAV is planned, designed and commissioned can determine its usefulness for policy-makers. In other words, ESAVs need to be more than just academic exercises.

They need to be embedded in the political context as a social process and need to establish a connection between ecosystems, societal needs and decision-making. To sum up, ESAVs need to meet several conditions to have concrete policy impacts.

These include:

- the criteria of credibility, legitimacy and relevance which generally apply to scientific policy advice;
- the connection between the assessment process and policy or decision-making; and
- the alignment of the assessment to its practical purpose.

These conditions are insufficient for ensuring policy impact – yet in our view, they are indispensable, if an ESAV's role is to influence, stimulate or support policy and decision-making, beyond contributing to the academic discourse.

In order to be able to ensure this, we will now familiarize ourselves with the key steps and processes of an ESAV. Learning what exactly an ESAV is, how it can be shaped and what purposes the different steps serve, helps in recognizing when an ESAV can and should be conducted, and also helps in ensuring an assessment's credibility, legitimacy and relevance within the political decision-making process.

8.1.2 Exercise 4 (group work): Understanding and framing policy issues in Exportul

**Supplementary information for exercise 4, Bykipedia of the country Bakul, is included in Annex 3.*

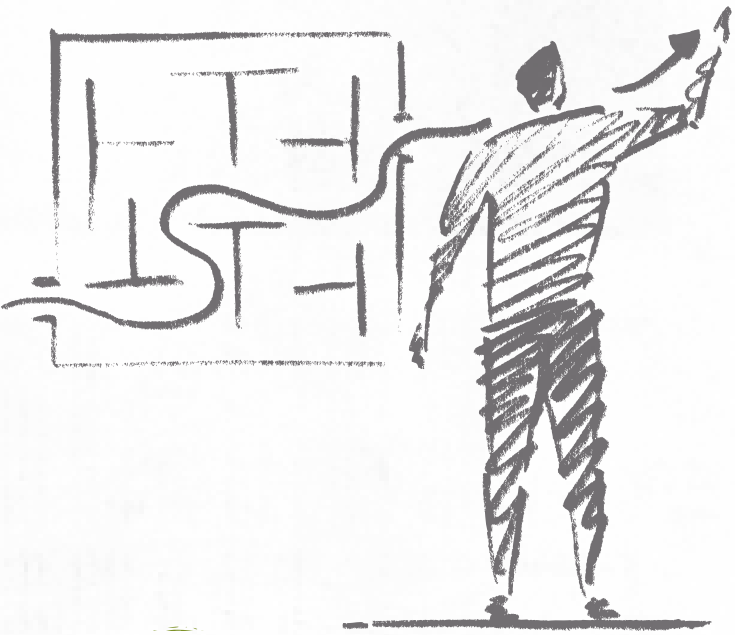
Read the Bykipedia of the country Bakul and its province Exportul. Then, split into five groups. Each of the groups will answer one of the questions below and write down their findings in a flip chart or panel. Then, each group will rotate and complement/discuss the answers of the next group regarding the next question. All groups will complement/discuss all questions. Select one person who will explain your findings to the other participants, and who will present the results in plenary.

1. What are the main policy issues in Exportul?

Consult the Bykipedia of the country Bakul to identify (some of the) main policy issues in Exportul. Which one do you think is particularly important, and why do you think so?

2. What are the main environmental issues in Exportul?

Consult the Bykipedia of the country Bakul to identify (some of the) main environmental issues in Exportul. Which one do you think is particularly important, and why do you think so?



3. What kind of policy instruments is the government using to promote development in Exportul?

Consider the policy instruments that were discussed earlier in the presentation. From the Bykipedia of the country Bakul, try to identify as many examples as you can of policy instruments implemented in Exportul.

4. Where in the policy cycle can you place the different initiatives that are being undertaken in Exportul (problem definition, agenda setting, policy development, implementation, evaluation and awareness raising)?

Consider the policy cycle that was discussed earlier in the presentation. From the Bykipedia of the country Bakul, try to identify an example of initiatives in Exportul that relate to each one of the steps in the policy cycle.

5. What would be some of the entry points that would facilitate a change in the development path of Exportul?

Consider the concept of entry point discussed earlier in the presentation. Form the Bykipedia of the country Bakul try to identify potential entry points for the case of Exportul. Also, draw on your own experiences in policy or decision-making, and try to distinguish possible opportunities for changing or affecting the political agenda of the province.

8.1.3 Exemplary answers for Exercise 4

QUESTIONS 1 & 2

What are the main policy and environmental issues in Exportul?

- Service
  - Beneficiary

Policy Issues

- Conflicts over land
- Water supply problems
- Drinking water contamination
- Community-based solutions
- Impacts of agriculture on ecosystems
- Pollution problems
- Fishing promotion policies
- Conservation of nature
- Industrial park development
- Needs and priorities of indigenous groups (Bankas and Kulres)
- Rising electricity demands
- Integrity of ecosystems

Environmental Issues

- Destruction / degradation of vegetation (for palm oil and other cash crop plantations)
- Decreasing soil fertility
- Water availability
- Water quality
- Longer dry seasons
- Pollution (reducing attractiveness of beaches and causing a decline in fish populations)
- Potential negative impacts of hydropower dam
- Overfishing

QUESTION 3

What kind of policy instruments is the government using to promote development in Exportul?

- Planning instruments
  - *national tourism development plan*
  - *participatory planning procedures*
  - *electricity generation plans*

- Informative measures
  - *environmental assessments and studies*

- Economic and fiscal instruments
  - *free trade zone and tax concessions*
  - *subsidies for cash crops and fisheries*

- Command and control instruments
  - *protected areas – Reskul National Park and seven new protected areas*
  - *regulations for timber operations and palm oil plantations*

- Cooperative measures
  - *cooperation with SOH Bakul (NGO) to strengthen small-scale agriculture of indigenous groups*
  - *various international protocols, such as Convention on Air Pollution, Antarctic Treaty, Kyoto Protocol, etc.*

QUESTION 4

Where in the policy cycle can you place the different initiatives that are being undertaken in Exportul?

- Problem Definition
  - *studies showing drinking water contamination*
- Agenda Setting
  - *participatory planning procedures*
  - *environmental assessments*
  - *cooperation with SOH Bakul*
- Policy Development
  - *national tourism development plan*
- Implementation
  - *construction of dam for hydropower*
  - *free trade zones and tax concessions*
  - *subsidies for cash crops and fisheries*
  - *protected areas*
  - *regulations for timber operations and palm oil plantations*
  - *international standards and protocols*
- Evaluation
  - *environmental assessments*
- Awareness Raising
  - *environmental assessments*

Next steps are generally to proceed to the next policy cycle dimension. That is, after having placed an issue on the political agenda, the next step would be to start designing a policy that aims at addressing this issue.

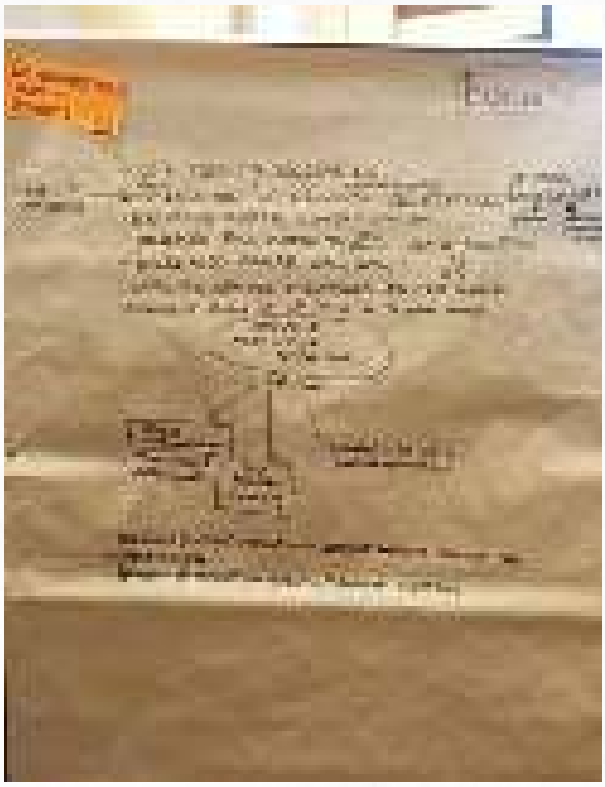
QUESTION 5

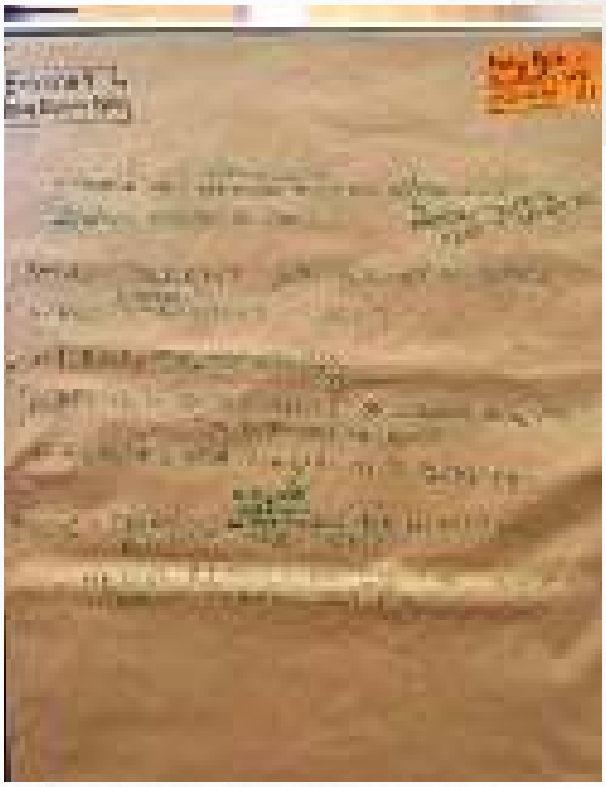
What would be some of the entry points that would facilitate a change in the development path of Exportul?

- Needs of stakeholders relevant to the current political agenda or constitute a majority of the voter base, or have the ability to influence decision-makers.
  For example, indigenous tribes or the 1/3 of the Bakul population that is described as poor.
- International agreements and protocols
- Influence of SOH Bakul
- Market-mechanisms
  For example tax concessions for new investments or free trade zones.
- Scientific knowledge on topics that are of political concern.
  For example the study that showed that drinking water is contaminated.
- Participatory planning procedures
- Media attention if it can mobilize the masses for a specific issue.
- National tourism development plan.
- Environmental problems that are of political concern.
  For example, deforestation or land conversion.
- Pledges of the new government.
- Seven new protected areas by 2018
- Overseas assistance and international donations.

8.1.4 Visualization examples for Exercise 4

Note that each panel contains answers to each one of the exercise questions. It is important to have one panel per question so that groups can rotate via the carrousel method and complement each other's answers.





8.2 POLICY AND RESEARCH QUESTIONS

Objectives

- Start to frame ESAV: Translating its purpose and context into relevant policy questions.
- Identify and formulate policy and research questions.
- Understand how to link policy and research questions.
- Identify and communicate key messages to different audiences.

EXERCISE – IDENTIFYING POLICY AND RESEARCH QUESTIONS						
Time consideration (min)	Presentation	Reading Time	Group Work	Presentation of Results	Discussion	Total
	15	15	60	30		~120

Overview	• **PPT: Module 2 – Integrating ESAV into Policy Planning**
	  • **PPT 2.3** Policy and Research Questions
	
	• **Exercise 5:** Policy and Research Questions
	  • Exercise objectives
	  • Time frame for this exercise
	  • Explain the task to participants
	
	• **Content:**
	  - Policy Questions
	  - Research Questions
	  - Difference between Policy and Research Questions					

Preparation	• Presentation. • Presentation of the context of Exportul for introducing the exercises. • Write the exercise objectives and questions on a flip chart. • Prepare a flip chart to write down important and interesting notions that are raised in the discussion. • Handouts for participants: exercise 5a, 5b and 5c (Identifying Policy and Research Questions, Preparing a Statement for a TV Interview and Adjusting the Policy and Research Questions). • Prepare the result matrixes in a panel for each of the three groups (look at matrix in exercise 5a). • Distribute flip charts, cards and markers for groups to take notes and visually represent their group work. • Set stage and scenario for the interview in *Good Evening Exportul* TV show (exercise 5b). You can use some sound and visual aids. Ask participants to get into their roles (environmental institution), but also, as a trainer, be creative in getting into your role (interviewer of Good Evening Exportul).					

Materials	· Handouts for participants: exercise 5a, 5b and 5c (Identifying Policy and Research Questions, Preparing a Statement for a TV Interview and Adjusting the Policy and Research Questions). · 3 pin-boards. · 1-2 flip charts, 1-2 pieces of flip-chart paper, cards in different colours, markers, pins.
Handouts	· Handouts for participants: exercise 5a, 5b and 5c (Identifying Policy and Research Questions, Preparing a Statement for a TV Interview and Adjusting the Policy and Research Questions). · Distribute cards and markers for groups to take notes and visually represent their group work
Methods	**Group Work** Before starting the exercise, quickly explain the objectives of exercises 5a, 5b and 5c (Identifying Policy and Research Questions, Preparing a Statement for a TV Interview and Adjusting the Policy and Research Questions); and give the instructions of exercise 5a. Give some time for clarification questions. Give a quick introduction about the context in Exportul and how this is linked to the exercises. *Objectives:* a) Start to frame ESAV: Translating its purpose and context into relevant policy questions; b) identify and formulate policy and research questions; c) understand how to link policy and research questions; and d) identify and communicate key messages to different audiences. **Exercise 5a (group work)** *Instructions:* Ask the participants to read through the exercise 5a. Then, ask them to break up into three work teams, mixing the participants who have taken the IES training and those who haven't. Also, try to make groups with an equal number of participants. Each one of the groups will represent an environmental institution (the local NGO SOH Bakul, The Environmental Unit of the provincial government and the Environmental Research Unit of Exportul). The groups must answer the questions and select one person in the group, who will present the results in plenary. Also, they must choose a moderator and time keeper. In case there is time, a presentation in plenary of each one of the groups can be done. Otherwise, you can carry on with exercise 5b and 5c, and leave the presentation of the results of the three exercises after exercise 5c. *Recommendations for running exercise 5a.* During group work, try not to encourage the group to have the perfect policy and research questions: during exercise 5b and 5c, they will have the chance to make the respective adjustments. On the other hand, try to guide them by reminding them of the rationale of policy and research questions. Be available to assist each group with questions that they might have. It is very important that groups visualize their results, as they should present their findings and receive feedback from other groups in a rotation format (exercise 5c). You can prepare the result matrixes in a panel for each of the three groups (look at matrix in exercise 5a, policy and research questions). Pay attention to the findings of each one of the groups, especially on the research and policy questions that you think will need improvement or adjustments. This will help you to prepare the questions and discussions you will address as a TV host of *Good Evening Exportul* TV show in exercise 5b. →

Methods

Exercise 5b (role play)

Instructions.

After the groups present their findings on exercise 5a, explain the instructions for exercise 5b. Give a quick introduction about the context in Exportul and how this is linked to the exercises. Remind participants that the exercise consists of a role play and they will have to find key arguments, based on the previous exercise, for their participation in an interview in the local TV Show *Good Evening Exportul*. Also, they must select one person in their group to participate in the interview. As a trainer, set the stage and scenario for the *Good Evening Exportul* TV show.
Remember that one of the trainers will play the role of interviewer.

Recommendations for running exercise 5b.

Set stage and scenario for the interview in *Good Evening Exportul* TV show. You can use some sound and visual aids. Ask participants to get into their roles (environmental institution), but also, as a trainer, be creative in getting into your role (interviewer of Good Evening Exportul).

You should not only study the context of Exportul to prepare your questions as the moderator and TV host. Moreover, you should analyse the results of the groups in exercise 5a and try to ask questions that encourage them to adjust their policy and research questions for designing an ESAV for policy impact. Ask about the political relevance of their assessment: what is the importance of their ESAV for the development path in Exportul? Why is the group addressing a particular target audience and what would be the impact of that?

The idea is that the groups come out of a *research perspective* into a *political perspective*. In this sense, the TV host must encourage them to think in political terms and reflect on how to frame their ESAV according to the political context, so that it can contribute to solve the policy issue. The TV host should talk about the important events in the context of Exportul from a political perspective, and leave aside the research perspective. This should help participants to adjust their policy and research questions.

Moreover, it is also important that the TV host points out some of the most important stakeholders in Exportul (associated to the recent events in the province), so that the participants also start to think about their target audience and how to frame the ESAV to address it.

Exercise 5c (world café/carrousel)

Instructions.

After the groups participated in the interview *Good Evening Exportul*, explain the instructions of exercise 5c. Give a quick introduction about the context in Exportul and how this is linked to the exercises. In case there is time in the agenda, this exercise can be made with a world café/carrousel format: a) each of the groups will have 10 minutes to adjust their policy and research questions in their panels; b) each group will rotate and complement/discuss the answers of the policy and research questions of the next group, until all groups have completed a full rotation and complemented/discussed all questions. They must select one person in the group who will explain the findings to the other groups, and who will present the results in plenary. Also, they must choose a moderator and time keeper.

Recommendations for running exercise 5c.

In case there is time in the agenda, each one of the groups will present their adjustments to policy and research questions to all of the other groups via the carrousel method and then, present a final conclusion in plenary. In case there is no time in the agenda for implementing the exercise in the world café/carrousel format, you can ask participants to present their adjustments in plenary, and encourage the rest of the groups to provide feedback and discuss their findings.

Presentation of results	· Open discussion in plenary · **Exercise 5a.** If there is time, a presentation in plenary of each one of the groups can be done. Otherwise, you can carry on with exercise 5b and 5c, and leave the presentation of the results of the three exercises after exercise 5c. · **Exercise 5b.** There is no presentation of results as such. The groups participate in a role play: *Good Evening Exportul* (look at the section *Methods*) · **Exercise 5c.** If there is time in the agenda (look at the section *Methods*), each one of the groups will present their adjustments to policy and research questions to all of the other groups via the carousel method, and then present a conclusion in plenary. If there is no time in the agenda for implementing the exercise in the world café/carousel format, you can ask participants to present their adjustments in plenary, and encourage the rest of the groups to provide feedback and discuss their findings.
Reflection	· Open discussion in plenary. · Encourage participants to contribute with their knowledge to the discussion. · Write important points, ideas, and questions on flip charts or on cards. · As a trainer, use the exemplary answers of the exercise to encourage discussion on different results and to ask questions that have not been raised during the reflection. **Possible guiding questions for reflection:** · What were the main highlights of the discussion regarding policy and research questions? · What do you think is the main purpose of policy questions as far as decision-making is concerned? · What do you think is the main purpose of research questions as far as decision-making is concerned? · Why do you think that research questions should address policy issues? · What are some of the main challenges of formulating policy and research questions? · Can you think of stakeholders that might not need to be directly involved in the formulation of the questions, but whose interests should nevertheless be taken into account?
Key messages	· ESAVs should provide relevant and objective information in a way that is understandable for politicians, stakeholders and administrators. · ESAVs should be tailored to each specific decision-making process and use adequate entry points. · ESAVs should be guided by a clear policy question from which specific research questions can be derived. · Policy questions give a political framework to ESAV and reflect its main purpose. · Importance of framing policy questions: Framing means to consider the economic, social and cultural context. Translating the ESAVs purpose and its context into policy relevant questions. · ESAVs should be framed and should deliver answers to policy questions. · Research questions contribute to answering policy questions and reflect the objectives of ESAV. · Understand that a policy issue is never simple and many different aspects need to be taken into account and researched. The right questions need to be asked to find a successful solution. · ESAVs should not be too costly or time consuming, so as to be aligned with decision-making processes. · ESAVs can generate momentum but not necessarily guarantee good decisions.

8.2.1 Policy and Research Questions (Theoretical Input)

We have now learned how an issue can be brought to the attention of decision-makers and which policy instruments are available. Additionally, we have learned about the different steps in the policy design and implementation process and have discussed the use and purpose of ESAVs during each step. We now turn to looking into how an ESAV can be tailored to solve policy-relevant issues. The first step in designing a policy-oriented ESAV is to tailor the right study questions. The first step is to think about the policy issue that needs to be resolved or that merits a deeper investigation and subsequently identify which items should be researched more closely to provide relevant information to reach decisions. These steps are respectively labelled policy and research questions. A policy question frames an issue in a way that lets it be placed into the context of a pre-defined socio-economic setting and relates to human behaviours and practices (Gardner and Stern, 1996). A policy question intends to examine how to solve a problem based on an existing political framework and does not necessarily focus on understanding an issue entirely. A policy question also considers the choosing of different options and attempts to contrast options to identify the best solutions. They are, therefore, precise and target-driven. Their aims are to understand a problem situation, the challenges and kinds of options available.

Research questions are a sub-set of policy questions and aim to explore the issues behind policy issues. They aim to assess a problem situation, consider the consequences and impacts, and examine different options to deal with an issue. However, unlike policy questions, research questions are problem-driven. Research questions aim at understanding an issue and are asked in a way that allows clarifying the causes and consequences of an issue. They are more *exploratory;* they can examine aspects of an issue that may otherwise not be considered in the decision-making process.

In other words, policy questions are solution-driven, and are thus aimed at exploring in which ways an issue can be overcome or solved, whereas research questions are problem-driven, and are aimed at understanding what, how and why an issue exists. Below are examples of policy and research questions.

EXAMPLE OF POLICY QUESTIONS

- What directions of an *issue* could be explored?
- What are current challenges related with an *issue*?
- What future threats could be attributed to an *issue*?
- What are the main impacts of the *issue*?
- What are possible options to solve the *issue*?
- What is the general framework around which the *issue* operates?
- What is a desirable outcome?
- What are consequences to other parties / areas related with the *issue*?

EXAMPLE OF RESEARCH QUESTIONS

- What is the underlying cause of an *issue* and what factors contribute to creating it?
- Do these different factors influence each other?
- What are advantages or disadvantages of choosing a specific scenario?
- What are options to monitor and evaluate trends and conditions of an *issue*?
- Who are relevant stakeholders?
- Does a win-win scenario exist? If yes, what does it look like and what would be required to achieve it?

8.2.2 Exercise 5.a (group work): Identifying policy and research questions

The recent media coverage on pollution problems and the social protests against the development of infrastructure in Exportul have attracted the attention of the Ministry of Planning. During cabinet meetings and other reunions, the minister has been insisting that the links between citizeń s well-being, the economy and environmental quality should be better understood. How to do this remains an open question, particularly since economic growth is one of the main concerns of the national administration.

You represent one of the following environmental institutions:

1) The local NGO SOH Bakul (representing the civil society)
2) The Environmental Unit of the provincial government (representing the government)
3) The Environmental Research Institute of Exportul (representing academia)

With colleagues from your institution, you find that the interest of the minister in the topic is a great opportunity since you are developing ideas on how to conduct an ecosystem service assessment that could integrate environmental issues and alternative measures into the current development plan of Exportul.

In order to design an assessment geared towards achieving policy change, answer the following questions with your environmental institution. Consider that the ultimate objective is to protect ecosystems but you are also aware that the province has many other problems. If you want your assessment to have an impact on policies, you must frame it according to the policy context of the province.

You can organize your answers in the matrix on the next page. Select one person in the group, who will present the results in plenary.

1. **Remember the policy issues identified during the last exercise. Choose one issue that, as representative of one the three sectors above you find very important, and identify one or more policy questions (i.e. questions which address issues that policy makers need to decide on).**

Identify a policy issue that you think is especially important for your stakeholder group and formulate related policy questions.

2. **For one of these policy questions, identify two or more possible research questions that may be answered by means of an ecosystem service assessment.**

Identify a few research questions that you think are important for your policy question.

3. **Clarify who needs to be involved in addressing the research questions to ensure its relevance for decision-making.**

This question highlights the variety of stakeholders that are involved in solving the research questions. Their participation will also help to address the policy question and place the policy issue in the political agenda.

8.2.3 Exemplary answers for Exercise 5.a

CHOSEN POLICY ISSUE: FISHERIES	
Policy question 1	Should the government continue subsidizing fishing activities?
Policy question 2	What are possible alternatives to sustain fish populations in light of increasing demand?
Research question 1	Which ecosystem services do fishing activities depend on the most and which stakeholders are related to them?
Actors to be involved	Research institutes, fishing sector (fishers, fishing companies, market sellers), local communities, government actors from relevant ministries
Research question 2	What are impacts of industrial pollution on the fishing industry in Exportul? How are those impacts related to fiscal policies?
Actors to be involved	Research institutes, local experts, representatives from fishing sector, government, municipalities etc.

8.2.4 Visualization example for Exercise 5.b

9

MODULE 3 – GETTING STARTED WITH ESAV

9.1 INTRODUCTION AND DEFINING THE SCOPE

Objectives

- Understand the characteristics of ESAV.
- Identify different purposes for ESAV.
- Understand the importance of appropriate scoping.
- Identify key elements of scoping.
- Fit ESAVs to practical purposes and needs, framed in the policy context.
- Get an overview of some methods that can help in the scoping exercise.

EXERCISE 6 – DEFINING THE SCOPE IN EXPORTUL							
Time consideration (min)	Presentation		Reading Time	Group Work	Presenta-tion of Results	Discussion	Total
	PPT 3.1	PPT 3.2					
	~15	~30	~15	~60	~45		~165

Overview	• **Module 3 – Getting started with ESAV**
	  • **PPT 3.1** Introduction
	  • **PPT 3.2** Step 1 IES – Defining the Scope
	
	• **Exercise 6:** Defining the Scope in Exportul
	  • Exercise objectives
	  • Time frame for this exercise
	  • Explain the matrix that participants are supposed to fill out
	  • Explain the task to participants
	
	• **Content:**
	  - Characteristics and purpose of ESAVs
	  - Main steps, elements and processes of ESAVs
	  - Examples of ESAV projects
	  - Elements, importance and purpose of scoping
	  - Tools and methods for scoping						

Preparation	· Presentation. · Presentation of the context of Exportul for introducing the exercise. · Write the exercise objectives and questions on a flip chart. · Prepare a flip chart to write down important and interesting notions that are raised in the discussion. · Handouts for participants: exercise 6 (defining the scope in Exportul). · Prepare the result matrixes in a panel for each of the three groups (look at matrix in exercise 6, defining the scope in Exportul). · Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.
Materials	· 1-2 flip charts, 1-2 pieces of flip-chart paper, cards in different colours, markers, pins. · 3 pin boards. · Handouts for participants: exercise 6 (defining the scope in Exportul).
Handouts	· Handouts for participants: exercise 6 (defining the scope in Exportul). · Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.
Methods	**Group work.** Before starting the exercise, quickly explain the objectives and give the instructions. Give some time for clarification questions. Give a quick introduction about the context in Exportul and how this is linked to the exercises. *Objectives:* a) Understand the characteristics of ESAV; b) Identify different purposes for ESAV; d) understand the importance of appropriate scoping; e) identify key elements of scoping; f) fit ESAVs to practical purposes and needs, framed in the policy context; and e) get an overview of some methods that can help in the scoping exercise. *Instructions.* Ask the participants to read through the exercise 6. Then ask them to group with their environmental groups (same groups as in the previous exercise: the local NGO SOH Bakul, The Environmental Unit of the provincial government and the Environmental Research Unit of Exportul). The groups must answer the questions and select one person in the group, who will present the results to the Governor. Also, they must choose a moderator and time keeper. *Recommendations for running the exercise.* During the group work, make sure that each one of the teams adjusts the purpose of the ESAV to promote change regarding their policy issue. Also, try to encourage them to narrow down a specific target audience and explain why addressing.
Presentation of results	· Open discussion in plenary · During the presentation, each group should present their findings to a fictitious *committee* formed by the governor, the planning minister and other experts or authorities with the help of the main messages derived from their filled-out matrix. The trainers and other resource persons should form part of this committee. At the end of the presentation, everybody can ask questions, give feedback, comment on the results and reflect.

Reflection	· Open discussion in plenary. · Encourage participants to contribute with their knowledge to the discussion. · Write important points, ideas, and questions on flip charts or on cards. · As a trainer, use the exemplary answers of the exercise to encourage discussion on different results and to ask questions that have not been raised during the reflection. · Discuss with the participants the importance of undertaking a scoping analysis. The purpose must reflect the contribution of the ESAV to generate changes in the policy issue and solve the policy question. To do this, the ESAV must be addressed to the appropriate target audience and should provide results that encourage the fulfillment of the purpose. · Ask participants why they think this exercise is important and how it links to the previous exercises. **Possible guiding questions for reflection:** · Given the policy and research questions, what were the challenges of narrowing the purpose of ESAV? · Are there any challenges associated with the definition of the area of scope of the ESAV? How can you overcome these challenges in a pragmatic way? · Who should be part of the steering/management committee for an ESAV? · How could your selected target audience be involved in the ESAV process? · Which stakeholders do you think could oppose the plans formulated by each of the groups? How would you propose to approach them? · What do you think are possible limitations or challenges attached to conducting your proposed assessment? How would you address such challenges?
Key messages	· There are many types of ESAVs: the type of ESAV you should conduct depends on the context and what you want to achieve. · There should be a clear purpose for ESAVs, and it must be linked to the policy and research questions. Think on the political relevance of the questions for the context at place. · If you want to influence policy, involve decision-makers from the beginning as they are your main target group. · Invest time and effort for scoping as it will shape your entire assessment. · A preliminary stakeholder analysis is of key importance in scoping and in ecosystem services assessments. · Discussions with peers and colleagues is highly recommendable. · Early consultation of experts from outside the environmental domain offers important additional insights. Consider approaching stakeholders both individually and in groups. Individual meetings can help identify interests and needs more clearly, while group discussions allow for the exploration of different topics and the attainment of different insights stemming from various perspectives and preferences. · Taking sufficient time for planning and designing the ESAV is of crucial importance. · There are many possibilities for conducting ESAVs, but it is not always necessary to undertake one.

9.1.1 Introduction and Defining the Scope

9.1.1.1 Introduction

Earlier we reviewed the basic concepts of ecosystems and their services. We addressed spatial and temporal dynamics, trade-offs, the concept of different benefits and different beneficiaries, and discussed aspects of benefit dependence and connectivity of services. Module 2 then provided an introduction to the policy arena and explained the process of formulating a policy, choosing between different options and gave an overview of different instruments that were available to policy-makers. We have also touched upon the importance of ESAVs in the policy process. We know that ecosystem service assessments and their valuation can be important and powerful tools for providing knowledge and mobilizing stakeholder attention around specific issues. For ESAVs to provide meaningful results, every ESAV should be tailored according to the specific issue that needs to be resolved. In general terms, ESAVs can be broken down into a number of essential steps that should be part of each assessment. It helps to think of ESAVs as a process. The following steps should be considered in every ESAV:

1. Defining the Scope
2. Screening and Prioritizing
3. Identifying conditions, trends, drivers and trade-offs

9.1.1.2 Step 1 – Defining the Scope

This section will explain the importance of scoping for ESAVs and will identify and discuss key elements of scoping. Further, methods that can be used during scoping will be introduced and briefly explained. The ValuES methods navigator provides an overview of the purposes, policy areas and scoping methods . After this chapter, it should be clear why scoping is relevant. Interesting to note is that scoping itself can already provide sufficient information and insights for policy analysis and decision-making.

The main goal of the scoping phase is to explain the purpose and understand the context where an ESAV will take place and to prepare a comprehensive and exhaustive foundation on which the other steps can build upon. This will make it easier to decide what kind of ESAV should be conducted and which methods come into question.

A first overview of a problem situation is carried out during the scoping phase. This step entails more than a mere identification of the problem, but rather also addresses consequences and the leading causes which may be generating changes in ecosystems and their services. Moreover, relevant stakeholders that are either affected by or can influence an issue are identified, approached and categorized. The involvement of decision-makers early on helps to ensure that the ESAVs can actually have an influence on policy development later on. Categorizing stakeholders enables further steps in the ESAVs to proceed more smoothly and allows the different stakes and interests to remain in view. As a result of the scoping, a number of questions for which answers will need to be provided will be prepared, so as to ensure that the outcome of the ESAV will be relevant for policy-making.

Scoping starts off from a broad context and then narrows its focus to a specific issue (or on different issues) relevant to a specific geographic area. It thus provides a bigger picture of the current situation (status quo), and allows for the identification of a number of issues, which can then be examined more closely. For example, during scoping, all relevant ecosystem services could be considered and a broad

stakeholder analysis can be undertaken in order to subsequently zoom into a more specific issue in a given geographic setting. Below is an example of typical questions that could be addressed during scoping:

- What is the purpose of the ESAV?
- What is the current situation or status quo regarding a specific problem situation?
- What issue or problem should be addressed?
- Which are some windows of opportunity or entry points to address that problem?
- What kind of information is needed and for what?
- What kind of information already exists and what is missing?
- What resources are available (time, money, people)?
- What scale is required (local, regional, national)?
- Who are important stakeholders and what are their interests and needs?
- Who is the target group and what results do they require?
- What are suitable assessment methods for the purpose?

In order to find answers to these questions, different tools and methods designed for gathering preliminary information can be used, such as interviews, surveys, questionnaires, group discussions, stakeholder analyses, participatory mapping (which we will address in more detail in module 4), land-use appraisals, among others.[5] Good scoping helps to define and prepare other steps in ESAVs, as it provides vital direction, ensures political (or socio-economic) relevancy of the assessment, identifies key issues and stakeholders, helps to integrate assessments into a policy context (e.g. by identifying entry points), and is a good way to build a solid participatory base, which can render the further analysis legitimate. It is therefore a crucial step, since it consists of an analysis of the linkages between ecosystem services, the socio-economic system, the cultural context and the policy arena. Another important aspect of scoping is the ability to include local experts and stakeholders early on, which can provide valuable (local) insights about the current situation and the issue at hand. During scoping, a flexible and adaptive management approach is crucial, as stakeholders, experts and colleagues will give valuable input, which might help shape the ESAV in ways not previously foreseen.

Below are some tips that should be kept in mind when attempting to initiate an ESAV:

- *Maintain your focus*
- *Methods shape what you measure*
- *Take communication seriously*
- *Understand the value and role of stakeholders and the socio-political context*
- *Don't be afraid to ask for help*

5 Visit: http://www.aboutvalues.net/additional_tools/ for a more detailed overview and explanation of the different scoping methods.

9.1.2 Exercise 6 (group work): Defining the scope in Exportul

The TV interview *Good Evening Exportul* has generated some interest in the province and a debate has arisen on the meaning of integrating environmental issues in the development plan. Nevertheless, the office of the Governor and the Minister of Planning support the current development plan and they are not fully persuaded that a revision is needed since this would generate additional costs in exchange for few tangible benefits.

Based on the identified policy issue that your environmental institution identified, you need to convince the Governor and the Minister of Planning of the importance of conducting an ESAV to support the sustainable development of the province. To do this, you should first conduct a scoping exercise to pinpoint exactly what might be the ESAV's purpose, target audience and expected results. You can organize your answers in the matrix on the next page. Select one person in the group, who will present the results to the Governor.

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1. Select one policy question and its respective research questions from the previous exercise and fine-tune the purpose of the ESAV (try to construct your purpose in a persuasive way: why would an ESAV be important?).

Be conscious of the stakeholders that you are representing. Try to think like them. The aim is to choose one policy issue and explain why an ESAV would be useful and in what way it could contribute to solving the problem.

2. What area(s) or region(s) would the ESAV include?

Look at the map of Exportul. As a group, identify areas or regions that could potentially be affected by the issue that you are researching. Make sure to think about the whole chain of services, not just about the area where the impacts are felt the most.

3. What kind of information do you need and what for?

Consider the target audience of your assessment and what you want to achieve with the assessment (go back to the purpose you chose). Reflect on the kind of change that you would like to propel with the whole process.

4. What initial scoping methods would you include?

Consider looking at the previous presentation to find different methods that you can use during scoping. Choose some methods that you think are more suitable for your assessment and explain why you selected them. Take some time to look at the inventory of methods *(www.aboutvalues.net)*, particularly at the scoping tools and methods *(www.aboutvalues.net/additional_tools/)*.

5. Who are the key stakeholders that need to be involved in the ESAV process and why?

Explain your selection of stakeholders. Think carefully about the dependence of stakeholders on ecosystem services. Some stakeholders may benefit while others may have to assume costs. Additionally, some stakeholders might be relevant as information and expertise providers; and others might need to be considered as they might not support the ESAV process. Look at the methods that focus stakeholder analysis *(www.aboutvalues.net)*.

6. Who is the target audience of your ESAV and why? What type of results does your ESAV need to produce to inform/persuade your target audience?

Think about what kind of assessment you would like to conduct and who is your target audience. Then, reflect on which results you require. For example, the Ministry of Finance would find more useful the results of a social cost-benefit analysis of an infrastructure project to inform a decision on sustainable public budget allocation, while a protected area management team might be more interested in the results of an environmental impact assessment to understand the risks of an infrastructure project to the protected area.

MATRIX FOR EXERCISE 6 (DEFINING THE SCOPE IN EXPORTUL)

Policy question:			
Research question(s):			
Purpose of the ESAV:			
Area or region	**Information needed**	**Scoping methods**	**Key stakeholders**
Target audience:			
Type of results that your ESAV need to produce to inform/persuade your target audience:			

9.1.3 Exemplary answers for Exercise 6

Policy question: What are possible alternatives to sustain fish populations in light of increasing demand?

Research question(s): How does industrial pollution affect the fishing industry? How are livelihoods threatened? What are the causes of rising industrial pollution?

Purpose of the ESAV: The export of fish and shrimp is an important economic activity in Exportul, but it is currently threatened by pollution originating from Moneila and adjacent industrial areas. An ecosystem service assessment will help to determine the effect of environmental damages on fishers' livelihoods. This in turn will allow for the identification of alternative measures to protect fish populations, curb industrial pollution and preserve Exportul's important fishing industry.

Area or region	Information needed	Scoping methods	Key stakeholders
- *Exportul* - *Nha Du River* - *aquatic ecosystems of Blue Ocean on the east coast of Bakul*	- *Information on pollution, i.e. cause, source and amount of pollution* - *characteristics and impacts of subsidies* - Information on fish stocks - Economic impacts of pollution - *(Most heavily) affected fishing activities* - *Impacts on livelihoods* - Possible policy strategies and options - Opinions, views and needs of stakeholders	- *Stakeholder Analysis* - *Interviews* - *PRA (Probabilistic Risk Assessment) What are the challenges and in what way do they affect the assessment or the area of fishing*	*Industry responsible for pollution (want to continue producing with as little internal costs as possible)* *Moneila municipality (want to have maximum sustainable economic revenues for the region)* *Fishing industry (want to uphold their harvest yields and economic revenues)* *Subsistence fisher (threatened to lose their livelihood and require assistance)*

Target audience and what results do you need to produce for them?:
The target audience for this assessment would be the local municipality of Exportul. The assessment will determine likely fish population changes, and will calculate the financial losses that the fishing industry would experience. Furthermore, the ESAV will attempt to show costs of adjusting industrial activities (creating less pollution) or installing better water treatment facilities (counteracting pollution). These costs can then be compared to the costs of having a reduced fishing harvest.

This information will allow the municipality of Moneila to decide what measures to take and to formulate a development plan for the area.

9.1.4 Visualization example for Exercise 6

9.2 IDENTIFYING AND PRIORITIZING ECOSYSTEM SERVICES AND STAKEHOLDER PARTICIPATION

(OVERVIEW OF PPT 3.3)

Objectives

- Understand, select and discuss criteria to prioritize ES.
- Identify the nexus between dependencies and impacts on ecosystem services and the actors behind the activities, which depend on or impact ES.
- Identify the actors behind the economic activities, which depend on or impact ES.
- Understand why stakeholders may value ES differently.

EXERCISE 7 – IDENTIFYING AND PRIORITIZING ECOSYSTEM SERVICES AND STAKEHOLDER PARTICIPATION						
Time consideration (min)	Presentation	Reading Time	Group Work	Presentation of Results	Discussion	Total
	~15	10	~80	~60		~165

Overview	• **Module 3 – Getting started with ESAV**
	  • **PPT 3.3** Identifying and prioritizing ES and stakeholder participation
	
	• **Exercise 7:** Identifying and Prioritizing ES and Stakeholder Participation
	  • Exercise objectives
	  • Time frame for this exercise
	  • Explain the task to participants
	
	• **Content:**
	  - Importance, purpose and elements of screening and prioritizing
	  - Different criteria to prioritize ES
	  - Impact and Dependence					

Preparation	• Presentation. • Presentation of the context of Exportul for introducing the exercise. • Write the exercise objectives and questions on a flip chart. • Prepare a flip chart to write down important and interesting notions that are raised in the discussion. • Handouts for participants: exercise 7 (Identifying and Prioritizing Ecosystem Services and Stakeholder Participation) and supplementary information for the exercise 7 (included in Annex 4). • The exercise is undertaken on the *autumn leaves* format. Prepare cards or sheets of paper (*autumn leaves)* with the name of the economic activity related to the stakeholders on one side, and the description of the activity and the stakeholder on the other side. Find the name of economic activities and related stakeholders in Annex 4. • Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.					

Materials	· 1-2 flip charts, 1-2 pieces of flip-chart paper, cards in different colours, markers, pins. · 3 pin boards. · Handouts for participants: exercise 7 (Identifying and Prioritizing Ecosystem Services and Stakeholder Participation) and supplementary information for the exercise 7 (included in Annex 4). · The exercise is undertaken in the *autumn leaves* format. Prepare cards or sheets of paper (*autumn leaves*) with the name of the economic activity related to the stakeholders on one side, and the description of the activity and the stakeholder on the other side. Find the name of economic activities and related stakeholders in Annex 4.
Handouts	· Handouts for participants: exercise 7 (Identifying and Prioritizing Ecosystem Services and Stakeholder Participation) and supplementary information for the exercise 7 (included in Annex 4). · In case it is required, a handout with an explanation of the *autumn leaves* method. · Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.
Methods	**Group work and Autumn Leaves Method.** Before starting the exercise, quickly explain the objectives and give the instructions. Give some time for clarification questions. Give a quick introduction about the context in Exportul and how this is linked to the exercises. *Objectives:* a) Understand, select and discuss criteria to prioritize ES; b) identify the stakeholders behind the activities, which depend on or impact ES; and d) understand why stakeholders value ES differently. *Recommendations for running the exercise:* Ask the participants to read through exercise 7. Clarify that for this exercise they will represent other relevant stakeholders in Exportul (different from the environmental institutions). Then, ask them to group into 5-7 working groups. With their teams, they must select one of the *autumn leaves* placed on the floor, which contains the description of one of the economic activities and the stakeholder in Exportul. They have to read the description together and answer the questions by putting themselves in the place of the selected stakeholder. The groups must answer the questions and select one person in the team who will present the results in plenary. Also, they must choose a moderator and time keeper. Make sure participants understand that they should solve the exercise (select criteria and prioritize relevant ES) by representing the stakeholder that was written on their card. Answer any questions that groups might have about their activity and give them enough time to read their description.
Presentation of results	· During the presentation, each group should present their findings in the meeting organized by the governor, and the other stakeholders. The trainers and other resource persons can play the role of moderators of the meeting. At the end of the presentation, everybody can ask questions, give feedback, comment on the results and reflect.

Reflection

- Open discussion in plenary.
- Encourage participants to contribute with their knowledge to the discussion.
- Write important points, ideas, and questions on flip charts or on cards.
- As a trainer, use the exemplary answers of the exercise to encourage discussion on different results and to ask questions that have not been raised during the reflection.
- Try to place the panels or flip charts with the results of each team next to one another. In this way, you can make some comparisons and point out differences between their work.
- During the discussion, ask participants about the advantages and disadvantages of the prioritization criteria they chose. Discuss how the selection of criteria responds to their role and specific context: the criteria and ES selected, depends on the context and interest of the stakeholder who undertook the prioritization exercise. In this sense, one of the main challenges in the ESAV process consists of integrating the views of different stakeholders in the prioritization of ES.
- Emphasize that the criteria can also be political (as *political momentum, relevance for decision-makers agenda*, etc.) and in terms of feasibility for undertaking the assessment (*availability of information*, *systematization of data*, etc.).
- Show the prioritization matrix suggested in the IES approach (dependencies and impacts) after the exercise. When presenting the matrix, make sure to point out its advantages and disadvantages. Indicate that the matrix is useful to prioritize ES in terms of the dependencies and impacts associated with economic activities. This allows for clarification of the trade-offs and risks associated with ES and the fulfillment of the development plan. On the other hand, the matrix does not take into account other criteria that could be useful to ensure political relevance or a further analysis of ES in the ESAV process, for example, the importance of the ES for decision makers, conservation priority, data availability, difficulty of measurement, etc. Additionally, sometimes ranking ES can be unhelpful, as provisioning services tend to be more tangible, and thus often rank higher than other services.
- Ask participants why they think this exercise is important and how it links to the previous exercises. Remember to ask the groups whether their results of this exercise would address the purpose of an ESAV and why.
- In general, encourage participants to draw from their own experiences. Be sure to explain any questions that participants may have regarding the tasks.
- As an introduction to the next module, ask the participants what would be the following steps in the ESAV process. If required, go back to the IES six-step approach diagram and synthesize the key messages of the training up until this step.

Possible guiding questions for reflection:

- What are the main relevant criteria that you applied to prioritize ES?
- Do you think the applied prioritization category would be sensible for ESAVs? If so, for what kind of ESAV and why?
- What are some advantages and disadvantages of prioritizing ES?
- How can you diversify the ES you prioritize? What aspects can you choose and/or complement (e.g. activities)?
- Thinking back on each of the filled out matrices, what do you think are key ecosystem services in Exportul and why?
- Who should be a part of the ESAV committee? Who is the target audience? Reconsider the answer to this question in your last exercise.

Key messages	· Two good criteria to prioritize ES are dependence and impacts of the economic activity on ES, since these might be clear and tangible for all the groups. Nonetheless, you can also prioritize ES based on the needs and interests of stakeholders or many other categories (e.g. rareness of species, conservation priority, cultural identity…). · Highlight advantages and disadvantages of prioritizing. Sometimes ranking ES can be misleading, as provisioning services tend to be more tangible, and thus often rank higher than other services. · The results of a prioritization will depend on the stakeholders undertaking the prioritization. Therefore, it is very important to have *a big picture* of the political and environmental context in the appropriate scope. · Discuss different tools for prioritizing ES (Multi-Criteria-Analysis, …)

9.2.1 Screening and Prioritizing ES and Stakeholder Participation

Step 2 of the IES Six-Step-Approach concentrates on identifying and prioritizing ecosystem services. A preliminary identification of services is often already conducted in step 1 (scoping) and further refined during this step, as services that are of particular relevance for the issue that is examined are identified and prioritized. As an example, if pollution of a river would be the issue, then part of the screening process would be to examine the services that are directly related to the problem and those that are directly or indirectly related to it (e.g. the provision and regulation of water, and the water purification capacity of an ecosystem). Thus, during screening and prioritizing, key ecosystem services are identified and analysed. Then a few key ecosystem services are chosen as priorities in order to focus the analysis and to ensure that available resources are used effectively. Note that resources may be limited and not all ecosystem services that have been identified can be assessed. You may also remember that ESAVs should always connect the supply of ES (ecosystems) with their demand (people). In order to do this, criteria for assessing and prioritizing ecosystem services are needed. This entails the collection of information concerning ecosystems and their services in an area, the activities that both depend and impact those services and the components of well-being that are related with the ecosystem services. Guiding questions during this process could include:

- Which economic, social or cultural activities are relevant for people in the area?
- Which ecosystem services do these activities depend on or have an impact on?
- Which are the most relevant ecosystem services for the area and why?
- Which stakeholders carry out which activities and how are they dependent on the benefits of key ecosystem services?

Hence, as part of this step of the ESAV, detailed and extensive data on the provision and service flow of each service is collected. That information is then systematized. Based on this approach, different criteria are then used to prioritize ecosystem services. A popular concept when assessing and prioritizing ecosystem services is dependencies and impacts (see figure at the next page). To apply this concept, key ecosystem services and activities that are carried out in an area need to be

identified first. Dependency refers to the degree that an (economic or social) activity relies on a certain provided quantity or quality of a service, while impact means the degree to which an activity affects an ES negatively or positively or can cause a change in the provision of a given service.

In the example below, we see that timber exports depend on the existence of trees and also depend on soil fertility (which is important for plant and tree growth in general). Based on the table below, we see that timber exports also influence the provision of timber, as trees are chopped down and *extracted* from the ecosystem. However, while the export of timber does not depend on water regulation, it can still impact the service heavily, as the degradation of vegetation can cause a change in surface runoff and retention of water. Hence, activities can depend and impact ecosystem services differently. By filling out the matrix for each activity and each identified ecosystem service, we can then in turn identify

a) key services, and
b) activities that have a large influence on the provision of ecosystem services (or also activities that heavily depend on services).

In the example below, we can see that the production of biofuels and the extraction of timber have the highest degree of impact on the identified key ecosystem services. These would, therefore, be logical targets for new policies or measures to better manage an ecosystem.

Similarly, the ecosystem service of soil fertility was rated highest when summing up the scores for dependence and impact. As such, this ecosystem service could be tentatively judged to be of key importance for the region. It needs to be kept in mind though, that this is a qualitative approach, and as such the results should be treated with care. It is important to remember that the goal during screening and prioritizing is NOT to assess the state and conditions of an ecosystem (which is undertaken in the next step), but rather to identify ecosystem services and to rank their importance according to dependencies and impacts of human activities on these ecosystem services.

EXAMPLE OF A DEPENDENCY AND IMPACT MATRIX FOR A VARIETY OF ECOSYSTEM SERVICES AND HUMAN ACTIVITIES.

ECOSYSTEM SERVICES	DEVELOPMENT OF (ECONOMIC)ACTIVITIES IN AN AREA										SUM
	Meat an Diary Production		**Water Treatment Plant**		**Communal Tourism**		**Timber export**		**Cotton Production**		
	Dep*	Imp*	Dep	Imp	Dep	Imp	Dep	Imp	Dep	Imp	
Water Regulation	1*	2	2	0	1	1	0	2	2	1	12
Provision of Raw Materials	0	1	0	0	1	0	2	2	0	1	7
Recreation	0	1	0	1	2	1	0	1	0	1	7
Soil Fertility	2	2	0	0	1	1	1	1	2	2	7
Soil Flexation	2	1	1	0	1	1	0	2	2	1	11
Sum Impacts & Dependencies	**5**	**7**	**3**	**1**	**6**	**4**	**3**	**8**	**6**	**5**	

*Dep = Dependence, Imp = Impact, 0 = no connection/relevancy, 1 = minor connection, 2 = major connection

Examples of other criteria to prioritize ecosystem services include:

- Biophysical change and levels of degradation
- Supply reliability
- Number of beneficiaries
- Difficulty of substitution
- Ease of reliable measurement
- Relevance to decision-makers
- Public concern

These are just a few examples of many different ways of ranking and prioritizing ecosystems (see *www.aboutvalues.net* for additional information and an overview of these types of methods).

To sum up, during screening and prioritizing, key ecosystem services are identified and are linked to development, economic, social and cultural activities. They are then prioritized by either looking at impacts and dependencies between services and activities or by applying other criteria, such as the ones mentioned above. In addition, the main stakeholders that are involved in the activities are identified. This will then allow for focusing on a few key activities and services for the next step in the ESAV and will thus provide a more focused approach.

9.2.2 Exercise 7 (autumn leaves and group work): Identifying and prioritizing ecosystem services and stakeholder participation.

**Supplementary information for exercise 7, a description of relevant stakeholders of Exportul, is included in Annex 4.*

Prioritizing ES for the ESAV

The scoping proposals presented by the environmental groups raised a great deal of expectations and worries from different ministries and other stakeholders in Exportul. Some of the questions stakeholders were raising included the following: What changes to the industrial development plans of the province are needed for more sustainable natural resource use? How can agriculture be supported if soils become less productive? Will Exportul maintain its touristic attractiveness? How can you ensure the livelihoods of people that rely on fishing as their main source of income?

It became clear that it was necessary to incorporate various actors at all stages of an ecosystem service assessment, as their knowledge, interests, needs and political influence can shape the results of such efforts. Because of this and to facilitate transparent discussions (in order to avoid losing the support of the public), the Governor decided to convene a meeting with some of the key stakeholders in Moneilá s Town Hall. It is expected that the outcomes of this meeting will help to better understand how important economic activities relate to the natural wealth of Exportul and how different stakeholders are dependent on or related to each other. The meeting should make the relationship between economic development, environmental sustainability and social well-being more tangible and visible.

You will now represent one of the stakeholders invited to the meeting. Split into five to seven groups and choose one autumn leaf with an activity on it. Prepare for the meeting by reading through the description and answer the following questions:

1. **Which ES are relevant for the economic activity undertaken by your stakeholder group?**

Make a brainstorming exercise to list ES relevant to the economic activity undertaken by your stakeholder

group. You can use the list provided for exercise number 2 (main characteristics of ecosystem services and challenges). Also, consider what you have learned about Exportul so far.

2. Select appropriate criteria to prioritize the most relevant ES for the economic activity undertaken by your stakeholder group.

The criteria should be determined by considering the socio-economic context and interests of your stakeholder group.

3. Using the selected criteria, prioritize 3-5 ecosystem services from the list that you prepared in question 1.

Attempt to prioritize and rank different ES. The prioritized ES should be relevant to the activity of the stakeholders, and therefore relevant to their interests. Groups should also be encouraged to think in terms of long-term stability of ES. Use your own experience and make assumptions. This will make prioritizing the ES easier.

9.2.3 Exemplary answers for Exercise 7

Activity 1

Fishing
Stakeholder: Fishing Cooperative

Relevant & Prioritized Ecosystem Services
1. Provision of food
2. Nursery services
3. Waste-water treatment

Explanation
The provision of fish is the most important service for fishing activities. Even if habitat conditions were excellent and no pollution whatsoever were happening, there are no fisheries without fish. Nursery services are immensely important for fish stock. Without good breeding grounds and a suitable living space, fish populations will rapidly decline. The ecosystem's ability to treat waste water is also important. Pollution is a threat to fish populations in Exportul, and can potentially lead to a decline in fish populations. The chosen criteria to rank the ES in this case was *degradation level* and *number of beneficiaries* and *difficulty of substitution*.

Activity 2

Manufacturing
Stakeholder: Chamber of Commerce or Industrial Park Developers

Relevant & Prioritized Ecosystem Services
1. Provision of raw materials
2. Waste-water treatment
3. Protection against extreme weather events

Explanation
The chosen criteria in this case was *dependency of activity on ES*, *impact on ES and other stakeholders* and *difficulty of substitution*. As such, the provision of raw materials was chosen as the most important service, as these materials are the dominant input in the manufacturing process. Waste water treatment was placed ahead of the protection against extreme weather events, as the industries' waste water poses a significant threat since the waste treatment infrastructure is not sufficient and efficient. Nonetheless, protection of factories and infrastructure against extreme weather events is also important but can be partially substituted with grey infrastructure.

Activity 3

Small-Scale Farming in Reskul National Park
Stakeholder: Bankas Indigenous Federation of Organic Producers

Relevant & Prioritized Ecosystem Services
1. Soil formation and retention
2. Maintenance of nutrient cycling
3. Biological control

Explanation
The chosen criteria were *long-term sustainability of small-scale farming activities* and *degree of dependency*, i.e. to preserve farming as the primary livelihood for indigenous groups. The formation of soil was identified as very important, as it is a prerequisite for successful farming. Similarly, the preservation and maintenance of nutrients and the ecosystem's ability to strengthen the resilience of plants against pest and diseases were also included.

Activity 4

Large-Scale Cash Crop Plantations
Stakeholder: Agribusiness Chamber of Commerce

Relevant & Prioritized Ecosystem Services
1. Soil formation and retention
2. Pollination
3. Maintenance of nutrient cycling
4. Climate regulation
5. Moderation of extreme events

Explanation
The chosen criteria were *dependency* and *degradation level*. Soil formation is the basis of any farming activity. Without a fruitful and nutrient-rich soil, plants will not grow. Pollination is another extremely important ES for large-scale farming, especially as bee populations are in decline in Exportul at this moment. Nutrient cycling, the regulation of climate to provide a suitable environment for cash crop plantations and the moderation of extreme events, which helps to reduce the impacts of droughts and other weather events were also considered important.

Activity 5

Hydropower
Stakeholder: Industrial Development Bureau

Relevant & Prioritized Ecosystem Services
1. Water regulation
2. Habitat
3. Nursery services

Explanation
A steady flow of water is necessary for the production of hydro power from a dam. Habitat and nursery services were chosen because they can be quite heavily impacted by the construction of a dam, thus, the development bureau should take care to investigate and assess potential consequences of the project on biodiversity and nursery services. *Ease of substitution, supply reliability, beneficiary dependency* and *ease of reliable measurement* were important prioritization criteria.

Activity 6

Tourism
Stakeholder: Tourism Association

Relevant & Prioritized Ecosystem Services
1. Recreation and aesthetic value
2. Protection against extreme events
4. Waste-Water treatment

Explanation
The ES were sorted according to the *number of dependent beneficiaries* and the *difficulty of substitution* Recreation and aesthetic value are the most important ES, since beaches and scenic beauty is what tourists look for. Protection against extreme events is ranked second here because of the need to safeguard tourism infrastructure. Waste water treatment was also considered important owing to the amount of waste water discharge from hotels and other tourism amenities.

Activity 7

Ecotourism
Stakeholder: NGO SOH Bakul

Relevant & Prioritized Ecosystem Services
1. Recreation and aesthetic value
2. Waste-water treatment
5. Provision of food

Explanation
For tourists looking for nature experiences, looking at a healthy and wholesome landscape is very important. Improperly managed ecotourism may quickly result in the depletion of scenic beaut, if solid waste starts to pile up and hotel infrastructure ruins the view. Waste water treatment is also important, as some waste water discharges have affected some areas within protected areas visited by tourists. Food provision is also an important ES, since many rural communities, who cater to tourists, require a steady supply of food to meet the growing tourism demand. Prioritization criteria included *activity's degree of dependency and impact.*

10

MODULE 4 – RUNNING AN ESAV

10.1 IDENTIFYING CONDITIONS, TRENDS, DRIVERS AND TRADE-OFFS

Objectives

- Analyse the conditions and trends of supply and demand of ES.
- Identify the direct and indirect drivers (underlying causes) of change of ES.
- Refresh concepts of trade-offs, direct and indirect drivers (underlying causes).
- Understand the spatial/temporal dynamics of ES and how human activities can represent drivers that contribute in a positive or negative way to conditions and trends.

EXERCISE – ECOSYSTEM SERVICE CONDITIONS, TRENDS, DRIVERS AND TRADE-OFFS						
Time consideration (min)	Presentation	Reading Time	Group Work	Presentation of Results	Discussion	Total
	~15	10	45	60		~130

Overview	• **Module 4 – Running an ESAV**
	  • **PPT 4.1** Identifying Conditions, Trends, Drivers and Trade-offs
	
	• **Exercise 8:** Identifying Conditions, Trends, Drivers and Trade-offs
	  • Objectives of the exercise
	  • Explain how to fill out matrix
	  • Provide time frame for exercise
	
	• **Content:**
	  - Importance, purpose and elements of conditions, trends and trade-offs
	  - Recap on trade-offs and spatial/temporal dynamics
	  - Direct and indirect drivers
	  - Example from Portugal					

Preparation	• Presentation. • Presentation of the context of Exportul for introducing the exercise. • Write the exercise objectives and questions on a flip chart. • Prepare a flip chart to write down important and interesting notions that are raised in the discussion. • Handouts for participants: exercise 8 (Identifying Ecosystem Services Conditions, Trends and Trade-offs). • Prepare the result matrixes in a panel for each of the three groups (look at matrix in exercise 8, Identifying Ecosystem Services Conditions, Trends and Trade-offs). • Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.					

Materials	· 1-2 flip charts, 1-2 pieces of flip-chart paper, cards in different colours, markers, pins. · 3 Pin boards. · Handouts for participants: exercise 8 (Identifying Ecosystem Services Conditions, Trends and Trade-offs). · Result matrixes in a panel for each of the three groups (look at matrix in exercise 8, Identifying Ecosystem Services Conditions, Trends and Trade-offs).
Handouts	· Handouts for participants: exercise 8 (Identifying Ecosystem Services Conditions, Trends and Trade-offs). · Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.
Methods	**Group work and Autumn Leaves Method.** Before starting the exercise, quickly explain the objectives and give the instructions. Explain carefully each one of the elements in the matrix (see matrix in exercise 8). Give some time for clarification questions. Give a quick introduction about the context in Exportul and how this is linked to the exercises. *Objectives:* a) analyse the conditions and trends of the demand and supply of ES; b) identify the direct and indirect drivers (underlying causes) of change to ES; c) refresh concepts of trade-offs, direct and indirect drivers (underlying causes); d) understand the spatial/temporal dynamics of ES and how activities can represent drivers that contribute in a positive or negative way to conditions and trends; and e) identify opportunities for changing underlying causes that lead to negative trends in the provision of ES. *Instructions.* Ask the participants to read through exercise 8. Then, ask them to group with their environmental groups (same groups as in the exercises 5 & 6: the local NGO SOH Bakul, The Environmental Unit of the provincial government and the Environmental Research Unit of Exportul). The groups must answer the questions and select one person in the group, who will present the results in plenary. Also, they must choose a moderator and time keeper. *Recommendations for running the exercise.* During group work, make sure participants identify an economic activity and its associated drivers. They must analyse how the direct and indirect drivers (underlying causes) change the provision of the ecosystem services. If time is a constraint, groups can work only in one or two ecosystem services and one or two economic activities.
Presentation of results	· Each group must choose a participant to present their group work in plenary. After presentation, other groups can ask questions and provide feedback.

Reflection	· Open discussion in plenary. · Encourage participants to contribute with their knowledge to the discussion. · Write important points, ideas, and questions on flip charts or on cards. · As a trainer, use the exemplary answers of the exercise to encourage discussion on different results and to ask questions that have not been raised during the reflection. · Try to place the panels or flip charts with the results of each team next to one another. In this way, you can make some comparisons and point out differences between their work. · Ask participants why they think this exercise is important and how it links to the previous exercises. Remember to ask the groups whether their results of this exercise address the purpose of their ESAV and why. Encourage them to think of the way that the ESAV process has encouraged changes associated to the policy issue and policy question. If this has not been achieved, ask them what is missing. · Remind them that the ESAV implies a trade-off analysis, which has the main objective of generating changes on a given policy issue. Discuss how trade-offs and drivers of change are related. Reflect on the fact that negative trade-offs indicate a potential conflict in which ES provision is at risk due to direct and indirect drivers of change (underlying causes). These indicate where the change needs to happen in order to conserve the ecosystem and promote a constant provision of ES. **Possible guiding questions for reflection:** · How did you decide on the most important trade-offs? Why do you think they are important? Why it is important to differentiate the conditions on supply and demand of ES from the trends? · Why is it important to differentiate the supply and demand of ES? · Why is it important to identify the location of the provision of ES? How are the trade-offs related to the drivers of change? · Why is it necessary to distinguish between the direct and indirect drivers of change of ES? · What are different underlying causes for drivers in general that you can think of? · Which policies or which policy instruments would you make use of in order to influence or change underlying causes and drivers?
Key messages	· A trade-off is a choice that involves losing some quality or quantity of one ES in return for gaining another ES's quality or quantity. · The conditions and trends of the supply of ES are evidence of the actual state and the changes in quality and quantity of the provision of an ES. The conditions and trends on the demand of ES are evidence of the dependence or necessity of certain stakeholders on the quantity and quality of an ES and how that dependence or necessity changes. · The analysis of conditions and trends of the supply and demand of ES is evidence of the trade-offs (spatially, temporally and on beneficiaries). · Human activities can represent drivers that contribute positively or negatively to conditions and trends of ES. A driver is an element that causes a change in the provision of an ES, directly or indirectly (underlying causes). · Most underlying causes are related to policies, measures and incentives that influence how actors think and act, which is a key issue when we want to change the situation and improve upon the state of an ecosystem and the services it provides. · Direct and indirect drivers (underlying causes) indicate where the change needs to happen in order to conserve the ecosystem and to promote the constant provision of ES and the well-being of its beneficiaries.

10.1.1 Identifying Conditions, Trends, Drivers and Trade-offs (Theoretical Input)

Steps 1 and 2 have mainly dealt with *setting the ground work* and providing the necessary preliminary information to be able to identify key ecosystem services and social and economic activities related with them. Step 3 of the Six-Step Approach goes further into detail and attempts to collect information about the conditions of an ecosystem and ecosystem services, trends for the future for different key ecosystem services, drivers of change, underlying causes and the identification of trade-offs. While steps 1 and 2 set the groundwork for the ESAV, step 3 deals with the actual ES assessment. This is a very important step to better analyse the causes of degradation and the interplay between different factors.

A logical first approach to step 3 is to gather and analyse data concerning the conditions (present) and trends (future) in the supply and demand for key ecosystem services. That is, information on the quality, quantity and supply and demand of specific ES is collected and its trends analysed. Supply in this case refers to the quantity of a service that is provided (e.g. hectares of forest, tons of fruit, litres of water) and to the quality (e.g. air quality, cleanliness of water).

Demand refers to the needed amount of a resource in an area or by an activity (e.g. hectares for primary production, water needs, vulnerable infrastructure to extreme weather). To determine the current condition, the data can be collected through various means. Examples would include literature searches, surveys and interviews, biophysical measurements, data on usage and consumption of different resources. These data will serve as the backbone of the assessment. Further methods and tools can be applied to analyse the information and come up with useful results for decision-makers.

However, it is much more difficult to assess the future conditions (trends) of an ecosystem service. To do this, it is usually helpful to look at the past and present situation and then attempt to foresee future trends based on these observations. Generally, data should be available concerning the changes in an area relevant to the provision and demand of a service (expansion of industry, rate of deforestation, rate of degradation of natural vegetation, availability of water). Based on developments in the past and factoring in current developments, ESAVs can predict likely future trends. Obviously these future trends are uncertain and could change. Nevertheless, a prediction of the future based on current and past trends is immensely helpful when attempting to find a solution for a problem situation, as it gives an indication of a future state. Moreover, by looking at different possible scenarios (e.g. a status quo vs. a new policy scenario), ESAVs are able to provide information on the possible consequences of different measures. In other words, assessing the condition and trends of identified ecosystem services in an area will reveal how current trends (social trends or economic activities) affect their supply in the future. It will reveal any associated risks and opportunities for a proposed new policy or development plan. The information can also provide a baseline for comparing future changes to ecosystem services.

In order to better assess current and predicted future conditions more accurately, it is also important to include drivers and trade-offs in the assessment. Drivers refer to changes in an ecosystem or in the provision of its services (MEA, 2005). According to the framework provided in MEA (2005), there are two types of drivers:

- Direct drivers
- Indirect drivers (which are also known as *underlying causes*)

A direct driver has a direct impact on an ecosystem. Examples could be land conversion, spreading of biological diseases, climate change, pollution, among others. Direct drivers are thus a consequence of natural resource management decisions and cause physical changes that can be identified and monitored. Productive, social or cultural activities are directly related with these drivers, as decisions within this realm are ultimately what affects ecosystems and their services.

An indirect driver is less obvious and more diffuse (MEA, 2005). It does not have a direct impact on a specific issue, but rather influences other drivers (direct and indirect), which affect an ecosystem. They are usually the cause of direct drivers that then have a

direct impact on conditions and trends. Examples of an indirect driver could be demographic change (e.g. population growth), economic growth (e.g. increased consumption, increased wealth), policy drivers (e.g. subsidies for a specific industrial activity), among others. Indirect drivers operate by altering the level or rate of change of one or more direct drivers (MEA, 2005). Often, it is the interaction of these indirect drivers that shape the development of direct drivers in the future, which is why they need to be considered. Indirect drivers are closely related to the incentives of actors to act and behave in a certain way. The more specifically people can identify and describe the indirect drivers, the more effective can be the measures planned to reverse or change them.

Exploring the complex web of interrelations among drivers and how they influence each other is not an easy task. This discussion is likely to be shaped by different stakeholder perspectives and differences in knowledge on each topic. Assessing the current impacts and trends of direct and indirect drivers on ecosystem services builds on steps 1 and 2 of the assessment. Information on drivers may be available from strategic environmental assessments, environmental impact assessments, and from other local or regional assessments conducted in the focus area. Once information on the current drivers has been collected, the potential effects of a new policy or development plan on these drivers can be evaluated. Discussing the interactions between direct and indirect drivers can also help identify possible thresholds that will not only change the quality and quantity of a given ecosystem service, but also affect the functioning of the whole system.

It is also worth noting that the degree of influence that decision-makers can have depends on their ability to influence and make decisions. For instance, individual farmers decide how much fertilizer to use (a direct driver of ecosystem change), while a finance minister might influence the global prices of the farmers' commodities (an indirect driver). A careful review of the drivers, and whether they are direct or indirect, reveals the linkages that are essential to understanding and influencing the mechanisms through which ecosystems change.

The discussion of the certainty of future trends is crucial, as scenarios should be developed to understand different future pathways. The possible trends and trajectories for each driver should be discussed, such as possible economic growth rates in the future. It is also important to identify how different stakeholders perceive these trends and how certain they are about how they will play out in the future. This will help uncover stakeholders' main assumptions about the future. The identification of direct and indirect driving forces can help identify the main uncertainties for the future, as any threshold points or bifurcation points identified can later help develop actual scenario storylines, which should consider and report on uncertainties. Different assessment methods base results on future scenarios. For more information on specific scenario modeling tools and methods, please visit *www.aboutvalues.net/method_navigator*.

The identification and understanding of direct and particularly indirect drivers is of crucial importance while proposing policy measures. The design and implementation of policies should address indirect drivers in an effective form if they are expected to have a sustained impact on conditions and trends of ecosystems. For this reason, the analysis of indirect drivers plays a key role, is a tipping point for changing and providing direction, and should therefore be considered by ESAVs seeking to have a policy impact.

10.1.2 Exercise 8 (group work): Ecosystem services conditions, trends, drivers and trade-offs

Assessing ecosystem services

Your environmental institution has been receiving phone calls from the governoŕ s office. There is suspicion that more children are getting sick from drinking water in schools although nobody has claimed responsibility. Also, there are looming protests by the Bankas who are demanding explanations about an upcoming dam project. The governor knows that your environmental institutions are *addressing these issues and he would like to know about the preliminary findings of your ESAV.*

Your group decides to perform a preliminary analysis on conditions, trends and drivers of change of some of the prioritized ecosystem services and present it to the governor. Guide your analysis by answering the following questions and organize your results as shown in the table at the next page. Select one person in the group who will present the results.

Remember: as in real life, you probably will not find all information you need in the given material. So, whatever information you do not have handy, simply deduce it from the general trends of the province and country.

1. **Select one or two ecosystem services that you consider relevant for the ESAV you are conducting (look at your results in exercise 7) and identify the ecosystems that are generating each one of those ES.**

2. **For each one of the ES, assess the condition and main trends in the supply and demand as indicated in the matrix on the next page.**

   Think about the current conditions of the ES and what could happen if current trends continue in the future. Be aware that many of the conditions and trends are going to be site specific, depending for example, on the land-use system. Consider upstream-downstream relationships in watersheds.

3. **Determine the direct and indirect drivers of degradation based on the economic activities related to the policy area chosen by your group. Also, specify related stakeholders for each one of the drivers.**

   Explain how each of the activities acts as a driver* of degradation (direct or indirect) of the analysed ES. For some of the drivers, identify at least one underlying cause** and the stakeholders related.

   **A direct driver is understood as an element that affects an ecosystem directly, and therefore, the provision of an ES. For instance: urbanization, land-use change for agriculture, overfishing, waste disposal.*

   ***An indirect driver (underlying cause) is a reason for a driver to exist and is an incentive for people to act the way they do. For instance, market prices, subsidies, taxes, changes in taste and preferences across generations.*

4. **Identify (two to three) trade-offs and the stakeholders involved.**

   Explain why the selected trade-offs and stakeholders are crucial for the analysis.

5. **Choose one or two cases where you can propose a policy and/or an instrument to solve the problem or reverse the underlying causes of ES degradation.**

   Use the information from previous modules to answer this task. Undertake a quick feasibility analysis (economic, social and political).

Matrix for exercise 8 (Ecosystem services conditions, trends, drivers and trade-offs)

Recreate this matrix on a flip chart/panel for the 1-2 prioritized ES by your environmental institution.

Ecosystem service (ES)	Ecosystem that generates the service	Current condition of the ES (++/+/-/--)	Trends in the provision of the ES (→ ↗ ↘)		Driver of Degradation (For example, how does an economic activity cause a degradation in the ES?)		
			Supply	Demand	Activity 1	Activity 2	Activity 3
Food Crops					Driver: Underlying cause: Stakeholders:		
Soil fertility							

Recreation							
Fresh water							
Food Fish							
Some of the main activities of the development plan : (1) Fishing, (2) Manufacturing, (3) Small scale Farming, (4) Cash Crops,(5) Hydropower, (6) Tourism, (7) Ecotourism.							

10.1.3 Exemplary answers for Exercise 8 (Example for ES: Food provision (crops), Soil fertility, Recreation)

ES	Where	Condition (++/+/-/--)	Trends over time (→ ↗ ↘)		Driver of Change (i.e. how does the economic activity cause a change in the ES?)		
			Supply	Demand	Cash Crops	Hydropower	Tourism
Food provision (crops)	Eastern lowlands	++	↗	↗	**Underlying causes:** Growing population and increased international trade (exports). Government needs revenue from exports; subsidizes certain production inputs and provides tax reductions for exporters. **Driver:** Increasing demand encourages more land conversion and more use of agrochemicals, which results in higher harvest yields in the short term. Nevertheless, this degrades natural vegetation and eventually, decreases soil fertility.	**Underlying causes:** Pledges of government to build a hydropower plant. Demand of electricity for a growing population. Reputation of government as provider of basic services. **Driver:** Water used for power generation reduces water availability for irrigation, which may decrease food production.	**Underlying causes:** Promotion of tourism to increase revenue, results in increasing demand for specific kinds of food. **Driver:** Land conversion for infrastructure development, pollution and degradation of natural vegetation, including landscape fragmentation.
Soil fertility	South of Moneila	-	↘	↗	**Underlying causes:** More demand for crops due to growing population or from increasing tourism. Changes in traditional livelihoods and agricultural practices due changing markets and tastes. Driver: An increase in the application of fertilizers and pesticides causes pollution problems and reduces soil fertility. Potential Policy Strategy: Subsidize the application of organic fertilizers that are less harmful to the environment.	**Underlying causes:** Pledges of government to build a hydropower plant, visibility and demand of electricity for an increasing population. **Driver:** The construction of a hydropower plant interferes with water flows and therefore, soil formation and soil fertility.	**Underlying causes:** New development plan that aims at expanding touristic sector. **Driver:** Building of touristic infrastructure seals soil surface, affecting its fertility.

Recreation	Reskul Coast	+	↗	↗	**Driver:** Not a driver for the ecosystem service, as no large-scale agriculture is applied at the coast.	**Underlying causes:** Pledges of government to build a hydropower plant and demand of electricity for an increasing population. **Driver:** Energy availability for domestic use and touristic purposes. Nevertheless, the construction of a dam reduces the attractiveness of the area for recreation and tourism.	**Underlying causes:** New development plan that aims at expanding touristic sector and associated infrastructure. **Driver:** Increase of tourism and touristic investment and infrastructure, increases recreation opportunities in the short term. Nevertheless, in the long run, as the infrastructure and number of tourists increases, the attractiveness for recreation decreases. **Potential Policy Strategy:** Apply an entrance fee to national parks or raise hotel fees to use a portion of this to maintain and preserve the ecosystem services.
Some of the main activities of the development plan: (1) Fishing, (2) Manufacturing, (3) Small scale Farming, (4) Cash Crops,(5) Hydropower, (6) Tourism, (7) Ecotourism.							

Identify two to three trade-offs and identify key stakeholders involved.

- Trade-off between cash crops and soil fertility. An increase in cash crop plantations increases agricultural productivity but reduces soil fertility in the surrounding landscape. The involved stakeholders could be commercial farmers, landowners, subsistence farmers, the municipality and the agricultural department of the government.
- Trade-off between hydropower and recreation. The construction of a dam would create energy availability for domestic and touristic purposes but reduce the attractiveness of the area for tourism and recreation. Involved stakeholders could be representatives from touristic enterprises, the government and the municipality, and indigenous groups.
- Trade-off between cash crops and recreation. An increase in cash crops could extend the agricultural frontier at the costs of say, the landscape beauty of the forest.

10.2 THE VALUES METHODS NAVIGATOR

Objectives

- Learn how to use the ValuES Methods Navigator.
- Learn about the resources that can be found in the ValuES Methods Navigator (methods, tool tips, cases).
- Get an overview of the methods, required resources for its implementation, the expected results of its application, uses, advantages and disadvantages.

EXERCISE – USING THE VALUES METHODS NAVIGATOR						
Time consideration (min)	Presentation	Reading Time	Group Work	Presentation of Results	Discussion	Total
	~20	15	~60	~45		~140

Overview	• **Module 4 – Running an ESAV**
	  • **PPT 4.4** The ValuES Methods Navigator
	
	• **Exercise 9:** Using the ValuES Methods Navigator
	  • Exercise objectives
	  • Time frame for this exercise
	  • Explain the task to participants
	
	• **Content:**
	  - Importance, purpose and elements of the ValuES Methods Navigator
	  - Understand what can be found in the ValuES Methods Navigator
	  - Learn how to use the ValuES Methods Navigator
	  - Overview of tools and methods					

Preparation	• Presentation. • Presentation of the context of Exportul for introducing the exercise. • Write the exercise objectives and questions on a flip chart. • Prepare a flip chart to write down important and interesting notions that are raised in the discussion. • Handouts for participants: exercise 9 (Using the ValuES Method Navigator). • Make sure there is internet available for making an interactive presentation of the ValuES Method Navigator and for the participants to perform the exercise. • Make sure there are 3-4 computers available for solving the exercise. • Handout of the method descriptions on cards if no internet or not enough laptops are available. • Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.					

Materials	· 1-2 flip charts, 1-2 pieces of flip-chart paper, cards in different colours, markers, pins. · Handouts for participants: exercise 9 (Using the ValuES Method Navigator). · 3 Pin Boards. · 3-4 computers. · Methods descriptions on cards (if no internet or not enough laptops are available). · Flip charts, cards and markers.
Handouts	· Handouts for participants: exercise 9 (Using the ValuES Method Navigator). · Handout of the methods descriptions on cards if no internet or not enough laptops are available. · Distribute flip charts, cards and markers for groups.
Methods	**Group work** Before starting the exercise, quickly explain the objectives and give the instructions. Give some time for clarification questions. Give a quick introduction about the context in Exportul and how this is linked to the exercises. *Objectives:* a) Learn how to use the ValuES Method Navigator; b) Learn about the resources that can be found in the ValuES Method Navigator (methods, top tips, cases); and c) get an overview of the methods, required resources for its implementation, the expected results of its application, uses, advantages and disadvantages. *Instructions.* Ask the participants to read through the exercise 9. Then, ask them to group with their environmental groups (same groups as in the previous exercise: the local NGO SOH Bakul, The Environmental Unit of the provincial government and the Environmental Research Unit of Exportul). The groups must answer the questions and select one person in the group, who will present the results in plenary. Each one of the groups should have a computer to access the ValuES Method Navigator. Also, they must choose a moderator and time keeper. *Recommendations for running the exercise.* You will need internet access for this exercise. If that is not available, either print out the short description of methods and put them on cards or use an off-line version of the navigator.
Presentation of results	· Each group must choose a representative to present their group work in plenary. After each presentation, other groups can ask questions and provide feedback.
Reflection	· Open discussion in plenary. · Encourage participants to contribute with their knowledge to the discussion. · Write important points, ideas, and questions on flip charts or on cards. · As a trainer, use the exemplary answers of the exercise to encourage discussion on different results and to ask questions that have not been raised during the reflection. **Possible guiding questions for reflection:** · What were the main challenges during the exercise? · How was the experience of using the navigator? Would you like to see anything else included? · Can you think of examples where you can make use of the methods navigator? · What other information would you find useful for making a decision on which methods to use?

Key messages	· During the session, the participants must be clear about where to find the ValuES Methods Navigator, how to use it, what to use it for, and when to use it. · The selection of appropriate methods depends on the context of the ESAV. In any case, the methods should be adapted to the context, not the other way around. · The ValuES Methods Navigator is an excellent tool to sift through available and possible methods and case studies, organized around pre-selected purposes.

10.2.1 The Methods Navigator

Ecosystem service assessments should be 'issue driven'. They can serve various purposes, such as gaining new insights on a specific issue or problem, making a strong argument for an issue, starting a discussion, helping settle a negotiation, generating information for a planning process, or comparing between different policy options. There are many different methods available for doing an assessment. The ValuES Methods Navigator *(www.aboutvalues.net/method_navigator)* can help you identify the right methods and tools according to different purposes.

The database contains profiles of a diverse range of methods, tools and sources. Filters help the user find a suitable selection of methods that could be applied in different scenarios. To do this, there are different themes (policy areas) that users can choose from (e.g. infrastructure planning, management of water resources, nature conservation and protected areas, among others). After having selected an area of interest, the purpose of an assessment needs to be specified (for instance, comparing alternative policies, programmes and projects, scoping and situation analysis, sourcing new funds for conservation, among others). Once the user selects a general policy area and a purpose, the user is directed to a page with more information on the types of questions, tips and ESAV case studies with a similar purpose. There is a downloadable *Top Tips* file for each purpose, which provides information on key points to consider when conducting an assessment for each specific purpose. The case studies have a short summary of what was done and a more elaborated overview of how it was conducted and why. The database then provides an overview of suitable methods that could be applied for the intended assessment. The methods cover a wide range of approaches, from modeling and mapping biophysical assessments to social and economic valuation. Each method comes with a short description and a document, which contains more details on the method, including its mechanics, input requirements and outputs, resource requirements, pros and cons, relevant cases, links, among other information.

10.2.2 Exercise 9 (group work): Using the ValuES Method Navigator

Given the findings of your preliminary analysis, your environmental institution would like to select the most suitable method(s) to carry on with the ESAV. To support your search and find the most suitable methods(s) for your ESAV, you decided to use the ValuES Method Navigator *(www.aboutvalues.net/method_navigator)*.

Follow the steps described below and answer the following questions. Select one person in the group, who will present the results.

1. **Go back to the policy and research questions and purpose of the ESAV you formulated before (during exercise 6) and focus on some key ecosystem services for further analysis.**

Determining the assessment's purpose is important, since it defines the goals of the assessment more precisely. Use your own experience, apply what you have learned so far, and think about different aspects of the problem. Discuss amongst each other which ecosystems and ecosystem services you think will be impacted by the policy situation and why.

2. **Use the ValuES Method Navigator to choose two or three methods for your ESAV.**

Go to the methods navigator *(www.aboutvalues.net/method_navigator)*, and, according to the purpose of your ESAV, choose a policy area, a purpose and refine the search by focusing on types of methods and/or key ecosystem services.

3. **Prepare an overview of the selected methods (look at short and long descriptions, top-tips and examples).**

Prepare key information and requirements related to each one of the methods.

4. **According to the chosen methods, what could be the type of findings for your ESAV?**

Describe how the implementation of the method will contribute to fulfill the purpose of your ESAV.

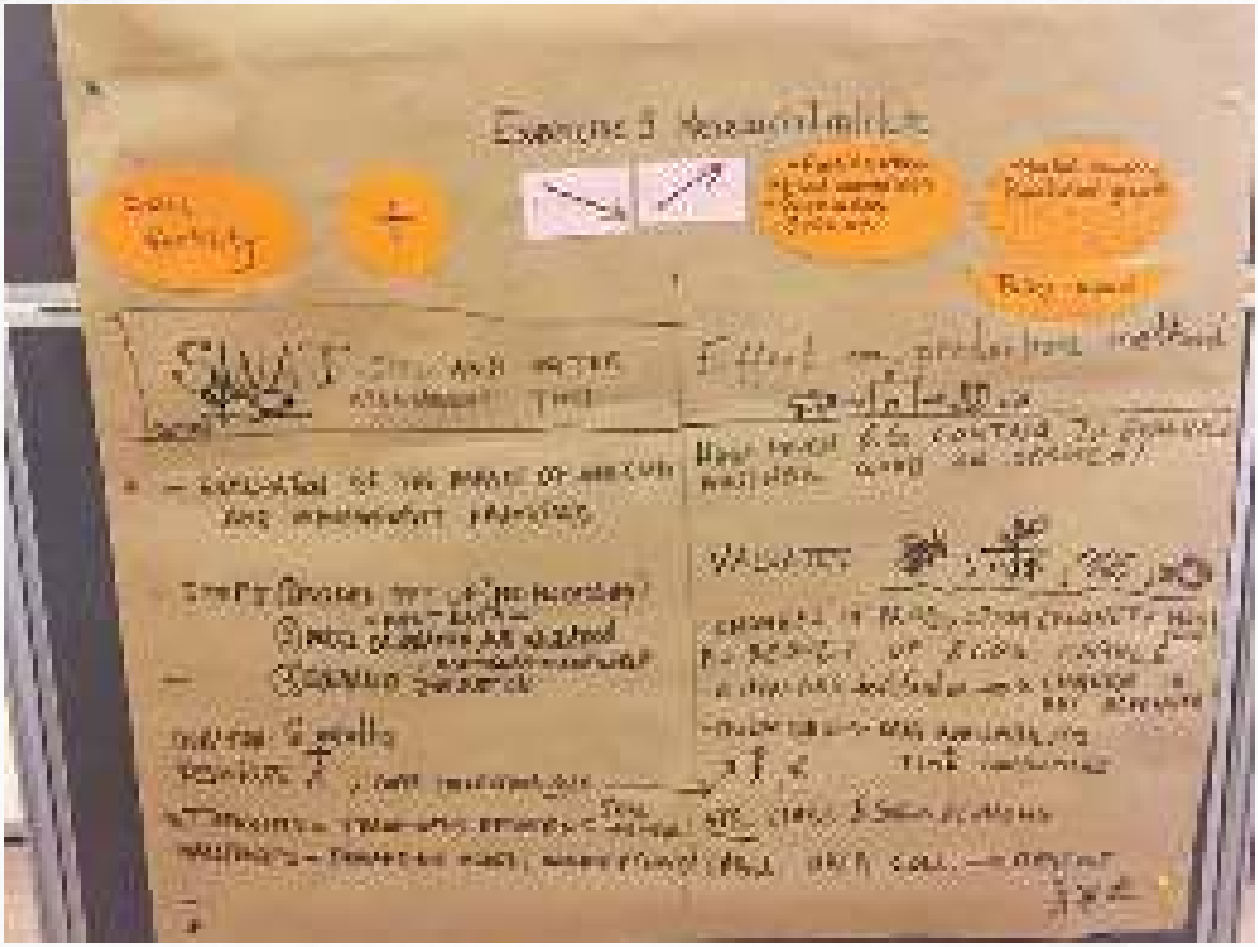
5. **Which stakeholders would you incorporate in the implementation of the methods and why?**

10.2.3 Exemplary answers for Exercise 9

Assessment purpose:	Evidence the importance of *Reskul Protected Area* (RPA) for Agriculture and Tourism in Exportul			
Ecosystem services	Provision of fresh water, recreation, pollination.			
Method(s)/ Instrument(s)	**Information needs**	**Resources needed**	**Expected results**	**Stakeholders to involve**
PRODUCTION FUNCTION Measures how much an ecosystem service contributes to the productivity of another (usually marketed) good or service, in this case, Agriculture and Tourism.	Determining and quantifying the biophysical relationship that links changes in the supply of ecosystems services provided by the RPA with changes in food production and number of tourists. Data on agricultural production (crop yields) and number of tourists. Market prices of crop production and tourism-related visits (hotel, fees of entrance to RPA, etc.)	Data, software for running models, a work team that includes experienced economists in the field.	Change in agriculture production and income when there is a change in the provision of the main ecosystem services associated with this activity. Change in number of tourists and income when there is change in the provision of the main ecosystem services associated with Tourism.	Ministry of Environment, Ministry of Finance, Ministry of Tourism, Ministry of Agriculture, Governor, agricultural companies, tourism companies, RPA Managers

Method(s)/ Instrument(s)	Information needs	Resources needed	Expected results	Stakeholders to involve
TRAVEL COST METHOD *Uses data from visitors to determine the value of an area's ecosystem services. The underlying principle is that there is a direct correlation between travel expenses and a site's value. This method uses questionnaires to determine who visitors are, how old they are, where they come from; how much they spend (to get to the site, to get into the site, while they're there); what their motivations for visiting are; and how often they visit. This information is used to estimate the demand curve.* (TEEB)	Through surveys to a significant sample of visitors, obtain data about: number of visits to the RPA, amount spent in traveling to the RPA (fee of entrance, hotels, gasoline, etc.), and socioeconomic data.	Data, software for running models, a work team that includes experts in statistics, design and interpretation of surveys.	Change in the number of visitors to the RPA when there is a change in the provision of the main ecosystem services associated with tourism. Change in income for touristic companies and local inhabitants when there is a change in the provision of the main ecosystem services provided by RPA associated with tourism. Contribution (in monetary units) of the recreation-related ecosystem services provided by RPA to tourism income (including companies and local inhabitants benefiting).	Ministry of Environment, Ministry of Finance, Ministry of Tourism, Governor, Protected Area Managers, agricultural companies, tourism companies, RPA Managers

10.2.4 Visualization example for Exercise 9



10.3 ECOSYSTEM SERVICES INDICATORS

Objectives

- Understand the characteristics, importance and use of indicators.
- Understand the construction of indicators as a social process, and the use of metrics in indicators.
- Understand the framework proposed by the World Resources Institute (WRI) of ecosystem services indicators.

EXERCISE – ECOSYSTEM SERVICES INDICATORS						
Time consideration (min)	Presentation	Reading Time	Group Work	Presentation of Results	Discussion	Total
	30	10	30+30	20		120

Overview	• **Module 4 – Running an ESAV**
	  • **PPT 4.2** Ecosystem Services Indicators
	
	• **Exercise 10:** Ecosystem Services Indicators
	  • Exercise objectives
	  • Time frame for this exercise
	  • Explain how to fill out the matrix
	  • Explain the indicator categories of the framework figure from WRI (2010)
	  • Explain the task to participants
	
	• **Content:**
	  - Importance, purpose and elements of indicators
	  - Indicators as a social process
	  - Tips and hints for how to use indicators
	  - Indicator categories
	  - Framework, stocks and flows
	  - Challenges
	  - Examples
	  - Example Finland					

Preparation	• Presentation. • Presentation of the context of Exportul for introducing the exercise. • Write the exercise objectives and questions on a flip chart. • Prepare a flip chart to write down important and interesting notions that are raised in the discussion. • Handouts for participants: exercise 10 (Ecosystem Services Indicators). • Prepare the result matrixes in a panel for each of the three groups (look at matrix in exercise 10, Ecosystem Services Indicators). • Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.					

Materials	· 1-2 flip charts, 1-2 pieces of flip-chart paper, cards in different colours, markers, pins, 3 pin boards. · Handouts for participants: exercise 10 (Ecosystem Services Indicators).
Handouts	· Handouts for participants: exercise 10 (Ecosystem Services Indicators). · Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.
Methods	**Group work (world café/carousel)** Before starting the exercise, quickly explain the objectives and give the instructions. Give some time for clarification questions. Give a quick introduction about the context in Exportul and how this is linked to the exercises. *Objectives:* a) Understand the characteristics, importance and use of indicators; b) understand the construction of indicators as a social process, and the use of metrics in indicators; and c) understand the framework proposed by the World Resources Institute of ecosystem services indicators. *Instructions.* Ask the participants to read through the exercise 10. Then, ask them to group with their environmental groups (same groups as in the previous exercise: the local NGO SOH Bakul, The Environmental Unit of the provincial government and the Environmental Research Unit of Exportul). The groups must answer the questions and select one person in the group, who will present the results in plenary. Also, they must choose a moderator and time keeper.
Presentation of results	· Each group must choose a participant to present their group work in plenary. After each presentation, other groups may ask questions and provide feedback.
Reflection	· Open discussion in plenary. · Encourage participants to contribute with their knowledge to the discussion. · Write important points, ideas, and questions on flip charts or on cards. · As a trainer, use the exemplary answers of the exercise to encourage discussion on different results and to ask questions that have not been raised during the reflection. · Ask participants why they think this exercise is important and how it links to the previous exercises. Remember to ask the groups whether the indicators they chose address the purpose of their ESAV and why. Do they think that these indicators will contribute to generate changes in the policy issue? Also, discuss the importance of the target audience on the selection of appropriate indicators. **Possible guiding questions for reflection:** · Can some of the indicators that were identified also be used for other categories? · Are any indicators placed in the wrong category? · What other metrics can be used to measure an indicator? · What did you find easy while answering the questions in your group, and what did you find difficult? · What do you think is the most important aspect of an indicator? What ist the least important aspect? · Can you think of important indicators for policies (that you know or have heard of)? · What do you think is the single most important aspect for an indicator concerning decision-making (i.e. should it be cheap? Comprehensive? Informative? Easy to measure? Target-oriented?)

Key messages	· Indicators convey information and help to measure and visualize issues of importance. · Indicators can be applied to different categories and can respond to trends, conditions, drivers, benefits, service provision, etc. · Good indicators should be SMART (Specific, Measurable, Attainable, Relevant and Time-bound) and geared to measuring changes that are relevant to the policy issues currently being faced. · Communication is of key importance when using indicators, especially when identifying possible indicators. · Before you think about which indicators to use, think on what you want to know and why. Link it to the policy question of your ESAV and your target audience. · Indicators should be easy to understand, easy to measure and not too expensive. · Indicators help to monitor the effectiveness of an implemented measure.

10.3.1 Ecosystem Services Indicators (Theoretical Input)

Monitoring ecosystem services is an essential way of collecting information to aid ecosystem management. Without knowing the state of an ecosystem and the way it changes over time, it is almost impossible to devise proper management strategies. Indicators are the backbone of monitoring systems, as they define the elements that will be tracked. Ecosystem service indicators can focus on biophysical aspects of ecosystem change or on socioeconomic issues surrounding human well-being. They, therefore, cover a wide observation spectrum, from looking solely at ecosystem dynamics, such as changes in ecosystem structures and processes, to exploring issues surrounding the connection between human well-being and nature.

The following information is mainly based on information that is contained in the Millennium Ecosystem Assessment (2005):

An indicator can be anything that contains useful information, where information is understood as knowledge that can make a difference. In other words, an indicator can be used to express information about the state, condition or trends of an ecosystem service, which can be later used to inform decision-making. Indicators can also reflect the degree of impact that a human activity has or can have on nature, or can also show to what degree ecosystem change can affect human well-being.

In order for an indicator to be understandable, legitimate and relevant to the policy context, it needs to be purpose and audience specific if it is to increase the sensitivity, reliability and ease of communication. The construction of an indicator should be considered as a social process, since it serves a special purpose and use, which in this case should be connected to the needs of stakeholders to evaluate and monitor the impacts of policies on ecosystems and subsequently on human well-being.

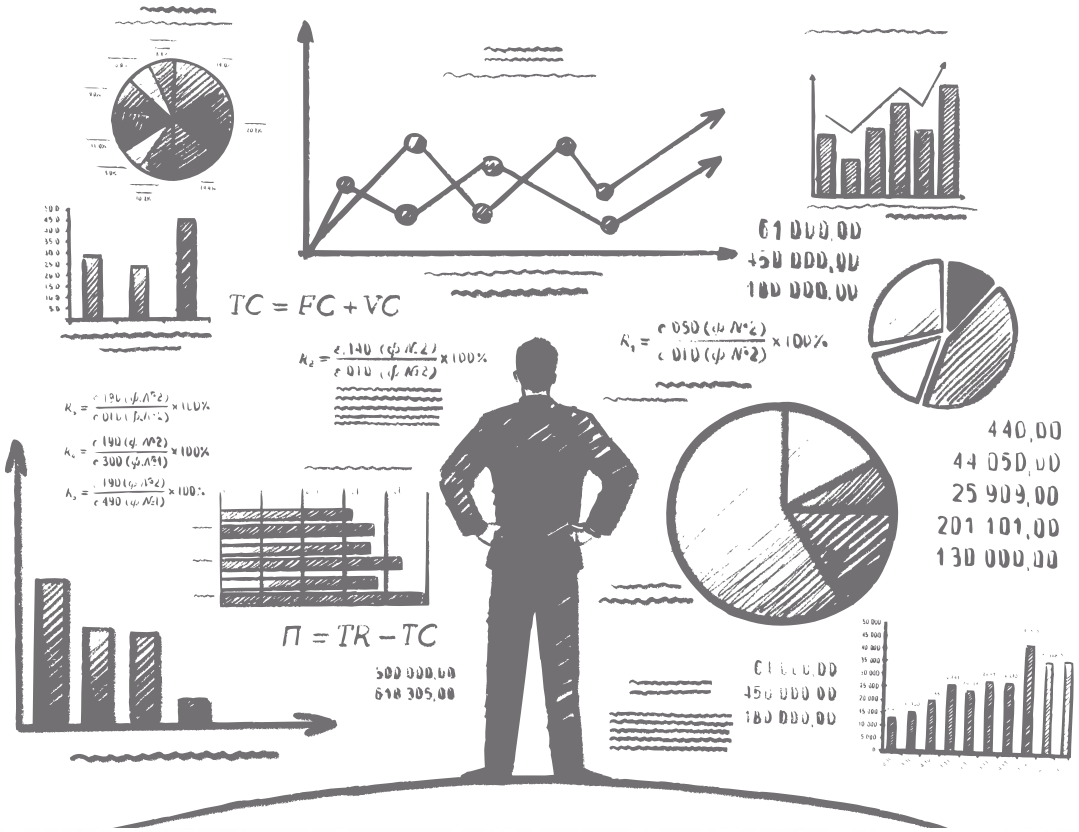
Many ecosystem services are not directly measurable. Thus the use of an indicator serves as a proxy to gain insights on the conditions and values surrounding a service. However, indicators can be helpful in many ways. As we are well aware by now that ecosystems are complex, indicators can help to simplify information and make it more graspable. More specifically, an indicator measures a state, quantity or process that can be derived from observations. To do this, an indicator uses metrics, which are a set of measurements or data that underpin each indicator. In most cases these will be quantifiable data -number of species or number of hectares- or information obtained through surveys or similar tools, such as preferences or changes in attitudes, among others. Metrics help to express the multivariate nature of an attribute, such as the different benefits derived from an ecosystem service, in a single value, like the relative monetary value of the benefits. This helps in obtaining informa-

tion which is comparable across time and space and may help policy-makers in the decision-making process.

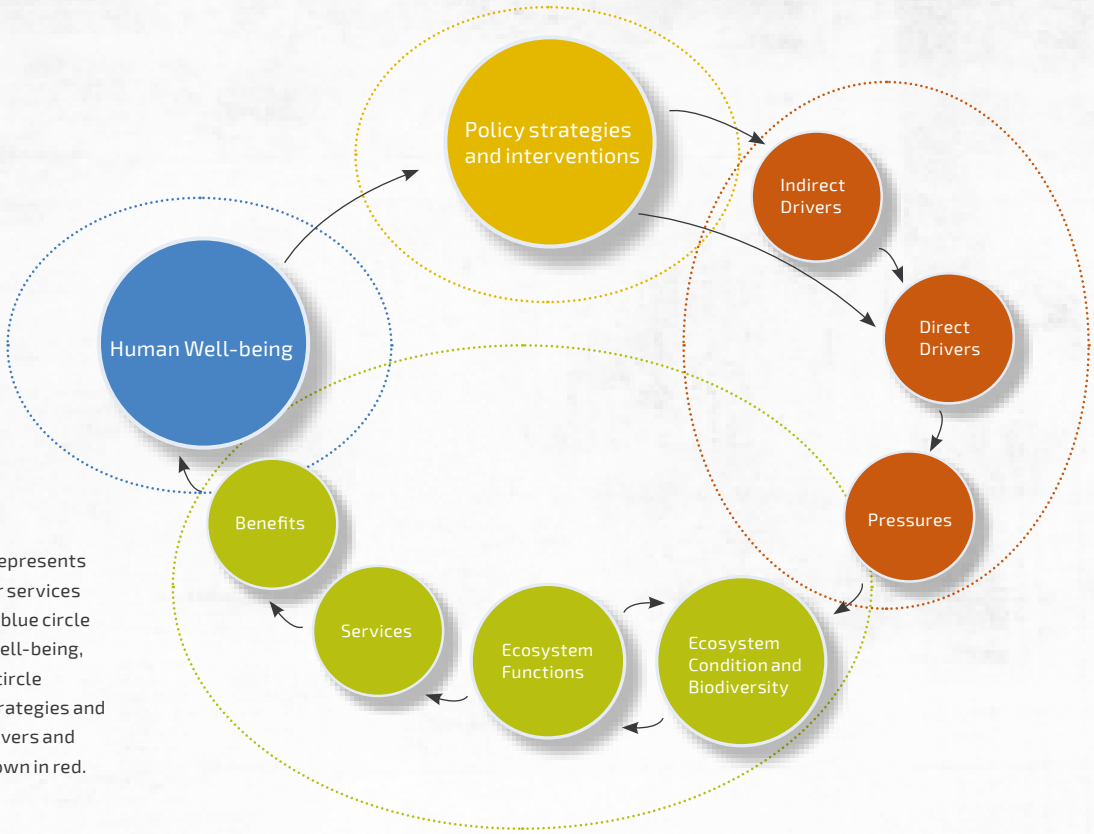
Depending on what information about an ecosystem service is required, an indicator can focus on:

- **State** (measure conditions and changes, such as timber production or water supply)
- **Pressure** (trends over time, such as change in forest cover or change in nutrient concentration)
- **Driver** (extent of the impact of human activities, such as fertilization rates or CO2 emissions)
- **Benefits** (extent of goods and services consumed by people, such as number of visitors to a national park or consumption of food)
- **Well-Being** (extent to which ecosystem services influence social, economic and cultural well-being, such as people employed, relative happiness or access to drinking water, among others)

A comprehensive overview is provided by the framework below. It shows different categories that indicators can relate to as far as their contribution to policy dialogue and decision-making is concerned (WRI, 2010). The framework is the result of a combination of elements from the ecosystem service conceptual framework (MEA, 2005), and from different ecosystem service approaches developed for specific applications such as economic valuation (e.g. Fisher et al, 2009), and the *Driving Force-Pressure-State-Impact-Response* (DPSIR) framework.



ECOSYSTEM SERVICE INDICATORS FRAMEWORK



The green circle represents ecosystems, their services and benefits. The blue circle reflects human well-being, while the yellow circle denotes policy strategies and interventions. Drivers and pressures are shown in red.

(from WRI, 2010)

Keep in mind that indicators can be expressed in terms of stocks or flows. Stocks are expressed in quantity units, whereas flows are expressed as quantities per unit of time. In that sense, most ecosystem services are flows (think about the harvest of food products over a season). Distinguishing if an indicator should be measuring a stock or a flow is important in order to make sure that what is measured is relevant to what is being researched or what needs to be tracked in order to inform policy change. The table at right shows an overview of some different indicator examples related to ESAVs and the purposes behind each one of them:

EXAMPLES OF DIFFERENT INDICATOR CATEGORIES, METRICS AND MESSAGES

What does the indicator examine?	**What is assessed?**	**Examples**	**What does the indicator express?**
Ecosystem	The state of an ecosystem	- number of species on the red list - ha of forest cover - temperature / rainfall	Important to assess the **sustainability** of ES
Drivers of Change	The driving forces behind a change in the ecosystem / ES	- land cover change - climate change - emissions of CO_2	Important to assess the **dynamics** of ES
Ecosystem Services	The change in the supply of ES (can be either stock or flow indicators)	- m^3 of water per sec - timber production - tourist revenues	Important to assess the **benefits** of ES

(Source: WRI, 2010).

Now that we understand what an indicator is and what it is useful for, we turn our attention to the process of generating and applying an indicator. There are several steps that should be observed when attempting to create and use an indicator. These steps are summarized below (adapted from WCMC, 2014):

1. Identify ecosystem services related to policy objectives.
2. Determine key questions and the intended use of indicators.
3. Look at the available data.
4. Identify possible indicators and analyse efforts needed to create and use them.
5. Communicate and interpret indicators.
6. Test and refine indicators with relevant stakeholders.
7. Develop monitoring and report systems to collect information and data for indicators.

Following these steps will ensure that sensible indicators are identified. However, some aspects or challenges should be kept in mind. Despite their usefulness, indicators are only a simplification of a complex reality and might not capture all elements of what is being measured (MEA, 2005). Moreover, monitoring schemes usually focus on what is easy to measure, which can result in a bias towards provisioning services and leaving the more complex regulating or cultural services without appropriate measurement. Despite these shortcomings, indicators remain an important asset in all ESAVs. The following guidelines are helpful in order to ensure an indicator's usefulness. A good indicator should be **SMART:**

- **S** pecific (should be geared at key issues)
- **M** easurable (based on data that can be easily collected and is understandable)
- **A** ffordable (its design and application should not be too expensive)
- **R** elevant (should fit the user's needs and address the correct issues)
- **T** ime-bound (applicable for a certain period of time)

10.3.2 Exercise 10 (group work): Ecosystem services indicators

As part of the analysis, the environmental groups have been given the task to formulate indicators to gauge changes of ecosystem services, so that the impacts of different policy alternatives for the Development Plan of Exportul can be measured. Your group has chosen WRI's (2010) indicator framework to develop the relevant indicators.

Choose one of the ecosystem services from the last exercise and answer the following questions. You can use the matrix below to organize your results. Select one person in the group who will present the results to the Governor and the Minister of Planning.

1. Define at least three indicators (from different categories) for your ecosystem service?

First, you need to identify three indicators for three different categories (you can choose from the categories that are defined by the indicator category framework, see figure below). Remember to think about *why you need an indicator, what you want to communicate to whom and why.*

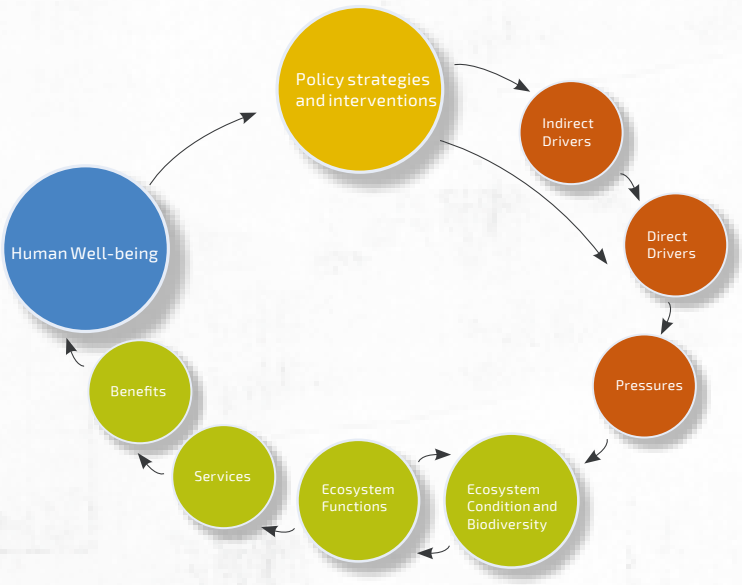
2. How is your indicator going to be measured (metrics)?

Decide on what exactly it is that you want to measure.

3. Who needs to be involved to build / improve / measure the indicator, and who is the target audience?

Think about the stakeholders involved in creating and monitoring your indicator. Also, think about the intended receiver of your indicator. The information that results from your indicator should be relevant to his or her interests.

ECOSYSTEM SERVICE INDICATOR CATEGORY FRAMEWORK



Overview of different categories relevant to the provision and benefits of services, for which indicators can be used as a means of measuring quantities (Source: WRI, 2010).

MATRIX FOR EXERCISE 10 (ECOSYSTEM SERVICES INDICATORS)

Key ecosystem service	Indicator category	Indicator	Metrics	Involved stakeholders	Target audience

10.3.3 Exemplary answers for Exercise 10

Key ecosystem service	Indicator category	Indicator	Metrics	Involved stakeholders	Target audience
Fresh Water Provision	Ecosystem condition	Quantity and quality of water; environmental flow	Amount of water available per second flowing from a river (m^3/s), chemical composition of water (analysis of water quality)	Research institute, government (environmental department), local experts, NGO, landowners	Municipality and water company (to judge water source reliability and quality)
	Ecosystem service	Amount of water from a given source reaching the city	Amount of available water in the city per second (m^3/per s)	Research institute, water company, government	Municipality and water company (to plan future actions and infrastructure to ensure water provision)
	Human well-being	Access to water	Proportion of people with access to water in an urban area	Research institute, water company, inhabitants of Exportul, government	Municipality and central government (to plan infrastructure and risk management).

10.4 MAPPING ECOSYSTEM SERVICES

Objectives

- Understand the usefulness of ES mapping as a relevant tool for ESAV.
- Analyse the use of mapping for identification and management of trade-offs.
- Learn about the advantages, disadvantages and challenges of ES.

EXERCISE –ECOSYSTEM SERVICES MAPPING						
Time consideration (min)	Presentation	Reading Time	Group Work	Presentation of Results	Discussion	Total
	45	15	75	45		180

Overview	• **Module 4 – Running an ESAV**
	  • **PPT 4.3** Mapping Ecosystem Services
	
	• **Exercise 11:** Ecosystem Services Mapping
	  • Exercise objectives
	  • Explain the task to participants
	  • Time frame for this exercise
	
	• **Content:**
	  - Why, what, when and how to map
	  - Participatory Mapping
	  - Overlay Mapping
	  - Mapping and Modelling
	  - What resources are needed for mapping?
	  - Examples
	  - Challenges					

Preparation	• Presentation. • Presentation of the context of Exportul for introducing the exercise. • Write the exercise objectives and questions on a flip chart. • Prepare a flip chart to write down important and interesting notions that are raised in the discussion. • Handouts for participants: exercise 11 (Ecosystem Services Mapping). It is important that the maps included in the exercise are printed in colour. • Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.					

Materials	· 1-2 flip charts, 1-2 pieces of flip-chart paper, cards in different colours, markers, pins. · 3 Pin boards. · Handouts for participants: exercise 11 (Ecosystem Services Mapping). It is important that the maps included in the exercise are printed in colour.
Handouts	· Handouts for participants: exercise 11 (Ecosystem Services Mapping). It is important that the maps included in the exercise are printed in colour. · Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.
Methods	**Group work** Before starting the exercise, quickly explain the objectives and give the instructions. Give some time for clarification questions. Give a quick introduction about the context in Exportul and how this is linked to the exercises. *Objectives:* a) Understand the usefulness of ES mapping as a relevant tool for ESAV; b) analyse the use of mapping for identification and management of trade-offs; and c) learn about the advantages, disadvantages and challenges of ES. *Instructions.* Ask the participants to read through the exercise 11. Then, ask them to group with their environmental groups (same groups as in the previous exercise: the local NGO SOH Bakul, The Environmental Unit of the provincial government and the Environmental Research Unit of Exportul). The groups must answer the questions and select one person in the group, who will present the results to the Minister of Finance. Also, they must choose a moderator and time keeper. *Recommendations for running the exercise.* It is important to print the maps of the exercise in colour.
Presentation of results	· During the presentation, each group should present their findings to the Minister of Finance. The trainers and other resource persons should play the role of the Minister. At the end of the presentation, everybody can ask questions, give feedback, comment on the results and reflect.
Reflection	· Open discussion in plenary. · Encourage participants to contribute with their knowledge to the discussion. · Write important points, ideas, and questions on flip charts or on cards. · As a trainer, use the exemplary answers of the exercise to encourage discussion on different results and to ask questions that have not been raised during the reflection. **Possible guiding questions for reflection:** · What do you think are possible limitations or shortcomings of maps of ES and mapping tools? · Do you think the maps were useful in the specific context or could other methods have provided better results? · What are the advantages of using maps of ES? · Based on your knowledge and experience, can you think of an example where you think creating a map of ES could have been beneficial and would have added an additional benefit? · Do you have any prior experience in working with maps of ES? If so, why was it created and in what context? Was it useful?

Key messages	· Mapping ES can help to visualize and understand how drivers impact ecosystem services and their distribution. · Mapping visualizes supply and demand of ES, the trade-offs and where conflicts exist. · Mapping can help to identify challenges and administrative limits and can thus be particularly helpful during scoping. · Visualization helps to distinguish and differentiate between different areas, and is useful to determine where management interventions should take place. · Mapping ES should contribute to address the policy question of an ESAV. · There are many different mapping methods available, and which one is selected as the most appropriate depends on each specific context and problem situation, as well as on the available resources and available data. · Mapping ES can be a powerful tool to communicate the importance of ES to relevant actors. · Mapping can be especially useful when looking at different scenarios and comparing them.

10.4.1 Mapping Ecosystem Services (Theoretical Input)

Mapping is an immensely helpful tool for assessing ecosystem services and for analysing and communicating assessment results. Maps have the peculiar advantage that they can show and communicate diverse aspects in a very simple and easy-to-understand manner.

Some information that can be visualized in maps, and that can be relevant for the ESAV process include: the area where the ES are supplied, the quantity and quality of the ES supply, the sites where benefits of ES are received and their distribution, the sites where the ES are demanded, sites where there are conflict areas for use in quantity and quality of ES, land use, areas where ES supply is at risk, etc. This information can be visualized for a certain moment in time or for different periods. In addition, it can be compared between different scenarios.

In this sense, some of the purposes of mapping include:

- Distinguish between the areas of supply and demand of ES, and how the supply can fulfill the demand.
- Identify the spatial mismatches between supply and demand.
- Visualize the administrative limits and the associated challenges in the management of supply and demand of ES.
- Identify the distribution of beneficiaries of ES in the area, and analyse the distributional issues.
- Identify patterns of land cover and land use, and the impacts in ES supply.
- Visualize trade-offs between different economic activities and land uses: understand conflicts, measure the intensity of such conflicts for different stakeholders and analyse how conflicts can be managed.
- Identify bundles of ES.
- Compare scenarios on ES supply and demand, and determine management interventions and resource allocation.
- Communicate any of the above in an illustrative format and encourage policy and decision-making impacts.

According to Schägner et al., 2013, in general, ES mapping is used to contribute to the following policies (69 publications and 79 separate case studies analysed):

1. Land-use policy. ES mapping allows the assessment of broad land-use policies at different scales. Maps helps to visualize the trade-offs and synergies in ES values, as a result of land-use change.
2. Resource allocation. ES mapping provides information to know where to conduct a policy measure. It allows the identification of locations in order to minimise negative or maximise positive ecological side effects.
3. Green accounting. ES mapping helps estimating the green GDP at different spatial scales, by summing up total ES values across the region of interest (TEEB, 2010).
4. Payments for ES. As ES mapping makes ES values spatially explicit, information is available on how to design more efficient incentives for ES providers.

ES mapping can be used as long as it provides more than biophysical information. In an ESAV, ES mapping is a useful tool if it addresses the research and policy questions, thereby contributing to the fulfillment of the ESAV's purpose.

A large variety of different methods exists for mapping, but in this section, we will focus on the following: participatory mapping, participatory 3-D modeling, and overlay mapping and modeling (which is usually characterized as a *geo-information systems* (GIS) method). These three methods were chosen, since they are commonly applied and can be used in most of the purposes mentioned before.

10.4.1.1 Participatory mapping

Participatory mapping is a popular mapping tool, as it fosters the involvement of stakeholders and may pinpoint their potential future contribution to a project. Its applications encourage ownership and promote *good governance*, as the mapping becomes a product structured by the stakeholders involved (JNCC Report, 2014). The resulting map reflects stakeholders' practical knowledge, and thus may evidence their priorities and perspectives related to, among others, ecosystem services use. The method is also useful as it allows affected stakeholders (e.g. an indigenous tribe) to articulate their needs and to communicate possible conflict situations in the planning process of ESAVs. Moreover, participatory mapping is especially successful in gathering information about conflict situations (conflicts, history), which are often not reflected when using more common modeling approaches (such as GIS), as it does not depend on extensive *scientific data*, but rather on the knowledge of stakeholders. There are four main methods for implementing participatory mapping: ground mapping, sketch mapping, transect mapping and scale mapping (International Fund for Agricultural Development, 2009).

Ground mapping is perhaps the most basic of these approaches and is based on a request to stakeholders to draw maps on the ground, based on their memory. Oftentimes, rocks, twigs, pebbles and similar tools are used to create a visual representation of an area. The method is easily applicable in almost any context and requires little prior knowledge or training. It is very useful for scoping. Nevertheless, the map may not be highly precise.

Sketch mapping is a more advanced form of ground mapping and is conducted by requesting stakeholders to draw a map on large pieces of paper. Again, the map is entirely based on the knowledge and memory of the stakeholders. Similar to the ground mapping method, maps might not be precise and lack of specific scale measurements. However, sketch maps are easily facilitated and can be used for scoping and planning more detailed mapping efforts.

Transect mapping is a spatial cross-section of an area, depicting important features such as houses or vegetation along a planned route. Transect maps are done with the guidance of local stakeholders, and help to gather information regarding the use of ecosystem services, the current land-use practices and conflicts. Outputs are not geo-referenced.

Scale mapping is a more time-consuming method. Here, stakeholders are questioned and their remarks are represented in a prepared geo-referenced map. All the features indicated by the stakeholders are represented in a specified scale in the geo-referenced map (e.g. a scale of 1:20,000 means that every length unit on the map represents 25,000 units in the real area; i.e. one centimeter in the map represents 250 meters in the real area). The method is more difficult to execute and requires more training and preparation but has the advantage that the final product should represent an understandable and accurate representation of an area based on stakeholder knowledge.

10.4.1.2 Participatory 3-D modeling

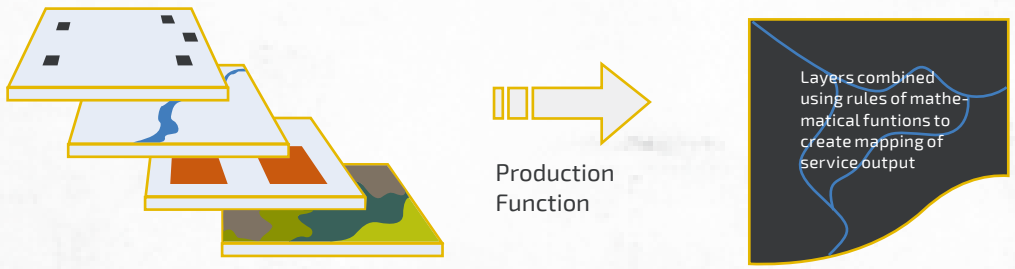
Participatory 3D modeling involves producing a map in a three-dimensional representation of an area, based on the knowledge of local people and other stakeholders. The main difference is that it involves slightly more cost and effort, and that it is not easy to apply on a larger scale. For this method, a physical model of an area (e.g. built with cardboard and other materials) is created based on existing topographic maps and completed with the help of local stakeholders. This method allows better visualization of topographic conditions (mountains, valleys, and rivers, among other landscape features). The final result can be converted into a GIS program (or similar software). Having the final map in a digital format makes it easier to use for an assessment and allows its usage for multiple planning exercises.

10.4.1.3 Overlay mapping and modeling

Overlay mapping and modeling relies on GIS data layers. These separate layers, which can be considered as a set of constraints, are combined through a rule-based map overlay technique to predict a specific level of service output (JNCC, 2014) (see figure below).

The result is a combination of the information of the different GIS layers in a synthesized map where all the layers' information is considered.

Overlay mapping is especially useful for identifying and monitoring interactions between ecosystems and socio-economic systems, for setting relevant targets, and for responding to spatial planning needs.



Visualization of the inputs and output in a overlay mapping approach. On the left side we see the different inputs (spatial features such as rivers, different habitats, communities, dams) (from JNCC, 2014).

10.4.1.4 Challenges related to mapping

One of the main challenges of ES mapping relates to the scarcity of accurate data. Sometimes, there is not GIS data on some the most relevant ES to be analysed. Moreover, some of the available data may not have the required scale or may not have enough quality to be used in the ESAV. In addition, it might happen that, due to their characteristics, the data on certain ES have different resolutions. For example, a much higher resolution is needed to properly map pollination services compared to climate regulation services. It is important to understand that a map can only be as good as the data that is used to create it, but that good data on its own is not a guarantee for a good map.

When analysing maps of ES, it is important to notice whether some crucial aspects have been missed or omitted. For example, it has been stated that most mapping and modeling approaches have focused more on supply than demand (Bagstad et al., 2013). This means that while the potential provision of services is addressed, oftentimes the demand for individual services is not adequately considered. This may represent a limitation for fulfilling an impacting ESAV.

Moreover, it is important to note that maps do not necessarily display information in a neutral, objective and disinterested way. In some cases, important aspects could be intentionally left out of a map to strengthen one's own position. Additionally, some maps can use scales, colors and symbols that reflect the intention of their authors (Hauck, 2013).

10.4.2 Exercise 11 (group work): Ecosystem services mapping

**Supplementary information for exercise 11, maps of the study area, is included in Annex 5.*

Creating a clearer picture

Last week, the Ministry of Finance of Exportul received three proposals for Strategic Planning from the Agriculture, Tourism and Housing ministries, which have important projects near Reskul Protected Area. The proposals include a map indicating the most suitable sites, based on economic criteria, for increasing production in agriculture (palm production), livestock (pasture), ecotourism and tourism, as well as expanding urban areas. Nevertheless, before approving the proposals, the Minister would like to analyse them under the ecosystem services approach, including consideration of trade-offs. After all, the Governor has been really interested in the topic, and it might become an important approach in the future.

The Minister asked the Institute of Geography of the University of Bakul for some information. The Institute prepared some maps, but the Minister was not able to interpret them under the ecosystem services approach in order to reach relevant conclusions. The Minister of Finance is aware that your environmental institutions have been working with the government of Exportul in some ESAV for integrating ES in the development plan, so he asked for your support.

Your environmental team received the three maps provided by the Institute of Geography of the University of Bakul: a map of the watershed, a map of the land-use characteristics and a map that includes the places where the Ministries of Agriculture, Tourism and Housing want to implement their Strategic Plans.

Your environmental group will analyse the information in the maps and answer the following questions. Select one person in the group who will present the results to the Minister of Finance.

1. **Identify the key ecosystem services provided in the area and the benefits for agriculture, tourism and housing.**

2. **Identify the trade-offs associated with the implementation of the strategic plans in the area.**

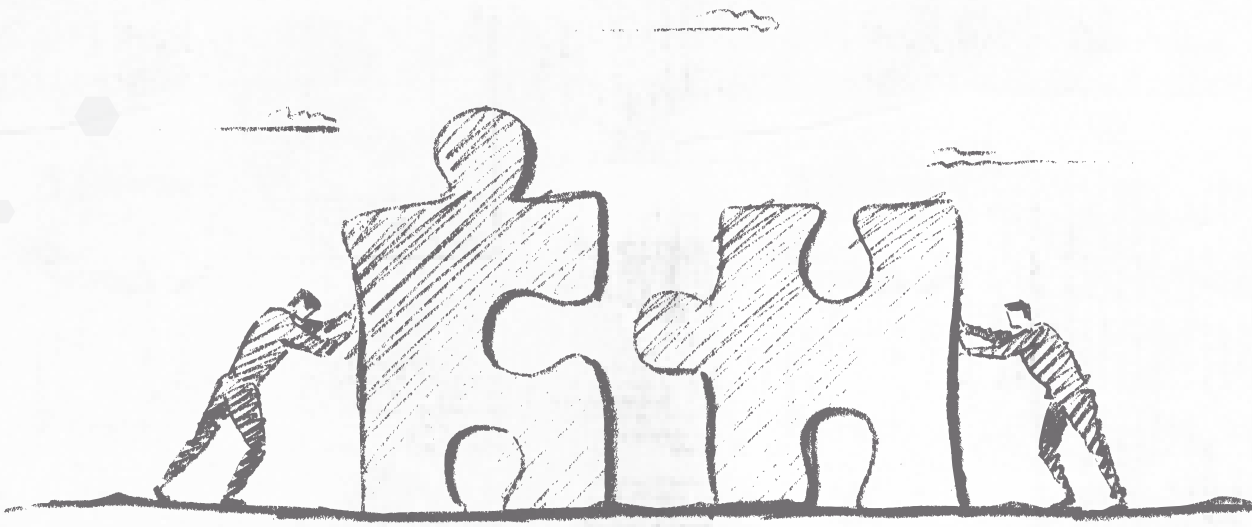
3. **Should the Minister of Finance approve the Strategic Plans of Agriculture, Tourism and Housing? If not, write down some key recommendations.**

10.4.3 Exemplary answers for Exercise 11

1. Identify the key ecosystem services provided in the area and the benefits for agriculture, tourism and housing.

Some of the key ecosystem services provided in the area and their beneficiaries are:

ECOSYSTEM SERVICES	BENEFICIARIES
Water provision (quality and quantity)	Agriculture (irrigation) Fisheries (water quality for the commercial fishing species) Inhabitants of urban areas (domestic use) Inhabitants of indigenous property areas (domestic use) Tourist companies and tourists (recreation and use in touristic infrastructure)
Recreation	Tourist companies and tourists Inhabitants of urban areas Inhabitants of indigenous property areas
Food provision	Agriculture (income) Inhabitants of urban areas (food) Inhabitants of indigenous property areas (food) Tourist companies and tourists (food)



2. Identify the trade-offs associated with the implementation of the three strategic plans in the area. Should the Minister of Finance approve the Strategic Plans of Agriculture, Tourism and Housing? If not, write down some key recommendations.

TRADE-OFF	RECOMMENDATION
Increase of housing projects, trespassing a perennial river (to the west), will cause pollution and decrease water quality for agriculture and for the inhabitants of the cities themselves.	Minister of Finance should not approve the current Strategic Plan of the Ministry of Housing. Some adjustments to the plan should result in avoiding growth to the east, along the perennial river, and trying to find suitable land in the west. In any case, incentives should be found for encouraging sustainable construction of public infrastructure and housing.
Increase of tourism infrastructure in the property areas of the Bankas and Kulres, will cause a damage in aesthetic and cultural ecosystem services for indigenous communities. Also, it may cause the degradation of remnant vegetation and reforested areas, impacting water recharge, carbon sequestration and local climate regulation — services that are relevant for all the economic activities.	Minister of Finance should not approve the current Strategic Plan of the Ministry of Tourism. Some adjustments to the Plan should include limiting the growth in areas of indigenous property (with remnant vegetation) and in the area along the perennial river. One option is to encourage incentives so that tourism infrastructure projects conduct environmental impact assessments and avoid areas of supply and provision of ES for other activities. Also, in the meantime, the Ministry of Planning should identify suitable areas by coordinating an ecological land planning process with the relevant stakeholders. In most cases, best practices should be implemented. The Ministry of Environment could also participate by providing a map, indicating the prioritized areas for conservation (integrating the ecosystem services perspective) and some areas relevant for investing in possible compensations.
Increase of agriculture along the perennial river, may cause pollution of water and decrease water quality for domestic uses, and for fishing and touristic activities. Additionally, the Plan integrates many conflictive policy areas, such as conservation and tourism. The latter can decrease aesthetic beauty and recreation sites. Moreover, the Plan may cause the degradation of remnant vegetation and reforested areas, impacting water recharge, carbon sequestration and local climate regulation — services that are relevant for all the economic activities.	Minister of Finance should not approve the current Strategic Plan of the Ministry of Agriculture. The Plan should be reformulated and be more clear on prioritized sites for growth. The fact that there are so many suitable sites increases the environmental and social conflicts with other sectors. In particular, the crop plantations should not be located next to the perennial river or in areas with remnant and reforested vegetation. It will be important to request that the Minister of Agriculture consider land owners and stakeholders in the Strategic Plan. In addition, the Ministry of Planning should identify suitable areas by coordinating an ecological land planning with the relevant stakeholders. In most cases, best practices should be implemented. The Ministry of Environment could also participate by providing a map, indicating the prioritized areas for conservation (integrating the ecosystem services perspective) and some areas relevant for investing in possible compensations.

11

MODULE 5 – COMMUNICATION AND INFLUENCING SKILLS

11.1 COMMUNICATION AND INFLUENCING SKILLS

Objectives

- Learn how to effectively communicate and present persuasive arguments on policy issues and the ESAV process, in order to influence decision-making and policies.
- Find different ways of conveying information to encourage policy impact.
- Learn how to take into account different interests and stakeholders, when communicating arguments on policy issues and the ESAV process.

EXERCISE – COMMUNICATION AND INFLUENCING SKILLS						
Time consideration (min)	Presentation	Reading Time	Group Work	Presentation of Results	Discussion	Total
	30	5	20	25		80

Overview	• **Module 5 – Communication and Influencing Skills**
	  • **PPT 5.1** Role of ESAV in Influencing Decision – Making
	  • **PPT 5.2** Influencing Skills – Getting others on board with your ideas!
	
	• **Exercise 12:** Communication and influencing skills.
	  • Exercise objectives
	  • Explain the task to participants
	  • Time frame for this exercise
	
	• **Content:**
	  - Role of *Ecosystem Service Knowledge* (ESK)
	  - Role of ESAV in influencing policy making
	  - Decision-Making Process
	  - Communication
	  - Various examples of ESAV tools in policy-making context
	  - Case studies from different countries
	  - Influencing Skills					

Preparation	• Presentation. • Presentation of the context of Exportul for introducing the exercise. • Write the exercise objectives and questions on a flip chart. • Prepare a flip chart to write down important and interesting notions that are raised in the discussion. • Handouts for participants: exercise 12 (Communication and Influencing Skills). • Distribute flip charts, cards and markers for groups to take notes and visually represent their group work. • Set stage and scenario for the talk show in *Good Evening Exportul* TV show. You can use some sound and visual aids. Ask participants to get into their roles (environmental institution), but also, as a trainer, be creative in getting into your role (host of Good Evening Exportul).					

Materials	· 1-2 flip charts, 1-2 pieces of flip-chart paper, cards in different colours, markers, pins, 3 pin boards. · Handouts for participants: exercise 12 (Communication and Influencing Skills).
Handouts	· Handouts for participants: exercise 12 (Communication and Influencing Skills). · Distribute flip charts, cards and markers for groups to take notes and visually represent their group work.
Methods	**Group work** Before starting the exercise, quickly explain the objectives and give the instructions. Give some time for clarification questions. Give a quick introduction about the context in Exportul and how this is linked to the exercises. *Objectives:* a) Learn how to effectively communicate and present persuasive arguments on policy issues and the ESAV process in order to influence decision-making processes and policies; b) find different ways of conveying information to encourage policy impact; and c) learn how to take into account different interests and stakeholders when communicating arguments on policy issues and the ESAV process. *Instructions.* Ask the participants to read through exercise 12. Then, ask them to group with their environmental groups (same groups as in the previous exercise: the local NGO SOH Bakul, The Environmental Unit of the provincial government and the Environmental Research Unit of Exportul). The groups must answer the questions of the exercise and use their findings to prepare key arguments. They must choose a person in the team who will participate in the TV show. Each one of the representatives of the groups must communicate their key arguments to their audience, including the Minister of Agriculture and Fisheries and the Head of the Industrial Development Bureau. The objective is to generate impact in how they think about the policy issues and ESAV of the teams. *Recommendations for running the exercise.* Set stage and scenario for the talk show in *Good Evening Exportul* TV show. You can use some sound and visual aids. Ask participants to get into their roles (environmental institution). In this case, one of the trainers should play the role of the host of *Good Evening Exportul*. You will also need the help of the other trainer, resource person or even some participants, to play the role of the Minister of Agriculture and Fisheries and the Head of the Industrial Development Bureau. It is important that if you ask for the help of someone who is not a trainer, to guide them in how they should behave in their role. They must think from a financial perspective; they know very little about ecosystem services and environmental problems, and they are only willing to pay attention and respond to the environmental groups when the groups address topics related to their industries and to their areas of interest.
Presentation of results	· Each group must choose a participant to present their group work in plenary. After presentation, other groups may ask questions and provide feedback.

Reflection	· Open discussion in plenary. · Encourage participants to contribute with their knowledge to the discussion. · Write important points, ideas, and questions on flip charts or on cards. · As a trainer, use the exemplary answers of the exercise to encourage discussion on different results and to ask questions that have not been raised during the reflection. **Possible guiding questions for reflection:** · Do you think communication is important for an ESAV to have impact? Why? · Did you think it is a worthwhile experience to put yourself in different roles? · What arguments that were used in the role play have convinced you? What arguments have not persuaded you? Why? · What are your experiences in influencing decisions? · What are some of the success factors for achieving this? · Which other success factors can we identify? · What are the main challenges? · Considering that this is the last exercise, do you think ESAV are useful for impacting decision-making and influencing policies? Explain.
Key messages	· Good communication skills are required for an ESAV to have impact. · Communication is not only important for presenting the results of an ESAV. A communication strategy should be formulated from the design of an ESAV and for each part of its process. In this way, it is more feasible to count on stakeholders' participation, legitimize the process and its results. · Good communication implies assuming the role of the target audiences and taking into account their perspectives, positions, interests and needs. It is important to realize the way that the target audience makes decisions: does he/she follow a rational model? Or would he/she be more sensitive to political arguments? etc. · Arguments and messages should be short, precise, easy to understand, targeted to a specific audience, and relevant to a given problem situation; they should provide a different perspective on a topic than what has been explored so far. · ESAVs… …can generate powerful figures and evidence …need to respond to *client demand* from the start …help to identify more strategic entry points and leverage opportunities …depend on good communication and clear messages (know your audience) …are only reliable if data and figures are credible and legitimate …are influenced by the individual or organization that is undertaking and presenting the assessment

11.1.1 Communication and Influencing Skills (Theoretical Input)

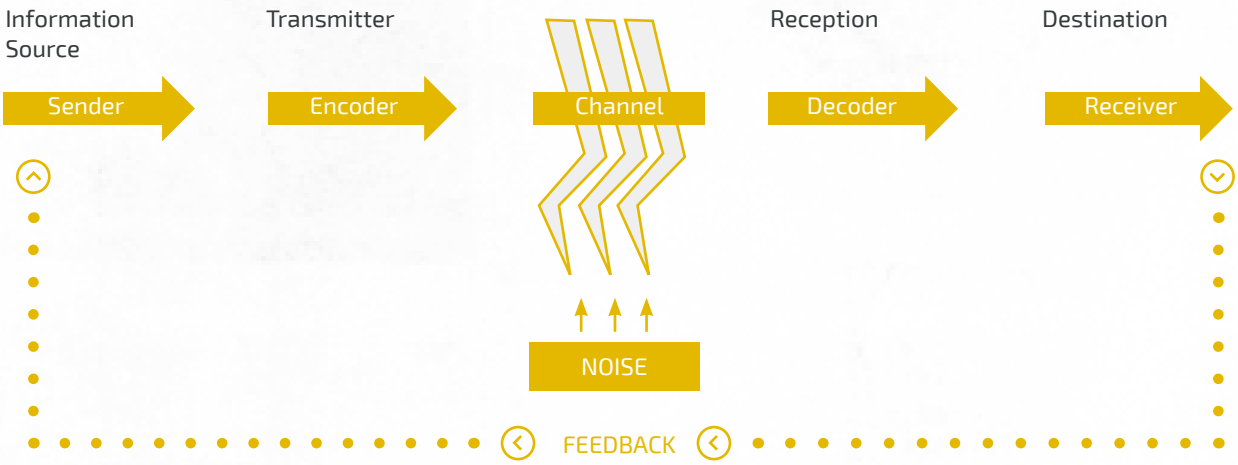
The last module of this training deals with ways to communicate effectively in ways that enable you to influence decision-making and thereby contribute to shaping policies. First, we need to clarify what is meant when we talk about communication, specifically in the context of policy making and communicating with decision-makers.

11.1.1.1 Communication

The word communication generally entails the activity of providing or exchanging information between two or more participants with the goal of conveying a meaning in an intended and understandable way. Most often this is done through verbal or written exchange, although other forms of communication exist as well (via symbols or signs, among others). In this section we will focus on verbal and written communication, as these are the major communication tools in a political context.

Before we discuss the importance of proper communication of ESAV results, it is important to understand first some basic elements and challenges in communication in general. The two most basic elements within a communication process are the 'sending' of information and the 'receiving' of information. The person who sends a message generally goes through a process of determining the intent of the message that he wants to send, followed by aligning the message to this intent and then putting it into a code that can be understood (language). Then, the sender has to transmit that signal to another person with the help of a 'channel' (speech, letter, email, among others) in a way that it can be received and understood. The receiver has to go through the process of decoding the received message, attributing an intent to the message and interpreting the message. Finally, the receiver provides feedback and reacts to the message that he/she received. The figure below provides a visual overview of the framework described here.

SHANNON-WEAVER'S MODEL OF COMMUNICATION



Model of the different steps that take place in a communication process (The Shannon-Weaver Model, 1949).

Communication may not be as simple as it first appears. Multiple steps within the communication process can be layered with traps and pitfalls. A message can easily be misinterpreted or misunderstood, thereby reducing the effectiveness of the communication process. Some of these barriers to communication include selective perception, information overload, emotions, language-barriers, differences in culture or gender, political correctness, personal preferences and belief systems (Robbins et al., 2011). Especially important among these might be cultural barriers. For the most part, people communicating are aware of their intent, their emotions, possible language barriers, but it happens frequently that a cultural barrier is overlooked. Oftentimes, two participants might not even be aware that such a barrier exists between them and that it might impede the communication process. Cultural differences are based on different sets of values that are attributed to the cultural upbringing of the individual person. These might exist on a local, regional, national or even continental level. Cultural differences are mostly non-verbal and relate to body language, choice of words, how and in what way information is shared or conveyed, and hand gestures or similar signs.
Some general tips and rules of thumb that can be applied to improve the effectiveness of a communication process could include
(based on *en.wikipedia.org/communication*):

- **Standard terminology** (the use of understandable and common words)
- **Clarification** (request or provide clarification if something is not clear)
- **Preciseness** (the use of unambiguous and precise words)
- **Frequent communication** (talk to the recipient often and keep him/her updated to avoid confusion)
- **Nonverbal communication** (make use of different nonverbal communication tools such as body language, intonation or attire)

11.1.1.2 Communication, ESAVs and Decision-Making

If we consider that (public) environmental decision-making is driven by a number of aspects (e.g. public risk perception, available solutions, legal obligations and institutions), then we ought to be aware that ESAVs need to relate to these aspects if they are to successfully influence a policy process. As such, we already know from previous modules that ESAVs provide specific information that can lead to the formation of a more complete picture, including a better representation of unintended consequences and hidden values attached to a specific measure or policy option. In other words, in many cases political decision-making is based on taking into account (social and economic) costs and benefits, and ESAVs can now support this approach of decision-making by completing the picture and by revealing values that would otherwise not be considered (as environmental issues and services are often not explicitly considered).

Thus, ESAVs can fulfill different roles in the policy process (think back on the policy cycle), but there are also different applications of ESAVs in a decision-making process:

- **Instrumental:** ESAVs examine and shed light on different available or potential options
- **Conceptual:** ESAVs broaden and deepen understanding and facilitate target- and solution-driven thinking
- **Strategic:** ESAVs promote or justify a specific policy option

In order for ESAVs to fulfill this role, however, communication is of key importance. Many examples in the literature exist in which decision-makers had access to scientific data and findings, but these findings were not instrumental in reaching a decision. This can often be explained by a lack of proper communication between the decision-makers and the designers and implementers of ESAVs. It should thus be kept in mind that only providing information is not sufficient.

Rather, the type of information and especially the way it is communicated is often a crucial step in allowing ESAVs to influence decision-makers or public opinion. Ruckelshaus et al. (2015) gives an example of a decision-making process in which communication during the ESAV process played a central role. In 2010,

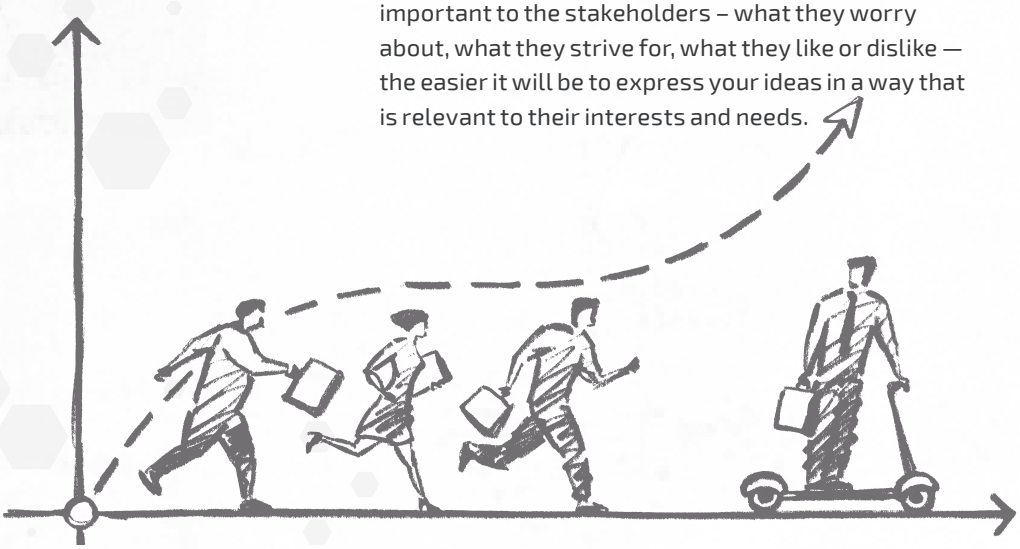
Belize's *Coastal Zone Management Authority and Institute* (CZMAI) wanted to create a new national coastal zone management plan. The institute partnered with the Natural Capital Project and with WWF to identify, develop and compare alternative coastal zoning schemes. Ruckelshaus et al. (2015) highlight that without close collaboration and frequent communication efforts, such as co-developing alternative zoning schemes and producing scenarios jointly, it would have been likely that the assessment would have ended as an academic exercise without actual integration into the national planning process. However, due to the effective communication between the stakeholders, facilitated in part by the use of the mapping tool InVEST, the assessment was able to propose several alternative zoning schemes, one of which was submitted to legislature for approval as a new law in 2014.

11.1.1.3 Influencing Others

Influencing can be defined as *using interpersonal and social skills to make others voluntarily change their attitudes to events, people and decisions, to enable your ideas to be implemented* (Bragg, 1996). All too often people believe that the only way to influence another person or a group of persons is through means of authority. This, however, is only partially true. There are many other channels for influencing others apart from leveraging a position of power, for example:

- **Resources:** The ability to exert control over anything that is considered scarce – budget, staff, access to stakeholders, among others;.
- **Information:** Access to information about social, technical, environmental or economic aspects;.
- **Expertise:** Specific knowledge about social, technical, environmental or economic aspects;.
- **Connections:** Relations with people that can support or shape an undertaking.
- **Personality:** Natural charisma derived from conveying values, vision and passion in a convincing way.

There are many possible ways and strategies to influence others. Examples could include the building of relationships, the ability to let others feel empowered, the ability to bargain or the ability to persuade others. All strategies, however, share the characteristic that whoever wants to do the influencing will first need to reflect on his/her own position and situation. It is imperative that you look at your ideas from the perspective of those that you want to influence. In other words, you need to be able to put yourself in the shoes of others. The better you understand what is important to the stakeholders – what they worry about, what they strive for, what they like or dislike — the easier it will be to express your ideas in a way that is relevant to their interests and needs.



11.1.1.4 Persuasive communication

Shaping messages in a way that increases their persuasive power means not only understanding our audiencé s rationality but actually delving into their emotional realm. Tailoring messages in ways that incorporate an emotional content requires understanding the audiencé s motivations, aspirations and in which ways you can gain their trust. In order to understand your audience, you need to become anthropologists of sorts and find out who exactly your audience is:

How old are they? What language do they use? What do they want? What are they searching for? What are their aspirations? What are their motivations? What is it that really matters to them? What are their fears? What do they need to hear or feel in order to trust us? Are they decision-makers or do they have influence over others? If they have the power to convince others, what kinds of arguments do they need from us?

Once we have explored our audience's motivations and aspirations, we should ask ourselves what it entails to see the world from their perspective and convey messages combining rational and emotional arguments. Being successful in this endeavour means attracting our audiencé s attention and communicating persuasively. Six principles underpin persuasive messages:

5. **Reciprocity:** It is more likely for someone to say yes to something if they have received it before.
6. **Scarcity:** People want more of what they cannot have.
7. **Authority:** People are more likely to say *yes* if there is a trustworthy, reliable or credible source behind a message.
8. **Coherence:** People are usually more willing to accept a larger compromise if they accepted a smaller compromise in the past.
9. **Consensus:** People are more likely to act if others have done so as well.
10. **Likeability:** People tend to agree on something when they find something in common with the other person.

A concrete way of tailoring persuasive messages entails understanding your audience's *pain points* or issues that they are particularly concerned about, fear or aspire to receive. Next, identify which emotions might be tied with those pain points. After doing this, you can think of the rational content of the message (the *what)* and then tailor your messages by making sure that they touch on those emotions. Messages can then be complemented with other, non-verbal means (pictures, music, graphs, charts), which may emphasize the messages' emotional traits.

11.1.2 Exercise 12 (group work and role play): Communication and influencing skills

Adapted from Céntrico Digital: empathic communication

After the environmental group´s presentations of the assessment methodologies and hypotheses of findings to the Governor of Exportul and the National Planning Minister, the TV program *Good Evening Exportul* has decided to host a special talk show titled *Our challenges for green development in Exportul!*. During the talk show the provincial government s ideas to revise some of the key development policies will be discussed. Some of the most skeptical government leaders, as well as representatives from the three environmental groups, have been invited to a live debate on the provincé s development and its connection with nature. The invited leaders from the government include the Head of the Industrial Development Bureau, who is a strong supporter of the dam along the Tonkin River, as well as of developing a strong manufacturing base and tourism infrastructure in the region. The Minister of Agriculture and Fisheries has also been invited. From a wealthy family farming background, the Minister has supported the high-tech export-oriented agricultural transformation and large-scale fishing activities of Exportul.

Both ministers are not familiar with the concept of ecosystem services and the jargon associated with it. A representative from each of the three teams has been invited to the talk show. You will need to develop two or three messages which clearly reflect what you are trying to achieve with your assessment. Think of the pain points of your audience and adapt your messages so that they resonate with their perspective. Before the talk show begins, your team will have time (about 40´) to prepare. For your preparation, focus on the chosen policy issue from the previous exercises and focus on the following questions.

1. Who is your audience?

Try to understand whom you will be facing in the talk show (Head of Industrial Development Bureau, Minister of Agriculture and of course, anyone watching the TV show). Who are they or who is he/she? What are his/her main worries or concerns? Is he/she a decision maker or does he/she need to convince somebody else? If he/she is a decision-maker, does anyone have an influence over him/her? What are their main worries or fears? Identify the main *pain points* of your audience:

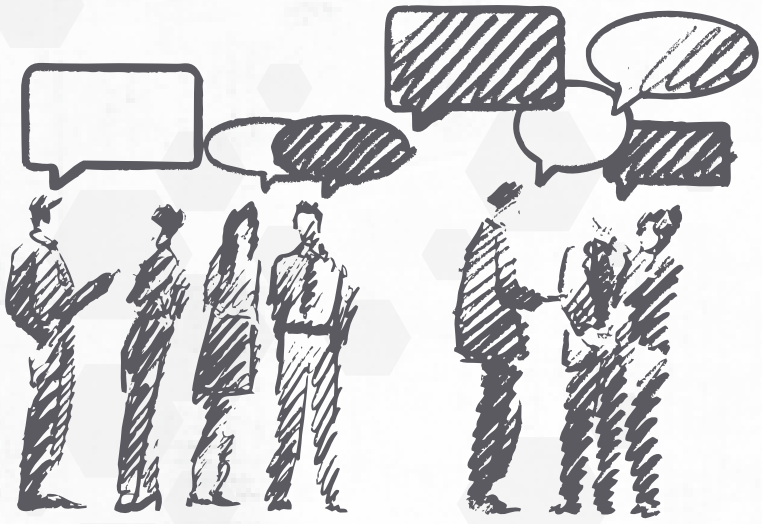
What are the three main **pain points** of my audience?	What emotions might he/she feel?
	Anger
	Frustration
	Fear, etc…

2. Define the what.
What do you want to communicate? Describe what your assessment intends to do in three short sentences. What makes it different? Define your own pain points and the emotions you feel.

Intention of the ESAV:

What are my/our own **pain points?**	What emotions do I/we feel?
	Anger
	Frustration
	Fear, etc...

3. Define the how: What are your key messages?
Develop three key messages related with your assessment and reflect on how your audiencé s perspective was incorporated into these messages. Review your messages. Do they really touch on the emotions (fears, frustration, anger, etc.) that you defined previously? If not, try to adapt your messages. Bring those messages with you to the meeting. If you think it makes sense, come prepared with charts, graphs and pictures to prove your point.



11.1.3. Exemplary answers for Exercise 12

1. Who is your audience?

Minister of Planning of Exportul

What are the three main **pain points** of my audience?	What emotions might he/she feel?
Environmental concerns can hinder or make the implementation of the development plan more expensive. Some powerful stakeholder groups might not be interested in investing or considering environment friendly solutions.).	Fear, that the consideration of environmental issues could go against the interests of powerful groups who support him to become elected (e.g. palm oil investors). Conflicts arising from environmental problems could be damaging for his political career.
His credibility and legitimacy in front of different stakeholder groups with different and incompatible interests	Frustration as he does not know to what extent environmental problems are *real problems* that can hinder the implementation of the development plan and achieve development goals. Without this information, he cannot proceed with a decision.
His political career (which might be more affected if he loses his job).	**Uncertainty regarding how the environmental conflicts will develop and if this will impact his political career.**

2. Define the what

As the Environmental Research Unit of Exportul
Intention of the ESAV: find what needs to be done (alternatives) to decrease the water pollution of the Tonkin river.

What are my/our own **pain points?**	What emotions do I/we feel?
Credibility as a research institute.	Frustration about not being heard by the authorities.
Finding financing for undertaking an ESAV.	Fear of not having more resources to operate the institute.
Perception of the research institute of being *too academic* to provide practical recommendations.	**Desperation to have results of the ESAV as soon as possible and give recommendations while there is political momentum.**

3. Define the how: What are your key messages?

The selected policy issue for the ESAV: Water discharges have caused high pollution levels in Tonkin river, decreasing its quality, which has resulted in health problems and conflicts with other economic activities.

The purpose of the ESAV: Provide alternatives to decrease water pollution in Tonkin River.

The **three main messages** are:

1. By maintaining current water quality, the development plan will not be fulfilled and will cost Exportul nearly XXXX per year (% of GDP and % of Development Plan Budget).

2. The proposed incentives to promote change in the quality and quantity of water discharges will decrease water pollution and will allow for the fulfillment of the development plan. Moreover, it will decrease conflicts between related stakeholders.

3. The current poor water quality is affecting the health of the local population and may even work against potential foreign and domestic investors, as they are deterred by the lack of clean water.

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ANNEXES

Annex 1: Six steps of IES approach (for Module 0)

Here is an overview of the IES Six-Step approach.

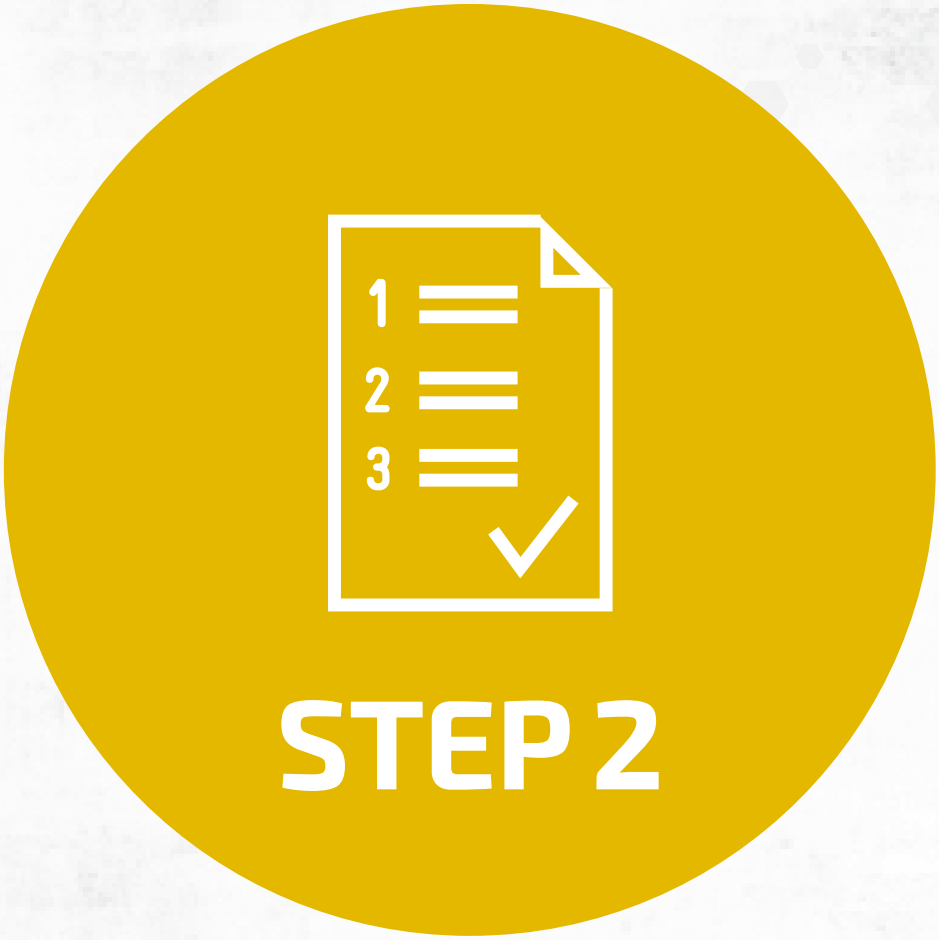
STEP	SUMMARY	EXPECTED OUTCOME	GUIDING QUESTIONS
STEP 1: Defining the scope and setting the stage 	Step 1 involves undertaking the groundwork that is required to get the IES process started. The main tasks are: defining the objective(s), outlining the scope of work and identifying main stakeholders to be involved. At the end of Step 1, the design and next steps in the IES process should be defined, including the division of tasks and responsibilities. The availability of the necessary human and financial resources and other inputs should also be clarified as far as possible.	▯ Clear definition of management challenge or issues to be addressed ▯ Documented and agreed. objective, scope and expected outcome of the IES process. ▯ Documented and agreed work plan, including resource requirements. ▯ Stakeholder map and engagement plan. ▯ Communications plan.	▯ What are the main development and management issues that need to be addressed by the IES process, and for which purpose? ▯ Who are the relevant stakeholders and how should they participate in the IES process? ▯ What are the milestones and expected outcomes of the IES process? ▯ What staff, funds and other inputs are required to carry out the IES exercise? ▯ How will key messages be communicated to target groups?
Step 2: Screening and prioritizing ecosystem services 	Step 2 helps prioritize the most relevant ecosystem services that are related with the development plan. At the end of this step priority ecosystem services will have been identified. The main task is to screen the development plan so as to identify risks and opportunities related with the impacts and dependence of different development activities on ecosystem services and the key beneficiaries or affected stakeholders.	▯ Matrix showing ecosystem service dependencies and impacts in relation to the development plan. ▯ Agreed list of priority ecosystem services. ▯ Summary of potential areas of conflict or competition, which may result in trade-offs.	▯ How does the development plan (including associated economic activities and livelihoods) depend and impact on ecosystem services? ▯ Which stakeholders stand to be affected by the development plan and by changes in ecosystem services? ▯ What costs and benefits are associated with these changes and how will they be distributed between different groups? ▯ Do potential areas of conflict, competition or synergies emerge? ▯ Which are the most important ecosystem services for the development plan and why?
Step 3: Identifying conditions, trends and trade-offs 	Step 3 looks at the cause-and-effect relationships that operate between ecosystem services and the development plan. The status and main trends in the supply and demand for ecosystem services are analysed. Drivers of ecosystem change and key stakeholders are also identified. A particular concern is to identify where there may be synergies and trade-offs between the between different groups, goals or services.	▯ Information on ecosystem services conditions and trends. ▯ Overview of the main drivers of change, related stakeholders. ▯ Analysis of ecosystem services synergies and trade-offs in the context of the development plan. ▯ Key messages for different audiences.	▯ What information and evidence on ecosystem service conditions and trends exists and what are the main information gaps? ▯ What are the current conditions and likely future trends in ecosystem service demand and supply? ▯ What are the main drivers of change? ▯ What trade-offs might arise between development goals and ecosystem services and how will these affect different stakeholders?

STEP	SUMMARY	EXPECTED OUTCOME	GUIDING QUESTIONS
STEP 4: Appraising the institutional and cultural framework 	Step 4 complements the information that has been gathered in Step 3. It appraises institutional, policy, legal and cultural characteristics, and identifies the resulting incentive structures in relation to ecosystem services and the development plan. These factors mediate and influence how people manage, use and impact on ecosystems and their services, and may act as drivers of either positive or negative ecosystem change.	▯ List of key institutional, policy, legal and cultural characteristics and the resulting incentive structures (that influence how people manage, use and impact on ecosystems and their services). ▯ Identification of underlying causes and drivers of ecosystem degradation. ▯ Overview of stakeholders' positions, interest, needs, values and rights. ▯ Information on existing and possible areas of conflict or cooperation relating to ecosystem use, management and incentives	▯ Which organisations and institutions govern ecosystems and their services? ▯ Who participates in decision-making and in what role? ▯ Which policies, regulations and incentives influence ecosystem use and management? Who or what do they target? How are they enforced? ▯ Are there conflicts or inconsistencies between different institutional, policy, legal and cultural frameworks and associated incentive systems? ▯ Which other needs, interests, values and rights drive ecosystem management choices?
STEP 5: Preparing better decision-making 	Step 5 summarises and analyses the information that has been gathered in the previous steps. Based on this information, risks and opportunities for the development plan are investigated. It suggests policy options which can serve to maintain or increase the flow of ecosystem services, and identifies suitable entry-points for guiding or influencing decision-making.	▯ Analysis of risks and opportunities associated with the development plan. ▯ Shortlist of policy-options and corresponding entry-points into decision-making. ▯ Communications messages on policy options.	▯ What are the ecosystem service-related risks and opportunities to the development plan? ▯ Could economic valuation be useful? If so, how? ▯ What are the most feasible policy options and entry points for reducing or avoiding risks and capturing ecosystem service opportunities? ▯ How can policy measures, instruments and interventions build on existing experiences?
STEP 6: Implementing change 	Step 6 involves developing a strategy to operationalise the policy recommendations generated in step 5. It involves preparing a work plan, as well as a stakeholder engagement and communication strategy for the implementation of concrete measures to integrate ecosystem services into the development plan.	▯ Implementation strategy and operational work plan. ▯ Communication strategy specifying target audience, key messages and possible champions and allies to encourage and operationalise the required changes.	▯ Are the proposed policy options realistic, feasible, acceptable and consistent with the development plan? ▯ Are the necessary financial, technical, human resource and institutional capacities in place to deliver the selected policy options? ▯ Who will be involved in implementing the policy measures and in what role? ▯ How will the impacts of the policy measures be monitored? ▯ How will learning be generated, shared and communicated?

You can print and cut out the symbols and explanations for each one of the steps. You can then create cards with the symbols on one side and paste the explanation on the back of the symbol (for Exercise 0).

STEP 1 (IES Approach). Defining the scope

Step 1 involves undertaking the groundwork that is required to get the IES process started. The main tasks are: defining the objective(s), outlining the scope of work and identifying main stakeholders to be involved. At the end of Step 1, the design and next steps in the IES process should be defined, including the division of tasks and responsibilities. The availability of the necessary human and financial resources and other inputs should also be clarified as far as possible.



STEP 2 (IES Approach). Screening and prioritizing ecosystem services

Step 2 helps prioritize the most relevant ecosystem services that are related with the development plan. At the end of this step priority ecosystem services will have been identified. The main task is to screen the development plan so as to identify risks and opportunities related with the impacts and dependence of different development activities on ecosystem services and the key beneficiaries or affected stakeholders.

STEP 3 (IES Approach). Identifying ecosystem services conditions, trends and trade-offs

Step 3 looks at the cause-and-effect relationships that operate between ecosystem services and the development plan. The status and main trends in the supply and demand for ecosystem services are analysed. Drivers of ecosystem change and key stakeholders are also identified. A particular concern is to identify where there may be synergies and trade-offs between the between different groups, goals or services.

STEP 4 (IES Approach). Appraising the institutional and cultural framework

Step 4 complements the information that has been gathered in Step 3. It appraises institutional, policy, legal and cultural characteristics, and identifies the resulting incentive structures in relation to ecosystem services and the development plan. These factors mediate and influence how people manage, use and impact on ecosystems and their services, and may act as drivers of either positive or negative ecosystem change.

STEP 5 (IES Approach). Preparing better decision making

Step 5 summarises and analyses the information that has been gathered in the previous steps. Based on this information, risks and opportunities for the development plan are investigated. It suggests policy options which can serve to maintain or increase the flow of ecosystem services, and identifies suitable entry-points for guiding or influencing decision-making.

STEP 6 (IES Approach). Implementing change

Step 6 involves developing a strategy to operationalise the policy recommendations generated in step 5. It involves preparing a work plan, as well as a stakeholder engagement and communication strategy for the implementation of concrete measures to integrate ecosystem services into the development plan.

Annex 2: List of Ecosystem Services[6]

Supporting information for all exercises (required for Exercise 2)

1) Provisioning Services are ecosystem services that describe the material outputs from ecosystems. They include food, water, raw materials and other resources.

	Food	Ecosystems provide the conditions for growing food – in wild habitats and in managed agro-ecosystems.
	Raw materials	Ecosystems provide a great diversity of materials for construction and fuel.
	Fresh water	Ecosystems provide good quality surface and ground-water.
	Medicinal resources	Many plants are used as traditional medicines and as input for the pharmaceutical industry.

2) Regulating Services are the services that ecosystems provide by acting as regulators. For instance, regulating the quality of air and soil or by providing flood and disease control.

	Local climate and air quality regulation	Trees provide shade and remove pollutants from the atmosphere. Forests influence rainfall.
	Carbon sequestration and storage	As trees and plants grow, they remove carbon dioxide from the atmosphere and effectively lock it away in their tissues.
	Moderation of extreme events	Ecosystems and living organisms create buffers against natural hazards such as floods, storms, and landslides.
	Waste-water treatment	Micro-organisms in soil and water decompose human and animal waste, as well as many pollutants.

6 Adapted from: Integrating Climate Change Adaptation into Development Cooperation - A Practice-Oriented Training Based on the OECD Policy Guidance. Trainer Handbook. GIZ 2011.

	Erosion prevention and maintenance of soil fertility	Soil erosion is a key factor in the process of land degradation and desertification.
	Pollination	Some 87 out of the 115 leading global food crops depend on animal pollination, including important cash crops such as cocoa and coffee.
	Biological control	Ecosystems are important for regulating pests and vector borne diseases.

3) Habitat or Supporting Services underpin almost all other services. Ecosystems provide living spaces for plants or animals; they also maintain a diversity of different breeds of plants and animals.

	Habitats for species	Habitats provide everything that an individual plant or animal needs to survive. For instance, migratory species need habitats along their migrating routes.
	Maintenance of genetic diversity	Genetic diversity distinguishes different breeds or races, providing the basis for locally well-adapted cultivars and a gene pool for further developing commercial crops and livestock.

4) Cultural Services include the non-material benefits people obtain from contact with ecosystems. They include aesthetic, spiritual and psychological benefits.

	Recreation and mental and physical health	Natural landscapes and urban green spaces play a role in maintaining mental and physical health.
	Tourism	Nature tourism provides considerable economic benefits and is a vital source of income for many countries.
	Aesthetic appreciation and inspiration for culture, art and design	Language, knowledge and appreciation of the natural environment have been intertwined throughout human history.
	Spiritual experience and sense of place	Nature is a common element of all major religions; natural landscapes also help form local identity and sense of belonging.

Annex 3: Supporting information for Exercise 4 (Understanding and Framing Policy Issues in Exportul)

BAKUL
From Bykipedia, the free encyclopedia

Bakul, officially the Republic of Bakul (Bakulesi: Sathalanalat dschoik Bakul), is a representative democratic republic. The political history of the country has been turbulent. Since its independence from colonial powers in 1964, it has had numerous political turnovers.

Bakul is a developing country with a market-oriented economy. From the start, the economic development of Bakul has been strongly influenced by external markets. Periods of high economic growth have, therefore, succeeded basically due to export booms of commodities such as rubber and sugar. This development pattern, with inadequate export diversification, has left the economy vulnerable to chronic shocks. Historically, the country's economic performance has been tied to exports which provide hard currency to finance imports and external debt payments. Although these exports have provided substantial revenue; self-sustained growth and a more egalitarian distribution of income have proven elusive. Its capital city is Hanku, which was declared a World Heritage Site by UNESCO in the 1970s for having the best preserved and least altered historic centre worldwide. The beautiful beach promenade of Hanku is especially renowned and hosts plenty of restaurants (Bakulesi and international cuisine), cafés and hotels. The cuisine in Bakul is excellent and has recently received international acclaim due to its diversity of natural ingredients and mix of ancient and modern techniques.

Demographics
Bakul is a multi-ethnic country formed by a combination of different groups over centuries.

- As of 2016, total population is 15 Million, with 55 % living in urban areas and 45 % in rural areas.
- The population growth rate is currently 1.9% per year, but declining slowly.
- 31.3% of Bakul's total population is classified as poor, including 9.8% that is extremely poor (2016).
- Bakulesi is the primary language of the country coexisting with several indigenous languages.

Republic of Bakul

Capital: Hanku (3 Million)
Population: 15 Million (2010 estimate)
Total: Area300.000 km2
Official Language: Bakulesi
Political parties:
Social Rights Party (SRP), rather conservative and ruling since the last elections
Power to the People (PTP), which is popular in the rural northern district.
Independence: 1964

- The main indigenous groups include: Tabakalues and Hankules (Northern territory), and Bankas and Kulres (Southern territory).
- Urban areas are home to a growing middle class, as well as growing areas of extreme poverty, especially due to the influx of unskilled and semi-skilled rural immigrants.

Economy
Bakul is a developing country with a market-oriented economy. The IMF estimates its 2016 per capita income at US$5,195. It has a medium Human Development Index score of 0.723 based on data from 2016. Historically, the country economic performance has been tied to exports, which provide hard currency to finance imports and external debt payments. Although these exports have provided substantial revenue, self-sustained growth and a more egalitarian distribution of income have proven elusive. The current administration is trying to increase social spending and improve social conditions through promotion of key cash crops such as palm oil and through the development of new income sources such as tourism and textiles. However, most of Bakul's industry is oriented towards servicing domestic markets and since income per capita is low, it is difficult to make the market grow. In addition, levels of education and medical services still have to be improved for the majority of the population.

- Agriculture, forestry and fisheries: Presently, the main export crops are palm oil, fish and shrimp, and, to a lesser degree, timber. Fluctuations in world market prices can have a substantial domestic impact. Small-scale fishing and subsistence agriculture remain the backbone of the economy for more than 45% of the population living in

rural areas. Timber companies are having difficulties renewing licenses since most of the remaining forests are either in remote areas, or within indigenous territories. Nevertheless, most of the benefits coming from ecosystems in terms of goods and services are not accounted for in terms of their impacts on the economy.

- Industry is largely oriented towards servicing the domestic market, with some regional exports. However, this is meant to change, considering plans from the Ministry of Transport to expand by 2025 the existing Historic Harbour. The objective by 2025 is to achieve a handling capacity of 60 million tons of cargo/year.

- Tourism is gaining importance as the nations' fastest growing industry in terms of revenue. It is mainly based on the country's archaeological monuments, ecotourism in the rainforest, adventure tourism in the Mighty Mountains and beach tourism. Beach resorts are plentiful with a couple of new luxury resorts having recently been built on the south-eastern coast. Another tourist hot-spot can be found just north of Hanku city in the Nelam wetlands. They are part of the Ramsar List of Wetlands of International Importance and a mecca for bird-watchers. British tourists particularly love this beautiful and varied landscape with its countless birds.

Climate

The great variety of Bakuĺ s climate zones is largely determined by altitude. In the mountain valleys, the weather is mild all year round. The rainforest areas of the lowlands are characterised by a humid climate. The coastal area has a tropical climate with a severe rainy season. Bakul's seasons are defined by how much rain falls during a particular period.

The year can be split into two distinct periods: the dry season known to the residents as summer, and the rainy season, known locally as winter. The summer goes from December to April, and winter goes from May to November, which coincides with the cyclone season. During this time, it rains constantly and sometimes severely in some regions. Average rainfall in Bakul varies considerably, from 1,350 mm in Indare province to over 4,500 mm in the extreme south of Exportul province. Seasonal differences in rainfall are greatest in the northern and central regions of the country where, between January and April or May, less than 100 mm of rain falls per month. The dry season is shorter in the south, normally only lasting from February to March.

Temperatures vary according to elevation and proximity to the coast. Average temperatures in the coastal regions range from 24 °C in January to 27 °C in July. Temperatures are slightly higher inland. Overall, the seasons are marked more by differences in humidity and rainfall than in temperature.

Environment

Bakul is one of 17 megadiverse countries in the world according to Conservation International, and it has more biodiversity per square kilometre than that of any other nation. The total number of bird species in the mainland area amount to 1,600 (15% of the world's known bird species) including the endemic Bakulu bird (it was declared the national bird by the government in 2001). In addition, Bakul is home to over 16,000 plant species, 106 endemic reptiles, 138 endemic amphibians and 6,000 species of butterfly. The current protected areas system (14 % of the countrý s area) includes 6 national parks, 4 communal reserves and 3 ecological reserves, among others. Well-known areas include the Nelam-wetlands and Tabakalues reserve (Indare), the HANCER reserve (Belandu) and Reskul national park (Exportul).

A large number of landholders (especially small-scale landholders and indigenous communities) in Indare and Belandu do not have legal land titles and enforcing property rights is costly, especially in remote areas. Insecure property rights (especially land use and tenure rights) often prevail, resulting in violent land conflicts and expropriation procedures. At the same time, these conflicts reduce the present value of forests and foster forest conversion into agricultural and pasture lands. Landowners clear the forest as a preventative measure in order to assert the productive use of land and to reduce expropriation risk. Squatters invade land plots, clear the forest and may afterwards gain official recognition with formal property titles. To avoid social revolts, in recent decades the government has acknowledged indigenous territories in some parts of the country. However, some of these territories overlap with national parks and public policies tend not to be properly coordinated.
Land conversion, deforestation, and subsequent soil and water depletion are some of the main environmental problems the country is facing. The national environmental authority, the Ministry of Environment, has established complex regulations for timber operations and some for palm oil plantations. Overseas

development assistance and international donations have financed important conservation efforts, particularly the strengthening of controls on timber operations and the creation of the *National Park System* (NPS).

Governance and administration
Bakul is a representative democratic republic that gained independence in 1964. Due to the central government's weak enforcement of national laws and international treaties, there is a strong presence of NGOs and advocacy organisations.

Administratively, Bakul is divided into three provinces: Indare, Exportul and Belandu. The three provinces have considerable autonomy, as well as limited taxation powers. Although each province generates revenue towards provincial budgets, most of the development budget is provided by the national government. Ministries cover all important sectors at both national and provincial levels. Most important are the Prime Ministry and Ministries of Planning, Finance and Economy, Industry, Water Resources, and the Ministry of Agriculture, which is also responsible for Fisheries. The Ministry of the Environment was created in 2004 but lacks sufficient resource allocation to address the complex environmental problems in the country and enforcement is lacking.

1. Indare province
Indare province is known for its lovely hillsides, the crystal clear water of the Coroné River, the Nelam-wetlands and its beautiful beaches.

- While the lowlandś natural vegetation is tropical evergreen forest, the eastern foothills of the Mighty Mountains are covered with tropical mountain rainforest. These forests are very rich in species and are widely considered as hotspots of biodiversity.
- Hanku city is located at the banks of the river Milaku, just south of the Nelam-wetlands. They are internationally known for their amazing flora and fauna and recognized as an Endemic Bird Area (EBA) with the largest number of restricted-range birds of any EBA on the continent. During the last decade, the water quality of the Milaku River dramatically decreased and the water company of Hanku city has planned a new water treatment plant.
- The economy of the province relies mainly on industrial and artisanal fisheries, as well as agriculture. Agricultural production is dominated by smallholders that are descendents from different indigenous groups. Livelihoods of farmers are based on cash crops, such as cacao and tropical fruits, as well as timber sales. Recently the tourism sector has been growing rapidly. Tourists love the beautiful beaches and national parks that the province offers. However, tourism infrastructure is still poorly developed and many potential visitors are left without options to explore the wetlands.
- Recently, investors from Moneila city in the south are frequently seen in this part of the country buying land in order to convert them into palm oil plantations.

2. Belandu province
The highland province of Belandu is well-known for its excellent dairy products. It is characterized by subsistence agriculture which is mostly carried out by indigenous groups. At the same time, the textile industry is becoming more and more important.

- The main city is Kalu.
- Farmers have been migrating to this area in recent years, clearing the forest for pastures and increasing the number of cattle. Presently, there are approximately 300 farmers in the area surrounding Kalu, with land holdings varying in size from 10 to 50 hectares. Uncontrolled expansion of cattle farming has led to severe problems with erosion and river contamination, in particular the Milaku River. The textile industry might increase water pollution in this area as well.
- Forests are still covering large parts of the region but soon may be restricted to steep slopes and remote areas. The province hosts the water catchment areas of important rivers such as the Milaku und Coroné. In this area, highland vegetation can be found between the upper forest line and the permanent snow line. In the northern part you can find the Hankulen Community Ecological Reserve (HANCER), which is co-managed by the national service for protected areas and the local indigenous communities. HANCER is home to endemic species and the source and catchment area of the Coroné River ,which crosses the northern part of the country until the river merges with the Nelam-wetlands.

3. Exportul province
The province of Exportul is the centre of the agribusiness industry, which is run by both medium- and large-scale farmers, as well as foreign investors. Manufacturing and beach tourism is also becoming important in the region.

In the last two centuries, timber extraction, the rubber economy and land conversion for banana and sugar cane plantations have changed the landscape radi-

cally. Today, most of the original vegetation cover has been depleted for palm oil, sugar cane and other cash crops. In order to reduce conflicts over land and promote investment, the province has undertaken efforts to issue land titles and update the land registration. However, environmental assessments have shown that after years of intensive use, soil fertility is decreasing and there are water supply problems, especially because of reported longer dry seasons. More recently, the main daily newspaper in the province, Exportul Today, reported that a study commissioned by the Ministry of Agriculture and Fisheries had found evidence of serious drinking water contamination, resulting from over-use of agrochemicals in the plantations. The Ministry and the local authorities tried to keep it a secret, but the story turned into a national scandal after several children in a local school got extremely ill from drinking tap water. As a consequence, there have been demands for the resignation of both the Minister and the city mayor, but so far, no decisions have been made.

The main commercial centre of the region, Moneila city, has been growing rapidly and is now the economic and financial heart of the country, attracting financial capital to be invested in agribusiness, tourism resorts along the coast and foreign and national direct investment in manufacturing, which has been made more attractive through the creation of industrial zones and free-trade zones.

There is mounting evidence that the water discharges from Moneila and adjacent industrial areas that are directly poured into the Nha Du River are generating pollution problems. This contamination not only affects the attractiveness of the beaches, which in some parts now *stink of rotten eggs*, according to several foreign tourists, but is also generating problems for the small-scale fishers who fish along the coast of Exportul. Massive fish deaths and increased algae growth in the reef areas are reducing fish availability and quality. Several fishers have been voicing their discontent over this situation and have been pressing the Ministry of Agriculture and Fisheries to look into this problem. The Ministry has traditionally provided fuel and equipment subsidies to the fishers, a situation that has resulted in over-fishing.

In the south of the province there is a national park named Reskul. It houses some of the country´s native plant species and has many endemic fauna species. Reskul National Park overlaps with parts of the ancient territory of the Bankas and Kulres. The protected area´s management plan restricts land-based activities in some areas and permits sustainable natural resource use in others. However, enforcement is lax and there is no clear definition of what exactly a sustainable natural resource use entails. Currently, there are plans to change the status of the national park to a biosphere reserve to enable a properly planned and defined mix of nature conservation and sustainable natural resource use. The protected-areas authority has been having regular meetings with international donors and scientists to develop an action plan to change the status of Reskul National Park.

The sad history of the Bankas and Kulres, who live in an around Reskul, is intertwined with the economic development of the province. In former times, these groups were forced to work as indentured labourers on their own ancestral lands as they were gradually bought out by wealthy large-scale farmers, who created cash-crop plantations. Permanent and seasonal outmigration to nearby cities has been historically high. Community members survive from subsistence agriculture and complement their incomes via seasonal employment in the big plantations and other menial jobs in the urban areas. However, few decent job opportunities exist. Work conditions and salaries both in the plantations and in urban areas are quite bad. The NGO Save Our Heritage Bakul (SOH-Bakul), financed by the Environment Ministry and international donors, has recently been implementing pilot projects with the Bankas and Kulres to strengthen their own small-scale agricultural activities by converting to agro-ecological schemes, and in developing community tourism. This initiative aims to protect their land rights, ensure that they can have alternative sources of income and promote a localized form of development in line with nature conservation.

The Reskul National Park´s ecosystems and local indigenous group´s access to land and livelihood alternatives are threatened by the provincial government´s plan to build a dam along the Tonkin River. This plan is perceived very positively by the Industrial Development Bureau, part of the Ministry of Economics, as there is a need to generate hydropower to cover the rising demand for electricity for new manufacturing investments, hotels and urban growth in the provincé s capital. However, many environmental NGOs and scientists have pointed out that the dam would flood extensive areas within the National Park, destroying ecosystems. In recent months, there have been several demonstrations in Moneila centre and in

the country s capital, Hanku, demanding a halt to the scoping work of the Industrial Development Bureau. Several local residents have reported repeated visits by government personnel accompanied by engineers to the proposed site for the dam.

In a nutshell: Key features of Bakul

AREA	300,000 km² (a size similar to the Philippines, Ecuador or Ivory Coast)
POPULATION	15 Million; with 55 % living in urban and 45 % in rural areas
POPULATION GROWTH RATE	1.9% per year; mainly in urban areas due to continuing rural to urban migration and natural growth
GOVERNMENT	· Representative Democratic Republic · Three provinces: Indare, Exportul and Belandu with considerable autonomy, yet limited taxation powers
GOVERNMENT	**US$5,195 (2016)**
COMPOSITION OF ECONOMY	· Market-oriented economy with trend towards increased exports · Main export crops: palm oil, fish and shrimp, rubber, timber and, to a lesser degree, cacao and tropical fruits · Small-scale fishing and subsistence agriculture remain key pillars of the economy for more than 45% of the population living in coastal and rural areas · Tourism is gaining importance as the nations fastest growing industry in terms of revenue.
HUMAN DEVEL-OPMENT INDEX	0.723 (2016)
PORTION OF POP-ULATION LIVING BELOW NATIONAL POVERTY LINE	31.3% of Bakul's total population is classified as poor, including 9.8% that is extremely poor.
GEOGRAPHY	Bakul is a tropical country with a great variety of ecosystems: · Mighty Mountains: a high-altitude belt (up to 2000 meters) running north-south along the west of the country, large parts are still covered by forests with a mild climate all year round. · Low-lying lands to the east with a humid climate in the rainforest areas. · Coastline: Coroné Delta and the Nelam Wetlands (Endemic Bird Area) with its large Mangrove forest in the north and palm oil plantations and agricultural lands for cash crops in the south, as well as many beaches and islands and the world-famous Bakul barrier reef including the Bakul Barrier Reef Protected Area.
BIODIVERSITY	· The variations in elevation and climate lead to a wide diversity of ecosystems each with different vegetation types and species. · Bakul is one of 17 megadiverse countries in the world according to Conservation International, and it has more biodiversity per square kilometre than that of any other nation. · The current protected areas system (14 % of the country s area) includes 6 national parks, 4 communal reserves and 3 ecological reserves, among others. Well-known areas include the Nelam-wetlands and Tabakalues reserve (Indare), the HANCER reserve (Belandu) and Reskul national park (Exportul).

Annex 4: Supplementary Information for Exercise 7 (Identifying and Prioritizing Ecosystem Services and Stakeholder Participation)

1. Fishing Cooperative (small-scale fishing)
Fishing has been an important traditional activity in Exportul. Common catches include mollusks, found mainly on reefs and rock formations near to the shore, crustaceans, such as shrimp, and other commercially-viable fish species such as snappers, mackerel, sea bass, sharks and tuna. Some of these species are mainly consumed locally, while many find their way to international markets. Recently, total fish catches of yellow-fin tuna, shrimp and sharks, have decreased substantially. Some fishing cooperatives blame the decline on illegal vessels from neighbouring countries that have been spotted in Bakul's marine areas. Depletion of fish stocks is also due to a lack of adherence to fishing regulations (e.g. seasonal bans or off-limit areas are ignored), and to increasing pollution coming from the river, which has generated sudden massive fish deaths and algae growth in reef areas. The construction of infrastructure and tourism developments have given rise to the destruction of mangrove areas along the coast and in estuaries, jeopardizing future fish stocks. Subsidies for fuel and equipment have also generated incentives for overfishing.

2. Industrial Park Developers (manufacturing)
Exportul is the centre of manufacturing in Bakul. There has been a significant increase in new direct investments due to newly created industrial parks and free-trade zones around Moneila and the coast. During the last five years, the largest proportion of new job creation in the province can be attributed to a growth in this sector. Manufacturing activities are centred on textiles, electrical appliances and food processing. Textile and appliances are geared mostly to international markets, while food processing caters largely to national markets with some exports to neighbouring countries. Many of these activities obtain their raw materials directly from Bakul (cotton and other fibres for garments, fruits and vegetables for food processing). The new industrial parks, however, lack sufficient infrastructure for the treatment of waste (particularly, residual waters and solid waste from textile production and food processing), which either end up directly in the NhaDu River or in open air waste dumps. This generates pollution of surface and underground water sources. Some industrial park developers, however, have started improving their waste treatment facilities based on international standards. Nevertheless, the lack of provincial incentives and limited access to adequate public infrastructure, create problems once the residuals are transported out of the parks.

3. Bankas Indigenous Federation of Organic Producers (small-scale subsistence farming in Reskul National Park)
The indigenous Bankas and Kulres engage in subsistence farming within and outside the Reskul protected area. Traditional farming practices are highly efficient and yield several grains, fruits and vegetables all year round. Production is for their own consumption, although some of it is sold in local small-scale markets. While the traditional practices relied only on natural soil fertilization and pest-control methods, some farmers have recently introduced agrochemicals to their farms to increase production. In some cases, the excessive and inappropriate use of chemicals has polluted streams, decreased soil fertility and caused health problems. In recent years, however, due to promotional efforts from national and local NGOs, several producers have r-adopted agro-ecological practices and some have even gone organic. Local processing of farm products is also gaining importance as some cooperatives have received credits and technical assistance to build small food processing plants. Despite the higher labour intensity from organic farming, some farmers have obtained benefits from regional and international organic markets. One group, the Bankas Indigenous Federation of Organic Producers, has managed to tap into international markets for their delicious jams and dried fruits. Complaints and distrust amongst farmers ,who have adopted agro-ecological practices and those who have not, is increasing.

4. Agribusiness Chamber of Commerce (large-scale cash crop plantations)
Cacao, sugar cane, cotton, tropical fruits and the rise of palm oil for biofuel production are some of the main cash crops produced in Exportul. Most of the production is destined to international markets, providing important export revenues for the country. The emerging textile and food-processing industries

are propelling domestic demand for cotton and tropical fruits. Extensive farming practices with an intensive use of agrochemicals dominate cash crop production, where average farm sizes are nearly 50 hectares. Farming activities are concentrated in the south of Moneila and in the Eastern Lowlands. The areas formerly occupied by dense forests have now been transformed into commercial plantations. Soil and land degradation, deforestation and pollution of water sources near farms are common. Moreover, in recent years, some farmers have witnessed massive bee deaths and a drying out of natural springs. This is an acute problem due to longer dry periods in the past 15 years. Farming practices have been increasingly under public scrutiny due to the alleged pollution of drinking water sources with agrochemicals. All of this has begun to generate a slow but persistent change in the perspectives of farmers. Some of them have noticed that having a functioning forest ecosystem yields important benefits such as securing water sources, pollination and soil formation. Some, especially in the Eastern Lowlands (where some important forest patches still exist) have started voluntarily conserving forest in the form of private protected areas or entering into agreements with other farmers, who still have some forested areas.

5. Industrial Development Bureau (hydropower plant)

New tourism developments, urban growth and industrial areas in Moneila, have increased the demand for electricity, which has prompted the government to look for new energy sources. An obvious option is the generation of hydroelectricity from a dam on the Tonkin River. Estimates from engineers place hydroelectric capacity from such a dam at 300 MW, which would be more than enough to cover rising demand for at least the next ten years and even generate some surplus, which could be sold to other provinces. According to the Industrial Development Bureau, this source of energy is considered highly-efficient, cost-effective, renewable and low-carbon. However, the flooding of ancestral lands and some parts of the Reskul protected area could result in habitat and livelihood losses. Some of these losses may be compensated by the introduction of commercial fish species in the new reservoir, an alternative that biologists consider outrageous due to the potential invasive behaviour of the introduced species. Furthermore, decreased water flow would jeopardize coastal ecosystems and estuaries downstream. This, in turn, could affect the livelihoods of fishermen. Some scientists and NGOs are insisting that a proper cost-benefit analysis should be carried out before an investment decision is made. This would ensure that social and environmental values, are properly accounted for.

6. Tourism Association (tourism)

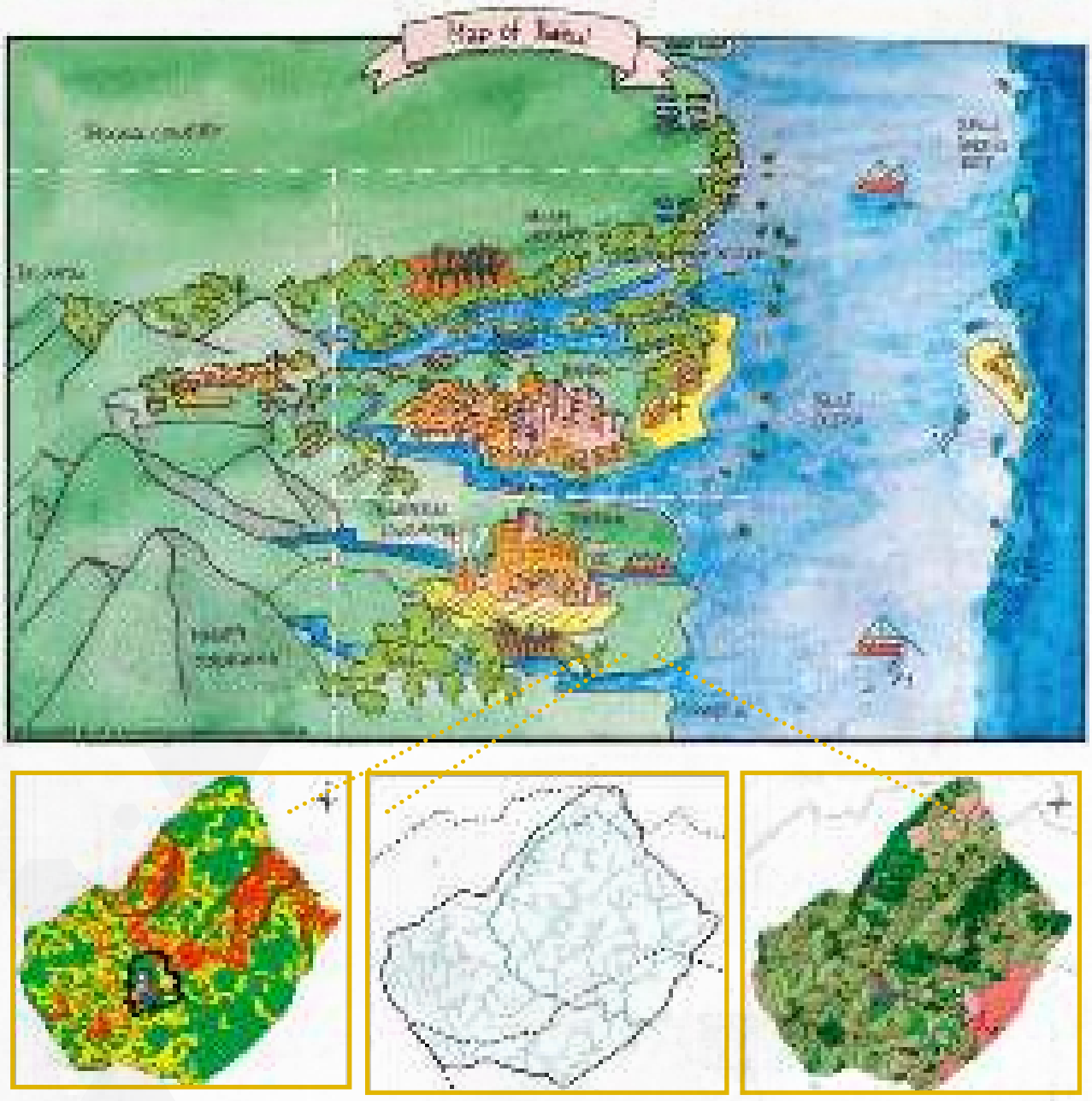
The tourism sector is booming in Exportul. The beautiful white sand beaches, turquoise clear ocean waters and coral reefs have attracted local and international tourists of every sort. Many new hotels (from backpacker dens to luxury resorts) have been built along the coast. It is estimated that currently installed capacity is now around 45,000 beds and could double in the next few years. This unprecedented expansion has generated several environmental problems. Poor water treatment facilities means that highly contaminated discharges end up in rivers, estuaries and streams. Some tourists have begun complaining of bad odours in some beach areas. Lack of land planning has resulted in the clearing of some mangrove areas to give way to new hotels and resorts. This could jeopardize fish production in the long run and augment the risk of infrastructure damage from extreme events. Some coral reefs have also been damaged from careless divers and boat operators, who anchor their vessels wherever they see fit. The new government, however, is pushing hard to come up with a new development plan for the sector.

7. NGO SOH Bakul (Ecotourism)

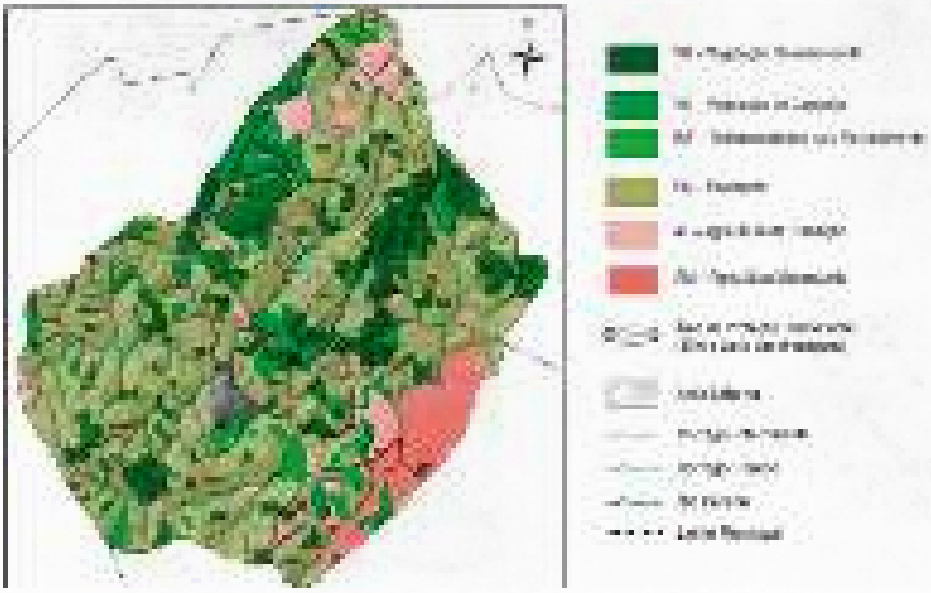
Ecotourism is a new form of tourism in Exportul. It has developed in the surroundings of the Reskul protected area, although some hotels along the beach also claim to offer environmentally friendly facilities and field trips to nearby natural attractions. Ecotourism is primarily carried out by indigenous groups with the technical and financial support of the NGO SOH Bakul and certain government agencies. Facilities and activities include staying overnight in small

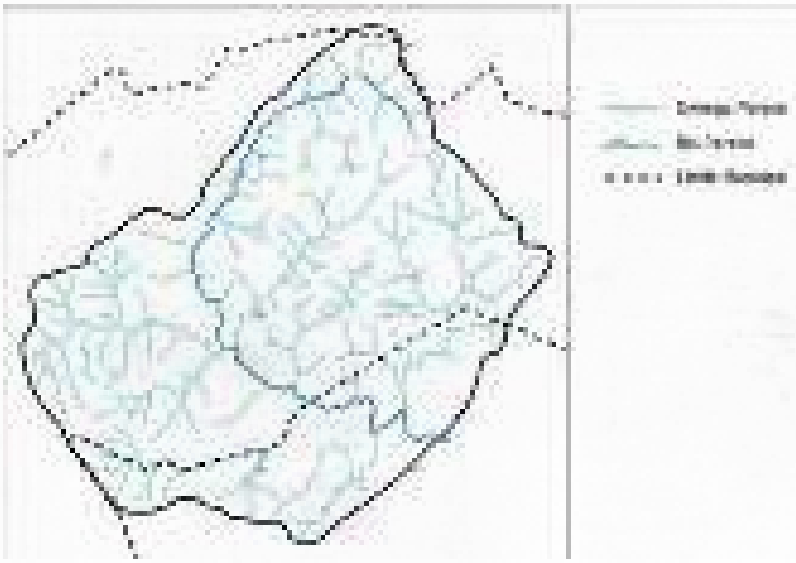
lodges, trekking and hiking in protected areas, the possibility to harvest and cook together with local communities, and canoeing in the Tonkin River. Most of the food offered to tourists is produced locally and all profits from ecotourism are managed solely by the indigenous communities. However, recently there have been some problems with waste disposal in some small lakes and streams inside the protected area. The basic infrastructure needs to be improved too. On one occasion, a group of German tourists got lost for two days in the hilly parts of the reserve since the trekking paths were not properly marked. Luckily no one got hurt but this occurrence received some negative international news coverage. The NGO SOH Bakul and some of the more consolidated ecotourism organizations are urging all groups involved to set clear guidelines for the handling of waste and to improve infrastructure and security.

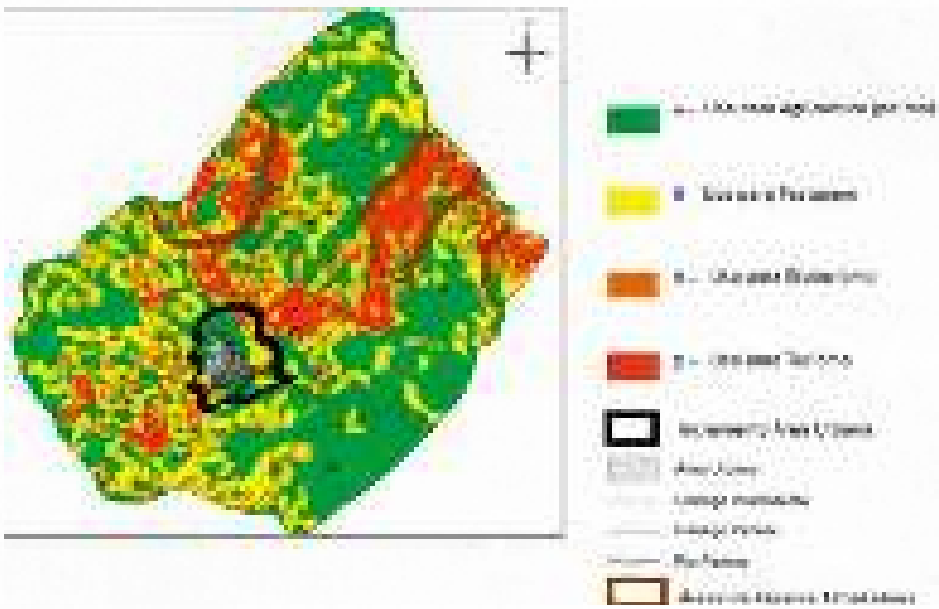
Annex 5: Supplementary Information for Exercise 11 (Ecosystem Services Mapping)



Note. Maps are based and modified from: Oliveira, L.F.C.; Calil, P.M.; Rodrigues, C.; Liemann, H.J.; Olivera, V.A. Potencial do uso dos solos da bacia hidrográfica do alto ria Meia Ponte, Goiás. Ambi-Agua, Taubaté, v.8, n.l., p 222-238, 2013.







NOTES

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