# InnoForESt

## Smart information, governance and business innovations for sustainable supply and payment mechanisms for forest ecosystem services

**GA no. 763899**

# D5.5: Ecosystems Service Governance Navigator & Manual for its Use


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# Executive summary

We aim for the Navigator to be a **practical tool** that should help finding orientation and direction for (forest) ecosystem innovation processes. To that end we provide suggestions for practical application throughout most of the sections.

Deliverable 5.5 presents a Navigator to be used as a guidance to improve understanding on Forest Ecosystem Services governance innovations. The Navigator comprises the **InnoForESt approach**, as it has emerged in the course of this innovation action project. The Navigator entails a compendium of "heuristics" understood as a set of practical tools (rooted in theory) integrating the project knowledge generation and communication approach to forest ecosystem services (project glossary, analytical framework, fact sheets, typologies, workshops, etc.). It aims at giving orientation, not setting hard rules. The Navigator dedicated to the interested public outside this project for a first impression of the InnoForESt approach.

A governance innovation Navigator, as we understand it in InnoForESt, is **strongly rooted in the socio-political context** of the innovations that are studied and cannot instantly be separated from this context. To understand the variation across the innovation contexts, we have mapped the biophysical and institutional features of forest ecosystem service provision as well as studied the governance and stakeholder contexts of the innovations. All methods applied are tailored to the innovations to be analysed and further developed. In turn, this also means that a presentation of methods is not complete without outline of the innovations themselves. Hence, this Navigator also refers to **empirical findings** from the regional socio-political innovation contexts including the respective project's practice and scientific partners, entities we term Innovation Regions. There are InnoForESt Innovation Regions, in which payment schemes for ecosystem services or variants thereof are introduced or developed further, for example, in Finland and Germany. Others rethink the way they convey knowledge about forest ecosystem services, as it happens in Sweden and Austria. In Italy, the provincial forest management agency undertakes efforts to innovate its management practices of their special land-use type, the mid-elevation forest-pasture landscape. Finally, in the Czech and Slovak Innovation Regions, new practices of collective forest management are explored.

After the introduction, in section 2, we present an overview of the **theoretical background** of the project (cf. InnoForESt Deliverable 3.1, Sorge & Mann 2019) as well as the **analytical approaches** used to come to the empirical orientations based on Stakeholder Analysis (cf. InnoForESt Deliverable 5.2, Schleyer et al. 2019), Governance Situation Assessment, and a reconstruction of the regional Innovation Journeys (cf. InnoForESt Deliverable 4.3, Loft et al. 2019). Section 3 provides a deeper look at the methods used in InnoForESt, including a technology-assessment-based, multi-stakeholder-driven **Constructive Innovation Assessment** (cf. InnoForESt Deliverable 4.2, Aukes et al. 2020a), experimental **Role Board Games** and the systematic development of **prototypes** (cf. InnoForESt Deliverable 3.2, Kluvánková et al. 2019). In section 4, the Navigator ends with an outlook on plans **how to convey the knowledge and methods** acquired in the project in training circumstances, practice interactions, as well as the digital innovation platform which InnoForESt is developing.

This deliverable, elaborated under WP5 leadership, has been co-authored with colleagues from the entire project and is thus a true **joint deliverable**. It draws information from the other InnoForESt

work packages by integrating their analytical approaches, tools, and methods employed. It reflects on possibilities and limitations, options and alternatives of the elements currently in use. It also builds on the experience of the six Innovation Regions identifying basic patterns of forest ecosystem services governance innovation in practice "that work".

In the text, we **refer** to other results of the project that illustrate exciting aspects and from which further knowledge can be obtained: on the basis of which you can see how we did it in the project.

## Non-technical summary

We aim for the Navigator to be a **practical tool** that should help finding orientation and direction for (forest) ecosystem innovation processes. To that end we provide suggestions for practical application throughout most of the sections.

This document **outlines the approach** the InnoForESt project has developed. It provides all project members and all others interested orientation about how InnoForESt worked. This is the reason why it is called a **Navigator**.

The report provides overview, examples, and guidance. It is less of a scientific character than a **manual**:

- In **section 2**, we present an overview of ways we do analysis and come to orientations about relevant processes influencing novel developments in the Innovation Regions.
- **Section 3** provides a deeper look at the methods used in InnoForESt, including a method for "Constructive Innovation Assessment", and experiments called "Role Board Games". It also describes methods for developing test cases ("prototypes") for the innovations, and for the reconstructions of the journey of an innovation ("Innovation Journeys"). The latter supports a better understanding of the innovation during the process and afterwards. A number of fact sheets about the methods employed are also available in this report.
- In **section 4**, we describe which training resources and interactions with practitioners were developed during InnoForESt. This section also includes a reflection on the digital innovation platform which InnoForESt has developed.

In the text, we refer to other **results** of the project that illustrate exciting aspects and from which further knowledge can be obtained: on the basis of which you can see how we did it in the project.

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# List of acronyms

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|---|---|
| CINA | Constructive Innovation Assessment |
| CICES | The Common International Classification of Ecosystem Services |
| CLC | CORINE Land Cover |
| CORINE | Coordination of Information on the Environment |
| CTA | Constructive Technology Assessment |
| Dx.y | Deliverable x.y |
| EU | European Union |
| EW | Eisenwurzen region, Austria |
| FES | Forest Ecosystem Services |
| FIN | Finland |
| GSA | Governance Situation Assessment |
| HYB | Hybe (region in Slovak Republic) |
| InnoForESt | Smart information, governance and business innovations for sustainable supply and payment mechanisms for forest ecosystem services |
| LIB | Liberec region, Czech Republic |
| MAES | Mapping and Assessment of Ecosystems and their Services |
| MLP | Multi-Level Perspective |
| NGO | Non-Governmental Organization |
| Oppla | Operationalisation of Natural Capital and Ecosystem Services |
| PAT | Provincia Autonoma di Trentino (Autonomous Province of Trentino), Italy |
| PES | Payments for Ecosystem Services |
| RBG | Role Board Game |
| STA | Stakeholder Analysis |
| SETFIS | Socio-ecological Technical Forestry Innovation Systems |
| SME | Small and Medium-sized Enterprises |
| WP | Work package |

# Deliverables

D2.1 – Deliverable 2.1: Mapping of forest ecosystem services and institutional frameworks, draft report
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# Work packages

WP1 – Project management and coordination
WP2 – Mapping and assessing forest ecosystem services and institutional frameworks
WP3 – Smart ecosystem services governance innovations
WP4 – Innovation platforms for policy and business
WP5 – Innovation process integration
WP6 – Policy and business recommendations and dissemination
WP7 – Ethics requirements

# 1 Introduction

This InnoForESt Navigator provides **an integrated view on the core approach** chosen by the project partners. Its main aim is to observe existing innovations and stimulate new and further innovations of forest ecosystem services governance. We take stock of what has been developed in the InnoForESt project. It collects, interprets and explains, as well as translates useful strategies for forest ecosystem services governance innovations into practical terms. We aim for the Navigator to be a **practical tool** that should help finding orientation and direction for (forest) ecosystem innovation processes.

To that end we provide suggestions for practical application throughout most of the sections.

**Defining the Navigator**

The Navigator should be seen as a practical tool. You can use it as a manual to apply to your innovation to develop it further.

*You will find that the Navigator contains different methods to further understand your innovation and its social context. We hope to clarify the applicability of those methods with the help of introductory explanations.*

As a project, InnoForESt was constructed to assist innovations in **six different practice contexts**. We called these practice contexts.

'Innovation Regions'. This comprised all of the practices, stakeholders, policies, and places that encompass the targeted innovation. The six Innovation Regions revolved around the following innovations:

- **Eisenwurzen, Austria (EW)**: exploration of ways to strengthen existing and constructing novel value chains around forest products, potentially including material products (e.g., furniture, tiny houses) as well as educational programmes and tourism activities
- **Southern Finland, Finland (FIN)**: operationalisation of a 'payments for ecosystem services' scheme in the form of a habitat bank acting as intermediary for (corporate) investments in forest biodiversity protection
- **Mecklenburg-Western Pomerania, Germany (MWP)**: expanding an existing payment for ecosystem services scheme involving tree planting by investors
- **Fiera di Primiero, Trentino, Italy (PAT)**: exploration of new ways to maintain and sustain existing management practices for a specific landscape type: mid-elevation forest-pastures
- **Gothenburg, Sweden (GOT)**: Redevelopment of a multi-stakeholder program for increasing childrens' and young adults' knowledge about forests and their ecosystem services in times of climate change
- **Liberec, Czech Republic/Hybe, Slovak Republic (LIB/HYB)**: exploration of new ways to manage forests in a collectively-owned, self-organised forest socio-ecological systems.

The innovations pursued in the Innovation Regions selected by the project involved a variety of forest ecosystem services. This gave us a comprehensive **overview of practices 'that work'** in terms of making our societies' relation to forests more sustainable. Table 1.1 shows which services in the broader sense were targeted in which Innovation Region.

The Navigator shows how the individual analytical approaches, tools, and methods applied in the project fit together despite their diversity. It reflects on possibilities and limitations, options and alternatives of the elements. Thus, drawing on the experiences of the six Innovation Regions, this report helps to identify and clarify basic patterns of forest ecosystem services innovation practice 'that work'.

*Table 1.1: Ecosystem services targeted in the Innovation Regions*

| Ecosystem service | EW | FIN | MWP | PAT | GOT | LIB/HYB |
|---|---|---|---|---|---|---|
| *Timber* | ✓ | ✓ | ✓ | | | -/✓ |
| *Non-timber products* | | | ✓ | | | |
| *CO2 sequestration* | | ✓ | ✓ | | | ✓/✓ |
| *Water regulation* | | | | ✓ | | |
| *Biodiversity* | ✓ | ✓ | | | | ✓/✓ |
| *Natural hazards protection* | | | | ✓ | | |
| *Tourism and recreation* | ✓ | | | ✓ | ✓ | ✓/✓ |
| *Spiritual values* | | | | | ✓ | |

This report follows a structure that is unconventional at least from an academic writing perspective. In InnoForESt, the practice perspective takes precedence over the scientific one. In other words, promoting and inspiring the governance innovations in the Innovation Regions was the primary objective, while scientific progress was subordinated to this. Hence, this report intends to highlight those elements and aspects of InnoForESt's approach that are useful for and implementable by local innovators also outside the original project and autonomously. This is what we try to reflect in the report structure as well. We begin with presenting the specific, relatively easily separable methods the project partners applied throughout the project duration in **Section 2**. It presents the theoretical background and provides a glossary explaining the InnoForESt rationale and language, which can be useful when thinking about your innovation. In addition, two methods for assessing your innovation context are described. When we describe the project methods, we embed them in a narrative including when and how they can be used as well as what their limitations are. In **Section 3** we describe the practical implications of the work done in InnoForESt. It mirrors how the methods described in Section 2 mix in the actual innovation work and become more difficult to disentangle. This entanglement of methods and their results leads to the development of project specific interaction forms, which are described in this section. **Section 4** contains additional background and context information for the tools presented in Sections 2 and 3 that are not directly necessary for practical application, but that could be nonetheless interesting for local innovators who want to dive a little bit deeper into the matter.

# 2 Set of utensils

In this section, we present and briefly explain the **heuristics**[1] that helped the project to explore and assess the six Innovation Regions. This includes a glossary of core terms; the mapping of associated political and biophysical circumstances for forest ecosystem services governance innovations in the seven countries where the innovations took place; a conceptual framework developed by InnoForESt to analyse influential factors in socio-ecological technical forestry innovation systems (SETFIS; cf. InnoForESt Deliverable 3.1, Sorge & Mann 2019); suggestions for how to study the involved actors and governance situation (cf. InnoForESt Deliverables 5.2, Schleyer et al. 2019, and 5.1, Aukes et al. 2019[2]); a description of how InnoForESt envisioned the ideal innovation process; and an analytical method helping to understand and learn from the course, i.e., 'journey', of an innovation retrospectively.

These **utensils**[3] are used side by side. They complement each other: the glossary defines the key terms so that one has a common language regulation in the project, SETFIS offers the conceptual framework so that one shares coherent basic assumptions in the project, the mapping provides an overview of the other forest ecosystem services landscape, the Stakeholder Analysis and the Governance Situation Analysis translate all of this into specific questions for the site in the regions in which the innovations are to take place before the innovation work begins, and the other tools help to bring all of this into a concerted process and allow for systematic reflection on what is actually happening.

Each topic in this section follows a similar **structure**. First, it describes what the item or method is meant to be. Second, it describes how one may use it. Third, the limitations of the item or method in question are listed. Finally, the item or method is presented as it was applied or used over the course of InnoForESt.

We would like to point out that the texts that follow in sections 2.4 and 2.5 had the character of **manuals** or handouts in the project context.

[1] We understand "heuristics" as a set of **practical tools to assess and appraise** existing governance situations for forest ecosystem services (cf. Abbott 2004). These tools were developed by the different WPs and served both the interests of our local innovators and the scientific aspects of the project. The tools carved out the framework conditions of innovation contexts as well as possible activities fostering the sustainable use and provisioning of forest ecosystem services. This included the possibilities and limitations, options and alternatives as seen from the major theoretical, methodological, and analytical dimensions.

[2] D5.1 represented a compendium of potential method suggestions that could be used in the project. Here, we have revised the considered set of methods and only include those methods which have proven themselves in the project practice and which were widely applied.

[3] A "utensil" can be defined as *"A tool, container, or other article, especially for household use."* (www.lexico.com/definition /utensil, accessed: 16 December 2020) We like the idea that you understand these tools like very **basic** kitchen utensils. To get there, practicing and training may be necessary, however.

## 2.1 Utensil 1: Glossary of core terms and heuristics

*What is this?*

- Large international projects encompassing multi-actor approaches, like InnoForESt, require a **shared terminology** in order to develop a common conceptual understanding.
- This glossary is an alphabetical compendium of **key terms** with common usage in the project. It served as a pivotal element for coherent communication and to be able to link findings within the project.
- Several of the key terms in Table 2.1 originated in the InnoForESt proposal. These were continuously complemented based on discussions during periodic project meetings. The compilation of the glossary was an **ongoing activity** of improving and reviewing shared terminology throughout the course of the project.
- The common terminology of notions summarized in the glossary served as a point of reference—as an **integration** device on project level.

*How to use it?*

- The concepts presented below offered the chance to get a better idea of what we meant with certain terms **in this project as a whole**, as compared to specific literature or individual use.
- The glossary was used as a **reference** to enable clarifications during project meetings or workshops with different stakeholders.
- *Limitations of use*
- We are aware that other—in some cases also scientific—**meanings** of some terms exist, and we do not claim exclusiveness.
- Indeed, the glossary was **neither supposed to replace** the local language, which may have relevance for the actors in the Innovation Regions, nor to render readers' translation of the notions into the local mindsets and practice contexts unnecessary.

*Table 2.1: Glossary of key terms and concepts including definition as used in InnoForESt and this Navigator*

| Key term | Definition |
|---|---|
| *Biophysical and Institutional Mapping* | Europe's biophysical forest ecosystem services are well understood on a general level. InnoForESt refines the knowledge base by providing fine-grained maps of the supply of selected, relevant forest ecosystem services in Europe. The institutional mapping component adds knowledge about future societal demand for forest ecosystem services based on public policy. These mapping processes are not a stand-alone effort. They also provide relevant background knowledge for the Innovation Teams to understand and manage their innovation in their specific local context (WP4 and WP5). |
| *Business model* | *"Representation of a firm's underlying core logic and strategic choices for creating and capturing value within a value network"* (Shafer, Smith, & Linder 2005: 202)<br>Key components: the sample of strategic choices, the creation of value, the network, and the value preservation |

| Key term | Definition |
|---|---|
| *Constructive Innovation Assessment (CINA)* | Constructive Innovation Assessment (CINA) is the method for innovation assessment in InnoForESt, inspired by Constructive Technology Assessment (Schot & Rip 1997). It consists of a series of workshop activities, including preparation and evaluation, reflection, and learning materials, for<br>multi-stakeholder constructive visioning and assessment of the six governance Innovation Regions in focus. |
| *Digital innovation platform* | Digital innovation platforms are virtual spaces for knowledge exchange. As part of the InnoForESt webpage (www.innoforest.eu), each Innovation Region will be provided with a space, which has an open public part presenting the innovation in the respective local language and in English; and a protected space which the Innovation Teams can use for sharing information with their local network. The digital platform, like a physical one, should serve the stakeholders communication and exchange, and are co-designed with Innovation Teams. |
| *Ecosystem service governance innovations* | The six initial governance innovations in InnoForESt are different Payment schemes for forest Ecosystem Services (PES) and new partnerships, network approaches, or actor alliances. Payment schemes are in focus in Germany, Slovakia, Finland, and Italy; network or partnership approaches characterise the innovations in Austria, Czech Republic (as well as PES), and Sweden. |
| *Ecosystem service governance Navigator* | The Ecosystem service governance Navigator has the function for the project to provide an integrated view on the core approach chosen to stimulate and observe innovations of forest ecosystem governance. In this interim's version, we take stock of what has been developed during the first year of the project. It collects, interprets and explains, as well as translates useful strategies for forest ecosystem services governance innovations into more practical terms. |
| *Fact sheet* | These overviews provide easily accessible information about the diverse set of methods used in InnoForESt. By detailing the processes and suitability of the methods in different phases of an innovation process, the fact sheets present innovators in other innovation contexts with a toolbox to enrich the understanding of their Innovation Region and help them push their innovation. |
| *Factor reconfiguration* | Factor reconfiguration means hypothetical or real experimenting with changes in (key) factors when seeking a different design that can potentially work on a larger scale or in a different context. |
| *Factors* | Factors are *"observed conditions or processes that influence the innovation and its development process."* (InnoForESt Deliverable Deliverable 3.1, Sorge & Mann 2019: 3) |
| *FES* | Forest Ecosystem Services |

| Key term | Definition |
|---|---|
| *Forest Ecosystem Service categories* | . Provisioning: Includes all material outputs from forest ecosystems, such as wood, mushrooms, berries or game. These are tangible things that can be exchanged or traded, as well as consumed or used directly or processed, e.g., for construction, energy or food.<br>. Regulating: Includes all the ways in which ecosystems regulate ecosystem characteristics, functions or processes, such as drought resistance, carbon sequestration or water cycles. People benefit from these services directly and indirectly.<br>. Cultural: Includes all non-material ecosystem outputs that have symbolic, cultural or intellectual meaning or value (including, e.g., recreation). |
| *Governance Situation Assessment* | The Governance Situation Assessment in InnoForESt serves two purposes. Knowing about governance arrangements, histories, structures and processes not only provides an overview of the socio-political context in which an innovation is taking place or is planned, but also lays the groundwork for the development of scenarios that can be used in strategic workshops for the purpose of Constructive Innovation Assessment. |
| *Idealised innovation process* | The idealised innovation process depicts what should happen in Innovation Regions in order to best analyse, develop, and foster governance innovations for forest ecosystem service provision. The process consists of three interlinked elements: innovation platforms, networking activities, and workshops. |
| *Innovation Journey* | Innovations are conceived as a process or a journey and not solely as a product. The Innovation Journeys are reconstructions of innovation processes as an opportunity to get an overview of the mechanisms and dynamics of the innovation processes themselves. |
| *Innovation Partner (IP)* | Refers to the practice partners in Innovation Regions. |
| *Innovation Region (IR)* | Refers to the six initial governance Innovation Regions in InnoForESt (formerly 'Case Study Regions'). |
| *Innovation Team (IT)* | Innovation Teams (ITs; formerly 'Case Study Teams') consist of the science partner and the practice partner who are cooperating in the Innovation Regions. |
| *Matching framework* | The matching framework offers methods to assist in innovation and prototype development and assessment, which includes the assessment of their transferability to other places (matching). |
| *Matching tool* | The matching tool helps to identify contexts in which certain prototypes have potential to be fed into another context. The methods used for matching could be something very simple like an Excel table or much more complex (e.g., Stakeholder Analysis, Governance Situation Assessment, Net-map, etc.). |

| Key term | Definition |
|---|---|
| | The idea—in this project—is to develop a European matching tool to identify places with potential for innovations, e.g., as web-based devise, potentially to be integrated into the Oppla website[4]. |
| *Partners:*<br>*Practice partners*<br>*Science partners* | Together, as multi-actor teams, practice and science partners facilitate the innovation processes in the six Innovation Regions, starting as regional innovation network approaches that become scaled up (and interconnected) to national and to EU-wide networks on good innovation practices for exchange and learning.<br>*Practice partners* provide or establish the innovation network and stimulate the forest ecosystem services governance innovation idea. All scientific work and effort is supposed to contribute to the practice partners' objectives. Practice partners include public policy agencies, private forest owners and enterprises, industry partners, environmental NGOs, as well as tourism and hunting associations.<br>*Science partners* are research institutes from—or linked to—the six Innovation Regions collaborating with the practice partners to analyse and support the innovations scientifically. |
| *Prototype* | A prototype refers to a vision (a scenario, scenario narrative, and model) that describes the future development of governance innovation in focus. Future development directions are agreed upon by the Innovation Teams and stakeholders of governance innovation in terms of its upgrading and upscaling potentials. A prototype is based on the reconfiguration of factors (factors analyses) that improve the initial innovation. Prototypes of innovations are different from the initial innovation as they are a future vision that allows for an abstraction of conditions (i.e., decontextualized from the initial innovation context). |
| *Role Board Games (RBG)* | A Role Board Game is used for testing the innovation factors as well as testing and making visible behavioural changes of stakeholders in different settings. It also facilitates the stakeholders (or partners) to learn from each other during the game and to develop a mutual understanding. This is expected to foster innovations and problem solution strategies and sustainability-oriented behaviour, from individual towards collective level which, ideally, enables more sustainable behaviour of all stakeholders involved. |
| *Scenario* | A scenario, as InnoForESt understands it, is at the same time a 'useful fiction' and a 'holding device'. A 'useful fiction' is a coherent story or plot of a world, in which the innovation has taken on a specific shape. A 'holding device' is a condensation of what is known about one specific possible development. In other words, a scenario is a thoughtful, systematic, rich mixture of creativity |

[4] Oppla.eu is "a virtual hub where the latest thinking on natural capital, ecosystem services and nature-based solutions is brought together from across Europe" (www.openness-project.eu/oppla, accessed: 16 December 2020).

| Key term | Definition |
|---|---|
| | based on prior knowledge of the governance situation. See section 5.1 for more detail. |
| *Socio-ecological technical forestry innovation systems (SETFIS)* | This is the analysis framework for the governance of policy and business innovation types and conditions. It serves as an analytical lens to support the exploration of influencing factors on governance innovations to secure a sustainable provision of forest ecosystem services. The creation of the analysis framework builds on the idea of complex processes within linked social-ecological-technical-forestry-innovation systems (SETFIS) of the InnoForESt Innovation Regions. |
| *Stakeholder Analysis* | InnoForESt has carried out a stakeholder analysis in each Innovation Region. Such a mapping exercise is meant to find out about a broad range of stakeholder categories. It is necessary to cover such a broad, exploratory range of stakeholders as characteristics that are (potentially) important when shaping or fostering the governance innovation processes will differ across innovation contexts. |
| *Strategic workshop* | Constructive Innovation Assessment (see elsewhere in this glossary) is carried out in strategic workshops. As opposed to regular work floor interactions, these strategic workshops are characterised by a careful preparation including the (further) development of scenarios representing possible innovation prototypes. |
| *Support products* | InnoForESt produces a range of tailor-made support products that assist workshop activities and networks. These products are available at different points in time and relate to different innovation activities. Science partners in Innovation Teams function as translators for scientific support requests. Products are listed in the Appendix presenting "The idealised innovation process" and will be available on the digital innovation platform. |
| *Training* | InnoForESt's approach will be translated into a training manual for practitioners. The training materials are based on internal training sessions as well as other products and deliverables of the project. This contributes to InnoForESt's sustainability and enables the transfer of the approach to other innovation contexts. |
| *Typology of Forest Ecosystem Services Governance Innovation Situation* | The assessment of the governance situations in the Innovation Regions delivered a preliminary typology of governance innovation situations (see elsewhere in this glossary). Eleven categories were distinguished to meaningfully compare governance situations across such different innovation contexts. Based on the innovation analytical approach taken in InnoForESt, these categories cover different levels of the socio-technical system that is the innovation, e.g. regime, niche, and landscape developments. In addition, it maps the core issues in the innovation context and assesses their structuredness (see Fact sheet on Governance Situation Assessment for more details). |

| Key term | Definition |
|---|---|
| *Typology of Forest Ecosystem Services stakeholders* | Based on a thorough stakeholder analysis in InnoForESt's Innovation Regions, patterns of stakeholders were distinguished. The typology differentiates between stakeholders' (a) sphere, (b) business type, (c) scale, and a qualitative assessment of their (d) openness to innovation. |
| *Work floors / work meetings* | As opposed to strategic workshops, work floors or work meetings are all interactions between the Innovation Team and stakeholders that are not linked immediately to the discussion of scenarios. Think of simple phone calls to catch up with certain stakeholders, discussions in preparation of workshops or bringing stakeholders in contact with each other. |

## 2.2 Utensil 2: Biophysical and institutional mapping

*What is this?*

As both ecological and institutional contexts matter for innovations in the forest sector, InnoForESt provides a **first basis for a context-relevant analysis** of innovation evolution, which supports both evaluating where innovations originate, and learning from innovations elsewhere. In general, there is a good spatial understanding of Europe's biophysical forest ecosystem services (Maes et al. 2013), but ecosystem service supply and demand have been matched only as rough estimates of scarcity (Burkhard et al. 2012). InnoForESt has complemented this understanding by elaborating forest ecosystem service provision through an analysis of biophysical bundles and clusters in the European landscape (Orsi et al., 2020), through an institutional analysis of forest ecosystem service demand, innovations and governance (Primmer et al., 2021), and rights and responsibilities (InnoForEst Deliverable 2.2, Varumo et al. 2019).

**Ecosystem services and their measurement**

What are ecosystem services?

*Ecosystems – forests in the case of InnoForESt – provide a range of goods and services that contribute to the long-term benefit of society. These goods and services are termed 'ecosystem services'.*

How are these measured?

*There are different classifications of ecosystem services. For our biophysical and institutional mapping, we have used mainly two classification systems, namely 'The Common International Classification of Ecosystem Services' (CICES) and 'Mapping and Assessment of Ecosystems and their Services' (MAES).*

InnoForESt Deliverable D2.1 (Primmer et al. 2019) proposes that **societal demand** can be derived from formal goals and argumentation in public strategies and laws, as these are the results of processes engaging societal actors and experts. In the past years, several European policies have gradually taken up the notion of ecosystem services, and the European Forest Strategy fares well in reference to and integration of the term (Bouwma et al. 2018). To complement this understanding, InnoForESt analyses the ways in which national forest related policies recognise forest ecosystem services and how this recognition coincides with biophysical ecosystem service supply at the spatial scale.

The biophysical mapping of forest ecosystem services focuses on the supply of ecosystem services, identifies the **relevant services and defines indicators** to map the selected ones. Pan-European maps are produced using the 'Common International Classification of Ecosystem Services' (CICES) as well as the 'Mapping and Assessment of Ecosystems and their Services' (MAES) indicators using 'Coordination of Information on the Environment Land Cover' (CORINE or CLC) and MAES data and published literature, as reported in InnoForESt Deliverable D2.1 (Primmer et al. 2019). The relevant forest ecosystem **services** are:

- Presence of plants, mushrooms and game
- Biomass
- Bioenergy
- Mass stabilization and control of erosion rates
- Water retention potential
- Pollination potential
- Habitat maintenance and/or protection
- Soil organic matter
- Carbon storage
- Experiential and recreational use
- Symbolic value.

The institutional mapping is designed to **identify future societal demand** for forest ecosystem services, as formalized and expressed in policy, i.e., policy demand. The policy demand is analysed through detailed policy document analysis, for which a protocol and database are developed and reported in InnoForESt Deliverable 2.1 (Primmer et al. 2019). The mapping focuses on forest strategies in the Innovation Regions and their countries as well as in other forested countries of Europe. Also, biodiversity strategies and bioeconomy strategies are analysed in the Innovation Regions or their countries.

Based on the combination of biophysical and institutional mapping, InnoForESt recognizes the **connection between abundance or scarcity** of forest ecosystem services and their coincidence **with strategic commitment to innovations** and new governance mechanisms. The mapping supports the transfer of innovation as well as upscaling and further co-learning in comparative high potential context regions.

*How to use it?*

- InnoForESt innovations can be **included in the output map** as pins with pop-up boxes of information.
- Innovation Teams and Innovation Regions in InnoForESt and beyond can **look for**
- **similar** forest ecosystem services and/or institutional conditions for transferring their ideas.
- Innovation promoters, such as policy-makers can **look for biophysical and**
- **institutionally favourable** innovation and governance settings for the promotion of sustainable use and provision of ecosystem services.
- *Limitations for use*
- The six InnoForESt innovations provided much **detailed** understanding of innovation processes, but this kind of rich data cannot be mapped.
- The mapping is **coordinated with InnoForESt's sister project SINCERE**[5], to include
- over a hundred innovations as pins onto the map. If this does not eventuate, the map will include relatively little about innovations.

[5] "Spurring INnovations for forest eCosystem sERvices in Europe" (h ttps://sincereforests.eu/, accessed: 16 December 2020).

## 2.3 Utensil 3: Social-Ecological-Technical Forestry Innovation Systems (SETFIS)

*What is this?*

For a better understanding of governance innovations for forest ecosystem service provision, InnoForESt developed an **analysis framework** (cf. InnoForESt Deliverable 3.1, Sorge & Mann 2018).

The framework helps stakeholders to gain a good understanding of what influenced innovation development in terms of fostering or hindering context conditions. It explains the emergence, growth, and spread of successful governance innovations for the sustainable provision of forest ecosystem services taking ecological, social, institutional and technical context conditions into account.

Assuming that all types of innovations emerge in interconnected social-ecological-technical forestry systems, the analysis framework serves as an **analytical lens to explore** key factors that are influencing governance innovation types, processes and outcomes. Insights from such SETFIS analysis support local decision makers from forest science, policy and practice in two ways:

**SETFIS framework**

This is the theoretical background on which InnoForESt is built. You can think of it as a pair of glasses through which we look at innovation development in the six regions. With it, we can better understand how certain forest ecosystem services innovations came to be and how to support the implementation of other innovations.

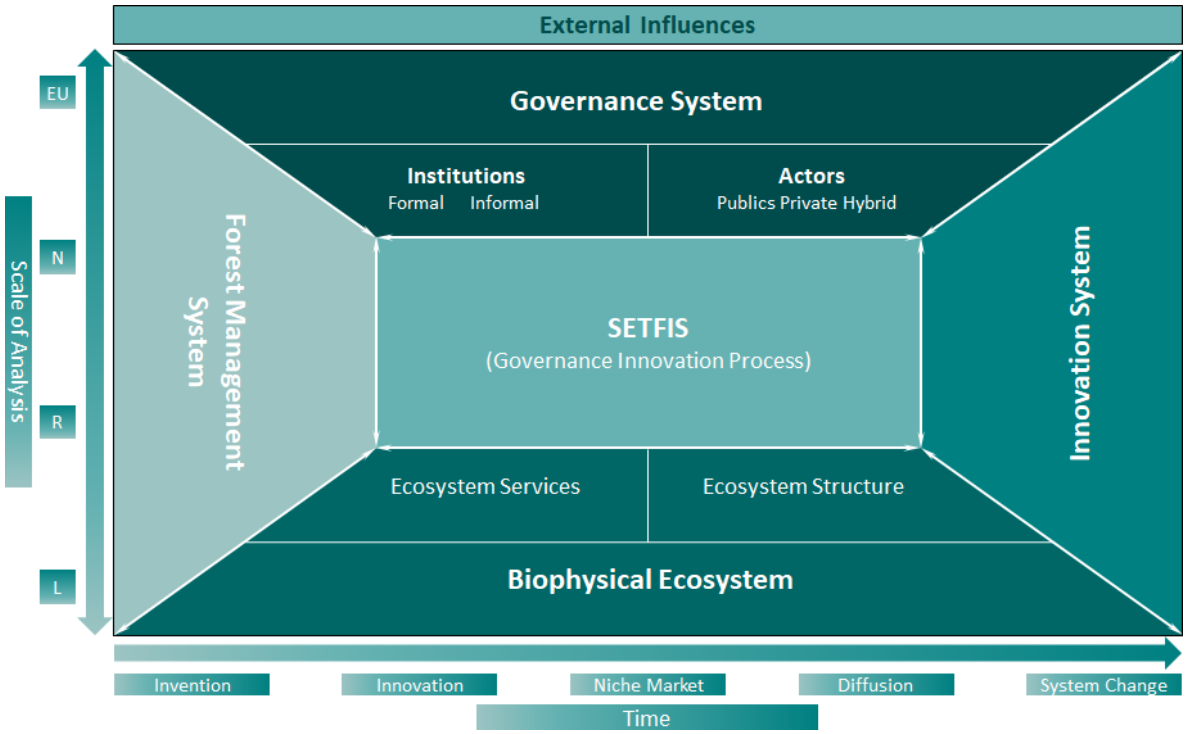
The framework is a combination of two perspectives: social-ecological systems theory and socio-technical systems theory. Both theories have different starting points and come from different scientific disciplines, despite their similarity in name.

a) **Retrospectively**, to gain a good understanding of the emergence and development of forest governance innovations (i.e., what factors have influenced the innovation, from early ideas of its emergence and its developments until now); and

b) **Prospectively**, on crucial conditions enabling their upscaling and upgrading potentials (i.e., what is needed for a similar innovation elsewhere, or an improved version of the innovation in the current context; how to reduce risks for failure).

However, systematic connections between social, biophysical, and technological context conditions on innovation development are scarce. Consequently, InnoForESt's SETFIS (Social-Ecological-Technical Forestry Innovation System) analysis framework builds on and combines theories and concepts in the realm of **social-ecological systems** (e.g., McGinnis & Ostrom 2014; Ostrom 2011), **institutional economics** (e.g., Hagedorn 2008; North 1990), **environmental and transformation governance** (e.g., Armitage et al. 2009; Gunderson 2002; Jordan 2001; Kemp et al. 2007; Olsson et al. 2004), and **socio-technical and innovation systems** (Asheim et al. 2011; Geels & Schot 2007; Voß & Fischer 2006) to describe the complexity of governance innovation development. As an inherent part of SETFIS, ideas of multiple-administrative levels and sectors, multiple actors, and multiple rationalities (Loft et al. 2015) are integrated in the design of the analysis framework.

*Figure 2.1: Graphical representation of the Social-Ecological-Technical Forestry Innovation System framework*




The analysis framework addresses various system dimensions that characterise a particular situation in which governance innovations for FES provision work: **biophysical, social, institutional (the rules), and technical nature characteristics** (see Figure 2.1). Each of these system dimensions is connected to a respective set of **fostering and hindering factors** that are derived from extensive literature studies that proved to potentially influence governance ((innovation) dynamics. Thus, the analysis framework serves as a tool to systematically check and collect information on the development of governance innovations, and anticipates crucial factors/context conditions to concentrate on in future activities for innovation development.

To allow and navigate users through such kind of analysis, we translate the system dimensions and the related influencing factors into qualitative questions to identify and explain how innovations emerge, develop, and unfold. This creation of knowledge with help of focused interviews with stakeholders closely involved in innovation activities helps to explicate the **connection and interrelation** between social-ecological-technical influences on governance innovations in a holistic and comparative way in Europe. As such, SETFIS analysis allows to detect key factors that influence governance innovation development in particular situations such as in our Innovation Regions, but also identifies similarities and differences across Innovation Regions. Over the time of SETFIS application, insights are gained on factors that play a general crucial role for innovation development where decision-makers can concentrate/focus on.

InnoForESt project partners have **empirically applied** the SETFIS analysis framework in the six Innovation Regions. In qualitative interviews and/or as part of strategic CINA workshops, stakeholders reveal the development history of 'their' governance innovation and are guided through the exploration of the forestry innovation system (InnoForESt Deliverable 4.2, Aukes et al. 2020a). In this process, both scientific partners and practice partners gain a good understanding of past and present innovation dynamics, which enables them to purposefully create an innovation-friendly environment, such as the adaptation of key influencing factors that are favouring certain intended development paths (see also InnoForEStDeliverable 5.3, Aukes et al. 2020b).

The analysis reveals critical forestry innovation system conditions and factor interdependencies together with stakeholders. These insights can be integrated into road mapping strategies for improving governance innovations in the light of the vision and ideas of participating actors. As such, the SETFIS analysis framework **supports collecting information in a comparable way** across Innovation Regions by analysing, diagnosing, explaining, and predicting system dimensions, influencing factors, outcomes, and requirements for governance innovations to emerge, develop, and work in an intended way. In combination with the CINA workshops (cf. InnoForESt Deliverable 4.2, Aukes et al. 2020a) and the Role Board Games (cf. InnoForESt Deliverable 3.2, Kluvánková 2020), these insights are one important basis for respective policy and business recommendations that create enabling conditions for the sustainable provision of forest ecosystem services (InnoForESt Deliverables 3.2, Kluvánková et al. 2020, and 5.3, Aukes et al. 2020b).

Forest and forestry-related decision-makers gain a better understanding of **conditions and contexts** that encourage and foster governance innovations and their uptake in the forestry sector. The implications for forest owners, and other local stakeholders, are to diversify their product and service portfolios. Ideally, service providers in the Innovation Regions benefit from creating favorable innovation conditions that allow new business opportunities, the creation of new income streams and job possibilities. Ideally, this leads to an increased provision in particular of regulating and cultural forest ecosystem services, such as carbon storage, improvement of biodiversity habitat, and recreational opportunities, etc.

*How to use it?*

- **Application of the framework**: The analysis framework serves as a checklist for comprehensively analysing the context conditions (organised as system dimension and potentially influencing factors) that have influenced governance innovation development in a region. The framework also offers a set of questions (Appendix of framework document, cf. InnoForESt Deliverable 3.1, Sorge & Mann 2019) asking for current information on biophysical, social, institutional and technical conditions in order to organise and generate insights into historical developments, and assumptions of future developments of the innovation in focus.
- **Data generation and analysis**: Information about innovation development is generated with help of semi-structured interviews, focus groups or workshops with key stakeholders in Innovation Regions. The set of questions helps to categorise and evaluate the influence of framework dimensions and factors that might have played out in particular contexts.
- **Translating results into future steps & strategies**: Results are translated into future steps for action (Road map) for concerned stakeholders in Innovation Regions. Based on insights on crucial influencing factors that are fostering certain innovation developments as well as the challenges and threats for innovations, strategies can be jointly developed to create favourable conditions in a structured and targeted way.

*Limitations for use*

- **SETFIS provides an orientation, not a prescription**: The set of questions is meant as an orientation to elaborate on factors influencing innovation. It is designed to detect further influences which are deemed important by stakeholders. We inserted open questions to improve our understanding of governance innovations design and functioning, and also to constantly improve the conceptual understanding of innovation development by each application. Also, not every question has to be asked, in particular when information has been already gathered by other project activities.

- **Dimensions, no sequence**: The sequence of analysis questions does not need to follow the sequence of dimensions as presented in this guideline; interviewees are free to reshuffle, combine questions or change them to 'yes-no' answers to ease the evaluation. However, for reasons of comparability among the different Innovation Regions, all dimensions should be covered in innovation assessment.

## 2.4 Utensil 4: Stakeholder Analysis

*What is this?*

This tool describes the analytical framework and provides practical guidance for **identifying** (potentially) **relevant stakeholders** in an Innovation Region and for assessing their characteristics including their **interests, visions, and concerns** as well as interlinkages between them (cf. InnoForESt Deliverable 5.2, Schleyer et al. 2019; see Appendix I). While the main focus lies on stakeholders at the **local and regional** level, the tool can also be used to identify and assess relevant **national, European or even 'global'** stakeholders. The generic Stakeholder Analysis carried out here is one **cornerstone** of the subsequent Governance Situation Assessment (cf. section 2.5 below); it allows for **comparative** analyses of relevant characteristics and stakeholder types across Innovation Regions, and contributes to the development of a corresponding Stakeholder Analysis **cutting across the entire project**.

*How to use it?*

- In practice, this tool suggests, first, a broad and rather comprehensive list of stakeholders and stakeholder types potentially relevant for fostering or hampering the governance innovation (process) in an Innovation Region. This does not mean that all stakeholder types are likely to be relevant in each and every Innovation Region and thus would need to be analysed in depth. Rather, it can be seen as some kind of 'checklist' Innovation Teams can use to decide which stakeholder (groups) might be relevant and thus would need to be considered in the Stakeholder Analysis in their Innovation Region. At the same time, this list can be complemented by stakeholders not yet featured in the list, but with high relevance for the respective governance innovation.
- Second, the tool provides an extensive overview of analytic categories to be covered by the empirical analysis, i.e. the potentially relevant stakeholder characteristics. Again, this is meant to be an initial starting point for, for example, designing semi-structured interview guidelines. It can—and should—be complemented with questions about additional characteristics considered particularly relevant for the governance innovation (process) under scrutiny.
- Third, a diverse set of empirical approaches is suggested, from which Innovation Teams can choose when planning the Stakeholder Analysis. Which approach to choose certainly depends, among others, on the already existing knowledge of stakeholder constellations and stakeholder interests and characteristics, the resources available to carry out such a Stakeholder Analysis, and the number and types of stakeholders to be covered.
- Forth, the visualization of stakeholder mappings (e.g., in Venn diagrams) as well as the presentation as posters at physical meetings of the Innovation Teams may facilitate the comparison of and reflection on the different stakeholder networks in the Innovation Regions and thus stimulate discussions between the Innovation Teams.

*Limitations for use*

- Although the tool neither prescribes a concrete number of stakeholders to be analysed, nor the level of detail on which to explore stakeholder characteristics, nor the empirical approach for collecting the stakeholder-relevant information, the sheer **range of potential stakeholders and their characteristics** potentially worthwhile to investigate may be perceived as overwhelming by the Innovation Teams.

- **Time and other resources** may be critical and/or limited on part of the Innovation Teams, or the team members tasked to carry out the Stakeholder Analysis. First-hand experiences with some of the empirical methods suggested may be limited. Here, a careful, yet thorough assessment of the knowledge gaps with respect to stakeholders and their characteristics and their relevance for the governance innovation under scrutiny is needed to enable the Innovation Team to choose the appropriate range and level of their empirical approach.
- **Synergies** with the concrete way of carrying out the Governance Situation Assessment that builds upon the Stakeholder Analysis will need to be explored.
- Even a carefully and properly conducted Stakeholder Analysis will only be able to capture the status quo. With the governance innovation (process) progressing, stakeholder constellations may **change**, as may the vested, specific interests of stakeholders involved in the governance innovation (process). Thus, procedures would need to be defined for updating and/or expanding the Stakeholder Analysis to account for the changes in context or focus of the respective governance innovation (process).

### *2.4.1 Main purpose of Stakeholder Analysis*

The project aims for an integrated approach to knowledge generation, stakeholder interaction, and triggering governance innovation. For such a purpose, it is crucial to identify and map a diversity of stakeholder characteristics, including their interests, visions, and concerns (e.g., civil society perceptions, user demands, facilitators' suggestions etc.) both regarding forest ecosystem services and in general. The Stakeholder Analysis is not carried out by an external party, but by the local innovators, i.e., the Innovation Teams, themselves, as they already have a feeling for potential conflicts and sensitivities in the area. Findings from the Stakeholder Analysis can feed into a typology for understanding the bigger picture and comparing the Innovation Regions and the respective governance innovations (cf. InnoForESt Deliverable 5.2, Schleyer et al. 2018). As a second aim, a deeper understanding of the stakeholder constellations in an Innovation Region enables a confident and cognisant facilitation of the co-production process of the innovation.

### *2.4.2 Typology and analysis of Forest Ecosystem Services stakeholders*

In practice, Innovation Teams are chiefly **responsible** for the empirical work. To allow for the comparison of stakeholder constellations across Innovation Regions, the categories of the stakeholder analysis have to be harmonised somewhat (i.e. targeted stakeholder types, analytical categories for stakeholder characteristics, and appropriate empirical methods). While harmonisation for the purpose of comparison is necessary, one needs to make sure that the special characteristics and peculiarities of the Innovation Regions are still visible and reflected in the findings. This will lead to the development of a cross-cutting stakeholder typology.

Note that the results of the individual Stakeholder Analyses are crucial ingredients for the innovation processes: Innovation Teams need them to plan the innovation co-production activities.

The Innovation Teams probably have some level of knowledge about the relevant stakeholders already. Whatever actual or perceived knowledge gaps exist on part of the Innovation Teams influences the data gathering method as well as the categories used to analyse those data. In addition, which stakeholders to interview or to enquire about as part of the Stakeholder Analysis depends on the required knowledge and expertise.

The following contains a suggested list (a) stakeholder types to be considered; (b) analytic categories of stakeholder characteristics; and (c) a range of possible empirical tools and methods to be employed:

a) **Stakeholder types** that might be considered in the Stakeholder Analysis include (not restricted to; might be partly overlapping):
   - Forest owners (public, private, collective)
   - Land owners (outside forests) (public, private, collective)
   - Forest managers/farm managers (might overlap with owners, but not necessarily so)
   - Protected Areas organisations (National Parks, biosphere reserves, etc.)
   - Public administration (national, regional, local)
   - Civil society actors (NGOs, forestry organisations, environmental, nature conservation, tourism, hunting, leisure, sport, other interest groups)
   - Municipalities (local community, villages)
   - Forestry industry (including sawmills and other major wood-processing, wood traders)
   - Small or Medium Enterprises (SME) (e.g., (wood) craftsmen, carpenters, (wood)-designers, tree-nurseries)
   - Networks for forestry or wood processing, federations of forest-/wood-related
   - companies
   - Consumers, including various types of tourists (day tourists, overnight tourists, hunters, youth organisations, 'everybody', locals)
   - Scientific/Research organisations (universities, research institutes)
   - Educational stakeholders (kindergartens, schools, universities)
   - Tourism industry/enterprises
   - Locals (using forests through collecting wood, fruits, mushrooms; for leisure and recreation; traditional use; religious use)
   - Financial enterprises (e.g., banks, funding agencies; business support funds).

There are many ways to **categorise** and 'sort' **stakeholders**. For example, they may have different actual or potential roles with respect to the governance innovation (process) under scrutiny, being, for example, funders, implementers, or mediators/intermediaries. They may come from different societal spheres, such as public or state, private sector, and civil society; or they might be (actual or potential) beneficiaries of, or (negatively) affected by the governance innovation under scrutiny. Further, they might be situated and active at various spatial and administrative scales, such as local, regional, national, or perhaps even international; and some might even be active at several scales at the same time. Furthermore, they might be enablers of the governance innovation, or slow down and oppose the innovation (process). Finally, the different stakeholder groups might also hold different levels of power (resources) to influence the governance innovation and affect the innovation process.

Indeed, the first step of the Stakeholder Analysis is to **identify** those actors that are actually or potentially involved in or affected by the governance innovation in the respective Innovation Region and at what levels and different realms they operate.

b) Some **categories of stakeholder characteristics** may refer to individual stakeholders, others more to the organisation, administration, or interest group they represent; sometimes both will be relevant, and perhaps distinct. Some of the characteristics might be directly related to the governance innovation, others might be more or less independent. If possible and appropriate for the individual Innovation Region, the analysis should shed light on the following characteristics for each type of stakeholder identified as relevant:

- Interests and motivations with respect to forest ecosystem services, forest governance, and the governance innovation (process)
- Actual or potential role and influence within his/her organisation, within forest governance and, if applicable, the governance innovation (process)
- Knowledge, competencies, educational background
- Power and other resources (including positional power, coercion, financial); control over resources
- How and to what degree affected by forest governance or the governance innovation (positively or negatively; politically, scientifically, financially)
- Forms and means of communication employed between relevant stakeholders
- Visions with respect to management and use of forest ecosystem services, forest governance, and the governance innovation (process)
- Concerns with respect to management and use of forest ecosystem services, forest governance, and the governance innovation (process)
- Differentiated rights to access and use forests and forest resources.

c) There is a wide range of **empirical tools and methods** that can be used to identify, describe, and assess stakeholder interests, visions, and concerns. Empirical approaches for Stakeholder Analysis include identifying and analysing written sources, such as relevant published research, legal documents, planning materials, policy documents, etc. Considered as particularly fruitful are:
   a. interviews: these can be exploratory, open, semi-structured; with all or a selection of relevant stakeholders; face-to-face or by telephone;
   b. group interactions: focus group discussions, other kinds of workshops, meetings with practice partners,
   c. surveys, and
   d. *Stakeholder Network Analysis*: such a comprehensive method could be used in a complementary way if time and resources allow.

These approaches may be employed separately or in combination. Which empirical method(s) to choose, depends on several factors. These factors include: the time and personnel available for the analysis; the intended degree of detail and comprehensiveness of the results; the availability and quality of relevant previous stakeholder analyses; and the complexity of the stakeholder context.

### *2.4.3 Time scheduling for the Stakeholder Analysis in project context*

*Table 2.2: Time scheduling help for the Stakeholder Analysis*

| **What** | **Who** | **Deadline** |
|---|---|---|
| Draft heuristic for each Innovation Team (stakeholder types and categories, analytical framework for stakeholder characteristics, and empirical methods suitable) | | |
| Discussion, revision of heuristic | | |
| Pre-final heuristics for Innovation Teams;<br>Example: Fact sheet on Austrian case study (Eisenwurzen)<br>(Appendix III) | | |
| Case-specific implementation plans, i.e., translation of heuristic in Innovation Region-specific plans for Stakeholder Analysis (iterative process) | | |
| Carrying out Stakeholder Analysis at Innovation Region level<br>• Stakeholder descriptions<br>• Sorting | | |
| Compiling the results of Stakeholder Analysis at Innovation Region level—draft Innovation Region report | | |
| Discussion, and perhaps revision of Stakeholder Analysis at Innovation Region level | | |
| Cross-Innovation Region comparison, typology, integration of biophysical and institutional mapping results (Stakeholder Analysis national and EU levels)—draft report | | |

## 2.5 Utensil 5: Governance Situation Assessment

*What is this?*

- **Mapping**: This tool shall give **early orientation** for carrying out the analysis of the governance situations, into which forest ecosystem services innovations may be placed.
- **Process, situation, and change in focus**: It combines a *situational view* on the constellation of stakeholders currently involved and their relations with the *dynamic perspective* of the prior, current, and future (planned, imagined, expected) developments.
- This heuristic **builds** upon the generic Stakeholder Analysis (cf. section 2.4 above), while now also **emphasising the politics** regarding what innovation shall be pursued and which role might be played by whom.
- It conceptually **anticipates** the SETFIS framework (cf. section 2.3 above), which is better usable at a later stage in the innovation trajectory when more knowledge has been gathered and the nature of the innovation has become clearer, thus has the role of a 'SETFIS light' or SETFIS starter-kit (cf. InnoForESt Deliverable 3.1, Sorge & Mann 2019).

*How to use it?*

- Analysts should use this "heuristic" as a guideline to include all crucial dimensions of the starting situation. It is a lens for **discovering** the situation, not a ready-made explanation of what the case is.
- Answer the questions under topics 1-5 to assess the situation in direct view of **preparing** activities and meetings in the Innovation Region with the stakeholders. It helps to **sketch the conditions** under which any option for pursuing an innovation needs to be seen.
- Use the answers and your knowledge of the situation to develop or elaborate the scenarios **for the CINA workshops** (cf. sections 3.4 and 4.1). It anchors the CINA **scenarios** in the (political, business) reality (cf. InnoForESt Deliverable 4.2, Aukes et al. 2020a).

*Limitations for use*

- Since the Governance Situation Assessment heuristic implies concepts which are not necessarily common knowledge, it requires the **assistance of experienced facilitators** (in this project through WP5) in a number of intensive meetings with each Innovation Team. It is also useful to hold a short workshop, during which the approach is elucidated.
- The **first version** of the findings may **require extensive commenting** by the facilitators and some collaboration in order to achieve the right density of analysis. Templates will be developed for future use.
- Users may find the approach **time consuming** or too **detailed**. However, the **usefulness** of having this overview at hand may become visible only during the scenario writing, the discussion of the scenarios during the first CINA workshop, or even during the analysis of the workshop results.

Further suggestions about how to use this heuristic are explained in detail below (see Appendix II for the original fact sheet as used in the project).

### *2.5.1 Assessing the governance situation: topics*

The following list is a set of guiding questions that should assist you to get a more comprehensive idea about the situation that characterises the innovation you are trying to tackle and foster in your Innovation Region.

We often look at complex relationships between actors, innovation ideas, institutional and economic conditions. Innovation is an ongoing process that does not lead to results at the push of a button. Governance can best do justice to this if the variability is taken into account by improving and developing unsuitable specifications (Kuhlmann et al. 2019).

**Purpose of Governance Situation Assessment**
Before you start promoting your innovation, analyse the governance situation.

This has 2 purposes:

1. You get an overview of the socio-political context.

   *You want to start up and nourish your niche innovation successfully. This depends on your deep knowledge of the socio-political context of your planned innovation.*

2. You do the groundwork for a 'Constructive Innovation Assessment'

   *You need thorough knowledge of the stakeholders in the socio-technical system for a fruitful Constructive Innovation Assessment. With that knowledge, you can explore new avenues for technological development.*

Topics 1 and 2 are the link to the Stakeholder Analysis (section 2.4). We are speaking of the 'forest ecosystem governance innovation', in brief: "the innovation". We are speaking of 'actors' in general, because it may be worth looking beyond the stakeholders already identified. It might be enough to describe the situation on one page per topic. Use more pages and be more detailed if convenient.

### *Topic 1: Actors*

In the Stakeholder Analysis, the actors are mapped as such; here, the focus is on their roles and interests in the governance and policy-making process; so, what's the actors' political agenda in the broadest sense, etc.

- Which actors are currently involved in the innovation? (Just fill in a table, please; in order to avoid redundancy, you can refer to the Stakeholder Analysis for more detail)
- How do they perceive the innovation?
- How do they perceive other actors and the interactions with them?
- Are there actors who are purposely or unintentionally excluded from involvement in the innovation? If so, why?

### *Topic 2: Actor interactions*

Emphasis here is on how actors play together and against each other; crucial to know regarding the political atmosphere.

- What is the general character of the interactions among actors? Are there long-standing business or policy relations or rather recent ones; are there (a) permanent, (b) temporary, (c) formal, (d) informal occasions or combinations of these, on which actors meet and interact? Which are they?
- Are relationships cooperative or competitive, asymmetrical or symmetrical (i.e., referring to aspects of power)? Are there relationships or interactions which are rather conflictual among specific actors; are there tensions, also very informal ones or on a personal level; if yes, which and among whom?
- Which issues do actors mainly discuss when they interact? What's at the core when they talk to each other?

- Are there actor alliances that pursue or at least support the innovation—or such that work against it? Specify!
- Are there specific actor relationships which are more and which are less fruitful than others? Specify!
- How do actors deal with disagreements and conflict situations? Please give examples!

### *TOPIC 3: HISTORY OF THE INNOVATION*

You could use a timeline here, e.g., in the form of a table listing the main features of the process line-by-line.

- What is the innovation's history: (a) main phases, (b) main events, (c) previous efforts, (d) drawbacks, (e) founding narrative or 'myth'? Could you also characterise the process of change and innovation?
- Who initiated the innovation? How? Why, for which purposes and reasons? What was the first impulse for the innovation?
- How did the innovation come to be accepted as such by the involved actors?
- What were the main barriers and how (far) was it possible to overcome them?
- How has the actor constellation changed over time?
- How have changes in the social context of the innovation changed its course or made adaptation of the innovation necessary?
- How has non-forest ecosystem services governance changed? Has this made adaptation of the innovation necessary?
- Is the innovation based on any similar governance pattern somewhere else? Has it been derived up from a totally different context?
- Which are the main (and the secondary) physical and ecological conditions under which forest ecosystem services governance developed in the past in your case?

### *TOPIC 4: CURRENT SITUATION OF THE INNOVATION*

- Which activities currently constitute the innovation process?
- Which policy instruments are currently used (or associated with) the innovation?
- What is currently perceived as key problems now to take care of regarding the innovation in the Innovation Region (by the stakeholders)?
- In terms of some imaginary project life cycle, at what point has the innovation now arrived for the key actors? Same for all?
- Has the innovation so far produced any unintended side effects?
- Are there any parallel developments that are (more or less) competing with this innovation?
- How is the innovation perceived in its direct and indirect social environment: (a) overall public image/perception, (b) support, (c) critique?
- Which are the main (and the secondary) physical and ecological conditions under which forest ecosystem services governance currently functions (more or less well)?

### *TOPIC 5: EXPECTED DEVELOPMENTS FOR THE INNOVATION*

This could be core to the workshop scenario alternatives!

- Is the journey of the innovation presently seen rather open-ended or closed—according (a) to the main stakeholders' views and (b) to your view as observers?

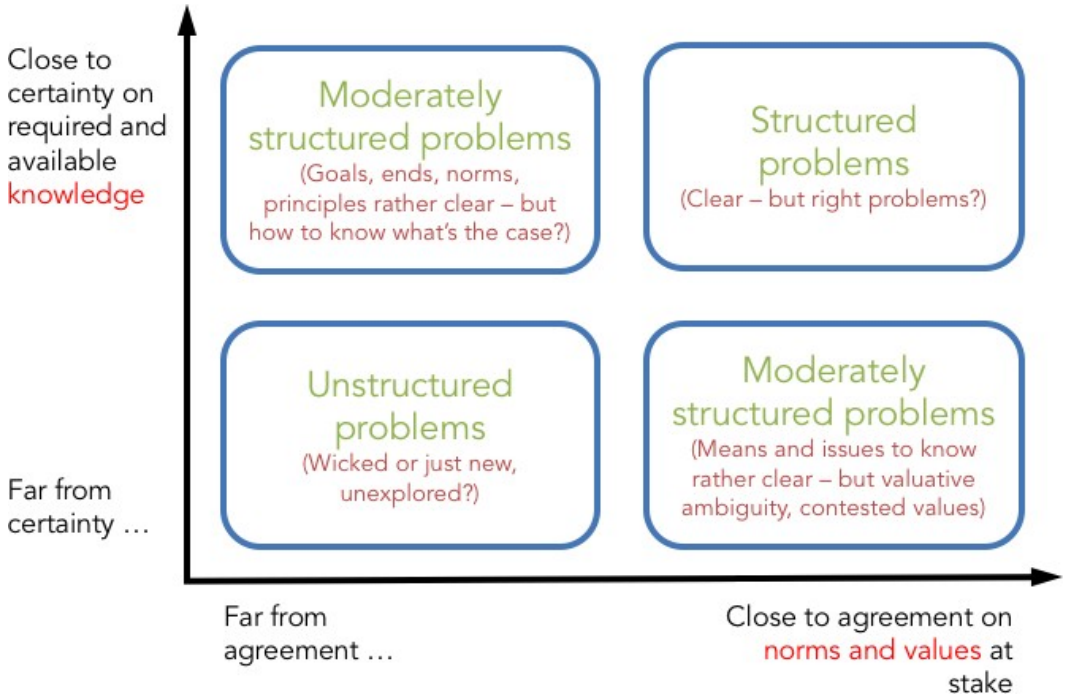
- Do you expect moments at which large choices have to be made which may (radically) influence the direction the project takes? If so, how would one know?
- Which problems with the innovation are perceived and which solutions are currently discussed (and which ones not?)
- Is the innovation part of or connected to a more general development in the broader landscape (trends, events, external pressures, etc.)?
- Which are the trends and directions towards which the main (and the secondary) physical and ecological conditions under which forest ecosystem services governance function?

### *2.5.2 Assessing the governance situation: the key problem structure*

This part aims at identifying the **problem structure** of the case: the main struggles and agreements. If you know these, you basically address them strategically.

**Look back into part 2.5.1 and collect the current *key problem issues*** in the advancement of the innovation in your case studies. „[*P*]*eople's involvement is mediated by problems that affect them*" (Marres 2007: 759). They mobilise such problem issues and are mobilised through them when dealing with public affairs. ***Key problem issues*** are those aspects of the innovation or its context that are perceived and eventually communicated in the Innovation Region as to be taken care of. These problem issues likely refer to a set of obstructions that need to be tackled in order to advance the innovation. They may actually characterise the crucial dimensions of the innovation.

*Figure 2.2: The level of structuredness of problems on the axes of norms/values and knowledge*




1. In a first step, identify and summarise these issues:
   - Make a list of all problem issues associated with the innovation (political, business, physical, cultural, technological, actors, etc., whatever you think characterises the state of affairs for the innovation for those involved), as found in section 2.5.1.
   - Decide which are the most important ones (a) from local innovators' viewpoints and (b) from an observer's point of view.

2. In a second step, describe each problem issue in terms of the ease or difficulty with which it can be handled.
   - We suggest allocating the problem issues into four (one more or less) different categories.
   - Please describe your problems in terms of their structure (see Figure 2.2; cf. Hoppe 2010).

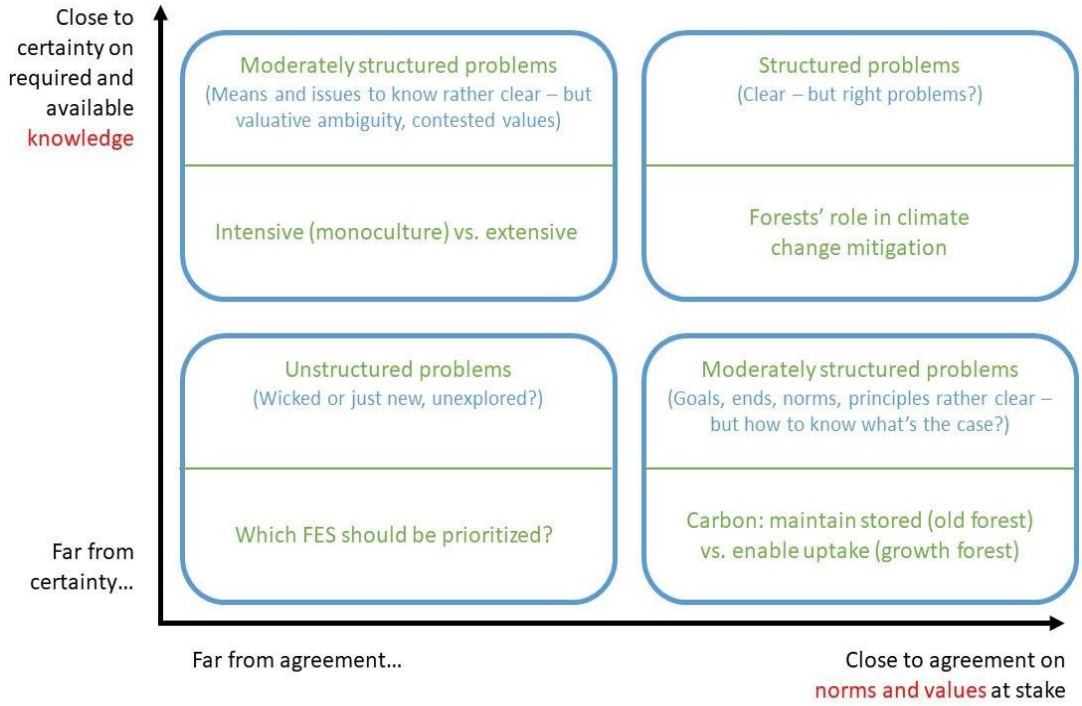
Please, describe in your words how it makes sense to categorise each of the crucial issues in such a way (you can be as brief as you think it sufficient to understand also for case outsiders).

### *2.5.3 Problem categories*

This section is supposed to elucidate how the figure on key problem issues works. The figure is based on what has been called the "governance of problems" and attempts to categorise types of problems depending on two dimensions:

A. How much is known about the problem?
B. How much do involved actors agree on the norms and values related to the problem?

*Figure 2.3: Exemplary application in terms of the structuredness of problems to forest ecosystem services issues*




To make this a little bit more concrete, we provide a similar figure including examples related to forest ecosystem services (Figure 2.3). These are just some examples. Based on your deeper knowledge and understanding of forest ecosystem services problematics you may as well categorise the examples differently. However, we hope, the figure can serve as a first hunch for how to describe "all issues associated with the innovation (political, business, physical, cultural, technological, etc., whatever you think characterises the state of affairs for the innovation)" in terms of their problem structure.

### *2.5.4 Time scheduling for Governance Situation Assessment in project context*

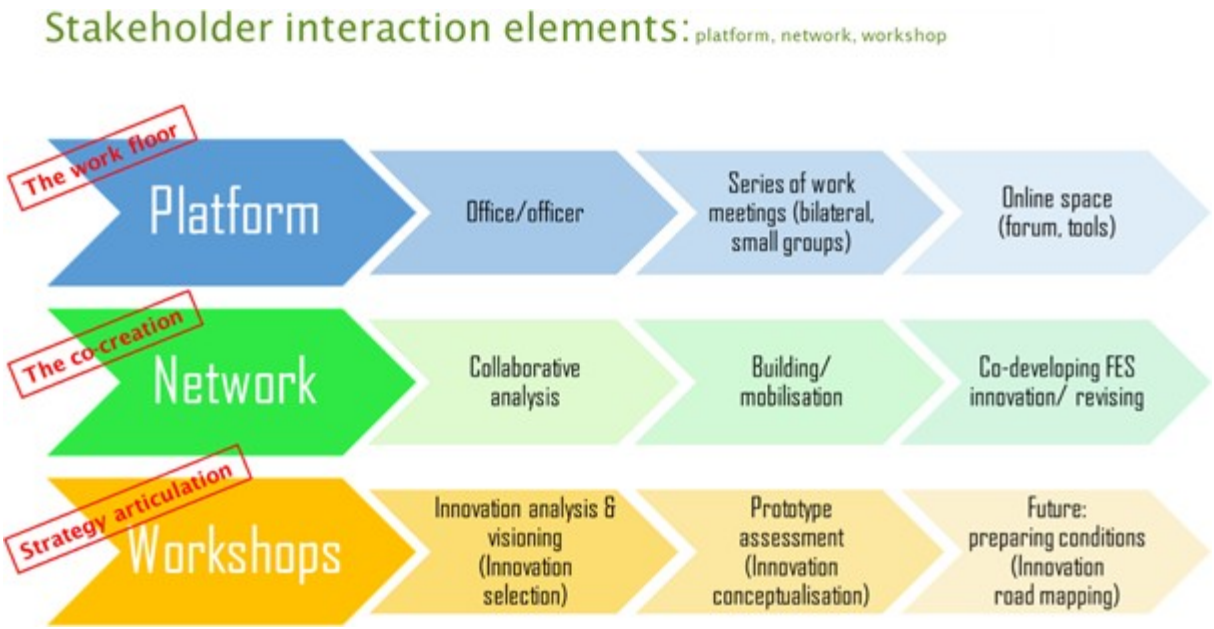
*Table 2.3: Time scheduling help for Governance Situation Assessment*

| **What** | **Who** | **Deadline** |
|---|---|---|
| Heuristic for case study partners | | |
| Discussion, revision of heuristic | | |
| Governance Situation Analysis on Innovation Region level<br>• Governance situation descriptions<br>• Sorting of opportunity structures, policy instruments, patterns of legitimation, problem structures<br>Draft reports (in order to be able to link this with the Stakeholder Analysis) | | |
| Governance Situation Analysis on Innovation Region level Final drafts (in order to be able to use this for preparing the strategic workshops) | | |
| Discussion, (if necessary) revision of Governance Situation Assessment | | |
| Final reports | | |
| Cross-Innovation Region comparison, typology, integration of biophysical and institutional mapping results (Stakeholder Analysis national/EU levels)<br>Navigator (Interim version) | | |

## 2.6 Utensil 6: Idealised Innovation Process

The Idealised Innovation Process is the overarching concept pulling together InnoForESt's multi-stakeholder, scenario-based **innovation process**, which allowed us to analyse, develop and foster forest ecosystem services governance innovations for sustainable forest/natural resources management and ecosystem service provision (see Figure 2.4). You will find the detailed description of each Idealised Innovation Process element in dedicated sections below.

*Figure 2.4: Overview of InnoForESt's idealized innovation process including sub-processes*




*What is this?*

Activities that helped analysing, developing and fostering innovations for sustainable futures consist of three sub-processes that were **closely linked to each other** (Figure 2.4):

1. Establishment of Innovation **Platforms**: through these platforms, InnoForESt offered meeting places for communication, knowledge exchange and common activities, such as seminars or workshops (see section 3.1 for more detail).
2. Innovation **Network** activities: involving partners in the region that help foster innovation and carry the innovation forward through the negotiation of aims and processes, collaboration and exchange (see section 3.2 for more detail).
3. CINA **Workshops**: Networks became involved in a series of workshop activities in the Innovation Regions. Case-specific scenario narratives were the main input. The workshop series consisted of three core types that are an integral part of innovation action: Innovation analysis and visioning, Prototype assessment, Preparing future conditions (see sections 3.3, 3.4 and 4.1).

*How to use it?*

The establishment of platforms was the essential structure required for the process facilitation. This requires a functioning work and meeting space and sufficient devoted time by the process manager. Once this was set-up, stakeholder engagement and networking activities started to form a group of committed partners for further advancing the innovation ideas and preparing them for the structured CINA process. Here, it was important that all these three CINA workshop types (Innovation analysis & visioning, Prototype assessment, and preparing future conditions) occurred **in each application context**. However, the implementation very much depended on the context, so decisions about which types to emphasise when had to be taken by the local innovators themselves. This implied that combinations of these types in one or more workshops were possible, as well as further innovation activities, workshops, etc.:

- **Adaptation** is crucial. Each application context differs in terms of innovation type, context conditions and innovation development stage.
- It is of crucial importance to adapt the idealized innovation process to the specific **context and needs** of the case study, when applying the three core elements of platform, network and workshops.
- It is important that **stakeholder interests** are closely incorporated in the innovation process, providing as much room and freedom for own ideas as possible.
- Keep the availability of **support products** in mind and make sure the core elements of workshop content are part of the process. This is important to allow for interaction and exchange.

*Limitations for use*

- It requires **resources** to set up and run innovation platforms, foster network establishment, management and workshop conduct.
- It also requires **trained personnel** (InnoForESt training material available on www.innoforest.eu).
- And it requires **dedicated participants**. The more the innovation activity is in line with stakeholder interests, visions and demands, the more involved over time they can be.

## 2.7 Utensil 7: Innovation Journey reconstruction and use

In research on corporate innovations, the concept of an 'innovation journey' had been developed to **make innovation more tangible**: to view an innovation not solely as a product, but as a process. While forest ecosystem services governance develops and uses policy instruments and struggles with their revision, reinvention or replacement under often changing circumstances, our particular focus on the innovation journeys is a novelty. We suggest an elaborated innovation journey concept tailored to the field of forest ecosystem services governance (cf. InnoForEst Deliverable 4.3, Loft et al 2020).

With an approach that emphasises the co-evolutionary character of the process and its context we aimed to avoid a common misunderstanding, i.e., that innovation processes are a matter of control, steering and management (cf. Van de Ven 2017)—the "*command and control approach*", as Rip (2010) puts it. Rather, when taking a closer look at the contingencies during innovation, retrospective attributions of success to certain approaches or persons often prove to be misleading. Thus, we suggest to imagine innovation as a journey into uncharted waters (Van de Ven et al. 1999: 212). In order to achieve anything, managers and policymakers "*are to go with the flow—although we can learn to manoeuvre the innovation journey, we cannot control it*" (Van de Ven et al. 1999: 213). For this reason, we developed an empirically grounded and theoretically informed conception of the innovation journey that "*captures the messy and complex progressions*" while travelling (Van de Ven et al. 1999: 212-213). This allowed us to describe the uncertain open-ended process by **reconstructing** precisely the open ends and uncertainties, the more or less organised social actions and negotiations, and to identify patterns and typical key components. At the end of the day, apart from its scientific contribution, this kind of information may be exactly what policy-makers and practitioners need when navigating along uncharted rivers in their own efforts to pursue a governance innovation. Figure 2.5 gives an example of an outcome of this kind of analysis.

*What is this?*

- **Innovation Journey:** a conceptual approach from innovation studies that regards an innovation not solely as a product, but as a process.
- The **reconstruction** of an Innovation Journeys is the description and analysis of the development of innovation processes along a set of event categories.
- This analysis focuses on the **niche innovation** but also considers its socio-technical context by taking into account the socially enacted interactions between the *niches*, established *regimes* as well as other socio-cultural, economic and political *landscape* developments and trends, against the background of which the more specific dynamics of particular regimes and niches evolve.
- Applied **in InnoForESt** it provided the grounds for a comparable analysis of the innovation developments within our Innovation Regions.

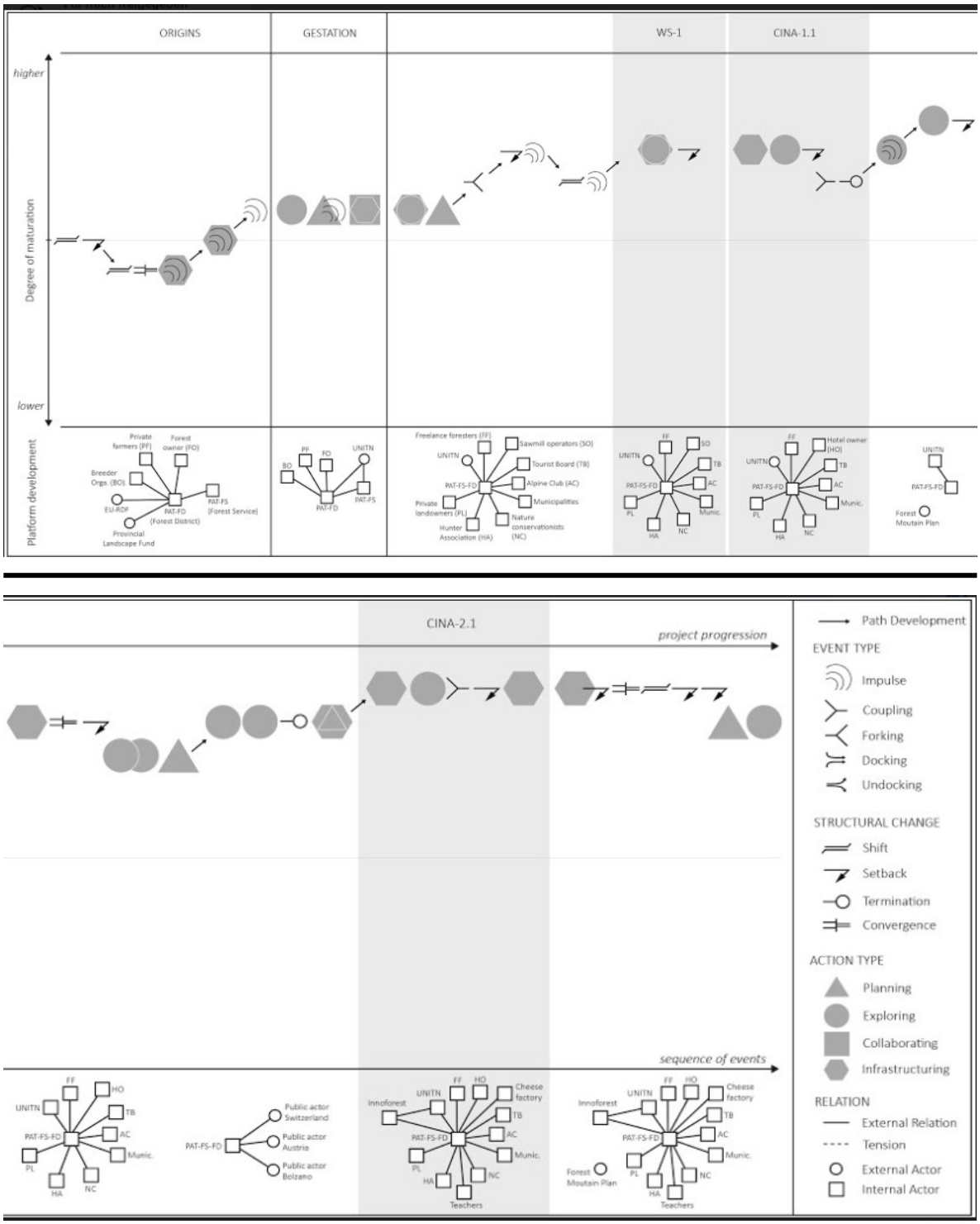
*How to use it?*

- Analysts should apply the adapted concept as a **guideline** to include all crucial events in the innovation development process.
- It provides an understanding of the **innovation process**. In particular, it helps to analyse and reflect on reasons for certain turns in the development process.

*Limitations for use*

- The Innovation Journey concept is not necessarily common knowledge, and thus requires the **assistance of experienced facilitators**.
- It requires a **detailed empirical basis**, i.e., well documented innovation process and access to involved stakeholders.
- The analysis of this material is **time consuming**, thus resources in terms of working time are a major limitation

*Figure 2.5: Example of a visualization of a reconstructed Innovation Journey (read top left to right, then bottom left to right)*



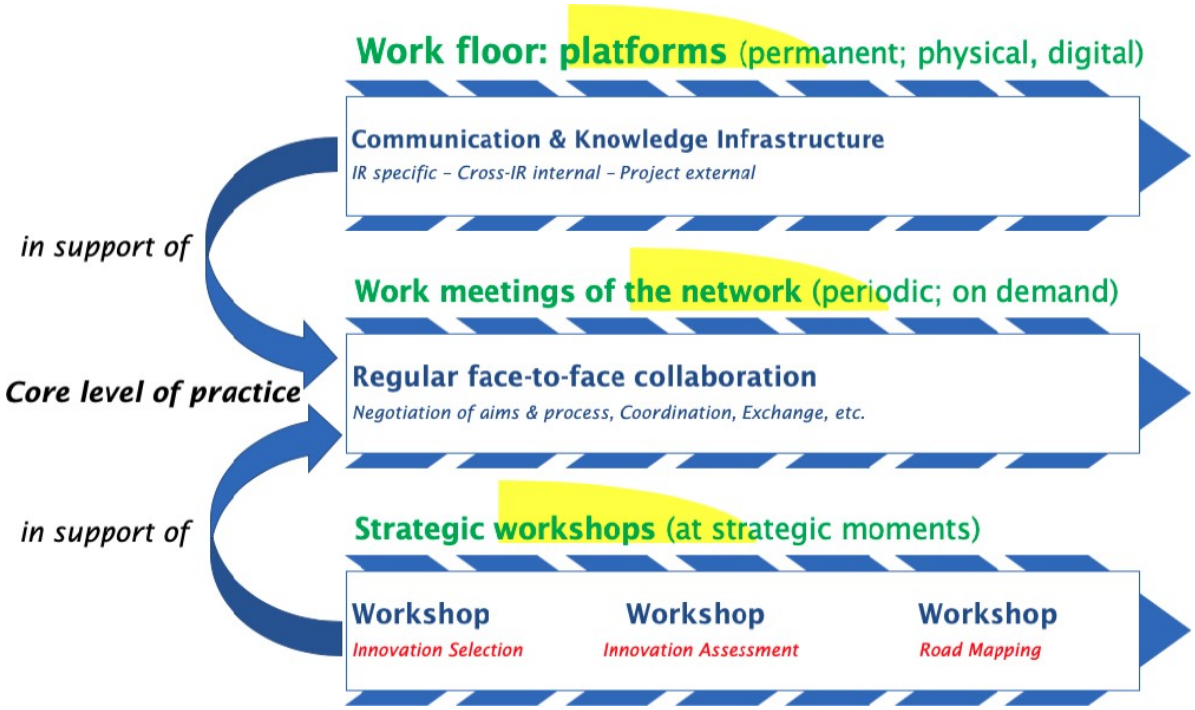
# 3 Stakeholders interaction approach: a set of modes of involvement

In this section, we describe the **overall stakeholder interaction strategy** for this project, as well as the key platform interaction strategies, such as:

- General engagement strategy with and among stakeholders;
- The empirical foundation of all interaction efforts;
- The CINA strategy articulation workshops;
- The prototype development and dissemination;
- The Responsibility Navigator[6] is introduced as a framework for coordinating and collaborating in this project and its innovation platforms.

The principal objective of InnoForESt was to **foster innovations on the ground**. This objective is mirrored in the strong cooperation with the local innovators from the Innovation Regions. Such an approach presupposes close engagement with existing groups of actors but also entails the active support of existing or new networks and platforms in later stages of the innovation process. Given the **strong actor orientation of the project**, ways of finding and mobilising stakeholders were emphasised. Finding and contacting them was relevant throughout the innovation process, in order to scope opportunities, but most important, when the innovation was rather new. Mobilising stakeholders can be an issue throughout the innovation process, too, as the Innovation Teams may need additional support to spark the interest of those stakeholders relevant for the innovation. On an operational level, this process entails a **continual dialogue** between science and local innovators, including bilateral talks about methodological issues, assistance with analyses, training, etc.

*Figure 3.1: The three types of processes in support of stakeholder interaction*




[6] This is not the InnoForESt Navigator for Forest Ecosystem Service Governance Innovation, but one specifically addressing stakeholder or multi-actor involvement. However, the InnoForESt Navigator was named after the Responsibility Navigator.

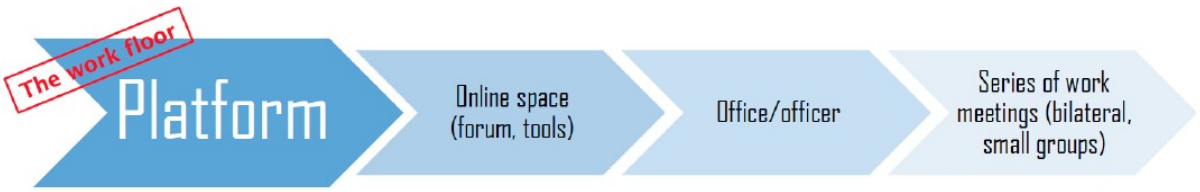
Stakeholder interaction happens according to an idealized innovation process with **three sub-processes** (see Figure 3.1 and Section 2.6). First, stakeholders **meet** under the label of the innovation platforms to communicate, exchange knowledge, and carry out common activities. Second, networking activities are used to **involve** potential additional partners in the region. In this way, the aims, processes, collaborations, and exchanges can be fostered. Third, the Innovation Teams organize a series of **workshops** with very specific targets of strategy articulation and innovation assessment. All three types of processes are closely linked and help the Innovation Teams to analyse, develop and foster their forest ecosystem services governance innovation. Figure 3.1 shows how all three types of processes build upon each other and how they are intended to support the core level of the innovation—a lively stakeholder network working towards more sustainable provision of forest ecosystem services. In order to make the platforms usable for the users, a service facing the users is required. This recognizes the needs and thought patterns of the users and helps them to use the platform accordingly (cf. Stegmaier et al. 2020).

## 3.1 First mode of involvement: Provision of a physical & digital platform

The InnoForESt approach provides a **meeting platform** in the real and the virtual world that represents the work floor of the innovation (Figure 3.2). In both cases, the platforms offer spaces to meet, exchange, and work together in meetings, seminars, and workshops. First, the infrastructure at the Innovation Region constitutes the physical part of the InnoForESt platform. This does not only include a stakeholder interaction facilitator with an office space to work and meet with stakeholders, but also all formal and informal meetings. The local stakeholder interaction officer organizes and manages the network and workshop activities taking place in the respective Innovation Region. Second, the InnoForESt website (www.innoforest.eu) essentially represents the digital platform. The website's protected section is exclusively accessible for project partners and allows for different types of knowledge exchange, for example, through fact sheets, blogs, etc. Connections to other platforms were possible. It functioned as a knowledge hub for storing and sharing information on methods, experiences and products for assisting/supporting innovation development.

Additionally, within the **digital platform**, each Innovation Region has its own protected online space adapted to local needs. These local digital platforms aim to support the facilitation of communication, the exchange of information, and to provide updated details on workshops outcomes, as well as latest news in the local languages (see, e.g., https://eisenwurzen.innoforest.eu/).

*Figure 3.2: The digital and physical meeting platforms*



## 3.2 Second mode of involvement: Innovation network

In order to successfully realize an innovation in practice, there has to be **a network of stakeholders** that carries the innovation forward. From the InnoForESt perspective, the innovation network consisted of all local and regional stakeholders familiar with, or interested in becoming involved in, the innovation action. Being a member of this network enabled stakeholders to participate in activities dealing with the innovation. They learned about it, debated its potentials and risks, and, in turn, gradually but surely co-developed it. In an ideal situation, the innovation network includes decision makers from forest practice and administration as well as otherwise interested actors from public administration, civil society, nature conservation, agriculture, tourism, or business.

The analysis of the Innovation Regions' Innovation Journeys has shown that in most stakeholder networks facilitated and coordinated by the Innovation Region Teams, both the **core composition of the networks** already existed prior to the start of the InnoForESt project and the stakeholders' interests were known to the coordinating local innovator. Thus, the challenge was rather to **motivate** the existing stakeholder networks to actively engage in developing a new innovation or adapting an existing one. In some innovations, such as the Habitat Bank of Finland or the Primiero forest-pasture management, emerging signs of 'stakeholder fatigue' complicated this process.

Stakeholder networks and platforms were central elements of the innovation development work in our cases. Yet, we observed **different intensities** of facilitating stakeholder engagement (cf. InnoForESt Deliverable 4.3, Loft et al. 2020).

- In the **Eisenwurzen** case, for example, practice partner Studia invested a lot of time in addressing potential stakeholders by series of phone calls, based on existing contacts in the region. In addition, the extensive interviews in the context of the stakeholder analysis in the first year of the project, helped to identify some stakeholders that had not been involved in related network activities in the region so far, and managed to encourage them to engage in the innovation development work. Figure 3.4, showing the InnoForESt Innovation Region Eisenwurzen, depicts the expansion and decline of the innovation network with a relatively stable hub of the project and project partners at the centre.
- In the Love the Forest case in **Gothenburg**, the platform work focused much on keeping the existing network interested in the innovation development by ensuring well-prepared and organized meetings and workshops.
- In the cases of **Primiero** and Forest Shares in **Mecklenburg Western-Pomerania** we observed that, after the first initializing phase of existing stakeholder networks, the drive for network expansion stalled quickly. Similar to the Love the Forest case, it can be regarded as network maintenance work rather than an effort to further engage new actors or establish a completely new network. Figure 3.4 shows the innovation network development in the InnoForESt Innovation Region of Mecklenburg-Western Pomerania. This network illustrates the growth of a relatively steady core of initially three and eventually four actors. Here, other actors incidentally connected to the network.
- In the **Čmelák** case in the Liberec region, Czech Republic, we had a loose network to start with. In contrast to the other networks the local stakeholders and the local innovator had a history of mutual interest, yet did not have an established collaborative working history. As a consequence, the network was more of a mutual expression of interest to start with. This led to an early faltering when stakeholders were busy with their daily duties. However fruiting later in the project duration and leading to further activities, but not yet reached a stable platform. Overall, in this case one could say that it was more about establishing a working relationship and networking effort rather than the maintenance of an existing network.

- Finally, budding **cross-Innovation Region** networks could be initiated that also included actors from other regions, the national level and different sectors that may become involved in networking activities over time.

*Figure 3.3: Stakeholder network development in InnoForESt Innovation Region Eisenwurzen: a dynamic network (read first row left to right, then second row left to right)*

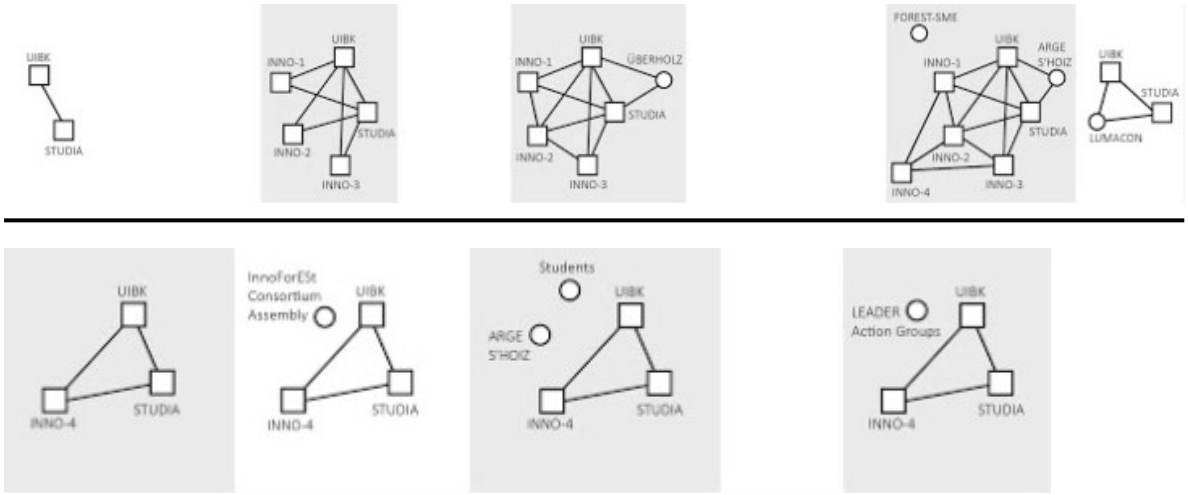
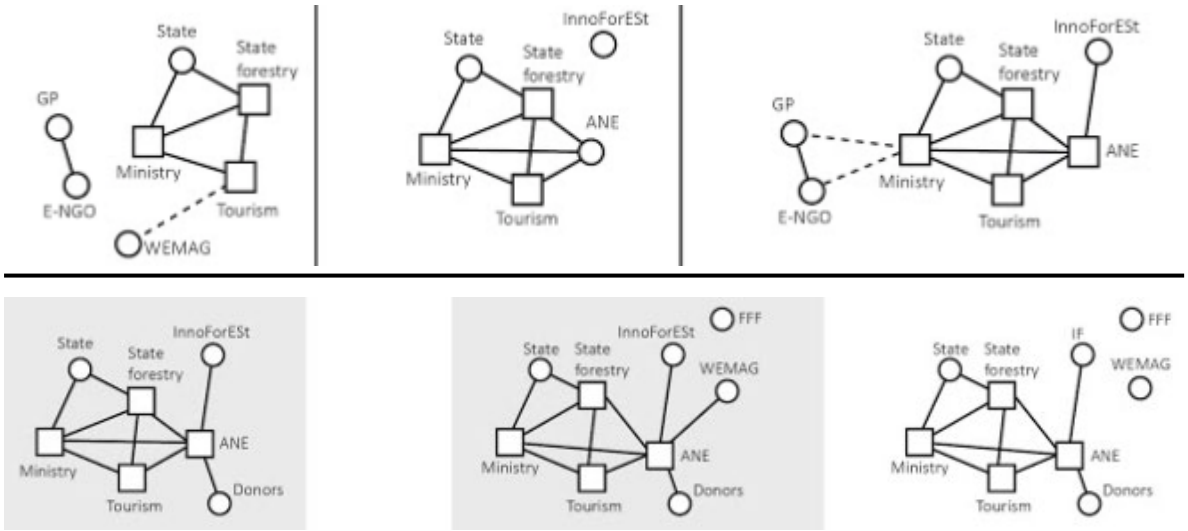



*Figure 3.4: Stakeholder network development in InnoForESt Innovation Region MVP: a stable network (read first row left to right, then second row left to right)*

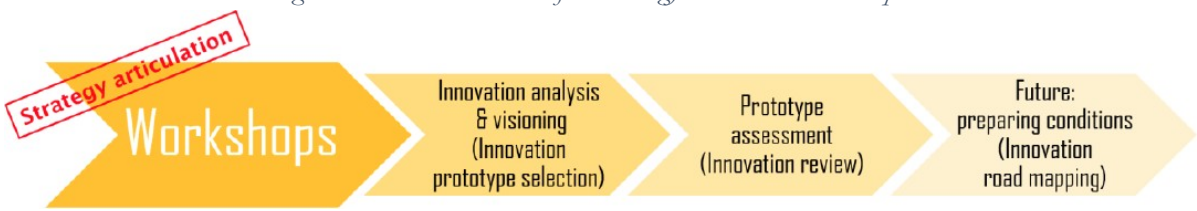


## 3.3 Third mode of involvement: Strategic workshops

Once innovation networks are initiated, the network members can be brought together in a series of strategic workshop activities. The platforms provide the organizational structure in which the workshops can take place. For a successful development of the forest ecosystem services governance innovation, **three types of strategic workshops** are implemented in each Innovation Region over the course of the project. These strategic workshops constitute the core of what the InnoForESt project calls 'Constructive Innovation Assessment'. Strategic workshops come to life and thrive when they are based on well-defined, innovation-specific scenario narratives as a main input. Scenario narratives can be seen as visions of possible futures of the innovation, which become more specific after every workshop and whose focus gradually shifts from innovation definition to road mapping.

The three types of strategic workshops constituting the workshop series are: (a) innovation analysis and visioning, (b) prototype assessment, and (c) preparing future conditions (see Figure 3.5 and Section 2.6).

*Figure 3.5: Three directions of the strategy articulation workshops*




These three types of workshops follow a logical **sequence of innovation development**, which can be entered at different levels depending on the stage of one's innovation:

- In the workshop dealing with '**innovation analysis and visioning**' an understanding is gained of what makes the innovation work, and what its actual and potential impacts and limits are. Furthermore, the activities develop a vision how the inn
- Innovation coordination can happen or improve. These discussions should all be based on insights of the development of the innovation and its key influencing factors (related to governance, institutions, economic, environmental, or practical issues). This workshop type leads to a set of concrete ideas on how the innovation should be improved and developed further, resulting in what InnoForESt calls innovation 'prototypes' (see Sections 2.1 and 4.5), i.e., the version of the innovation that the innovation network wants to proceed with.
- During the second type of strategic workshops, the **innovation prototype** chosen during the first analysis and visioning workshop is **assessed**.

  This comprises the critical debating of idealized models of the improved innovation by a large range of stakeholders from the innovation network, asking questions such as: (a) what are the chances of the innovation to succeed, (b) what are the risks of an improved innovation that is for example, augmented to a larger region, (c) what are current and potential economic, social, and ecological impacts and benefits? A special element in the prototype assessment workshop can be an experimental role board game, which will explore these questions from a different perspective.

- The last strategic workshop in the sequence discusses which **future conditions** need to be prepared. This presupposes a good idea of how the innovation should ideally look like and how it should work in future applications. Based on the discussion about the conditions that need to be prepared to make the innovation work, the stakeholders develop an innovation **roadmap** that highlights what needs to be changed, who needs to be included, and how all this may be achieved; and thereby match the developed vision of the innovation with reality to actually put it to work.

  While in the ideal situation, one workshop is organized for each kind of strategic workshop as well as for the role board game, InnoForESt acknowledges that this is not always realistic or practical or sometimes even unnecessary, depending on the situation the innovation is in.

## 3.4 Fourth mode of involvement: Constructive Innovation Assessment for strategy articulation

The core idea of assessing a technology or innovation 'constructively' is to contribute to the shaping of an innovation. In the context of InnoForESt, this means to develop a novel or revised forest ecosystem service governance approach. The question of how such a contribution can be made is not trivial. At early stages of the development of an innovation, there is plenty of scope for designing, but comparatively little indication about which direction the innovation can take or what the criteria might be to assess the design alternatives, whereas at later stages this assessment is easier, but the design scope will have decreased as routines and consolidation have been established (cf. Collingridge 1980). Before an innovation has stabilised, Constructive Innovation Assessment[7] inserts opportunities for **structured reflection on alternative innovation options, aspects, and dimensions**, as well as on the **conditions** under which an option could be realised.

CINA assumes that actors, which take different roles and positions with respect to an innovation, would also be taking **different perspectives** that ultimately may lead them to different valuations of the chances and limitations of a development. In this context, we speak of **'enactors'** and **'selectors'**—those actors who actively push an innovation forward and place it at the centre of their thinking, and those for whom this very innovation is only one option among several. In order to bridge and facilitate between these actors and their viewpoints, CINA offers specific occasions for shared reasoning.

Against all the variability of innovation and the limitedness of the chance to anticipate it, from an innovation studies point of view, the development of innovations follows **regularities and patterns**. Dynamics and patterns in different dimensions seem to play a role: from local micro processes over dynamics in specific areas to broader landscape developments, as well as typical governance, business, natural/biophysical, and techno-scientific dynamics. Knowing about and anticipating these patterns for a given innovation is expected to help the actors in the innovation network to carefully preview at least some principle aspects of what is typical for a particular kind of development and innovation format, as far as it can be described in a scenario and be done in a reflexive and controlled speculation. This collective speculation can, if done well, become part of the innovation process, as the negotiation of what enactors and selectors actually want to pursue.

The CINA approach **combines sound research** on innovation situations with a series of **stakeholder workshops**. The results of the research go into the preparation of the workshops, and the workshop results can be used by interested stakeholders as strategic intelligence for their innovation projects, and by the researchers for scholarly reflection and publication. The CINA approach aims at establishing a fertile environment, in which those interested can probe each other's worlds, provided that:

1. **Prior research** on the current situation of the targeted innovation is done.
2. The facilitators are very **familiar** with key stakeholders' perspectives, interests, visions, interactions, histories.
3. Stakeholders are equipped with a stimulating, realistic synthesis of what can be known (in form of **scenarios narratives**).
4. Stakeholders are **taken seriously** as equally well-informed experts of their own situation.
5. The innovation platforms are understood as **policy-making arenas**, not more, and not less. It is about **real innovation**, not just a mere game or speculation; real actors with real ideas and constraints engage in real interaction, and their commitment, ambitions, struggles, consensus, and dissent are also real.

[7] Constructive Innovation Assessment (CINA) has been developed from the Constructive Technology Assessment (CTA) approach (Schot and Rip 1997; Rip 2018).

The **research** can use all kinds of methods appropriate for the subject matter at hand. Since the CINA approach requires practical understanding about the innovation efforts (be it a new governance approach or a new technology, a new business model or service, a prototype or product) as well as a broader overview over the circumstances under which the innovation takes place (the alternatives to the innovation, the history, the expectations for the future of the innovation and its use, the policy and market environment, etc.), it is wise to study the innovation to a larger extent in its context and with direct communication with the practitioners involved.

Those **preparing** for a CINA workshop need to be quite familiar with the field and possess enough context knowledge in order to be able to moderate deliberations in such a way that they can stimulate discussion through specific hints and by including relevant issues and stakeholders, anticipating what kind of contributions they typically make. This is the case both for the composition of the workshop (invitation, setting the frame) as well as for carrying out the workshop. Well-informed, realistic, and thought-provoking scenarios (narratives, with conceptual graphs, symbolic pictures, etc.) are a core tool for CINA workshops. The preparation of a CINA workshop therefore crystallises in the development of scenarios the participants find compelling to discuss, because they mirror the situation they are in or aiming at, while also projecting realistic expectations about how specific conditions may influence the feasibility or further development of an innovation.

The **workshops** are to be moderated as safe spaces, in which those committed to collective reflection on an innovation can think out of the box. They serve as carefully and minimally structured occasions for strategy articulation:

- M**utual learning** about the opportunities and limitations of an innovation, the perspectives of other actors, how far one can converse or even start to collaborate with others, etc.
- **Encountering** actors, who are either like-minded or nevertheless can offer constructive inspiration even through pursuing their own agendas or seeing things differently.
- **Interconnecting** while making explicit the actors' strategic aims and considerations, thereby literally probing options of working together with one another.

The **workshops** need to be specific about the cases at hand, the actors participating, the options discussed through the scenarios—but they also need to be open-minded, unrestricted, inviting for critical remarks, counter-arguments, alternatives:

- **Being explicit about options**: supported by (socio-ecological, governance-related, physical) scenarios, which urge to express possible constellations fruitful for an innovation in clear terms, including what is ambivalent, unknown, or out of reach or of control.
- **Being explicit about constitutive elements**: options only start making sense when aspects upon which the scenario options are based are explicated.
- **Being specific about futures**: scenarios reflecting the near-term (or also mid-term) futures, by extrapolating existing trends, while elaborating on the conditions of changes as precisely as possible.
- **Conditions of the possibility that an option actually works**: in order to be also specific about what could lead to a future of the innovation.
- **Help stakeholders to anticipate and decide** through better understanding of ongoing dynamics, complexities, desired effects and less desired repercussions of possible actions.
- **Occasions to building visions together**, networks, priorities, instead of only solitary or mono-dimensional speculation without any contrasting views, alternative sources of knowledge and experience, or an idea about the broader spectrum of importance the innovation can have for other actors.

The **scenarios** derived will:

- feed into an estimation of potential effects of activities and into the development of strategies, taking into account desired outcomes and unintended impacts.
- provide the **collective reasoning space** for identifying crucial issues for the options and pathways, both in terms of potential problems and benefits together with key actors.
- should ideally include those who **enact** the innovation (because they find it worthwhile) and those who would possibly **select** it (as soon as they find the innovative results interesting enough, useful, desirable, or would choose for any other reason). This can mean to involve even third parties not yet directly engaged but promising as potential partners elucidating how certain policy or market conditions, business models, and technological or scientific **aspects** or **conditions** of an innovation may become viable.
- show the stakeholders how other actors, who normally might not be involved, could indeed be crucial for the advancement of the innovation.
- can be used as **decision aids** for selecting participants that actually need to be invited to have the full spectrum of relevant perspectives sitting at the table and being heard.

The scenarios in InnoForESt are based on a series of **research efforts** the project has placed in its first year: the mapping of biophysical and institutional conditions for forest ecosystem services across Europe and in the Innovation Regions, the Stakeholder Analysis and the Governance Situation Assessment. In the further pursuit of the project, particularly through the innovation platforms and the workshops, the research focuses on integrating the new findings from the interactions with the stakeholders in the Innovation Regions into the further development of the prototypes. The **learning curve** also connects one workshop to the subsequent one, as the results of one workshop will feed into the next innovation action, and the findings about the innovation actions will again feed into the next-stage workshop and the revised scenarios used there.

Please, read in InnoForESt Deliverable D4.2 (Aukes et al. 2020a) how the **implementation** of the CINA workshops went, and in InnoForESt Deliverable D4.3 (Aukes et al. 2020b) how the entire **innovation journeys** about the CINA workshops have developed around. InnoForESt Deliverable D5.4 (Schleyer et al. 2020) finally provides information on how the associated **training** in the project took place.

## 3.5 Fifth mode of involvement: Prototyping

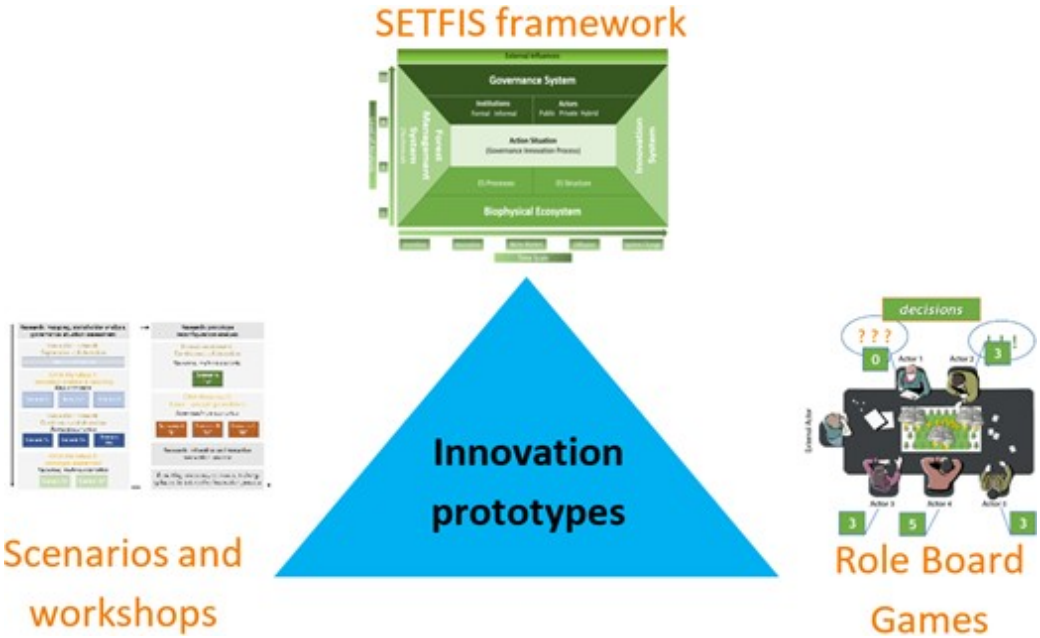
Prototyping in InnoForESt stands for all activities involved in the **development of innovation prototypes**. This development is based on the 'reconfiguration' of factors that make up the socio-political and biophysical conditions in the Innovation Region. Reconfiguration of factors means the optimization of key positive and mitigating negative influences of the socio-political and biophysical context on the innovation process. It also includes experimental testing of innovation visions. The process of reconfiguration and, in turn, the prototyping should lead to a policy and business innovation prototype. If there is more than one innovation involved in a project, as is the case in InnoForESt, those innovations may find collaborative potential based on the shape of the prototypes.

### *3.5.1 Prototype assessment*

As an integral part of the overall CINA methodology based on scenarios, the factor reconfiguration process integrates the following steps further (see also Figure 3.6):

- Identification of key factors that define governance, policy and business innovation types and conditions for smart governance innovations. Factors are identified in the previous InnoForESt work (e.g., Deliverable 2.2, Varumo et al. 2019; Deliverable 5.1, Aukes et al. 2018; Deliverable 5.2, Schleyer et al. 2018; Deliverable 4.2, Aukes et al. 2020) and analysed in the SETFIS framework factors analyses (Deliverable 3.1, Sorge and Mann 2018).
- Testing institutional and business innovations by using a model for experimenting for smart and sustainable forest a role board game applied to six IRs (Deliverable 3.2., Kluvánková et al. 2020; and Deliverable 4.1, Sattler 2019)
- Syntheses into the Innovation prototypes (Scenarios + Role Board Games + factor analyses = Innovation prototypes) (Mann et al., forthcoming).

*Figure 3.6: Reconfigurations towards Innovation prototypes*



Innovation prototypes build on visions describing the preferred future developments of governance innovations in the form of a scenario narrative (Figure 3.6, bottom left). Various factors affect these prototypes of business innovations and governance innovations, including voluntary payment and trading mechanisms of certification schemes that reconfigure the innovation niches as becomes visible through SETFIS framework factors analyses (Figure 3.6, top). By assessing them in behavioural experiments in the Innovation Regions settings (Figure 3.6, bottom right "Role Board Games"), we are able to model how a holistic basket of economic, socio-cultural, recreational, and environmental forest functions and services, and trade-offs between them shall be considered in innovation prototypes from both the supply and demand side.

The development of prototypes for innovations in each Innovation Region is based on the reconfiguration of factors. A three-part, factor-based process leads to the definition of the innovation prototype in the respective Innovation Region. First, a set of key positive and negative **influences** of the specific innovation processes needs to be compiled. Second, this set is **tested** experimentally by means of a standardised Role Board Game (for details see Deliverable 3.2., Kluvánková et al. 2020). Third, the **factors** are reconfigured optimally to construct the policy and business innovation prototype. Once the optimal form of the prototype is known, it is possible to identify potential fruitful collaborations among Innovation Teams based on similarities in the prototypes and the relevant factors.

### *3.5.2 Role Board Games for prototype assessment and reconfiguration*

The main aim of the Role Board Games is to **identify and test innovation factors** that may lead to a successful embedding of the innovation into its socio-political and biophysical context. It also aims at **deep mutual learning** among stakeholders who, by playing the game, discuss diverging uses or conflicts over forest ecosystem service provision that may arise between them.

In order to get a better understanding of the role and the impact of key innovation factors for each Innovation Region, we have designed a behavioural field experiment in the form of a role board game (interactive agent based model). The main question the Role Board Game addresses is: how to create conditions to enable innovations for sustainable use of forest ecosystem services and well-being in Innovation Regions under the diverging interest of forest ecosystem services users?

The Role Board Game tests **combinations of key innovation factors** as part of the innovation prototype development in a real-world setting. The factor combinations are based on the fundamental policy intervention taken from an Innovation Region's preferred future scenario for sustainable forest ecosystem services provision (e.g., strict regulation vs. payments for ecosystem services scheme, business incentives and external risk factors, such as climate event, depopulation, migration, market, etc.). The Role Board Games allows **testing stakeholders' specific behaviour** for resource use, **and innovation activities**, by exchanging incentives (certificates, compensation schemes, offset-banking, payments) and control mechanisms (state, bottom-up, monitoring mechanisms), collaboration strategies (networks, voluntary, regulatory), and elements of risk management. We argue that this elaboration of the Role Board Game assists in setting the conditions necessary for successful development of policy and business innovations in InnoForESt's Innovation Regions and that it fosters collaboration on sustainable provision of forest ecosystem services by stakeholders in the long term. [8]

[8] For more information on the rules and game play of the Role Board Games, see section 4.2.

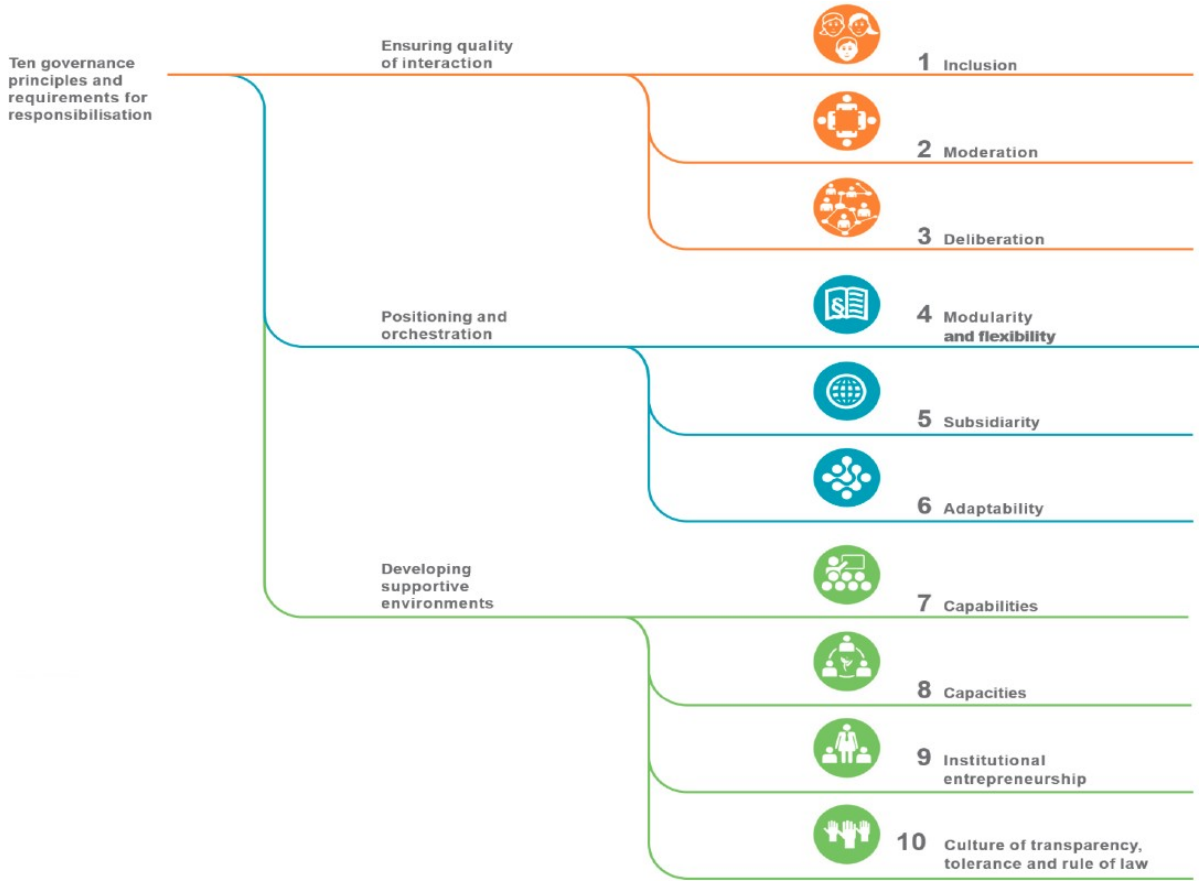
## 3.6 Sixth mode of involvement: Responsibility Navigator[9]

High quality stakeholder interaction is a key to the success of this project and similar projects. They need to be **sensitive to societal challenges and concerns** and respond adequately, especially to those stakeholders and other actors engaged in these projects. Integrating recommendations from the so-called Responsibility Navigator can **facilitate debate, negotiation, and learning** in a constructive and productive manner.[10] It entails a set of 10 requirements (see Figure 3.7, Lindner et al. 2016: 138-139) practitioners ('change agents') might want to consider when pursuing the innovation of forest ecosystem services governance, such as

1. Ensuring Quality of Interaction: **Inclusion – Moderation – Deliberation**;
2. Positioning and Orchestration: **Modularity & Flexibility – Subsidiarity – Adaptability**;
3. Developing Supportive Environments: **Capabilities – Capacities – Institutional Entrepreneurship – Culture of transparency, tolerance, and rule of law**.[11]

The basic idea of these requirements is that the *process* of stakeholder interaction for innovation which is organized is **just, legitimate and a broadly accepted course of action**. It does not predefine what outcomes of such a process would be. Focusing on a **responsible process** instead of steering towards one actor's desired outcome requires an open mind, tolerance of other perspectives, and an acknowledgement of 'being in this together' by all participating actors.

*Figure 3.7: Responsibility Navigator as developed in the FP7 Res-AgorA project*




[9] This is not the Navigator on InnoForESt Ecosystem Service Governance Innovation itself. The Responsibility Navigator is the product of the FP7 project Res-AgorA. (Cf. https://responsibility-navigator.eu/, accessed: 16 December 2020).

[10] https://responsibility-navigator.eu/navigator/; https://responsibility-navigator.eu/navigator/why-what-how/, (both accessed: 16 December 2020)

[11] Cf. https://responsibility-navigator.eu/wp-content/uploads/2016/01/Res-AGorA_Responsibility_Navigator.pdf, (accessed: 16 December 2020)

### *3.6.1 Ensuring Quality of Interaction*

For a high quality of the interactions in innovation projects, the Responsibility Navigator provides three processes: first, inclusion of a diverse set of actors which are relevant for the innovation as well as those impacted by the innovation. In the interactions, not only their interests should be considered, but also the values these actors might hold. The innovation process should be organized as such that all involved may **influence the decision making**. Second, innovators should ensure that their process is characterized by an **environment of trust and organized dialogue**, with the aim of increasing actors' potential goal alignment. Third, engaging such a **diversity** of actors with heterogeneous positions, interests and values requires systematic deliberation, which leads to *"confronting, synthesizing and eventually compromising"* (Lindner et al. 2016: 144). Spelling out the trade-offs that arise among the different actors who are involved in the innovation will decrease the long-term risks of the innovation failing and can, instead, strengthen the foundations of the innovation.

### *3.6.2 Positioning and Orchestration*

Three principles—all describing the character of regulation necessary for responsible innovation—constitute the interaction governance. First, a **mixed set** of hard and soft regulatory **mechanisms** is advised, allowing innovation participants the freedom to organize their process themselves within certain limits. A **balance** should be struck between self-regulation and external control and accountability. This external control returns in the next principle of **subsidiarity**, which states that external control mechanisms should only take on "*those tasks which cannot be performed effectively at a more immediate level*" (Lindner et al. 2016: 148). Finally, any regulatory mechanism devised for innovation should feature the possibility of being reviewed, i.e., **adaptability**, in the face of external changes.

### *3.6.3 Developing Supportive Environments*

The third domain of preparing the context of the innovation contains four principles. First, innovations will increasingly rely on the capabilities of participants. In a fast-changing world, adapting skills and capabilities to the needs of the innovation is paramount. This includes a set of **collective reflexive processes**, such as "*recognising, anticipating, deliberating, communicating, and collectively pursuing societally desired processes and outcomes […], and evaluating them*" (Lindner et al. 2016: 152). For innovations and the people involved in them to thrive, not only need the individual capabilities be in focus; a **supportive organizational environment** is equally important. This may entail "*access to information and resources, spaces for reflection, interaction and negotiation, appropriate incentive structures, and an open knowledge base*" (Lindner et al. 2016: 152). The former two practices can easily survive independently without producing meaningful responsible innovation. Hence, they must be enforced by **visionary and supporting leadership**, which constitutes the third principle. Finally, and most abstractly, responsible innovation can only take place in contexts **valuing and living basic democratic principles**. For example, only innovation contexts abiding by the rule of law can install the confidence of "*making claims and invoking legal or political means*" if required (Lindner et al. 2016: 158).

### *3.6.4 Practical issues for InnoForESt*

The Innovation Actions this project undertook in the Innovation Regions concerned the Innovation Partners and their stakeholders within their real-life contexts and needed to maintain or strive for a viable business. As in every interaction, productive cooperation depended on **flourishing togetherness**. Since compulsion was excluded, **voluntary collaboration** was the essence. The criteria listed above are intended to support the creation of a **constructive atmosphere** filling the innovation activities with life. However, members of this project needed to be equipped and able to moderate the collaboration, while being perceived as **honest brokers and facilitators**. The challenge was to balance the interests and viewpoints, to provide help needed to canalise the stream of information, and to handle situations that are potentially conflictive or competitive. The procedural principles have helped **legitimise the innovation** work in the regions by providing a set of rules all parties can agree to.

Nevertheless, our project members in the regions needed to **carefully observe, interpret, and adjust to the dynamics** in the innovation network among the participants—be it in a workshop meeting or in the overall process. The trick is to use the momentum of those who are very active while preventing them from disrupting interested others who are still considering collaboration.

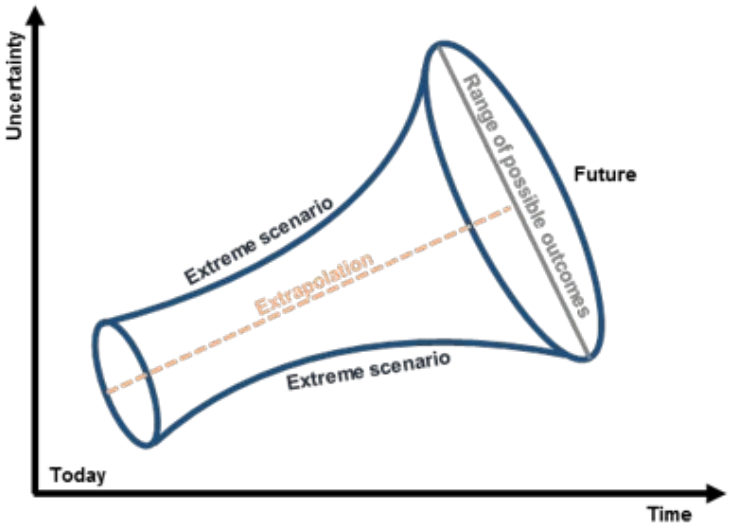
# 4 Additional background and context information

In this section we provide some **additional background information** for the main methods of the innovation work, i.e., the Constructive Innovation Assessment and the Role Board Game. It also briefly touches upon the training aspect, i.e., how the InnoForESt approach has been taught (described in more detail elsewhere in Deliverable 5.4, Schleyer et al. 2020). The information provided in this section is not immediately necessary for the practical implementation of each method, but may well be of interest for innovators who like to dive deeper into the matter.

## 4.1 Practical detail 1: Constructive Innovation Assessment

The CINA method (Stegmaier 2020; Visscher et al. 2020; Stegmaier & Visscher 2017; Rip & te Kulve 2008; Rip & van den Belt 1986) relies on the formulation of **scenarios** which are weighed against each other by stakeholders during intensive workshops. A scenario, as InnoForESt understands it, is at the same time a **'useful fiction'** and a **'holding device'**. We understand a 'useful fiction' as a coherent story or plot of a world, in which the innovation has taken on a specific shape. A 'holding device' is a condensation of what is known about one possible development. In other words, a scenario is a thoughtful, systematic, rich mixture of creativity and prior knowledge of the governance situation. It tells a thought-provoking story about how an innovation *may* take shape. Figure 4.1 visualises how scenarios can be understood as a telescope looking into the future. Based on the world today, the future holds a range of possible outcomes limited only by extreme scenarios, which border on impossibility. Opening up possible futures of the innovation for discussion, the **scenarios trigger speculation about and reflection on possible outcomes and their opinion and feelings about these**. This way of discussing potential governance innovations is an alternative for plain guessing, naively carrying on with known or outdated routines or for relying on prediction in the strictest sense. For the CINA method, some of these scenarios are used to take a closer look at and engage with.

*Figure 4.1: Representation of scenarios as telescopes directed at the future*




**During stakeholder workshops** a small set of, say, 3 scenarios with different plotlines and potential future contexts are discussed. Combinations of scenarios and how they relate to each other are depicted in Figure 4.2 (every colour represents one possible set of scenarios and their general thrust). Such discussion intends to tease stakeholders out of their shell and stimulate out-of-the-box talk about what is important, what may be missing in the scenarios or which links and incompatibilities exist between scenario elements. Mind that the scenarios are **thought experiments** and are not the only way the different scenario elements can be storified. In scenarios for following workshops, resonating elements from different scenarios may be recombined.

*Figure 4.2: Scenario combinations (colour groups) and their general thrust*

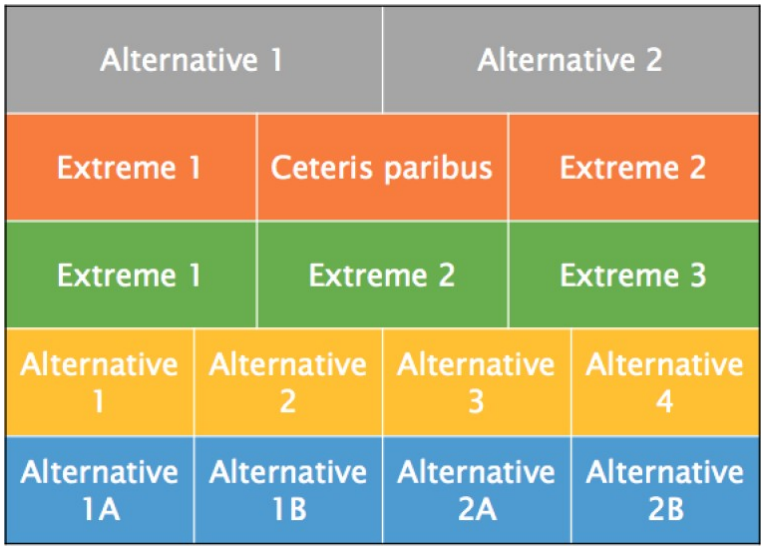
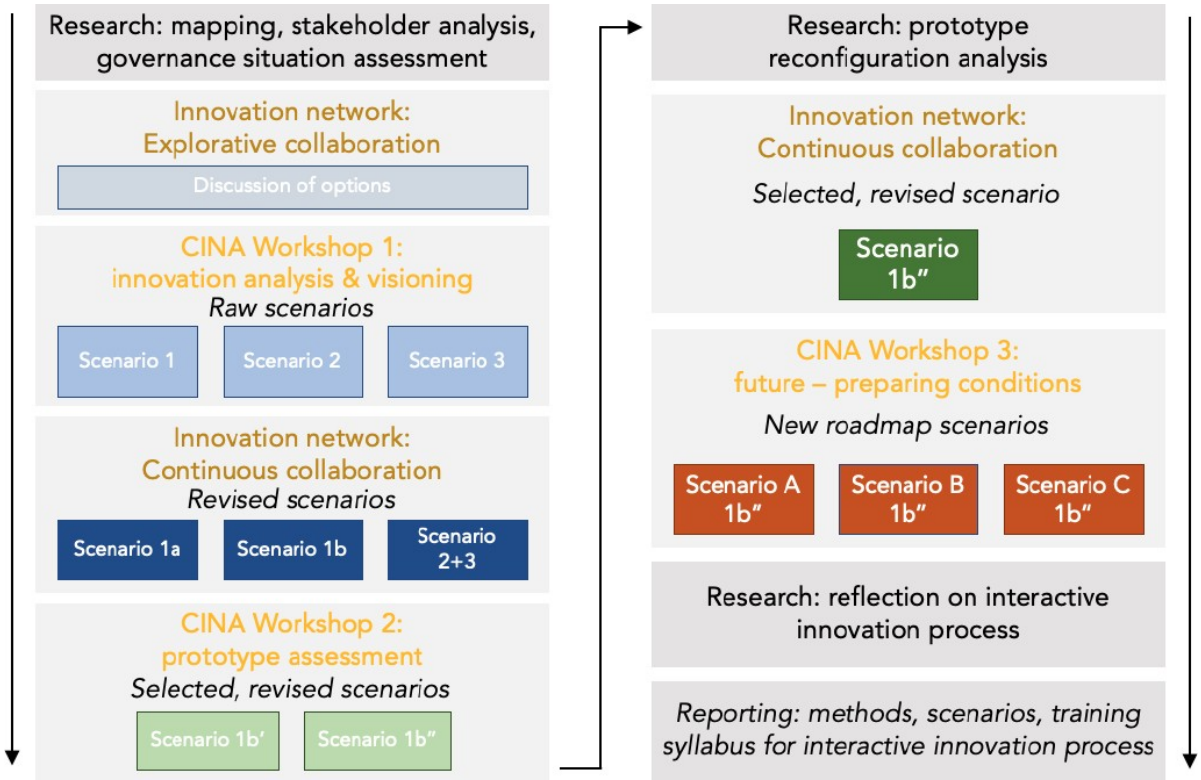


Figure 4.3 shows the idealised intertwining of research, network collaboration, and CINA workshops. In principle, the trajectory entails research to derive a set of raw scenarios which will subsequently be refined by close consultation with the stakeholders of the innovation network and in a first CINA workshop. At this first workshop, the most viable scenarios are selected and developed into the actual prototypes. Once the prototypes are clear and work with them has started, the second CINA workshop is dedicated to assessing and reconfiguring the prototypes—again as scenarios, this time of the prototypes. After the most viable prototype configuration has been advanced, roadmap scenarios for continuation of the prototype beyond the project time frame are probed in the third CINA workshop. The input for this workshop is again a set of explicit forward-looking scenarios.

*Figure 4.3: Principle coupling of CINA and innovation network processes*




### *4.1.1 Scenario building basics*

Scenario building rests on a **thorough analysis of the innovation context** prior to taking action. The types of analyses you can think of are not only Stakeholder Analysis and Governance Situation Assessment, but also a mapping of the biophysical and institutional setting of the innovation. As a general aid of thinking about which information would be useful, relevant or important, generic conceptualizations of a governance situation are helpful (Figure 4.4[12]). In a simpler way (Figure 4.4, left image), one can think of the potential innovation being

a) **constituted** by actors, things, issues, activities, and events,
b) **located** in some place, space, and time, and
**c)** surrounded by a certain **context.**

The question where context begins and ends, has to be solved empirically.

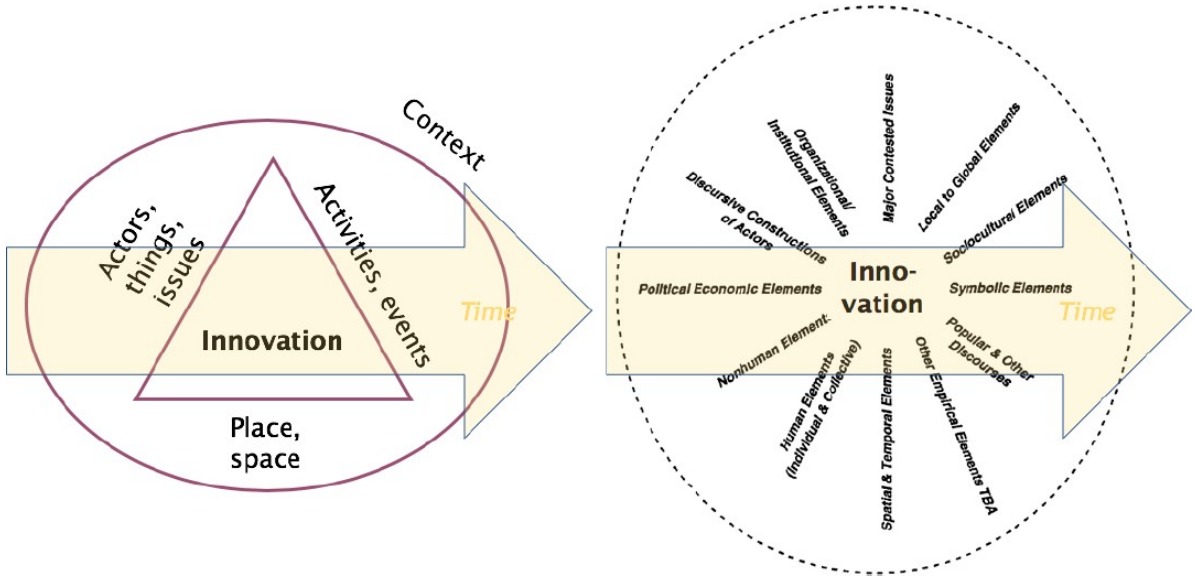
[12] Cf. Spradley (1980) left; Clarke (2005) right.

These very **generic categories** will have to be specified for the actual cases (Figure 4.4, right image). One should identify:

a) the socio-technical & socio-ecological processes impacting the governance innovation in the innovation context;
b) the impact of the governance innovation on its socio-technical and socio-ecological environment;
c) societal developments, which are not under the project's control;
d) current & expected uncertainties.

Once these aspects of the innovation context have been charted, scenarios are developed by discussing **imaginable variants** of the innovation. For a start, think of three variants. Following the identification of the variants, discuss how they may be embedded into socio-technical and socio-ecological futures. As a final step, formulate a narrative encompassing all of these aspects.

*Figure 4.4: Generic conceptualisations of a governance innovation situation*




### *4.1.2 Preparing for a stakeholder workshop*

If you want to give different stakeholders the opportunity to set something in motion together, you have to create opportunities where they can work together on the innovation and at the same time understand what is important for everyone involved (cf. Stegmaier 2009).

Besides developing the scenarios, there is another crucial element to a good CINA **method use**:

- For a lively discussion based on different perspectives and generating new insights, several aspects should be considered when preparing a stakeholder workshop. First, all relevant actors in a given field should be invited. [13] However, keep an open mind about stakeholders who may not be involved or acknowledged in the innovation context yet.

  Who may actually be connected to the envisioned innovation in a way not yet thought of. Such stakeholders could provide interesting new contributions to the discussion or even give decisive impulses.

[13] Knowing who the "usual suspects" are, who are always involved, who could be an interesting addition to the network and what their particular views and interests are, presupposes prior knowledge. This may already be present, but it may also be necessary to acquire or update it more systematically. This might also mean that the CINA workshop in which the scenarios are discussed will ideally not be the first interaction moment in the innovation effort.

- Motivating stakeholders for such a workshop and involving them can be tricky, as the workshop's utility may not always be clear for them. Thus, try to make the workshop appealing by offering participants to gain additional insights and networking opportunities with people they do not normally interact with. This makes the workshop useful and reduces the possible feeling of just being research subjects who are answering scientists' questions. Utility can also be increased by developing scenarios that resonate with the participants and which they may make use of also after the workshop, for example, at their respective home bases.

### *4.1.3 Documenting the stakeholder workshops*

Given that the aim of a stakeholder workshop in the CINA methodology is not extracting some kind of 'facts' from participants for research purposes, but that it rather intends to **elicit reflection and constructive discussion**, it is not enough to note down what was said in an abstract, technical manner. If the results of the workshop are to be used for follow-up workshops, for example, type 2 or 3 (see above), a different way of documentation needs to be pursued:

- First and foremost, the **responses to the scenarios** need to be noted. This not only includes spontaneous or primary responses to the scenarios as presented, but also combinations of elements from different scenarios, deviations, pros and cons, modifications, and aspects beyond the original scope need to be reported, preferably including whose suggestions these were.
- To construct a rich documentation honouring all **participants' positions**, it is also necessary to document strategies that were uttered on various levels (implicit/explicit, interpersonal/interorganisational/intergovernmental/international) as well as the interaction dynamics that evolve, including conflicts, convergences or collaboration. In other words, do not just describe single aspects, but put them into context, i.e., (a) those conditions under which they were mentioned in the discussions as well as (b) those conditions under which they could become real. These **deviations or suggestions beyond what you proposed as scenarios can be understood as alternative scenarios**, which are equally important as they tell you more about the position and opinion of the participant expressing them.
- At the end of the workshop, note all **next steps that were agreed** upon with the stakeholders. In addition, discuss participants' **expectations** of what will be achieved until the next strategic workshop. In turn, you can reflect back on these expectations at the start of the next workshop. Doing so allows for first or even second order learning processes as participants anticipate the future.
- Finally, do not forget to describe how you **prepared** for the workshop, i.e., the interaction strategy you had in mind. Describe which **new impulses**, such as unusual actors, materials, or additional examples, you brought into the discussion during the workshop.

Detailed notes on the workshop should be first taken in the local **language**. This guarantees maximum clarity, detail, and nuances. Detailed summaries will have to be translated into English or any other reporting language (cf. InnoForESt Deliverable 4.2, Aukes et al. 2020a).

## 4.2 Practical detail 2: Role Board Games[14]

InnoForESt Innovation Regions (conceptualised as social-ecological systems) are characterised by **manifold, sometimes diverging uses of forest ecosystem services**, such as extraction, recreation, preservation or education. These uses are driven by, for instance, depopulation, market pressures, and ecosystem dynamics (e.g., climate events). Depending on the legislative context, forest ecosystem services are often public or common goods facing diverging individual and societal interests that in turn affect the quality of ecosystems and well-being of the communities living nearby. This may result in overuse, degradation, or unsustainable behaviour, creating also barriers for cooperation, economic profit, and innovative business initiatives.

The proposed experimental session builds on Cardenas et al. (2013) and Castillo et al. (2011) as an **interactive agent-based model** arranging for repeated interaction and learning in real-world situations. It contributes to testing the effectiveness of incentives provision for the sustainable production of forest ecosystem services and the acceptance of such an intervention by forest ecosystem services communities (Kluvankova et al. 2019) and is further expanded in D3.2 – Kluvankova et al. (2020).

The game intends to **create a situation** in which a group of five forest ecosystem services **users make decisions** about the use and management of a forest for forest ecosystem services provision as a governance innovation and are confronted with fostering or hindering context conditions (local climate, economy, governance, innovation potential, etc.) and stakeholders' interests. Stakeholders face change in conditions or factors (e.g. individual or collective action, diversity of rules, innovation factors, external events and disturbances etc.) and are able to observe and test what conditions lead to successful collaboration for sustainable forest ecosystem services provision in their specific contextual conditions for well-being of their communities or regions. One stakeholder of the game represents an authority (e.g., national park, regional office, government, bank etc.) external to forest use but with regulatory and monitoring power. This approach creates a space to test innovation activities for prototype development (reflecting scenarios as preferred development options for the Innovation Regions).

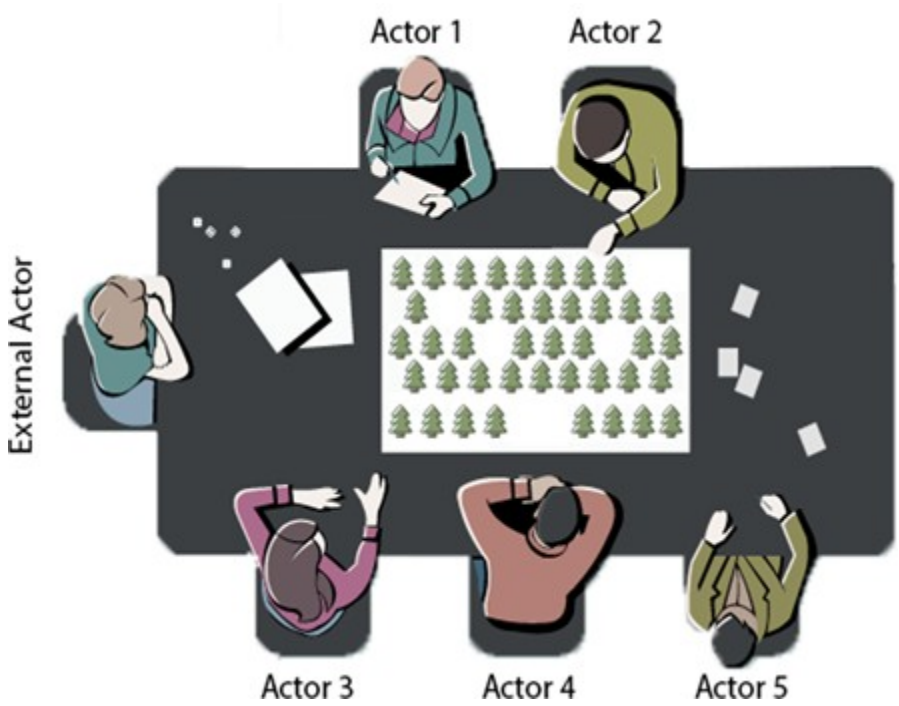
On the other hand, the experimental design of the Role Board Game allows to study and discuss **only a limited set of factors** and necessarily has to be based on **simplified** real-life situations from Innovation Regions. It has also lower explanatory power, so it is necessary to combine it with other research methods that enable to answer 'why' something is particular happening in Innovation Regions.

The game consists of **two optional treatments** (for more details see Appendix IV). Each treatment has two stages (two parts with 10 rounds to play with changing conditions). One group plays only one treatment. Both treatments have an identical first stage, with certain forest ecosystem services without any innovation in place. In the second stage, treatments are different in factors that may affect decisions and innovations and thus leads to behavioural change of stakeholders. For an exemplary game situation, see Figure 4.5.

[14] The proposed behavioural experiment (Role Board Game) undertaken under Tasks 3.2 and 3.3 of WP3 follows a transdisciplinary approach and aims for a co-production of empirical and theoretical knowledge among participating scientists and stakeholders to complement by and for specific Innovation Regions' needs. It contributes to InnoForESt objective 2: understanding success factors of novel policy and business models. The method allows testing innovation factors and stimulates the learning process on the functioning and impacts of governance innovations also across scales (objective 3), addressing policy recommendation (objective 4; cf. InnoForESt Deliverables 3.1 and 3.2).

- **Treatment 1**: concerns the **variety of motivations** that make innovations attractive for stakeholders to participate and support forest ecosystem services provision in the long term (**state regulations, payments for ecosystem services or a business innovation incentive**). It is here where the preferred vision for innovation development may be implemented.
- **Treatment 2:** focus on the **governance innovation, when the forest is affected by an external disturbance** (climate event, market pressure, etc.). Stakeholders can decide about the introduction of new regulatory rules, such as monitoring and sanctions, and they can collaborate on development of innovative social rules.

*Figure 4.5: Graphical illustration of InnoForESt Role Board Game*




**After playing**, stakeholders were asked to take part in a short survey to clarify the reasoning of their decisions during the game, their motivations, and their reflections on the game design. At the same time, calculations and graphical interpretation of the game are prepared to show the stakeholders their decisions during the game. Then, stakeholders were invited to a focus group discussion to discuss main findings and game implications for their innovations in the regions. Last minutes of the session were allocated for the stakeholders' payoffs that were based on their individual results from the game (in form of financial/material rewards to the stakeholder part was fixed and part was based on their individual decisions during the game).

## 4.3 Practical detail 3: Training

Being an Innovation Action, in InnoForESt, research approaches and methods were designed and employed as a means to conceptually, methodologically, and empirically support actual ongoing innovation work 'on the ground'. The main tasks in the InnoForESt project thus revolved around **coordination** (between the Innovation Regions and between the overall project and its work packages), **assistance** (continuous support of the innovation efforts in the regions), and **reflection** (making content and procedures that had emerged and perhaps even proven in one Innovation Region available to all Innovation Teams). It soon became clear in these interactions, that a whole range of skills had to be carried into the broader project and particularly to the Innovation Teams through **training** offers.[15] This was considered crucial for the implementation of a consistent approach to stakeholder participation, prototype creation, and comparability of results.

The **main elements** of internal training designed and implemented in the InnoForESt project focussed on (1) the ongoing assistance and integration activities for the individual Innovation Regions as well as (2) the Stakeholder Analysis and Governance Situation Assessment, (3) the CINA approach at large, (4) the Role Board Games, (5) the institutional mapping, (6) platform and network building, including facilitation and training for InnoForESt platform users in Innovation Regions, and (7) the socio-ecological-technological forest innovation systems analysis. InnoForESt Deliverable 5.4 (Schleyer et al. 2020) compiles and reflects all related forms of training and/or training events. For each element, the objective(s) and development context, the actual design(s), and key lessons learnt are presented. Here, it is also highlighted that both objectives and design were usually not static but needed to be—and often were—adapted to the project needs and demands for training articulated by the various members of the InnoForESt project.

Training **formats** included webinars, physical workshops, manuals, and training material made available online as well as components used during training events like introductions to the CINA approach or on empirical and analytical tools like Stakeholder Analysis and Role Board Games. InnoForESt Deliverable 5.4 (Schleyer et al. 2020) contains formats and components that worked, elaborates on the necessary practical, technical, and other preconditions that proved to be important, and reflects on the (experienced and/or anticipated) factors that made a particular format or method less effective and provides suggestions on how to overcome or mitigate obstacles and/or provides alternatives.

The experiences in the InnoForESt project show the need to pay even more attention in future projects on **training in methods** (e.g., stakeholder interaction and strategic data collection of these interactions) **and skills** (non-scientific communication, networking, team building, ability to play the role of change agent). The broad range of methods offered and the tasks to be carried out in the Innovation Regions and by the Innovation Teams was often perceived as overwhelming. Focussing on fewer methods and tasks may have allowed for more in-depth training in those.

[15] Given the very heterogeneous disciplinary background of project members and the great variety of concepts and methods employed in the project, key training areas had to be reduced to a few common denominators, such as core approaches to preparatory research (on Governance Situation Assessment (above section 2.5), cf. InnoForESt Deliverable 5.1, Aukes et al. 2019; on Stakeholder Analysis (above section 2.4), cf. InnoForESt Deliverable 5.2, Schleyer et al. 2018), carrying out strategic workshops (CINA approach, cf. above sections 3.4 and 4.1, as well as InnoForESt Deliverable 5.5, Aukes et al. 2020a), and documentation of the innovation work (cf. InnoForESt Deliverable 4.2, Aukes et al. 2020b).

Innovation Teams used and 'owned' the InnoForESt approach and the related tools and instruments in a quite different way: some really pushing, proactively using them and asking for 'help', i.e., training, and thus being 'in charge'. Others, however, felt that these tools and instruments were imposed on them, thus being reluctant to 'learn' them and carry them out. It cannot be taken for granted that both scientific and practice partners within the Innovation Teams are readily able to lead group processes, be it to moderate workshops or to motivate and mobilise stakeholders, to organize initiatives and to develop independent projects, which, initially with help of the project and then even without the project, would continue the initiative. This is a typical phenomenon and challenge in transdisciplinary projects, yet is seldom sufficiently anticipated and addressed in the composition of the research team and in the project design. Thus, a **stronger focus on enabling**, i.e., training, scientists and practitioners to work in a transdisciplinary way is strongly recommended for future projects.

# 5 Conclusion

In this InnoForESt interim Navigator, we have collected a **comprehensive compendium** of approaches applied in the project context. It ranges from the theoretical and conceptual backdrop to methods of innovation exploration and prototype testing. It also includes the project's intentions of sharing the gained knowledge with a broader audience in the future.

***How*** *should one deal with this now?*

1. ***Read*** *the Navigator carefully*
2. ***Try*** *it out*
3. ***Get advice*** *from users who already have experience*
4. ***Use*** *...*
5. *… and never lose your* ***practical*** *traction and contact with the stakeholders (this is not pure science!).*

Given the project is framed as an Innovation Action, the primary use of the empirical findings was **for the benefit of the local innovators** leading the forest ecosystem services governance innovations. Each local innovator was supported by a scientific team, and together they developed 'their' innovation further, using the set of heuristics tools explained in this Deliverable. When zooming out, it should be possible to learn from the Innovation Regions on a more abstract level, as well as to identify the success and hindering factors affecting the innovations which form the prototypes that could be upgraded or scaled up somewhere else with similar conditions. For this, we recommend the InnoForESt Deliverables 4.2, Aukes et al. 2020, and 4.3, Loft et al. 2020, which are providing ample detail on each innovation case.

In principle, the methods explained in this Navigator should be translatable into other Innovations Regions and innovations as well. An **extra adaptation effort** is necessary when the methods are intended to be used outside the InnoForESt context. The way it is now, one can work with the Navigator. In the future, we want to supplement with handouts for training and for the ability to carry out the interactions with the stakeholders themselves (i.e., also for practitioners and researchers who are otherwise used to doing things differently than dealing with stakeholders) and to use the analysis tools appropriately (cf. InnoForESt Deliverables 5.4, Schleyer et al. 2020, and 5.3, Aukes et al. 2020b).

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# Appendix

# Appendix I: Fact Sheet on Stakeholder Analysis

## Factsheet InnoForESt Stakeholder Analysis

*Christian Schleyer, Peter Stegmaier, Jutta Kister, Michael Klingler, Ewert Aukes*

V3.1

### 1. Main purpose of stakeholder analysis in InnoForESt

The **project aims** for an integrated approach to knowledge generation, stakeholder interaction, and triggering governance innovation. Thus, identifying, mapping, and integrating a diversity of stakeholders' interests, visions, and concerns, including civil society perceptions, user demands, and facilitators' suggestions is crucial.

**WP2** provides a basic overview mapping, the **case study teams** describe and empirically assess their – case-specific stakeholder constellations, and **WP5** integrates findings from both into a typology that helps comparing the cases and understand the bigger picture.
The assessment of the stakeholders' key orientations regarding forest ecosystem services (FES) governance innovation should also **foster** the co-production of the innovation networks and prototypes.

In this fact sheet, we focus on the first analysis of FES stakeholders in the case study regions to be compiled in D5.2 (month 12).

### 2. Typology and analysis of FES stakeholders (T5.2 / D5.2)

**2.1** For keeping the InnoForEST innovation action as **compatible** as possible with stakeholders' perspectives, we need to know who the stakeholders are, how they are interlinked, and what their interests, visions, and concerns are.

**Building on** the actors mapping in WP2, and the relevant work in WP3 and WP4, partly running in parallel, partly only starting after the completion of D5.2 in month 12 (October 2018), this task will develop a **common analytical framework** to identify and assess stakeholder characteristics in the case studies, i.e. taking a primarily local and regional perspective, yet without ignoring relevant national stakeholders.

Practically, the case study teams (practice partners together with scientific partners) will be chiefly **responsible** to organise and carry out the empirical work. Some harmonisation with respect to stakeholder types/categories targeted, analytical categories used for assessing the characteristics of stakeholders (including interests, visions, and concerns), and appropriate empirical methods/approaches will be aimed at since this will allow for comparative analyses of relevant characteristics and types across all InnoForESt case studies and for developing a corresponding cross-cutting stakeholder typology, to be compiled in D5.2 due in month 12. This typology will also flow into the T5.1 interims *FES governance innovation navigator* (due in month 15) *(see Factsheet on Governance situation analysis - T5.1/T4.2/D4.2/D5.1)*.

There will be considerable flexibility and room for manoeuvre on part of the **individual case study** teams to allow for case-specific contexts, stakeholder constellations, and stages of innovation development as well as for time and resources available/assigned to the stakeholder analysis in the case studies. It is also very important to keep in mind that the results of the individual stakeholder analyses are crucial ingredients for planning the activities in the respective case studies supposed to foster the innovation development/process. Thus, the respective knowledge needs should chiefly guide the stakeholder selection, the data gathering as well as the categories used analyse the data.

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**2.2** In the following, we suggest a list of a) stakeholder categories/types to be considered; b) analytic categories to be covered; c) a range of possible empirical approaches:

a) **Stakeholders / stakeholder categories** that might be considered in the stakeholder analysis include (not restricted to; might be partly overlapping):
   - *Forest Owners (public, private, collective)*
   - *Land owners (outside forests) (public, private, collective)*
   - *Forest managers / Farmers managers (might overlap with owners, but not necessarily so)*
   - *Protected Areas organisations (National Parks, Biosphere reserves, etc.)*
   - *Public administration (national, regional, local)*
   - *Civil society actors (NGOs, forestry organisations, environmental, nature conservation, tourism; hunting, leisure, sport, other interest groups)*
   - *Municipalities (local community, villages)*
   - *Forestry industry, including sawmills and other major wood-processing; wood traders*
   - *Smaller businesses (SME)(wood) craftsmen, carpenters, (wood)-designer, tree-nurseries*
   - *Networks for forestry or wood processing, federations of forest-/wood-related companies*
   - *Consumers, including various types of tourists (day tourists, over-night tourists; hunters, youth organisations, 'everyman' - local)*
   - *Scientific/Research organisations (universities, research institutes)*
   - *Educational stakeholders (kindergardens, schools, universities)*
   - *Tourism industry/enterprises*
   - *Locals (using forests through collecting wood, fruits, mushrooms; for leisure and recreation; traditional use; religious use)*
   - *Financial enterprises (e.g., banks, funding agencies; business support funds)*

There are many ways to **categorise** and 'sort' **stakeholders**. For example, they may have different actual or potential roles with respect to the governance innovation (process) under scrutiny, like funders, implementers, or mediators/intermediaries. They may come from different societal spheres, such as public/state, private, and civil society; or they might be (actual or potential) beneficiaries of or (negatively) affected by the innovation. Further, they might be situated/active a various spatial and administrative scales, such as local/regional, national, or perhaps even international – and some might even be active at several scales at the same time. Finally, they might be rather enablers of the governance innovation, or slow down and oppose the innovation (process).
Thus, the first step of the stakeholder analysis would actually mean to **identify** those actors that are involved in and/or affected by (actual or potential) the innovation governance targeted in the case study at the various levels and in the different realms

b) Some stakeholder characteristics may refer to individual stakeholders, others more to the organisation/administration/interest group he/she represents; sometimes both will be relevant, and perhaps distinct. Some of the characteristics might be directly related to the governance innovation, others might be more or less independent. If possible and appropriate for the individual case study, for each (type) of stakeholder identified as relevant (actual/potential) the analysis should shed light on the following characteristics:
   - *Interests / motivations with respect to forest ecosystem services, forest governance, and the governance innovation*
   - *(Actual/potential) Influence / role within organisation / within forest governance and, if applicable, the governance innovation*
   - *Available knowledge, competencies, educational background*
   - *Available power and other resources (incl. positional power, coercion, financial); control over resources*
   - *How/to what degree affected (positively or negatively; politically, scientifically, financially) by forest governance / the governance innovation*

- *Employed forms and means of communication between relevant stakeholders*
- *Visions with respect to (management/use of) forest ecosystem services, forest governance, and the governance innovation*
- *Concerns with respect to (management/use of) forest ecosystem services, forest governance, and the governance innovation*
- ...

c) There is a **wide range of empirical tools and methods** that can be used to identify, describe, and assess stakeholder interests, visions and concerns.
Which (combination of) method(s) to choose, **depends** to a large extent on the time and personnel available for undertaking the analysis, the degree of detail and comprehensiveness of the results of the analysis needed, the availability and quality of relevant previous stakeholder analyses, and the complexity of the stakeholder context.
Empirical **approaches** for stakeholder analysis include identifying and analysing relevant published research, legal documents, planning materials, policy documents, and other written sources. Particularly fruitful are further, exploratory (open) and/or semi-structured interviews with (key/all relevant) actors, either face-to-face or per telephone as well as focus groups or other kinds of workshops or meetings with practice partners, and surveys.

**2.3 Time schedule**

| What | Who | Deadline |
|---|---|---|
| Draft heuristic for case study teams (stakeholder categories, analytical framework for stakeholder characteristics, and empirical methods suitable) | WP5/T5.2 | 06.03.18 |
| Discussion, revision of heuristic | WP5/T5.2 with scientific CS leaders | 20.04.18 |
| Pre-final heuristic for case study teams; Example: Factsheet on Austrian case study (Eisenwurzen) | WP5/T5.2 with CS team Austria | 30.04.18 |
| Case-specific implementation plans, i.e. translation of heuristic in CS-specific plans for stakeholder analysis (iterative process) | CS teams, supported by WP5/T5.2 | 15.05.18 |
| Carrying out stakeholder analysis at CS level<br>– Stakeholder descriptions<br>– Sorting | CS teams | 20.6.18 |
| Compiling the results of stakeholder analysis at CS level – draft CS report | CS teams | 09.07.18 |
| Discussion, and perhaps revision of stakeholder analysis CS level | CS teams with WP5/T5.2 | 30.07.18 |
| Cross-CS comparison, typology, integration of WP2 results (stakeholder analysis national/EU levels) – draft D5.2 | WP5/T5.2, supported by WP2/T2.2 | 31.8.18 |

## Appendix II: Fact Sheet on Governance Situation Assessment

# A. Assessing the governance situation: topics

*Ewert Aukes, Peter Stegmaier, Christian Schleyer*

As of 12 June 2018

This is a set of **guiding questions** that may help to get a more comprehensive idea about the situation that characterises the innovation you are trying to tackle and foster in your case study. Topics 1 and 2 are the link to the Stakeholder Analysis (SA).

We are speaking of the 'forest ecosystem governance innovation', in brief: "the innovation". We are speaking of 'actors', because it may be worth looking beyond the already involved stakeholders. GSA = Governance Situation Assessment.

It might be enough to describe the situation on one page per topic. Use more pages/be more detailed if convenient.

***If anything is unclear, please, do not hesitate consulting with Peter, Ewert, or Christian!***

**Topic 1: Actors**

*(in SA, the actors entirely, as such, are in focus; here, the focus is on their roles and interests in the governance/policy-making; so, what's the actors' political (in the broadest sense) agenda?)*

- Which actors are currently involved in the innovation? (Just give a list/table, please; in order to avoid redundancy, you can refer to the stakeholder analysis for more detail!)
- How do they perceive the innovation?
- How do they perceive other actors and the interactions with them?
- Are there actors who are (purposely or unintentionally) excluded from involvement in the innovation? If so, why?

**Topic 2: Actor interactions**

*(emphasis here is on how actors play together/against each other; crucial to know regarding the political atmosphere)*

- What is the general character of the interactions among actors? Are there long-standing business or policy relations or rather recent ones; are there (a) permanent, (b) temporary, (c) formal, (d) informal occasions (or combinations), on which actors meet and interact? Which are they?
- Are then relationships cooperative or competitive, asymmetrical or symmetrical (referring to aspects of power)? Are there relationships or interactions which are rather conflictual among specific actors; are there tensions; if yes, which and among whom?
- Which issues do actors mainly discuss when they interact? What's at the core when they talk to each other?
- Are there actor alliances that pursue or at least support the innovation – or such that work against it? Specify!
- Are there specific actor relationships which are more/less fruitful than others? Specify!
- How do actors deal with disagreements and conflict situations (give examples)?

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**Topic 3: History of the innovation**

*(You could use a timeline here, e.g. in form of a table listing the main features of the process line-by-line.)*

- What is the innovation's history: (a) main phases, (b) main events, (c) previous efforts, (d) drawbacks, (e) founding narrative or "myth")? Could you also characterise the process of change/innovation?
- Who initiated the innovation? How?
- How did the innovation come to be accepted as such by the involved actors?
- How has the actor constellation changed over time?
- How have changes in the social context of the innovation changed its course or made adaptation of the innovation necessary? *Influence of non-FES governance innovations/changes*
- Is the innovation based on any similar governance pattern, or other derived from a totally different context?
- Which are the main (and the secondary) physical and ecological conditions under which forest ecosystem services governance developed in the past in your case?

**Topic 4: Current situation of the innovation**

- Which activities currently constitute the innovation process?
- Which policy instruments are currently used (or associated with) the innovation?
- What do they currently perceive as key problems now to take care of regarding the innovation?
- In terms of some imaginary project life cycle, at what point has the innovation now arrived for the key actors? *Same for all?*
- Has the innovation so far produced any unintended side effects?
- Are there any parallel developments that are (more or less) competing with this innovation?
- How is the innovation perceived in its direct and indirect social environment: (a) overall public image/perception, (b) support, (c) critique?
- Which are the main (and the secondary) physical and ecological conditions under which forest ecosystem services governance currently functions (more or less well)?

**Topic 5: Expected developments for the innovation** (this could be core to the alternative workshop scenarios)

- Is the journey of the innovation presently seen rather open-ended or closed – according (a) to the main stakeholders' views and (b) to your view as observers?
- Do you expect moments at which large choices have to be made which may (radically) influence the direction the project takes? If so, how would one know so?
- Which problems with the innovation are perceived and which solutions discussed (and which ones not?)
- Is the innovation part of or connected to a more general development in the broader landscape (trends, events, external pressures, etc.)?
- Which are the trends and directions towards which the main (and the secondary) physical and ecological conditions under which forest ecosystem services governance function?

# B. Assessing the governance situation: the key problem structure

This part aims at identifying the **problem structure** of the case: the main struggles and agreements. If you know this, you basically know **what the point is** with the case.

**Look back into part A and see which are actually currently the *key problem issues*** (= aspects of the innovation or its context that are perceived and eventually communicated as things to take care of) in the advancement of the innovation in your case studies. „[P]eople's involvement is mediated by problems that affect them" (Marres 2007). They mobilise such problem issues, and are mobilised through them when dealing with public affairs.

These problem issues could be seen as a set of barriers/obstructions that need to be tackled in order to advance the innovation and which thereby characterise the crucial dimensions of the innovation.

**(1) In a *first* step you would identify these issues:**

Make a list of all problem issues associated with the innovation (political, business, physical, cultural, technological, actors, etc., whatever you think characterises the state of affairs for the innovation for those involved), as found in A.

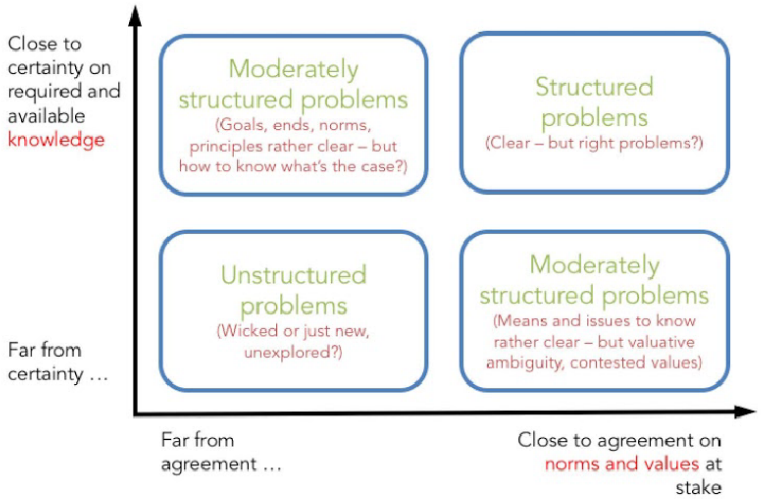
Decide which are the most important ones (a) from practitioners' viewpoints and (b) from your observant's point of view.

**(2) In a *second* step you would describe each problem issue in terms of the ease or difficulty with which it can be handled:**

Problem issues can be divided into four different categories:

Please, describe in your words how it makes sense to categorise each of the crucial issues in such a way (you can be as brief as you think it sufficient to understand also for case outsiders).

It may be four – or more or less – issues that you can identify and describe in terms of their problem structure.




From this, at a later stage a more fine-grained analysis of factors will follow. This is no factor analysis – just a rough exploration of the key tensions and agreements characterising the overall picture.

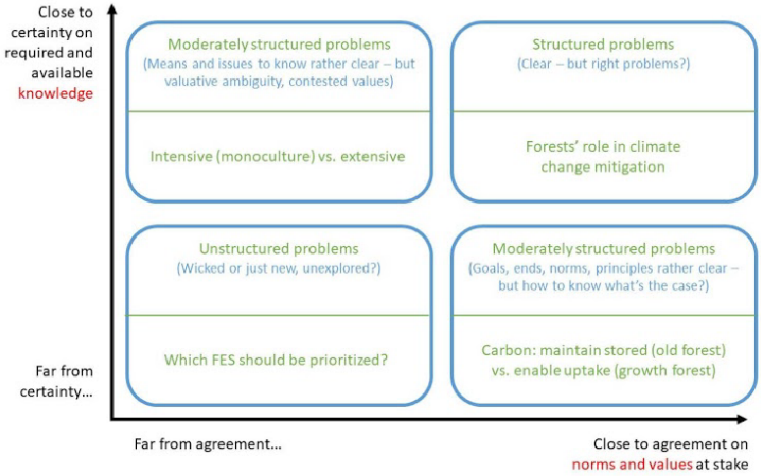
# Supplement:
# Problem categories

This supplement is supposed to elucidate how the figure on key issues works (p. 3 of the GSA sheet).

The figure is based on what has been called the governance of problems and attempts to categorise types of problems depending on two dimensions:

(a) How much is known about the problem?
(b) How much do involved actors agree on the norms and values related to the problem?

To make this a little bit more concrete, we provide a similar figure including examples related to FES, see below.




These are just some examples. Based on your deeper knowledge and understanding of FES problematics you may as well categorise the examples differently. However, we hope, the figure can serve as a first hunch for how to describe "all issues associated with the innovation (political, business, physical, cultural, technological, etc., whatever you think characterises the state of affairs for the innovation)" in terms of their problem structure.

If things are still unclear, we are happy to help!

# Time schedule

| | | |
|---|---|---|
| Heuristic for CS partners | WP5/T5.1 | 30.04.18 |
| Discussion, revision of heuristic | WP5/T5.1 with CS leaders | 03.-31.05.18 |
| Governance situation analysis CS level<br>– Governance situation descriptions<br>– Sorting of opportunity structures, policy instruments, patterns of legitimation, problem structures<br>Draft reports (in order to be able to link this with the Stakeholder Analysis) | CS leaders/teams | 20.07.2018 |
| Governance situation analysis CS level<br>Final drafts (in order to be able to use this for preparing the strategic workshops) | CS leaders/teams | 05.09.18 |
| Discussion, (if necessary) revision of governance situation analysis CS level | WP5/T5.1 with CS leaders | 10.09.18 |
| Final reports | CS leaders/teams | 20.09.18 |
| Cross-CS comparison, typology, integration of WP2 results (stakeholder analysis national/EU levels)<br>D5.1 Navigator (Interim version) | WP5/T5.1 | 15.12.18 |

## Appendix III: Fact sheet on Austrian case study (Eisenwurzen)

# Factsheet InnoForESt Stakeholder Analysis – Approach used for Case Study Austria "Eisenwurzen"

*Jutta Kister, Michael Klingler, Christian Schleyer*

V1.2

### 1. Main purpose of this Factsheet

For keeping the InnoForEST innovation action as compatible as possible with stakeholders' perspectives, we – case study teams and other WPs – need to know who the stakeholders are, how they are interlinked, and what their interests, visions, and concerns are. Thus, identifying, mapping, and integrating a diversity of stakeholders' interests, visions, and concerns, including civil society perceptions, user demands, and facilitators' suggestions is crucial. Moreover, a common understanding on stakeholder and analytical categories as well as empirical methods will facilitate compiling the case-study specific stakeholder analyses in D5.2 and will, thus, improve its outcomes by allowing for a proper cross-case study analysis. These insights will make D5.2 a valuable resource not only for all case studies in InnoForESt but also for other WPs referring to or building on these outcomes.

With this factsheet, we aim to demonstrate how we, the Austrian case study team, have been operationalising the **Factsheet InnoForESt Stakeholder Analysis (D5.2)** and how we tailored it to the context and 'needs' of our case study. We use the **Austrian case study**, located in the "Eisenwurzen" region, as an example for **one** possible conceptual, analytical, and empirical way to applicate the frame provided in the Stakeholder Analysis factsheet. We are aware, as every case study is different in its regional context, that the Stakeholder Analysis will most likely be comported in a different and case-specific way.

This approach presented here should be seen as work in progress, since we are still in the middle of our empirical and analytical work. With its presentation we share our work in order to enable exchange of application strategies across case studies, across disciplinary boundaries of and within case study teams, and contribute to a working structure which is able to effectively produce comparable results for integrating case-study specific stakeholder-related knowledge. Additionally, we hope to illustrate how the Stakeholder Analysis can be situated in the larger activities in and work flow of an individual case study.

We describe the approach in an understandable way in order to ease exchange it between inter- and transdisciplinary case study teams. More details can be given on request. Please feel free to comment and/or share your approach.

### 2. Empirical Approach – aims and methods

a) *General aims:*

The aim of our empirical study has been to gather information about the stakeholders of the case study region which are relevant for the objectives of our case study and the governance innovations focussed here. Thus, we collected information using these guiding questions:

- Who are the relevant stakeholders? Who has a stake in forest and wood-related economic activities? (located in the region and also in regional and national capital) – to make sure not to overlook stakeholders that may be important contributors to the case study network)
- What are their interests, visions and concerns (related to forest and wood-related economic activities)?
- How are these actors interlinked? Are there existing networks of co-operation?
- Which actors are open to innovation? Who is blocking innovation? What are constraints and options?

1

b) *Specific aims*:
The aim of the case study "Eisenwurzen" is to build up a network of innovative collaboration in order to improve sustainable use of forest and wood related resources with improved benefits for the region and the people living and working there. The region consists of a very high share of forest on its land use; protected areas are of relevance. As many other comparable rural regions it is confronted in increasing loss of population.

Our aim has been to deepen our knowledge of the stakeholder constellation in the region. After analysing the results, we will be able to conceive a series of workshops that suit the interests of the stakeholders' best, link up to their needs, and take into account and address their concerns. By using semi-structured interviews with key stakeholders, we have also been able to directly address potential participants, to inform them about InnoForESt, to explore their motivation to join the innovation activities, and, thus to (potentially) integrate a larger diversity of actors in the innovation network. In doing so, we hope to increase interest in InnoForESt innovation activities.

As the stakeholders have never been looked at in this contemplated way – integrating whole regional wood and forest-related commodity chains – before, there is a high added value of the study's results for the region itself, especially for regional planning, local policy making processes, and farmers' union (representing small-scale forest owners).

b) Empirical methods:
For investigating this data, we use qualitative survey methods, semi-structured interviews to be precise, as they are used in human geography and other social sciences. Interviews are taking place on the workplace of the interviewed person. We developed a set of open questions which are relevant for all types of stakeholders, but added interviewee-specific questions if appropriate (for the questions see 3). The interviews usually last about 1 hr or longer.

c) *Selection of interview partners*:
In order to identify the relevant interviewees we

- made a collection of potential addressees together with our local practice partner and prioritised them. We aimed to do at least one interview per stakeholder category (for stakeholder categories see 4). We further intended to ensure a certain regional distribution as the region is divided into several political and administrative districts.
- integrated other stakeholders that were mentioned in the interviews (snowball system) and prioritized them when they were mentioned more often.

d) *Data Analysis*
The audio files of the interviews are transcribed and analysed by using codes (using MAXQDA software) based on the analytical categories in the interview guideline. These codes help us to structure the text and (re)connect information to the research questions.

## 3. Qualitative survey – Interview guideline

For the semi-structured interviews, we developed a guideline of open questions that structure the interview.

Introduction: We start with a short introduction of the aims and scope of InnoForESt and why we chose "Eisenwurzen" as a project region. We explain what we want to achieve with the interview and how we will analyse the data.

1) Please present yourself, your institution and your tasks.
2) What do you consider the main challenges and opportunities in the topic of forest management and industry as well as regional value creation?
3) Are you / is your institution involved in activities or projects in this topic or have you been involved in the past?
   (Which one? With whom? Describe experiences? Your motivation?)
4) Do you know about other projects, ideas, concepts dealing with forest, forestry, wood processing or value creation out of wood that are taking place / took place in the region?

(Which one do you think are promising? Why? How do these support local value creation? What is missing to these initiatives to get more successful? How support?)

5) What exactly, do you consider "innovative" about these named projects / ideas / initiatives?
6) With regard to the region: which areas do you consider in need for innovative development (related to forestry, wood processing ...)?
   (Largest potentials for innovation? potentials to implement innovations? what hinders? difficulties?)
7) Which persons, institutions, and networks do you know, that drive innovative ideas forward?
   (Who is important bringing change and innovation to the region? What is this person, institution or network contributing? Resources, contacts, integrative capabilities, that this person (...) consists of?)
8) How do you consider your role in this topic?

## 4. Stakeholder categories

The stakeholders that we are addressing can be classified into categories. By doing so we can check, if we are addressing all relevant stakeholder categories and prevent to exclude stakeholders that might be of importance for improving the governance innovation. We also assess which stakeholder categories are of great or sufficient importance to our region, and which are not (yet). Over the project time, we keep on monitoring the stakeholder constellation, if maybe this picture is changing (new stakeholders may be included, stakeholders involve themselves into innovation process, ...).

Thinking ahead to the preparation of D5.2 the categories help us to compare the case-study specific Stakeholder Analyses and to synthesise core stakeholder features.

Stakeholder categories in "Eisenwurzen"

| **Stakeholder Category** | **Concrete stakeholder in the case study region** |
|---|---|
| **Protected Areas organisations** | National Park "Gesäuse", National Park "Kalkalpen" |
| **Public Administration** | Federal Environment Agency, LTSER-Administration, Deputy of National Assembly (out of the region), local public administration |
| **Municipalities** | Mayors (Steinbach / Steyr, Steinbach / Ziehberg) |
| **Network for Forestry or Wood processing** | MHC Möbel- und Holzcluster OÖ |
| **Smaller businesses (SME)** | Carpenter (furniture and construction), Wood trader, saw mill |
| **Federation of forest-/ wood- related companies** | Local Chamber of commerce |
| **Forest owners** | Farmers' union (also representing small-scale forest owners), Monasteries, Styrian state forests,... |
| **Regional Development Agency** | Regional management agents (several subregions) |
| **Scientific Organization** | STUDIA (local practice partner) |
| **Scientific Organization** | University of Innsbruck |

# Appendix IV: Extended Info sheet for behavioural experiment - Role board game

## Extended Info sheet for behavioural experiment – Role board game

### Rationale of the approach and the need within the InnoForESt innovation region

InnoForESt innovation regions (conceptualised as social-ecological systems, SES) are characterised by manifold, sometimes diverging uses of forest ecosystem services (FES), such as extraction, recreation, preservation or education. These uses are driven e.g. by depopulation, market pressures and ecosystem dynamics (e.g. climate events). FES are considered as public or common goods facing diverging individual and societal interests affecting the quality of ecosystems and well-being of the communities. This may result in overuse, degradation or unsustainable behaviour, creating also barriers for cooperation, economic profit and innovative business initiatives.

In order to get a better understanding of the role and the impact of key innovation factors for the regions, we have designed a behavioural experiment in the form of a Role board game. The main question to be addressed by Role board game is:

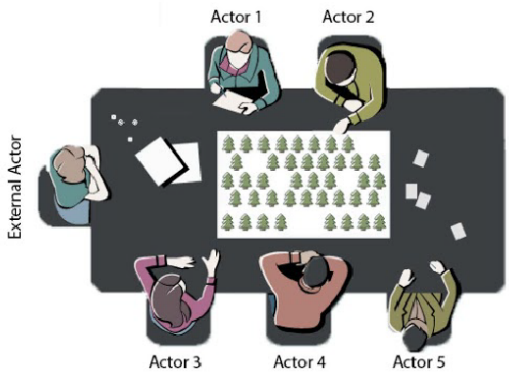
> *How to create conditions to enable innovations for sustainable use and well-being in innovation regions under the diverging interest of FES users?*

### Role board game design, basic rules and process

The Role board game is meant to test combination of innovation factors in real-world setting and is part of prototype development for governance and business innovations. It enables stakeholders from innovation regions to test different innovation approaches and factors, learn about their effect and potential, discuss necessary context conditions, increasing collaborative capacity and trust. Key factors to be tested are e.g. use of incentives (certificates, compensation schemes, offset-banking, payments), use of control mechanisms (state, bottom-up), collaboration strategies (networks, voluntary, regulatory), and risks management. The Role board game supports bringing forest ecosystem service provision from vision to reality in a sustainable, collaborative and innovative action.

The Role board game intends to create a situation in which a group of five different biodiversity and ecosystem service users and providers make decisions about the use and management of a forest for ecosystem service as a governance innovation. Moreover, their decisions are confronted by one external authority – 6$^{th}$ player (e.g. national park, regional office, government, bank etc.). The role of the 6$^{th}$ player is to discuss or regulate, and monitor the group's decisions (see Figure 1) .

**Figure 1: InnoForESt Role board game**




Players represent individual forest users / owners and play several rounds equivalent to years. Each group has an area of forest with 100 initial trees (ha of forest). Number of remaining trees represents the quality of the ecosystem which provides players and the entire community with benefits and services such as biodiversity, carbon sequestration but also climate control and water quality, flood protection, or recreation. Each round 5 players have to make a decision about how many hectares they want to harvest/use. They can harvest/use/consume a maximum of 5 hectares and minimum of 0 hectares. Their decisions in the Role board game can affect the quality of these ecosystem services. Each player makes private and anonymized harvest/utilization decisions, which are motivated by financial incentives. The 6$^{th}$ player's financial earnings are not calculated on the basis of forest harvesting / utilization, but on the number of trees remaining in the forest at the end of the simulation. This arrangement provides a space for discussion about diversified interests in the regions and enabling testing what conditions lead to successful collaboration for sustainable FES provision in their specific contextual conditions for well-being of their communities/region.
Decisions about the use and management of a forest for FES provision as a governance innovation are confronted with fostering or hindering context conditions (e.g. natural disasters). Decreased quality of ecosystem services increases the likelihood of unpredictable natural phenomena such as pest outbreak, whirlwind, droughts, or fires. This is in the simulation represented by further decrease of the number of trees. The probability of the natural disaster is increasing with the reduced quality of the ecosystem (represented by number of remaining trees). During the individual rounds, the ecosystem is naturally restored. For every 10 remaining trees, one new tree is restored.

The game consists of two optional treatments. Each treatment has two stages (two parts with 10 rounds to play with changing conditions). One group plays only one treatment. Both treatments have an identical first stage, with certain FES without any innovation in place. After the first stage players have an opportunity to start over the game with a different rule for the second stage. In the second stage, treatments are different in factors that may affect decisions and innovations and thus leads to behavioural change of stakeholders. This approach will create a space to test innovation activities for prototype development (reflecting scenarios as preferred development options for the innovation regions).

**Treatment 1:** concerns the **variety of motivations** that make innovations attractive for stakeholders to participate and support FES provision in a long term. They were designed for each innovation region and the narrative was changed accordingly, however, they were built on the same bases:

- **Payment for ecosystem services at the end of the game (ex-post payment)** – this option contains, on the one hand, reduced earnings from harvested /used trees, on the other hand it provides faster natural ecosystem recovery and additional end-of-game payment derived from remaining trees (quality of the ecosystem);
- **Payment for ecosystem services at the beginning of the game (ex-ante payment)** – this option contains, on the one hand, restriction for harvesting /utilization of ha of the forest (with probability of monitoring and sanctioning for breaking the rule), on the other hand it provides faster natural ecosystem recovery and additional compensation payment at the beginning of the game;
- **Payments for ecosystem services based on decisions at each round** – this option contains additional profit for reduced harvesting/ utilization of ha of the forest calculated from individual decisions of each player.

**Treatment 2:** focus on the **governance innovation, when the forest is affected by an external disturbance** (climate event, market pressure etc.). Stakeholders can decide about the introduction of new regulatory rules and they can collaborate on development of innovative social rules:

- **Top-down regulation** – this option contains an imposed limit of usage of the forest (with probability of monitoring and sanctioning for breaking the rule);
- **Rotation scheme** – this option contains limits in number of players who can use the forest in each round (with probability of monitoring and sanctioning for breaking the rule)
- **Self-organisation** – this option contains possibility of design own rules development based on discussion, the 6th player has an option to imposed limit of usage of the forest (with probability of monitoring and sanctioning for breaking the rule).

Please see Table 1 for overview of the game logic.

After playing, players were asked to take part in short survey to clarify reasoning of their decisions during the game, their motivations and their reflections on the game design. At the same time, calculations and graphical interpretation of the game were prepared to show them their aggregated decisions during the game. Then, players were invited to a focus group discussion to discuss main findings and game implications for their innovations in the regions. Last minutes of the session are allocated for the stakeholders' payoffs that are based on their individual results from the game (in form of financial/material rewards to the stakeholder part was fixed and part was based on their individual decisions during the game).

**Table 1: Overview of the InnoForESt Role board game treatments**

| *Basic parameters of the game:* | | | |
|---|---|---|---|
| ➢ in each round, group of 5 stakeholders make a decision about use of the forest (forest units);<br>➢ communication is allowed;<br>➢ one external stakeholder monitors and discusses others decisions;<br>➢ forest quality is subject to natural regeneration of the forest (10% regrowth);<br>➢ probability and consequences of external disturbances (e.g. climate event, market pressure etc.);<br>➢ technical maximum of FES use for each player/stakeholder. | | | |
| **TREATMENT 1 – EFFECT OF PAYMENTS** | | **TREATMENT 2 – EFFECT OF RULES** | |
| **Stage 1** | **Stage 2** | **Stage 1** | **Stage 2** |
| ➢ **Basic parameters of the game**<br>➢ No social rules are set.<br>➢ Game starts with **100 units** (trees, forest quality, habitats, etc.) | ➢ **Basic parameters of the game**<br>➢ Game starts with **100 units** (trees, forest quality, habitats, etc.)<br>➢ **Stakeholders vote** for preferred innovative element for FES management<br>***Innovative elements:***<br>Options for FES management:<br>a) Payment for ecosystem services at the end of the game (ex-post payment)<br>b) Payment for ecosystem services at the beginning of the game (ex-ante payment)<br>c) Payments for ecosystem services based on decisions at each round | ➢ **Basic parameters of the game**<br>➢ No social rules are set.<br>➢ Game starts with **100 units** (trees, forest quality, habitats, etc.) | ➢ **Basic parameters of the game**<br>➢ Game starts with **80 units** (trees, forest quality, habitats, etc.)<br>➢ **Stakeholders vote** for preferred social rule - innovative element for FES management<br>***Innovative elements:***<br>- inspection and sanction for regulation of usage;<br>- selection and development of rules:<br>a) top-down regulation (limited usage of the forest);<br>b) rotation scheme (limited number of players can use the forest)<br>c) self-organisation (own rules development based on discussion) |

## Steps of the Role board game

The total time needed for the Role board game is about 2 hours, consisting of:

1) Explanation of the rules (15-20 minutes).
2) Game playing (60 minutes).
3) Short survey on decision reasoning / calculation of the group results (5 minutes).
4) Focus group discussion: game results and comparison (25 minutes).
5) Payment of earnings to stakeholders (5 minutes).

## Flexible Role board game components and adjustments to Innovation regions

The Role board game session is based on common algorithm but allows for flexible arrangement and adaptation for each innovation region. Adapted can be:

- **the role of 6 stakeholders** can be specified in each case (e.g. networks, extraction and conservation users, students, visitors, bank, etc., depending on innovation region + networks);
- **the use of the resource** can be specified in each case (harvesting, reduction of forest quality, decrease of biodiversity/habitats, etc.);
- **Treatment 1** - offers options for modifying business innovations/prototypes towards sustainable FES provision specific to the case (based on scenarios: wood chipping, local wood furniture, recreation, education etc.);
- **Treatment 2** - offers space for design of authentic resource regime (e.g. self-organisation, network, centralized conservation, public - private partnership, etc.) dealing with external disturbance.