InnoForESt

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

GA no. 763899

D5.3: Final report on CINA workshops for ecosystem service governance innovations: Lessons learned

Main authors:

Ewert Aukes, Peter Stegmaier, Christian Schleyer

With contributions from: Francesca Bussola

Reviewers: Enzo Falco, Hannah Politor, Klaasjan Visscher

Work package	**WP5 Innovation process integration**			
Deliverable nature	**Report (R)**			
Dissemination level (Confidentiality)	**Public (PU)**			
Estimated indicated person-months	**5**			
Date of delivery	**Contractual:**	**31 March 2020**	**Actual:**	**30 November 2020**
Version	**1.0**			
Total number of pages	**49**			
Keywords	**Forest Ecosystem (FES) Governance Innovation, Constructive Innovation Assessment (CINA)**			

Executive summary

Constructive Innovation Assessment (CINA) is one of the **core methods** used in InnoForESt to support the governance innovation processes concerning forest ecosystem services. Its uses are both practical and scientific. It was the task of CINA to systematically **transfer this knowledge into the innovation process itself**. For this purpose, narrative, sometimes rather tabular, scenarios were developed that combine stakeholder interests, the innovation options and the governance situation.

The aim was to formulate realistic and context-based innovation options including the key tensions an innovation has to deal with. But it couldn't stop there, because the stakeholders are the linchpin of all our efforts: they have to be able and willing to do something with the ideas. So, we set up the **innovation work** in such a way that the scenarios were developed, stabilised or modified, and sometimes even sorted out (terminated) together with the stakeholders at important points in time, in the context of intensive workshops that were spread over the entire duration of the project. We refer to this entire procedure as the **CINA process**.

Working with the **CINA approach is not an end in itself**, but is **closely linked** to the respective situation in the region and the ability to involve stakeholders in such a way that practical work on an innovation is possible. CINA stands and falls with it.

Our review of the documents collected from the project showed that the following topics were decisive for the **feasibility and quality** of the CINA work:

1. The implementation and social embedding of an innovation: context matters
2. Scenarios: the core tool of CINA
3. Process approach and CINA workshop types: different formats are useful at different points of development
4. Links to the entire innovation process: concerted action helps to link CINA into the innovation
5. Preparatory research: strategic intelligence provides the basis
6. Scenario work: clear outlines of alternatives in context are the key working device
7. Prototype development: best understood as scenario work on another (practical) level
8. Inclusion of aspects and actors: a balancing act, for the right mixture and level of innovativeness
9. Stakeholder involvement, motivation and workshop productivity: commitment must be stimulated
10. Workshop moderation: being constructive in terms of content and group dynamics
11. Franchise approach: passing on requires being there.

On the one hand, this means that the CINA process must be imagined as being directly **interwoven** with what is happening around the forest ecosystem governance of a region. Everyone involved must understand that participating in the InnoForESt project is not just a series of workshops that are treated as purely compulsory exercises. On the other hand, we have learned that for the partners in the regions, participating in the InnoForESt project is also a practical challenge: to remain confident and true to oneself and one's own competencies, but at the same time have to be open to trying something different. For them, CINA is not only part of a broader process, but also a **method**. This method seems bulky at first, but in the course of dealing with it it gains more momentum and appeal.

The **effort** involved in introducing and supporting CINA is immense. If one does not want to return to a simple, linear illusion of innovation that can be controlled, then it is worth investing in assistance work with regional partners. All sides learn from it.

Table of contents

List of abbreviations

EU-MACS	European Markets for Climate Services
InnoForESt	Abbreviation for the project 'Smart information, governance and business innovations for sustainable supply and payment mechanisms for forest ecosystem services'
NGO	Non-governmental organisation
CINA	Constructive Innovation Assessment
CTA	Constructive Technology Assessment
GSA	Governance Situation Assessment (refers to InnoForESt Deliverable 5.1, Aukes et al. 2019, and Deliverable 5.5, Aukes et al. 2020)
STA	Stakeholder Analysis (refers to InnoForESt Deliverable 5.2, Schleyer et al. 2018)
SETFIS	Socio-ecological-technological forest innovation systems
SYKE	Finnish Environment Institute

List of tables

List of figures

List of implication boxes

List of pictures

1. Introduction

Constructive Innovation Assessment (CINA) is one of the **core methods** used in InnoForESt to support the governance innovation processes concerning forest ecosystem services. Its uses are both practical and scientific. On the one hand, with roots in Technology Assessment, it is well-fit to structure innovation processes in practice and support the further development of the innovation idea in question. On the other hand, it is an entry point for studying the functioning of innovation processes, in this case in the environmental domain. A methodological innovation in its own right (see section 2), this calls for an evaluation and an account of the lessons learnt, which we present with this report.[1]

This report **builds** directly on two other reports recently published by the InnoForESt project—which is an **Innovation Action**[2]—that deal with the CINA approach pursued in this project. On the one hand, it is based on the series of individual dossiers, which were prepared by project colleagues in the Innovation Regions via the CINA processes and were presented in **Deliverable 4.2** (Aukes et al. 2020), and, on the other hand, this report benefits greatly from the reconstructions of the individual Innovation Journeys in the regions and our systematic comparison, that were carried out in the course of **Deliverable 4.3** (Loft et al. 2020). What we want to discuss in this report, has been developed on empirical grounds. Firstly, we closely followed the colleagues in the individual regions throughout the project duration of IF (in many online meetings and on-site visits). Secondly, we discussed the reports for InnoForESt Deliverable 4.2 in detail with the colleagues in the regions. It builds, thirdly, on the detailed discussion of the innovation journeys with the colleagues in the regions. The deliverable now available has again been coordinated with the regions. This process ensured a solid base for this report. In this report, in a first step, we merged all the knowledge that we have about the **CINA workshops in the context of the entire innovation processes**.

In a second step, we formulated implications for various stakeholder groups that arise from the findings under the known circumstances. These **implications** are lessons learned as promised in the report title. In any case, it is those lessons that we can draw from experiences and discussions of the stakeholders and regional innovation facilitators. However, we cannot say (a) to what extent these experiences are instructive, (b) which are in fact already internalised, and (c) what impact they have on further innovation efforts. A big step needs to be taken after reflecting on the last action before lessons can be implemented in a new action. This step is not always easy because, firstly, one would have to break out of habits, and, secondly, translate the lessons into actually implementable instructions for new actions under new circumstances. However, we hope that this report will help to support and inform the chance of such a translation into further practice. We are also happy to provide direct **advice** to actors who want to tackle similar innovations in the future.

In order to make the lessons more tangible, we will not only talk about implications in the following, but always with reference to the **different perspectives of the actors involved**. We focus mainly on the following perspectives: (1) the **innovation facilitators** in the local organisations who try to facilitate interaction among various interested stakeholders in pursuit of an innovation idea, (2) the **stakeholders** who participate in the innovation attempts and ultimately carry the process (the innovation facilitators), (3) the **scientific advisors** and accompanying researchers in the Regions (the analytical advisors and partners), (4) the accompanying research on **project level** which overlooks several such efforts in order to generate scientific insights beyond the merely practical aspects (the analytical observers), and (5) the **public policy** procurers of innovation, e.g., in the European Commission, funding such a project as InnoForESt (policy), or local policymakers.

---

[1] See also InnoForESt Deliverable 4.3 (Loft et al. 2020, section 7.2).

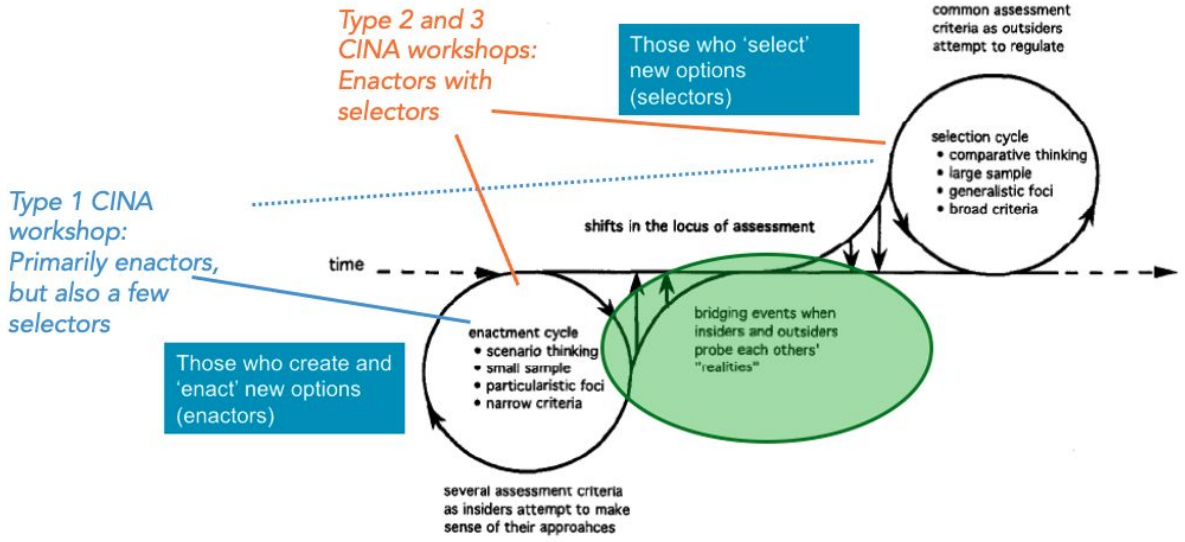
[2] In *HORIZON 2020 – WORK PROGRAMME 2018-2020 General Annexes, Section D. Types of action: specific provisions and funding rates, Part 19 – Commission Decision C(2017)7124*, an Innovation Action is defined as "*Action primarily consisting of activities directly aiming at producing plans and arrangements or designs for new, altered or improved products, processes or services. For this purpose they may include prototyping, testing, demonstrating, piloting, large-scale product validation and market replication.*"

In the following, we elaborate on the idea of Constructive Innovation Assessment and relate it to its core tool as well as other efforts undertaken under InnoForESt auspices (section 2). In section 3, we revisit the lessons gleaned from the individual Innovation Region experiences and in section 4 we summarize what was new and how CINA can be developed further.

2. CINA as an operational concept for assessing governance innovations

For InnoForESt we have developed various approaches to assure ourselves of the situation in which the governance innovations with regard to the ecosystem services take place. On the one hand, we researched **governance situations** very specifically by carrying out stakeholder analyses, as well as analyses of historical development dynamics and current governance problem structures. On the other hand, broader observations were made on the current **biophysical and institutional situations** in relevant EU countries (InnoForESt Deliverable 2.1, Primmer et al. 2019), which were supplemented by factor identification and discussion with stakeholders over the course of the project (InnoForESt Deliverable 3.2, Kluvánková et al. 2020). It was the task of CINA to systematically **transfer this knowledge into the innovation process itself**. For this purpose, narrative, sometimes rather tabular, scenarios were developed that combine stakeholder interests, the innovation options and the governance situation. The aim was to formulate realistic and context-based innovation options including the key tensions an innovation has to deal with (see Figure 1 below). But it couldn't stop there, because the stakeholders are the linchpin of all our efforts: they have to be able and willing to do something with the ideas. So, we set up the **innovation work** in such a way that the scenarios were developed, stabilised or modified, and sometimes even sorted out (terminated) together with the stakeholders at important points in time, in the context of intensive workshops that were spread over the entire duration of the project. We refer to this entire procedure as the **CINA process**.

Figure 1: CINA workshops in innovation context (cf. Garud & Ahlstrom 1997; Rip 2012)



The approach of CINA is in the tradition of Constructive Technology Assessment (CTA), which has long been known from the assessment of emerging technologies and has been used successfully (Rip & te Kulve 2008; Rip & van den Belt 1986) to explore alternatives that are more robust and acceptable socially, technically, commercially, politically, ethically, legally or otherwise (see also https://cta-toolbox.nl/). As forest ecosystem service provision and governance involves much beyond technology, we redesigned the CTA approach. The result is our **Constructive Innovation Assessment** (cf. Aukes et al. 2019; Stegmaier 2020). We already developed the first versions of this in the Horizon 2020 project European Markets for Climate Services (EU-MACS, http://eu-macs.eu/), but at that time we did not call it CINA yet, but CTA (Visscher et al. 2020; Stegmaier & Visscher 2017).

Table 1: Comparison of the Constructive Technology Assessment and Constructive Innovation Assessment approaches

	CTA	CINA
Aim	Optimisation of technology development	Reflection of and during innovation process
Mandate	State endorsed, payed Stakeholder acceptance	EU procurement Stakeholder acceptance
Motivation	Better technology for better society	Learning potentials for innovation process
Format	Workshop	Workshop, interview
Nature of bridging	Introduces "selectors" and bridges as core aim of the interaction	Introduces "selectors" and bridges as core aim of the interaction
Working devices (workshops)	Scenarios, multi-path maps, socio-technical configurations	Scenarios, multi-path maps, socio-technical configurations, typologies; additional formats (e.g., Role Board Games in this project)
Working devices (research)	The usual social research methods	Governance Situation Assessment (GSA), Stakeholder Analysis (STA), and the usual social research methods
Frequency	1 or a few times	Several time, along innovation process

While CTA primarily **focuses** on optimizing technology development, CINA aims at reflection during the innovation process (Table 1). So far, CTA has mostly been approved and paid for by the Dutch state in order to incorporate an instance and opportunity into specific national research programs through which both the potential and the concerns of those involved and affected can be identified and addressed directly. CINA, by contrast, has always been used in the context of EU procurement of innovations through so-called Innovation Actions in the framework program Horizon 2020 (InnoForESt itself and in the above mentioned EU-MACS projects). Both CTA and CINA also live to a large extent from the acceptance of the stakeholders involved. As a **motivation** for why these approaches were developed and used in the first place, one can name for CTA the goal of supporting better technology for a better society, while at CINA the promotion of learning potential is more decisive for the innovation process. In the first case it is about a broader social benefit, while in the second case the focus is more on the quality of the innovation process.
CTA rarely works with more than one workshop per innovation. CINA also knows this selective focus (Hamaker et al. 2019), whereby **workshops** can also be replaced by specially structured interviews if the circumstances so require, but has also introduced workshops for InnoForESt several times along the entire innovation process. This accompanies the **process** itself, not just a one-off impulse. Both approaches use the usual **methods** of social research, mostly qualitative (because direct interaction and understanding should be established with the stakeholders), but also quantitative (to record larger, quantifiable relationships), where appropriate. For InnoForESt, CINA has developed special analysis focuses, such as the so-called Governance Situation Assessment (GSA) and Stakeholder Analysis (STA), which are designed for the specifics of the change in the governance of forest ecosystem services. Both approaches use known techniques and formats for the preparation of innovation alternatives such as (narrative) scenarios, multi-path maps and socio-technical configurations. Specially created typologies have also been used for CINA (Visscher et al. 2020). Another difference is, of course, that CTA focuses on emerging technologies. Both approaches have the Collingridge dilemma[3] as underlying rationale, addressing uncertainty and ambiguity for the different stakeholders.

[3] The Collingridge dilemma is based on the assumption that there is plenty of scope for design in the early phases of technology development, but comparatively few clues to evaluate the possible design variants, while in later

Figure 2: Idealised workflow during a CINA workshop

Welcome, introduction	– Emphasise what's good for participants (project secondary) – Working mode – Let's probe our best ideas, put into scenarios – "Let's talk out of the box!"
Brief introduction to scenarios	– Key points in comparison – Participants have seen them before (sent by mail in advance)
Discussion of scenarios	– Now, in the hands of the moderator(s) to sense what participants want to emphasise – ... and when to channel the discussion to other aspects, too – Primarily open discussion, but can for some moments be filled with mini-games (sorting of options, voting, ...)
Joint summary: results of scenario appraisal	– How to see scenario alternatives – What needs to be modified (added, changed, etc.) – Which scenarios or parts of them should be pursued further?
Discussion of implications of selected scenario(s)	– Given the most attractive/realistic scenarios ... – what do to, what to focus upon? – whom/what else to include (missing in the innovation so far)?
Joint summary: results	– Summary of implications – Who commits to what? – Expression of expectations what should be done/come next
Finale	– Summary of overall results (if more general results need to be expressed than those in step before) – Eventually open discussion again for things that also need to be said – Expression of expectations what the next strategic workshop should address – Planning of next steps together

2.1 CINA as interplay between knowledge, negotiation, and the organisation of innovation

The CINA approach lives from the fact that **knowledge** is acquired along the entire process. In preparation of the workshops, the situation regarding the innovation and the participants is examined in detail. During the workshop the factual discussion is **thoroughly** followed and documented. After the workshop the documentation is appraised in detail in order to be able to precisely understand the new findings from the workshop **interaction**.
This can also be described as a constant going back and forth between research on the subject and discussion of the findings and interests, possibilities and limits for the present innovation in the light of the findings—research and innovation in interplay. This requires permanent feedback with the stakeholders (in order to involve them and keep them engaged). Taken together, this not only ensures the current strategically important knowledge, but also the integrity of the process.

2.1.1 Implementation and societal embedding of an innovation

The **ongoing exchange** between the stakeholders and the innovation workers of the project fulfills two tasks at the same time: On the one hand, all findings and innovation progress are continuously coordinated with the stakeholders and thus included in the innovation process (implementation); on the

phases the assessment and evaluation is easier the scope for design is greatly reduced due to the most diverse tendencies towards solidification (Collingridge 1980). In InnoForESt we have both cases: completely new innovations and well-developed re-innovations. The Collingridge dilemma actually describes two extreme conditions. In between, a more or less continuous transition from states of rather high configurability and rather difficult assessability to increasing consolidation can be expected. In addition, depending on the specific area, the degree of reversibility and assessability can be very different. In this respect, you are not dealing with an either / or option, but with a continuum along which the design approaches have to be adjusted (Kuhlmann et al. 2019). It is not - at least mostly—that at an early stage it is a question of deciding for or against a form of governance (CTA: technology), but to successively deliver contributions that provide indications for the development and its social embedding, which directions can presumably be socially desirable—and which are not. CINA and CTA now come into play before a technology and its social embedding gradually gain stability and, as indicated at the beginning, endeavors, in particular, to address—albeit not exclusively—actors who are involved in ongoing design.

other hand, the innovation process remains socially (politically, economically) embedded through the accompanying research and communication with stakeholders.

Picture 1: CINA Workshop on 8 May 2019 in Fiera di Primiero, Trentino, a researcher-discussion rapporteur (standing) listening to and and speaking with stakeholders

Picture 2: CINA Workshop on 8 May 2019 in Fiera di Primiero, Trentino, a researcher-discussion rapporteur (front left) listening to stakeholders

***Implications box:* Implementation and societal embedding of an innovation**

Workshop moderators:

- Make sure that CINA is more about exchanging and negotiating viable paths than just brainstorming or open discussions and that the moderator needs to be willing and able to support this. You also need a working relationship with and background knowledge about the participants.

Local innovation facilitators:

- Remember that contact with stakeholders is not only an end in itself, but always also about exploring interests, getting to know each other (better) and building a working relationship. Your stakeholders also learn from and respond to the way you address them, how the whole innovation project approaches them, how you include their specific points of view in the preparation of a workshop or innovation scenario and how seriously you take them.

Regional scientific advisors:

- Although you are often 'merely' responsible for contributing the research, when collecting data, it is not just about distant research, but about exploring interests, getting to know each other (better) and building a working relationship. Your stakeholders also learn from and respond to the way you carry out the research, how the whole innovation project approaches them, how you include their specific points of view in the preparation of a workshop or innovation scenario and how seriously you take them.

Cross-project observers:

- Compare how various innovation projects approach their stakeholders, how specifically their perspectives are included in the preparation of a workshop or innovation scenario and how seriously they are taken, especially if there are several sub-projects or participating regions like in InnoForESt. Informing the various local partners about the different approaches and thus making alternative courses of action and experiences accessible to them can be experienced as very helpful.

Policymakers:

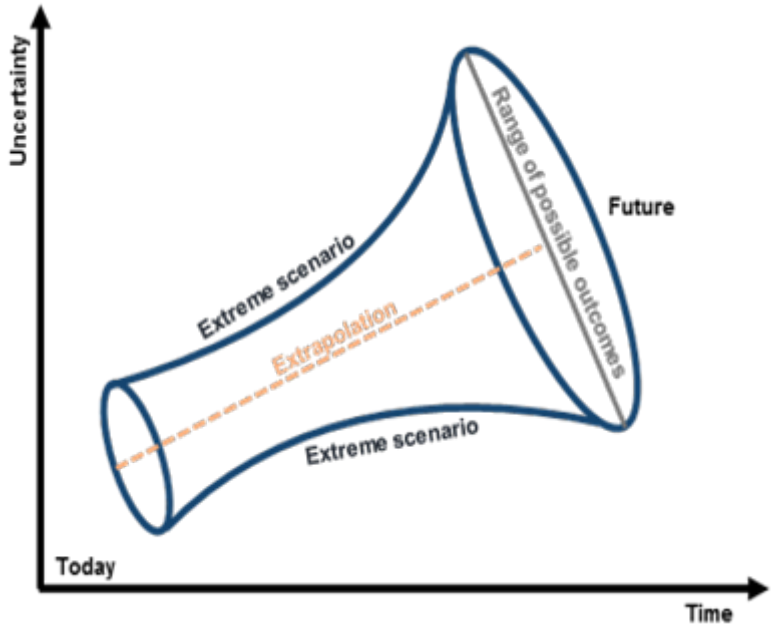
- Use your resources to create leeway for stakeholders to be thoroughly involved, if you want to increase the chances of success of the innovation project—this applies at both local and EU level.

2.1.2 Scenarios: CINA's core tool

Well-informed, realistic, and thought-provoking scenarios (Paradian & Rip 2013; Robinson 2009; Rip & te Kulve 2013) as narratives, with conceptual graphs, symbolic pictures, etc., were a core tool for CINA workshops. The preparation of a CINA workshop therefore crystallised in the development of scenarios the participants found compelling to discuss, because they **mirrored the situation** they were in or aiming at, while also **projecting realistic expectations** about how specific conditions may have influenced the feasibility or further development of an innovation (cf. InnoForESt Deliverable 5.1, Aukes et al. 2019: 50). Scenarios are often based on tensions in the current situation and provoke thinking about alternative futures (plausible under certain conditions).

The scenarios in InnoForESt have been based, firstly, on **research** the project has carried out in its first year: the mapping of biophysical and institutional conditions for forest ecosystem services across Europe (InnoForESt Deliverable 2.1, Primmer et al. 2019) and in the Innovation Regions, the Stakeholder Analysis and the Governance Situation Assessment (InnoForESt Deliverable 5.1: Aukes et al. 2019, chapters 2.5 & 3).

Figure 3: Basic horizon of CINA scenarios[4]



Moreover, in the further pursuit of the project—particularly through the innovation platforms and the workshops—the research focused on integrating the new findings from the interactions with the stakeholders in the Innovation Regions into the further development of the innovation prototypes[5], i.e., idealized models of the improved innovation. The **learning curve** also connected one workshop to the following one, as the results of one workshop fed into the next innovation action, and the findings about the innovation actions again fed into the next-stage workshop and the revised scenarios that have been used there (cf. InnoForESt Deliverable 5.1, Aukes et al. 2019: 51).

[4] https://cta-toolbox.nl/tools/scenarios/#aim [30 November 2020]

[5] This process, including the CINA workshops, Role Board Games and SETFIS reflection interviews was termed "interactive prototype development".

***Implications box:* Scenarios: CINA's core tool**

Workshop moderators:

- Know the situation, scenarios, and the workshop participants very well.
- Be deeply familiar with the CINA method, i.e., take part in the training courses offered by the project.
- Attend the workshop preparation sessions, which the CINA experts also attend, in order to help adapt the method to the respective workshop situation in the region.
- Identify not as mere moderators, but as communicators of knowledge and facilitators who are familiar with the matter, talk about the matter and make suggestions for the exchange between the participants.
- Demand the necessary input from regional/local innovation facilitators (practice partners) and analysts (science partners), supplemented by further information from the project about other regions (e.g., with similar problems or ideas) that they receive from the cross-project observers.

Local innovation facilitators:

- Coordinate constantly with those involved and monitor changes in the (political, legal, economic, personal, operational, biophysical, etc.) situation. You cannot only develop the innovation idea at the green table.

Regional scientific advisors:

- Follow the innovation process with all its interactions closely so that you can grasp the essence and the crux of the innovation.
- Be aware that you cannot rely on metrics or reports because it is the contextual knowledge that allows you to understand the documentation. You can only acquire that necessary contextual knowledge in the field.

Cross-project observers:

- Follow the innovation process with all its interactions closely so that you can grasp the essence and the crux of the innovation.
- Be aware that you cannot rely on metrics or reports because it is the contextual knowledge that allows you to understand the documentation. You can only acquire that necessary contextual knowledge in the field.

Policymakers:

- Acknowledge that innovation processes need time—to establish themselves, to try out what is possible and what is not, to be able to deal with setbacks, to see initial successes and to build on them and make progress.
- Support CINA in its accompaniment of such highly dynamic and hardly plannable processes at least over part of the route by making time and other resources available.
- Take these circumstances into account when making innovation policy, if you want to stimulate innovation with projects.

2.2 Processual approach and CINA workshop types

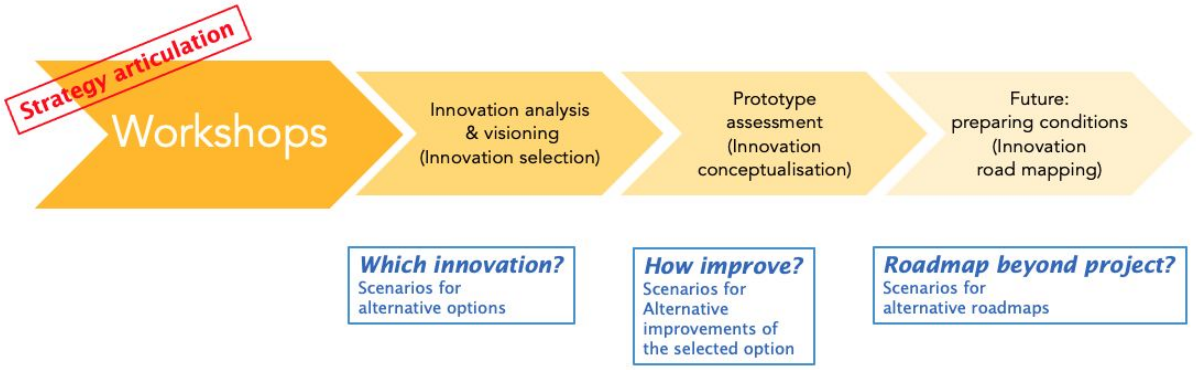
Constructive Innovation Assessment was not limited to, but revolved around the strategic workshops (Te Kulve & Konrad 2017; Te Kulve 2014). As opposed to regular work floor interactions, these strategic workshops—which are the CINA workshops—were characterised by a careful preparation including the (further) development of scenarios representing possible innovation prototypes (InnoForESt Deliverable 5.1, Aukes et al. 2019: 8).

Once innovation networks were initiated and regular work floor meetings with more specific, smaller groups of stakeholders or individuals had taken place, the network members could also be brought together in a series of strategic workshop activities. These strategic workshops were held as soon as **overarching questions and key decisions** were pending, for which one had liked to involve stakeholders from across the range in order to get a **broad basis** for further work.

For the development of the forest ecosystem services governance innovation, **three kinds of strategic CINA workshops** were 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 (InnoForESt Deliverable 5.1, Aukes et al. 2019: 47-48).

The three kinds of strategic workshops constituting the workshop series are (Figure 1): (a) innovation analysis and visioning, (b) prototype assessment, and (c) preparing future conditions partially inspired by https://cta-toolbox.nl/ and Schwerdtner et al. (2015). In many cases, the different types were carried out several times, in particular the first type was sometimes repeated in order to be able to choose an innovation option in the first place. There is no rule or guarantee that this must work the first time.

Figure 4: The workshop logic developed by InnoForESt



These three types of workshops followed a logical **sequence of innovation development**, which has been entered at different levels depending on the stage of an innovation:

1. In the workshops dealing with '**innovation analysis and visioning**', the aim was to gain an understanding of what made the innovation work, and what its actual and/or potential impacts and limits were.
   Furthermore, a vision was developed how the innovation coordination could happen or improve. These discussions were all based on insights of the development of the innovation and its key influencing factors (related to governance, institutions, economic, environmental, or practical issues).

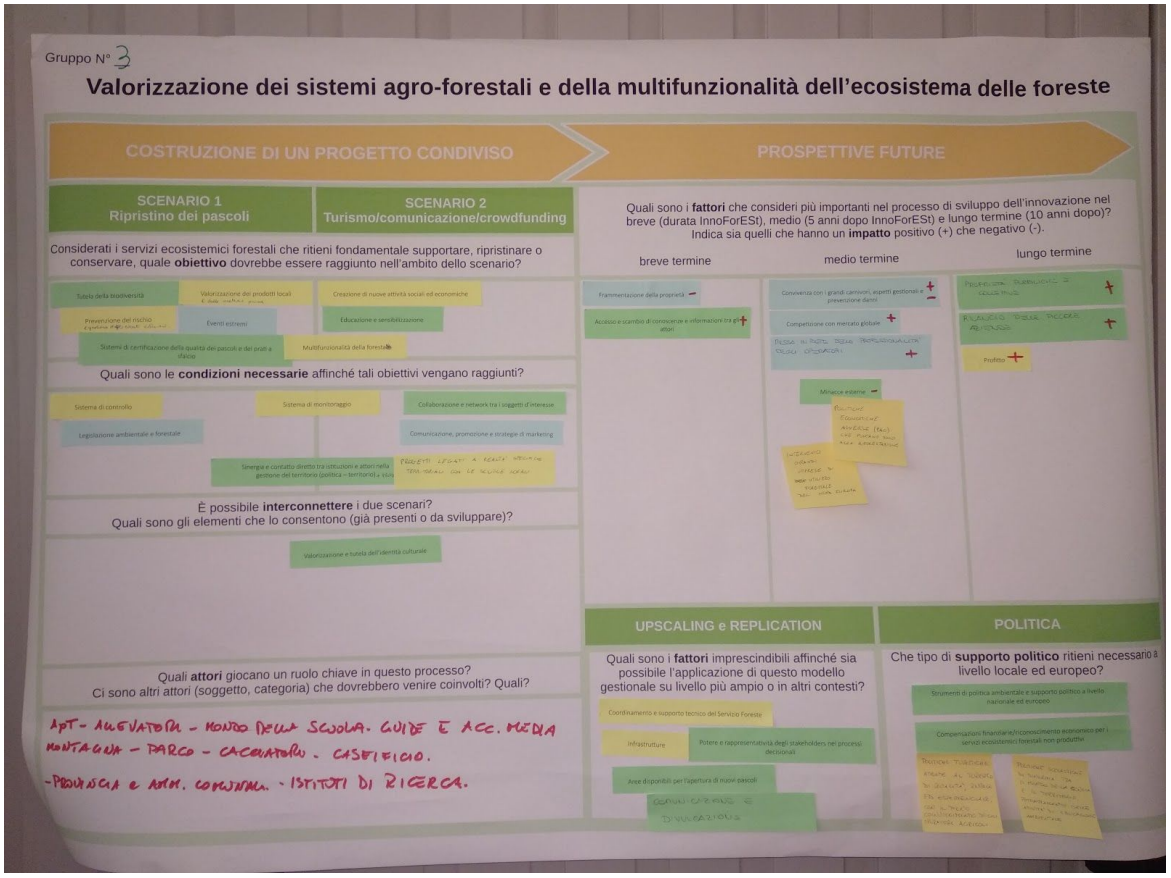
This workshop type led to a set of concrete ideas on how the innovation could be improved and developed further, resulting in what InnoForESt calls innovation 'prototypes', i.e., the version of the innovation that the innovation network wanted to proceed with.

2. During the second type of strategic workshops, the **innovation prototype** chosen during the first analysis and visioning workshop was **assessed**.
   This comprised the critical debating of idealised 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 has, in some cases where applicable, been an experimental role board game, which explored these questions from a different, more rational choice- and factor-oriented perspective.

3. The third kind of strategic workshop was typically used to discuss what future **conditions** need to be prepared. This presupposed 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 needed to be prepared to make the innovation work, the stakeholders developed a (more or less explicit) innovation **roadmap** that highlighted what needed to be changed, who needed to be included, and how all this could be achieved; and thereby matched the developed vision of the innovation with reality to actually put it to work.

CINA is thus linked to other activities and innovation policy work (Joly et al. 2010; Smits et al. 2010) in that both explicit arenas for negotiation (workshops) and knowledge bases (research, evidence-basis) have been created for this.

Picture 3: Second CINA workshop in Trentino/Primiero: canvas about factors selections, scenarios and future perspectives analyses



***Implications box:* Processual approach and CINA workshop types**

Workshop moderators:

- Coordinate well with the other parties involved in order to absorb the momentum. Rather than moderate, you need content-related co-execution and the establishment of basic personal relationships with those involved, who may also talk about confidential business ideas.
- Acquire an understanding of the dynamics of the project as it actually unfolded and the dramaturgy of the CINA approach.

Local innovation facilitators:

- Keep your ears close to the stakeholders. You need to take care of the practical relevance and suitability for practice and trust that the accompanying researchers will highlight hidden details and context.

Regional scientific advisors:

- Prepare the detailed and overview knowledge required and enrich the scenarios with it. You are responsible for highlighting hidden details and context, while the local innovation facilitators take care of the practical relevance and suitability for practice.

Cross-project observers:

- You need to travel and communicate through online meetings frequently, if you want to keep an overview of the various approaches and processes in the participating regions from the overall project perspective, since not just individual, but entire series of workshops may be carried out.
- Organize preliminary and debriefing meetings before and after all workshops and send observers to as many workshops as possible.
- Help with coordinating the scenario work as sparring partners to discuss the scenarios and to suggest ideas from the project and other regions. The aforementioned preliminary and debriefing meetings are also very useful for this.

Policymakers:

- From a policy point of view, process approaches such as CINA are useful, as they do not blackbox the actual innovation work, but stay on the trail of what is happening. You can then readjust the policy framework where it does not yet optimally support this process.
- A process approach also reveals the dynamics and obstacles in the course of innovations, and, in turn, increases the understanding of how precarious and stubborn these can become. You, unfortunately, cannot simply program for or order success to happen.

2.3 Links to overall innovation processes

If the CINA approach formed the backbone for the innovation process, one could observe two different interpretations of this role: (1) One variant emphasized the CINA workshops and greatly **reduced the innovation work to** the execution of these three types of **workshops**, or even three workshops of all three types each. (2) The other variant understood the innovation process to be **more diverse**: the thorough exploration of the situation, the establishment of contact and continued discussion with the stakeholders, the working meetings and occasionally the strategic CINA workshops as highlights. Both variants can make sense, depending on the circumstances: if you get **only little movement** into the stakeholder work, you will appreciate being able to get some attention and range of participation at least with the strategic workshops; if it was more **easy to mobilise the stakeholders** and develop attractive ideas for the innovation, the innovation work could of course be put on a broader footing and the workshops rather had the function of focusing and channeling the innovation work that was already ongoing at certain points.

The CINA process was often **complemented** by bilateral and smaller group **meetings** (sometimes called focus groups). This happened (a) at earlier stages when ideas were collected and stakeholders mobilised, (b) as well as in form of "task force" meetings later, once a prototype had been found and more targeted interaction took place to pursue this further (e.g., Eisenwurzen). There were also (c) extra events, only loosely connected to IF and CINA, such as a follow-up workshop by Čmelák (in the Liberec region) or the Pyrolysis project in Eisenwurzen as side project to InnoForESt that linked up to the regional InnoForESt network, used the platform, and then left again (for more details, see InnoForESt Deliverable 4.3, Loft et al. 2020, chapters 5.6 and 5.1).

Not all innovation projects set themselves the goal of involving the broadest possible **range of stakeholders**. For example, in politically very tense phases, enlargement tended to be dispensed with until the innovation idea emerged more strongly and at the same time the political tensions had weakened (Mecklenburg-Western Pomerania). In Eisenwurzen, a fairly large region that touches three Austrian federal states, on the one hand, by changing workshop locations, one has always been able to include other stakeholders who otherwise would not have gone the long way, but on the other hand, one also lost some of those before had been there and now found their way too long. At the same time, it also emerged who was so focused on the project that he or she was always there. In the case of the Love the Forest project in the Gothenburg region and the Habitat Bank of Finland, the composition of the stakeholders changed due to changing interests. This in turn led to the fact that innovation scenarios that were strongly tied to the missing stakeholders were sorted out in order to continue with the ideas that were actually supported by the current composition of the stakeholder group. In Eisenwurzen some stakeholders (mainly such who only joined the process during the second workshop) then left again, as it was difficult for them to connect to the ideas.

Implications box: Links to overall innovation process

Workshop moderators:

- Stand above the matter and understand the importance the local innovation facilitators attributed to the workshops, extra groups and activities. You need this profound understanding to be able to refer to them in such a way that the stakeholders are mobilised accordingly. You cannot promise anything that will not happen.
- Be familiar with the intra-regional differences and understand the changes in the scenarios.

Local innovation facilitators:

- The intensity of the innovation work depends on the importance you attribute to the workshops, extra groups and activities. You might miss the chance to gain momentum for the innovation, if you fail to notice that you have committed stakeholders or pressing problems and only organise a number of compulsory workshops.
- Undertaking too much can also be a problem, as that can overwhelm stakeholders, even though their commitment is rather weak, and stifle the innovation work.
- Translate changes in the stakeholder composition and the scenarios into constructive innovation work—which means being able to decide which options to hold onto or which ones to part with, if they are no longer entirely viable.

Regional scientific advisors:

- Provide strategic information that assesses the approach with minimal or extended workshop effort and suggest changes if necessary. You can possibly identify developments, obstacles or possibilities from a distance that the innovation facilitators did not notice in close contact.
- Absorb the changes in the stakeholder composition and the scenarios through the accompanying research. Sometimes, due to these changes, you need to re-investigate new constellations and derive strategic implications for the innovation work.

Cross-project observers:

- Share what was achieved or not achieved in other regions with different levels of activity.
- Make sure that everyone on a cross-project level understands that changes happen everywhere. You can feed this understanding back into the innovation processes, because local innovation facilitators may not always be sure whether things will work properly, in case something changes and what can sensibly be done about that.

Policymakers:

- Provide additional resources to promote the activities from the outset (if you have initiated the project) or whenever necessary (if you are monitoring or accompanying the situation locally). You can think of suitable venues, additional funds to enable the participation of weaker actors etc.

3. Revisiting CINA as interactive prototype assessment

Each Innovation Region had a characteristic way of implementing the CINA methodology. Apart from the specific social, political, economic and ecological context, this characteristic approach inspired and stimulated the assessment and development of prototype options. In this section, we describe various aspects including Innovation Region specific ones.

3.1 Preparatory research

All Innovation Teams carried out **research to develop their CINA scenarios**. Parts of this research were centrally organised by the InnoForESt consortium, notably the WP4 team. This served to gain a project-wide, relatively standardised overview of what was going on in the Innovation Regions. Others were left to the discretion of the Innovation Teams to take local circumstances and existing knowledge into account.

It is crucial to mention that getting an initial overview is not enough. Of course, it is foundational to a good understanding of the situation the innovation is in. However, throughout the duration of the innovation process, contexts can change. This includes new policies from various governmental levels or other stakeholders may impact the innovation. Previously established stakeholders may drop out and new ones may emerge. This calls for a **constantly alert attitude of innovation facilitators** towards their surroundings, be they socio-political, economic or even ecological.

The set of **centrally organized research** comprised (a) a stakeholder analysis detailing the range, type and networks of stakeholders; (b) a governance situation assessment uncovering the more political aspects of each Innovation Region and (c) an EU-wide quantitative mapping of the biophysical and analysis of institutional conditions in the EU in general and the Innovation Regions specifically (InnoForESt Deliverables 5.2, Schleyer et al. 2018; 5.1, Aukes et al. 2019; 2.1, Primmer et al. 2018 respectively).

Innovation-Region-specific knowledge production deployed along different lines. Most Innovation Teams made use of one-on-one interviews and focus groups in some form or another, but there were also other characteristic approaches. In the Liberec region, this involved the identification of the main barriers for innovation and reconstruction of the history of the innovation by stakeholders with intensive support of the scientific partners. The Eisenwurzen Innovation Team was in a peculiar situation as the incumbent regime in their Innovation Region was rather dispersed and fragmented: there was not yet a coherently visible forest value chain. Of course, some InnoForESt project partners already had existing knowledge about stakeholders and the socio-ecological situation of the forest in their Innovation Region, which they could build on. Notably, these included the Innovation Teams of Finland and Mecklenburg-Western Pomerania. Finally, the Gothenburg area Innovation Team had the opportunity to do thorough research into the incumbent regime as the forest educational program to be innovated was finalizing right after the beginning of InnoForESt. Hence, they were able to interview teachers and students at the closing events of the program.

The various approaches to preparatory research reflect several aspects. The way Innovation Teams approached their preparatory research depended on the level of pre-existing knowledge, familiarity of the Innovation Teams with their respective topics and the Innovation Teams' preferences for specific methods. Finally, what kind of preparatory research was conducted was **related to the stage the innovation was in**. In other words, some Innovation Regions could be seen as "greenfield innovations" while others were further developments of existing schemes each demanding other kinds and sources of knowledge.

Picture 4: Excursion to pasture / forest site on the day before the first CINA workshop in Primiero/Trentino

Implications box: preparatory research

Workshop moderators:

- Familiarise yourself with the history of the innovation. Is it a completely new idea or a further development of an existing scheme? Who came up with it? Who is already involved and are there stakeholders left out intentionally or unintentionally? How do participants in the workshop relate to each other, what are their positions and what kind of arguments can be expected from them regarding the innovation topic?

Local innovation facilitators:

- Be(-come) aware of the situation in which you want to develop your innovation, if you agree that innovations do not occur in a vacuum.
- Be alert of any changes occurring in your innovation's surroundings on any level and in any field. They might just present an opportunity for you. On the other hand, knowing of barriers while they emerge enables early strategy development towards tackling them.

Regional scientific advisors:

- Work together with local innovation facilitators to discern which aspects of the socio-technical regime are relevant for them.
- Monitor progress and inform local innovation facilitators in case there are new trends emerging that impact on the innovation in question.
- Acknowledge that your interests and expectations may differ from the local innovation facilitators. Reflect on these differences together so that everyone knows what they can expect from each other.

Cross-project observers:

- Be aware of the contextual differences between Innovation Regions. The fact that several may deal with, for example, a payment for ecosystem services scheme does not mean they will develop in the same way. Local situations are too complex to expect them to follow a foreseeable path.

Policymakers:

- Provide innovation facilitators with access and research infrastructure to gain a detailed image of the situation they are finding themselves and their innovation in.
- Give innovation facilitators time to do thorough research before and during an innovation process. This increases the chances of the process leading to something tangible in the end.

3.2 Scenario work

The centrality of scenarios in the CINA approach warrants a closer look at how the Innovation Regions developed and shaped them under their specific circumstances. We highlight aspects concerning the **content and presentation format of scenarios**. Furthermore, we describe how the Innovation Teams presented the scenarios and supplementary materials as well as some specific ways of discussing the scenarios during their CINA workshops. This section ends with a description of how and under what circumstances scenarios were developed further between CINA workshops.
As can be expected, the **content of scenarios** builds on pre-existing or freshly gained knowledge (see section 3.1). This can also include the factor studies as they have been carried out in InnoForESt (i.e., SETFIS process and role board games; Deliverable 3.1, Sorge and Mann 2019; InnoForESt Deliverable 4.1, Sattler 2019). Specific building blocks of scenarios can be discussed during workshops that do not follow the CINA approach. This has occurred in the Trentino and Gothenburg area Innovation Regions, where the Innovation Teams organized additional non-CINA workshops to verify certain scenario aspects with stakeholders. Most of the times, this process has led to a set of complementary scenarios that were distinguished, for example, based on different kinds of products or services to be developed (Eisenwurzen) or the governance modes underlying a payment for ecosystem services scheme (Finland, Mecklenburg-Western Pomerania).

Figure 5: Example of tabular scenarios as presented by Finnish Innovation Team at InnoForESt General Assembly in Trento, October 2018

Scenarios *Aspects*	Scenario 1 *Authority-driven mechanism*	Scenario 2 *Voluntary contracting*	Scenario 3 *Nature values bank*
Actor configuration	• Landowners offer sites for restoration • Added (nature) value assessed by the authority or an assigned expert • Authority chooses suitable offset sites • (Moderate) monitoring responsibility with the authority	• Landowners offer sites for restoration • Assessment carried out by an accredited consultant • Compensating actor receives a certificate • Landowner restores and possibly manages the site • Consultant will monitor impact of offset • Authority sets principles for contract and oversees legality of contracts	• Landowners offer sites for restoration • Bank monitors sites and development of nature values • Authority oversees only the bank.
Governance arrangement	• Authority sets the conditions	• Terms negotiated between the actor needing the compensation and the landowners offering the offsets	• Bank sets conditions for offsetting, following legal and possible strategic guidance principles
Organisational embedding	• Ministry of the Environment • Ministry of Agriculture and Forestry	• Landowners' Union • Ministries • Companies needing compensations • Consultants	• Nature values bank, which is a foundation like actor and an intermediary
Business model	• Government-driven, can include competitive supply	• Supply and demand develops in a network like market	• Landowner sells or leases the sites to the bank as nature capital • Bank sells added nature values to actors needed compensations • Supply and demand meet through bank
Role of citizenry	• Legal hearings?	• Expressing social demand for compensation?	• Small / no role? • Expressing social demand for compensation?
Role of technology & science	• Moderate, organized & predictable demand for impact assessment & monitoring • Selection & pairing of sites can benefit from new technologies & algorithms	• Impact assessment & monitoring can benefit from innovative knowledge processing • Selection & pairing of sites can benefit from new technologies & algorithms • Possibly new virtual market space	• Impact assessment & monitoring can benefit from innovative knowledge processing • Selection & pairing of sites can benefit from new technologies & algorithms • Possibly new virtual market space

The **format of a scenario** should be tailored to the innovation in question and the expected participants. This offered creative freedom on the part of the Innovation Teams. Encountered formats included Q&A (Eisenwurzen, all CINA workshops), bullet-point descriptions (Finland CINA 1.1[6] and 2.1), overarching topics (Gothenburg area CINA 1.1), summarising figures with accompanying text (Gothenburg area CINA 3.1), multi-paragraph narratives (Trentino CINA 2.1, Gothenburg area CINA 2.1), and a table with scenario aspects (Liberec region CINA 1.1, Mecklenburg-Western Pomerania all CINA workshops, Trentino CINA 1.1). The latter was also suggested as a useful basic structure for

[6] This numbering refers to a convention of CINA x.y, where x is the CINA workshop type and y denotes the number of iterations of this workshop type.

scenario development by the WP4 workshop accompaniment team during the early general InnoForESt assembly in Trento in October 2018 (Figure 2). It could be used as an effective connection between the preparatory research and first storylines for scenarios. An inspiring approach was taken by the Trentino Innovation Team who used a scale of degrees of expression of a set of variables to construct 'modular' scenarios, as it were.[7] In the Innovation Regions where supplementary material was presented, this involved, for example, general descriptions of ecological compensation (Finland) or more in-depth scenario descriptions (Eisenwurzen, Trentino, Gothenburg).

As long as **scenarios were discussed during a workshop**, the Innovation Teams were free to shape the interaction as they saw fit. Besides various workshop formats which are discussed in more detail below (section 3.5), we would like to highlight one content-oriented approach. In the case of the Habitat Bank of Finland, the team decided to have participants discuss the scenarios from the perspective of their organisation's expectations towards and requirements of new payment schemes.

It is central to the CINA approach that **scenarios be adapted** based on new insights coming from CINA workshops or other sources, such as developments originating outside the niche. This is especially true for the InnoForESt approach, in which the nature of scenarios develops in parallel with the innovation journey itself (cf. InnoForESt Deliverable 4.3, Loft et al. 2020). On the one hand, this may involve adaptations stemming from changing circumstances for the innovation, such as newly elected politicians pushing for favourable policy change in Finland or the occurrence of natural disasters, as in Liberec region, Eisenwurzen and Trentino. On the other hand, such changes can relate to concrete decisions made by Innovation Teams due to their favorability within the stakeholder network.

As the CINA approach suggests, scenarios are not a static storyline. Rather, they should be developed further continuously, for at least two reasons. First, requesting participants to discuss the same scenarios over and over again in consecutive workshops will contribute to 'stakeholder fatigue' and leave them wondering whether the process is progressing at all. Second, in many—if not most—cases, the time between workshops is never uneventful. Usually, things happen either on the landscape or regime level that trigger a shift in priorities and change the circumstances under which the planned innovation can and will flourish (cf. Trentino, Finland, Gothenburg). Concrete examples where this occurred come from the Waldaktie and Habitat Bank innovations. In both cases, the political discourses about compensation changed or underwent modifications. For the Waldaktie, this happened after the second visioning workshop, when it became clear that discursive changes at the state ministry associated with the innovation resulted in dwindling support and backing. In the Finnish Habitat Bank case, the national discourse on biodiversity offsetting developed in the opposite direction. Indeed, it became much more favourable towards the idea with biodiversity offsetting pilots moving up the political agenda. This, of course, represented a wave the innovation could ride. Additionally, engaged and committed local innovation facilitators will be undertaking individual 'innovation work' outside of CINA workshops to align stakeholders, explore new alliances or innovation avenues, based on the knowledge they gained from scenario discussions during CINA workshops. Hence, what local innovation facilitators do to **improve on and update the latest scenarios** is particularly relevant for gaining and keeping momentum in the innovation process. Specific examples of learning from what transpired during CINA workshops occurred in the Austrian and Finnish innovation. In the Austrian Innovation Region a more or less clear-cut new scenario emerged during the first visioning workshop alongside the initial three product- and service-oriented scenarios. During that workshop, stakeholders declared their urgent interest in more cooperation that could be facilitated through an institutionalised stakeholder network. It even turned out that it was important enough to dedicate a prototype development workshop to that scenario later on, in which three organisational forms were brought up for discussion. Learning also illustratively occurred in a Habitat Bank workshop, when stakeholders dismissed two scenarios due to their overall thrust. There, the stakeholders suggested incorporating sub-aspects from the dismissed scenarios into the remaining one (Finland CINA 2.1).

[7] See the Trentino sub-report in InnoForESt Deliverable 4.2, Orsi et al. 2020: for a detailed explanation of the scenarios used in their CINA workshop 1.1.

Figure 6: Example of tabular scenario discussion with the Czech/Slovak Innovation Team via a cloud-shared document in September 2019

Scenarios / Aspects	Scenario 1: Regulatory (compensations)	Scenario 2: Local market (PES, certificates ...)	Scenario 3: Hybrid ecosystem service governance (FES- community payments)
Actor configuration	- Forest owners, forest industry, recreation, nature conservation authority, municipality,	- Forest owners, forest (and timber) industry, recreation, nature conservation authority, municipality, local market chains and networks	- Forest owners, forest associations, nature conservation authority, municipality, recreation and citizens networks,
Actor relations, challenges	?	?	?
Governance arrangement	- Regulatory rules (state, local authority)	- Market rules + external authority (e.g., a certification committee which will guarantee the quality/regionalism of certificated goods and services - e.g., certificates for local wood)	- Self-governance/self-regulation within the community (the community will determine the purpose of the payments, the price for the services and goods as well as the decision about planting/not to harvest/other carbon forestry technologies
Governance, political challenges	?	?	?
Organisational embedding	- Ministry of Environment, Ministry of agriculture and Forestry	- Forest owners, land owners unions, external certification committee	- Forest associations (subject/agent which supply FES certificates)
Organisational challenges	?	?	?
Business model	- State regulation: harvesting limits, stress on nature conservation, compensation for loss of income (because of FES provision), support of nature conservation	- Profit growth / marketing of added value of local wood => more money for sustainable forestry activities, support of local economy - Expected harvesting payments - Local wood certification for products with added value	- (Voluntary) payments to support long-term FES provision - E.g. selling of carbon „indulgences" – reduction of carbon footprint => selling certificates of CO2 reduction to tourist, local businesses, wide public - FES as marketable good – continuous financial resources for wood chipping, planting new trees/forests, other carbon forestry technologies - Self-regulation and monitoring
Business challenges	?	?	?
Role of citizenry	- Citizens as members of forest cooperative and local community, enviro-activists and networks - Because of regulation realized by public administration is the role of citizenry very limited	- Common planting days (volunteers), users/ citizens - Pushing on local public administration to use local wood (in schools, town hall etc. ...) - Citizen demand (= tourists) for tourism infrastructure equipped with products from local wood (hotels, restaurants, outdoor benches etc.) - Customers of local companies – environmental awareness	- Citizens as members of forest cooperative and local community => collaborating on setting rules, enviro-activists and networks - As buyers of CO2 indulgences - Customers of local companies which are CO2 neutral – environmental awareness

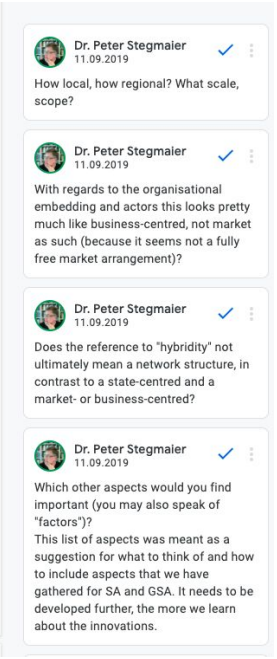


Figure 6 shows an example of an online-supported scenario discussion. We have deepened the set of scenarios with additional questions. This enabled findings from other regions to be communicated, conceptual advice given, questions arising from discussions with the regional innovation team to be taken up and ideas for the preparation of the next workshop to be conveyed. The aspects are in the left column. The ones that have existed since the General Assembly in October 2018 are left-aligned, the newly added ones are right-aligned and with question marks.

Implications box: Scenario work

Workshop moderators:

- Make sure you know the ins and outs of the scenarios you are inserting in the workshop.
- Involve and inspire each participant based on what you know about their position concerning the proposed innovation scenarios.
- Do not hesitate to point out tensions between scenarios or between a scenario and a participants' position. These tensions can be made productive and used to improve on the scenario ideas and the stakeholder network. Do so with caution and respect, of course.

Local innovation facilitators:

- Make sure your scenarios capture your innovation ideas in an engaging and attractive way that resonates with the workshop participants.
- Allow your scenarios to be tentative. Changes may become relevant due to events outside CINA workshops or due to discussions during a workshop. This offers openings for imagination that would be precluded with definitive scenarios.
- Appreciate the importance and benefit of innovation work outside CINA workshops. By refining knowledge about stakeholders and ongoing changes in various discourses and adapting your scenarios accordingly, they will become much more to-the-point and the potential for sparking discussion, inspiration and motivation will increase.

Regional scientific advisors:

- Be available for questions from local innovation facilitators regarding the development of rich context-sensitive scenarios.
- Support local innovation facilitators in the collection, processing and analysing of data relevant for scenario development.
- Take the role of a critical supporter with a view from the outside and point out potential weaknesses in the scenarios.

Cross-project observers:

- Support local innovation facilitators and scientific advisors by providing knowledge and experiences from other projects.
- If requested and required, participate in scenario discussions at workshops with your own individual perspective.

Policymakers:

- Create data hubs to support local innovation facilitators with scenario development. This could entail qualitative and quantitative data, as well as infrastructure to gather specific data.
- Provide resources and spaces for local innovation facilitators to meet with stakeholders and develop their stakeholder network.

3.3 Prototype development

The InnoForESt approach consists of the development, testing and—ideally—the implementation of an innovation prototype, defined as "idealized models of the improved innovation". Thus, the idea is that the innovations developed in their own individual contexts can also be abstracted to a general or ideal type. Before drawing conclusions and spending large sums on an innovation idea that is not yet experimented with and that has not been tested, variations of the innovation idea need to undergo critical reflection by a potential user community and other stakeholders. Hence, developing a prototype precedes its testing in a piloting stage.[8]

Over InnoForESt's three years, various **prototyping results** have seen the light. Owing to the varying starting situations and different levels of success in the development process, the developed prototypes range from incremental to more paradigmatic changes compared to whatever was before. In Eisenwurzen, the discussions during CINA workshops have led to the broadly supported request to develop a tighter collaboration between stakeholders in the value chain for forests and wood. Compared to the original ideas, which revolved around Tiny Houses, modular furniture and nature education, this represented a considerable change of focus—or, from the perspective of the Innovation Team, an addition of focus. The CINA process in this region has redirected the innovation process from a pure forest / wood product and service orientation to the development of stronger networking of stakeholders in the region through the establishment of a cooperation platform. Although this process has not been finalized at the time of writing, there are local stakeholders who have revealed their willingness to commit themselves to carrying this idea further. In other Innovation Regions, such as Liberec region and Finland, the prototype was much more concerned with the legal relationships between stakeholders and perhaps unsurprisingly so, because in both cases the innovation related to compensation schemes that rely on some kind of contractual security. Nevertheless, whereas it became clear quite early on in the Finnish Innovation Region, that voluntary compensation was the way to go, there are still quite some options on the table in Liberec. There, the local innovation facilitators are discussing the possibility of top-down regulation of their forest ecosystem services from the national level, whether a market including an external certification authority can be organized or whether the "payments for ecosystem services" scheme should remain predominantly in hands of the local community. Finally, in the German Innovation Region of Mecklenburg-Western Pomerania, two further developed variants of the current payment scheme are on the table. One variant would attempt to further specify the current forest share especially with respect to how realistic the compensation algorithm is. Another variant envisions the combination of the current forest share with other similar payment schemes in the region that for now concern swamps and meadow orchards respectively.

As we can see, the **relationship between scenarios and prototypes** is not clear-cut—and doesn't have to be. In the Austrian Innovation Region, there were in the early stages of the project four different prototypes. On the other hand, the prototype in the Swedish Innovation Region was relatively clear from the start: an educational program about forests. It only had to be elaborated in the various facets, such as target group or specific topic. So, scenarios can either represent one prototype or the variants of the prototype in "lower-level" dimensions.

[8] Within InnoForESt, there were also dedicated activities to test the prototypes that were developed, notably the SETFIS analysis and the Role Board Game (RBG) aimed at uncovering the factors that influenced each regional innovation. Here, we are interested in the process by which the prototypes came to be developed. For details about the content of the prototypes, please see InnoForESt Deliverables 3.1 on SETFIS, Sorge & Mann (2018), and 3.2, Kluvánková et al. (2020) on the RBG.

Implications box: Prototype development

Workshop moderators:

- Be deeply familiar with the prototypes in the shape as they are presented in the scenarios.
- Know the aspects/parts of the scenario that can be modulated or are open for changes and additions.

Local innovation facilitators:

- Choose an appropriate way of representing your prototype(s) in the scenarios. Once again, this depends on your participants and other aspects from the regime and landscape levels.
- Realize that the best discussions result from thoroughly researched scenarios with enticing prototypes that participants can relate to.

Regional scientific advisors:

- Develop a sound prototype together with the local innovation facilitators based on previous knowledge and specific data.

Cross-project observers:

- Compare prototypes across innovation projects to see more general opportunities and patterns.

Policymakers:

- Support processes such as CINA that can develop and test innovation prototypes at a higher quality level, with more concrete innovation scenarios and with the possibility of actually assisting with the innovation process than would be possible with immediate piloting.
- Create infrastructures that enable local innovation facilitators and scientific advisors to collaborate on the development of robust prototypes that can be embedded into local circumstances.
- Learn from patterns across projects, but be cautious about transplanting approaches to other locations without context-adaptations.

3.4 Inclusion of aspects and actors

As afore-mentioned, the CINA approach relies on thorough, thoughtful pre-research that attempts not only to walk the well-trodden path, but also to broaden the view of/on the innovation in question. Thus, **it matters which aspects and actors are included** in the development of scenarios and subsequently who is invited to CINA workshops. In other words, the development of innovations and technology, as well as their implementation, benefits from an inclusive approach. In this section, we discuss various issues concerning the inclusion of actors and aspects in InnoForESt's Innovation Regions. All of them relate to CINA workshops in the broader sense and relate to issues of organizing, objectives, and supporting activities outside of the actual workshops. We will also highlight some of the challenges Innovation Teams faced which emerged surrounding these issues.

CINA workshops had a broad range of objectives regarding actors and aspects. In the Liberec region, the workshops were seen as a **useful infrastructure** to bring together stakeholders, who had previously been unable to meet or did not know of each others' shared interest. Here, the workshop also served as a **starting point** for more structural bilateral relations, i.e. it represented a platform for further cooperation. It became clear in Eisenwurzen, that it was difficult to draw interested stakeholders to a workshop with an invitation lacking a clearly stated innovation objective. This shows that there is a fine line between opening up the discussion to maximize the range of aspects without foreclosing it and losing stakeholder interest due to vagueness of the process. With regards to actors, the Austrian Innovation Team successfully attempted the **balancing act** of activating inactive or unknown stakeholders while keeping active stakeholders on board. For the conduct of CINA workshops this presented the challenge of providing sufficient introduction to new stakeholders without leaving returning stakeholders bored of the repetition. Contrarily, the Czech Innovation Team also opted for restricting the range of participants exactly to enable a more focused discussion, which is helpful for specialist topics. To discuss the broad strokes of innovation ideas, the CINA approach advocates the involvement of a broad range of usual *and* unusual suspects.

Organizing a workshop using the CINA approach resulted in different **mixtures of participants** across the InnoForESt Innovation Regions. This not only related to the participants in the CINA workshops compared to stakeholders before InnoForESt began, but also between the CINA workshops in the series. In Mecklenburg-Western Pomerania, three workshops, equivalent to type 1 (visioning / selection), have been undertaken to thoroughly discuss the possibilities and alternatives. In the first workshop a mix of usual suspects, some new players as well as new observers participated. This changed in subsequent workshops, when it had become clear that—to make the innovation process meaningful—the opinion and ideas of users had to be included, too. As a result, in the following workshops also an important company making use of the forest share certificates participated. The range of stakeholders was relatively narrow here—deliberately limited to the traditional main actors behind the forest share. This group was only supplemented occasionally by scientific expertise, not by a broader spectrum of actors who could have brought a breath of fresh air into the matter (thus somewhat different from the actual CINA idea). In the Gothenburg forest education competition, the Innovation Team activated a gatekeeping actor, namely teachers, to engage other participants in the workshops. The Gothenburg workshops are also good examples for the selection of participants based on ongoing societal discussions (on regime level) and potential political tensions with former financial backers.

Such a mixture of participants also translates into choices of workshop organization in terms of **formats**. For example, after having decided to continue with thematic sub-groups each with a limited range of stakeholders, the Trentino Innovation Team distributed participants according to the anticipated interests. This decision was inspired by the observation in previous workshops that interest and level of engagement of actors in the discussions mainly depended on the economic relevance of the respective topic. For the CINA approach, this shows that "broad range of stakeholders in plenary discussion" is by no means the general rule. Splitting up stakeholders into sub-groups due to interest (Trentino) or according to innovation scenario (Gothenburg) can make sense in specific situations. The decision to do so lies with the Innovation Team, which has the best knowledge of the region and feeling with the stakeholders. Nevertheless, a CINA workshop cannot do without bringing together all

stakeholders in plenary discussion to avoid creating 'innovation bubbles' that risk remaining niches due to too little testing from competing perspectives. Finally, in case no external workshop facilitator has been called in for support, the double role of workshop organizers as discussion leaders and discussion participants (due to their interest in pushing the innovation) means careful balancing of these two roles on the part of the organizers, which can also be translated into the formats of the workshop (for more detail, see section 3.7).

CINA workshops never occur in isolation. Rather, they depend on the **innovation work that is done 'outside'** them. As was seen in Eisenwurzen, the high initial efforts to engage with potential workshop participants and beginning to build a stakeholder network paid off during the actual CINA workshops. Strong pre-engagement has several advantages. First, it demonstrates innovation facilitators' sincere interest in understanding the challenges and ideas present with stakeholders and having these guide the innovation process. In other words, such a pre-engagement process links potentially idealist motives for forest ecosystem service governance innovation with more pragmatist ones and the realisation that innovations rely on what is already there on the ground. Second, pre-engagement with potential stakeholders can create trust. Trust is a basic requirement for stakeholders to engage in the governance innovation InnoForESt strives for. Third, in the development process of innovation scenarios, floating scenario ideas in smaller pre-meetings gives insight into their applicability and resonance with the stakeholders. This enables the innovation facilitators to refine scenarios according to the outcomes and increase the potential for successful scenario discussions during CINA workshops. The innovation work outside of CINA workshops can take various shapes depending on demand. The **engagement formats** observed in InnoForESt Innovation Regions as support and preparation of CINA workshops included interviews, focus groups, targeted task force meetings and mass media PR. A final observation of innovation work outside CINA workshops is the increased likelihood of **side events**. Convening a stakeholder network at a CINA workshop, engaging and inspiring it, can spark interactions in the margins of the workshop that lead to a push forward in the innovation (e.g., Mecklenburg-Western Pomerania) or the branching off of other initiatives (e.g., Eisenwurzen).

Including broad ranges of actors and aspects is not easy. On the one hand, it is difficult to define the **catchment area of potential participants** as long as the innovation vision remains vague. In Eisenwurzen, this required frequent meetings among the Innovation Team to discuss and update each other about the stakeholder landscape. On the other hand, **commercially-oriented actors**, such as small and medium enterprises or agencies, are particularly hard to engage. For example, a lack of time besides their everyday work prevented forestry actors from attending CINA workshops in Eisenwurzen and Trentino. This highlights the problem that innovations are desirable for an improved and more sustainable forest governance, but involving a broader part of society into innovation processes also needs to cope with the time commitment required. Sometimes, it was not clear enough what the **use of participating** could be, as it was the case for companies in the Gothenburg area or even the tourism agency in Trentino (e.g. in Eisenwurzen, the tourism agency was a strong participant). Reluctance to participate due to afore-mentioned reasons needs to be acknowledged. In each specific innovation process, solutions need to be found to make it possible for many stakeholders to participate. In the CINA workshops organized to propel the Habitat Bank of Finland, the Innovation Team was successful in engaging larger businesses, research organizations and landowners. Unfortunately, it was not possible for NGOs, ministries and branch organizations to participate in the first workshop organized. In a follow-up CINA workshop, the Finnish Innovation Team put extended effort into specific types of actors to ensure meaningful participation. Another reason experienced by the Gothenburg area Innovation Team was **withdrawal from the workshop** on short notice without explicit reason. A final challenge for workshop organizers is the political and personal sensitivities that may exist among potential participants. Clashes during a workshop as a result of these may be unavoidable and should not be evaded. Instead, it is innovation facilitators' responsibility to know about these and attempt to make these productive, if possible. This can be done by moderating differences and providing constructive solutions through the innovation scenarios and prototypes.

***Implications box:* Inclusion of aspects and actors**

Workshop moderators:

- Take into account the "newness" of stakeholders to the innovation process. Configure the workshop as such that minimal time is used for bringing new ones up to speed.
- Attempt to make differences between the interests and positions of stakeholders productive instead of avoiding them. Find those aspects of the innovation scenarios that inspires constructive discussion about differences of opinion.
- See a broad range of participants with various perspectives as an asset to the innovation process. Many different viewpoints can be covered and a holistic view on the innovation prototypes can be achieved.

Local innovation facilitators:

- Appreciate the variety of objectives a CINA workshop can fulfil. Remember that this is not necessarily easier.
- Begin building the stakeholder network already before the CINA workshop by organizing smaller meetings, perhaps to test certain aspects of the planned scenarios.
- Encourage side events for stakeholders to get acquainted and discuss.
- Make sure you know clearly why each potential participant should participate and communicate this to them. You may not get the attention your innovation deserves, if it is unclear for stakeholders why they should come. You can only achieve this by doing pre-research.

Regional scientific advisors:

- Map out the stakeholder network as it develops in all its complexities. Include interests, opinions, whether the actor is active/passive, on which level (niche/regime/landscape), what commitment can be expected?
- Support local innovation facilitators in the development of rich scenarios that resonate with sufficient actors and cover many of the relevant aspects.
- Provide useful formats for CINA workshops and innovation work outside the workshop setting.

Cross-project observers:

- Provide local innovation facilitators and scientific advisors with input and inspiration from other projects to support cross-innovation learning.
- Probe whether certain (types of) actors and aspects could or should be involved based on experiences elsewhere.

Policymakers:

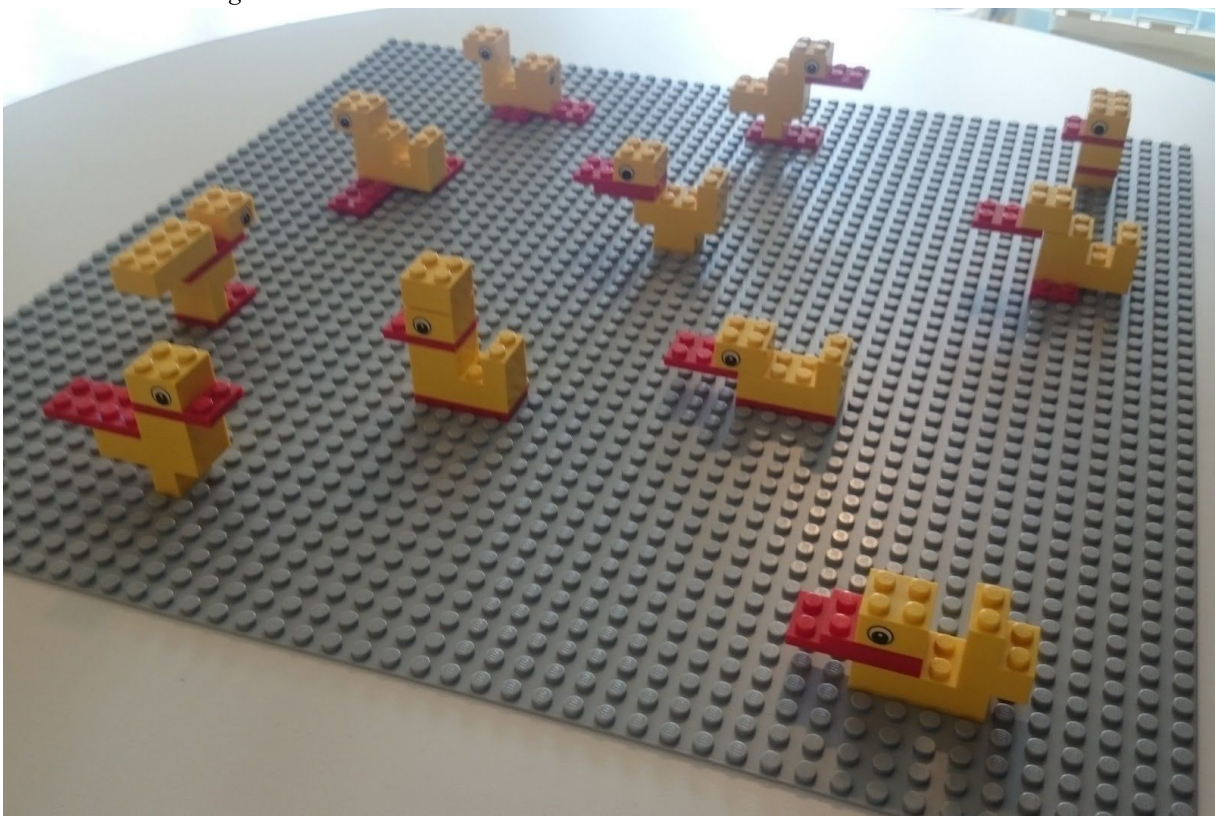
- Give local innovation facilitators the time to develop a strongly tied stakeholder network with actors willing to commit. This takes time due to the work that is needed to build trust before and in between CINA workshops. The complexities between stakeholders and in terms of issues on the ground is often such that quickfire processes are doomed to fail, when taking into account the processes chaperoned by InnoForESt.

3.5 Stakeholder turnout, motivation and workshop productivity

For stakeholders, the attractivity of CINA workshops hinges on various aspects. We have discussed some of the relevant aspects in the previous section. Here, we turn to specific issues raised by Innovation Teams regarding stakeholder motivation as well as methods and techniques used by them to make CINA workshops as productive as possible. Once again, we can divide points of attention into what happens before, during and after a workshop. The lion's share of the following discussion will be taken up by the question of how the workshops themselves can be organized and structured to maximize engagement and reflection of stakeholders.

When looking at the run-up to a CINA workshop, it has turned out not to be trivial **where a workshop is held**. The Austrian Innovation Team experienced that a workshop location in another valley nearby, though geographically close, was culturally too far away for stakeholders from the valley where the previous workshop was located. In the end, mainly stakeholders from the valley where the workshop was held were motivated enough to attend. Here, we observe a counteracting result of the objective of motivating stakeholders: even if they are geographically closeby, workshop locations need to be 'on the radar' so to speak of all intended participants. Or, the Trentino/Primiero team assumed that a workshop held in the city of Trento would have made it rather unattractive for the local stakeholders in Primiero, who did not want to interrupt their work for a whole day just to go to Trento, to take part in the workshops. Furthermore, depending on the state of the innovation process, it can be useful to explore knowledge, expectations and needs already in a larger non-strategic workshop before a first visioning workshop (Trentino before CINA 1.1).

Picture 5: Gothenburg icebreaker exercise



Homing in on what can be done during workshops, two reflections from Innovation Teams highlight the crucial character of workshop formats. On the one hand, it turned out that many stakeholders experience **similar problems**, which may increase the motivation to work together on solutions (cf. Liberec region). On the other hand, the Trentino Innovation Team experienced first-hand, that the **activation of stakeholders** and getting them to become proactive is not obvious. Thus, as has been mentioned before, the formats of CINA workshops need to be chosen carefully, not only to provide for

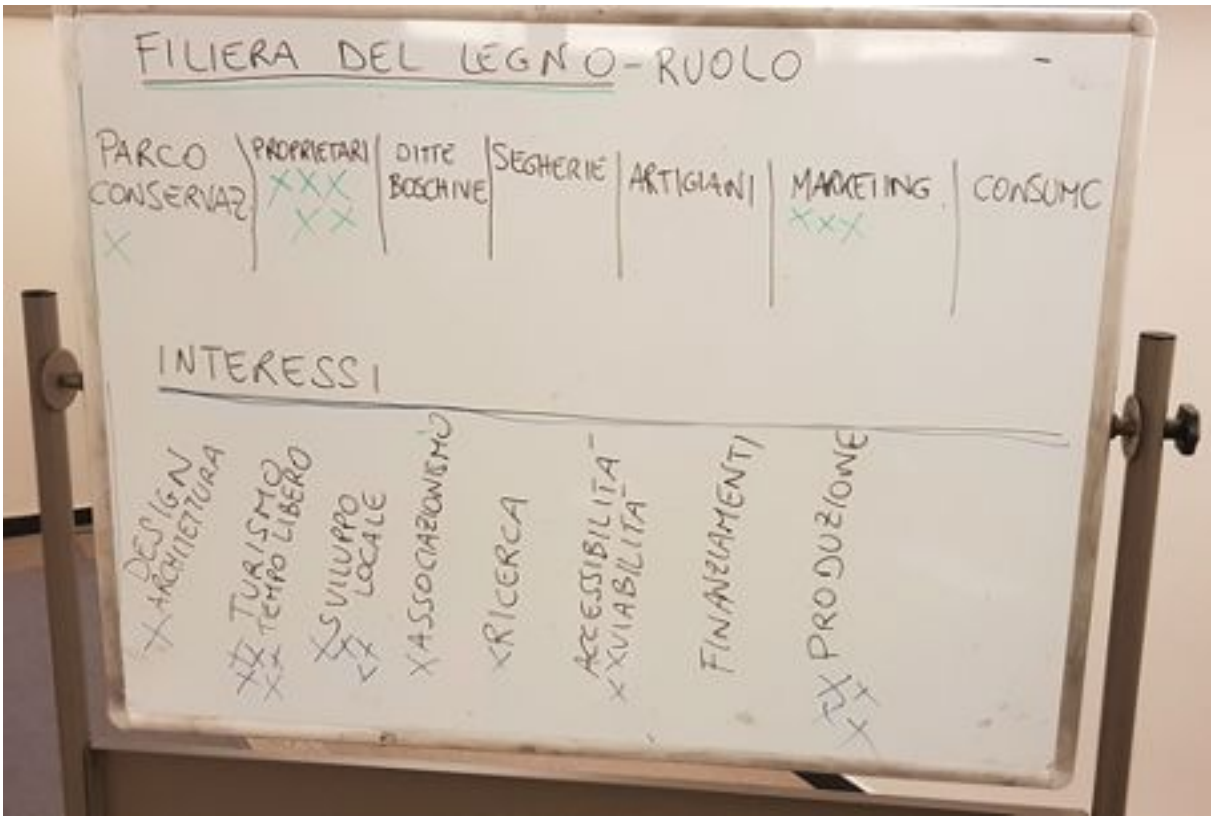
respectful and constructive atmosphere between stakeholders, but also to elicit enthusiasm and eagerness to engage in the discussion. Of course, a good tip beforehand is to take into account the planned workshop formats in the **venue choice**. This prevents space issues during the workshop and helps to make optimal use of the available location. In the InnoForESt Innovation Regions, CINA workshops had different **ways of starting**. For example, after a quick welcome, one of the Gothenburg area workshops began with an exercise geared toward getting acquainted and breaking the ice between participants by means of Lego. This got people talking before the content discussions began. Another interesting technique that was applied in Eisenwurzen and later taken up in Trentino as well, was to have participants locate themselves on a representation of the value chain for forests and wood with stickers to show where in the supply chain they are. A breakfast buffet and coffee breaks with the occasion for informal chats also helps to break the ice. In applying these techniques the groundwork was already done for the following scenario discussions and especially the latter could be used as a kind of reference later on during the workshop. In a more traditional conference or symposium set-up, the workshops were designed to kick off with content introductions by the workshop organizers and invited presentations by participants (cf. Finland). A pitfall of this design is that it can be difficult to maintain brevity of the inputs and may lead to front-loading of the participants, even before they have contributed anything to the discussion. In one of the Trentino workshops, it was attempted to circumvent this problem by purposefully prohibiting the use of presentation slides to make time management easier. For discussions, a **seating layout** that encourages discussion is very important. For example, chairs in rows are useful for frontal inputs, but U-shaped or circular seatings in which participants can see each others faces better and respond also to non-verbal communication (cf. Finland CINA 1.1, CINA 2.1). If the workshop organizer chooses to break out into sub-groups, it is useful—when coming back into the plenary setting—to **share the results of the group discussions** with the plenum (cf. Eisenwurzen CINA 2.1). This increases ownership of the discussion by participants and reflects the CINA principle that the plenum is the most important discussion setting to maximize the range of perspectives. As the Finnish Innovation Team demonstrated, the framework of CINA workshops can also be made productive to enable **breakout possibilities for private negotiations** between stakeholders about potential compensation contracts (cf. Finland CINA 2.1).

In general, it is useful if not important to build **flexibility** into the workshop structure to allow for ad-hoc deviations or an extension of scenario discussions if required (cf. Eisenwurzen CINA 1.1, Finland CINA 1.1). For workshop organizers to be able to respond to emerging issues adequately and not only after the fact (i.e., after the workshop) such flexibility is crucial. **Distributing a survey** to be filled in by participants about their goals, roles, resources, time limits and expected results after InnoForESt ends can be an additional tool for eliciting knowledge about stakeholders, especially if there are new or unknown stakeholders in the audience (Trentino CINA 2.1). It is advised to allocate some time for filling in such surveys rather towards the end of a CINA workshop after the most important discussions have taken place or relocate this activity into the online domain. For additional illustration, it could make sense to organize an **excursion** into the region that the workshop covers, as was done in Liberec. A similar event was scheduled during InnoForESt's General Assembly in Trento, when the storm Vaia prevented all project partners present to visit the Primiero area. However, during the General Assembly in Schlierbach, the Austrian Innovation Team had organized a tour to see the various facets of the value chain for forests and wood. Such illustrative excursions bring the scenario topics to life and spark the imagination of what else could be possible. Apart from excursions, a technique for illustration that has proven quite productive in the Austrian CINA workshops was the invitation of **inspiring external keynote speeches** by experts in various fields concerning the innovation scenarios (Eisenwurzen CINA 1.1, CINA 2.1). In that case, the experts in the forest and wood sector demonstrated best-practice examples of what mutual learning, trust, switching perspectives and interdisciplinary/intersectoral cooperation can do for the innovation process. Nevertheless, as touched upon previously, the timing and duration of such inputs is crucial, as the Austrian Innovation Team experienced. Eisenwurzen had those speeches in all CINA workshops. For instance, the one in the third workshop was crucial, as it highlighted the importance of stakeholder commitment for the continuing of the platform.

In the time immediately following a CINA workshop, it is advisable to organize **follow-up activities**, especially to keep momentum in between workshops. In Eisenwurzen, these activities consisted of efforts in community building and developing education. Finally, in the CINA logic developed by InnoForESt, it was good to realize that the fact that workshops were organized as one of a **series** offered the possibility to discuss aspects in one workshop and pick up on them in following ones (cf. Liberec region). Thus, through this realization and follow-up activities aligned with that, issues that emerge during one workshop can find their way into the innovation process and be tightly woven into discussions, scenarios and prototypes.
Some innovation facilitators in the regions also reported back to us that they felt **insecure** with the unfamiliar CINA approach and the deliberative work with the stakeholders, so that they had the impression that they had not communicated the process so confidently to the stakeholders world as necessary. Through a lot of communication during the preparation and participation in the workshop, we from the team of consultants have always tried to lower these inhibitions and to strengthen the partners in their work.

Picture 6: Participants located themselves on a representation of the forest/wood value chain with stickers in Eisenwurzen

Picture 7: Participants located themselves on a representation of the forest/wood value chain with stickers in Primiero/Trentino



Picture 8: Visualisation of the whole InnoForESt process at the CINA workshop in Eisenwurzen on 23 January 2020, SPES Zukunftsakademie Schlierbach

***Implications box:* Stakeholder turnout, motivation and workshop productivity**

Workshop moderators:

- Respond to needs for extended discussion or for deviating from the original workshop schedule based on emerging issues.
- Encourage constructive and respectful discussions in stimulating settings, but don't avoid tensions or potential conflicts. These are important and can either be resolved or even lead to an improved prototype and scenario.
- Integrate keynote speeches into the discussion by referring to them afterwards.
- Reflect on your moderation experience afterwards to gain additional insight into stakeholder interactions and improve on the scenarios and following workshops.

Local innovation facilitators:

- Your choice of venue has implications for who will be motivated to come and that the suitability of the venue itself depends on the formats you and the workshop moderator intend to put into practice.
- Share any input you want participants to reflect on, such as scenarios, before the workshop and keep new inputs to a minimum. This way, participants will be able to reflect individually and be more active in the discussion without having to process a lot of new information and ideas.
- Use the opportunity to adequately document the proceedings and results of the workshop as this can be a valuable source of knowledge for your further innovation work, including what follow-up activities should be conducted.
- Scan the network or external actors for interesting keynote speech opportunities that can be deployed as punctuated inputs for specific points of the scenario discussion.

Regional scientific advisors:

- Provide local innovation facilitators with a critical eye and ear for reflecting on the choices made concerning the workshop, such as venue, seating, schedule, inputs.
- Support and if necessary assist in the adequate documentation of the workshop. The more thorough this is done, the more useful the workshop will be also in the subsequent innovation work.

Cross-project observers:

- Share best-practices in workshop organization from other projects.
- Participate as a "comparative knowledge hub", if desired by local innovation facilitators and scientific advisors.
- Support the documentation of the workshop and contribute cross-project reflections.

Policymakers:

- Make sure that there is an infrastructure of locations/venues that can be used by local innovation facilitators to organize events as part of innovation processes.
- Create a knowledge hub with information on workshop formats and links to networks of speakers in various domains.

3.6 Workshop facilitation and external moderators

Workshop facilitation is crucial in the CINA approach. The facilitator needs to be familiar with the innovation process, including the stakeholders, their relationships and the ins and outs of the scenarios and prototypes. In the original approach (see section 2.2), it was suggested that only the local innovator or acting researcher could be sufficiently versed in the local circumstances to fulfil this role. And, indeed, it is in line with the thinking behind CINA that workshop participants and the facilitators—in InnoForESt's case the Innovation Teams (or their surrogates)—should be on eye-level to enable engagement as well as open and free discussions.

However, one of InnoForESt's revelations regarding the CINA approach was that the engagement of external moderators in the CINA workshops can also work. This occurred, for example, in the Swedish, Finnish, Austrian, and Italian Innovation Regions. For the development of the Love the Forest innovation, the Innovation Team hired a professional workshop facilitation company (Gothenburg area workshops CINA 1.1 and CINA 2.1). Making use of state-of-the-art facilitation techniques, including LEGO and paradoxical interventions, this company concretely supported the workshop process and allowed for a pleasant discussion atmosphere. Thereby, without forest governance or innovations specifically being its domain, the company professionally supported the development of the new Love the Forest program. In Finland, the facilitation company was closer to the discussion topic being located at the intersection between environmental science and workshop moderation (Finland CINA 2.1). Other than in the Swedish case, the facilitators also collaborated with SYKE on forest policy. The Italian external moderator was an expert in forestry communication at national level and has his own company aimed at promoting forest management and governance innovations—a regime level actor.

External moderators were called in in a number of projects because the scientific partners who typically take on this role in CINA did not trust themselves to moderate. In retrospect, the academic partner's **willingness and ability to moderate** could have been increased with **compulsory training**. We conclude this from feedback from the regional partners and from our own observations where the partners found it difficult. Using the help of external moderators has **pros and cons**:

(a) On the one hand, the external moderators introduced **useful skills and methods of moderation and group work** into the workshop design. On the other hand, they did not always see how important it is to be able to imagine the details and complexity of the innovation, interests and accompanying circumstances under the **scenarios**—even to be able to bring them into the discussion in a dosed manner. This could partly be compensated for by the fact that the scientific partners got involved in the discussions and thus brought in the context and detailed knowledge. Mixed forms, where trained moderators and the scientific partners share the tasks of structuring the interactions at the workshop, have proven to be successful. The external moderators also helped to **avoid a double role** for those actors who on the one hand oversee regional innovation within the framework of the project, but on the other hand are also parties, i.e., have their own stakes in the matter.

(b) However, it was also not always good when the scientific and practice partners took on the moderation themselves. There were cases where **too much was lectured frontally** instead of actively involving the stakeholders at an early stage. Interestingly, it happened both when the partners moderated alone and when they had called in external moderators. In the latter case, they first had to wait with their art until they were allowed to open the interaction. In both cases, breaks and later workshop phases showed that the participants could very well have entered the discussion right away—(i) because they had something to say, (ii) because they were not on the lips and (iii) because there were virulent open questions in the room that one urgently wanted to talk and argue about.

While InnoForESt has demonstrated that **external moderation** is no longer a no-go for CINA, it makes preparation for the workshop facilitator even more important. Local innovation facilitators need to brief workshop facilitators profoundly about the details of the innovation process to make a CINA workshop led by an outsider—or someone with potentially an own agenda—productive. Preferably,

the workshop facilitator would be present not only on the day itself but would also be available and active in the run-up to a workshop including the preparation of the scenarios.

Picture 9: CINA Workshop on 8 May 2019 in Fiera di Primiero, Trentino, the general workshop moderator (external, standing) speaking with a researcher-discussion rapporteur

***Implications box:* Workshop facilitation**

Workshop moderators:

- Facilitating workshops prepared based on the CINA approach does not only involve leading a discussion. You need to be deeply familiar with the details of the innovation process to be able to respond to emerging issues and be prepared for tensions between stakeholders that can be anticipated.
- Participate in the run-up of the CINA workshop to follow the development of the scenarios and prototypes or even help designing them.
- Make your own knowledge productive. Leading a discussion requires constructivity, an attitude of doubt and respect towards participants, not neutrality (cf. the Responsibility Navigator in InnoForESt Deliverables 5.1, ch. 3.9/5.5, ch. 4.6[9]).

Local innovation facilitators:

- Make sure that the external workshop facilitator you hire participates in the preparation phase of the workshop materials, i.e. prototypes and scenarios.
- Allow external moderators also to contribute with their knowledge and experience, it might be useful.

Regional scientific advisors:

- Contribute to the preparation of the external facilitator by making your knowledge about the innovation process accessible.

Cross-project observers:

- Share your experiences with other ways of facilitating CINA workshops.

Policymakers:

- Provide sufficient funding for innovation projects utilizing the CINA approach for them to be able to make their own decision about whether they need an external workshop facilitator.

[9] Cf. http://responsibility-navigator.eu/navigator/; http://responsibility-navigator.eu/navigator/why-what-how (13 November 2020).

3.7 Franchise approach

Before InnoForESt, none of the Innovation Teams were familiar with the CINA approach or its predecessors (see section 2.2). The project partner University of Twente provided the knowledge transfer and learning experience for the Innovation Teams to become their own experts in the method. Besides formal training in the method, University of Twente gave feedback on scenarios on-the-go and assisted in all matters related to the CINA process. This is what we call the CINA "franchise approach". In the following, we describe some of the **aspects and challenges** of this approach.

To teach the approach, a half-day **webinar** was organized including possibilities for questions and hands-on exercises. We supplied the pertinent scientific literature and were ready for any questions of understanding and brainstorming. From this learning process, some basic challenges emerged, which were also discussed during the WP6-organized virtual meeting for policy recommendations to be given from InnoForESt perspective. Some of these challenges involved the difficulties experienced during the teaching process. Although we continuously reiterated the centrality of thoroughly developing scenarios in the CINA approach and sharing these with us for reflection as well as with participants before workshops, it took quite some time until the **importance of the scenarios** was appreciated by project partners. This appreciation emerged through positive practical experiences by the Innovation Teams with applying scenarios at workshops. Furthermore, in two cases workshops had already taken place **before the teaching** moment, as it was not clear from the start that the workshops intended for InnoForESt were not simply physical meetings with stakeholders without any other guidance. This illustrates how difficult it can be to communicate between scholars from different disciplines, as is the case among the InnoForESt project partners, especially given limited time to elaborate and discuss.

The differences in understanding between WP4 and the Innovation Teams resulted in a **discretionary interpretation** of the CINA approach. Of course, the approach allows for flexibility to adapt to the local circumstances. The development of thoroughly prepared scenarios that are discussed in some way or another during a workshop placed strategically in time (and place) is really the only hard principle of the approach. Some examples of discretionary interpretation are the development of scenarios *as a result of* CINA workshop, where scenarios should exactly be the core content of a CINA workshop or using the same scenarios in more than one innovation contexts, thereby either overlooking the idiosyncrasies of each individual process or presenting less concrete and meaningful scenarios. **Positive feedback** came from the Finnish Innovation Team, where

> "*the workshops have given structure to the process and helped us to keep up with the schedule. Workshops have been an informative and successful discussion platform with the stakeholders, resembling roundtable discussions. When stakeholders were given an open possibility to share their views and ideas both novel solutions but also potential problems and bottlenecks in implementing the innovation were identified.*" (InnoForESt Deliverable 4.2, part II.3, Pekkonen et al. 2020: 235)

Although teaching the approach to project partners was not always easy, in the end most CINA workshops have demonstrated some resemblance with the CINA approach. It shows that it is purposefully a **flexible approach** geared towards contextual interpretation. Finally, due to these circumstances, the view on each innovation process differed between each Innovation Team and the WP4 assistance team, which had the overview of all innovation processes including the various CINA localized approaches.

Implications box: **Franchise approach**

Workshop moderators:

- Try to be present during the teaching events to learn where the CINA approach is coming from.
- Familiarize yourself with the requirements for workshop moderators in the CINA approach.
- Try to contact CINA experts, if it's impossible to attend teaching events.

Local innovation facilitators:

- Browse the material made available by InnoForESt to see what guidelines there are for CINA.
- CINA is a flexible approach meant to be adapted to the local situation, but that the discussion of future scenarios of innovation prototypes is the core of the approach.

Regional scientific advisors:

- Familiarize yourself with the literature and conceptual ideas in the existing literature on Constructive Technology Assessment and adjacent approaches such as Socio-Technical Integration Research (see section 2.2).

Cross-project observers:

- Support projects with experiences and knowledge from other locations applying the CINA approach.

Policymakers:

- CINA is not a simple method. Rather, it requires thorough immersion and learning, before it can be applied. It is useful and helpful to team local innovation facilitators up with scientific advisors in co-creation settings to make the CINA approach productive.

4. Outlook

We have learned some new things from the different ways of dealing with and circumstances in the various regions (4.1). We also got ideas on how to further develop the CINA approach (4.2).

4.1 Novelties that emerged during CINA practice

If one pursues an approach, but does not declare it to be a static obligation, which has to be carried out strictly according to existing stipulations, it is not surprising that also **new sides to the matter can be discovered** (although we would claim that a strictly standardised approach can lead to new perspectives if one has an eye for it). We would like to highlight the following four aspects:

(1) In some cases we have seen how important it is to find and establish **other forms of interaction before and after the CINA workshops**. This is precisely where the sustainability of innovation work becomes apparent: when it develops its own dynamic that only uses the CINA impulses strategically, but no longer fully relies on them. We already suspected that, and accordingly in Deliverable 5.1 and in support of the CINA work in the regions, we already spoke of the fact that the CINA workshops have the function of **strategic workshops**. This should not be confused with the fact that the workshops are also used to design and specify strategies in addition to demand articulation (Kulve & Konrad 2017, Kulve et al. 2018).

(2) Little practiced in the CTA context, the InnoForESt project with its overlapping methodological approaches has shown that CINA **can also be combined with other methods**. There were workshop formats that divided the time for scenario work in the sense of CINA on the one hand and role board games on the other. However, it has also been found that when you start working with scenarios in depth, there is hardly any time or energy left to do anything else—or if the other is in the foreground, you can still achieve a lot with the actual scenario work. So we advocate a **cautious combination with other methods—**not on principle, but because the effort (also time available) involved in getting something out of it shouldn't be underestimated. The other method must also be well coordinated with the scenario approach so that the participants do not have the feeling that the workshop is inherently inconsistent. Ideally, the elements should build on one another and complement each other—which usually means that the other methods should serve in some form to deepen or outline, prepare or follow up the actual scenario work.

(3) The way we presented CINA, it is **important to agree with the stakeholders** what scenarios should or must look like, how you want to change them or which (aspects) you want to put aside. The **pragmatic omission** of scenarios by the innovation facilitators, for example because important stakeholders are missing for a scenario, would be rather inappropriate from this point of view. In fact, the projects that have done this here and there have not failed because of that. It is not possible to say with certainty what would have happened if they had negotiated the omission directly with the stakeholders—for example, what impulses of any kind might have resulted from it.

(4) **Moderators** were included who did not belong to the innovation team from the start and permanently. We have already discussed the limits and possibilities under 2.2 above. The insight from this project is that **it works**, even if it is not ideal, but has to be well embedded and entails a considerable **additional training effort** (see InnoForESt Deliverable 5.4, Schleyer et al. 2020). This can only be avoided if the core staff is well prepared so that they can trust themselves to do what is intended. Moderation by the innovation facilitators and local scientific advisors is still preferable.

After we had experimented selectively with CINA-style interaction in the EU-MAC project (http://eu-macs.eu/; Visser et al. 2019, Stegmaier & Visser 2017,; Hamaker et al. 2019, Stegmaier 2019), we were able to try out the approach in this project as a **central approach** that all those involved had to address. We kept the implementation flexible, i.e., case-sensitive. This is a great opportunity. In addition to this more practical case report, we will continue to analyse methodically and theoretically what we can learn from it in future publications.

4.2 Developing CINA further, possible directions

Finally, we want to discuss and suggest a few directions in which the **further development** of the CINA approach could go:

(1) As already discussed above in chapter 2, unlike often in CTA or CINA before:
   (a) We have chosen a **phase approach** to carry out the CINA workshops. CINA thus not only concentrates on an early point in time when a lot is still open and changeable, nor on a middle point in time when one can already recognize a direction and at the same time influence or fine-tune it, and just as little on one alone late point in time at which one can only determine the further way. Rather, as we have practiced in InnoForESt, CINA extends over the entire course of the project. We combine different workshop formats that are important for innovation work at the respective times with different functions (innovation visioning / selection, prototype assessment, roadmapping).
   (b) In addition, it would only be logical to **diversify both the number and the type of workshops** even more broadly, because in areas other than forest ecosystem services with a regional focus in the countries we have been to, other perspectives may become important. Even in this project we sometimes had two to three visioning / selection workshops (CINA type 1) before we could even continue working on a prototype. One could say that InnoForESt has shown that CINA can be expanded as required, no matter how often ("CINA on demand", if you like).
   (c) For this, of course, the resources must be available (which was ideally the case in this project) and the task of the communication with the regional partners changes: not only adapt an existing scheme of workshop types to suit the case, but also **invent new types** and make them suitable for a CINA process. The current pandemic circumstances suggest innovations that make stakeholder interaction possible online or at a safe distance without losing the closeness necessary for a lively exchange.
   (d) We will have to provide an **extended toolbox**, which can be fed from other existing CTA / CINA experiences, but also get new CINA inserts, where you can specifically try out more.
   (e) This is accompanied by a **changed need for research**. So far, it was just enough to do the research on the initial situation fairly thoroughly before the first CINA workshop and then to pragmatically evaluate the interactions. We have the impression that the current situation should have been thoroughly updated before each workshop in order to get even more out of the workshop. If there are even more formats and workshop moments, you probably need a thorough update of the strategic intelligence that makes changes very clear—even where they are superficially and not easily seen from the pure action perspective of direct innovation work. That is, one must have the opportunity to look systematically and more deeply instead of always assessing the situation under the pressure of action. Otherwise we see the danger of getting bogged down.

(2) One of the strengths of the CINA approach in InnoForESt was that we **researched the situation very thoroughly** at the beginning.
   (a) To do this, we used two research perspectives that have proven to be very helpful: the stakeholder analysis and the governance situation assessment. The first was already planned in the project application, the second we had to develop ad hoc, according to the emerging needs, because otherwise the picture of the situation would have been incomplete. We have **combined perspectives from innovation and governance research**. That was new in form and now has to be further formulated theoretically and methodologically after the project.
   (b) It will also be important to **prepare a set of appropriate perspectives** from the two research traditions mentioned for users (CINA toolbox) so that they can be chosen and used in combination and that it becomes clear what is fundamentally needed and what can be added or omitted as required.

(3) If so much accompanying research is done and feedback options offered as in InnoForESt—instead of simply letting a few innovation attempts run unconnected -, then it would be only logical to also **reconstruct the learning curve** that the individual innovation projects go

through and to provide information with targeted reflection (cf. InnoForESt Deliverable 4.3, Loft et al. 2020, section 7.7).

(a) What has been missing so far, because it is only considered implicitly, is the systematic observation of how the individual initiatives learn from what they do. We assume that learning that can also question and revise previous approaches (**second order learning**[10]) cannot do without empirical foundations and interaction formats that go beyond mutual reporting, as is often the case at meetings of consortia.

(b) This would include an **interactive and empirically informed working level of reflection** in such projects, which must be well equipped—above all, there must be time and leeway.

(c) Perhaps general research on purely **scientific publication** should take a back seat—although one could also imagine that this collective reflection work, which is empirically founded, can firstly be well reconstructed and would also be worth reporting in specialist publications.

(4) We did not really have a **developed concept for training** colleagues in the various regions and institutes who come from different professions and disciplines. If necessary, we created joint learning opportunities and also "taught" the CINA approach in part by directly accompanying the individual regional innovations. As a result, we were able to **adapt the demands** of our colleagues very individually, but we also noticed that the means for training and maneuver criticism are reaching their **limits**. To do this, you would have to present a more realistic concept in a new project. InnoForESt Deliverable 5.4 (Schleyer at al. 2020) addresses this important task and also general teaching objectives to convey the InnoForESt approach to other interested parties even after the end of the project.

What could be better than a project in which one has the means to try out new things and gain experience. InnoForESt deserves the credit for having created such a **fertile framework and opportunity**.

[10] This refers to the concepts of first-order (single loop) and second-order (double loop) learning (Argyris & Schön 1978). **First order learning** corresponds to the improvement of an existing innovation system: when a given issue is identified, the solution will improve the situation while the socio-technical system remains unchanged. It may lead to a change in "*the level (or settings) of the basic instruments of [...] policy*" (Hall 1993: 278). **Second order learning** induces rethinking the system, the dominant paradigm and the action models. It is about setting new priorities, strategies and assumptions. It implies restructuring and transforming the socio-technical-ecological system. So, in contrast to first order learning, second order learning may lead "*to a change in both policy instruments and their settings*" (Grin & Loeber 2007: 206). In addition, what is called **third order learning** would then not only result in changing policy instruments and settings, but the entire policy paradigm: "*the framework of ideas and standards that specifies not only the goals of policy and the kind of instruments used to attain them, also the very nature of the problems they are meant to be addressing*" (Hall 1993: 279).

References

Argyris, C., & Schön, D.A. (1978). *Organizational Learning: A Theory of Action Perspective*. Reading, MA: Addison-Wesley

Aukes, E., Stegmaier, P., & Hernández-Morcillo, M. (2019). *Deliverable 5.1: Interim Ecosystems Service Governance Navigator & Manual for its Use*. Eberswalde: InnoForESt. Retrieved from: https://innoforest.eu/enabling-innovation/#fusion-tab-deliverables [30 November 2020]

Aukes, E., Stegmaier, P., & Schleyer, C. (2020). *Deliverable 4.2: Set of reports on CINA workshop findings in case study regions, compiled for ongoing co-design and knowledge exchange*. Eberswalde: InnoForESt. Retrieved from: https://innoforest.eu/enabling-innovation/#fusion-tab-deliverables [30 November 2020]

Collingridge, D. (1980). *The Social Control of Technology*. London: Pinter

Garud, R. & Ahlstrom, D. (1997). Technology Assessment: A Socio-Cognitive Perspective. *Journal of Engineering and Technology Management*, 14, 25-48

Grin, J., & Loeber, A. (2007). Theories of Policy Learning: Agency, Structure, and Change. In F. Fischer, G. J. Miller, & M. S. Sidney (Eds.), *Handbook of public policy analysis. Theory, politics, and methods* (pp. 201-219). Boca Raton: CRC

Hall, P.A. (1993). Policy Paradigms, Social Learning and the State. The Case of Economic Policymaking in Britain. *Comparative Politics, 25*(3), 275-296

Hamaker-Taylor, Robin, Adriaan Perrels, Laura Canevari, Väinö Nurmi, Tuukka Rautio, Amanda Rycerz and Francesca Larosa. 2018. *Results of explorations of the CS market for the financial sector*. EU-MACS deliverable 2.1. Retrieved from: http://eu-macs.eu/wp-content/uploads/2019/02/EUMACS_D21_FINAL.pdf [30 November 2020]

Joly, P.-B., Rip, A., & Callon, M. (2010). Re-inventing Innovation. In M.J. Arentsen, W. Van Rossum, & A.E. Steenge (Eds.), *Governance of Innovation. Firms, Clusters and Institutions in a Changing Setting*. Cheltenham: Elgar

Kluvánková, T., Špaček, M., Sorge, S., Mann, C., & Schleyer, C. (2020). *Deliverable 3.2: Application Summary of Prototypes for Ecosystem Service Governance Modes—Demonstrator*. Eberswalde: HNEE. Retrieved from: https://innoforest.eu/enabling-innovation/#fusion-tab-deliverables [30 November 2020]

Kuhlmann, S., Stegmaier, P., & Konrad, K. (2019). The tentative governance of emerging science and technology—A conceptual introduction. *Research Policy, 5*, 1091-1097

Loft, L., Stegmaier, P., Aukes, E., Sorge, S., Schleyer, C., Klingler, M., Zoll, F., Kister, J., Mann, C. (2020). *Deliverable 4.3: The emergence of governance innovations for the sustainable provision of European forest ecosystem services: A comparison of six innovation journeys*. Eberswalde: HNEE. Retrieved from: https://innoforest.eu/enabling-innovation/#fusion-tab-deliverables [30 November 2020]

Orsi, F., Bussola, F., Gagliano, C., & Falco, E. (2020). *Documentation of Constructive Innovation Assessment (CINA) workshops: InnoForESt Innovation Region Primiero/Trentino, Italy. D4.2 subreport*. Eberswalde: HNEE. Retrieved from: https://innoforest.eu/enabling-innovation/#fusion-tab-deliverables

Parandian, A., & Rip, A. (2013). Scenarios to explore the futures of the emerging technology of organic and large area electronics. *European Journal of Futures Research, 1*(9), 1-18

Pekkonen, M., Varumo, L., Kuusela, S., Granander, M., & Primmer, E. (2020). *Documentation of Constructive Innovation Assessment (CINA) workshops: InnoForESt Innovation Region Habitat*

Bank of Finland Helsinki, Finland. D4.2 subreport. Eberswalde: HNEE. Retrieved from: https://innoforest.eu/enabling-innovation/#fusion-tab-deliverables

Primmer, E., Orsi, F., Varumo, L., Krause, T., Geneletti, D., Brogaard, S., Loft, L., Meyer, C., Schleyer, C., Stegmaier, P., Aukes, E., Sorge, S., Grossmann, C., Maier, C., Sarvasova, Z., & Kister, J. (2019). *Deliverable 2.1: Mapping of forest ecosystem services and institutional frameworks*. Eberswalde: HNEE. Retrieved from: https://innoforest.eu/enabling-innovation/#fusion-tab-deliverables [30 November 2020]

Rip, A. (2002). *Co-Evolution of Science, Technology and Society. Expert Review for the Bundesministerium Bildung und Forschung's Förderinitiative 'Politik, Wissenschaft und Gesellschaft' (Science Policy Studies)*. Enschede: University of Twente

Rip, A. (2012). The Context of Innovation Journeys. *Creativity and Innovation Management, 21*(2), 158-170

Rip, A., & Te Kulve, H. (2008). Constructive Technology Assessment and Socio-Technical Scenarios. In E. Fisher, C. Selin, & J.M. Wetmore (Eds.), *The Yearbook of Nanotechnology in Society, Volume I: Presenting Futures* (pp. 49-70). Dordrecht: Springer Netherlands

Rip, A., & Van den Belt, H. (1986). Constructive technology assessment: Influencing technological development? *Journal für Entwicklungspolitik*, 3: 24–40

Robinson, D.K.R. (2009). Co-evolutionary scenarios: an application to prospecting futures of the responsible development of nanotechnology. *Technological Forecasting and Social Change 76*(9), 1222-1239

Sattler, C. (2019). *Deliverable 4.1: Mixed method matching analysis: Suggested methods to support the development and matching of prototypes to the different innovation regions*. Eberswalde: HNEE. Retrieved from: https://innoforest.eu/enabling-innovation/#fusion-tab-deliverables [30 November 2020]

Schleyer, C., Kister, J., Klingler, M., Stegmaier, P., & Aukes, E. (2019). *Deliverable 5.2: Report on stakeholders' interests, visions, and concerns*. Eberswalde: HNEE. Retrieved from: https://innoforest.eu/enabling-innovation/#fusion-tab-deliverables [30 November 2020]

Schwerdtner, W., Siebert, R., Busse, M., & Freisinger, U. (2015). Regional Open Innovation Roadmapping: A New Framework for Innovation-Based Regional Development. *Sustainability*, *7*(12), 2301-2321

Smits, R.E., Kuhlmann, S., & Shapira, P. (Eds.). (2010). *The theory and practice of innovation policy. An international handbook*. Cheltenham: Elgar

Sorge, S., & Mann, C. (2019). *Deliverable 3.1: Analysis Framework for the Governance of Policy and Business Innovation Types and Conditions*. Eberswalde: HNEE. Retrieved from: https://innoforest.eu/enabling-innovation/#fusion-tab-deliverables [30 November 2020]

Stegmaier, P. (2020). Constructive Technology Assessment (CTA): Innovationsmitgestaltung als Prozess gesellschaftlicher Aufklärung und Erwartungsmoderation. In B. Blättel-Mink, I. Schulz-Schaeffer, & A. Windeler (Eds.), *Handbuch Innovationsforschung*. Wiesbaden: Springer VS

Stegmaier, Peter, und Klaasjan Visscher. 2017. A multi-layer exploration on innovations for climate services markets. EU-MACS, deliverable 1.4. Retrieved from: http://eu-macs.eu/wp-content/uploads/2016/12/EU-MACS_D14_submitted_31102017-corrected-171113-JAK.pdf [30 November 2020]

Te Kulve, H. (2014). Anticipating Market Introduction of Nanotechnology-Enabled Drug Delivery Systems. In A. Demir Sezer (Ed.), *Application of Nanotechnology in Drug Delivery* (pp. 501-524). London: IntechOpen

Te Kulve, H., Boon, W.P.C., Konrad, K., & Schuitmaker, T.J. (2018). Influencing the direction of innovation processes: the shadow of authorities in demand articulation. *Science and Public Policy, 45*(4), 455-467

Te Kulve, H., & Konrad, K. (2017). Sectoral demand articulation: The case of emerging sensor technologies in the drinking water sector. *Technological Forecasting and Social Change, 119*, 154-169

Visscher, K., Stegmaier, P., Damm, A., Hamaker-Taylor, R., Harjanne, A., & Giordanao, R. (2020). Climate Services. Matching Supply and Demand: A Typology of Climate Services. *Climate Services, 17*.