



Forest Stewardship Council®



FSC Focus Forests Green Paper Summary

This paper provides FSC background to the Green Paper of the research consortium and summarizes the framework provided by the consortium. The Green Paper of the Consortium is included as Annex 1 in this paper.

Focus Forests Green Paper Now Available for your feedback

We would very much like to receive your feedback to the Green Paper through the following [link](#). **Please send your feedback until Friday 15 October 2021.**

We are looking forward to your comments.



All Rights Reserved FSC® International 2019-2020 FSC®F000100

Discussion
paper

1. Background

Every FSC member has a deep regard for forests. Collectively, the FSC membership agrees that biodiversity loss and climate change are pressing issues, and that forests are vital to solving these twin crises. They also agree that certification is instrumental to protecting and conserving forests.

However, while this general vision is shared, there is a divide within the membership regarding forested areas to which people assign significant value – like intact forest landscapes (IFLs), old growth forests, Indigenous Cultural Landscapes, sacred forests, and similar areas. Each of these have high ecological, social and cultural value. Collectively, we refer in this paper to these areas “forests of value” or “focus forests.”

Some FSC members argue that these forest landscapes need to be fully protected and not certified for production in any way. Others say that FSC certification will act as a safeguard against illegal activity and conversion to other uses. FSC Motion 65 crystallised this issue. Approved in 2014, it stipulates that 80% of designated IFLs, or “the vast majority” of an intact landscape within certified natural forest concessions must be protected.

The motion became the basis for an interim FSC rule in 2017, and now appears in [normative framework](#), [directive](#) and [guidance](#) documents, and an [advice note](#). The advice note implements the 80% default protection in countries where the national standard does not include specific rules for Intact Forest Landscapes. For the development of rules in national standards, the Guidance for Standard Development Groups explains in which situations the default of 80% protection within the Forest Management Unit can be brought down to 50% protection.

However, the motion continues to inspire debate among FSC members.

At the heart of this debate are three questions: What can happen, what should happen and can FSC stewardship protect and conserve these forests? With climate change looming and pressure on ecosystems rising, it is time to answer these questions.

In pursuit of these answers, FSC International seeks to create a platform and structure for constructive dialogue, in the context of the 2021-2026 Global Strategy, based on new, science-based approaches to dialogue and negotiation and that build on a landscape approach, rather than only looking at individual forest management units. The aim is to initiate fruitful dialogue with land users, local and indigenous communities, NGOs, government representatives, businesses, academics, other FSC stakeholders and members from all FSC chambers.

This initiative is called the Focus Forests project.

2. The research consortium's Green Paper

The development of the Focus Forests project is informed by research outlined in papers produced by a scientific consortium partnering with FSC, led by ETH Zurich and CIRAD, and comprised of 12 scientists, experts and facilitators. This consortium has produced a Green Paper.

The Green Paper's general objective is to foster dialogue and build consensus on the methods, tools and concepts to be used in the Focus Forests project.

Its specific objectives are to:

1. Propose a unified, global definition of the term “forests of value” (or in FSC terms: focus forests) that will serve as a foundation for negotiation in a multi-stakeholder context on landscape use mapping.
2. Introduce a framework that reflects the values which different stakeholders attribute to these forests; and
3. Propose a global map of potential forest cover to support the development of future scenarios of these forests.

3. The Framework

3A. Definitions

The Focus Forests framework aims to identify how forests of value are understood, described and defined by different stakeholders.

The consortium's view is that: *“Despite demonstrations of political will and global efforts, forest loss, fragmentation, and degradation continue unabated. No clear evidence exists to suggest that initiatives [to address these problems] are working. A key reason for this apparent ineffectiveness could lie in the failure to recognize the agency of all stakeholders involved. Landscapes do not happen. We shape them.”*

Forests of value are described in many ways – in terms of their structure, composition, dynamics, size, and so on. While these descriptions can be based on science, definitions are often political. Forests are frequently defined on the basis of management objectives, which decide who has authority, where funds will be channelled and what activities are tolerated. These definitions are used in different ways by different institutions and different stakeholders, often with unintended consequences.

Differing definitions can lead to inconsistencies in the way a forest is categorised by different stakeholders, in turn leading to significant differences in how forests are assessed and evaluated. The ambiguity in these varying, overlapping definitions of forests represents a challenge for meaningful and effective policies and regulations, and affects the implementation of sustainable management actions.

For this reason, the research consortium proposes to begin with the simplest definition possible: **A forest of value is a forest to which people attribute value.**

In spite of its simplicity, the consortium believes that this definition is a solid foundation for dialogue, as it is inclusive and clear. It also raises questions about who attributes values to forests and the nature of these values. Using this definition as a springboard,

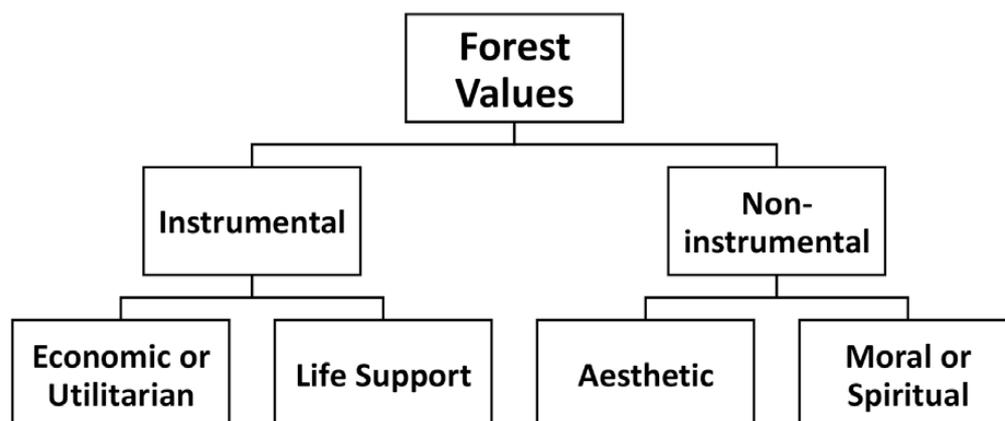
the research consortium in the Focus Forests project is conducting a systematic literature mapping exercise on how forests of value are defined and described in scientific publications and official documents around the world. This mapping process is based on a protocol that was shared with members for feedback in April 2021 and has now been published in a [peer-reviewed journal](#).

3B. Values

Values are central to FSC. The High Conservation Value (HCV) concept was originally developed by FSC in 1999 for use in forest management certification. Today, environmental and social values are a key component of the Principles and Criteria of FSC, particularly Principle 6 (Environmental Values and Impacts), Principle 9 (High Conservation Values) and Principles 2 and 3 on Workers' and Indigenous Peoples' rights, respectively.

A cornerstone of the Focus Forests project is the acknowledgment that people hold different understandings of what forests are, what forests ought to be and how forests should be managed. The Green Paper proposes that the values of a forest are the result of interactions between forests and observers, i.e., the values that people attribute to forests stem from their beliefs about the relationships between forests and people. These are formed by their perception of how forests directly or indirectly contribute to their well-being. Additionally, every forest stakeholder makes subjective choices, and different stakeholders hold varying levels of power in different situations.

The Green Paper goes into further detail on the nature of values and beliefs. These fall into several categories, shown below:



Given their importance to every stakeholder, the Focus Forests project believes that values and beliefs are vital to dialogue.

Here is an example. In a Qset survey shared with FSC members in April 2021, respondents agreed that climate change and biodiversity loss are pressing problems, and that forests hold the key to overcoming these crises. But they differed in their concerns about what will happen to these forests in the future. Some expressed fear that further deforestation and degradation will cross irreversible planetary boundaries, others feared that reducing the capacity of FSC members to resist external pressures will sign the death warrant of these forests. All respondents feared environmental and social disruption, yet their concerns about how these fears will be manifested were

different. Still, both sets of concerns are legitimate, as both scenarios are plausible and may happen, unless collective solutions are found.

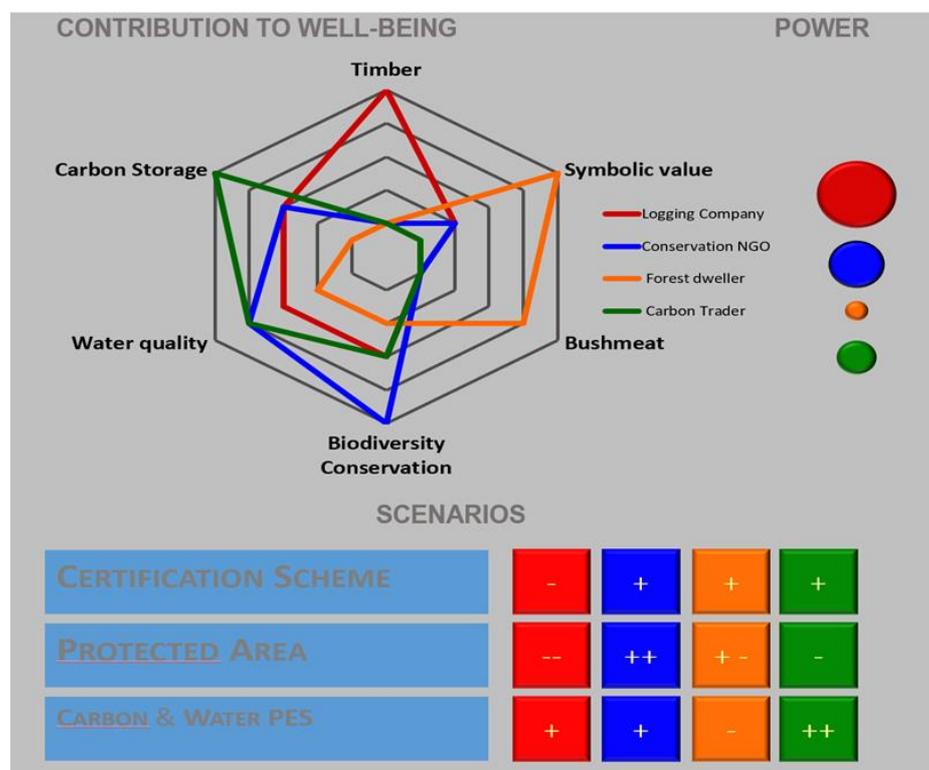
When stakeholders negotiate in multi-stakeholder processes as proposed in the Focus Forests project, trade-offs will occur. “Win-win” outcomes are not assured, they need to be created, and certain solutions will require difficult choices to be made between competing objectives. By understanding who “wins” and who “loses” from a negotiation, and making these facts explicit and transparent, the politics of that negotiation become clear. Therefore, a structured process is needed to analyse the distribution of values between land users in order to address hidden inequities and ensure that promises are kept.

The Green Paper illustrates these trade-offs through a case study on an FSC-certified forest concession in Central Africa. This examines the winners and losers in a forest intervention by looking at three main questions:

1. Which actors have motivations and incentives to bring about change?
2. What resources do they need to make other actors shift their position?
3. What levers do they have to realise their strategic interests?

In this case study, the negotiation between 4 strategic groups is summarized: logging company, conservation NGO, forest dweller and carbon trader. The uses negotiated are carbon storage, water quality, timber, bushmeat, biodiversity conservation and symbolic value. The final value assessment between the groups is summarized here:

In the case study, each strategic group is identified by their potential power to influence local outcomes. The relative importance of the six forest values from the perspective of four strategic groups is inventoried. For example, a logging company may rank the production of timber as their most preferred output, while a conservation NGO may prefer the conservation of biodiversity.



The Focus Forests project aims to encourage this type of structured thinking by allowing diverse groups of people, linked to the forest landscape on which they depend, to negotiate with each other to identify and assess trade-offs. Recognising and making the trade-offs between stakeholders visible to all is a vital step in this project process. The Focus Forests project seeks to explore if a structured process can deliver an agreed understanding of preferred land use as a preliminary and required first step before agreeing the requirements for protection inside a forest management unit in a Focus Forest Landscape. This will then inform the likelihood of success related to different values of FSC certification in the specific context.

3C. Maps

Because they are so subjective, forest values cannot be represented as objective layers on a map. The researchers' position is that using a single set map for decision-making is a top-down solution that could alienate some forest stakeholders – they argue that a normative map is the end result of local dialogue, rather than a starting point.

Furthermore, they believe that a set forest value map risks undermining the attempts of FSC to be inclusive of all sectors and viewpoints. As an alternative, the researchers propose using counterfactual maps of potential tree cover as a basis for scenario-building with multiple stakeholders (counterfactual proposals modify existing events to propose different outcomes using “what if” thinking). Developing a common vision of what a given landscape **should be** is a difficult task if stakeholder values are entrenched. It is also not essential. For collaboration to succeed, people do not need to agree on a shared vision, they just need to agree on how the world works and how it **can** change.

The Focus Forests project proposes that stakeholders jointly develop different scenarios of forest change, imagining possible “what if” future states of the landscapes they manage or depend on; considering all physically possible scenarios before narrowing them down to preferred futures. These possibilities will be explored first through maps of potential tree cover.

The project has produced a series of maps of potential global tree restoration under different environmental conditions. These maps were developed by the research team using field observations and satellite data and may be [viewed here](#). Climate data are the main drivers of the potential tree cover in the model, and differences in the data produce important differences in the model results.

4. Next steps

The next steps of the researchers in the Focus Forests project are:

1. Systematic mapping of the concept of “forests of value.
2. ”Demonstration of the consensus building potential of scenarios developed by stakeholders using strategy games designed to represent the constraints in given landscapes. These demonstrations will be organised using FSC member volunteers and consist initially of two landscapes, one a tropical biome and the other a boreal biome.

END

Annex 1: Green Paper developed by the research consortium

Green Paper Focus Forests

C. Garcia, J-F. Bastin, M. Bourey, A. Dray, Ida N. Djenontin, F. Kleinschroth, N. Lausberg, M.- A. Ngo Bieng, F. Quétier, S. Savilaakso, N. Stoudmann, M. Virah-Sawmy, P. O. Waeber and J. Wierer

“Landscapes do not happen. We shape them.”
Garcia et al. 2020

In September 2020, FSC International issued a request for proposals for the identification of highly valuable forests and their sustainable uses. ETH Zurich and its partners presented a proposal to identify how forests of particular value are defined by management and research institutions worldwide, develop a map of potential forest cover to guide decisions and a framework to support the negotiation process on these forests of high value. Based on feedback received in the initial phase of the survey, the label “High Value Forest” has been abandoned and the project renamed Focus Forest (FF). The objective remains unchanged: **to support FSC members and certificate holders reach consensus on how to manage the forests seen as essential in the context of the climate and biodiversity urgency.** In the remainder of this document, we will refer to Focus Forest as our project and to Forests of Value as the forests people want to focus on.

The Focus Forests project aims to find solutions for stewardship in forests with special social and environmental values – the forests of value. Through this project, FSC will look for ways to address biodiversity loss and climate change, while continuing to enable the provision of responsibly produced goods and services from leading forest management practices. We anticipate that the project will facilitate a process to help understand whether and how certification inside forests of value can be reconciled with FSC’s commitments to combat climate change and conserve and restore forest biodiversity. Forestry is under increased scrutiny, particularly in intact forest landscapes (IFLs) and similar forests¹ identified for their contribution to various Sustainable Development Goals (SDGs). FSC is therefore seeking support for discussions amongst FSC members and certificate holders on the development of a common position on forests playing a critical role as climate/livelihood/biodiversity nexus. This is done in anticipation of the FSC General Assembly planned for October 2021. Building consensus on what “forests of value” (Focus Forests) are and what that means requires an approach that is as transparent and value neutral² as possible.

Focus Forest is therefore not about forest, but about what people say about forests and how they can reach consensus when their values and worldviews differ.

¹ Terms such as ‘pristine forest’, ‘old growth’, ‘ancient forest’, ‘intact forest’, ‘untouched forest’—inter alia—are used interchangeably to ‘primary forest’ in the literature.

² Here we understand the values of a forest as a result of the interaction between the forest and an observer. They are relative, subjective, intangible and fluid. The process of capturing and understanding these values requires a shift away from the forests and towards the people, in particular their values, mental models and beliefs. Such a shift involves a process of value elicitation and negotiation.

Objectives of the green paper

A green paper is a discussion document intended to stimulate debate and launch a process of consultation on a particular topic. In administrations world over, a green paper usually presents a range of ideas and is meant to invite interested individuals or organizations to contribute views and information. Green papers set out for discussion, and present proposals which are still at a formative stage.

The general objective of this Focus Forest Green Paper is to **foster dialogue and build consensus on the methods, tools and concepts put forward by the Focus Forest team as a service to the FSC members, certificate holders and boundary partners**. The green paper is part of the strategy of co-creation between communities, practitioners and academics adopted by the Focus Forest.

The specific objectives are:

4. Propose a global definition of forests of value that serves as a foundation for negotiating management dispositions.
5. Introduce a framework that reflects the values different stakeholders attribute to specific forests as a guide for negotiating management interventions.
6. Present a global map about potential forest cover to support the identification of the forests of value.

1. Definitions: What is a forest of value?

The problem with definitions

Forests are valued for different aspects by different groups of people. There are many concepts used to describe forests. These can relate to forest structure, composition, forest dynamics, size, human activity, quality or value. Examples of such terms are 'Intact forest Landscapes' (IFLs) as well as 'ancient forests' (often defined by human activity) and 'primary forests' (often defined by intact ecological processes and natural regeneration). These definitions are used differently by different institutions and stakeholders. Unintended consequences arise when definitions are used beyond their scope of relevance.

Forests are defined in many different ways. Apart from ecological and structural factors, associated values and provided ecosystem services are an important part of forest definitions. Typically, forest types are differentiated based on climatic regions and on degrees of human modification. A better understanding of how to distinguish different forests on the basis of the values they provide was provided with the development of the High Conservation Value Areas framework and the HCV Resource Network (see Box 1 and 2), and was needed to advance global policies put forward by organizations such as the Convention on Biological Diversity (CBD), the United Nations Framework Convention on Climate Change (UNFCCC), or the UN Sustainable Development Goals (SDGs).

Box 1:

“High Conservation Value Areas (HCVAs) are natural habitats, which are of outstanding significance or critical importance due to their high biological, ecological, social or cultural values. These areas need to be appropriately managed in order to maintain or enhance those identified values. The High Conservation Value (HCV) concept was originally developed by the Forest Stewardship Council (FSC) in 1999 for use in forest management certification.¹ The HCV Resource Network was established in 2005. The scope was widened from “HCV Forest” to “HCV Area” (HCVA).¹ It is now a keystone principle of sustainability standards for palm oil, soy, sugar, biofuels and carbon, as well as being widely used for landscape mapping, conservation and natural resource planning and advocacy. The HCV approach consists of six Values, which cover environmental and social priorities shared by a wide range of stakeholder groups.² (...)”

From <https://www.biodiversitya-z.org/content/high-conservation-value-areas-hcva>

Definitions are tied to management objectives (Chazdon et al. 2016). Forest definitions provide the basis for policies and monitoring systems driving or enabling deforestation, degradation, reforestation, and restoration. Definitions are therefore political statements and the result of power struggles between decision makers. Definitions mark the boundaries of what will be accepted and rejected, supported or forbidden, considered or neglected. In that sense, imposing one more definition of high value forest or focus forests for that matter would be counterproductive, particularly if done through a process that is perceived as opaque and lacking legitimacy.

Box 2:

“Formed in 2006, The HCV Resource Network is a charter-based organisation composed of a network of members, including representatives from producer companies, NGOs, research organisations, auditors and other practitioners, who share a mission to conserve outstanding and/or critical environmental and social values, as part of responsible natural resource management.”

From www.hcvnetwork.org.

An example taken from the definition of Intact Forest Landscapes illustrates the challenge.

- Academics defined IFLs as “a seamless mosaic of forest and naturally treeless ecosystems **with no remotely detected signs of human activity** and a minimum area of 500 km²” (Popatov et al. 2017). (emphasis added)
- FSC Motions 2014/07 and 2014/65 use the term IFL, defined as “a territory within today’s global extent of forest cover which contains forest and non-forest ecosystems **minimally influenced by human economic activity**, with an area of at least 500km² (50,000 ha) and a minimal width of 10km” (emphasis added).

Both definitions are subtly but significantly different, the latter giving room for interpretation what the minimal influence could be. This is particularly relevant for selective logging operations in tropical forests that can be carried out in biodiversity-friendly ways (Morgan et al. 2018) but are still detectable through remote sensing due to the presence of roads (Kleinschroth et al. 2019a).

When academics report on the loss of IFLs within FSC certified concessions, they are measuring according to their remote-sensing definition, which is not the one FSC

members have adopted. In other words, the yardstick used to measure performance has not been agreed upon by those being measured—a fact obscured by the adoption of the same terminology. Forest concepts with similar goals can contradict or work antagonistically to one another (Kleinschroth et al. 2019b).

Defining Forests of Value

It is critical to identify the definitions that exist in literature, recognize by whom they are made, and to understand whether there are gaps in the knowledge. This work is currently being done by our consortium, through a systematic mapping of the literature that has already been shared with the members (Savilaakso et al. 2021). This literature review is not necessarily the first step. Definitions are necessary to reach management objectives (Altamirano et al. 2013). However, in this case, agreement is more important than precision (Garcia et al. 2020). Thus, we propose the following:

We define things so we can understand the meaning of the words and understand each other. We describe things so we can recognize them. We designate things so we can manage them.

Defining what a “forest of value” is helps people understand what the label means.

Describing a forest of value helps people recognize it for what it is.

Designating a forest as a forest of value is the result of a negotiation process that has implications for management.

Here, we work on definitions, not on descriptions nor designations.

We propose to turn to philosophy to devise a definition. In his *Treatise on the Improvement of Understanding*, Spinoza writes:

“A definition, if it is to be called perfect, must explain the inmost essence of a thing, and must take care not to substitute for this any of its properties.”

This prevents us from defining forests of value through the measurement of their attributes such as carbon content or species richness, since these are descriptions of some of their properties.

1. [...] the definition must [...] comprehend the proximate cause.
2. A [...] definition of a thing should be such that all the properties of that thing [...] can be deduced from it.

Taking these elements into consideration, the definition of a forest of value that we propose follows:

A forest of value is a forest that people attribute value to.

This definition will not give satisfaction on first consideration. It is not what is expected and it will seem useless. We propose, however, that this is the best possible foundation for the following dialogues. It is simple and clear, leaves no room for interpretation and is explicit on the worldview it conveys. From this foundation, all the necessary questions will arise. What is a value? Who gives value? What values are given?

Another concern will be that this definition is anthropocentric, and that it negates the existence value of forests. Our response is that the existence value is acknowledged and included in the framework we propose together and on the same footing that all the others. Forest existence value is a value held by people about forests and nature for their own sake. The existence value is therefore included in the definition we propose, provided there is someone sitting at the table to hold and defend that value.

Forests, People, Values and Beliefs

The definition provided for the forests of value forces us to consider the values people attribute to forests. It also requires we understand what a value is. **A value is defined by the IPBES as a principle or core belief underpinning rules and moral judgements.** Values vary from one culture to another and within a culture from one individual to another (Pereira et al. 2020). We need thus to clarify one more notion, the concept of belief.

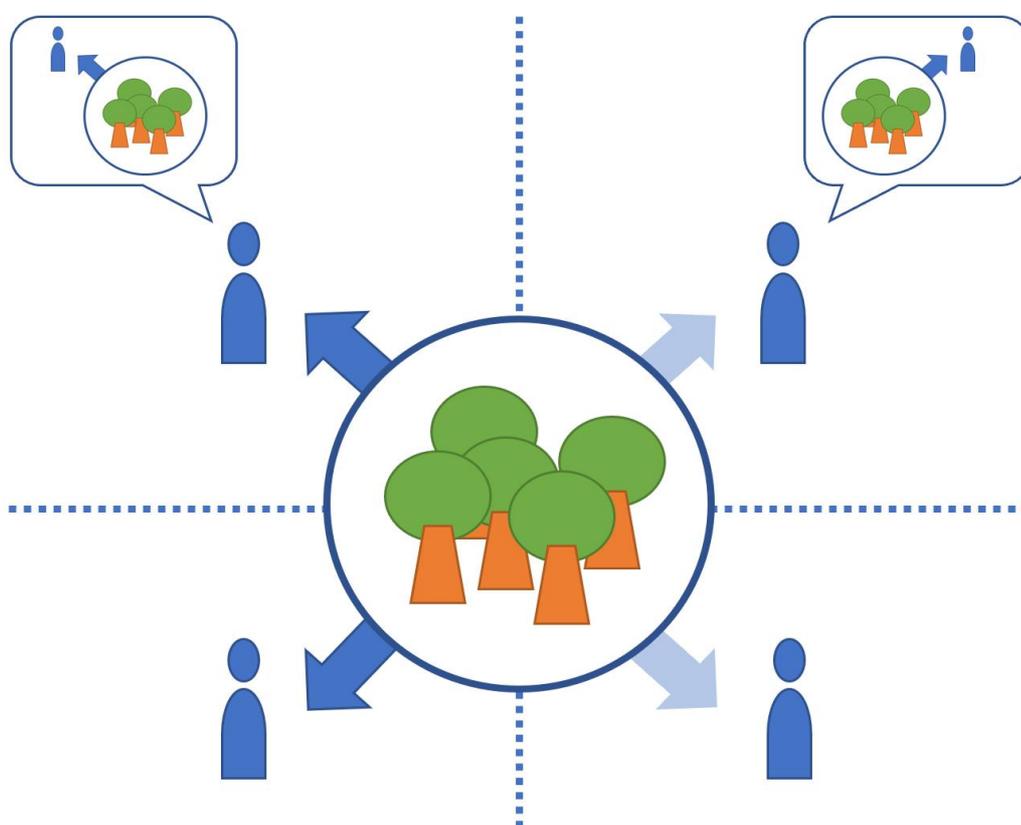


Figure 1: Forest values as narratives people develop about forests. We have placed the forest at the center. Different stakeholders benefit differently from the forest. The arrows represent the full contribution of the forest to the well-being of the stakeholder. Dark blue arrows represent a significant contribution. Light blue arrows represent a marginal contribution. Some of the stakeholders express the value they attribute to the forest, others do not – they can be unaware, unable or uninterested. The expression can be an accurate representation or not.

A belief is generally defined as the acceptance that a proposition is true. The traditional approach is to consider that our beliefs help us decide and achieve external goals. An accurate belief is therefore a belief that helps achieve these goals. If the goal escapes us, we might revise our belief. However, beliefs are more than just a means to achieve our goals. They are also a “source of value in and of themselves” and people are therefore motivated to hold on to particular beliefs independently of their accuracy (Bromberg-Martin and Sharot, 2020). This explains why information is insufficient to

change beliefs and prevents us from forming a more accurate picture of the world (Figure 2).

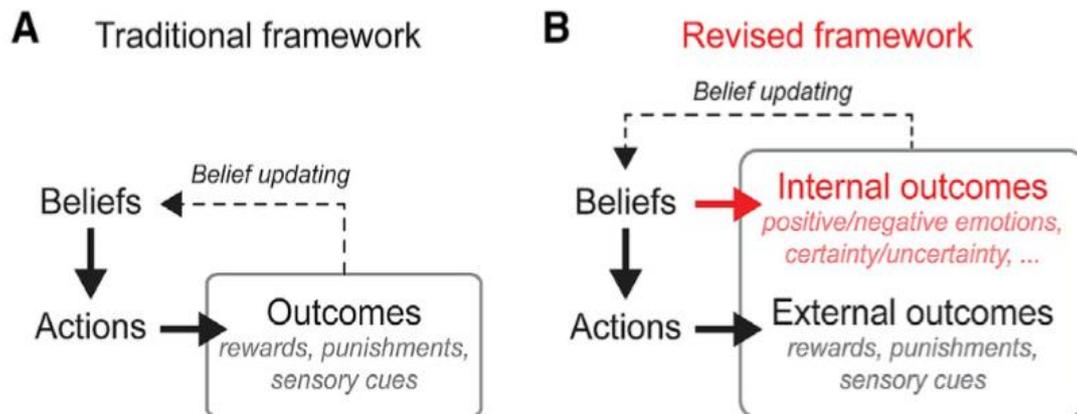


Figure 2: Traditional and revised framework on the value of beliefs. The traditional framework presents beliefs as enabling effective action. The value of a belief rests therefore in its actionability. The revised framework highlights some beliefs have worth by themselves and people are motivated to hold on to them irrespective of their instrumental value. Figure from Bromberg-Martin and Sharot 2020.

The values people attribute to forests are beliefs about the relationship between these forests and the people – themselves and others. More specifically they relate to the contribution the forests have directly or indirectly to their well-being. Some of these beliefs will be accurate, others less so. Some of these beliefs serve external goals, others have value in themselves. All are held with more or less strength by the people in the landscape. These values can be public and transparent. They can also be tacit, unknown, suppressed, or misrepresented. Tacit values are thought to be shared and therefore never expressed directly – they go without saying. Unknown values are those values that the beneficiaries are oblivious to. Suppressed values cannot be expressed for a multitude of reasons, including marginalization. Misrepresented values are those values that do not correspond to fact, here also, for a variety of reasons including deceit (Figure 1). All these points are possible sources of miscommunication and misunderstanding.

Focus Forest, FSC members and worldviews

Key to the Focus Forest project is the acknowledgment that different people hold different understandings of what a system is (here, forests). This understanding is shaped by their values and beliefs, which in turn shape how different people make different decisions (Figure 3).

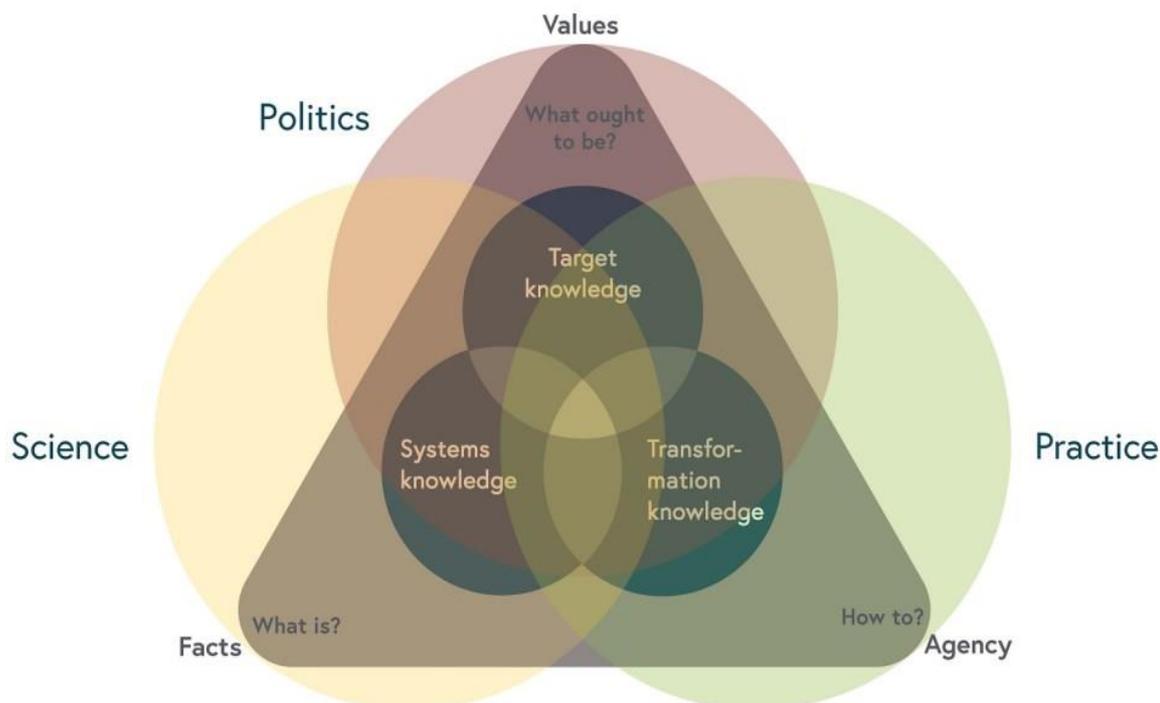


Figure 3: Three types of knowledge. System knowledge built on facts answers to the question of “What is?”. Target knowledge built on values answers the question “What ought to be?”, Transformation knowledge based on agency answers the questions “how to?”. The three types of knowledge are traditionally associated with science, politics and practices. In Focus Forest we propose to bridge all three, developing an integrated approach to landscape management. Source: <https://i2insights.org/2021/02/11/three-types-of-knowledge/>

People clash about values more than they clash about facts. When they clash about facts it is because of the values underneath the representation of facts. The question “What is a forest of value” meets with objection not because of the object we discuss but because of the intentions attributed to those asking the question. The concerns voiced in the first steps of the Focus Forest project were of two sorts: (1) fear that the discussion would lead to one additional layer of restrictions on forest management, destroying jobs, revenues and companies and (2) fear that the discussion would undermine existing conservation commitments and institutions, destroying forests and the communities that depend on them. The two concerns appear antagonistic to one another but they are not, both are legitimate, both could turn out to be true. Focus Forest is about finding a third way, ensuring none of them become reality (Figure 4).

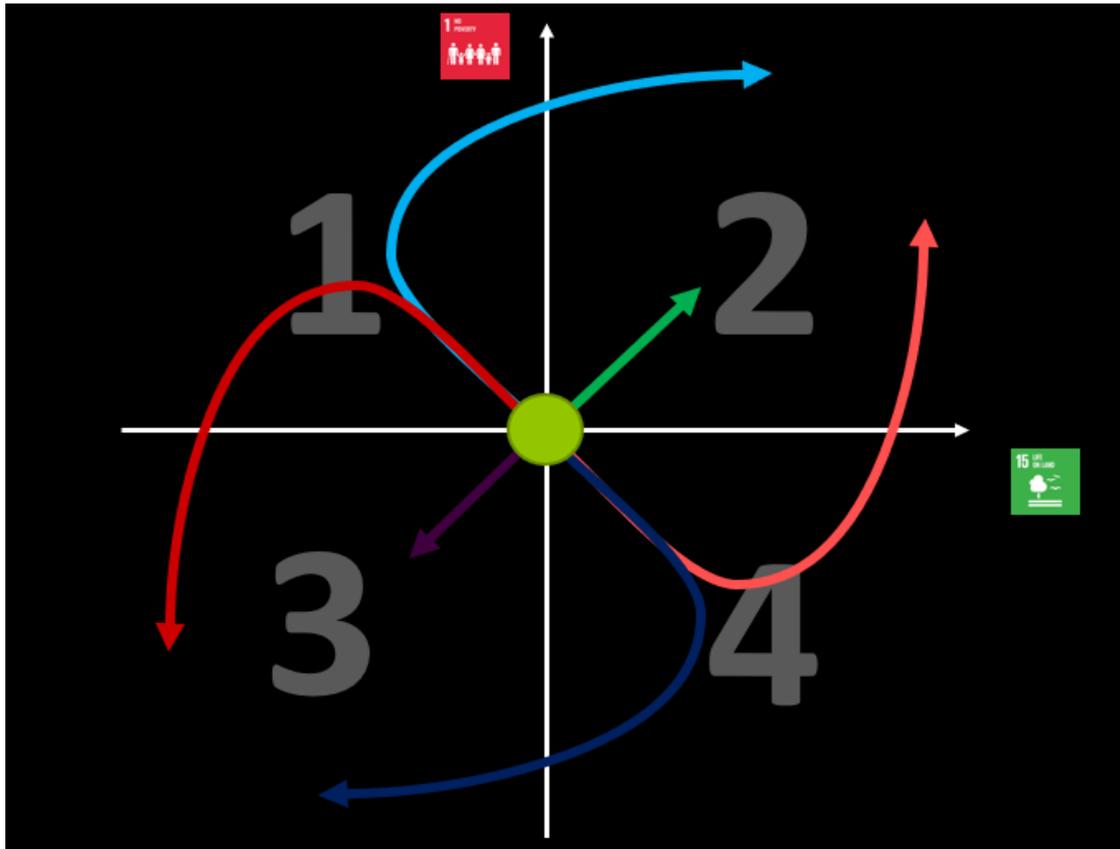


Figure 4: Pathways for the future. Using two simple dimensions to represent social and environmental changes, we have described future pathways that translate the concerns expressed by the respondents to the first Focus Forest survey. Those thinking Focus Forest would undermine existing conservation efforts dread Quadrants 1 and 3 (red pathways) and want to reach Quadrant 2 through immediate efforts to restore forests at the cost of society (pink pathway). Those thinking Focus Forest would prevent certified forest operations dread quadrants 4 and 3 (dark blue pathway). They seek to strengthen society in order to better conserve forests (light blue pathway). Few respondents could imagine Focus Forest helping find ways towards Quadrant 2. Adapted from: Waeber et al. 2021. <https://www.mdpi.com/2071-1050/13/6/3578/htm>

Worldviews and Consensus

Given the fact values and worldviews are the core of the definition of forests of value, we have proposed to explore the worldviews and narratives of the FSC members, certificate holders and boundary partners through a method called Qset. The Q methodology has been designed for the systematic study of subjectivity allowing for a quantitative analysis of people’s viewpoints (Krueger & Robbins, 2000). Participants are asked to rank-order a set of statements (Q set) developed by the researcher along a “most agree” to “most disagree” dimension. Following this, the sorted statements (Q sorts) are intercorrelated and subjected to a by-person factor analysis, revealing existing viewpoints (Watts & Stenner 2012). One of the key characteristics of the Q methodology is that it explores a “population of ideas and not a population of people” (Risdon et al., 2003, p. 377). The primary goal is to uncover different patterns of thought, to identify and describe shared stories among participants – not to count how many people think the way they do (Brown, 2004, p. 1).

We selected in total 35 statements from the initial survey conducted by FSC in January-February 2021 on High Value Forests and communications about the Focus Forest research project between members, FSC staff and the research consortium. We left the wording as close as possible to the original statements, editing only for

misspelling, clarity or to translate to English. The Q survey was sent to 68 respondents that had expressed interest in engaging with the project. We have received 13 responses. This small number does not prevent the identification of narratives as the Q method is about ideas, not people. It remains possible for late comers to take the survey and their responses can be counted as supplementary data, helping refine the narratives.

When we plot the responses of the participants, we see two groups. There are two distinct narratives unfolding within the respondents of the survey, we refer to them as discourse 1 and 2. Importantly, these discourses share a core set of common statements (Figure 5). We are going to present the outcomes of the analysis as if a discourse was a person. It will represent anyone endorsing that set of beliefs.

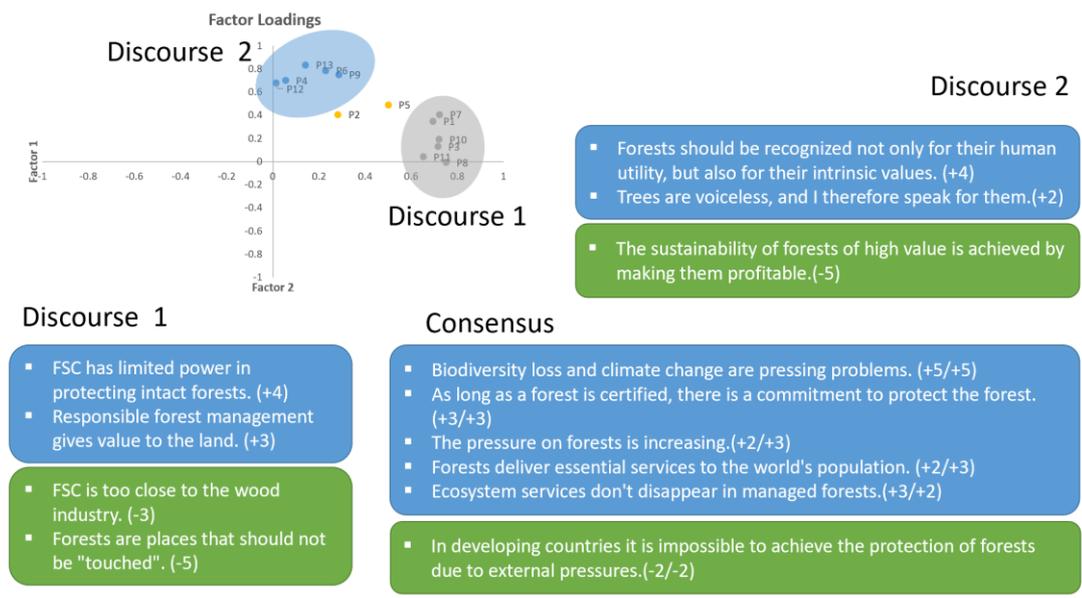


Figure 5: The two discourses. Participants develop two narratives with a strong core consensus. We distinguish three sets of statements, one of the statements that bring people together, and two that distinguish two different discourses. The first discourse has strong associations with the core consensus statements. The second discourse is aligned with existence value statement and the concept of conservation. The core consensual statements relate to the climate and biodiversity urgency, the pressure on forests, and the commitment to protect forests through certification. Blue boxes indicate statements the set agrees with, green boxes indicate statements the set disagrees with. Numbers in brackets indicate the level of agreement/disagreement. In the Consensus boxes, the first number is the level of agreement on statement for discourse 1, the second for discourse 2.

Consensus: The two discourses consent most on statement 8: “Biodiversity loss and climate change are pressing problems.” This statement is the highest-ranking statement for both discourses. Both discourses recognize forests as essential for the world’s population and that “the pressure on forests is increasing”. The conservation of forests is a high priority of both discourses. The certification of forests indicates a commitment to protect the forest. Ecosystem services remain also in managed forests. Both discourses believe the protection of forests can be achieved in developing countries.

Discourse 1 sees the protection of forests as an important priority. Forests are recognized as essential to humans, although intact forest landscapes are not a big priority in that discourse. The value of forests is defined by their relationship to humans, and can be expressed in monetary terms. Forests are there for humans and should be used. The certification means a commitment to protect the forest. Managed forests do

not lose the ecosystem services they are providing, and restriction of using the forest can bring social issues or lower the capacity to protect the forests. While they are seen as appropriate, some approaches taken by FSC such as HCV designation and IFL protection are also seen as constraints for which local communities and forest managers should be compensated. The discourse does not present FSC as too close to the wood industry and states that the purview of FSC and forest managers to protect forests is limited.

Discourse 2 also sees the protection of forests as an important priority. Intact forest landscapes play a bigger role than for discourse 1. While discourse 2 indicates that a forest's value depends on the relationship with humans, it also indicates that value is detached from utility and not measurable in monetary terms. Discourse 2 states forests have an existence value. All intact forests are of high value and everything determined as HCV matters. Despite this, discourse 2 disagrees with forests being places that should not be "touched" and agrees with ecosystem services remaining also in managed forests. Forests play an important role (e.g. ecosystem services), not just for generating profits. The sustainability of forests of high value is not achieved by making them profitable. Discourse 2 also sees certification as a commitment to protect the forest. Maintaining, enhancing and restoring HCVs is an appropriate approach and not a constraint for certification. Discourse 2 has a stronger belief in the FSC's and forest manager's powers to protect the forests than discourse 1. It recognizes that many forests of high value are zoned for exploitation. For discourse 2 there is a higher discrepancy between what there is, and what is possible, than for discourse 1. Discourse 2's viewpoint is dominated by the topic of protecting forests. This makes discourse 2 more dissenting and motivated. Discourse 2 places the statements referring to social issues in the more neutral positions. It sees itself as a protector of trees: "Trees are voiceless, and therefore I speak for them."

From this initial analysis, we observe that these two discourses align with the concerns expressed at large in the initial survey. For people adopting discourse 1, adding one more layer of constraints further reduces the capacity of the forest operators to protect the forest. For those adopting discourse 2, undermining conservation efforts puts the forests in danger.

We want to stress we do not find opposition between the two narratives – discourse 1 being defined essentially by what binds all respondents together and not by its disagreement with discourse 2. We do not see antagonism in the narratives, even if that antagonisms might be perceived between the proponents of the discourses.

2. Framework: Forests, values and power

What is a forest value?

Forest values are values narrowed to forest ecosystems. Forests values are understood as the relative lasting good associated to forests and forest ecosystems and reflect the ways in which forests and their resources are important to individuals or communities (Bengston 2020). FSC defines environmental values as follows:

Environmental values: The following set of elements of the biophysical and human environment:

- a) ecosystem functions (including carbon sequestration and storage)
- a) biological diversity
- b) water resources
- c) soils
- d) atmosphere
- e) landscape values (including cultural and spiritual values).

The actual worth attributed to these elements depends on human and societal perceptions.
 Source: FSC-STD-01-001 V5-2

In Focus Forest, we propose to define a forest value as the contribution a person sees a forest brings to her quality of life and well-being³.

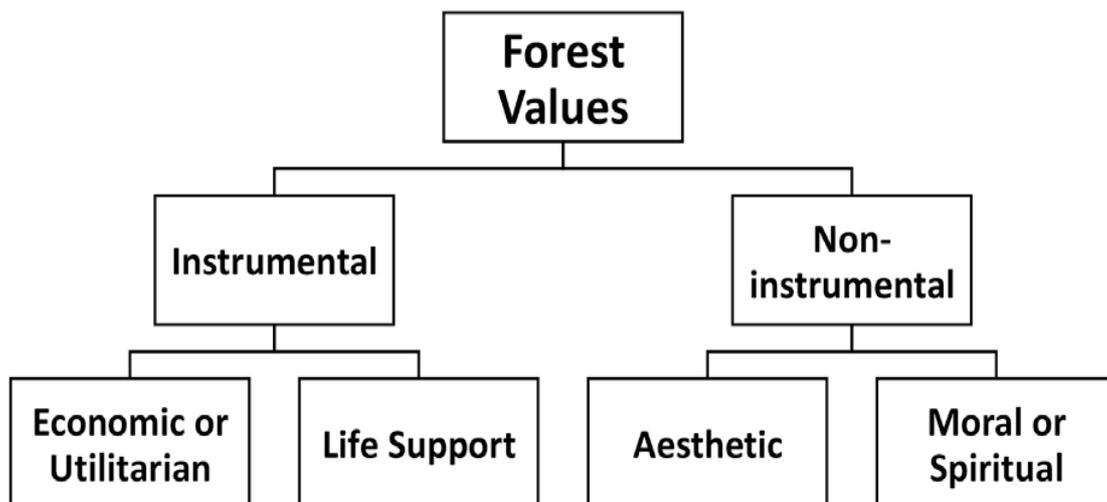


Figure 6: Typology of forest values. Instrumental forest values describe what is useful as a means to desirable end. Non instrumental forest values cover what is seen as worth in itself. Source: Bengston 2020.

Values are central to FSC. The High Conservation Value (HCV) concept was originally developed by the Forest Stewardship Council (FSC) in 1999 for use in forest management certification. Today, environmental values are core to Principle 6 (Environmental Values and Impacts), and High Conservation Values are the backbone of Principle 9 (High Conservation Values). Environmental values in Principle 6 include (1) ecosystem functions (including carbon sequestration and storage), (2) biological diversity, (3) water resources, (4) soils, (5) atmosphere and (6) landscape values (including cultural and spiritual values). The 6 HCV include Species diversity (HCV1), landscape level ecosystems and mosaics (HCV2), Ecosystems and habitats (HCV 3), Critical ecosystem services (HCV4), Community Needs (HCV5) and Cultural Values (HCV 6).

These thorough definitions are the result of years of collective work by FSC members, academics, and then the HCV Resource Network. We do not pretend to discover new values or undermine the ones that are already identified. We propose a more politically-informed framework for analyzing trade-offs between these values, reconciling top-down global definitions with bottom-up locally relevant ones. This is not different from what has been promoted for the last 20 years with the concept of Ecosystem Services, and what is already integral part of the forest management plans

³ We also attribute value to the wellbeing of others. This definition includes the altruistic concept that a person can value the contribution forests bring to the Quality of Life of other people.

being developed as part of certified forest operation worldwide. The addition here is the acceptance of the **subjectivity** of the choices made, the explicit consideration of the **power** relations among stakeholder groups and the collective exploration of **alternative states** of the world and their likely implications for different actors.

Who gives value?

Having clarified the concept of the forest value, we need to be explicit about who gives value. The concepts of Ecosystem services and High Conservation Values are inherently attractive because they provide an opportunity to relate environmental concerns to their impacts on human well-being. These frameworks have allowed the assessment and recognition of previously under-appreciated ecosystem services that provide important supporting, regulating and aesthetic and spiritual functions, which underpin human well-being. Making the links between forests and people's quality of life more explicit does not, however, resolve the trade-offs between positive environmental outcomes and improvements in social and economic development. 'Win-wins' cannot be assumed as a direct consequence of adopting an ecosystem services perspective, although this expectation is prevalent in some policy debates.

In reality, many—if not all—situations involve difficult choices between competing social objectives. The ecosystem services concept is powerful precisely because it provides a more explicit way of framing these decisions and their impacts on different individuals and groups, using a common framework. The linking of forests to people enables a more nuanced understanding of the political economy of environmental decision-making. By understanding who wins and who loses from a forest value based intervention, it is possible to clarify the nature of political negotiations that a given intervention will generate—which actors have motivations and incentives to bring about changes, what resources do they need to make other actors shift their position, and what levers do they actually have to attain their strategic interests?

We propose to adopt a structured process to analyze the distribution of forest values among different groups in a landscape, and how this distribution changes as a consequence of management decisions to secure the delivery of particular forest values. Without explicitly examining these outcomes, management interventions risk generating as many disappointments, resistance and failures as previous attempts at balancing conservation and socio-economic outcomes. Given the uncertainties and the multiplicity of the actors involved, each with personal and often conflicting agendas, this analysis is a necessary step to avoid ineffectiveness and risks negative and/or unintended consequences especially in terms of equity, well-being and environmental outcomes.

Since all values are unlikely to be simultaneously maximized within a landscape, the beneficiaries of these different values are also unlikely to have their needs met all together; there will be winners and losers. These trade-offs between stakeholders have both spatial and temporal dimensions, with some of the conflicts being between local and more widely distributed actors, whereas others involve inter-generational choices between present and future harvests and those who benefit from these. Sometimes, the trade-offs may also be internal to the same user group, or even to an individual. For example, maximizing storm protection services provided by mangroves may help reduce vulnerability to episodic weather events, but may require a reduction in the amount of fuelwood that can be extracted on a frequent basis, generating a trade-off between long-term physical security and short-term energy security for local households.

Beneficiaries from forest values are not physically determined but are socially constructed and legitimized. Beneficiaries exist on the basis of rights and institutions that define and permit access, and technology that enables certain kinds of use. Measuring the change in the total yield from a forest for example does not necessarily indicate its impact on livelihoods, since rules of access may exclude many potential users. Even if the aggregate amount of a service increases, and there is no loss of other services, people's well-being may be differently impacted due to the nature of social institutions which determine and regulate access.

What values are given?

There is a clear relationship between the relative power that actors exercise in society, and the ways in which institutions regulate use and benefits. Land grabbing, insecure tenure and overlapping claims to land often reflect unequal power relations in rural societies, and usually result in less powerful and often poorer users being unable to claim their fair share of potential benefits from changes in landscape interventions. Powerful actors typically secure greater benefits through influence or direct capture, while weaker groups who are dependent on forests may find themselves excluded.

In Focus Forest, we adopt the following definition

A stakeholder is any person or group who influences or is influenced by the management.⁴

FSC distinguishes in its glossary between affected and interested stakeholders. The above definition encompasses both, and includes the forest managers. The concept of 'strategic groups' (Evers, 1973), defined as "empirical social aggregates of variable geometry, who defend shared interests in the appropriation of resources, in particular by means of social and political action" (Bierschenk and de Sardan 1997, p.240) is used here to identify and distinguish between different stakeholders, and the ways in which they interact in relation to landscape management.

Our understanding of values and the trade-offs they imply suggests that compensating the visible losers from a proposed change in landscape management may not necessarily address all sources of potential conflict, especially if these reflect deeper social and political inequalities and imbalances in power between stakeholder groups. We propose a more politically informed framework for analyzing trade-offs, which considers alternative states of the world (scenarios) and their likely implications for different actors. Such scenarios need to consider the impacts of different choices on the resource interests, access rules and the distribution of power between stakeholders, in order to make the political process of negotiation more transparent, and ultimately to result in more effective and equitable choices about forest landscape management.

Case study: a certified forest concession in Central Africa

⁴ For a more extended exploration of the concept of stakeholder refer to Carney et al. 2009. Please note that Latour would likely consider non-humans to be stakeholders, a conception shared by some FSC members as seen in the results of the Qsort. We do not follow this line, considering a threshold of collective coordination is required to engage in strategic interactions.

Several issues need to be considered when examining the impacts of alternative forest management strategies on stakeholders within a landscape (Figure 7). We stress that we do not consider here only the biophysical outcomes that emerge from alternative scenarios, we point explicitly to the trade-offs between interests of different stakeholders in the system. There is therefore no conflict with the classical, accepted methods to measure ecosystem services or identify High Conservation Values of forests, we are simply advocating a more socially and politically grounded analytical approach.

The case study is chosen because it is relevant to the ongoing discussion on IFL in Central Africa, and specifically illustrates the additional value of the framework, revealing the distribution of outcomes across different stakeholder groups under the different scenarios (Figure 7).

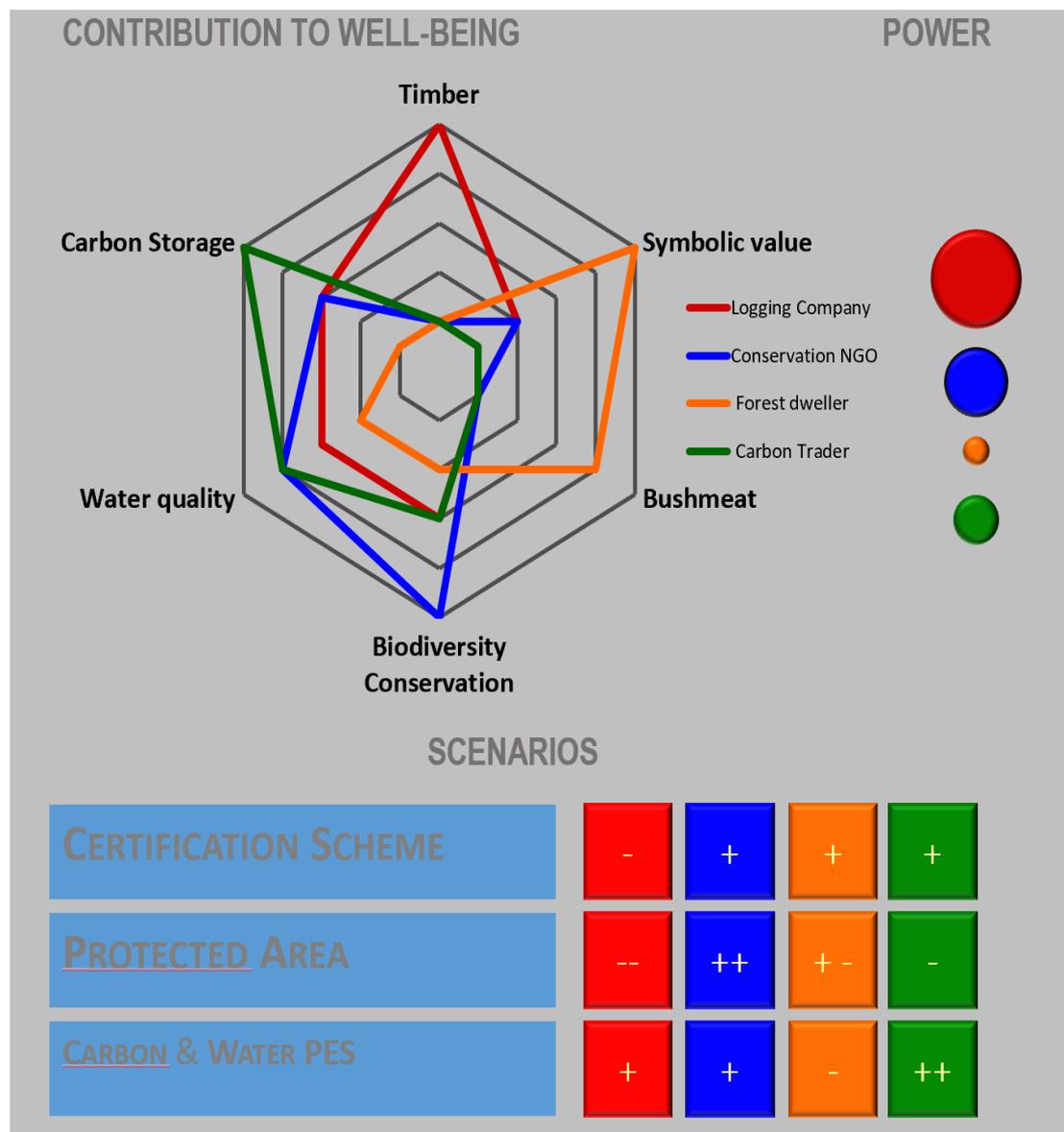


Figure 7: Trade-off framework. Different types of trade-offs that are involved in negotiations over forest values. The upper right panel uses the size of the circles next to each strategic group as a simplified representation of their potential power to influence outcomes in the local context. In the upper left panel 'Contribution to Well Being', the relative importance of six different forest values from the perspective of the four different strategic groups are represented in a radial diagram, with the color codes describing the identity of each strategic group. Thus, the logging company ranks the production of timber as their most

preferred output from the system, while the interests of forest dwellers are to maximize the capture of bushmeat for both own consumption and local trade. The final panel consists of a representation of alternative management scenarios considered for the forest concession or the Forest Management Unit. The outcomes from each scenario are color coded to reflect the interests of each of the strategic groups that are used in this illustrative example. These three scenarios are in no way limitative and serve only to demonstrate the use of the framework to shed light on the winners and losers of any management intervention.

These strategic groups, values, scenarios and their outcomes are proposed as illustrations only. They reflect plausible situations of classic management interventions and FSC members familiar with the context should be able to relate to both the scenarios and the outcomes for the different parties. The intention here is to demonstrate the explanatory power of the framework to represent the winners and losers of different management interventions.

How are environmental targets considered in this framework if there is no strategic group to uphold these values in the landscape? How are global public goods taken into account? The analysis outlined by the framework remains valid and can guide strategic engagement by external groups. The question is then for those wanting to secure environmental targets how to exercise power to influence the choices of the local groups. What rules need to change for local actors to have a genuine interest? The topics of responsibility, legitimacy and of validity of the claims linking well-being and forest will then come to the forefront. All these topics are already part of the negotiations happening across landscapes – the framework we propose will simply make them visible and transparent, subject to scrutiny and improvement.

The scenarios contemplated and the decisions that stem from a dialogue informed by this framework will likely include a range of options, which could include those that establish payment schemes in market-like transactions, but these need to be seen as just one alternative within a suite of possibilities. The chosen intervention is likely to reflect the balance of power between strategic groups, as well as the ideological commitment of the decision makers who are empowered to act in any particular context. In making these choices, we need to recognize that outcomes are likely to favor the interests of some groups above those of others, and the process by which these choices are made needs to be transparent and legitimate for decisions to be equitable and sustainable. Interventions will thus not be right or wrong, but more or less accepted by the different groups, a condition recognized by the “wicked problem” paradigm (Batie 2008; Rittel & Webber 1973).

What is the novelty?

If the concepts of Ecosystem Services and High Conservation Value are well established, we lack a similar level of knowledge about the social and economic trade-offs resulting from ecosystem service management decisions, and how these are politically negotiated. This framework provides a structured way of thinking about these trade-offs and applying appropriate tools to understand their impacts, by focusing on socially differentiated strategic groups, and how their interests are represented in alternative approaches for the management of forest landscapes.

The framework we propose facilitates this structured thinking and allows diverse groups of people, linked to the forest landscape on which they depend, to negotiate with each other to identify and assess trade-offs. However, despite this potential for elucidating new opportunities and challenges in addressing human well-being, it must not be seen as a universal panacea for conflicts over forest landscape management, especially as it is rarely possible to meet the needs of all stakeholders in a system. Power asymmetries will not be dissolved once made visible. Priorities for forest

management already consider the interests and identities of different actors, and make reasoned choices which reflect concerns for equity, justice and fairness, without necessarily privileging the interests of those who are most wealthy or powerful. We argue that recognizing and making these trade-offs between stakeholders visible to all is a vital step in this process.

3. Maps: Forest Potential

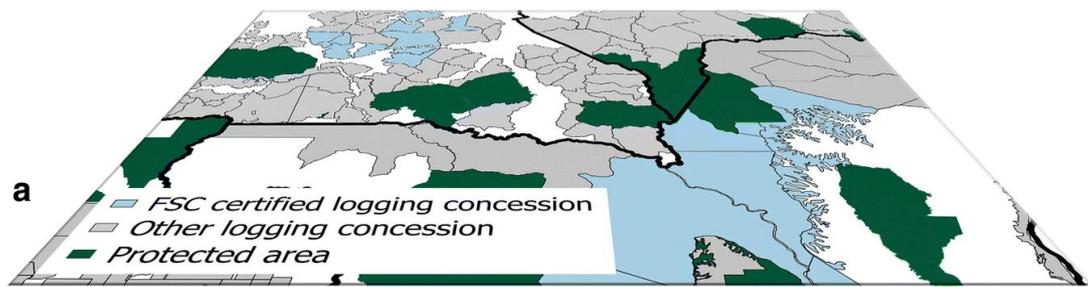
Since forest values are the result of the relationship a stakeholder establishes with a forest, these cannot be represented as objective layers without incurring systematic bias. To some extent, this is one of the vexing problems posed by the IFL discussion, where a descriptive layer of the world—the layers of forest intactness detected through remote sensing—is treated as a policy target (Figure 8). Focus Forest’s position is that using one global map for decision-making would be a top-down solution that risks alienating the plurality of views represented by the many different stakeholders who have an interest in forests. In other words, the normative map is the end result of the local dialogues, and not the starting point (Figure 8).

Forest Futures

The use of anticipatory knowledge in policy remains negligible at best
van der Steen and van Twist 2013

Once the concepts have been defined and we have designed a framework that sheds lights on the choices to make and the trade-offs to resolve, how can strategic groups move beyond power struggles and tug-of-wars that characterize landscape management decisions? How can the differences in values be resolved to allow for more effective collaboration?

Focus Forest proposes that it will be very expensive, perhaps even futile, to invest in trying to change the values of strategic groups active in a landscape in order to bring about forest transitions or any other systemic environmental transformations. Developing a common vision of what a given landscape should be will be difficult, exhausting, and possibly impossible if the values held, as we have seen, are at loggerheads. More importantly, it is not required (Garcia et al. 2020). For collaboration between agents to emerge, they do not need to agree on a common objective or shared vision. It is sufficient that they agree on how the world works and how it could change.



Policy



Science



Figure 8: Overlapping normative (policy) and descriptive (science) images of a forest landscape in the Congo Basin. **a** Image of forest concessions with and without FSC certification (<http://www.wri.org/tags/forest-atlas>) and protected areas (www.protectedplanet.net) with administrative implications. **b** Image of forest intactness (<http://www.intactforests.org/>) based on the absence of human impacts (such as roads) detected through remote sensing. **c** Descriptive image of road patterns visually detected from Landsat satellite images (Kleinschroth et al. 2017). **d** LANDSAT ETM+ pan mosaics of the forest landscape (Data available from the U.S. Geological Survey). **e** Location of the area shown in (a–d) on a globe with country borders (www.naturalearthdata.com). Source: Kleinschroth et al 2019.

We propose to contribute to resolving the current gridlock around IFL management and other forests of value by proposing stakeholders to jointly develop scenarios of landscape change, in other words imagining together the future states of the landscapes they manage, as a way to make better decisions today. Discussions about forest potential, are necessarily discussions about the future. Statements about the future do not follow classic logic. They are not false or true. They are undetermined, or contingent. Each story about the future, each scenario is tied to the probability it happens and these probabilities fluctuate based on the flow of events and decisions (Van Dorsser et a 2018). To begin the discussions in a landscape about how to manage focus forests, the wider we cast the net when designing scenarios, the higher the chances we find win-win solutions for all the strategic groups engaged in the dialogue. However, to develop more plausible scenarios, it helps to know where the physical limits of the system are. In other words, to be useful, the Focus Forest dialogues should contemplate all physically possible scenarios of change before narrowing down to the preferred futures and how to reach them (Figure 9). We need to know the forest potential of the landscapes we are going to build dialogues on.

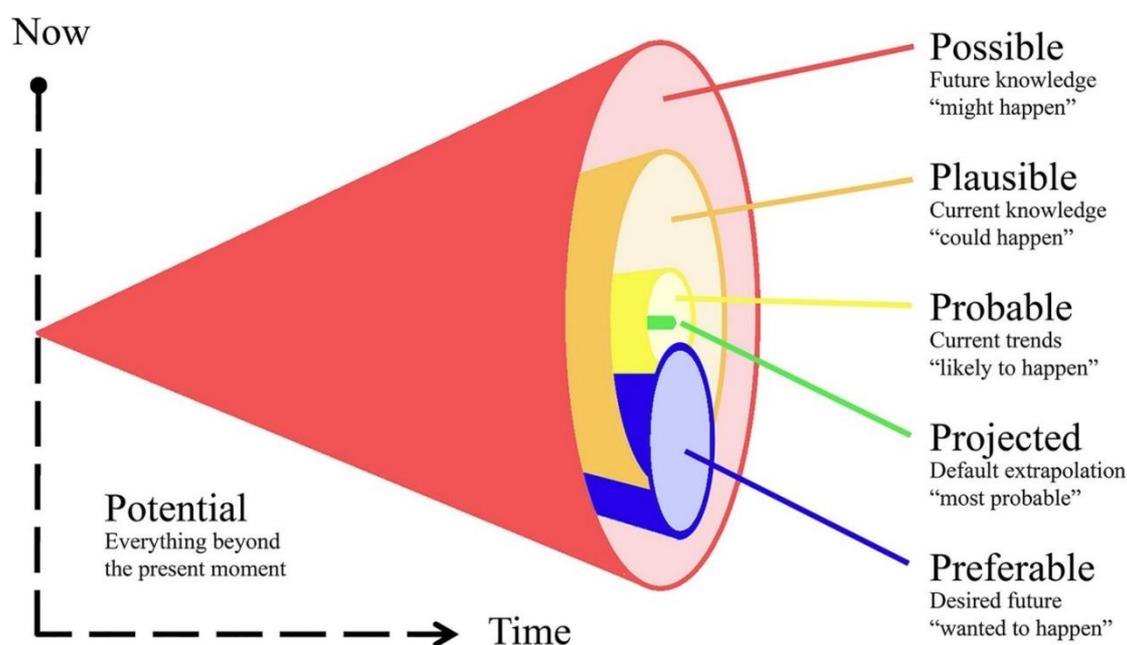


Figure 9: Futures Cone and families of scenarios, from Van Dorsser et a 2018.

Mapping Forest Potential

A scan of the available literature that presents maps of forest values shows a large body of potential maps to be considered from different viewpoints. We are not proposing to combine these, because they do not form a comparable set of sources due to the differences in their objectives, scrutiny of analysis, spatial and temporal resolutions. We suggest that using one particular forest value map risks undermining the attempt of FSC to be inclusive across sectors and viewpoints. As an alternative, we propose the use of counterfactual maps of potential tree cover as a base for scenario-building with multiple stakeholders. A counterfactual is defined as a proposition that considers what would be the results if events happen in a different way than what we assume will happen. Developing sound counterfactuals is the foundation of scenario building.

The Focus Forest team has developed global maps of the tree carrying capacity based on the earth global tree restoration potential led by J.-F. Bastin. (Bastin et al. 2019). In the original study, more than 70,000 points with photo-interpreted tree cover records were used to calibrate and validate a random forest model predicting the tree cover from environmental data. These 70,000 points were coming from FAO assessment of the tree cover (Bastin et al. 2017) in all the protected regions of the world listed in the World Database on Protected Areas. The result presented in Figure 2A of the original publication tends to underestimate the potential tree cover in Europe because Natura2000 sites were used as indicators of “natural ecosystems”, while many Natura2000 sites are partially impacted by human activities and therefore partially degraded. To correct for this bias, here we made a more restrictive selection of the protected areas by keeping only polygons of categories IUCN protected area categories I, II, or III. This resulted in a final selection of 19,000 points to calibrate and validate the model.

Climate data are the main drivers of the potential tree cover in the model, differences in the data might lead to important differences in the result of the model. Preliminary investigations showed discrepancies between climate databases to describe our current climate (1970–2000). To account for these differences, we modelled two different “total potential tree cover” of the planet, one using variables extracted from Worldclim (interpolated from field observations) and one using the exact same variables extracted from ERA5 (extrapolated from satellite observations). This resulted in the production of two layers:

1. The total potential tree cover with Worldclim;
2. The total potential tree cover with ERA5;

A finer resolution layer is provided using exclusively the WorldClim data set (250 m., Figure 10). However, for the purposes of comparing the two treatments, the spatial resolution of the two datasets were adjusted to the lowest resolution, i.e. 0.25 degrees. It allows the assessment of the difference between the two products without projection mismatch.

The assessment of the difference between the potential and the current tree cover also relies on the quality of the assessment of the current tree cover. The assessment of the current tree cover varies between the different existing products (Sexton et al. 2016). We account for such variations by comparing the results using two state-of-the-art reference maps that estimated the tree cover per pixel for the year 2000 using Landsat satellite images, i.e. the map of Hansen et al. (2013) and the map of Sexton et al. (2013). This resulted in the productions of 4 different maps of the potential tree cover restoration. The 4 different maps are produced from the different possible combination between the two “total potential tree cover” and the two “current tree cover” maps available. All these layers and the links to explore the maps are detailed in the Focus Forest WP2 Technical Handout and accessible here: <https://bastinjf-climate.users.earthengine.app/view/fscforestfocusrestorationpotential>

One of the limits we already see in the newly trained models is that the potential tree cover of boreal zones seems to be underestimated. Further work as part of Phase 2 will tell if this is something that can be corrected with a better training of the model, or if, and it is a possibility, we are witnessing changes to the potential tree cover that might significantly affect the future of these forests.

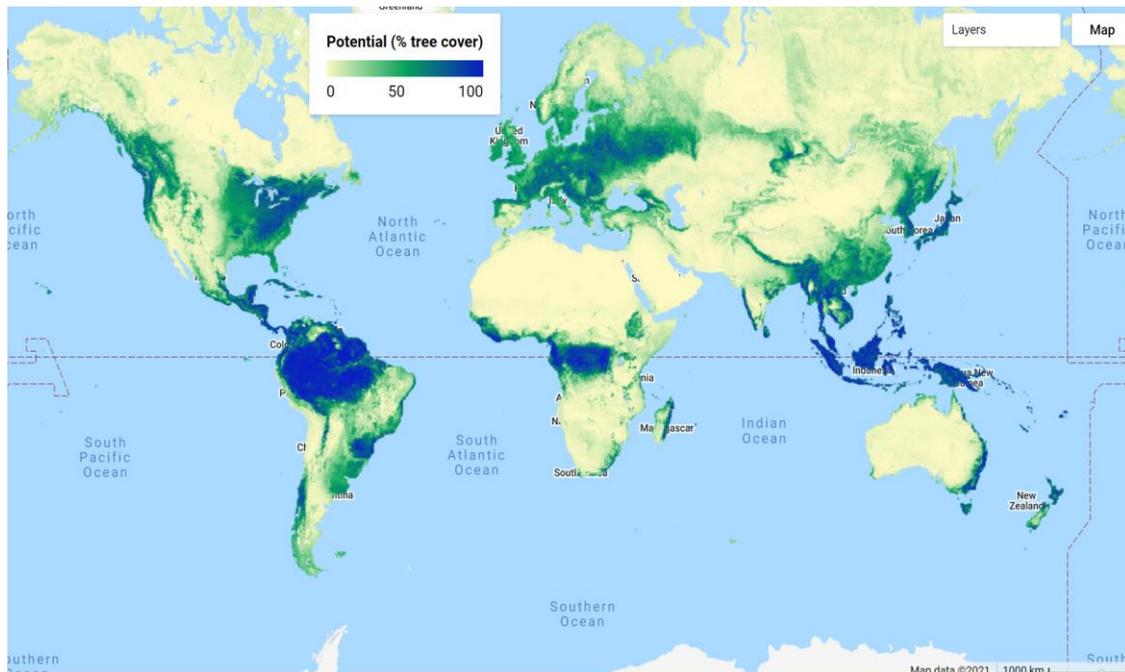


Figure 10: Map of potential tree cover based on Worldclim data. Other layers are accessible to the users. Source: <https://bastinjf-climate.users.earthengine.app/view/fscforestfocusrestorationpotential>

Next steps

The next steps of Focus Forest involve the systematic mapping of the concept of forests of value, and the demonstration of the consensus building potential of dialogues based on counterfactuals and common descriptions of how landscapes work. Future scenarios are developed by strategic groups using strategy games designed to represent the constraints that operate in any given landscape. Demonstrations will be organized with volunteering FSC members in two landscapes, one in a tropical biome and one in a boreal biome, ensuring the value proposition of the frameworks and tools we present in Focus Forest is shared and discussed with the wider membership of FSC and their partners.

Conclusion

This green paper has been developed to serve as the foundation of the dialogue—presenting concepts, frameworks, references, definitions and deliverables that stem from the collective experience of the consortium members and their boundary partners. Its aim is to present ideas and elicit feedback.

At a glance, we have proposed and/or identified

- definitions that highlight the questions that need addressing in any landscape where management interventions are contemplated to reverse the trend of deforestation and biodiversity loss;
- a framework that reveals the trade-offs between strategic group’s interests, as a way to have more pragmatic and hands-on discussions;
- commonalities in the worldviews of FSC membership on which constructive dialogues can develop and flagged discrepancies—namely the existence value of forest—that can be resolved provided collective action enables moving landscapes towards the desired pathway;
- maps that highlight the tree carrying potential of every landscape as a means to engage strategic groups in scenario building based on plausible yet wide counterfactuals.

References

- Altamirano, A., Aplin, P., Miranda, A., Cayuela, L., Algar, A. C., & Field, R. (2013). High rates of forest loss and turnover obscured by classical landscape measures. *Applied Geography*, 40, 199-211.
- Bastin, J.-F., Berrahmouni, N., Grainger, A., Maniatis, D., Mollicone, D., Moore, R., et al. (2017). The extent of forest in dryland biomes. *Science*, 356, 635–638
- Bastin, J. F., Finegold, Y., Garcia, C., Mollicone, D., Rezende, M., Routh, D., ... & Crowther, T. W. (2019). The global tree restoration potential. *Science*, 365(6448), 76-79.
- Batie, S. S. (2008). Wicked problems and applied economics. *Amer. J. Agr. Econ*, 90(5), 1176-1191.
- Bierschenk, T., & de Sardan, J. P. (1997). ECRIS: Rapid collective inquiry for the identification of conflicts and strategic groups. *Human Organization*, 56(2), 238-244.
- Bengston, D. N. (2020). Shifting forest values as a driver of change. In: Dockry, Michael J.; Bengston, David N.; Westphal, Lynne M., comps. *Drivers of change in US forests and forestry over the next 20 years*. Gen. Tech. Rep. NRS-P-197., 68-75.
- Bromberg-Martin, E. S., & Sharot, T. (2020). The value of beliefs. *Neuron*, 106(4), 561-565.
- Brown, S.R. 2004. Illuminating patterns of perception: an overview of Q methodology. The Software Engineering Institute, Carnegie Mellon University.
- Carney, S., Whitmarsh, L., Nicholson-Cole, S. A., & Shackley, S. (2009). A dynamic typology of stakeholder engagement within climate change research. Tyndall Center for Climate Change Research, Working Paper, 128.
- Chazdon, R. L., Brancalion, P. H., Laestadius, L., Bennett-Curry, A., Buckingham, K., Kumar, C., ... & Wilson, S. J. (2016). When is a forest a forest? Forest concepts and definitions in the era of forest and landscape restoration. *Ambio*, 45(5), 538-550.
- Evers, H. D. (1973). *Group conflict and class formation in Southeast Asia* (Vol. 1973, pp. 108-31). Oxford University Press.
- Garcia, C. A., Savilaakso, S., Verburg, R. W., Gutierrez, V., Wilson, S. J., Krug, C. B., ... & Waeber, P. O. (2020). The global forest transition as a human affair. *One Earth*, 2(5), 417-428.
- Hansen, M.C., Potapov, P. V., Moore, R., Hancher, M., Turubanova, S.A., Tyukavina, A., et al. (2013) High-resolution global maps of 21st-century forest cover change. *Science* (80), 342, 850–853
- Kleinschroth, F., Laporte, N., Laurance, W.F., Goetz, S.J. & Ghazoul, J. 2019. Road expansion and persistence in forests of the Congo Basin. *Nature Sustainability* 2: 628–634.
- Kleinschroth, F., Garcia, C., & Ghazoul, J. (2019b). Reconciling certification and intact forest landscape conservation. *Ambio*, 48(2), 153-159.
- Kleinschroth, F., Healey, J. R., Gourlet-Fleury, S., Mortier, F., & Stoica, R. S. (2017). Effects of logging on roadless space in intact forest landscapes of the Congo Basin. *Conservation Biology*, 31(2), 469-480.
- Krueger, R. & Robbins, P. 2000. Beyond bias? The promise and limits of Q method in Human Geography. *Professional Geographer* 52: 636–648.

- Morgan, D., Mundry, R., Sanz, C., Ayina, C. E., Strindberg, S., Lonsdorf, E., & Kühl, H. S. (2018). African apes coexisting with logging: comparing chimpanzee (*Pan troglodytes troglodytes*) and gorilla (*Gorilla gorilla gorilla*) resource needs and responses to forestry activities. *Biological Conservation*, 218, 277-286.
- Pereira, L. M., Davies, K. K., den Belder, E., Ferrier, S., Karlsson-Vinkhuyzen, S., Kim, H., ... & Lundquist, C. J. (2020). Developing multiscale and integrative nature–people scenarios using the Nature Futures Framework. *People and Nature*, 2(4), 1172-1195.
- Potapov, P., Hansen, M.C., Laestadius, L., Turubanova, S., Yaroshenko, A., Thies, C., Smith, W., Zhuravleva, I., Komarova, A., Minnemeyer, S. & Esipova, E. 2017. The last frontiers of wilderness: Tracking loss of intact forest landscapes from 2000 to 2013. *Science Advances* 3: e1600821.
- Risdon, A., Eccleston, C., Crombez, G. & McCracken, L. 2003. How can we learn to live with pain? A Q- methodological analysis of the diverse understandings of acceptance of chronic pain. *Social Science & Medicine* 56: 375–386.
- Rittel, H. W., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy sciences*, 4(2), 155-169.
- Savilaakso S, Lausberg N, Garcia CA, Grenacher R, Kleinschroth F, Waeber PO. Definitions of and Perspectives on Forests of High Value: A Systematic Map Protocol. *Forests*. 2021; 12(7):876. <https://doi.org/10.3390/f12070876>
- Sexton, J.O., Noojipady, P., Song, X.P., Feng, M., Song, D.X., Kim, D.H., et al. (2016). Conservation policy and the measurement of forests. *Nat. Clim. Chang.*, 6, 192–196.
- Sexton, J.O., Song, X.P., Feng, M., Noojipady, P., Anand, A., Huang, C., et al. (2013). Global, 30-m resolution continuous fields of tree cover: Landsat-based rescaling of MODIS vegetation continuous fields with lidar-based estimates of error. *Int. J. Digit. Earth*, 6, 427–448
- Spinoza, B. D., & Eisenberg, P. D. (1977). Treatise on the Improvement of the Understanding. *Philosophy Research Archives*, 3, 553-679.
- Van der Steen, M. A., & Van Twist, M. J. W. (2013). Foresight and long-term policy-making: An analysis of anticipatory boundary work in policy organizations in The Netherlands. *Futures*, 54, 33-42.
- Van Dorsser, C., Walker, W. E., Taneja, P., & Marchau, V. A. (2018). Improving the link between the futures field and policymaking. *Futures*, 104, 75-84.
- Waeber, P. O., Stoudmann, N., Langston, J. D., Ghazoul, J., Wilmé, L., Sayer, J., ... & Garcia, C. A. (2021). Choices We Make in Times of Crisis. *Sustainability*, 13(6), 3578.
- Watts, S. & Stenner, P. 2012. *Doing Q Methodological Research: Theory, Method & Interpretation*. Sage Publishing, London.