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Regional sustainability transition through forest-based bioeconomy? Development actors' perspectives on related policies, power, and justice

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ABSTRACT

Forests and forest-based bioeconomy have central roles in the contemporary sustainability transition. However, the transition towards a bioeconomy is loaded with tensions regarding economic growth, ecological integrity, and social justice. These tensions reproduce varying transition discourses. Political actors at the level of the European Union (EU) and nation states take part in the processes creating the discourses and aim to govern the forest bioeconomy-based transition in certain directions viewed as favourable.

The transition tensions are strongly felt in regions that are rich with forest resources but poor in terms of economic and political power, called 'forest peripheries'. In this study, we explored how the forest bioeconomy discourses are downscaled in the development of the forest peripheries in East and North Finland. We examined the ways in which the regional development actors interpret prevailing forest-related policies and reproduce or challenge associated forest discourse(s). The focus was on the linkages between the macro-policies and the regional development, uncertainties that relate to the practical implementation and realisation of the policies, and the conflicts and power relations between the policies, practices, and the actors behind them. As a research strategy, we used embedded triangulation, where the interviews of development actors as initial data were contrasted with policy documents as the supportive data. For the analysis, we used the critical discourse analysis.

From the policy documents, we identified the 'You can have it all (if you close your eyes)' discourse as the most hegemonic discourse, which aims to merge all the sides under the sustainable forest bioeconomy that favours the biomass regime. From the interviews, we identified three interlinked regional forest bioeconomy discourses: 1) 'You can have it all is possible', 2) 'You can have it all is dependent on many ifs', and 3) 'You can have it all runs into conflicts'. The first discourse reproduced the hegemonic discourse, power relations appeared to be vertically unproblematic, and relatively manifested just transition for the forest peripheries. The second discourse produced an alternative discourse, which displayed more dependencies on the qualities of economic actors under the biotech regime. Power relations appeared to be more horizontal and complex, with a random just transition. The third discourse manifested tensions between the ideological aspirations of the policies and the practical reality in the forest peripheries. Conflicts arise from disharmonies between policy implementation and regional needs, cultural clashes, and misrecognition of the regional perspectives. The discourse reflected skewed power relations in vertical and horizontal manners. The transition appeared to be unjust in many ways because the external benefits seemed to be regarded over the regional ones.

1. Introduction

The bioeconomy has a central role in the sustainability transition (e.g. Rakovic et al., 2020; Skarbøvik et al., 2020). The main target of the sustainability transition is a low-carbon, just, and equitable society that is steered by initiatives and programs on many scales from global to

national and regional (e.g. UNEP, 2011; EC, European Commission, 2019; Lindberg et al., 2019; Cipler and Harrison, 2020). Transition through the bioeconomy seems promising for a forest-rich country such as Finland in which desired future and growth expectations are centred around the innovative forest bioeconomy and related businesses (Hetemäki et al., 2017; Hurmekoski et al., 2018; Programme of Prime

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Minister Sanna Marin's Government, 2019; Näyhä, 2019, 2020a; D'Amato et al., 2020; Kunttu et al., 2020). These expectations are especially relevant for the economies in peripheral regions that are dependent on natural resources. Thus, it is not surprising that in northern European forest peripheries such as East and North Finland most of the regions have also set expectations for a forest-based bioeconomy in their economic transition (East and North Finland, 2019). We understand these forest peripheries as places or regions in which economic development is highly dependent on the use of the natural resources, the external linkages to the markets and the governance of the resources (e.g. Halonen, 2019). The tendency towards valorisation of the regional resources is prominent in these regions, but remain overshadowed by the unfavourable power relations of peripheries and their role only as a source of raw material for others to add value (cf. Ahlqvist and Sirviö, 2019). Even though the stakes for socio-economic development are high in these regions, it is possible that the bioeconomy will only deepen their positions as sources of forest resources.

The policies regarding the use of the forests are loaded with various tensions and diverging agendas (e.g. Giurca, 2020; Holmgren et al., 2020). The former concerns the relationship between economic growth and ecological integrity, such as biodiversity and carbon sinks (see Mutanen et al., 2019), and the latter concerns social justice, fairness, and equity (e.g. Ramcilovic-Suominen and Pülzl, 2018). To understand how the policies in connection with forests and sustainability are downscaled into the development of peripheries, a geographical perspective proves useful. Truffer et al. (2015, also Truffer and Coenen, 2012) raise three main issues regarding the spatiality in sustainability transition: multi-scalarity, socio-spatial embedding, and issues of power. Multi-scalarity refers to the "diversity of scales and actors associated with the evolution of sociotechnical systems" (Truffer et al., 2015, p. 64). Socio-spatial embedding pays attention to the geographical differences among actors, institutions¹, cultures, economic and political systems, and networks, because of which the possibilities of promoting and supporting sustainability transition in a certain direction vary (Truffer et al., 2015). Issues of power relate to the position of regions and their actors within the spatial hierarchy, leading to questions such as who can impact the transition, whose values, voices, and concerns are recognised, and whose socio-economic and environmental benefits are improved by the sustainability transition (cf. Lawhon and Murphy, 2012; Truffer et al., 2015; Kenter et al., 2019).

Sustainability transitions can be understood as regime shifts, in which the institutionalised regulative, normative, and cognitive structures of a certain system change profoundly (Fuenfschilling and Truffer, 2016). The existing research on sustainability transition focuses largely on urban environments and the local aspects of sustainability transition, rather than their spatial distribution (Coenen et al., 2012; Hansen and Coenen, 2015; Köhler et al., 2019). The viewpoint of just transition (e.g. Ciptet and Harrison, 2020) in particular calls for considering and recognising the uneven power relations and diversity of values related to transition processes that have different outcomes in different contexts. The spatial hierarchies and power relations affect the abilities of resource peripheries to respond to the new policies of sustainability

transition, to construct and benefit from their environmental resources, and to survive within their environments (Halonen, 2019; Häyrynen and Hämeenaho, 2020). To avoid clashes caused by the generalised sustainability patterns governed from above, the spatial variation of cultural dimensions should also be taken into account when downscaling the sustainability policies into regional or local levels (see Häyrynen and Hämeenaho, 2020).

In this study, our aim is to explore the forest-based bioeconomy transition discourses in the peripheral regions in East and North Finland. More specifically, we study how the development actors in the peripheries interpret prevailing forest-related policies and reproduce or challenge the related transition discourse(s). The focus is on the linkages between the macro-policies and the regional development, uncertainties that relate to the practical implementation and realisation of the policies, and the conflicts and power relations between the policies, practices, and the actors behind them. Thus, we seek to fill the research gap in empirical findings on the relations between discourses on forest-related policies, their implementation, and development (De Jong et al., 2017). Our results contribute specifically to the understanding of aspects of regional power, agency, and justice in the context of forest bioeconomy-based sustainability transition. Our paper proceeds as follows: in Section 2, we discuss sustainability transition from the viewpoint of bioeconomy and give an overview of forest policy discourses, especially in the Finnish context; in Section 3, we present the methodological setting, and in Section 4, the findings of the study; in Section 5, we synthesise the findings, while in Section 6 we present our conclusions.

2. Theoretical framework

2.1. Bioeconomy-based sustainability transition

Sustainability transition implies a fundamental shift in the societal space during which the existing social, economic, and technological structures are set into a new, more sustainable order (see, for example, Perez, 2016; Loorbach et al., 2017). One such radical transition is the transformation of the economic system based on fossil resources into a system based on renewables – a bioeconomy transition (McCormick and Kautto, 2013; Schanz et al., 2019). The concept of bioeconomy is debated: some perceive it as promoting a "technical fix" instead of systemic change, while others see that it entails far-reaching changes along several dimensions of the society (McCormick and Kautto, 2013). Any radical transition of socio-technical systems entails regime shifts, in which the modes of production and consumption change, as do material infrastructure, technology, culture, and institutions (Kemp, 1994; Markard et al., 2012). According to the multi-level perspective (MLP), regime shifts are affected by macro-level landscape developments and (micro-level) diffusion of niche innovations (Geels, 2011; Gibbs and O'Neill, 2017). Niches are "protected spaces" where innovations and reconfigurations that are able to change the existing structures take place (Geels, 2011).

The direction that transitions should take is often far from self-evident, but is subject to discursive contests and societal debates (Meadowcroft, 2011; Jensen, 2012; Haukkala, 2018). In the context of bioeconomy, Befort (2020) has outlined two somewhat contrasting transition discourses that reflect differing background orientations related to whether the transition is mainly driven by Schumpeterian technological innovations (the techno-economic orientation; see Freeman and Perez, 1988; Perez, 2010, 2013; Pülzl et al., 2014; Tykkyläinen et al., 2017) or the institutional environment (the socio-technical orientation; cf. Geels, 2011): the biotech regime and the biomass regime. Within the biotech regime, bioeconomy is seen as a part of the biotechnology industry characterised by innovation activities, at the heart of which lies "the promise of a new industrial revolution" (Befort, 2020, p. 3). In contrast, the biomass regime is oriented towards replacing the fossil economy with bio-based counterparts as a source of

¹ Institutions, agency, and actors: We consider institutions as social rules that create the structure for interaction between actors (Hodgson, 2004). Thus, institutions refer to the informal conventions, norms, and social routines and the formal rules and regulations that guide the socio-economic structures and human behaviour (Martin, 2000; Bathelt and Glückler, 2014). Further, echoing North (1990/1999), we see institutions as the rules of the game that are set by the players of the game, i.e. institutional actors such as organisations. Agency refers to the capability to do things; for that reason, agency also applies to the power relating to a certain type of action (Giddens, 1984). For instance, the state as an institutional actor is a typical example that possesses institutional capacity (cf. MacKinnon et al., 2009), which we understand as an example of having the agency to set formal institutions such as rules and regulations.

Table 1
 Characteristics of the regimes (the content modified from De Besi and McCormick, 2015; Bugge et al., 2016; Befort, 2020).

	Biotech regime	Biomass regime	Biosave regime
Idea	Technical innovations resolve ecological problems with new 'less polluting' solutions	Renewing bioresources replace the 'more polluting/non-renewing' resources and thence resolve ecological problems. Requires more efficient use of the resources so the resource use does not increase	Degrowth and restricting the use of the resource to the minimum resolve socio-ecological problems. Techno-economic solutions have a minor role
Progress	Driven by markets -> R&D and investment support, and policies follows	Driven by normative policies and related R&D and investment support -> markets follow	Driven by normative policies and regulations -> markets follow
Role of institutions	Supporting of the markets	Guiding the markets and resource use	Restricting and restraining of the markets
Driving actors	Economic/market-oriented actors, e.g. companies, business organisations	Public organisations, NGOs	Public organisations, NGOs, citizens
Supporting/enabling actors	Public organisations, consumers	Companies, customers	Companies, customers

green growth (Kleinschmit et al., 2014; Befort, 2020). In addition, sustainability and environmental concerns are pivotal among the current macro-landscape developments (Perez, 2013; Wilenius, 2014; Kurki and Wilenius, 2015), which we, however, see as a challenge for the biotech and biomass regimes. This challenging third regime we have labelled as the 'biosave regime', which aims to reduce the utilisation of diminishing natural resources because of climate change, biodiversity, and other ecological values (cf. Mustalahti, 2018; Ramcilovic-Suominen and Pülzl, 2018; Näyhä, 2019; D'Amato et al., 2020). We understand the biotech and biomass regimes as being closer to resource economics, which aim for the optimal use of natural resources – biotech especially from the private and biomass from the social perspectives – whereas we link the biosave regime to environmental valuation, which also focuses on the environmental externalities of bioeconomy (cf. Kleinschmit et al., 2014). In Table 1, we have outlined the basic characteristics of these three alternative regimes in terms of the basic idea, progress, role of institutions, driving actors, and supporting or enabling actors based on a synthesis from existing work on the topic.

2.2. Discourses on forest-based bioeconomy in Finland

Discourses are socially constructed ways to describe, characterise and drive the world, and express relations between people and their surroundings (Shaw et al., 2010). The role of discourses as social constructions stems from Foucault's work, in which discourses are seen as actively constructing society by constituting objects of knowledge, social relations, and conceptual frameworks (Fairclough, 1995). Herewith, we see forest discourses as an umbrella term for various types of discourses through which the knowledge about forests and people's relations with forests are characterised, conceptualised, and directed. In the following, we will discuss the discursive contests surrounding, in particular, the Finnish forest-based bioeconomy.

Forest-related policies and their formulation processes are surrounded by various and often competing needs, hopes, and agendas, including issues such as biodiversity conservation, climate change mitigation, and scale and targets for forest-based biomass utilisation (Arts and Buizer, 2009; Kleinschmit et al., 2014; Pülzl et al., 2014; Mustalahti, 2018; Näyhä, 2019, 2020b; D'Amato et al., 2020; Peltomaa et al., 2020). In Finland, timber production and economically sustainable harvesting have traditionally been the key goals in Finnish forest policy (Kotilainen and Rytteri, 2011). In forest-related articles in magazines and newspapers, multi-objective discourse may have "created an illusion about harmonious objectives and about the economically, ecologically, socially, and culturally sustainable forestry" but the emphasis of the discourse has been on the wood production (Takala et al., 2019, p. 9). This is the case also with the EU bioeconomy policy framework, in which the economic dimension of sustainability is highlighted over environmental and social ones (Ramcilovic-Suominen and Pülzl, 2018). The emphasis on the economic dimension has contributed to the recent polarised societal debates on wood utilisation and related impacts on ecological sustainability, carbon stocks, and biodiversity (e.g. Kotilainen and Rytteri, 2011; Näyhä and Horn, 2012; Kleinschmit et al., 2014; Näyhä, 2019, 2020a). However, as Kröger and Raitio (2017) note, disagreement on forest conservation and the forest policy goal of maximising timber production is long-lived.

Ramcilovic-Suominen and Pülzl (2018) argue that social justice, fairness, and equity, as well as social and environmental safeguards and local traditional knowledge, should be given more attention in the context of the forest-based bioeconomy. Indeed, in the Finnish context, regional debates on forest utilisation and the related sustainability challenges have a long history (Rannikko, 1999). Often these debates have focused on the various impacts of forest utilisation on diverse local and regional communities and groups (Rannikko and Lehtinen, 2004). In particular, external influences and threats shaking the traditional ways and habits of utilising local or regional forests have caused tensions. The juxtaposition of local knowledge and forest relations and

distant, externally steered forest policies has been at the core of these debates (Björn, 2000). Local knowledge has typically been related to experience-based knowledge and rather as an opposite to professional, scientific, modern, or even universal knowledge (Nygren, 1999; Pynnönen et al., 2019). However, local knowledge and preferences are neither homogeneous nor permanent (Björn, 2003), which can be observed in the tensional role of regional development actors in relation to bioeconomy discourses.

The regional approaches to forest utilisation and forest-based bioeconomy tend to subordinate ecological and social approaches under economic growth (e.g. Ahlqvist and Sirviö, 2019; Holmgren et al., 2020; Andersson and Grundel, 2021). Even though many regional development actors have widened their approaches from industrial interests towards more plural ways to use or protect forests (Rannikko, 2010), in general the forest bioeconomy manifests a new opportunity for the economic development of forest peripheries – after decades of being

pushed even further onto the economic periphery during the ICT boom (see Lehtonen, 2015; Halonen, 2019). The rise of the bioeconomy has raised new hopes, promises, and expectations; it has appeared as a new possibility to improve economic development in peripheries as well as reposition themselves among the competitive regions in Finland (Ahlqvist and Sirviö, 2019; Sanz-Hernández et al., 2019; Eversberg and Holz, 2020).

So far, it is unclear to what extent the steps taken towards a bioeconomy open genuinely new opportunities for local, small-scale actors in peripheral regions to improve their economic situation. In the bioeconomy transition, peripheries are easily positioned as biomass providers benefiting urban centres, which highlights the critical importance of local solutions and the involvement of local actors (Ahlqvist and Sirviö, 2019). In Finland, the newly built Äänekoski mill represents a bioeconomy project heavily supported by public investments in infrastructure (Albrecht et al., 2021) that has strengthened the regional forest

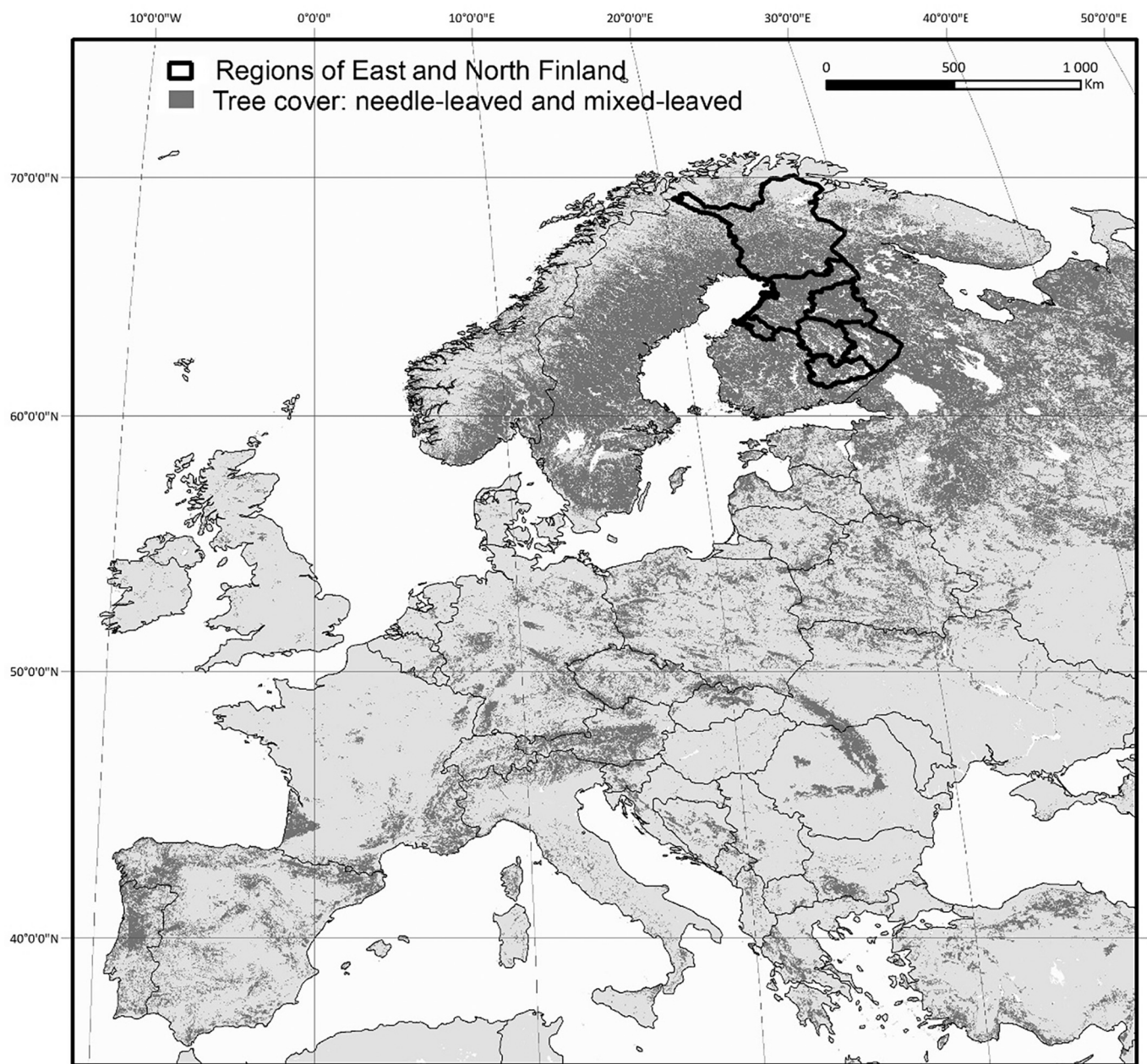


Fig. 1. Forest peripheries in the European and national context (Data sources: ECJRC, European Commission Joint Research Centre, 2003; ArcGIS Hub, 2015; National Land Survey of Finland, Ek, 2021).

bioeconomy. Such projects demand large-scale support for research and development and the involvement of public funding bodies (Ahlvist and Sirviö, 2019; Näyhä, 2019; Refsgaard et al., 2021). The project can be seen as a manifestation of the “more of everything” narrative identified by Kröger and Raitio (2017) in their analysis of official policy documents focusing on the future challenges of Finnish forestry, which promotes “a productivist forest policy under the guise of a ‘forest bioeconomy’” (ibid., 7).

3. Data and methods

3.1. Empirical forest peripheries

Our empirical study focuses on East and North Finland, which consist of seven regions, *maakunta* (Fig. 1). In the EU, they are considered to be sparsely populated and nationally lagging regions despite their successful industries (EC, European Commission, 2021) and they have been defined as part of the Nordic peripheries within the EU (Gløersen et al., 2006). As is typical of peripheries, they have relatively small populations, and they are distant from the major markets and administrative centres (Polèse and Shearmur, 2006; Halonen, 2019). We specify these peripheries as ‘forest’ peripheries, which positions them as regions with extensive, even globally significant, boreal forests. Their socio-economic development has been based on the utilisation of natural resources, which has also been typical for peripheries in advanced countries (Halseth, 2017). Traditionally, centres have been positioned with power and peripheries as powerless; however, this simple dualism hides the varieties of the power of actors in the networks of peripheries, and the varieties of relations between the centres and peripheries (Kühn, 2015; Glückler and Panitz, 2021). In policy approaches, peripheries have been excluded from the decision-making processes and setting of political agendas, but fairly little is known of how, when, or by whom the exclusion takes place (see Kühn, 2015).

3.2. From policy documents to interviews

First, we analysed policy documents to seek a better understanding of the societal system in which forest-related actors and their stakeholders at all levels are embedded. In particular, we were interested in the key views and discourses that can be found. We identified 10 forest-focused (the main focus on forests, e.g. National Forest Strategy) or forest-related (associated with forests, e.g. Finnish Bioeconomy Strategy) policy documents altogether for our analysis (presented in Appendix A). In our view, these documents introduce focal normative top-down policies that set the rules of the game (see Arts and Buizer, 2009), aiming to govern the sustainability transition and the general principles of favourable development in the studied field. Top-down refers to the agency of institutional organisations, such as the EU and the state, to hold a power to decide the final versions of the policies (cf. Giddens, 1984; MacKinnon et al., 2009), although many lobbying stakeholders have been involved in the policy-making process (e.g. Albrecht et al., 2017; Andersson and Grundel, 2021). As such, relatively aspatial policies represent the macro-policies, the ideas and goals of which are downscaled to the lower scales.

Second, we turned to the perspective of regional and subregional actors. The interviews with the development actors present the inductive side of the research since attention is paid to how sustainability transition appears from the perceptions of actors, in specific conditions, in a specific location (see Sayer, 1992; Tykkyläinen, 2015). The interview data were collected in 2020–2021 and cover all the regions, *maakunta*, in East and North Finland (for regions, see Fig. 1). In all, the data consist of interviews with 20 directors or managers in regional or subregional development organisations. Regional organisations refer to provincial organisations (interviews 1H1–1H7) and subregional organisations to development organisations (interviews 2H1–2H13), which are commonly established by a few neighbouring municipalities or

exceptionally by one municipality. Interviews were semi-structured according to the main themes (Appendix B), but the specific questions were tailored on the basis of the individual perceptions of an expert (cf. Alastalo and Åkerman, 2017). The analysis of this article is based on the sections and expressions in the interviews that focus on forests exclusively or as part of the wider approach relevant to the utilisation of forests. As is typical for agent-based approaches (see Millington and Wainwright, 2017), we expected descriptions of the current state but also perceptions of how the forest bioeconomy in the regions should be promoted. The development actors are viewed as intermediaries who act as filters between the macro-policies and regional development. A crucial part of the study is to reflect the key findings from the interviews in policy documents, which govern the forest-based bioeconomy transition. We identify this as a form of embedded triangulation where the interviews as initial data will be contrasted with policies as the supportive data (Creswell and Plano Clark, 2007).

3.3. Critical discourse analysis

Discourse analysis has been a popular method for analysis in the field of forest and forest-related policies (Winkel, 2012). However, the tensions between different levels, complex regimes, perceptions, and policies have been less commonly in focus (see Leipold, 2014). We seek to explore these complex relations by applying critical discourse analysis. The approach is critical as we are not interested in describing the discursive policy documents and interviews only; instead, we are also interested in the ways these discourses (re)produce the political, economic, and cultural changes, power relations, forms of (un)justice, and the effects on institutionally produced macro-structures and more localised social action (cf. Fairclough, 1995; Fairclough et al., 2013). By modifying Fairclough (1995) and further Arts and Buizer’s (2009) hegemonic discourse on policies, we first identified the current hegemonic forest policy discourse from the policy documents. Similarly to Loorbach et al. (2017), we view policy documents as a way to produce the dominant discourse, which possibly creates tensions between regimes and becomes contested by the alternative discourses.

We see power relations as crucial for gaining knowledge about the forms of transformability and tensions. Vertical power refers to macro policies that represent the external power of authorities in examined regions (cf. Ramcilovic-Suominen and Kotilainen, 2020), whereas horizontal power relations appear within (cf. Nchanji et al., 2021) and between the regions. The vertical power relation addresses issues such as internalisation of forests, hierarchical policy efforts, and vertical coordination of them, while the horizontal approach refers to actor-based power relations that arise from everyday practices at the regional level (cf. Krott et al., 2014). As Avelino (2017) explains, a crucial question regarding the transformation is how capable and willing actors are to exercise the power they might have.

From the interviews, we identified different types of discourses by first describing the content of the three regional regimes and regional outliers, and then interpreting the different types of discursive relations between the regimes and outliers (cf. Fairclough, 1995, p. 97). By regional outliers, we mean specific characteristics of the regions that relate to regimes but which are not suitable under the existing regimes as such. The discourses we consider as a way to describe, conceptualise and construct relations between the regionally important parts of the regimes. For the systemic order of the analysis, we have used the modified illustrative method (see Neuman, 2006). In our analytical framework, the titles of the boxes are based on the theoretical and contextual framework (Fig. 2) but the contents of the boxes and the discursive relations are based on the synthesis of policy documents and interviews.

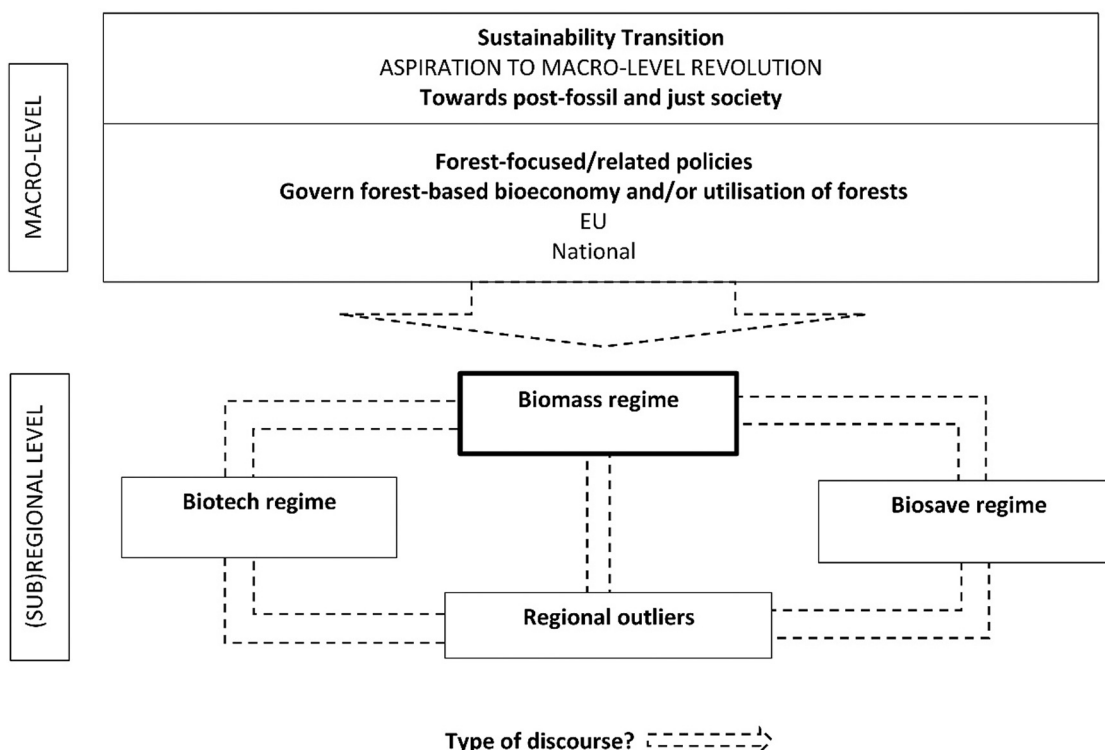


Fig. 2. Analytical framework for the critical discourse analysis on regional forest bioeconomy development.

4. Findings

4.1. Policy documents at the EU and national levels: You can have it all

The Green Economy under the United Nations Environment Programme (UNEP) and the Green Deal of the EU represent the highest-level policies governing the transition. According to these programmes, the main aim is to strive for an economy that is low-carbon, resource efficient, and clean in production, and a society where equal development of all the regions and countries is guaranteed (see UNEP, 2011; EC, European Commission, 2018, 2019; for original quotes see Appendix A). Although maintaining biodiversity and carbon sinks may be challenging simultaneously with the economic objectives, such an explicit observation cannot be reached from the policy documents. For instance, the EU biodiversity strategy for 2030 (EC, European Commission, 2020a) is presented as a part of the Green Deal and in line with its aims regarding bioeconomy. This, however, may also be seen as a signal of a subordinate position of the ecological dimension compared to its economic counterpart (cf. Ramcilovic-Suominen and Pülzl, 2018). The relation between the binding regulation on the inclusion of greenhouse gas emissions and removals from land use, land use change, and forestry (EU Regulation 2018/841) –Lulucf for short – and bioeconomy seems to be less straightforward. The forest-related policies and their main aims are downscaled to the national level through policies such as the Finnish Bioeconomy Strategy (Ministry of Economy and Employment of Finland, 2014), the Programme of Prime Minister Sanna Marin’s Government (2019), and the Sustainable Growth Programme for Finland (Finnish Government, 2021).

Forest-focused policies have traditionally been governed from the national level while EU forest strategy (EC, European Commission, 2013) is a relatively loose framework. The current strategy of the EU (EC, European Commission, 2020b) is evaluated as being too loose to tackle the pressures beyond national boundaries and coordinate the utilisation of forests in the EU and its member states. This setting may be changed by the new EU Forest strategy, which seeks to support the new growth model through the European Green Deal: simultaneously 1)

acknowledging the importance of forests for biodiversity and climate change mitigation, 2) enabling a modern, resource efficient, and competitive forest sector, and 3) maintaining lively and wealthy rural regions (EC, European Commission, 2020b).

The National Forest Strategy 2025 defines the key goals for forest-based businesses and activities until 2025. The focus is on creating a competitive operational environment for forest-based businesses, renewing the forest-based sector, and enforcing a bioeconomy while acknowledging the sustainable use of forest resources and taking into account the 2030 Agenda goals for forests. The strategy is based on the Government Report on Forest Policy 2050 and the parliamentary opinion of it. The government’s report on Forest Policy 2050 (Ministry of Agriculture and Forestry of Finland, 2014) defines the long-term vision and strategic objectives for forest management. Its aim is to support the transition towards the use of renewable natural resources and to reduce the dependence on fossil fuels, while emphasising economic growth and employment by intensifying the use of forest-based resources and putting emphasis on high value added products (Ministry of Economy and Employment of Finland, 2014; Ministry of Agriculture and Forestry of Finland, 2019).

From the analysed policy documents, we identified as the most striking, hegemonic discourse the ‘You can have it all (if you close your eyes)’ discourse in which the biomass regime dominates but does not displace other regimes (see Table 1). This discourse encompasses the idea that the utilisation of forest-based resources can be done in a way that economic growth and various benefits to the current generation can be provided without ruining biomass production possibilities, the welfare of future generations, or the ecological system. The detected discourse is well aligned with the “more of everything pathway” recognised by Kröger and Raitio (2017), as well as the “multi-objective hegemony” discussed by Takala et al. (2019, 2020). Similar views are recognised by Kuhmonen et al. (2021) who point out that all the key policies and strategies governing forest utilisation in Finland over the past 10 to 15 years have indicated goals for the forest-based sector to attain larger revenues and more value added products, while at the same time creating climate and societal benefits.

It is noteworthy that very little emphasis has been given to potential challenges related to multi-purpose forest utilisation in the analysed documents. In many contexts, it appears that environmental sustainability and related biodiversity are the issues that are not given in-depth focus, and they are discussed in a rather shallow manner. In addition, the diverse views, values, or motivational factors of various stakeholders have not been considered much, and neither have potential conflicts arising from these different understandings. There is also a lack of concrete steps and examples that would be needed to concretise often very vague goals presented in the documents such as in the rural context, peripheral areas' potential related to entrepreneurship and possibilities in terms of raw material production. In many contexts, there is rarely any prioritising of the goals or considerations of the simultaneous realisation of often conflicting objectives.

4.2. Regional development aspirations: You can have it all is possible

According to the discourse of the interviewees, the utilisation of forest resources as a part of the sustainability transition is suitable and desired from the regional development perspective. The suitability is evident in the ways development actors reflect the relation between the policies and regional development as well as in how they highlight the role of regional natural resources within the new paradigm (1–1H5, original quotes [Appendix C](#)). Although interviewed actors raise the importance of regional and national economic lobbying to the EU (2–1H1), the discourse reflects the way the aims of the macro-policies are downscaled and conceptualised from the top-down to regional development (3–1H4). The normative downscaling is also linked to the funding as a way to renew economic structures and guide the transition towards green transition and a fossil-free society (4–2H9), whose development actors aim to promote (5–1H7).

Development actors reproduce the hegemonic policy discourse on forests by linking the sustainable development, related policies such as the Green Deal, and the bioeconomy together (6–2H6). The interviewees have high expectations on the potential of a forest bioeconomy, especially related to renewable energy and wood-based materials replacing fossils (7–2H11). The circulation is an inseparable part of the sustainable and efficient use of forests (8–1H1), which often requires innovative utilisation of wood-based side streams (9–2H5). The circulation of sawdust is already in use or under development in several places, but there are aspirations to reach towards higher value added wood-based products and materials such as chemicals (10–1H2). Higher value added products are seen as a practical way to redirect profits and sustain or increase employment in the region (11–2H1). Preferably, the facilities would be located close to each other and the wood resources, creating a local circular business ecosystem, where virgin materials and side streams can be transported efficiently (12–2H2; 13–2H12). By the interviews, a regionally sustainable forest-based bioeconomy should improve profits and economy-related social benefits targeted at the regions and their actors. These views not only reflect the regional actors' goals to improve the economic development in the region but also their aim to transform these peripheries from sources of raw materials – to which others add value and get the benefits – to better economic position and performance in spatial hierarchy (14–2H13; cf. [Ahlqvist and Sirviö, 2019](#); [Halonen, 2019](#)).

The transition can be regarded as regionally sustainable only if socio-economic and ecological benefits are in balance with each other. This, in turn, is often difficult to achieve (15–1H2). The views of the respondents indicate that the economic dimension is given a more notable position (cf. [Ramcilovic-Suominen and Pülzl, 2018](#)), although the fragility and slow renewal of forest are acknowledged (16–1H4). Most often the reflections on traditional silviculture indicate the aims of sustaining wood resources for commercial forestry in the future (17–2H7; 18–2H5). Even the justification and reasoning to strive for climate change mitigation are linked to the prevention of regional deforestation for the sake of forestry (19–2H8). The only clear exceptions relate to the closeness of

clean or otherwise valuable water systems (20–1H1). Among other ecological threats, exceeding the ecological boundary of the regional waterfront was emphasised as a reason to prevent the establishment of the forest mill (21–1H7).

4.3. Regional development in the context: You can have it all is dependent on many ifs

This discourse set the aims in the context and presents many ifs on the way towards the realisation of policies and the expectations of development actors. The interviewees have high expectations towards the forest bioeconomy-based transition in terms of improvement of the economies of the regions after a long-lasting decline in regional development (22–1H4). Typically, the destruction in the forest industry stems from the difficulties in maturing forest mills, which are closed due to common spatial reorganisations of units, or more severe problems such as what forest industries are confronted with by the ICT transition when the demand for paper starts falling (23–2H7; 24–1H1). Most commonly the closures have had negative consequences for the socio-economic development of the region (25–2H3). Then again, development actors highlight that the destruction of the old facilities can also be seen as a necessity for sustainable renewal, for instance in cases where forest biomass for both old and new businesses cannot be guaranteed in sustainable way (26–2H12). Overall, we consider the statements on decline as reflections of the burdening development of the forest peripheries to which development actors now wish a turn by the renewing transition (cf. [Lehtonen, 2015](#); [Ahlqvist and Sirviö, 2019](#); [Halonen, 2019](#)).

Through the interviewees, the policies may set the aims, but the actual solutions and steps are expected to be created by the research and economic actors (27–1H3). Based on the interviews, we regard that the favourable development through the forest bioeconomy is dependent on the desired economic actors, which are still seemingly rare, and their spatial distributions appear to be random. In general, it is desired that the economic actors act in a sustainable manner, taking into consideration their profits, people in the region, and the global environment at the same time (28–2H11). As ideal entrepreneurs, development actors present innovative, flexible, market oriented, and place-bound economic actors, but whose characteristics rarely meet the examples of the existing actors as a whole. The existing examples of good economic actors are divided into three categories. The first category represents *place-bound leaders* who are highly development oriented and rooted to the place (29–2H1). The second category reflects *international leaders* who appreciate the proximity of forest resources and are well connected to the end markets (30–2H7). The third category includes *investors* chasing after new, innovative forest-based production (31–1H2). We consider these economic actors as reflections of innovative Schumpeterian entrepreneurs who are expected to strive for revolutionary innovations (see [Perez, 2010](#); [Tykkyläinen et al., 2017](#)) that are typical of biotech regime (cf. [Befort, 2020](#)).

Similarly, development actors discuss innovations in a manner that gives the impression that innovations are dependent on whether the regional economic actors are willing or able to invent or introduce innovations (cf. [Avelino, 2017](#)). Place-bound economic actors are seen as good regional assets in sustaining employment but their willingness or capability to adopt innovation varies (32–1H1; 33–1H6). In turn, international leaders are seen as able and willing to use their innovative power but their commitment to the regions is questionable (34–2H3). Investors most typically put their transformative power into action using new technologies, and they bring employment and investment funding to the region but their commitment to the regions is uncertain.

4.4. Regional development tensions: You can have it all runs into conflicts

In spite of relatively echoing reflections of the hegemonic discourse, development actors also present more cautious and even critical statements regarding the implementation of policies. We identified two types

of criticism on this discourse. The first presents quite concrete examples of the problems in implementation. Secondly, there is also criticism stemming from the cultural differences. As a concrete problem our findings indicate that especially the small-scale of economic activities and the appearance of mini-niches tend to collide with the funding instruments, which are evaluated as being more suitable for larger development actions (35–2H3). The funding criteria and practical needs of the regions may not encounter well (36–2H8). By ‘mini-niches’ we refer to niche spaces that are significant for the regions but tend to be minor for the national development. According to the interviewees, the absence of nationally significant support for R&D in East and North Finland is a severe problem and these regions are outcompeted by the biggest city regions which benefit their larger population and better economic performance (37–1H1). In addition to the smaller population and weaker economy, the distant location also seems to be a barrier to the funding of transportation infrastructure, which would be needed to improve safety and the sustainability of the logistics (38–2H12).

The other concrete tension relates to ‘non-regional ownerships’ – our conceptualisation referring to legal ownerships of forests or the forest facilities over which regions or local people have no rights regarding the concrete regional benefits. The difference between regional and non-regional ownership seems to be that if the owners are considered to be local, for example through local private forest owners or local common forests, the benefits are seen as being better allocated for the local economy (39–1H6). In contrast, non-regional ownerships are regarded as a way to divert the economic benefits out of the regions. These ownerships are also seen as a major structural and political challenge that cannot be solved by the actors in forest peripheries (40–1H5). We interpret this as an example of skewed division of economic benefits and unbalanced power relations, which should also be reconsidered as a part of just transition (cf. Kenter et al., 2019; Cipler and Harrison, 2020). Development actors bring up forest-based companies and the state as typical non-regional owners, but individuals and families who no longer live in the region, as well as external investors, are also included in this group.

By echoing Häyrynen and Hämeenaho (2020), we identified reflections regarding (eco-)cultural clashes that are potentially caused by distancing the forest policies from the regions and the national level to the EU. The increasing emphasis on forest protection and ecological dimensions does not seem to clash with the values of regional development actors in principle. The main conflicts concern how restrictions are seen as generalised from above. This gives an impression for the development actors that the regional knowledge and actions towards protection and biodiversity are not recognised, and neither is the specificity of the forestry in peripheral regions understood at the EU (41–1H1). Our findings indicate that in particular the undervaluation of the local knowledge and heritage of “living with” and “living from” the forest – which are seen as being typical for people in the forest peripheries – raise criticism among development actors and highlight the knowledge gap between people far away and those nearby specific forests (42–2H10). We do interpret phrases such as “living with” as references to local knowledge which is based on the experiences especially, however, we do not find any references to local knowledge as being the opposite of professional, scientific, or modern knowledge as is typically presented (see Nygren, 1999; Björn, 2003; Pynnönen et al., 2019). By local knowledge regional actors seem to refer to any type of knowledge that has a connection to the region, thus including the professional and scientific knowledge that regional actors – themselves and others – may have. As one solution to solve debates on forests, development actors call for constructive collaboration among different kinds of regional stakeholders rather than building extreme opposites between parties or only trying to govern the regional forest use through rigid directives from the top (43–2H1; 44–1H5).

5. Synthesis of the discourses

From the analysed policies, we identified the ‘You can have it all (if you close your eyes)’ discourse as the most hegemonic discourse which aims to merge all the sides under the sustainable forest bioeconomy that favours the biomass regime. According to this ideal, the utilisation of forest-based resources can be done in a way that guarantees biomass production and welfare – including economic growth and benefits to people in rural-like regions – and the protection of ecological systems in the future. However, in our view, environmental sustainability and biodiversity have been discussed in a shallow manner.

Next, we reflected development actors’ views on the policy documents and were able to identify three coexisting discourses: 1) ‘You can have it all is possible’, 2) ‘You can have it all is dependent on many ifs’, and 3) ‘You can have it all runs into conflicts’ (see Fig. 3). It is noteworthy that the regional forest bioeconomy discourses are not divided according to the different regimes or the regional outliers. Instead, the parts of the regimes and regional outliers are given different meanings depending on the type of the discourse development actors (re)produce and thus the contents of the regimes are blended in the discourses. In other words, the views of interviewees do not comprise full discourses following the borders of biomass, biotech, or biosave regimes but describe different types of relations between the regimes. Currently the development actors reflect a phase in which a balance between regimes is being sought rather than an exact shift in regime from one to another (on regime shift, see Kemp, 1994; Markard et al., 2012).

The first discourse of development actors is smoothly aligned with the macro-level policies and reproduces the hegemonic ‘You can have it all’ discourse. This discourse reflects the aspirations and governing attempts towards a biomass regime as the dominant regime in which other regimes and regional outliers can be merged. For instance, interviewees do not present the aims of climate change mitigation as the opposite to a regional biomass regime but as a natural part of it. As such, this discourse also reflects previous all-encompassing views (Kröger and Raitio, 2017; Takala et al., 2019, 2020; Kuhmonen et al., 2021). The power relation represents mainly vertical forms where macro-level policies are downscaled to regional level without a conflict. Institutional organisations as drivers of the transition are emphasised, thus reflecting the socio-technical orientation (cf. Geels, 2011). The bioeconomy policies are seen as promising from the perspective of possible improvements in development and the position of forest peripheries (cf. Ahlqvist and Sirviö, 2019; Eversberg and Holz, 2020). The benefits and harms seem to be evenly balanced, which we interpret as a reflection of a regionally just transition (cf. Cipler and Harrison, 2020).

The second discourse ‘You can have it all is dependent on many ifs’ presents the reality of the regional forest bioeconomy development and reveals the sides of many ‘ifs’ that policies are not able to govern or control. In other words, this discourse becomes explicit when the policies are downscaled from the objectives and aspirations to the practical implementations. The realisation of the biomass regime appears to be reliant on the specific qualities of the regional biotech regime and related regional outliers. This discourse reproduces Avelino’s (2017) view on the realisation of transition, which depends on the capacity and willingness of actors to use their transformative power. Simultaneously, the economic actors as expected drivers of the transition reflect a step towards the biotech regime and reproduce the traditional biotech orientation in bioeconomy (cf. Püzl et al., 2014). Thus, the discourse challenges the institutionally driven orientation (cf. Geels, 2011) and the emphasis on biomasses and bioresources (cf. Kleinschmit et al., 2014; Befort, 2020). The power relations become more complex as they do not appear simply vertical but rather horizontal within the heterogeneous actors’ networks in the regions. Because of the uncontrollable and random regional development and diffusion of benefits and/or harms for different stakeholders, it is extremely difficult to predict the outcomes. This also means that it is very difficult to assess how just the transition is for different regions.

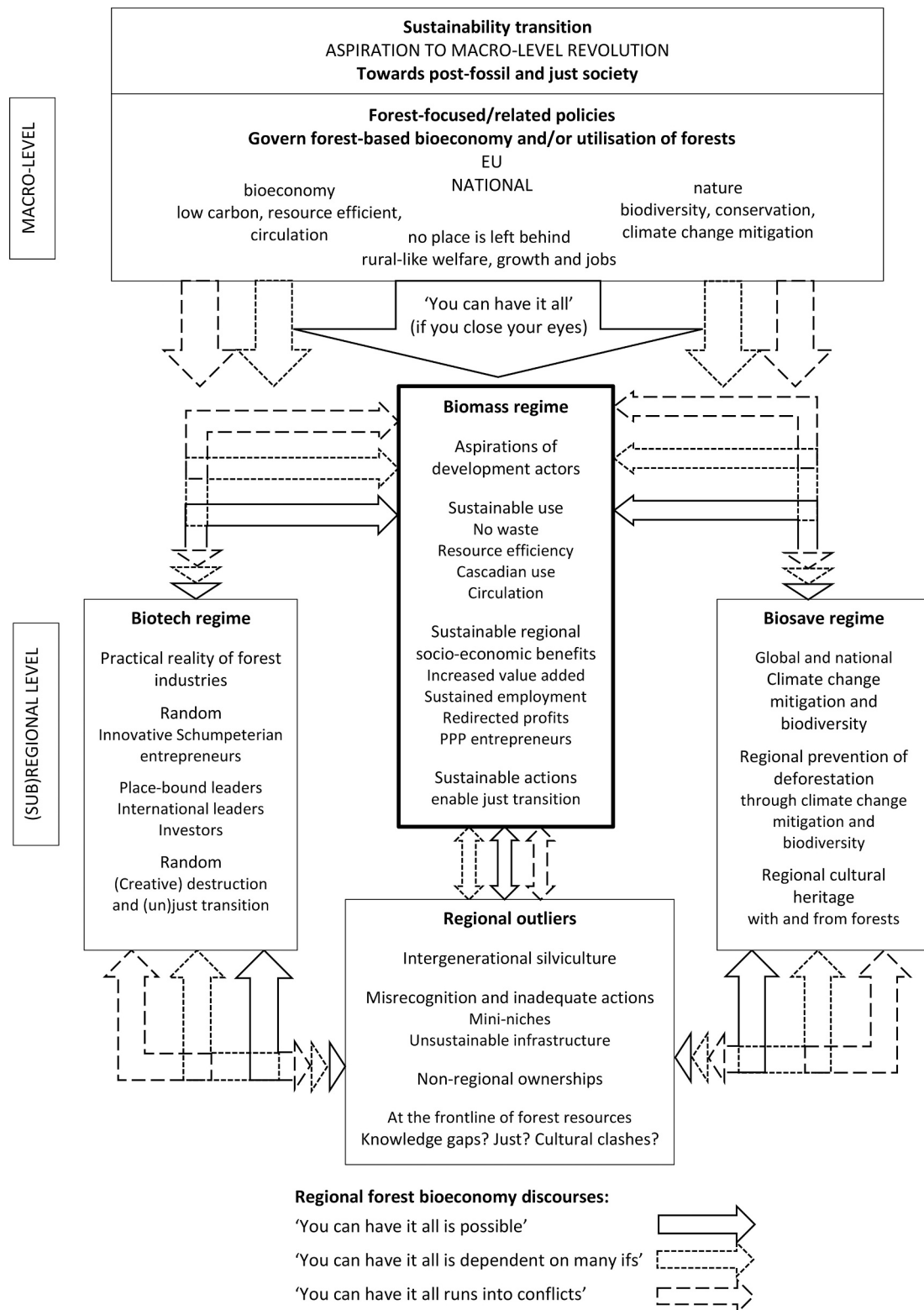


Fig. 3. Three coexisting discourses on regional forest bioeconomy development: 1) 'You can have it all is possible', 2) 'You can have it all is dependent on many ifs', and 3) 'You can have it all runs into conflicts'. The bolded line of the biomass regime box describes the dominant position in the discourses. The arrows of regional bioeconomy discourses display the different types of relations between the macro-level policies, three (sub)regional regimes, and regional outliers that are produced by the discourses of the interviewees. The solid line describes relatively smooth relation whereas dashed lines reflect the contradictions and breaks in the relations.

The third discourse 'You can have it all runs into conflicts' presents concrete disharmonies between policy implementation and regional needs and/or benefits. It also contains the abstract or hidden tensions that arise from cultural clashes, and misrecognition, or undervaluation of the regional perspectives. The regimes do not collide as such but conflicts arise because of unfavourable interlinkages between two or more regimes, policies, or actors. In this discourse, the powerless and peripheral position and relatively small-scale appear to be burdening characteristics (cf. Ahlqvist and Sirviö, 2019; Halonen, 2019). The conflicts and tensions manifest skewed power relations in a vertical way in particular. In the worst-case scenario, these regions become peripheralised (cf. Kühn, 2015) by the suspension of investments and/or the protection that paralyses forest-based activities. Even if the protection of forests or a certain type of logging of forests may be framed through an ecological perspective that benefits all in principle, from a regional perspective the externally set control often harnesses forest utilisation both randomly and unjustly. The transition appears unjust in many ways because the external benefits are considered over the regional ones. To be more precise, the benefits of someone else are regarded as external and unjust – whether in the economic, social, or ecological sense, or from the perspective of individuals, families, companies, or nations – if they displace the regional benefits for living and future development.

6. Concluding remarks

In conclusion, the sustainability transition through the forest-based bioeconomy can be governed by the institutions within certain limits. However, the realisation of the aims seems to require a suitable match between the forms of implementations, preferable actors, regimes, and regional outliers. Regime factors should be in line thus working in the same direction. As a whole, this complex system develops partly randomly and therefore the outcome is highly unpredictable, including the unsure realisation of just transition. From the regional development perspective, efficient and higher value added utilisation of forest resources through cascading and recycling in the region contributes to better socio-economic development but also support the reasonable use of the forests. This, in turn, means that more benefits remain in the region, making the transition far more favourable, just, and sustainable for the region. The transition can be seen as more unsustainable or unjust if forests are overexploited and undervalued for disposable consumption while mostly benefiting external actors.

In our view, the current political documents create idealistic future views without discussing concrete steps to achieve the presented aims. The widely enabling aims of the policies collide with the implementation in various ways. Little emphasis is placed on the challenges, different views, and knowledge of various regional stakeholders, or on the evaluation of the various outcomes. Social and environmental sustainability and prerequisites for a just transition should also be given the attention that they are entitled to (see also Holmgren et al., 2020). In addition, the developmental needs often conflict with the skewed or rigid funding criteria based on prevailing policies.

The polarisation of the societal perspectives can be seen as an inevitable consequence of the unbalanced and unclear connections and approaches between the policies and practical reality. Constructive discussion on, and further understanding of, the common goals are often lacking (see also Näyhä, 2019, 2020b). We consider that more realistic identification of the challenges and sensitive stakeholder dialogue from and within different types of regions, and collaboration for effective problem solving in forest-based bioeconomy policy-making, would be needed. To support these (practical) needs and to widen the societal understanding of regional perspectives and of the significance of these regions in a forest-based bioeconomy transition, we believe that (participative) foresight studies in the field are needed. More

specifically, there is a need to explore the spatial differences within and between regions, and/or from various regional perspectives. Those perspectives should include different kinds of forest actors, as well as different age groups, NGOs, consumers, and citizens, and/or the cultural-environmental perspectives that go beyond the production-protection dualism.

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Relevance

Forest bioeconomy-based sustainability transition affects severely and complex ways on the utilisation of forests and development of resource rich regions. The complex relations between different levels, regimes, policies, and practices are investigated by contrasting regional interviews as initial data (original empirical data) to forest-focused or forest-related policy documents as the supportive data (policy review). Results contribute to understanding of realisation of policies and related aspects of power, agency, and justice from regional development actor's perspective of forest peripheries.

CRedit authorship contribution statement

Maija Halonen: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing. **Annukka Näyhä:** Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – original draft, Writing – review & editing. **Irene Kuhmonen:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Reviewed forest-related and forest-focused policy documents with examples of original statements

Level	Focus	Document	Original statements (quotes)
International	General	UNEP: Towards a Green Economy	“green economy can be thought of as one that is low carbon, resource efficient and socially inclusive [...] reduces carbon emissions and pollution, enhances energy and resource efficiency, and prevents the loss of biodiversity and ecosystem services. The concept of a ‘green economy’ does not replace sustainable development, but there is now a growing recognition that achieving sustainability rests almost entirely on getting the economy right” (UNEP, 2011, pp. 1–2)
International	General	EU: The European Green Deal	“The European Green Deal – a roadmap for making the EU’s economy sustainable by turning climate and environmental challenges into opportunities across all policy areas and making the transition just and inclusive for all. [...] Europe needs a new growth strategy that transforms the Union into a modern, resource efficient and competitive economy where there are no net emissions of greenhouse gases by 2050, where economic growth is decoupled from resource use and where no one and no place is left behind” (EC, European Commission, 2019)
International	Bioeconomy	EU: A Sustainable Bioeconomy for Europe	“The deployment of a sustainable European bioeconomy would lead to the creation of jobs, particularly in coastal and rural areas through the growing participation of primary producers in their local bioeconomies. [...] A sustainable European bioeconomy is necessary to build a carbon-neutral future in line with the Climate objectives of the Paris Agreement. [...] Decentralised models, where at least the first transformation of biomass takes place as close as possible to the biomass provisioning areas, be they rural (agriculture, forestry), coastal (aquatic) or urban and peri-urban (biowaste and waste water), offer potential for reinvigorating local economies through the creation of skilled ‘green’ jobs” (EC, European Commission, 2018, pp. 5, 30)
International	Biodiversity	EU: Biodiversity Strategy for 2030	“The European Green Deal – the EU’s growth strategy – will be the compass for our recovery, ensuring that the economy serves people and society and gives back to nature more than it takes away. The business case for biodiversity is compelling. [...] Biodiversity conservation has potential direct economic benefits for many sectors of the economy” (EC, European Commission, 2020a, p. 1)
International	Land use, Forests	EU Regulation.2018/841, n.d.: Lulucf ^a	“Sustainable management practices in the LULUCF sector can contribute to climate change mitigation in several ways, in particular by reducing emissions, and maintaining and enhancing sinks and carbon stocks. In order for measures aiming in particular at increasing carbon sequestration to be effective, the long-term stability and adaptability of carbon pools is essential. In addition, sustainable management practices can maintain the productivity, regeneration capacity and vitality of the LULUCF sector and thereby promote economic and social development, while reducing the carbon and ecological footprint of that sector” (EU Regulation.2018/841, n.d., L 156/2)
International	Forests	EU: Forest Strategy (current & preparation)	“Guiding principles: Sustainable forest management and the multifunctional role of forests, delivering multiple goods and services in a balanced way and ensuring forest protection; Resource efficiency, optimising the contribution of forests and the forest sector to rural development, growth and job creation; Global forest responsibility, promoting sustainable production and consumption of forest products” (EC, European Commission, 2013, p. 5) “The EU Forest Strategy will enable the contribution of the forest sector to the new Commission priorities of building a new growth model through the European Green Deal, including advancing rural areas. [...] Forests and the forest-based sector should contribute to a modern, climate-neutral, resource efficient and competitive economy; preserve lively rural areas and help maintain wealthy rural populations; and preserve landscapes, culture and heritage, [...] Many challenges and pressures go beyond national boundaries and can be better addressed at EU level, such as global drivers of climate change and biodiversity loss, transboundary effects of disasters and disturbances on forests, or the global forest-based value chains and markets” (EC, European Commission, 2020b, pp. 1–2)
National	General	Programme of Prime Minister Sanna Marin’s Government	“Finland’s forests and their sustainable use are an important part of the work to combat climate change, not the source of problems. [...] In economic policy decision-making, account will be taken of the target for carbon-neutral Finland and Finland’s objectives and commitments with respect to EU and global climate policy. [...] We will do this by accelerating emissions reduction measures and strengthening carbon sinks. [...] Emissions reduction measures will be carried out in a way that is fair from a social and regional perspective. [...] The transition to a low-carbon economy will require additional investments, particularly in bioeconomy, circular economy, [...] We will promote the use of diverse forestry and forest management methods, including continuous cover forestry, while taking into account climate targets and financial aspects. [...] We will mitigate clear-cutting of forests for construction purposes by, for example, adopting charges for changes to land use. [...] We will advance research and product development concerning wood products with a high processing value and long carbon storage period, along with the sustainable utilisation of industry side streams. [...] We will halt the decline of biodiversity in Finland. Finland will achieve the goals of the UN Convention on Biological Diversity (Programme of Prime Minister Sanna Marin’s Government, 2019, pp. 10, 14, 35–36, 38–40, 42)
National	General	Sustainable Growth Programme for Finland	“The Sustainable Growth Programme for Finland provides broad support for the targets of the Paris Climate Accord and the EU Green Deal [...] PILLAR 1: The green transition will support structural adjustment of the economy and underpin a carbon-neutral welfare society [...] sustainable growth must be achieved by reducing the use of non-renewable natural resources and sustainably using renewable natural resources, and by reorienting production and consumption towards products less harmful to the environment and the climate” (Finnish Government, 2021, pp. 11, 27)
National	Bioeconomy	Bioeconomy Strategy 2014	“The objective of the Finnish Bioeconomy Strategy is to generate new economic growth and new jobs from an increase in the bioeconomy business and from high added-value products and services while securing the operating conditions for the nature’s ecosystems.” [...] “Cities, municipalities, regions and the central government play a key role in introducing new bioeconomy solutions. Local authorities and their large-scale investments as well as public procurement provide important development environments for the bioeconomy” (Ministry of Economy and Employment of Finland, 2014, pp. 3, 18)
National	Forests	National Forest Strategy 2025 (updated 2019)	“The vision highlights diverse wellbeing/fare attained from forests, and also that forests offer solutions for humans and societies’ needs” “Strategic goals are [...]” “Finland is a competitive operational environment for forest-based businesses” [...] “Forests are in active – economically, ecologically, socially and culturally sustainable – use” Forest-based versatile business will grow, including services

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Level	Focus	Document	Original statements (quotes)
National	Forests	Government Report on Forest Policy 2050	and non-timber forest products” Forest resources are plentiful, wealthy and well-growing, and they respond to the needs of growing bioeconomy” “Decreasing biodiversity of forest ecosystems will cease by 2020 and a favourable state for the biodiversity has been secured by 2050” (Ministry of Agriculture and Forestry of Finland, 2019, pp. 8–10, 18) “13 action unities for attaining strategic goals [defined in the National Forest Strategy 2025] and related welfare. The most important ones are: We create prerequisites for renewal of the companies in the field [...] We secure availability of resources to respond to demand and improve the functionality of the markets. We target publicly funded R&D to support forest-based sector renewal and transition to a bioeconomy. We guarantee biodiversity of forest ecosystems, ecosystem services and ecological and social sustainability” (Ministry of Agriculture and Forestry of Finland, 2014, p. 6)

^a Lulucf regulation is counted as a part of governing policies.

Appendix B. Thematic questions for the interviews

How would you describe the main regional factors relating to economic structure and resources?

- Main industries, key actors, and collaboration
- Diversity of industries and places within the region, e.g. renewal or decline
- Natural resources, e.g. utilisation, protection, conflicts, values

How would you describe the external factors relating to regional development?

- Political, e.g. support, regulation, expectations, collaboration – EU, national, other
- Economic, e.g. market development
- Ecological, e.g. climate change, biodiversity
- Social, e.g. habits, values

How would you describe the common strategies of East and North Finland (e.g. sustainable bioeconomy, mining and travelling)?

- Suitability and meaning for your region/subregion
- Possible missing field(s) from your perspective
- Expected development in the region/subregion
- Support for, and barriers to, reaching expectations

How would you describe the strategies of your region?
(Questions for development actors of subregion)

- Suitability and meaning for your region/subregion
- Possible missing field(s) from your perspective
- Expected development in the region/subregion
- Support for, and barriers to, reaching expectations

How would you describe the peripherality or remoteness of/within your region?

- Is or is not peripheral or remote from the development perspective
- Main transport: goods, people, modes, directions
- Distances and infrastructure in relation to accessibility and sustainability
- Strengths, flaws, and expectations towards infrastructure
- Support, barriers, and responsibility of improvements in infrastructure

How would you describe the vision or scenario regarding the development of your region?

- a) desirable, b) plausible, c) worst-case vision/scenario

How would you describe the following aims typical of development strategies and programmes?

- Growth: of what, (un)desirable, boundaries, and relation to sustainability
- New kinds of actions: renewal, support, (un)desirable ways among economic actors
- New innovations: strengths, weaknesses, support, ongoing, barrier, diversity

How, do you think, has the Covid pandemic changed, or might possibly change, the development of the region?

- Diversity of industries and places within the region
- Changes in development strategies, programmes, actions
- Learning from the pandemic, if any learning occurred

Appendix C. Original quotes from the interviews (translated by the authors, spellchecked)

Regional development aspirations: You can have it all is possible

- 1–1H5 “New EU programme period, this climate change discourse, which has raised a global knowledge and kind of new paradigm, has emerged. Of course, it impacts [...] The alignments of the EU support well [our region] and more broadly East and North Finland. This sustainable growth [is good for us] as we have high skills and lots of natural resources.”
- 2–1H1 “In some legislation processes it is good that we also have lobbyists from the economic life to the EU.”
- 3–1H4 “These objectives of the sustainable development by the UN – we are for them – and the Green Deal and new funding [arrangements] of the EU as linked to it, we seek to renew our [programmes and agreements] through the lenses of sustainable development, i.e. through these aims of the UN and the EU.”
- 4–2H9 “The central issue is that the aim is to renew the economic structures, so they support sustainable development from the perspective of the environment. [...] This kind of funding for green transition, to get away from the consumption of the fossil-based raw materials. These kinds of major policies and sources of funding will guide more than before the action [...] through which carbon footprint and climate change could be diminished.”
- 5–1H7 “Funding is coming to projects which promote renewing of economic life [...] so we get to fossil-free society. [...] Now we need to set them into action.”
- 6–2H6 “Green Deal, green transition, everything relating to it, and bioeconomy, these are very positive to our region.”
- 7–2H11 “Our main asset is our forest [and] more the bioeconomy [...] renewable materials, renewable energy, new materials [...] new wood-based products. [...] The aim is to replace plastic with cardboard.”
- 8–1H1 “The solutions of circular economy [...] that different ingredients of the wood could be used reasonably and efficiently [...] according to sustainable growth.”
- 9–2H5 “It is linked to circular economy. Currently sawdust is in use but, at some point, a new type of wood pulp should be used, knots and so on. [...] Also value added and new kinds of industrial innovations increase.”
- 10–1H2 “Sawdust comes from the sawmill [...] it is still under development and the process is slow, but it is also a good example of the use of the by-products – the use of sawdust which used to have no value. Further, lignin and other materials could be obtained.”
- 11–2H1 “As desirable [development] I would see the growth of value added. More money and benefits would come to regional economy. So the raw materials would not be exported but the processed products. It would be more reasonable for the [regional] economy and employment.”
- 12–2H2 “All [mills] are side by side, it is convenient and also ecological, because there is no need to transport the raw material over such long distances.”
- 13–2H12 “Here it [production] would be in the middle of forest resources which would save [long] transportation.”
- 14–2H13 “We wish and promote [...] further processing within our region as far as possible [...] So not in a way that raw material is exported and processes somewhere else, taking the creams off.”
- 15–1H2 “The discourse on sustainable development emphasises the triple connection between social, economic and environmental but often you may notice that these are not similarly considered and one of these is highlighted due to certain interests.”
- 16–1H4 “The nature is really fragile here and renewal is slow [...] and for that reason the relationship with utilisation of nature has long been sustainable – the fragility of nature is acknowledged and acted sustainably based on that.”
- 17–2H7 “Although it can be said that forest grows [...] but forests are not an inexhaustible resource either and it takes certain time to grow again. So how about the future.”
- 18–2H5 “It would be a short way – to log beyond its capacity.”
- 19–2H8 “I see climate change as a threat for forestry. The warming brings the pest risk closer [...] and also the capricious weather, unfrozen winters and storms increase.”
- 20–1H1 “In forest planning, we have to take into account the lake areas, the special proceedings, to look at the run-off water and the catchments.”
- 21–1H7 “This mill which did not come after all. It was related to questions on how much forest can be felled, how they affect to carbon sinks, [...] What kinds of influence it has on the waterfront. [...] After all, there were no certainties.”

Regional development in practice: You can have it all is dependent on many ifs

- 22–1H4 “Long time this has been a declining region. [...] but if the new biorefinery will be realised it will bring new vitality to the region.”
- 23–2H7 “Sawing was centralized, so last time the production was transferred from here to [other location].”
- 24–1H1 “Some sectors decline [...] like the paper in the past [...] Its development has gone with the global technological development, and the demand for the paper declines.”
- 25–2H3 “When the sawmill was closed, it appeared as a decline in industrial employment.”
- 26–2H12 “The sustainability of logging and location was under discussion [...] when plans considered two new bioproduction units and there was already one old forest mill [in the region]. But as the old one was dropped from the markets, there will be enough wood” (2H12).
- 27–1H3 “Ideally, the economic life and research will solve these global problems regarding climate, energy and so on.”
- 28–2H11 “PPP, i.e. profit, planet and people [...] we have companies which have realised it and go accordingly. Some are not but they should.”
- 29–2H1 “We have these family-based companies which are local, and it is a great asset. They also want to develop the region and see the importance of employment for the region. [...] Sawmill and further processing of the wood material, so they are in the strong economic growth and development path.”
- 30–2H7 “Our top companies are international, act in global markets [...] from natural resources, wood material is most needed and upgraded, so the central issue is, how it is available here.”
- 31–1H2 “Investment potentials, [...] the biggest is [forest biorefinery] but those are in the hands of the external investors.”
- 32–1H1 “We had these local actors [...] intelligent people started development [...] now there is a testing environment [...] and the business is global.”
- 33–1H6 “The local private mills are in good positions and the tradition is strong, but they are not willing to take innovations further.”
- 34–2H3 “Most recently [international mill] shut down the local sawmill. [...] and relocated to another place. That was a shock.”

Regional development by/with tensions: You can have it all runs into conflicts

- 35–2H3 “There is money for these good and big projects which are suitable under the green transition.”
- 36–2H8 “There is funding but for what it is intended and what is actually needed here, those do not really match.”
- 37–1H1 “We do struggle with this, the funding support to R&D. [...] Compared to Tampere-Turku-Helsinki. [...] if the weight stays in the volume of population and business, then it is very minor here in East and North Finland.”
- 38–2H12 “We have calculated that already the current transportations [of wood] would make the [the new] rail worthwhile. It is awful, currently the main road [...] is loaded with those trucks. It is very dangerous, and in very poor condition. More funding should be obtained to improve it. [...] We try to lobby to get funding and get it prioritized, too. [...] However, when we are so minor, these road investments always follow the capital city area.”
- 39–1H6 “There the local private ownership is very extensive and there is also common forest so those are well allocated to the use of the local economy.”
- 40–1H5 “The structure of the ownership, the majority of forests are owned by the forest companies or the state. It means that the proceeds from the forests do not stay in the region. [...] This is a big structural issue and probably our political resources are not enough. This is part of the core issue – our natural resources benefit other parts of the country, especially the capital city area, more than our region” (1H5).
- 41–1H1 These restrictions on the natural resources, especially concerning the use of the forests. Seems that in [the EU] there is no understanding of the forestry, and here in [Finland] also protection and biodiversity are considered rather well. This is kind of a sensitive issue – how subnational decision-making also recognises and considers the perspectives of the peripheral regions.”
- 42–2H10 The discourse on forest in recent years, it is awful that we should let the EU reserve us and our forests. This is a bit exacerbating, but [...] also within Finland there is a huge incomprehension between the South and North. [...] Those who understand city parks as forests see these peripheral forests only as nature parks or conservation areas, and do not understand the conditions of living or the living in a way that understand the nature here – Do they know better than us who live here?”
- 43–2H1

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Regional development aspirations: You can have it all is possible	
	“All the time the debate is on a razor edge [...] protection, landscape, logging, carbon issues, very fast discussion culminates, and parties misunderstand each other. These locals can also create conflicts by themselves. [...] However, interesting experiments have started, common understanding, local entrepreneurs and other actors have been joined” (2H1).
44–1H5	“Conflicting issue is, forest policy has been national policy and then the political alignments have been made which does not match with it. As is Lulucf directive, where the logging of wood is kind of an environmental offence. [...] I think we are an environmentally conscious population, then some idiotic directive is restricting how the forests are utilised.”

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