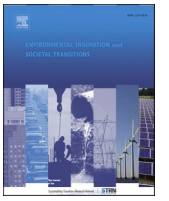
Environmental Innovation and Societal Transitions 52 (2024) 100857

Contents lists available at ScienceDirect

Environmental Innovation and Societal Transitions

journal homepage: www.elsevier.com/locate/eist



# Tipping the scales of the blue transition: Framing the geography of a Norwegian seafood mission

Matthijs Mouthaan [a,*], Koen Frenken [a], Laura Piscicelli [a], Taneli Vaskelainen [b]

[a] Copernicus Institute of Sustainable Development, Utrecht University. Address: Princetonlaan 8a, 3584 CB, Utrecht, The Netherlands
[b] Ruralia Institute, University of Helsinki. Address: Lönnrotinkatu 7, 50100 Mikkeli, Finland

ARTICLE INFO

*Keywords:*
Missions
Geography
Scale
Rescaling
Policy
Food

ABSTRACT

Sustainability transitions and innovation policy research has studied barriers and drivers of structural change at different spatial scales, but lacks attention to how scale is discursively invoked by actors to (il)legitimate such change. We address this gap by studying how scale is framed by actors in the issue field of a Norwegian seafood mission. Based on an analysis of 'scale frames' in consultation submissions to the mission's proposed implementation, the case highlights that environmental problems do not fit the jurisdictional boundaries of policy and thus induce negotiation over the geography of missions. We show that scale constitutes a crucial discursive strategy used by actors to secure their interests in the mission discourse and that attempts to depoliticize this discussion through science-based policy remain contested due to the constructed nature of scale. Future research can benefit from constructivist conceptualizations of scale and enrich our understanding of geography with institutional and power perspectives.

## 1. Introduction

Systemic, socio-technical sustainability transitions require policies that steer innovation towards desirable, more sustainable paths. Recently, the concept of 'missions' has become popular in innovation policy literature to describe such directionality in policy efforts to address sustainability challenges (Mazzucato, 2017). Missions can be understood as the identification and articulation of concrete societal problems "*that require system-wide transformation across different types of sectors, and involves partnerships between different actors*" (Mazzucato, 2017, p. 3). Establishing directionality is a complex process where the articulation of missions is the negotiated outcome between stakeholders "*with incongruent interests*" instead of being defined top-down by governments (Ghosh et al., 2021, p. 741; Janssen et al., 2021; Wanzenböck et al., 2020). The implementation of missions tends to focus on the jurisdictional scales covered by the respective policy actors, although actual socioenvironmental processes underlying sustainability challenges escape such scales (Wanzenböck and Frenken, 2020). The resulting tensions in policy processes are still ill-understood. We address this gap by analysing how scale is discursively constructed and contested in the exemplary case of a Norwegian seafood mission's discourse.

In 2013, the Norwegian government announced their long-term policy goal to become the worlds' leading seafood nation by quintupling the value of seafood production by 2050 to contribute to a global 'blue transition' (Ministry of Trade, Industry and Fisheries, 2013). This objective can be understood *de facto* as a mission, as it includes a well-defined goal motivated by societal challenges (global food security, socioeconomic development of Norwegian coastal regions), a reliance on new, diverse knowledge

* Corresponding author.
*E-mail address:* m.mouthaan@uu.nl (M. Mouthaan).

https://doi.org/10.1016/j.eist.2024.100857
Received 15 June 2023; Received in revised form 8 May 2024; Accepted 22 May 2024
Available online 8 June 2024

through the Norwegian seafood innovation system, and a deviation from past technocratic policy. The mission was endorsed by the parliament and became the public reference point for the future of the Norwegian seafood industry to this day. This mission steered an ongoing discussion of Norwegian aquaculture[1] policy, which represents the most dominant sector of Norwegian seafood production in terms of value (Johansen et al., 2019). This discussion culminated in a new aquaculture policy introduced in 2017 referred to as the 'Traffic Light System' (TLS). This policy aims to stimulate sustainable Norwegian aquaculture expansion based on the environmental carrying capacity of newly constructed ecological zones, reflecting a radical rescaling of previous policy aimed at the jurisdictional level while monitoring and regulating individual fish farms and production license holders. Despite a bottom-up approach with three stakeholder consultations informing the TLS, the new policy was highly criticised by a variety of stakeholders (Hersoug, 2022; Olaussen, 2018).

Using this mission as an exemplary case, we argue that missions have an inherent problem and solution demarcation to certain scales, often implying a marginalization of other scales. We show that the construction of scale through 'scalar strategies' is a salient and divisive strategy in actors' attempts to (re)frame the mission and its policy implementation. While a constructivist view on geography, which regards notions such as scale as social constructs, has been suggested as an important research avenue in the sustainability transitions literature (Coenen and Truffer, 2012; Hansen and Coenen, 2015; Murphy, 2015; Raven et al., 2012), empirical research in the geography of sustainability transitions has shown little sensitivity to scale as a 'category of practice', i.e., how actors (re)construct the scale of problems, causes, and solutions. We address this research gap by analysing missions through a constructivist lens on scale, which allows us to understand how different stakeholder interests materialize in policy debates through scalar strategies. This study thus contributes to literature on missions for sustainability transitions by addressing scale as a political and fluid social construct that actors strategically use to frame and (il)legitimate the geography of a mission's problem-solution space (Madsen, 2022).

Section 2 reviews literature on scale as a social construct in the fields of environmental governance and human geography. Section 3 introduces the case, the origin of the mission and the implementation in new aquaculture policy. Section 4 presents the methodology. Section 5 describes the findings and elaborates on the identified scale frames and scalar strategies. Section 6 discusses the findings, provides suggestions for future research, and concludes with policy implications.

## 2. Theoretical background

If we understand the problems that missions seek to address as 'wicked' (Rittel and Webber, 1973), it is apparent that contestation over the problem and solution framing due to "*social pluralism and stakeholder divergence*" (Wanzenböck et al., 2020, p. 477) is an inherent part of identifying the mission and implementing it into policy. Contestation will not be limited to the problem and solution framing alone, but also concerns the spatial scales at which problems and solutions are to be conceived and acted upon. We argue that a mission's multi-scalarity is thus a fundamental part of its problem-solution structure. Yet, contributions on the geography of missions (Coenen et al., 2015; Grillitsch et al., 2023; Wanzenböck and Frenken, 2020; Wanzenböck et al., 2020) and transitions (Binz et al., 2020; Hansen and Coenen, 2015; Raven et al., 2012; Truffer et al., 2015) reflect that scholarship traditionally uses scale for the analytical purpose to demarcate analyses in space and time. This is surprising, as early contributions to the geography of transitions have emphasized that scale is socially constructed and, indeed, often contested (see e.g., Coenen and Truffer, 2012; Hansen and Coenen, 2015; Murphy, 2015; Raven et al., 2012).

### *2.1 Alternative conceptualization of scale*

The notion of scale transcends disciplines and has been discussed in a variety of fields with different interpretations and uses (Cumming et al., 2006). Scale can be defined as a sensemaking device for the construction and ordering of reality by differentiating hierarchical, multi-level relations in space. As this definition implies, we follow constructivist literature in viewing scale as a continuously emerging outcome of a sociopolitical organization of space. This is a process that "*is always deeply heterogeneous, conflictual and contested*" (Swyngedouw, 1997, p. 140). Simultaneously, we adhere to a political economy perspective that this fluidity is limited by collectively established and legitimated relational hierarchies of space. In other words, and in contrast to traditional post-structural assumptions, scale does "*pre-exist social activity through past processes of social construction*" (MacKinnon, 2011, p. 27). Scales are thus guiding, and guided by, social processes, with varying levels of institutionalization embedded in discursive and material practices that tend to reify established spatial hierarchies and associated distributions of power (MacKinnon, 2011; Moore, 2008).

Recent contributions on the geography of sustainability transitions apply more constructivist conceptualizations of scale. Madsen (2022) argues that as scale does not describe fixed levels with inherent properties, innovation policy cannot be containerized into pre-determined 'scalar arrangements' of efficacious decision-making power at subnational, national, or supranational scales. Instead, rescaling is considered an important transition mechanism where policies and associated politics shift in scale. Miörner and Binz (2021) approach scale as an 'analytical dimension' of actor-networks and institutional arrangements, where rescaling of these system elements from, e.g., local ideas to global rationalities represents an important transition mechanism. Bögel et al., (2022) similarly describe scale primarily as an analytical descriptor, here related to the scale of agency in attempts to scale up transition initiatives from individuals to the collective using the case of an urban transition experiment.

We seek to contribute to these recent advancements on the geography of transitions and missions in two particular ways. First, as is

[1] Aquaculture refers to the controlled cultivation ('farming') of marine species.

common to transition studies, respective scholarship has addressed scale with a socio-technical lens that neglects the role of the natural environment (Andersson, 2024; Loorbach et al., 2017; Vermunt et al., 2020). This gap is particularly pressing for the geography debate as the scale of ecological systems is rarely aligned to the jurisdictional scales at which they are traditionally governed (Cumming et al., 2006; Koppen and Bush, 2018). More fundamentally, "*nature and society operate together*" in constructing and contesting scale (Marston et al., 2005, p. 418; Swyngedouw, 2004b). We synthesize environmental governance literature to advance our understanding of how the natural environment constrains and shapes constructions of scale in the context of sustainability transitions and associated policy (Section 2.1.1). Second, the contributions of Madsen (2022) and Miörner and Binz (2021) remain focussed on the material dimension of scale (re)production by studying changes in the scaling of policy, standards, or experiments through interviews and secondary data. While the discursive dimension is discussed by these contributions, there is little explicit engagement with established literature on the role of scale in discursive practices. As the discursive use of scale is a powerful rhetorical device to (il)legitimate problem and solution frames, this research gap is particularly relevant for missions that seek to facilitate just and inclusive transitions. We thus synthesize human geography literature to more explicitly study the discursive practices through which scale is (re)produced (Section 2.1.2).

### *2.1.1. Scale in environmental governance*

Environmental governance literature is highly reflexive of the recurring tensions between the jurisdictional scale of policy and the ecological scale of the natural resources they seek to govern. To capture these tensions, scholars have productively differentiated between 'scalar levels' and 'scalar dimensions'. Scalar levels describe the hierarchical levels along which space is socially organized, such as the municipal level, county level, national level, and so forth (Cash et al., 2006; Moss and Newig, 2010; Reilly and Adamowski, 2017). Related scalar levels describe a common 'scalar dimension' of space, such as the jurisdictional dimension in the case of the previous examples of scalar levels. Other scalar dimensions include ecological or even temporal dimensions (Cash et al., 2006). Referring to 'scalar dimensions' and associated 'scalar levels' helps to categorize scale-related vocabulary, thereby avoiding a simplistic aggregation of all spatially sensitive terminology under the single term of scale (Moss and Newig, 2010).

The reach of policy is traditionally limited to jurisdictional levels (e.g., a municipality, county, city, nation), which is generally misaligned with the dimensions and levels of the socioenvironmental processes they seek to address (e.g., river flows, nutrient cycles, air pollution). Particularly the nation-state has been a popular scale to govern environmental resources despite the constraints it poses on multi-scalar perspectives (Cumming et al., 2006; Koppen and Bush, 2018). The spatial complexity is further aggravated by increasingly globalized value chains that spatially dislocate causes and solutions from problems (Fuenfschilling and Binz, 2018; Nepstad et al., 2013). Addressing socioenvironmental problems with policy is, therefore, paralyzed by a low "*match between institutional arrangements and the defining features of the problems they address*" (Koppen and Bush, 2018, p. 306). This has also been referred to as 'scale mismatches' (Cumming et al., 2006; Folke et al., 1998) or a low 'institutional fit' (Koppen and Bush, 2018).

Critiques of state-dominated environmental governance have motivated alternative modes of governance, of which two are particularly relevant in this context. First, multi-level governance has been proposed as promising due to its focus on interaction and coordination between governing bodies and policies at different jurisdictional levels (Dittrich, 2022; Koppen and Bush, 2018; Moss and Newig, 2010). Yet, some authors reflect that these vertical interactions (e.g., between state and municipalities) are prone to institutional asymmetry, understood as situations in which "*the operation of one institution affects others significantly without triggering equivalent responses*" (Young and Gasser, 2002, p. 84). For example, proposals to address 'grand challenges' on a global scale are criticized for reiterating problems of the commons, lacking local participation, and neglecting sensitivity to local contexts (Dittrich, 2022; Wanzenböck and Frenken, 2020). Furthermore, attempts at providing more power to local policymaking are often found to be symbolic acts, as control by central governments is in practice frequently retained or even strengthened by co-management strategies (Castro and Nielsen, 2001; Ribot et al., 2006).

A second and more recent strategy to address the limitations of state-level environmental governance is to 'rescale' policy. Rescaling in this context refers to a policy strategy to govern socioenvironmental issues to (often newly constructed) ecological scales. For example, the European Union initiative 'Water Framework Directive' aims to improve the quality of European water bodies based on governance of cross-jurisdictional river basins (Hüesker and Moss, 2015). Similar examples of rescaled water governance can be found in Australia, New Zealand, and in strategies and projects of intergovernmental organizations (Kaika and Page, 2003; Kemper et al., 2007; Mitchell and Hollick, 1993). Rescaling is generally assumed to be more fit to govern socioenvironmental concerns based on ecosystem management and often appears more scientific, creating a desired sense of apoliticality (Cohen and Bakker, 2014). While rescaling is perceived by many policymakers as a convenient 'eco-scalar fix', scholars have argued that it *re*politicizes rather than depoliticizes the process of rescaling, as analytical categories (e.g., a watershed, an ecosystem) inevitably in- and exclude perceptions of who is affected, and what is the problem, cause, or solution (Cohen and Bakker, 2014; Kurtz, 2003).

### *2.1.2. Scale in human geography*

Literature on human geography has long understood the social organization of space as a political, contested process. Scale is a continuously 'emerging' outcome of this ongoing process and a source of power, shaping in turn these social processes (Leitner, 1997; Smith, 1993). From this perspective, scale is a socially constructed ordering device that can be strategically used to (il)legitimate attempts to (re)organize space (Cash et al., 2006; Dittrich, 2022; MacKinnon, 2011; Moore, 2008). Turning away from perceiving scale as pre-existing and fixated allows us to consider how scalar constructions can be strategically used to pursue certain interests, (il)legitimate certain arguments, and (dis)empower certain actor groups (Reilly and Adamowski, 2017). This perspective enables the

study of 'scalar politics', where scale is understood as a dimension of the contested social organization of space with a material-discursive nature that questions the relationship between certain 'pre-existing' or institutionalized scales and emerging scalar 'arrangements and configurations' (MacKinnon, 2011).

Post-structural literature in human geography has valuably contributed to the collective understanding of scale as being embedded and (re)produced in practices and discourse rather than being concrete or fixed analytical classifications, which risks reifying spatial hierarchies (MacKinnon, 2011). In other words, viewing scales as epistemological rather than ontological relations helps to analytically approach them as "*a way of framing political-spatiality that in turn has material effects*" (Jones, 1998, p. 27). We thus follow geography scholars that iterate the value of scale as a "*lens through which to think about and act upon change*" (Jonas, 2006, p. 404), compared to sceptics who favor abandoning scale as its hierarchical verticality risks marginalizing social practice to "*a lower rung on the hierarchy*" (Marston et al., 2005, p. 427) compared to broader forces like 'globalization'. Whereas scholars sceptical of scale seek to redirect attention to networks, sites, and practices in what some of its proponents describe as an "*anarchist flat ontology*" (Springer, 2014, p. 402), geographers in favor of a hierarchical approach reflect that avoiding rather than recognizing scale can obscure an analysis and critique of power imbalances and inequalities (Jonas, 2006; Leitner and Miller, 2007). Furthermore, we echo recent contributions that a structural approach to scale is also compatible with prevailing frameworks in transition studies, thereby fostering further theorization across the two fields (Bögel et al., 2022; Miörner and Binz, 2021; Madsen, 2022).

An important tenet is that "*the concepts of scale and ideology are linked*" (Irvine, 2016, p. 214). That social practices, interests, and rationalities underlie scalar politics is, for example, shown by Molle (2009), who links regionalist sentiment and a high-modernist ideology to experiments with the rescaling of river-basin planning in the United States at the beginning of the twentieth century. Similarly, it has been argued that the rescaling of forestry management or watersheds from jurisdictional governance to community-based initiatives reflects a neoliberal paradigm where the community "*becomes a supplement to capitalism*" (Cohen, 2012; McCarthy, 2005, p. 1009). Swyngedouw (2000) considers how the increasing popularity of 'entrepreneurial cities' and 'competitive spaces' in the face of increasing globalization does not reflect an affinity with the localized scalar level as such, but rather, with the possibility of resistance or empowerment that is constituent of the locale. Furthermore, Aiken et al. (2022) suggest that the political pursuit to scale up sustainable community initiatives reflects a 'scalar logic' that is at odds with the ideology that motivated the inception of many such initiatives in the first place. Table 1 summarizes the main differences between conceptualizations of scale in literature on transitions and missions on the one hand, and environmental governance literature and human geography on the other hand.

These perspectives have two important implications for the geography of missions. First, we argue that a more constructivist, epistemological conceptualization of scale as a *category of practice* is crucial to better understand the scalar politics that emerge in negotiations over the spatial organization of a mission. Particularly in the context of missions for sustainability transitions, we inherently demarcate problems, causes, and solutions to spatio-temporal scales to assess whether they are '(un)sustainable' (Fresco and Kroonenberg, 1992). In this construction process, we consequently and inevitably marginalize other scales (Cash et al., 2006). For example, Scott and Smith (2017) contend that (inter)national political pursuits for energy transitions can disempower the concerns and interests of local communities situated in 'sacrifice zones' where, for example, wind turbines are placed. Similarly, literature on 'green extractivism' (Voskoboynik and Andreucci, 2021) emphasizes how renewable technologies for energy transitions in the Global North might not be sustainable at other levels and scales (e.g., mining externalities of rare earth elements in the Global South). To facilitate the conceptualization of scale as a category of practice, we turn to the notion of scale frames and scalar strategies.

### 2.2. Scale frames and scalar strategies

If we conceptualize scale as a category of practice, it becomes evident that actors can use certain scales to strategically construct missions and their translation into new policy in ways that (de)legitimize issues, interests, and stakeholders associated with other scales (Reilly and Adamowski, 2017). Swyngedouw (2004a) proposes that capitalist processes of capital circulation and accumulation induce a contested global 'reshuffling' of "*scales of governance and of regulation of social conflict and social reproduction*" (p. 32)[2]. This argument implies that spatial tensions and conflicts are likely to emerge in contemporary discourse of (the governance of) socio-environmental issues. In this context, some have employed the notion of 'scale frames', defined as "*the discursive practices that construct meaningful (and actionable) linkages between the scale at which a social problem is experienced and the scale(s) at which it could be politically addressed or resolved*" (Kurtz, 2003, p. 894). In these types of frames, the construction of an existing condition as 'unjust' (i.e., the problem), the construction of a target to blame (i.e., the cause), and the construction of suggested remedies (i.e., the solution) are strategically imbued with rhetorical references to scale (Kurtz, 2003). While the diversity in contributions on this phenomenon has led to notions similar to scale frames (such as 'scalar narratives', see e.g., Gray et al., and (2014) and Swyngedouw (2004a)), we theoretically approach the use of scale as a political tool through 'scale frames' as this concept has garnered an established following and

[2] Swyngedouw (2004a) refers to this overall process of reshuffling as 'rescaling'. However, in related literature, 'rescaling' has also been used to describe more narrowly a specific scalar strategy by which actors (re)frame or regulate issues at a different scalar dimension. Given our interest in scalar strategies and to avoid conceptual confusion, we refrain from using the term as defined in the work of Swyngedouw. The definition we follow is described in more detail in Section 2.2.2.

**Table 1**
Conceptual differences between dominant uses of scale.

| | Missions and transitions literature | Environmental governance and human geography |
|---|---|---|
| *Use of scale* | Analytical demarcation | Empirical interest |
| *Rigidity of scale* | Fixed | Fluid |
| *Origin of scale* | Pregiven, ontological | Constructed, epistemological |
| *Purpose of scale* | Functional | Political |

**Table 2**
Overview of considered scalar strategies.

| Scalar strategy | Description |
|---|---|
| Upscaling | Framing a problem, cause, or solution at a higher scalar level |
| Downscaling | Framing a problem, cause, or solution at a lower scalar level |
| Scale stacking | Framing a problem, cause, or solution at two or more scalar levels |
| Rescaling | Framing a problem, cause, or solution to a different scalar dimension |
| Scale coupling | Framing a problem, cause, or solution at two or more scalar dimensions |

maturation since its inception (Kurtz, 2003). Indeed, scale frames have been used to study scale as a commonly (contested) category of practice in human geography as well as environmental governance literature. From this body of work, we attempt to synthesize a typology of dominant relationships between scalar levels and scalar dimensions most commonly invoked in scale frames. Inspired by previous contributions that have loosely referred to such salient relational patterns as 'scalar strategies' (see e.g., Smith, 1993; Swyngedouw, 2004b), from here onwards we define these typified relationships as 'scalar strategies'. From the literature discussed in Section 2.1, we synthesize five recurring scalar strategies: upscaling, downscaling, scale stacking, rescaling, and scale coupling[3].

### 2.2.1. Scalar strategies to shift the scalar level

'Upscaling', 'downscaling', and 'scale stacking' refer to strategic shifts in the scalar *level* of a problem, cause, or solution. Upscaling refers to frames at a higher scalar level. For example, Scott (2010) describes how an Appalachian coal mining region was framed by proponents of coal mining as a marginal, peripheral 'sacrifice zone' for the benefit of national energy security. Similarly, Fløysand et al. (2010) show how Chilean environmental organizations established relations with global partners to help frame Chilean aquaculture as problematic beyond the local level. Downscaling refers to frames at a lower scalar level. Californian pesticide drifts have been framed by certain actors as incidental, localized incidents rather than as a recurring, systemic problem to illegitimate proposals for federal state-level action (Harrison, 2006). Downscaling global warming to locally situated climate change experiences and frames has also been suggested as a way for the issue to become more perceived as urgent (Reser et al., 2014). Scale stacking refers to frames at two or more scalar levels. Sica (2015) reconstructs how societal elites framed fracking in Pennsylvania as beneficial for local jobs; regional economic growth and cheap gas; national energy independence; and as an international example. This strategy builds a multi-level scale frame that acts to illegitimate narrower, single-level arguments against fracking. Conversely, opponents to frac sand mining in Wisconsin framed mining as the loss of a historical, spiritual place; the loss of regional, tourism-related jobs due to the environmental effects of mining; and as an undesirable sacrifice for all state residents (Holifield and Day, 2017).

### 2.2.2. Scalar strategies to shift the scalar dimension

'Rescaling' and 'scale coupling' refer to strategic shifts in the scalar *dimension* of a problem, cause, or solution. Rescaling refers to frames at a different scalar dimension. Common examples include shifts between jurisdictional and ecological scales. For example, McCarthy (2005) compares how community-based forestry initiatives are framed as beneficial through local participation, community access, and voluntary compliance, compared to jurisdictional command-and-control forest management. Similarly, watershed management of water bodies has been framed as superior to traditional state-controlled or jurisdictional governance due to its perceived scientific basis and ecosystem approach (Cohen, 2012). Scale coupling refers to frames at two or more scalar dimensions. Van Lieshout et al. (2012) show how actors amplify the unfeasibility of getting administrative approval for agricultural initiatives by coupling the administrative and temporal dimension, e.g. through stating it 'will take another 10 years'. By framing Australian wildfires during the summer of 2019-2020 as national or regional state of emergencies, authorities propagated the urgency by coupling jurisdictional (national, regional) to temporal (emergency) scales (Patterson et al., 2021). Table 2 summarizes the scalar strategies employed in scale frames, as synthesized in Section 2.2.1 and Section 2.2.2. Fig. 1 visualizes the scalar strategies along two hypothetical scalar dimensions.

[3] These scalar strategies merge similar concepts discussed in disparate strands of literature (e.g., upscaling and 'scale jumping' by Smith (1993)). It is also important to note that while these scalar strategies are here understood and treated as discursively invoked relationships between problems, solutions, or causes and their scale, the terminology can mirror what in e.g., environmental governance is considered a policy outcome: for instance, 'rescaling' is here understood as a scale strategy but can also refer to the rescaling of policy to a new scalar dimension, e.g., a shift from jurisdictional levels to biophysical ones.

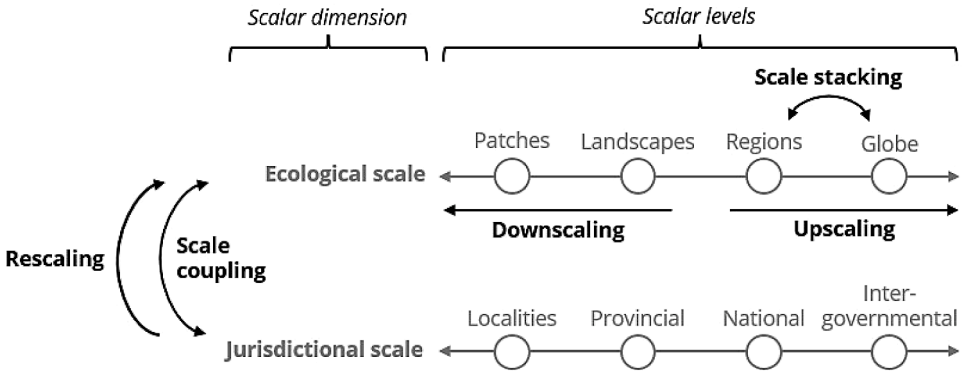



**Fig. 1.** Identified scalar strategies along hypothetical scalar levels and dimensions.

## 3. Setting the scene: Norway's new seafood mission

In 2013, the Norwegian government announced an ambitious strategy: 'becoming the world's leading seafood nation' by quintupling the value of seafood production by 2050, hereafter referred to as the 'mission' (Ministry of Trade, Industry and Fisheries, 2013). The mission is legitimated by a multi-scalar set of societal challenges including a responsibility for global food security, the high environmental footprint of terrestrial food and protein production, and the socioeconomic development of Norwegian coastal areas. The mission aligns with intergovernmental modernization discourses for a 'blue transition' of the global food system that promises sustainable and inclusive benefits of seafood expansion, and aquaculture growth in particular, at global, national, regional, and local levels (Nahuelhual et al., 2019). The mission reiterates the importance of Norway's national innovation system as new scientific knowledge of the marine environment, technologies, and future markets are deemed necessary. While not explicitly framed as a mission, this well-defined policy ambition remains a shared horizon and serves as a long-term public agenda for the Norwegian seafood sector in which aquaculture, and particularly salmon farming, contributes to the majority of generated value (Iversen, 2020; Johansen et al., 2019; Straume et al., 2020). Despite stagnating aquaculture production at the time the mission was announced (see Fig. 2), the former minister referred to the mission as 'too modest' and to opponents as 'dark forces' (Aftenposten, 2016; E24, 2017).

The new mission informed a radical shift of aquaculture policy from established technology-led strategies to environmental sustainability as the prerequisite for regulating production growth. In 2017 the redesigned aquaculture policy (the TLS) was implemented after several years of political discussions and stakeholder deliberation, the latter exemplified by three consultation rounds (in 2011, 2015, and 2016). The TLS primarily consisted of three rescaled policy instruments: production zones, one carrying capacity indicator, and an action rule. Research institutes were appointed to scientifically model and demarcate production zones and operationalize environmental indicators (Kristoffersen et al., 2018). Thirteen production zones were designed along the coastline, scaled to ecological

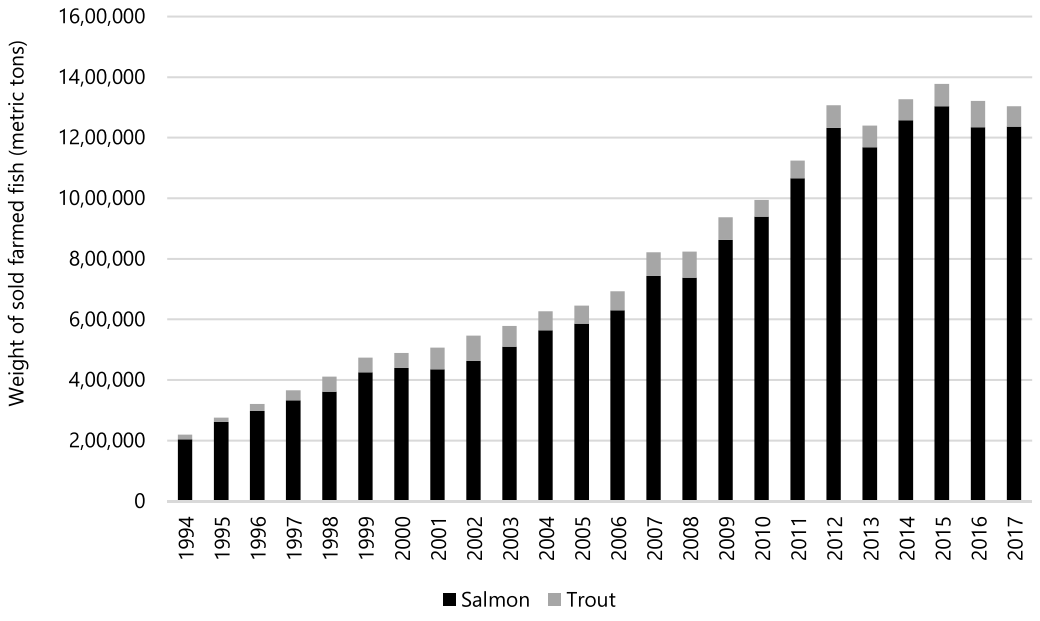



**Fig. 2.** Norwegian aquaculture production from 1994 to 2017 (Fiskeridirektoratet, 2022).

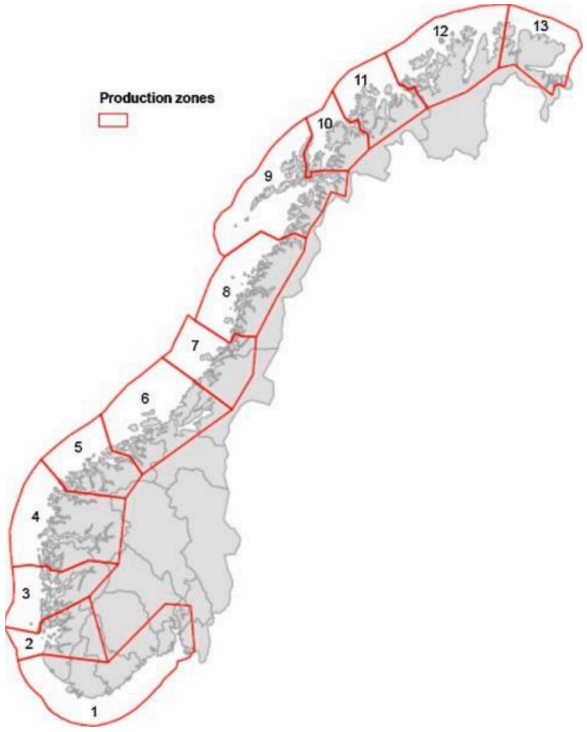



**Fig. 3.** Construction of production zones (red lines) along existing jurisdictions (grey lines) (Kristoffersen et al., 2018).

rather than jurisdictional dimensions (see Fig. 3). This rescaling would minimize water connectivity between zones, thereby limiting the dispersion of pathogens and salmon and facilitating production growth in healthy production zones (Kristoffersen et al., 2018). These production zones are assessed on one environmental indicator: the estimated mortality rate of wild salmon attributed to parasitic sea lice in a production zone. Sea lice was selected as the sole indicator[4] because it can be "*measured, quantified, and modelled*" (Hersoug, 2015; Osmundsen et al., 2020, p. 122). Other suggested sustainability indicators such as nutrient pollution, escapes of farmed salmon, or the welfare of farmed salmon were ultimately not selected due to a perceived lack of knowledge or a scale unsuitable for production zones, such as local nutrient emissions (Hersoug, 2021).

An action rule that links the production capacity of production zones to indicator performance was formulated: zones are biannually categorized as red, yellow, or green, based on the estimated mortality rate of wild salmon attributed to sea lice in a production zone, which respectively corresponds to forced reductions, freezes, or possible production capacity increases. Despite the consultation rounds, stakeholders were highly critical of the TLS. Environmental organizations criticized that only one indicator was used to represent and operationalize the carrying capacity and that the action rule was too lenient (Michaelsen-Svendsen, 2019; Osmundsen et al., 2020). The seafood industry questioned the scientific basis of sea lice as an indicator and the legality of 'collective punishment' of farmers operating in the same production zone (Olaussen, 2018). After a production zone coloured red during the first TLS assessment in 2020 and was forced to reduce production capacity, farmers sued the Norwegian state but lost the case (Hersoug, 2022).

## 4. Methodology

To study scalar politics in the negotiated construction of a mission and its translation into new policy, we study what scale frames and scalar strategies stakeholders use to construct a mission and its policy implementation. Specifically, we study those stakeholders that responded to each of the three consultation rounds in 2011, 2015, and 2016 mentioned in Section 3. The unit of analysis is the 'issue field' of translating the mission of the Norwegian government to quintuple the value of seafood production by 2050 into new aquaculture policy. Issue fields describe the set of organizations that compete and negotiate over the construction of socio-environmental issues and solutions (Benford and Snow, 2000; Hoffman, 1999). The three consultation rounds serve as the temporal demarcation of the issue field to a period (2011–2016) where scalar strategies are particularly visible as stakeholders were invited to publicly position themselves with regards to the new mission and emerging policy proposals for its implementation.

We do not consider the identified scalar strategies as responsible mechanisms for the rescaled aquaculture policy. In other words, we do not treat the TLS as an outcome of the scalar strategies used by stakeholders during the consultations. Instead, we understand the

[4] While the government formulated the intent to include more indicators over time, sea lice is to this moment the only indicator considered in the biannual assessments.

policy rescaling as the result of a complex web of factors that includes policy paradigms beyond the scope of this study (Bailey and Eggereide, 2020). We view the observed policy rescaling and especially its critical reception as a 'marker' for scalar politics and contestation over the institutional fit of the mission, and therefore, as an exemplary case to better understand the role of scale in missions. A case study allows close 'proximity to reality' and detailed description (Flyvbjerg, 2006). This helps us to arrive at contextualized explanations which, we argue, are particularly valuable when the empirical complexity is relevant to the research aim (Welch et al., 2022).

### 4.1. Data collection

We analytically demarcate the issue field to those stakeholders that responded in each of the three consultation rounds organized to reform aquaculture policy. 21 stakeholders[5] fulfilled this requirement (see Table A.1), representing 65 cumulative consultation responses. We argue that stakeholders responding in each consultation round are the most active and representative participants in the issue field. Eight selected actors are associations (e.g., collectives of salmon producers, river owners, or municipalities), which strengthens this argument. We regard the consultation responses as highly valuable data for three reasons. First, the responses build upon one another as decisions made after previous decision-making rounds influence the next round, leaving an 'intertextual trail' that allows us to compare documents and identify justifications for decisions (Coffey, 2014). Second, consultation responses represent 'primary documents' (Scott, 2014), providing a documented description close to the constructed reality of actors (Mills et al., 2006). Third, archival documents are static, which avoids post-hoc rationalization or recall bias if information were to be gathered through interviews.

Two preliminary steps were taken before the data analysis. First, as consultation responses were written in Norwegian, they were translated to English using DeepL, an automated online translation tool. The quality and accuracy of these translations was validated by a native speaker with a sample of text fragments. Apparent errors in the collected data were translated manually. Second, we inductively categorized the 21 selected stakeholders in six 'communities' to analyze and describe findings in a more aggregated manner. The identified communities are national regulatory bodies, research institutes, counties, municipal organizations, the seafood industry, and environmental organizations. These communities were identified through explorative reading of the data and respondents were aggregated based on similar identities, purpose, and activities, assuming that this homogenizes the scalar strategies used within a community.

### 4.2. Data analysis

We constructed two scale frames per community related to (1) the mission and (2) its policy implementation in the form of the TLS. The choice to construct two frames per actor community was abductively motivated by the observation that most consultation respondents had distinct frames for the mission (more emphasis on scalar politics, i.e., the discursive dimension of scale) and its policy implications (more concerned with its institutional fit, i.e., the material dimension of scale). To identify scale frames, we analyzed consultation responses inductively for "*words, phrases, etc., that could possibly point toward scale-related issues*" (Reilly and Adamowski, 2017; Van Lieshout et al., 2011) to identify scales and arguments used by actors in the issue field. In parallel, we deductively derived scalar dimensions and levels as sensitizing lenses from literature on scale-related socioenvironmental issues to iteratively complement and make sense of emerging scales (Reilly and Adamowski, 2017; Van Lieshout et al., 2011, 2017).

709 scale-related excerpts were identified and coded among the 589 pages of consultation responses. We validated emerging frames by triangulating the data with recent literature on Norwegian aquaculture that discusses arguments and interests of different stakeholders (Christiansen and Jakobsen, 2017; Fløysand and Jakobsen, 2017; Olsen and Osmundsen, 2017; Osmundsen and Olsen, 2017). While we were reflexive to heterogeneity within stakeholder communities and frame changes over time, neither were explicitly observed. Table 3 summarizes the scales most apparent in the consultation responses and extant literature. After constructing scale frames, we sought to identify scalar strategies per scale frame. A more deductive process was followed for this procedure, drawing on the identified strategies in Section 2.2 (Table 2). Simultaneously, we remained open to other strategic uses of scale in the data corpus. Furthermore, as mentioned before, scalar strategies are relational – they describe how scales are invoked in relationship, and response to, other scales. In this case, the scale imposed by the government was understood as a *national* mission (i.e., quintupling the value of Norwegian seafood production by 2050) and a reform of *national* aquaculture policy to ensure alignment with the mission.

## 5. Findings

The next two sections discuss the scale frames and scalar strategies of stakeholders regarding the mission (Section 5.1) and the institutional fit of the emerging TLS (Section 5.2). A summary of used scale frames and scalar strategies is provided in Table B.1 and B.2. To motivate storylines per stakeholder community, we use power quotes in Section 5.1 and Section 5.2. Additional proof quotes for support (see Pratt, 2008) are provided in Table C.1 and C.2.

[5] This excludes the Ministry of Justice and Public Security, which was omitted from the analysis because the actor did not elaborate on either mission or policy proposals in any consultation round.

**Table 3**
Overview of considered scales.

| Scalar dimension | Scalar level |
|---|---|
| Aquacultural | Farmed salmon; Farming area; Producer; Norwegian seafood industry; Global food system |
| Ecological | Wild salmon; Population; Production zone; Coastal zone |
| Jurisdictional | Farm; Municipality; County; National; Intergovernmental |

### *5.1. The mission*

**National regulatory bodies** pay limited attention to the political pursuit of seafood expansion. Yet, the Norwegian Environmental Agency, responsible for monitoring and conserving Norwegian nature and wildlife, strategically *stacks* scalar levels by reminding the government of national and intergovernmental obligations to conserve wild salmon populations and their genetic integrity. Nonetheless, among actors in this community there is little use of scalar strategies with regards to the mission, likely due to their supervisory and administrative role under the governments' jurisdiction. Similarly, **research institutes** are not active in vocalizing their support for or opposition to the mission either, possibly due to their expected apolitical advisory role in the policy reform. Whereas national regulatory bodies focus on regulatory adherence, research institutes explicitly *couple* the aquacultural and ecological scalar dimension through reviewing and summarizing scientific literature on the effects of aquaculture activities on the ecology in farming ecosystems. Through this coupling, they establish a link between salmon farming and negative impacts in the environment that ought to be addressed.

**Counties** use scalar strategies more actively. Actors predominantly *downscale* the national mission to its implications in counties and municipalities by combining both experience and forecasts. They weigh the benefits that counties and associated municipalities enjoy or have enjoyed through employment and wealth from aquaculture activities against the increasingly visible problems and diminishing returns that counties perceive. Whereas some organizations actively construct their county as having sufficient space for aquaculture expansion (such as Troms county), other counties with established aquaculture activity reflect more critically on the experienced environmental externalities (such as Hordaland county). Thus, there is some discrepancy among counties in the support for aquaculture growth, but all build their argument from localized experience and share the message that the environment as well as local decision-making power ought to have a place in the policy reform. Through downscaling, they make it possible to use experience-based knowledge of what is happening in their county to legitimate this view. For example:

> "Although the [Ministry of Trade, Industry and Fisheries] does not consider it appropriate to use an indicator of escapes, escaped salmon must be included in the assessment in production zones that have rivers with persistently high escapes of farmed fish in the wild salmon stocks. Although it is not always the case that escaped salmon will necessarily migrate to the nearest waterways, there is a greater likelihood that they will do so, particularly if the fish are large, and the escape occurs during the summer. We experienced this in Troms during the June 2008 escapes at Sør-Senja."
>
> - Troms county, 2015

**Municipalities** similarly construct the (il)legitimacy of the mission by *downscaling* to a lower jurisdictional level than counties, i.e., to its effects on municipalities and its communities. In their construction of production growth, municipal organizations weigh past benefits of aquaculture against the present-day, where the perceived contribution of aquaculture does not legitimate active support by municipalities. They reflect that financial compensation is insufficient to offset doubts regarding industry consolidation at the expense of local ownership, increasingly competing uses of land, and environmental problems. Through this past-present juxtaposition, they explicitly incorporate a temporal dimension to their scalar frame: although their support is currently decreased, with the right policy measures, it can and must be restored to its past level to allow for the industry expansion the government desires. The Network for fjord and coastal municipalities together with Marine Harvest, for instance, strategically use a downscaling strategy to portray the dependency of the national mission on local support:

> "Coastal communities will be a prerequisite for establishing and further developing marine industries, which will highlight the mutual dependency between industry and municipalities. (…) It is also a prerequisite for the establishment and operation of locally based supply, technology, and service industries, which are increasingly important for local and national economic development."
>
> - Network for fjord and coastal municipalities and Marine Harvest, 2016

The **seafood industry** is another active community that uses scalar strategies to, in their case, legitimate the mission. Throughout the consultation rounds, it draws on two strategies in particular: *coupling* and *upscaling*. They couple the ecological scale and aquacultural scale, but with a different argument than research institutes. While the latter uses this strategy to establish a harmful cause-effect relationship between farming and the environment, the former concludes that successful aquaculture production is dependent on a well-functioning ecological ecosystem and that this, therefore, represents a largely successful, self-regulating relationship: farmers continuously seek to operate within the environmental carrying capacity, since their survival and success depends on it. Long-standing experience-based knowledge of the interdependencies allows industry actors to act responsibly. Through this coupling, they build a rhetoric that prefers and legitimates industry-led responsibility over the mission rather than a perceived unnecessary, interfering reform of aquaculture policy. Marine Harvest showcases this coupling:

> "There is a good agreement between what is an economically good [farming] site and a site with good ecological carrying capacity. In the short term, it is perfectly possible to operate economically well on a site with limited ecological carrying capacity, but in the longer term, accumulation of waste and excreta may make such a site unsuitable for profitable operation. In the long term, environment and economy go hand in hand."
>
> – Marine Harvest, 2011

Next to the coupling of aquacultural and ecological scales, the seafood industry is highly active in legitimating the mission through an upscaling strategy, both along the jurisdictional dimension and the aquaculture dimension. Intergovernmental organizations such as the United Nations, the World Health Organization, and the Food and Agriculture Organization are extensively used to rebalance a perceived overemphasis on the local environmental side of 'sustainability', and instead construct a narrative on global food security. For example, in 2011 the Norwegian Seafood Federation refers to higher-level global food security forecasts ("*Norway can increase its production to a volume that (…) covers the seafood needs of the majority of the EU population, as indicated by the World Health Organization (WHO)"*); definitions of sustainability *("(…) today's aquaculture in Norway is within the framework of an environmentally sustainable development as this is defined by the United Nations Commission on Environment and Development"*); and the responsibility of Norway ("*According to the UN Convention (…) the right to food is a human right*"). By referring to intergovernmental organizations and concerns over the global food system, actors in the seafood industry marginalize 'localized' environmental concerns in favor of more urgent higher-level problems, and more knowledgeable higher-level actors. Through upscaling, localized environmental problems become a barrier to a superior mission (i.e., production expansion for Norway's global responsibility) rather than a legitimate and primary concern in and of itself. As the Norwegian Seafood Federation frames the mission:

> "The three biggest challenges the world faces are most likely 1) the supply of food for a growing population, 2) climate change as a result of emissions of greenhouse gases, and 3) the health challenges resulting from diet and lifestyle. With a growing world population, Norway has an obligation to (…) maximize the supply of seafood."
>
> – Norwegian Seafood Federation, 2015

Similar to research institutes, **environmental organizations** *couple* the ecological and aquacultural dimension to establish a link between aquaculture activities and their harmful effects on ecosystems. From this rationale, the environmental carrying capacity is primarily met through limited or no production expansion. As such, their advocacy is a steward-like view of conserving and preserving pristine nature, particularly the conservation and genetic integrity of wild salmon stocks. Next to this, excerpts from consultation responses reflect an *upscaling* strategy where the intergovernmental treaties and agreements to safeguard wild salmon populations are iterated ("*WWF reminds that Norway has a special responsibility to protect wild Atlantic salmon (…) under the Bonn and Bern Conventions"* – WWF Norway, 2016). Similarly, references to intergovernmental organizations are used to criticize the contribution of Norwegian aquaculture to global food security (and with that, the mission), as assumed by both government strategies and actors from the seafood industry:

> "The FAO and the World Bank consider that there is a direct contradiction between a global supply situation favourable to the production of salmonids and a food security situation which protects the poorest populations in the world. We therefore believe that a growing world population and ethical responsibility for Norway cannot be used as an argument for allowing an aquaculture industry that could have a strong negative effect on wild stocks of salmonids in Norway."
>
> – Norwegian Salmon Rivers, 2015

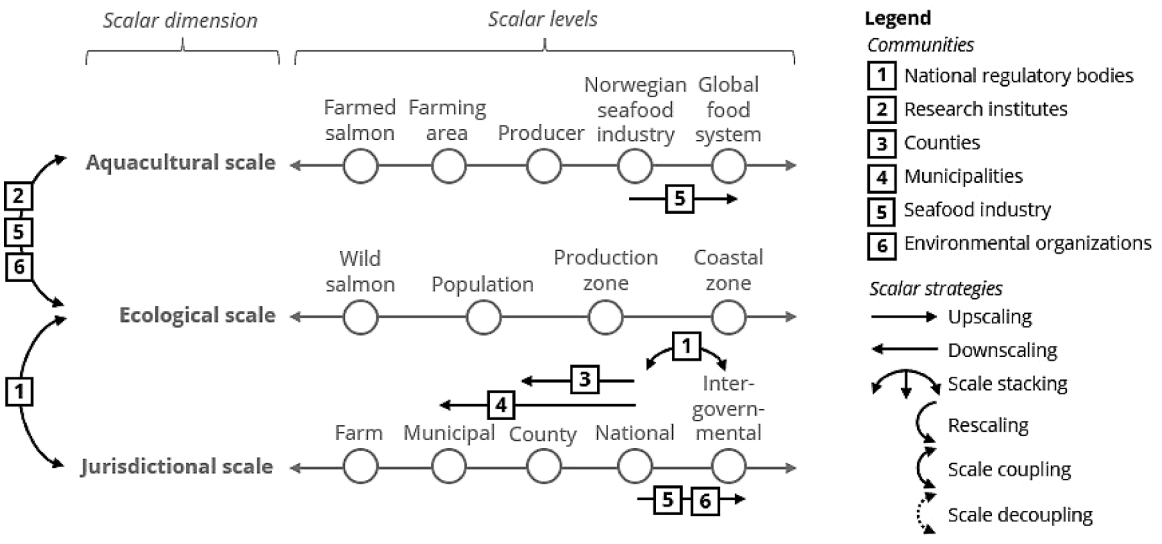



**Fig. 4.** Visualized dominant scalar strategies in consultation responses on the mission.

Fig. 4 visualizes the dominant scalar strategies, dimensions, and levels prevalent in the issue field with regards to the mission.

### 5.2. Institutional fit of aquaculture policy

While **national regulatory bodies** are relatively less active in the use of scalar strategies to construct the mission, they are most active in the design of new aquaculture policy. This prevalence is likely due to their advisory and administrative role and being well-informed on effective policy instruments. All actors in this community strongly adhere to a *rescaling* strategy to advocate that aquaculture production as well as the environment can benefit from the reform. Despite their support for the expert committee's policy proposals, they *couple* the conceptual production zones at the ecological dimension to the jurisdictional dimension to voice differing concerns. The Norwegian Food Safety Authority contends throughout the consultations that established farm-level monitoring remains necessary to ensure timely measures for poorly performing farms. The Directorate of Fisheries, on the other hand, questions whether regulatory flexibility is possible through exceptions in production zones when individual farms disproportionately affect the performance of the overall production area: *"(…) situations can be envisaged where the cause of an unacceptable environmental condition in part of a zone can be linked to one or a few sites in such a way that growth can be allowed in the zone as a whole"*. The Norwegian Environment Agency is receptive to rescaling but as the consultation rounds progress, questions whether the details of the reform are not increasingly in conflict with established national regulation for wild salmon preservation.

**Research institutes** similarly follow the proposal to *rescale* aquaculture policy. The support for rescaling is often legitimated by a scientific reasoning that farm-level impacts on the environment can best be understood and assessed by acknowledging the ecological complexity of the coastal ecosystems in which farmers operate. In other words, attention to hydrological, spatio-temporal dispersion patterns is needed, including the influence of temperature, currents, seasonal variation, and other variables. However, it is also this understanding of complexity and epistemic uncertainty that the Marine Institute of Research iterates as a complicating factor for rescaling policy. The establishment of production zones based on ecological considerations requires well-developed knowledge on hydrological variables to accurately model, measure, predict, and ultimately legitimate the design of production zones, indicators, and an action rule:

> "A general comment is that it will be professionally challenging to achieve a precise geographical delimitation of the production zones and the corresponding designations. (…) It is also technically challenging to link negative environmental effects in a given region/zone to emissions/removals from a given production zone, as pathogenic factors such as salmon and salmon lice may be spread over large areas."
>
> – Institute of Marine Research, 2011

**Counties** receive the proposed rescaling well, acknowledging that regulating production at the farm-level has been unsuccessful to curb environmental concerns. However, while such rescaling is generally applauded, organizations are also wary of an overly homogeneous view of production zones. They frequently argue that production zones should be understood as each representing unique hydrological areas with different environmental contexts, concerns and, therefore, different indicators. In this sense, counties complement *rescaling* by *downscaling* to specific, more localized concerns that they perceive on ecological levels closer to their county. The county authority of Hordaland, for example, argues in 2015 that they perceive nutrient emissions as a threatening and more localized problem that is omitted from the policy reform due to the nutrients' limited spatio-temporal spread in production zones. Together with the nuances from research institutes mentioned above, these arguments highlight a crucial spatial tension: defining 'sustainability', here based on the environmental carrying capacity, requires a geographical demarcation that inherently marginalizes certain scales, problems, and solutions over others.

**Municipalities** and the **seafood industry** are the two most vocal opponents of rescaling. Their shared scepticism is made visible in a joint response letter in the consultation round of 2016. Municipalities perceive rescaling as a threat to their autonomy on allocating aquaculture production in their jurisdiction. They emphasize instead the importance of *downscaling* aquaculture policy to provide more decision-making power and compensation to municipalities. A recurring critique among municipal respondents is the perceived trivialization of local concerns regarding aquaculture production and municipal autonomy. Given their opposition to the rationale behind rescaling, they provide little in-depth feedback on specific proposals for production zone boundaries, indicator thresholds, or action rules. The seafood industry is another vocal critic of the proposed policy rescaling and similarly pursues a *downscaling* rhetoric, albeit to the jurisdictional level of farms. The threat of collectively reduced production capacity is framed as illegal and detrimental to the motivation of individual production license holders to innovate and cooperate. Salmon Group, an association of small- and medium salmonid farmers, fear that individual, poorly performing farmers can become 'scapegoats' in production zones and that such conditions cannot be "*associated with being a food producer in Norway*".

Whereas most seafood organizations remain adamant in opposition, some organizations attempt to compromise. Through a strategy of *rescaling* to the aquacultural dimension, these seafood organizations iterate that even with the establishment of ecological production zones for the assessment of the environmental carrying capacity, monitoring, and production adjustments can best be done on individual farms and by farmers themselves. With experience-based knowledge of effective farm-level measures against pathogens, a perceived compatibility is constructed between the establishment of ecological production zones on the one hand, and private autonomy and responsibility for farmers on the other hand. For example:

> "Effective ways to keep lice levels down must therefore be implemented in the form of good control on a case-by-case basis. Local history in Agder and other individual localities around the country has shown that this works."
>
> - Marine Harvest, 2015

**Environmental organizations** are supportive of *rescaling* proposals as their dominant concerns predominantly materialize at the higher ecological levels (e.g., influences on wild salmon stocks). These impacts could thus be better addressed with this policy reform. However, they combine this support with an emphasis for complementary farm-level monitoring and compliance, and policy flexibility depending on the specific ecological nature of each production zone. Through *downscaling*, they seek to better account for the multi-scalar nature of causes and effects (e.g., escapes at one farm can have lasting genetic effects on salmon populations residing in wider fjord basins) and the multi-scalar nature of diverse concerns (e.g., excessive local depositions of nutrients versus sea lice pressure in a production zone). They are aware that the policy reform creates conflicts of vertical asymmetry, but contend that the rationale of rescaling implies (or should imply) limited attention to municipal concerns:

> "There will probably also be conflicts between national governance and local autonomy. In a new system where boundaries have to be drawn according to purely technical criteria (flow maps, etc.), it is certainly very important that, if environmental considerations dictate that the municipality's marine areas should be free of fish farming, it cannot be up to the municipalities themselves to decide where the farms should be located."
>
> - Norwegian Hunter and Fishermen Association, 2015

We argue that a novel scalar strategy can be identified from the argumentation of actors in their opposition to the policy reform: scalar *decoupling*. Scalar decoupling describes a strategy where dimensions previously coupled by actors in the issue field are deliberately *decoupled*. Actors from the seafood industry particularly seek to decouple the aquacultural and ecological dimensions (i.e., the argument that aquaculture negatively affects the environmental carrying capacity) previously established by research institutes, national regulatory bodies, and environmental organizations. For example, in 2016 the Norwegian Seafood Companies Association draws on a research report to argue that we "*still lack conclusive knowledge on the link between the amount of salmon lice in the sea and the risk of unacceptable levels of salmon lice in wild fish*"; in the same year, the Norwegian Seafood Federation concludes that "*there is reason to question the main premise of the proposal since salmon lice do not represent a risk that is serious or irreversible for the populations of wild trout and salmon*". Similarly, the Norwegian Confederation of Trade Unions decouples the assumed link between aquaculture and the surrounding ecology by stating that "*the level of lice in wild stocks can be affected by factors beyond the seafood industry's control*".

A second decoupling attempt by actors in the seafood industry concern the ecological and jurisdictional dimensions (i.e., the proposed aquaculture policy where ecological production zones is an effective means to impose national regulation on indicators and capacity adjustments). For example, Marine Harvest in 2015 states that "*regionalization* [establishing production zones] *as lice control is not validated - lice will always be found in Norway*"; the Norwegian Seafood Federation concludes in 2016 that "*there is also no knowledge that makes it possible to quantify the ratio between 'lice from farming' and 'lice from wild fish' among the lice that actually affect wild fish*" and that "*no mathematical expression has even been developed for the relationship between lice counts at sites and mortality of wild fish*". Decoupling is predominantly used in the last two consultation rounds, possibly because the governments' preference for rescaling becomes increasingly apparent. By decoupling the ecological and aquacultural scale as well as the ecological and jurisdictional one, the opponents of the policy reform seek to strategically illegitimate the policy rescaling through criticizing both the necessity (aquaculture does not negatively impact the environment) and efficacy (there is insufficient knowledge to rescale policy instruments). Fig. 5 visualizes the dominant scalar strategies, dimensions, and levels prevalent in the issue field with regards to rescaling aquaculture policy.

## 6. Discussion and conclusion

This article contributes to literature on the geography of missions by studying scale as a category of practice, drawing on scalar

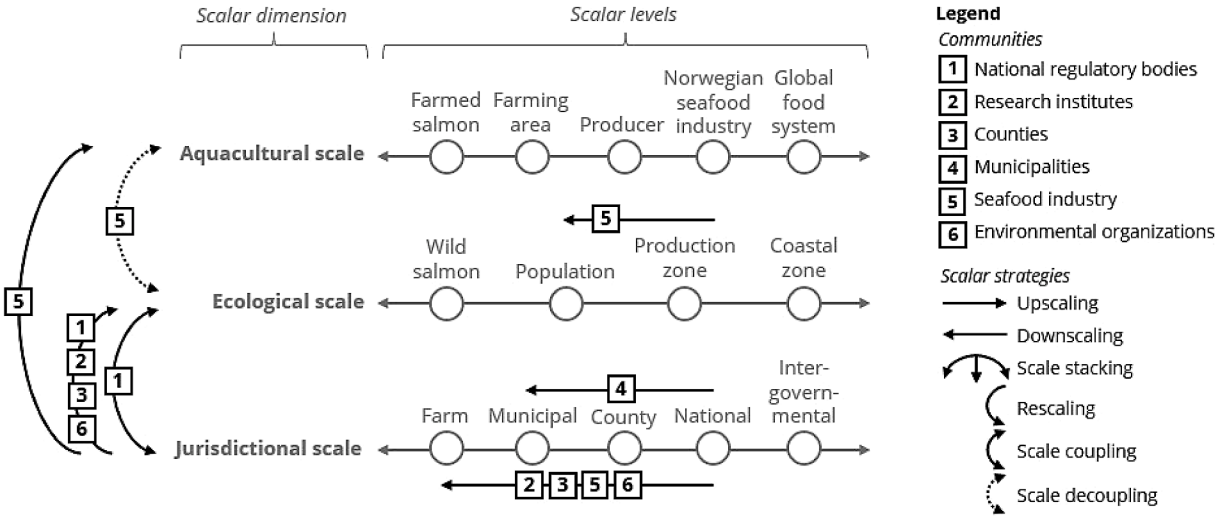



**Fig. 5.** Visualized dominant scalar strategies concerning aquaculture policy.

strategies employed by actors in the issue field of a Norwegian seafood mission that fosters a 'blue transition'. Through an abductive analysis, we find an array of references to scalar dimensions and levels that we summarize in scale frames and categorize by scalar strategy. The findings indicate that the scales invoked in the mission of the Norwegian government induces actors in the issue field to adopt a variety of competing scalar strategies to voice their interests and belief systems. Among the actors, a general tendency is visible to use scales that align most directly with their interests. As a reflection of scalar politics, municipalities and counties often downscale in their argumentation to legitimate and motivate their needs and interests, whether it is financial compensation or local problems of aquaculture. Environmental organizations frequently rescale to the ecological dimension to advocate that wild salmon population and the broader coastal ecosystem are at risk, whereas the seafood industry frequently refers to the global food system on which they are highly dependent due to the export-oriented nature of Norwegian aquaculture.

However, we found that actors not only invoke those scales to which they, or their interests, are closely affiliated. Our findings indicate that the pursuit of a certain scalar strategy by one actor (community) can induce others to 'mimic' that same scalar strategy if they wish to engage with one another. For example, government white papers and the seafood industry legitimate increases in production partially due to forecasts of a growing world population, growing global demand for seafood, as well as concerns over global food security. In response, Norwegian Salmon Rivers seeks to illegitimate this viewpoint not only by iterating its primary, more localized concern (wild Norwegian salmon stocks), but also by making use of an upscaling strategy. Invoking the same intergovernmental organizations used by its opposition, it formulates counterpoints to critique global food projections and the role of Norwegian salmon as a high-value export commodity in aiding the populations most vulnerable to food scarcity. Thus, even if a specific scalar strategy is perceived as flawed or illegitimate, this case suggests that actors can be induced to mimic the respective scalar strategy as a response. Yet, a mimicking response risks the marginalization of actors' core concerns at a particular scale. This observation implies that actors steering the discourse to a scale frame different from its oppositions' concerns, regardless of the frame's perceived validity, can in and of itself serve as a powerful tool to redirect the collective attention away from the opposing interests.

The ideology imbued in certain scale frames concerning the institutional fit of the mission-induced policy change can help explain why the TLS remained so divisive, despite apparent support for the mission. Whereas past aquaculture policy largely reflected a market-based 'logic' of industry-led experimentation, innovation, and R&D funding to improve productivity and address environmental concerns (Asche et al., 1999, 2009; Fløysand and Jakobsen, 2017; Garlock et al., 2020; Osmundsen et al., 2017), many of the scale frames identified in the consultation rounds mobilize an alternative, science-based 'logic'. The excerpts on rescaling, scalar coupling, and scalar decoupling particularly lean for their legitimacy on scientific argumentation. The focal role for research institutes in operationalizing the rescaling process, as well as the prominence of science-based terminology in policy reports similarly imply a shared perception of policy rescaling as a scientific rather than political process (Ministry of Trade, Industry and Fisheries, 2013; 2015). Resorting to scientific knowledge as a remedy to contestation over missions and their policy implementation can imply a flawed assumption that policymaking can be based solely on facts and that uncertainty is a hurdle in its way (e.g., Botterill and Hindmoor, 2012). This view of uncertainty is simplistic because natural phenomena have an inherent, epistemic uncertainty due to natural randomness, and problematic because uncertainty can also be mobilized strategically as a reason for inaction (Bradshaw and Borchers, 2000).

### 6.1. *Theoretical implications and future research*

Our findings have three theoretical implications in particular for the geography of transitions and missions. First, the case fundamentally highlights that the discursive use of scale serves a purpose beyond negotiating the desirable material scale of governance or transition trajectories, which has been the primary focus of previous work on scale in transition studies (see e.g., Madsen, 2022; Miörner and Binz, 2021). Scalar strategies (il)legitimate incumbent or marginalized interests and the inclusion and exclusion of respective social groups in collectively framing a mission. Scale frames and scalar strategies thus provide a productive theoretical lens to situate and appraise the geography of missions and sustainability transitions. Second, we find that the natural environment holds much explanatory power in our analysis and theorize that scalar strategies will be particularly salient in missions that address ecological issues. The natural environment imposes a spatio-temporal materiality onto Norway's mission where (un)desirable effects of the mission's objective – production growth – arise at various spatial (from proximate to distant effects) and temporal (from immediate to long-term effects) levels. This ecological wickedness is a source of uncertainty, contestation, and complexity in stakeholder consultations to the point that traditional sources of expertise (i.e., scientific knowledge), policy principles (i.e., the precautionary principle), and governance scales (i.e., municipalities and counties) become contentious. This finding strengthens recent calls and contributions on integrating ecology into transitions literature (see e.g., Andersson et al., 2024; Nogueira et al., 2021; Van der Jagt et al., 2020; Vermunt et al., 2020). Third, in contrast to some post-structural contributions who posit that acknowledging the structural properties of scale, or the concept of scale altogether is problematic as it risks neglecting or reproducing power imbalances through "*essentialist, hierarchical, or binary modes of thought*" (see e.g., Ash, 2020, p. 345; Marston et al., 2005; Springer, 2014), we find that analysing such discrepancies is aided, rather than neglected, by understanding scales as culturally mediated hierarchies with constituent ideologies (e.g., the 'global' and neoliberal principles).

The findings indicate that research on the geography of missions and transitions would benefit from constructivist perspectives to better acknowledge the strategic role scale can play in (il)legitimating incumbent vis-à-vis marginalized interests in the discourse of missions and their implementation. The literature on institutional fit and scalar politics provides a rich toolbox of complementary perspectives and concepts to study tensions around the spatial organization of missions. As mentioned in Section 2, scale is conceptualized here from a spatial and structural perspective. The findings hint to other possible constructivist conceptualizations of scale by more explicitly considering temporality, and even the nature of knowledge, as concepts with scalar qualities (Cash et al., 2006). We

further contend that it would be especially valuable to study scalar strategies from an institutional perspective. The institutional logics perspective has provided interesting insights to transitions studies on how organizational fields change through the shifts in dominance of field logics (Fuenfschilling and Truffer, 2014, 2016; Runhaar et al., 2020; Smink et al., 2015), roughly understood as the "the practices and underlying belief systems that guide actors' behavior and thinking" (Smink et al., 2015, p. 226). In our discussion we suggest that different scalar strategies do not necessarily have different 'logics' nor that a dominant 'logic' necessarily leads to field-level convergence, but, rather, that dominant field-level 'logics' can help explain argumentative patterns found in scalar strategies (e.g., the market- and science-based logic mentioned earlier in Section 6). Following recent theorizing that defines transitions as shifts of dominant institutional logics (Fuenfschilling, 2019; Fuenfschilling and Truffer, 2014), attention to the structural character of collectively held rationalities can provide explanatory power to the question why certain scale frames come to dominate transition or mission discourse and their implementation, based on the alignment of frames with prevailing logics in the respective socio-technical system. Not limited to scale, studying missions and related policy processes also holds a potential contribution for recently emerged spatial perspectives on institutional work (Lawrence and Dover, 2015; Rodner et al., 2020; Siebert et al., 2017; Wright et al., 2022). Next to institutional perspectives, transitions research on the role of power and justice could also benefit from explicit attention to scalar politics, as they are inextricably linked to the in- and exclusion of stakeholders and interests (see e.g., Cruger and Finewood, 2013; Kurtz, 2003; Sica, 2015; Weller, 2019).

### *6.2. Policy implications*

Lastly, this study has a general implication for policy. Rescaling policy to ecological dimensions is often regarded as better suited to capture the low institutional fit of ecological processes with jurisdictional scales, while rescaling allures policymakers for its assumed apolitical nature due to the scientific process of demarcating new ecological levels for governance (Cohen and Bakker, 2014). However, we contend that in this endeavour the scientific process becomes politicized, since any presumed objectivity is prone to contestation. The complexity of the problem-solution space, uncertainty, and heterogeneous access to information make the assumed 'apolitical' pursuit of rescaling in Norwegian aquaculture a contested and divisive strategy. In other words, the assumption that rescaling attempts will allow for a rational, apolitical transformation is flawed. The design of new policies with missions inevitably requires a consideration of the social organization of space, invoking a discussion over which scales are to be emphasized or marginalized. Policymakers could benefit from the awareness that this is ultimately a political process, particularly as missions are often heralded as a means for inclusion and stakeholder deliberation (Janssen et al., 2021; Mazzucato, 2017).

## CRediT authorship contribution statement

**Matthijs Mouthaan:** Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Koen Frenken:** Writing – review & editing, Supervision, Project administration, Funding acquisition, Conceptualization. **Laura Piscicelli:** Writing – review & editing, Supervision, Conceptualization. **Taneli Vaskelainen:** Writing – review & editing, Supervision, Conceptualization.

## 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.

## Data availability

Data will be made available on request.

*Acknowledgements*

We are grateful for input from participants at the International Sustainability Transitions (IST) conference 2022, the Network for Early career researchers in Sustainability Transitions (NEST) conference 2022, and colleagues from the INTRANSIT research centre who provided input at different stages of the project. We are particularly indebted to Iris Wanzenböck for providing valuable feedback on an earlier version of the paper.

*Funding*

This work was supported by the Research Council of Norway under Grant number 295021. The funding source had no involvement in the preparation or conduct of the research.

## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.eist.2024.100857.

## References


Ash, J. (2020). Flat ontology and geography. *Dialogues in Human Geography*, 10(3), 345–361. https://doi.org/10.1177/2043820620940052.

Aftenposten. (2016). *Varsler oppgjør med «mørke motkrefter»*. https://www.aftenposten.no/norge/politikk/i/o36K/varsler-oppgjoer-med-moerke-motkrefter Accessed on June 9, 2023.

Aiken, G.T., Eadson, W., Hobson, K., Dinnie, L., 2022. Vicarious scale and instrumental imaginaries in community sustainable transitions. Global Environ. Change 75, 102543. https://doi.org/10.1016/j.gloenvcha.2022.102543.

Andersson, J., Lennerfors, T.T., Fornstedt, H., 2024. Towards a socio-techno-ecological approach to sustainability transitions. Environ. Innov. Soc. Transit. 51, 100846 https://doi.org/10.1016/j.eist.2024.100846.

Asche, F., Guttormsen, A.G., Tveterås, R., 1999. Environmental problems, productivity and innovations in Norwegian salmon aquaculture. Aquacult. Econ. Manag. 3 (1), 19–29. https://doi.org/10.1080/13657309909380230.

Asche, F., Roll, K.H., Tveteras, R., 2009. Economic inefficiency and environmental impact: an application to aquaculture production. J. Environ. Econ. Manage 58 (1), 93–105. https://doi.org/10.1016/j.jeem.2008.10.003.

Bailey, J.L., Eggereide, S.S., 2020. Indicating sustainable salmon farming: the case of the new Norwegian aquaculture management scheme. Mar. Policy. 117, 103925 https://doi.org/10.1016/j.marpol.2020.103925.

Benford, R.D., Snow, D.A., 2000. Framing processes and social movements: an overview and assessment. Annu Rev. Sociol. 26 (1), 611–639. https://doi.org/10.1146/annurev.soc.26.1.611.

Binz, C., Coenen, L., Murphy, J.T., Truffer, B., 2020. Geographies of transition—from topical concerns to theoretical engagement: A comment on the transitions research agenda. Environ. Innov. Soc. Transit. 34, 1–3. https://doi.org/10.1016/j.eist.2019.11.002.

Bögel, P.M., Augenstein, K., Levin-Keitel, M., Upham, P., 2022. An interdisciplinary perspective on scaling in transitions: connecting actors and space. Environ. Innov. Soc. Transit. 42, 170–183.

Botterill, L.C., Hindmoor, A., 2012. Turtles all the way down: bounded rationality in an evidence-based age. Policy Studies 33 (5), 367–379. https://doi.org/10.1080/01442872.2011.626315.

Bradshaw, G.A., Borchers, J.G., 2000. Uncertainty as information: narrowing the science-policy gap. Conservation ecology 4 (1).

Cash, D.W., Adger, W.N., Berkes, F., Garden, P., Lebel, L., Olsson, P., Young, O., 2006. Scale and cross-scale dynamics: governance and information in a multilevel world. Ecol. Soc. 11 (2). hTtps://www.jstor.org/stable/26265993.

Castro, A.P., Nielsen, E., 2001. Indigenous people and co-management: implications for conflict management. Environ. Sci. Policy 4 (4-5), 229–239. https://doi.org/10.1016/S1462-9011(01)00022-3.

Christiansen, E.A., Jakobsen, S.-E., 2017. Diversity in narratives to green the Norwegian salmon farming industry. Mar. Policy. 75, 156–164. https://doi.org/10.1016/j.marpol.2016.10.020.

Coenen, L., Hansen, T., Rekers, J.V., 2015. Innovation policy for grand challenges. an economic geography perspective. Geogr. Compass. 9 (9), 483–496. https://doi.org/10.1111/gec3.12231.

Coenen, L., Truffer, B., 2012. Places and spaces of sustainability transitions: geographical contributions to an emerging research and policy field. Eur. Plan. Stud. 20 (3), 367–374. https://doi.org/10.1080/09654313.2012.651802.

Coffey, A., 2014. Analysing Documents. In: Flick, U. (Ed.), The SAGE handbook of qualitative data analysis. SAGE Publication, London, pp. 367–380.

Cohen, A., 2012. Rescaling environmental governance: watersheds as boundary objects at the intersection of science, neoliberalism, and participation. Environ. Plann. A 44 (9), 2207–2224. https://doi.org/10.1068/a44265.

Cohen, A., Bakker, K., 2014. The eco-scalar fix: Rescaling environmental governance and the politics of ecological boundaries in Alberta, Canada. Environ. Plann. D: Soc. Space 32 (1), 128–146. https://doi.org/10.1068/d0813.

Cruger, K., Finewood, M., 2013. Blue is the new green: neoliberal logic and the co-optation of environmental justice discourses in the pennsylvania fracking debate. In: Meisner, M.S., Sriskandarejah, N., Depoe, S.P. (Eds.).

Cumming, G.S., Cumming, D.H., Redman, C.L., 2006. Scale mismatches in social-ecological systems: Causes, consequences, and solutions. Ecol. Soc. 11 (1). hTtps://www.jstor.org/stable/26267802.

Dittrich, K., 2022. Scale in research on grand challenges. Res. Sociol. Org. 79, 187–203. https://doi.org/10.1108/S0733-558X20220000079016.

E24. (2017). *Fiskeriministeren: – Tror femdobling er beskjedent*. https://e24.no/boers-og-finans/i/m6o49O/fiskeriministeren-tror-femdobling-er-beskjedent Accessed on: January 25, 2024.

Fiskeridirektoratet. (2022). Akvakulturstatistikk. https://www.fiskeridir.no/Akvakultur/Tall-og-analyse/Akvakulturstatistikk-tidsserier Accessed on: November 20, 2022.

Fløysand, A., Haarstad, H., Barton, J., 2010. Global economic imperatives, crisis generation and local spaces of engagement in the Chilean aquaculture industry. Norsk Geografisk Tidsskrift-Norwegian J. Geography 64 (4), 199–210. https://doi.org/10.1080/00291951.2010.528226.

Fløysand, A., Jakobsen, S.E., 2017. Industrial renewal: narratives in play in the development of green technologies in the Norwegian salmon farming industry. Geogr. J. 183 (2), 140–151. https://doi.org/10.1111/geoj.12194.

Flyvbjerg, B., 2006. Five misunderstandings about case-study research. Qual. Inquiry 12 (2), 219–245. https://doi.org/10.1177/1077800405284363.

Folke, C., Pritchard, L., Berkes, F., Colding, J., and Svedin, U. (1998). *The problem of fit between ecosystems and institutions (Working Paper)*. International Human Dimensions Programme (IHDP).

Fresco, L.O., Kroonenberg, S.B., 1992. Time and spatial scales in ecological sustainability. Land. use policy. 9 (3), 155–168. https://doi.org/10.1016/0264-8377(92)90040-4.

Fuenfschilling, L., 2019. An institutional perspective on sustainability transitions. In: Boons, F., McMeekin, A. (Eds.), Handbook of sustainable innovation. Edward Elgar Publishing, Cheltenham, pp. 219–237.

Fuenfschilling, L., Binz, C., 2018. Global socio-technical regimes. Res. Policy. 47, 735–749. https://doi.org/10.1016/j.respol.2018.02.003.

Fuenfschilling, L., Truffer, B., 2014. The structuration of socio-technical regimes—conceptual foundations from institutional theory. Res. Policy. 43, 772–791. https://doi.org/10.1016/j.respol.2013.10.010.

Fuenfschilling, L., Truffer, B., 2016. The interplay of institutions, actors and technologies in socio-technical systems — an analysis of transformations in the Australian urban water sector. Technol. Forecast. Soc. Change 103, 298–312. https://doi.org/10.1016/j.techfore.2015.11.023.

Garlock, T., Asche, F., Anderson, J., Bjørndal, T., Kumar, G., Lorenzen, K., Tveterås, R., 2020. A global blue revolution: aquaculture growth across regions, species, and countries. Rev. Fish. Sci. Aquacult. 28 (1), 107–116. https://doi.org/10.1080/23308249.2019.1678111.

Ghosh, B., Kivimaa, P., Ramirez, M., Schot, J., Torrens, J., 2021. Transformative outcomes: Assessing and reorienting experimentation with transformative innovation policy. Sci. Public Policy 48 (5), 739–756. https://doi.org/10.1093/scipol/scab045.

Gray, N.J., Gruby, R.L., Campbell, L.M., 2014. Boundary objects and global consensus: scalar narratives of marine conservation in the convention on biological diversity. Glob. Environ. Polit. 14 (3), 64–83.

Grillitsch, M., Coenen, L., Morgan, K., 2023. Directionality and Subsidiarity: A Regional Policy for People and Planet [Working Paper]. Papers in Innovation Studies. Centre for Innovation Research (CIRCLE.

Hansen, T., Coenen, L., 2015. The geography of sustainability transitions: review, synthesis and reflections on an emergent research field. Environ. Innov. Soc. Transit. 17, 92–109. https://doi.org/10.1016/j.eist.2014.11.001.

Harrison, J.L., 2006. 'Accidents' and invisibilities: scaled discourse and the naturalization of regulatory neglect in California's pesticide drift conflict. Polit. Geogr. 25 (5), 506–529. https://doi.org/10.1016/j.polgeo.2006.02.003.

Hersoug, B., 2015. The greening of Norwegian salmon production. Maritime Studies 14 (1), 1–19. https://doi.org/10.1186/s40152-015-0034-9.

Hersoug, B., 2021. Why and how to regulate Norwegian salmon production?–The history of Maximum Allowable Biomass (MAB). Aquaculture 545, 737144. https://doi.org/10.1016/j.aquaculture.2021.737144.

Hersoug, B., 2022. One country, ten systems"–The use of different licensing systems in Norwegian aquaculture. Mar. Policy. 137, 104902 https://doi.org/10.1016/j.marpol.2021.104902.
Hoffman, A.J., 1999. Institutional evolution and change: environmentalism and the US chemical industry. Acad. Manag. J. 42 (4), 351–371. https://doi.org/10.5465/257008.
Holifield, R., Day, M., 2017. A framework for a critical physical geography of 'sacrifice zones': physical landscapes and discursive spaces of frac sand mining in western Wisconsin. Geoforum. 85, 269–279. https://doi.org/10.1016/j.geoforum.2017.08.004.
Hüesker, F., Moss, T., 2015. The politics of multi-scalar action in river basin management: implementing the EU Water Framework Directive (WFD). Land. use policy. 42, 38–47. https://doi.org/10.1016/j.landusepol.2014.07.003.
Irvine, J.T., 2016. Going upscale. In: Carr, E.S., Lempert, M. (Eds.), Scale: Discourse and dimensions of social life. University of California Press, Oakland, pp. 213–231.
Iversen, A., Asche, F., Hermansen, Ø., Nystøyl, R., 2020. Production cost and competitiveness in major salmon farming countries 2003–2018. Aquaculture 522, 735089. https://doi.org/10.1016/j.aquaculture.2020.735089.
Janssen, M.J., Torrens, J., Wesseling, J.H., Wanzenböck, I., 2021. The promises and premises of mission-oriented innovation policy—a reflection and ways forward. Sci. Public Policy 48 (3), 438–444. https://doi.org/10.1093/scipol/scaa072.
Johansen, U., Bull-Berg, H., Vik, L.H., Stokka, A.M., Richardsen, R., Winther, U., 2019. The Norwegian seafood industry–importance for the national economy. Mar. Policy. 110, 103561 https://doi.org/10.1016/j.marpol.2019.103561.
Jonas, A.E., 2006. Pro scale: further reflections on the'scale debate'in human geography. Trans. Inst. Br. Geograph., pp. 399–406.
Jones, K.T., 1998. Scale as epistemology. Polit. Geogr. 17 (1), 25–28. https://doi.org/10.1016/S0962-6298(97)00049-8.
Kaika, M., Page, B., 2003. The EU water framework directive: Part 1. European policy-making and the changing topography of lobbying. Eur. Environ. 13 (6), 314–327. https://doi.org/10.1002/eet.331.
Kemper, K.E., Blomquist, W.A., Dinar, A., 2007. Integrated river basin management through decentralization. Springer, New York.
Koppen, C., Bush, S.R., 2018. Spatial frames and the quest for institutional fit. In: Boström, M., Davidson, D.J. (Eds.), Environment and Society. Palgrave Macmillan, Cham, pp. 305–326.
Kristoffersen, A.B., Qviller, L., Helgesen, K.O., Vollset, K.W., Viljugrein, H., Jansen, P.A., 2018. Quantitative risk assessment of salmon louse-induced mortality of seaward-migrating post-smolt Atlantic salmon. Epidemics. 23, 19–33. https://doi.org/10.1016/j.epidem.2017.11.001.
Kurtz, H.E., 2003. Scale frames and counter-scale frames: constructing the problem of environmental injustice. Polit. Geogr. 22 (8), 887–916. https://doi.org/10.1016/j.polgeo.2003.09.001.
Lawrence, T.B., Dover, G., 2015. Place and institutional work: creating housing for the hard-to-house. Adm. Sci. Q. 60 (3), 371–410. https://doi.org/10.1177/0001839215589813.
Leitner, H., 1997. Reconfiguring the spatiality of power: the construction of a supranational migration framework for the European Union. Polit. Geogr. 16 (2), 123–143. https://doi.org/10.1016/S0962-6298(96)00047-9.
Leitner, H., Miller, B., 2007. Scale and the limitations of ontological debate: a commentary on Marston, Jones and Woodward. Trans. Inst. Br. Geographers 32 (1), 116–125.
Loorbach, D., Frantzeskaki, N., Avelino, F., 2017. Sustainability transitions research: transforming science and practice for societal change. Annu Rev. Environ. Resour. 42, 599–626. https://doi.org/10.1146/annurev-environ-102014-021340.
MacKinnon, D., 2011. Reconstructing scale: towards a new scalar politics. Prog. Hum. Geogr. 35 (1), 21–36. https://doi.org/10.1177/0309132510367841.
Madsen, S.H.J., 2022. A constructivist approach to the spatial organization of transformative innovation policy. Environ. Innov. Soc. Transit. 42, 340–351. https://doi.org/10.1016/j.eist.2022.01.007.
Marston, S. A., Jones, J. P., and Woodward, K. (2005). Transactions of the Institute of British Geographers, 30, 416–432. 10.1111/j.1475-5661.2005.00180.x.
Mazzucato, M. (2017). Mission-oriented innovation policy: challenges and opportunities. *UCL Institute for Innovation and Public Purpose Working Paper,* (2017-1). https://www.ucl.ac.uk/bartlett/public-purpose/publications/2018/jan/mission-oriented-innovation-policy-challenges-and-opportunities.
McCarthy, J., 2005. Devolution in the woods: community forestry as hybrid neoliberalism. Environ. Plann. A 37 (6), 995–1014. https://doi.org/10.1068/a36266.
Michaelsen-Svendsen, B., 2019. Implementation of the Traffic Light System in Norwegian Salmon Aquaculture-Success or Failure for Whom? Master's Thesis. The Arctic University of Norway.
Mills, J., Bonner, A., Francis, K., 2006. The development of constructivist grounded theory. Int. J. Qual. Methods 5 (1), 25–35. https://doi.org/10.1177/160940690600500103.
Ministry of Trade, Industry and Fisheries. (2013). *Verdens fremste sjømatnasjon.* https://www.regjeringen.no/no/dokumenter/meld-st-22-20122013/id718631/?ch=1 Accessed on: January 25, 2024.
Ministry of Trade, Industry and Fisheries. (2015). *Forutsigbar og miljømessig bærekraftig vekst i norsk lakse- og ørretoppdrett.* https://www.regjeringen.no/contentassets/6d27616f18af458aa930f4db9492fbe5/no/pdfs/stm201420150016000dddpdfs.pdf. Accessed on: January 25, 2024.
Miörner, J., Binz, C., 2021. Towards a multi-scalar perspective on transition trajectories. Environ. Innov. Soc. Transit. 40, 172–188. https://doi.org/10.1016/j.eist.2021.06.004.
Mitchell, B., Hollick, M., 1993. Integrated catchment management in Western Australia: transition from concept to implementation. Environ. Manage 17, 735–743. https://doi.org/10.1007/BF02393894.
Molle, F., 2009. River-basin planning and management: the social life of a concept. Geoforum. 40 (3), 484–494. https://doi.org/10.1016/j.geoforum.2009.03.004.
Moore, A., 2008. Rethinking scale as a geographical category: from analysis to practice. Prog. Hum. Geogr. 32 (2), 203–225. https://doi.org/10.1177/0309132507087647.
Moss, T., Newig, J., 2010. Multilevel water governance and problems of scale: setting the stage for a broader debate. Environ. Manage 46, 1–6. https://doi.org/10.1007/s00267-010-9531-1.
Murphy, J.T., 2015. Human geography and socio-technical transition studies: promising intersections. Environ. Innov. Soc. Transit. 17, 73–91. https://doi.org/10.1016/j.eist.2015.03.002.
Nahuelhual, L., Defeo, O., Vergara, X., Blanco, G., Marín, S.L., Bozzeda, F., 2019. Is there a blue transition underway? Fish Fish. 20 (3), 584–595. https://doi.org/10.1111/faf.12354.
Nepstad, D., Irawan, S., Bezerra, T., Boyd, W., Stickler, C., Shimada, J., Alencar, A., 2013. More food, more forests, fewer emissions, better livelihoods: linking REDD+, sustainable supply chains and domestic policy in Brazil, Indonesia and Colombia. Carbon. Manage 4 (6), 639–658. https://doi.org/10.4155/cmt.13.65.
Nogueira, L.A., Wigger, K.A., Jolly, S., 2021. Common-pool resources and governance in sustainability transitions. Environ. Innov. Soc. Transit. 41, 35–38. https://doi.org/10.1016/j.eist.2021.10.004.
Olaussen, J.O., 2018. Environmental problems and regulation in the aquaculture industry. Insights Norway. Marine Policy 98, 158–163. https://doi.org/10.1016/j.marpol.2018.08.005.
Olsen, M.S., Osmundsen, T.C., 2017. Media framing of aquaculture. Mar. Policy. 76, 19–27. https://doi.org/10.1016/j.marpol.2016.11.013.
Osmundsen, T.C., Almklov, P., Tveterås, R., 2017. Fish farmers and regulators coping with the wickedness of aquaculture. Aquacult. Econ. Manag. 21 (1), 163–183. https://doi.org/10.1080/13657305.2017.1262476.
Osmundsen, T.C., Olsen, M.S., 2017. The imperishable controversy over aquaculture. Mar. Policy. 76, 136–142. https://doi.org/10.1016/j.marpol.2016.11.022.
Osmundsen, T.C., Olsen, M.S., Thorvaldsen, T., 2020. The making of a louse - constructing governmental technology for sustainable aquaculture. Environ. Sci. Policy 104, 121–128. https://doi.org/10.1016/j.envsci.2019.12.002.
Patterson, J., Wyborn, C., Westman, L., Brisbois, M.C., Milkoreit, M., Jayaram, D., 2021. The political effects of emergency frames in sustainability. Nat. Sustain. 4 (10), 841–850. https://doi.org/10.1038/s41893-021-00749-9.
Pratt, M.G., 2008. Fitting oval pegs into round holes: tensions in evaluating and publishing qualitative research in top-tier North American journals. Organ. Res. Methods 11 (3), 481–509. https://doi.org/10.1177/1094428107303349.

Raven, R., Schot, J., Berkhout, F., 2012. Space and scale in socio-technical transitions. Environ. Innov. Soc. Transit. 4, 63–78. https://doi.org/10.1016/j.eist.2012.08.001.
Reilly, K.H., Adamowski, J.F., 2017. Spatial and temporal scale framing of a decision on the future of the Mactaquac Dam in New Brunswick, *Canada*. Ecol. Soc. 22 (3). hTtps://www.jstor.org/stable/26270159.
Reser, J.P., Bradley, G.L., Ellul, M.C., 2014. Encountering climate change:'Seeing'is more than 'believing. Wiley Interdiscipl. Reviews: Climate Change 5 (4), 521–537. https://doi.org/10.1002/wcc.286.
Ribot, J.C., Agrawal, A., Larson, A.M., 2006. Recentralizing while decentralizing: how national governments reappropriate forest resources. World Dev. 34 (11), 1864–1886. https://doi.org/10.1016/j.worlddev.2005.11.020.
Rittel, H.W., Webber, M.M., 1973. Dilemmas in a general theory of planning. Policy Sciences 4 (2), 155–169. https://doi.org/10.1007/BF01405730.
Rodner, V., Roulet, T.J., Kerrigan, F., Vom Lehn, D., 2020. Making space for art: a spatial perspective of disruptive and defensive institutional work in Venezuela's art world. Acad. Manag. J. 63 (4), 1054–1081.
Runhaar, H., Fünfschilling, L., van den Pol-Van Dasselaar, A., Moors, E.H., Temmink, R., Hekkert, M., 2020. Endogenous regime change: lessons from transition pathways in Dutch dairy farming. Environ. Innov. Soc. Transit. 36, 137–150. https://doi.org/10.1016/j.eist.2020.06.001.
Scott, D.N., Smith, A.A., 2017. Sacrifice zones" in the green energy economy: toward an environmental justice framework. McGill Law J. 62 (3), 861–898. https://doi.org/10.7202/1042776ar.
Scott, J., 2014. A matter of record: Documentary sources in social research. Polity Press, Cambridge.
Scott, R.R., 2010. Removing mountains: Extracting nature and identity in the Appalachian coalfields. University of Minnesota Press, Minneapolis.
Sica, C.E., 2015. Stacked scale frames: Building hegemony for fracking across scales. Area 47 (4), 443–450. https://doi.org/10.1111/area.12213.
Siebert, S., Wilson, F., Hamilton, J.R., 2017. Devils may sit here:" the role of enchantment in institutional maintenance. Acad. Manag. J. 60 (4), 1607–1632. https://doi.org/10.5465/amj.2014.0487.
Smink, M., Negro, S.O., Niesten, E., Hekkert, M.P., 2015. How mismatching institutional logics hinder niche–regime interaction and how boundary spanners intervene. Technol. Forecast. Soc. Change 100, 225–237. https://doi.org/10.1016/j.techfore.2015.07.004.
Smith, N., 1993. Homeless/global: Scaling places. In: Bird, J., Curtis, B., Putnam, T., Tickern, L. (Eds.), Mapping the Future: Local Cultures, Global Change. Routledge, London, pp. 87–119.
Springer, S., 2014. Human geography without hierarchy. Prog. Hum. Geogr. 38 (3), 402–419. https://doi.org/10.1177/0309132513508208.
Straume, H.-M., Anderson, J.L., Asche, F., Gaasland, I., 2020. Delivering the goods: the determinants of Norwegian seafood exports. Marine Resource Econ. 35 (1), 83–96. https://doi.org/10.1086/707067.
Swyngedouw, E., 2000. Authoritarian governance, power, and the politics of rescaling. Environ. Plann. D: Soc. Space 18 (1), 63–76. https://doi.org/10.1068/d9s.
Swyngedouw, E., 2004a. Globalisation or 'glocalisation'? Networks, territories and rescaling. Cambridge Rev. Int. Affairs 17 (1), 25–48. https://doi.org/10.1080/0955757042000203632.
Swyngedouw, E., 2004b. Scaled geographies: nature, place, and the politics of scale. In: Sheppard, E., McMaster, R.B. (Eds.), Scale and Geographic Inquiry: Nature, Society, and Method. Blackwell Publishing, Malden, pp. 129–153.
Truffer, B., Murphy, J.T., Raven, R., 2015. The geography of sustainability transitions: contours of an emerging theme. Environ. Innov. Soc. Transit. 17, 63–72. https://doi.org/10.1016/j.eist.2015.07.004.
Van der Jagt, A.P., Raven, R., Dorst, H., Runhaar, H., 2020. Nature-based innovation systems. Environ. Innov. Soc. Transit. 35, 202–216. https://doi.org/10.1016/j.eist.2019.09.005.
Van Lieshout, M., Dewulf, A., Aarts, N., Termeer, C., 2011. Do scale frames matter? Scale frame mismatches in the decision making process of a "mega farm" in a small Dutch village. Ecol. Soc. 16 (1).
Van Lieshout, M., Dewulf, A., Aarts, N., Termeer, C., 2012. Doing scalar politics: Interactive scale framing for managing accountability in complex policy processes. Crit. Policy. Stud. 6 (2), 163–181. https://doi.org/10.1080/19460171.2012.689736.
Van Lieshout, M., Dewulf, A., Aarts, N., Termeer, C., 2017. The power to frame the scale? Analysing scalar politics over, in and of a deliberative governance process. J. Environ. Policy Plann. 19 (5), 550–573. https://doi.org/10.1080/1523908X.2014.936581.
Vermunt, D.A., Negro, S.O., Van Laerhoven, F.S.J., Verweij, P.A., Hekkert, M.P., 2020. Sustainability transitions in the agri-food sector: How ecology affects transition dynamics. Environ. Innov. Soc. Transit. 36, 236–249. https://doi.org/10.1016/j.eist.2020.06.003.
Voskoboynik, D.M., Andreucci, D., 2021. Greening extractivism: environmental discourses and resource governance in the 'Lithium Triangle'. Environ. Plann. E: Nature Space, 25148486211006345. https://doi.org/10.1177/25148486211006345.
Wanzenböck, I., Frenken, K., 2020. The subsidiarity principle in innovation policy for societal challenges. Glob. Transit. 2, 51–59. https://doi.org/10.1016/j.glt.2020.02.002.
Wanzenböck, I., Wesseling, J.H., Frenken, K., Hekkert, M.P., Weber, K.M., 2020. A framework for mission-oriented innovation policy: alternative pathways through the problem–solution space. Sci. Public Policy 47 (4), 474–489. https://doi.org/10.1093/scipol/scaa027.
Welch, C., Paavilainen-Mäntymäki, E., Piekkari, R., Plakoyiannaki, E., 2022. Reconciling theory and context: how the case study can set a new agenda for international business research. J. Int. Bus. Stud. 53 (1), 4–26. https://doi.org/10.1057/s41267-021-00484-5.
Weller, S.A., 2019. Just transition? Strategic framing and the challenges facing coal dependent communities. Environ. Plann. C: Politic. Space 37 (2), 298–316. https://doi.org/10.1177/2399654418784304.
Wright, A.L., Irving, G., Zafar, A., Reay, T., 2022. The role of space and place in organizational and institutional change: a systematic review of the literature. J. Manag. Stud. https://doi.org/10.1111/joms.12868.
Young, O.R., Gasser, L., 2002. The Institutional Dimensions of Environmental Change: Fit, Interplay, and Scale. MIT Press, Cambridge.