New Human-landscape Relations in the Face of Global Environmental Crises: A Governance Scoping Statement Based On the Danish Agri-food Transition



#### COMMENTARY

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## ABSTRACT

The current global crises of climate change, biodiversity loss, waterway pollution, and land-system change need far-reaching collective action, with major implications for future human-landscape relations. However, whereas there has been a radical acceleration in green solutions brought forward within science and technology, less attention has been paid to their social integration and long-term sustainability. Based on experiences with a large-scale Danish agri-food transition expert scenario exercise, this commentary scopes ideas for further research on how to accelerate a socially sensitive agri-food transition with clear visionary goals for radically new and sustainable human-landscape relations and forms of governance. We argue that this should be a process of making liveable landscapes, countryside spaces and cities, and one that 1) builds on trust, public embedment, and co-creation; 2) regards humans as part of nature; and 3) is inclusive and fair—locally and globally.

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# 1. INTRODUCTION: FUTURE AGRI-FOOD LANDSCAPES?

The global food system is the world's largest greenhousegas-emitting sector, as well as a main cause of biodiversity loss, terrestrial ecosystem destruction, freshwater consumption, and waterway pollution (Rockström et al., 2020). These combined challenges call for fast and far-reaching transformations in the organization of agricultural production landscapes.

In response, an extensive body of knowledge on detrimental environmental effects and technological innovation is being put at the forefront of the green agrifood transition (e.g. Herrero et al., 2020). Alongside crop enhancement efforts, technological innovation in the shape of dietary additives for livestock, genome editing, vertical farming, robotics, and so on dominate current agendas for agricultural transition. Comparable logics, largely detached from socio-cultural reflection, arguably thrive within global and national nature conservation agendas (UN Biodiversity Conference; Global Biodiversity Framework). Such agendas embrace ideas of restoring or rewilding 'nature' as something to be protected and separated from humans and their primarily destructive production apparatus—without questioning or promoting alternative visions for the often unsustainable narratives and livelihoods at work in that apparatus.

In comparison to these responses, insight into the socio-cultural and governance dimensions of more sustainable agri-food transitions remain fragmented. Nevertheless, the importance of integrating knowledge of the socio-cultural factors enabling territorial governance as well as its social consequences can be seen in key historical precedents of coordinated initiatives in rural landscape changes. For example, the agrarian reforms and historical enclosures of the 17th-19th-centuries implied a fundamental rupture in community life and local attachment to rural landscapes in Denmark (Bjørn, 1988; Løgstrup, 2007). Relatedly, the large-scale drainage and cultivation projects of the mid 19th to the mid 20th-century in Denmark—while considered integral to expanding the burgeoning democracy of the time-led to an 80–90% loss in heathland habitats and a complete extinction of heathland farming and herding (Pedersen, 1971). The current situation requires us to learn from these past large-scale transitions and their wider social consequences.

This commentary piece departs from our experience as socio-cultural researchers participating in a largescale Danish agri-food scenario initiative, coordinated during 2021 as part of the Danish governments' socalled mission-based innovation strategy (AgriFoodTure, 2021). The initiative mainly brought together actors from the university and business sectors, involving more than 300 experts, primarily from the natural and technical sciences. Reminiscent of the above-mentioned dominant agendas, the resulting scenario focused on viable technological pathways to a new agri-food system in line with the country's goal of a 70% reduction in GHG emissions by 2030, compared to 1990 levels, as well as contributing to turning 30% of Europe's land into protected areas for biodiversity conservation. In essence, this scenario aimed to technologically optimize, rather than break with the key present-day parameters of Danish agriculture—including its large animal-industrial sector. Socio-cultural perspectives were allowed only peripheral attention in the scenario building process and was to a large extent ignored in the official roadmap (AgriFoodTure, 2021).

Later on, socio-cultural perspectives were partially reinserted into a researcher-driven 'white paper' version of the roadmap that was made available online (Olesen et al., 2021) in the shape of a section authored by us under the title 'Governing the Danish agri-food transition' (ibid.: 68–71). In this commentary, we partly draw on and reframe key points from our specific section contribution to the white paper (such that 'we' refers throughout to the present two authors, and at no time to all the authors of the white paper).<sup>1</sup> We hope thereby, to render our ideas on key socio-cultural and governance dimensions of the agri-food transition in Denmark accessible to a wider research community as a scoping for further, and geographically broader, socio-cultural landscape research for agri-food transition.

Strengthening and expanding the socio-cultural agenda is pivotal. In light of our own experiences, we argue that social-cultural perspectives in the governance of agri-food transition remains overlooked or downplayed. This relative absence makes developing credible long-term pathways—instead of short-term technological and green fixes — challenging. Specifically, we argue that the current technical solution-oriented agenda also contributes to entrenching a productionist approach to rural landscapes, while failing to include insights from environmental humanities into rural landscapes as sites of livability for non-industrial species.

Against this backdrop, and in a forward-looking fashion, we argue in this commentary that the sociocultural sciences possess a considerable body of knowledge, including historically based and empirical cases, as well as analytical tools, to accelerate a *socially* and ecologically sensitive agri-food transition with clear visionary goals for creating radically new humanlandscape relations and forms of governance. Building on relevant academic literatures on transition management, nature-culture relations, and adaptive and collaborative governance that collectively go far beyond issues of 'consumer behavior', we suggest three main principles to guide such collective learning and transition processes so that they:

- build on trust, co-creation, and public embedment,
- integrate humans in resilient forms of rural-to-urban landscape relations,
- are inclusive, democratic, and fair—locally and globally.

We suggest that an increased focus on these three principles of socio-cultural transition research, as broadly construed, could and should contribute to creating new common narratives and realms of understanding in agrifood transition processes. In what follows, we briefly outline some key contours of what these principles may entail for an expanded research agenda that incorporates attention to changing landscapes at the core.

## 2. TRUST-BASED AND ADAPTIVE TRANSITION GOVERNANCE

In our section of the white paper, we argue that the agrifood transition is critically hindered by a collective action problem (Olesen et al., 2021: 68f). On one hand, the collective benefits from a shift towards a more sustainable, plant-based agri-food system are scientifically wellestablished (Prag & Henriksen, 2020). On the other hand, few individual entities along the relevant value chains possess sufficient incentives to change habitual practices or norms. Transition governance must change this lockin situation into a virtuous circle of ongoing, trust-based, and involving change across the agri-food complex (Loorbach, 2010). To accelerate attendant practice and norm change, participation must be broadened to include active and continuous involvement from political agencies, market actors (including farmers), civil society groups, everyday citizen-consumers, and cross-cutting partnerships (Nyborg et al., 2016; Herrero et al., 2020).

We approach governance broadly to encompass the socio-cultural processes conditioning human-landscape relations. Hence, in our definition, agri-food transition governance comprises a range of means for orchestrating (Eckersley, 2020), directing, and coordinating the interplay of organizations, institutions, and social practices that comprise society's food chains and agricultural systems towards enhanced sustainability, environmental as well as social. Transition governance is both formal and informal, and it requires sustained coordination across spatial (local-global) and temporal (short-, medium- and long-term) scales. Relative to our white-paper argument (Olesen et al., 2021: 68f), we highlight in this paper that such a broad, multidisciplinary definition enables bringing socio-cultural landscape research more centrally into transition governance research than it is at present.

Sustainable food consumption, for instance, should be recognized as a key driver for, and as itself conditioned by, changing landscape relations. Research on sustainable food consumption shows that governance works best with diverse citizen-consumers when combining tools from across three types of intervention (Keller et al., 2016; Graca et al., 2019). First, price incentives and choice environment design target individual incentives. Second, official food guidelines, public procurement policies, and similar initiatives target social norms and peer acceptance. Third, new infrastructures like the sustainability labelling of local products targets the level of everyday habits and convenience. These insights have the potential to inform participatory and adaptive (Loorbach, 2010) behavioral and norm-change efforts, in ways that take cultural and social diversity seriously.

More generally, policy research suggests that traditional supply-side agri-food policies (e.g., the EU's common agricultural policy) should be supplemented with more hybrid and demand-side measures to facilitate norm change (Nyborg et al., 2016). Here, the cases of organic and meat-substitute products suggest that large retailers and procurement via public-sector kitchens and canteens in particular, can play important roles in fostering the collective demand that also incentivizes production-side change (Tziva et al., 2020).

By implementing and gradually adjusting appropriate top-down policies, an interplay should be established with bottom-up civil society experiments, such as grassroots food collectives and civic-driven agricultural cooperatives (Laage-Thomsen & Blok, 2020). Civic networks often provide practical knowledge, critical questions, and legitimacy pressures for markets and policies to respond to, in a process of reflexive institutional learning (Eckersley, 2020). In addition, strategic agri-food initiatives should encompass broad-based public deliberation, such as representative citizen assemblies (Ejsing et al., 2023), to ensure democratic accountability and warrant that socio-technical transition pathways remain appropriate and responsive to local landscape and development aspirations. Socio-cultural research and perspectives, we argue, should be integral to fostering the kinds of trustbased, involving, and adaptive governance needed for the entire transition process.

## 3. A GREEN TRANSITION THAT REGARDS HUMANS AS PART OF NATURE

As a second principle, we argue that it is paramount to ask what kinds of collective values should be harbored and expressed in agri-food transition governance, not least when it comes to human-landscape implications (Olesen et al., 2021: 69f). The landscape models promoted in such collective efforts must meet different needs and values besides the four bottom lines of people, profit, planet, and progress. And in order to work, people at all levels in society must take the lead in this, not only in terms of consumer demand, but also in terms of value creation and governance. Below, extending on our white paper, we provide more texture to the kinds of landscape models and production systems entailed in current debates.

An ambitious agri-food transition challenges prevailing views of nature, including life and species hierarchies that are taken for granted (Povinelli, 2016; Tsing, 2018). It involves a shift from seeing humans mainly as consumers, producers, and nature destructors to viewing humans as landscape governors and responsible co-creators (Descola & Pálsson, 1996; Løvschal & Perez, 2022). This shift should be based on a radically non-hierarchical view of nature, where cultural history, and essentially humans and their farming practices, are not seen in opposition to nature, but as responsible stewards for landscape management and landscape conservationall with a view to ensuring biodiversity and preventing crises caused by imbalances in the relationship between humans and nonhumans. The various values expressed in landscape experiences and landscape conservation all presuppose clear and democratic governance, including to balance differences in interests.

To reduce the distance between humans and other species, e.g. plants and animals, as well as between consumers and the agricultural sector, more biodiverse and mosaic vegetation structures need to be encouraged. (Pre-)historic and present-day cases of polyculture and landscape mosaic production systems, such as heath farms and other low-to-medium nutrient forms of agriculture, permaculture and rotational cultivation could inspire reinvented forms of integrated land-use systems (Fagúndez, 2013; Løvschal, 2021; Woestenburg, 2018). These land-use systems often combine high-intensity (land sparing) and low-intensity (land sharing) production practices, as well as different kinds of ecologies, including pastures, croplands, fallow land, forests, and meadows (Kremen, 2015). Fostering such a land-use transition in locally appropriate ways will require far-reaching alterations in governance, not least in settings such as Denmark, where present-day landscapes are dominated by feed production for intensive, large-scale, animalindustrial agriculture.

More generally, landscape mosaics indicate that landscapes can be protected without being either enclosed or taken completely out of production systems. In the Danish setting, exploring alternative production forms could mean developing new agricultural business and management models (e.g., heath farms) and associated technologies, including rotational grazing and herding, removing drains, nitrogen re-deposition, and reforestation. There is international inspiration (e.g., from the Netherlands, but also from across Asia, Africa, and Latin America) to be found in small-scale examples for use in nature (re-)creation and combining nature conservation (e.g., NATURA 2000 network) and cultural heritage protection. Efforts to integrate land use and production systems with conservation can potentially be scaled: local initiatives must maintain a view to achieving a global sustainability balance in the agri-food transition (and vice versa) to make the transition socially fair and food-secure. In settings like Denmark, stakeholders should maintain a double focus on both densely populated and sparsely populated areas, and on green cities and landscape management. Strategic initiatives should accommodate skills development and re-education programs alongside citizen-engaging projects, with viable solutions often arising on a local scale before travelling, scaling up, and re-embedding elsewhere (Gamache et al., 2020).

In short, to quote our white paper contribution (Olesen et al., 2021: 70), 'a national and globally embedded ... agri-food transition will inevitably involve comprehensive value shifts that are not only related to biodiversity enhancements or increased areas of protected land, but will also influence human livelihoods, beliefs, and identities on multiple levels.' Associated governance challenges abound: as a society, how do we create appropriate spaces for discussing these issues? How do we handle ensuing dilemmas? We need inclusive governance processes for acknowledging, balancing, and handling conflicting values and multidimensional considerations that will arise over time, as well as finding ways of working together across differences. The historical, archeological, and cross-cultural knowledge of the humanities has a key role to play in interdisciplinary collaborations and contributions to the building of potential scenarios. In particular, they have a role to play to inspire a view that ties citizenship to soil and landscapes in new ways, pushing for such relations to be considered mutually embedded nature-cultures in the future. For example, prehistoric heathland agriculture could be highly constructive in terms of rethinking human production systems and their embeddedness in regionally specific ecologies.

## 4. A FAIR AND DEMOCRATIC GREEN TRANSITION BASED ON CO-CREATION

Third, we argue that more research is needed on how to drive a transition that fundamentally promotes agri-food transition together with social justice, cultural viability, and global balance for the benefit of both people and nature. Here, stakeholders and researchers should build on but also move beyond established commitments to user involvement in technology-oriented living labs, landscape management, and established practices of citizen and stakeholder involvement in planning and policy-making (Bulkeley & Betsill, 2005). Moving further in the direction of democratic co-creation promises a better chance of delivering on ambitious environmental targets by facilitating collective learning. Moreover, if done right, it may also revitalize local economies, address rural-urban divides, and promote further social cohesion (Gamache et al., 2020). Below, we mainly recount key points that we make in this respect in our white paper contribution (Olesen et al., 2021: 70f).

First, any ambitious agricultural transition in a setting like Denmark will involve significant land redistributions that must be accompanied by the carefully organized participation of involved citizens and stakeholders, with special respect for land tenure rights. Models for involving citizens and affected parties—including representatives of locally significant non-human species—in the planning and management processes are an indispensable part of the agri-food transition (McGreavy et al., 2016; Ejsing et al., 2023). Such processes may be played out in various ways on multiple scales and encompass both formal and informal procedures and forms of knowledge. Overall, citizen and stakeholder involvement in governance experiments is what warrants contextually informed landscape changes.

Second, living labs constitute a widely acknowledged methodology for fostering stakeholder-inclusive technological innovation for agri-food transition. At the same time, however, stakeholders and researchers should acknowledge not one but two types of living labs, both of which could have complementary roles: the user-centered and the citizen-centered lab, respectively (Gamache et al., 2020). User-centered living labs are techno-centric and market-oriented, serving as testbeds for new technologies and product designs, in addition to involving consumers in spurring early market adoption. Citizen-centered living labs, by contrast, are generally oriented to a broader and more holistic sense of local development, seeking to foster citizenconsumer empowerment and transformative learning as part of building more sustainable local communities. In Denmark, the cooperative movement tradition has relied on building strong ties between these two types of living labs, serving as inspiration for a future-oriented agricultural transition.

Third, in Denmark and across Europe, the green agri-food transition creates a need to enhance rural innovation capacities by way of revitalizing rural territories and policies (Carstensen & Bason, 2012), as well as (re-)connecting rural-to-urban value chains in emerging green city initiatives for wellbeing (Houlden et al., 2018). In the context of sectoral shifts and the decline of the relative importance of agriculture and forestry in rural economies, agricultural employment has dropped considerably in Denmark, as elsewhere in Europe. New activities have developed in rural economies, including tourism, small-scale and niche manufacturing and food production, and business services. However, the food security agenda and the increasing demand for biomass for a variety of bio-based applications have again raised new interest in the economic opportunities related to

primary production and associated value chains. Cocreating knowledge as part of adaptive local transition governance could potentially help policymakers become more attendant to sustainability trade-offs and more able to seize new opportunities for rural-urban linkages, centered in new plant-based value chains and the developments of mosaic rural landscapes.

Ultimately, locally appropriate pathways for agri-food transition must remain responsible to the wider global context of environmental and intergenerational justice, with a view to long-term sustainability goals. As we argued in the white paper, the collective action problems of climate and biodiversity are indicative of how societal decision-making processes have so far tended to remain insufficiently attuned to this urgent agenda. We are now faced with the need for a far-reaching collective learning process across diverse and sometimes conflicting values. Not everything about the agri-food sociotechnical transition is at present, amenable to sciencebased and/or linear planning approaches, despite such approaches taking center stage in the Danish scenario initiative that spurred our own reflections. Beyond such established procedures, we need to include socio-cultural perspectives in future scenario initiatives and inspire more inclusive, fair, democratic, and adaptive procedures of agri-food transition governance.

# 5. CONCLUDING REMARKS: STEPS AHEAD?

We hope that the scoping statement provided in this commentary may provide policymakers, stakeholders, and researchers in the natural-technical sciences with a greater understanding of the key roles that socio-cultural research should play in agri-food transition in Denmark and beyond. Moreover, we hope that the ideas presented here may strengthen existing research and also inspire new research agendas in the socio-cultural sciences and their integration with technological developments, given what we see as their importance to any governed transition. Across otherwise scattered literatures, we have identified adaptive transition management; landscape planning that regards humans as part of nature; and fairness-oriented local co-creation as promising key concepts for future agri-food transition research and practice.

We argue that much can be learnt from earlier work across the socio-cultural sciences about agri-food governance, yet relevant institutions may not always acknowledge this, as our own experiences testify. We suggest that policymakers, stakeholders, civil society, and innovation initiatives start building more consciously and systematically on the principles, we identify, in their practical efforts. Further, we suggest that adaptive governance will require a continual learning process to which socio-cultural researchers should contribute actively, thus also strengthening this knowledge base. Such a strengthening is needed to ensure that collective capacities for agri-food transition match the challenges ahead and the collective benefits that can be realized.

### NOTE

1 We have liaised with the core editorial team behind the white paper, and they all support the publication of this commentary in its present format.

## **COMPETING INTERESTS**

The authors have no competing interests to declare.

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