FOOD SYSTEMS

Degrowth scenarios for emissions neutrality

Degrowth can aid climate mitigation in the food system by integrating reduced animal protein demand, emissions pricing and wealth redistribution into a global food systems transformation.

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Existing climate mitigation scenarios assume that all nations continue to pursue economic growth, regardless of how rich they have already become. This is a problem for climate mitigation because more growth entails more energy and material use, which makes decarbonization more difficult to achieve. To square continued growth with the Paris Agreement goals, scenario modellers are forced to rely on speculative assumptions about efficiency improvements and technological change.

Proponents of degrowth postulate that technological fixes alone will not be enough to keep humanity in a safe operating space and that achieving rapid climate mitigation requires a societal transformation towards equity and sufficiency[1]. Specifically, affluent economies should scale down less necessary forms of production and consumption, reducing aggregate energy and resource use to enable rapid mitigation. Economic policy should prioritize meeting human needs and supporting strong social outcomes rather than economic growth, even if this implies a decline in production and gross domestic product[2]. This raises questions about food systems, however, because while food-related greenhouse gas (GHG) emissions are high, food is an essential good and is crucial to meeting human needs. Indeed, access to nutritious food needs to be increased for much of the world's population, especially those afflicted by malnutrition and food insecurity.

Reporting in *Nature Food*, Bodirsky and colleagues[3] use integrated assessment modelling, a technique prevalent in informing the Intergovernmental Panel on Climate Change (IPCC), to explore degrowth possibilities for the food system, with four policy levers: capping income, redistributing income, GHG pricing and dietary transformation. While capping or redistributing global income is effective at curbing consumption and emissions in affluent countries, it achieves little in terms of bringing about sustainable and healthy diets in lower-income countries. GHG pricing aimed at improving food system efficiency is found to incentivize less-polluting management practices, afforestation and productivity improvements, reducing emissions by almost half. But transformative dietary change that reduces animal protein demand emerges as the single most effective strategy, not just for GHG mitigation, but also for achieving public health and biodiversity objectives. Combining dietary change with wealth redistribution to the Global South and GHG pricing leads to the strongest decline in emissions. With this combined approach, GHG neutrality in the food system could be achieved by 2100 — a target that would be missed by implementing any individual strategy alone.

Integrated assessment models cover future scenarios for the world in a mostly aggregated representation and are poor at analysing detailed features of a food system transition. For example, maintaining adequate protein intake from plant-based sources may require importing protein-rich crops, where they are insufficient locally[4], which raises questions about food miles emissions[5]. In this context, the potential of marine aquaculture as a local protein source could be explored[6,7]. Another extension would be to examine the degree to which food system transformation can create room for bioenergy cultivation and rewilding of landscapes.

Despite the limits of integrated assessment models, Bodirsky and colleagues' findings advance food systems research by revealing the role that degrowth approaches could play in achieving an emissions-neutral food system. Their findings capture the essence of degrowth thinking: a scenario characterized by a radical, qualitative transformation of production, designed to scale down excess resource use while reducing inequality and supporting strong social outcomes, in the context of a global steady-state economy.

Like any strategy of deep, systemic social change, a needs-based transformation of diets and the underlying food system cannot yet rely on evidence from any successful large-scale precedent. This applies in a wider sense to current post-growth and degrowth policy proposals, but also to 'green growth' visions[2]. While GHG pricing is increasingly being debated in policy circles, Bodirsky and colleagues show that this alone does not lead to emissions neutrality. This is because pricing does not transform dietary choices, owing to food consumers' inelastic price-increase response. This leaves us with non-fiscal mechanisms, such as advertisement bans, public food provisioning as well as persuasion, regulation, nudging or labelling. While proven at the case-study level, real-world practical experience with radical behavioural change is so far restricted to small-scale communities[8,9], and larger-scale transformations are absent. While demand-side proposals have potential to reduce emissions across all food system sectors, they face structural barriers such as counterproductive state subsidies and food labelling practices[10]. Thus, research is needed to determine what kinds of social movements, political economy and institutional conditions are necessary to make such radical transformations possible, and to inform food policy actions that support sustainable diets and emissions neutrality. ❐

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Competing interests

The authors declare no competing interests.