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Hens Runhaar

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Four critical conditions for agroecological transitions in Europe

Hens Runhaar^{a,b}

^aCopernicus Institute of Sustainable Development, Utrecht University, Utrecht, the Netherlands; ^bForest and Nature Conservation Policy Group, Wageningen University and Research, Wageningen, the Netherlands

1. Introduction

Over the past few years, reputable international institutes and networks have stressed the need for a fundamental change in our food systems, calling for ‘transitions’, ‘transformations’, ‘paradigm shifts’ and so on (e.g. Gliessman et al., 2018; Díaz et al., 2019; Pharo et al., 2019; Shukla et al., 2019; FAO, 2020; De Schutter, 2019; Goïta & Frison, 2020; Herren and Haerlin, 2020). The basic claim is that in order to effectively address the global challenges of food security, biodiversity loss, climate change and rural livelihoods, radical rather than incremental change is needed. In particular there have been pleas to replace *industrial* agricultural practices by *agroecological* ones, which can provide multiple benefits to society while also contributing to more resilient food production (DeLonge et al., 2016; Goïta & Frison, 2020; Herren and Haerlin, 2020). The recent COVID-19 outbreak is considered an extra motivation to reconsider industrial food systems, now that it has become clear that their global nature generates reinforces vulnerabilities related to food security, labour availability and farm system resilience (Blay-Palmer et al., 2020; Gliessman, 2020; Jumba et al., 2020; Stephens et al., 2020).

Pleas for food system transitions are not new (e.g. Schaller, 1993), but nowadays the urgency seems higher than ever (IPES-Food, 2020). Yet, despite all the commitments of many governments worldwide to working towards substantially more sustainable food systems (e.g. HM Government, 2018; LNV, 2018; EC, 2019; see also CCAFS, 2016 and FAO, n.d.), such transitions do not come by themselves (Runhaar, 2017). Food systems are highly persistent to change (Gliessman et al., 2018; Magrini et al., 2018; Oliver et al., 2018). Path dependencies and ‘lock-ins’ in

industrial food systems are created by an ongoing pressure to further intensify, enlarge scale and specialize, which in turn are associated with the export orientation of many food systems and the increasing concentration in the agri-food sector that limits farmers’ freedom in making their own choices in what to produce, how and for whom (Gliessman et al., 2018; Mooney et al., 2017; Oliver et al., 2018). Also food policies are attuned to industrial agriculture, providing barriers to alternative food systems because of rules that do not accommodate these and, due to their compartmentalized character, often do not support alternative, holistic concepts such as agroecology (Duru et al., 2015; Gliessman et al., 2018). Last but not least, not all actors in food systems have an interest in abandoning industrial agriculture (Runhaar, 2017).

Scholars from transition studies therefore have argued that food system transitions require *regime change*: substantial changes in ‘the semi-coherent set of rules that orient and coordinate the activities of the social groups that reproduce the various elements of sociotechnical systems’ (Geels, 2011, p. 5). Regimes encompass markets, technologies, policies, regulations, networks and cultural expectations (Runhaar et al., 2020). As many farmers have limited degrees of freedom, regimes have to be transformed in order to provide favourable conditions to adopt agroecological practices. The literature mentions various barriers that should be removed in food regimes and identifies various leverage points (Giomi et al., 2018; Gliessman, 2020; Sanderson et al., 2013; Schoonhoven & Runhaar, 2018; Vermunt et al., 2020). Yet the literature is relatively silent about what is needed to *activate* these leverage

points: the critical conditions to *trigger* change, to set regimes *in motion*.

2. Learning from food system transitions in practice: The Netherlands

Empirical analysis is helpful here. Below I discuss four critical conditions for setting industrial food systems in motion to promote agroecological farming. These conditions are identified during the study of the societal and political debate about ‘nature-inclusive’ agriculture in The Netherlands. Nature-inclusive agriculture is the Dutch policy term for agroecology. It is based on three interconnected principles: employ ecosystem services rather than external inputs; minimize environmental pressures and contribute maximally to ‘non-functional’ biodiversity and landscape quality (Oberč & Schnell, 2020; Runhaar, 2017). Despite the increasing adoption of the concept by public and private actors, still less than 10% of all Dutch farmers classifies as nature-inclusive (Bouma et al., 2019; Vermunt et al., 2020). Surveys have shown that many more farmers are willing to operate in more nature-friendly ways (Bouma et al., 2019; Runhaar et al., 2018; Trouw, 2018). Yet, a large majority faces structural barriers to switch to nature-inclusive farming styles, including unclarity about what is exactly expected from farmers, high debts and sunk investments inhibiting change, limited knowledge and a lack of reward systems for the provision of collective goods that nature-inclusive agriculture delivers, such as biodiversity and environmental and landscape quality (Oberč & Schnell, 2020; Runhaar et al., 2018; Schuurbiers et al., 2019; Vermunt et al., 2020). These barriers find their origin in the dominant industrial food regime that is export-oriented, capital intensive¹ and that steers towards ongoing scale enlargement and intensification (Erisman et al., 2016; Pez, 2018; Runhaar et al., 2020).

Like other food systems, the Dutch industrial food system is very stable and resistant to regime change (Vink & Boezeman, 2018). Yet over the past 15–20 years a remarkable regime-level change occurred that *did* deviate from the industrial model: the successful sector-wide efforts to restore grazing practices in dairy farming (Runhaar et al., 2020). Grazing is more sustainable than the indoor housing of cows, although not in all perspectives and moreover only to a modest extent.² Driven by ongoing scale enlargement and intensification, a growing number of dairy farmers started employing indoor housing systems in order to reduce labour, maximize milk production, optimize

feeding and manure processing etc. Growing farm size also implied a lack of land for grazing among large dairy farmers (Runhaar et al., 2020). Increasing concerns among, and pressure from, citizens,³ environmental NGOs and political parties combined with legitimacy concerns in the dairy sector led to collaborative efforts to promote grazing: a covenant signed by all regime actors (farmer interest groups, processors, feed suppliers, banks, NGOs, government etc.), a foundation charged with knowledge production and dissemination and certification, premiums for grazing, the large-scale introduction of ‘grazing dairy’, the sectoral commitment to the ‘land-based’ character of dairy farming etc. In 2018 a trend reversal was achieved, and stakeholders are confident that this is durable (see Runhaar et al., 2020).

By contrasting this ‘crack in the system’ with the difficulties to bring about wider regime change favouring nature-inclusive agriculture, I identify four critical conditions for setting transitions in food systems in motion. I explore their wider relevance by, where possible, zooming out to empirical analyses of food system transitions elsewhere.

The Dutch food regime⁴ is not representative of industrial food systems worldwide. Yet it offers an interesting example as it has the typical characteristics of industrial food systems (export orientation, concentration, intensification etc.; Erisman et al., 2016; Pez, 2018) and the associated sustainability challenges, of which the current ‘nitrogen crisis’ is very prominent (see Stokstad, 2019). As the Dutch food system regime has a strong European dimension,⁵ I believe the conditions below will apply to other European countries with industrial food systems as well.

3. Condition 1: concrete goals or actions

Even though in early stages of a transition it can be useful to employ open concepts such as nature-inclusive agriculture so that every stakeholder can contribute to its definition (Runhaar, 2017), the case of grazing in Dutch dairy farming shows that *concrete goals or actions* that are broadly supported are needed in order to bring about change in food regimes. Stakeholders agreed on reversing the trend towards increasing indoor housing of cows, more specifically to work towards the situation in 2012: at least 81.2% of all dairy cows grazing at least 120 days a year, 6 h a day. Stakeholders had their own interests in enhancing grazing: animal welfare and a threshold to further intensification for environmental

NGOs; legitimacy but also a market opportunity for the dairy sector ('grazing dairy' now forms the majority of dairy sold); animal welfare but also citizen's concerns about the disappearing cows in grasslands among politicians; etc. (Runhaar et al., 2020). This concrete goal facilitated joining forces and the monitoring of progress, the development of certification schemes and reward systems, the development of tailor-made advice to dairy farmers etc. (Runhaar et al., 2020). Concrete goals also provide certainty for farmers and a basis for their future plans and investments.

The importance of focusing on concrete 'boundary objects' in order to bring stakeholders together to pursue more sustainable agricultural practices has also been reported in other contexts (see, e.g. Zinngrube et al. (2020) on agroforestry in Honduras, Peru, Indonesia and Uganda or Morris et al. (2020) on livestock farming in Burkina Faso, Ethiopia and Tanzania).

In the case of nature-inclusive agriculture interests do not automatically align, because it is not concrete enough and, moreover, because there are divergent ideas and expectations round this concept (Kruiswijk, 2020; Runhaar, 2017; Runhaar et al., 2019; Vermunt et al., 2020). Ambiguity round the concept of agroecology is not typically Dutch (see, e.g. van Hulst et al., 2020). With a concrete measure such as *herb-rich grasslands* it may be possible to realize synergies. There are indications that herb-rich grasslands are more resilient to weather extremes and that it can contribute to biodiversity, animal welfare and carbon storage (Hautier et al., 2015; Peña-Espinoza et al., 2018; Yang et al., 2019). Similar to grazing, herb-rich grasslands are very visible and with that more concrete for citizens than the abstract concept of 'nature-inclusive' agriculture. Etc. Herb-rich grasslands have the potential to form a next boundary object in the dairy regime round which interests can be aligned.

4. Condition 2: political and societal pressure

A second critical condition in the regime change that favoured grazing was the political and societal pressure to halt the trend of increased indoor housing of cows. The status quo was neither desirable nor possible to sustain. There was a threat to implement a legal requirement for grazing if the sector would not be able to reverse the trend (Runhaar et al., 2020). Other scholars also report on societal and political pressure as a critical condition

for food regime change (Triboulet et al., 2019), although by itself it is not always enough to bring about regime change (see, e.g. Heyen & Wolff, 2019).

Dutch agriculture is under pressure to reduce its negative impact on nature and biodiversity, with currently a specific focus on particularly dairy farming because of its contribution to excessive nitrogen deposition (Stokstad, 2019). However, as explained above, there is no clear direction yet into which agriculture should develop.

5. Condition 3: a broad coalition

In order to restore grazing stakeholders were mutually dependent. Farmers had to re-adopt grazing practices, extension services, knowledge institutes and agricultural education had to produce and disseminate knowledge on how to re-integrate grazing in farming systems, processors and retailers had to produce and market 'grazing dairy', NGOs and governments had to facilitate, support and legitimize etc. The importance of forming broad coalitions, involving both representatives of the established regime and actors favouring agroecological farming, has also been found in other studies (e.g. Elzen et al., 2012; Gliessman et al., 2018; Mench et al., 2016), although it is no guarantee for actual regime change and the large-scale adoption of more sustainable farming practices (see, e.g. Linton, 2019, for an analysis of the efforts to enhance the sustainability of the Irish dairy sector).

In the case of nature-inclusive agriculture stakeholders are also mutually dependent but there is not yet a clear coalition as in the case of the grazing covenant. This has to do with diverging ideas and expectations about nature-inclusive agriculture (see above). I therefore do not expect a coalition on nature-inclusive agriculture to form automatically, at least not at the national level.⁶ At the local and regional level coalitions are forming (Vermunt et al., 2020), but these coalitions do not include all regime actors.

6. Condition 4: building institutions to support and sustain regime change

In order to promote grazing, huge efforts were made to enable the (re)adoption of grazing practices by means of the creation of new institutions. A covenant helped bringing *and* keeping stakeholders together. A foundation was established to produce and

disseminate knowledge, to certify and to lobby. There were independent advisors reaching out to farmers.⁷ New educational modules were developed. Etc. These institutions complemented the ‘dairy regime’ and provide durable incentives and support for grazing. The importance of institutions in bringing about regime change is also reported in other contexts; e.g. Greece and Italy (Swagemakers et al., 2017; Vlahos et al., 2017).

Institution building included a *cultural* component: refuting the initial idea that grazing was not compatible with modern dairy farming and leading to higher costs or lower yields (Runhaar et al., 2020). Incompatibility with ideas about a ‘good farmer’ represent a well-known barrier to the adoption of more sustainable practices (Ponisio & Ehrlich, 2016; Saunders, 2016). Personalized advice and of course the premiums helped overcoming resistance among farmers.

The process of institution building for nature-inclusive agriculture is ongoing. A growing number of organizations, such as provincial authorities, the Ministry, food processors and NGOs have adopted the concept of nature-inclusive agriculture and have implemented stimulating measures such as subsidies for projects and pilot studies. A ‘green deal’ has been established to develop new educational modules. Investments are made in extension services. At the regional level some covenant-like agreements have been made. Etc. What ‘nature inclusive’ entails in these initiatives (both in terms of indicators and ambition levels), often is not (yet) operationalized in full.⁸ For a regime change favouring nature-inclusive agriculture these institutions need to be aligned, particularly regarding the aims that are strived after (which will probably be differentiated for agricultural sub sectors, soil types and cultural and ecological landscape characteristics).

7. What’s next?

The four conditions needed to set food regimes in motion to enable a transition towards nature-inclusive agriculture build on each other and reinforce each other. While the conditions will probably manifest themselves differently in different contexts, I assume they will also apply to food regimes elsewhere in Europe. Further research is needed in at least two directions: (1) verify the presence of these conditions and determine when and how opportunities for regime change can be *seized*, and by whom; (2) examine

whether and how these conditions can be purposefully *created*, by whom and with what strategies.

Notes

1. This is among other things due to the high land prices in the Netherlands (Eurostat, 2018).
2. The main benefits are that grazing allows cows to express their natural behaviour and biodiversity benefits. There are some disadvantages as well, including higher risk of infections with specific pathogens and more nitrate leaching, denitrification, higher nitrous oxide emissions and more nitrogen losses (see Runhaar et al., 2020 for details and references).
3. Surveys have repeatedly shown that Dutch citizens enjoy seeing cows in meadows; see Runhaar et al. (2020).
4. This food regime is comprised of various ‘sub regimes’ for specific sectors such as arable farming, dairy farming, pig and poultry farming etc. and within these of ‘sub sub regimes’ for e.g. conventional and organic farming,
5. Trade; see Muilwijk et al., 2019; the EU Common Agricultural Policy and other European policies that play an important role in the regime; processors/suppliers operating and located in Europe etc.
6. At the local and regional level various coalitions have been formed (see e.g. Runhaar, 2017). In general it will probably be very difficult to operationalize nature-inclusive agriculture at a national level because of differences in soils and regional cultural identities. However, at a national level some *overall* goals can be formulated, e.g. no net biodiversity loss in year xx, a yy% reduction in greenhouse gases in year zz etc.
7. ‘Grazing coaches’ had reached out to about a third of all dairy farmers, either individually or in small groups, to provide advice on how to integrate grazing in their farming systems (Runhaar et al., 2020).
8. In contrast, a reward system for biodiversity in dairy farming has been developed that includes clear indicators for biodiversity. This system now is mainly based on a bonus-malus arrangement: the dairy cooperative rewards farmers who do well with a higher milk price while those who do not, receive less. This implies a (slight) reallocation of the turnover of milk delivered by the supplying farmers. However, pilots are implemented that foresee payments from provincial authorities (Vermunt et al., 2020).

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No potential conflict of interest was reported by the author(s).

Notes on contributors

Hens Runhaar is Associate Professor of Governance of Nature and Biodiversity at Utrecht University and Visiting Professor at Wageningen University and Research. His research focuses on interventions by governments, companies and NGOs to

protect or enhance nature and biodiversity, with a special interest in agriculture.

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