

Enabling Sustainable Agro-Food Futures: Exploring Fault Lines and Synergies Between the Integrated Territorial Paradigm, Rural Eco-Economy and Circular Economy

Dan Kristian Kristensen¹ · Chris Kjeldsen¹ ·
Martin Hvarregaard Thorsøe¹

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Abstract What kind of futures does agro-food imaginaries enable and who can get involved in the making of agro-food futures? In this respect, what can the increasingly influential idea of circular economy potentially offer in terms of enabling more sustainable agrofood futures? We approach this task by first outlining the interconnected challenges that the agro-food system is facing related to environmental degradation, economic crises and social problems. Then we consider the way these challenges are being addressed in agro-food studies. We argue that agro-food research in recent years has seen important contributions in relation to studies of alternative food networks and the “quality” turn. These research agendas have challenged the current logic of the food system in terms of offering alternative visions of future development. We highlight two examples from the literature—the eco-economy and the integrated territorial agri-food paradigm—that develop broader frameworks for rethinking the future of the agro-food system and which have distinguished themselves in contrast to the industrialized and globalized conventional food system. We find that with respect to reorienting and reconfiguring economic structures and relations all three approaches share a common goal, but circular economy stands out in relation to the actors that are included by, for example, emphasizing collaborations and partnerships with extant agro-food businesses. Also with regards to scalar politics, it would be prudent to consider the potentials offered by the increasingly influential ideas around circular economy.

✉ Chris Kjeldsen
Chris.Kjeldsen@agro.au.dk

Dan Kristian Kristensen
DanK.Kristensen@agro.au.dk

Martin Hvarregaard Thorsøe
MartinH.Thorsoe@agro.au.dk

¹ Department of Agroecology, Aarhus University, PO Box 50, 8830 Tjele, Denmark

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Introduction

The way we think about the future of the food system is consequential in respect to how the food system of the future gets shaped. The ideas and the models we think with holds important implications for the kinds of futures which can become possible, but equally important is the question of who gets involved in the process of thinking about agro-food futures and how this involvement can take place. In recent years an increasing number of scholars and commentators have argued that current ideas, mindsets and models are unable to address present and future challenges facing the agro-food system. Consequently work related to agro-food imaginaries and ways of rethinking agro-food futures is coming to the fore in agro-food studies (Carolan 2013). This is largely a response to the recognition that the challenges facing the agro-food system requires change of a more fundamental character in order to achieve sustainable futures (Marsden and Morley 2014).

In this paper we take up the question:

What kind of futures does agro-food imaginaries enable and who can get involved in the making of agro-food futures? In this respect, we further ask, what can the increasingly influential idea of circular economy potentially offer in terms of enabling more sustainable agro-food futures?

We approach this task by first outlining the interconnected challenges that the agro-food system is facing related to environmental degradation, economic crises and social problems. Then we consider the way these challenges are being addressed in agro-food studies. We argue that agro-food research in recent years has seen important contributions in relation to studies of alternative food networks and the “quality” turn. These research agendas have challenged the current logic of the food system in terms of offering alternative visions of future development.

We highlight two examples from the literature—the eco-economy and the integrated territorial agri-food paradigm—that develop broader frameworks for rethinking the future of the agro-food system and which have distinguished themselves in contrast to the industrialized and globalized conventional food system. The notion of the eco-economy is a marked example of a framework that has attracted interest as an alternative future trajectory for the agro-food system (Hurlings and Marsden 2014; Kitchen and Marsden 2009; Marsden 2013). The eco-economy is developed in contrast to the current dominant narrative of the bio-economy and its tenets is to reorient economic activities towards rural economies by drawing on a more diverse understanding of the resources found in these areas. Another framework, the integrated territorial agri-food paradigm, has been developed by Wiskerke (2009) and co-researchers (Lamine et al. 2012). In this framework an alternative food geography is argued to be emerging, which is in contrast to the dominant food system and ‘is grounded in a different logic and incorporating other than economic values only’ (Wiskerke 2009, p. 375). This framework offers possible strategies that can foster

change towards a sustainable food system. We present both of these frameworks more fully before we move on to consider the circular economy as a new player in the landscape of possible agro-food futures.

Circular economy is an approach that is gaining prominence and it has recently been adopted by a number of agenda setting stakeholders such as the European Commission. Most recently circular economy has begun to be applied in relation food and agriculture and proponents of circular economy are beginning to actively engage with issues of agro-food futures. So far, the implications of circular economy and its agenda for change have not been considered within agro-food studies. Arguably, with its increasing influence the potential synergies and likely discrepancies between circular economy and other approaches to alternative agro-food futures needs to be explored. In our discussion we analyze and compare these three frameworks with respect to the way they each enable future making in the agro-food system and we identify and discuss possible fault lines and synergies between these approaches.

Challenges for Agriculture and the Food System and New Approaches

According to an increasing number of studies the food system face a number of different and interconnected challenges (Foresight 2011; McIntyre et al. 2009; Rockström et al. 2009; SCAR 2011; Thompson et al. 2007; UNCTAD 2013). The challenges are, for instance, related to environmental issues such as greenhouse gas emissions from agriculture which contributes significantly to climate change. The unsustainable exploitation of non-renewable resources, such as phosphorous is also increasingly of concern. Agricultural soils are showing signs that industrial agricultural practices are having a detrimental effect: compaction negatively impacts soil structure; depletion of nutrients and soil organic matter decreases fertility and erosion by wind and water degrade arable lands. Furthermore excessive nutrient runoff and leaching from agriculture has a detrimental effect on the aquatic environment. Challenges in the agro-food system related to social aspects is also frequently brought up, with issues related to unequal access to food and exploitation of farm and food workers a particular cause for concern. Moreover the negative economic effects caused by both hunger and obesity are increasingly coming to the attention of decision makers.

It is increasingly argued that the challenges that are facing the agro-food system is grounded in the operating logic that currently dominates the global agro-food system (Lang 2010). These interrelated challenges make it more and more apparent that traditional scientific approaches are left struggling as they confront the uncertainty and unpredictability characteristic of the above mentioned challenges. It is on this background that a discussion about adopting approaches, which has been termed post-normal science, becomes relevant (Ravetz and Funtowicz 1999). Hence the challenges are not only related to the organization of the food system, but also related to our mode of producing knowledge regarding the food system (Alrøe and Noe 2014).

Within the field of agro-food studies recent contributions have emphasized the relevance of reorienting agro-food approaches and expand the repertoire of future

possibilities. Michael Carolan argues that rather than striving towards being prescriptive, agro-food studies could benefit from embracing a stance which he describes with terms such as *'inquisitive and experimental'* and *'co-experimental'* (Carolan 2013, p. 420). He emphasizes, that it is *"important to keep in mind that 'success' in co-experimentation is not about winning or losing or about producing better or more accurate representations. Instead it is about changing engagements and making new configurations of people and things possible"* (Carolan 2013, pp. 422–423). Similar ideas have been proposed widely across the social sciences. Examples include work on how social scientists should engage themselves with regards to making new configurations between human and non-human entities possible (Hinchliffe et al. 2005), how social scientists should embrace the notion of *'engaged scholarship'* as an approach for interaction between academia and the wider public (van de Ven 1989, 2007), and how social scientists should address matters of public concern by doing phronetic rather than epistemic research (Flyvbjerg 2001, 2003, 2004, 2006).

Conceptualizing New Futures for the Agro-Food System

In recent years agro-food scholarship has increasingly developed an interest in initiatives and approaches that offer different alternatives to global food. The "turn to quality", agendas related to the relocalization of food and rising interest in agro-ecology all reflects that the operating logic which dominates in the global agro-food system is being questioned on a fundamental level in various ways. This resonates with a general tendency in agro-food scholarship which seeks to go *'beyond the placeless foodscape'* (Morgan et al. 2006, pp. 166–197) and to *'relocate food as a key vehicle in societal development'* (Marsden and Morley 2014, p. 214). The role that agro-food scholars play in fostering change is also increasingly becoming part of research agendas. Lowe (2010) for example advances ideas around enactive scholarship and Campbell and Rosin (2011) suggest thinking in terms of co-experimentation as an approach to develop this type of research encounters. Moreover, recent contributions suggests that progress towards sustainability in relation to agro-food futures crucially depends on constructing new *'Food utopias'* (Rosin 2013). It is argued, that *'an utopian perspective that accounts for the cultural, social and environmental qualities of food'* is required in order to reorient the agro-food system (Rosin 2013, p. 57). This process of re-conceptualizing also directs attention to the ideological underpinnings of the current food system (Stock and Carolan 2012; Stock et al. 2015) and this marks an important move towards a more critical awareness that *'things could be otherwise'* in relation to food and agriculture, see for example (Kristensen and Kjeldsen 2016).

In the agro-food studies landscape the rural eco-economy (Kitchen and Marsden 2009) and the territorially embedded agri-food paradigm (Wiskerke 2009) both stand out as approaches that suggest strategies and policies for achieving sustainable change in relation to food, agriculture and (rural) economies. In both cases the original frameworks have been discussed in the literature and both have been applied by other researchers and have been developed further by collaborators. We

have chosen to engage with these frameworks as examples of what we broadly think of as agro-food imaginaries; that is resources for thinking differently and doing otherwise (Carolan 2013).

The Rural Eco-Economy and the Bio-Economy

In their work on development trajectories for the agro-food system Kitchen and Marsden (2009) distinguish between, what they term, the bio-economy and the (rural) eco-economy as divergent pathways. In this framework the eco-economy is conceived of as *'an essentially sociological understanding of both production and consumption spheres. It consists of complex networks or webs of new viable businesses and economic activities that utilise the varied and differentiated forms of environmental resources in more sustainable ways'* (Kitchen and Marsden 2009, p. 275). The re-localization of economic activities is a central tenet in this approach and the *'eco-economy places an emphasis upon the recalibration of micro-economic behaviour and practices that, added together, can potentially realign production-consumption chains and capture local and regional value between rural and urban spaces'* (Kitchen and Marsden 2009, p. 275). One of the features which Kitchen and Marsden attribute with the rural eco-economy is the integration between different sectors in the rural economy (Fig. 1).

This integration across sectors is also coupled with the idea that the traditional notion of rural economy is inadequate to point towards new possibilities. Traditionally, rural economy has been based on the idea that commodities are produced as a result of the utilization of land resources and mobilization of man-made resources such as financial capital. In case of crises or challenges to the economic performance of rural enterprises, a logical approach after this perspective is to open up new land resources or mobilize additional resources, such as financial capital (van der Ploeg et al. 2002) (Fig. 2).

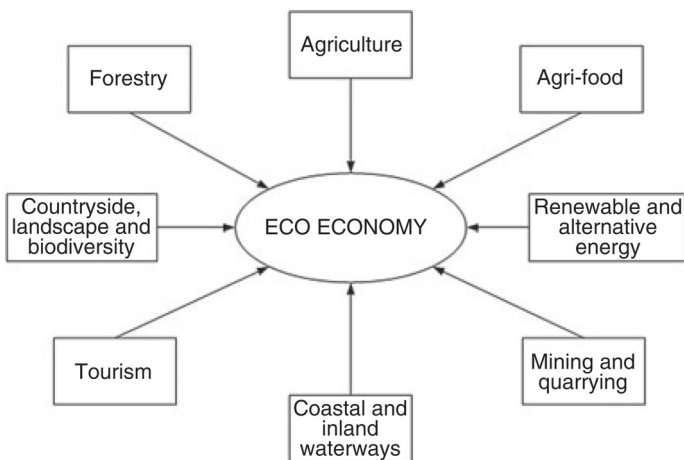


Fig. 1 Potential sectors of the rural eco-economy (Kitchen and Marsden 2009, p. 276)

Fig. 2 The three sides of the traditional rural enterprise (Kitchen and Marsden 2009, p. 281)

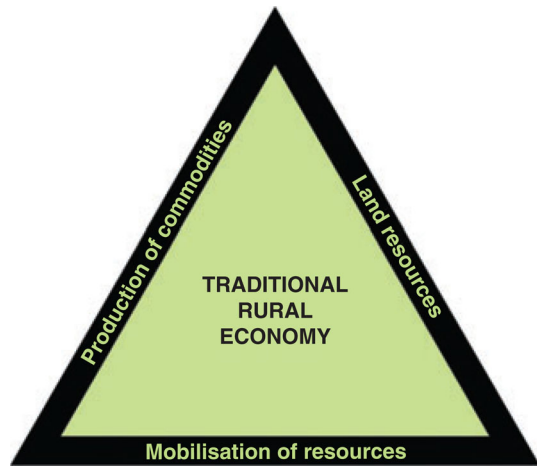
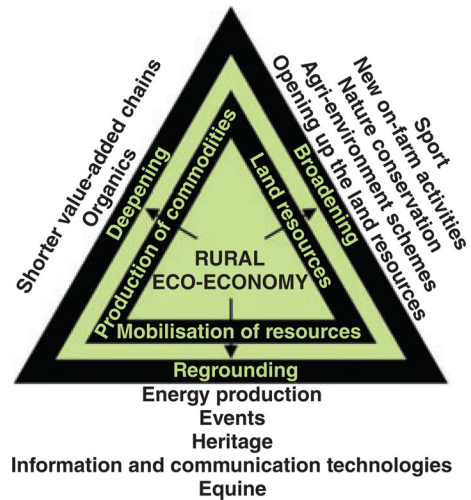


Fig. 3 The dynamics of rural development at enterprise level (Kitchen and Marsden 2009, p. 281)



Kitchen and Marsden argue, based on earlier contributions from van der Ploeg and colleagues (Oostindie and Van Broekhuizen 2008; Oostindie et al. 2008; Renting et al. 2009; van der Ploeg et al. 2002; van der Ploeg and Renting 2004), that this model needs to be reformulated after a market for other products than standardized commodities have emerged. Instead, they propose that the rural eco-economy is attributed with an emphasis on the three related processes of regrounding, broadening and deepening of the rural economy (Fig. 3).

The bio-economy, in this framework, is conceived of as the technologically advanced production of biomass and bio-fuels. In the bio-economy chemical engineering, biotechnologies, genomics and enzyme technology become central features in a largely corporate controlled globally operating economy. With

reference to transitions theory and ecological modernization theory, Horlings and Marsden (2011) associates the bio-economy with the *'dominant food regime'* or the *'conventional agri-food paradigm'* and this pathway is argued to be an expression of weak ecological modernization. Kitchen and Marsden asserts that the (re)emergence of the eco-economy is a sign of a larger and deep-rooted movement towards *'a new rural paradigm based upon the reconstruction of a rural eco-economy'* (Kitchen and Marsden 2009, p. 289). See also Marsden (2004) for a related discussion of the *'new age'* of ecology. It is argued that in order to obtain the benefits in terms of sustainability, the state needs to ensure *'the development of the eco-economy rather than the bio-economy'* (Kitchen and Marsden 2009, p. 289), see also (Marsden and Farioli 2015).

Alternative Food Geography Versus Hypermodern Food Geography

Wiskerke (2009) conceptualizes two different 'paradigms' which is founded on diverging 'logics'. The spatial or territorial dimension of agro-food development is central to this argument and he states that: *'[a]longside the well established though contested hypermodern food geography an alternative (or collection of alternatives) is arising, grounded in a different logic and incorporating other than economic values only'* (Wiskerke 2009, p. 375) see also Lamine et al. (2012) for a discussion and use of this delineation in relation to transition theory. In this conceptualization the established and dominant model—termed the agri-industrial paradigm—is in contrast to an emerging, still marginal, integrated territorial agri-food paradigm. What characterizes the agri-industrial paradigm is said to be: intensive production according to an emphasis on achieving 'economies of scale'; Continued standardization of food processing which then lead to new products by re-composition of these standard elements; tracking and tracing systems to ensure consumer trust and handle food safety (reactively). In sum *'Advocates of this [agri-industrial] paradigm share a firm belief in the technological solutions'* Wiskerke (2009, p. 374) to environmental pollution and ecological degradation and the social problems associated with industrial agriculture. In contrast the integrated territorial agri-food paradigm revolves around: localized/regionalized food networks for managing nutrient cycles; traditional plant and animal varieties with attention to seasonality and local conditions. A key feature is *'spatially bound consumer-producer relations'* Wiskerke (2009, p. 377) as a basis for trust and reciprocity in agriculture and food.

As emphasized in the dimensions listed in Table 1, the two competing agri-food paradigms are characterized by divergent food geographies. Also in terms of governance, Wiskerke attributes the integrated territorial agri-food paradigm with different forms of interaction between government, market and civil society. With regards to governance structures, Wiskerke proposes the territory as the stage for interaction between the three levels, with food being the primary link between urban and rural spaces.

Table 1 Competing agri-food paradigms and differentiated food geographies (Wiskerke 2009, p. 375)

Problem/Issue addressed	Agri-industrial paradigm (hypermodern food geography)	Integrated territorial agri-food paradigm (alternative food geography)
Economic position of primary producers	Intensive production 'lock-in'; economies of scale approach; cost price reduction	Economies of scope approach; increase producers' share in consumers' food spending
Environmental sustainability	Technical solutions for environmental problems: agriindustrial parks, pest and disease resistant GMO crops, low/zero emission livestock housing systems; eco-efficient systems for mass distribution of food products	Localized/regionalized food networks; nutrient cycles at regional level; traditional plant varieties and animal breeds adapted to local conditions; organic or low external input production; seasonal products
Organoleptic quality and diversity	End-of-chain diversification; Created by the food processing industry based on standardized primary product	Created by farmers and/or artisanal food processors; quality linked to region (terroir)/tradition/nature
Consumers' trust	Quality and safety assurance schemes; industry and retail labels and hallmarks; tracking and tracing	Personal trust based relations; denomination of origin labels; transparent food supply chains
Health	Nutritionism: nutritionally engineered functional food (food as a carrier of vitamins, calories, proteins, nutrients, etc.)	Focus on lifestyle, dietary pattern and eating habits: more fresh food and less convenience & processed products, more physical exercise; organic products

Circular Economy

Recently, the Ellen MacArthur foundation, has taken the lead in bringing circular economy thinking forward on the public and political agenda. On its website the organization offers the following broad definition of circular economy: '*[t]he circular economy is a generic term for an economy that is regenerative by design. Materials flows are of two types, biological materials, designed to reenter the biosphere, and technical materials, designed to circulate with minimal loss of quality, in turn entraining the shift towards an economy ultimately powered by renewable energy*'. The Ellen McArthur Foundation is operating '*with the aim of inspiring a generation to rethink, redesign, and build a positive future through the vision of a circular economy*' (Ellen MacArthur Foundation 2012, p. 96).

This rethinking starts with the diagnosis that our current economic system is based on a linear model of resource extraction and utilization. In short this can be summarized as take → make → dump, where resources are extracted, used to produce a product, which at the end of its (short) life is disposed of by landfilling or incineration; a model that is argued to be inherently unsustainable. In contrast a circular economy is inspired by how natural systems work. Thereby the functions of resources are transformed. Products at the end their life and byproducts from production processes is not to be considered as waste to be discarded in landfills or incinerated, but instead they should recirculate as valuable input to other processes and products (Preston 2012). Thinking in terms of circular economy implies

operating the economy in closed circles or loops that ideally require only the input of energy derived from renewable sources. It optimizes utilization of resources by cascading (e.g. reuse, refurbishing and recycling) materials through consecutive stages of value extraction. As defined above the basis of this line of thinking is a clear distinction between what is termed biological nutrients and technical nutrient and their respective regenerative cycles (McDonough and Braungart 2002). Holding up this distinction enables the effective and uncontaminated circulation of both kinds of nutrients avoiding ‘downcycling’ and allowing and encouraging ‘upcycling’, whereby value is increasingly added through product or service enhancements (McDonough and Braungart 2013). Maintaining this distinction requires a very strong emphasis on the design of products, business models, collection systems, institutions and economic incentive structures (Bilitewski 2012).

The ambition of moving towards a circular economy has especially gained traction in Europe and, as a prominent example, the European Union (EU) has embraced circular economy as a societal goal and an objective for policy across EU institutions stating that in ‘*a world with growing pressures on resources and the environment, the EU has no choice but to go for the transition to a resource-efficient and ultimately regenerative circular economy*’ (European Commission 2012), see also (European Commission 2011, 2013a). In the report “Towards a circular economy: A zero waste programme for Europe” the benefits of adopting circular economy for European competitiveness and future prosperity are outlined along with key challenges for making the transition (European Commission 2014). In terms of environmental protection and the associated societal benefits the recently published European Union 7th Environment Action Programme “Living well, within the limits of our planet” also state that ‘*prosperity and [a] healthy environment stem from an innovative, circular economy where nothing is wasted and where natural resources are managed sustainably*’ (European Commission 2013b).

A number of multinational corporations are also beginning to adopt circular economy; seeing it as a strategy for maintaining and securing availability of resources in an uncertain future. Examples include Nestlé, H&M, Arla, Google, Phillips and Renault that have begun to work such thinking into their corporate mindset and in their long term strategies (Ellen MacArthur Foundation 2014; Fooddrinkeurope 2014; Nordic Council of Ministers 2015; Philips 2014; Woods 2014).

In a review of the UK context regarding circular economy (Hobson 2016) reports how different semi- or non-governmental organizations in the UK work with the ideas of circular economy. Examples include the environmental think tank The Green Alliance, which convenes the UK Circular Economy Task Force, and other organizations such as WRAP (a non-profit company which facilitate greater waste prevention and resource efficiency), the Royal Institute of International Affairs (aka Chatham House), the Aldersgate Group (‘an alliance of leaders from business, politics and society that drives action for a sustainable economy’), and several others (Hobson 2016, p. 8). Hobson argue, based on various studies of global production networks (Crang et al. 2013; Lepawsky and Mather 2011), that ‘*what is potentially intriguing around and within CE spaces is their potential to acknowledge, reconfigure and redistribute socio-material agency*’ and their ability to ‘*serve*

as spaces of contemplation and/or creation of new ‘after lives’ of objects’ (Hobson 2016, p. 8). These examples illustrate that circular economy is being utilized by a wide range of actors, and is currently being integrated in strategic development on different scales, spanning from public policies to corporate strategies.

Circular Economy and the Agro Food System

In relation to the agro-food system recent reports from the Ellen MacArthur Foundation has emphasized how a ‘*circular development path could advance towards a regenerative food system*’. In this scenario the food system undergoes systemic change towards a situation where the ‘*[food] system would be generative, closing nutrient loops with minimal leakage and maximum long-term value extraction from each loop in short, local supply chains with almost zero waste*’ (Ellen MacArthur Foundation 2015, p. 76). In the circular economy framework it is stated that ‘*[i]n a circular economy, agricultural practices aim at optimising yields while also improving the quality of soil, water, and air. It views the long-term health of our agricultural systems as our best chance for long-term performance*’ (Ellen MacArthur Foundation 2013, pp. 23–24). With these visions and ideas specifically related to the agro-food system the proponents of circular economy has clearly begun to engage directly with questions about sustainable agro-food futures.

Highlighting the long term perspective is of crucial importance for addressing and reorienting the unsustainable practices in agriculture, hence, circular economy thinking—at least to some degree—is going beyond the pursuit of technological quick fixes that has been a characteristic feature of agro-food development historically. In terms of indicating the types of practices that is believed to foster a sustainable agricultural system a subsequent report from the Ellen MacArthur Foundation (2015) highlights what is termed ‘*regenerative farming practices*’ this involves such practices as organic farming and No-till farming. The ecological recycling agriculture concept which has been promoted in the Baltic region is also highlighted as an important example (BERAS 2015). Other approaches such as ‘*agroforestry, holistic planned grazing, silvopastoral systems, and pasture-based dairy systems with no/minimal fertiliser use*’ is also included as part of the repertoire of practices that is seen as promising in terms of sustainability (Ellen MacArthur Foundation 2015).

Discussion

In the following we turn to a discussion aiming at addressing the question posed in the introduction of the paper: *What kind of futures does agro-food imaginaries enable and who can get involved in the remaking of agro-food futures? And in this respect what can circular economy potentially offer in terms of remaking agro-food futures?*

Table 2 highlights similarities and differences between the eco-economy, the integrated territorial paradigm and circular economy and in the following sections we discuss the implications with respect to constructing agro-food futures. Firstly,

Table 2 Comparing eco-economy, integrated territorial agri-food paradigm and the circular economy

	Eco-economy	Integrated territorial agri-food paradigm	Circular economy
Problem diagnosis	Existing sectoral ways of considering the rural economy that are characterized by disembedding production from consumption	The hypermodern food geographies that disembeds production from consumption	The circular economy problematizes the linearity of the current modes of resource use and consumption
Relation to the conventional industrial agro-food system	A new food system based on the mobilization of new actors like revitalizing the microeconomic dynamics and processes, based on the resource basis in rural areas	A new food system, based on the mobilization of new actors like, NGO's, local food networks, farmers, in trust based relationships	Transformation of the logic in the conventional agro-food system among the actors that currently comprise the system, as well as new entrants
Scalar politics	Remobilization of the rural areas by emphasizing and recasting local resources thereby transforming the economic relations between rural and urban areas	Re-localization of the food system by transforming food qualities emphasizing the symbolic and cultural meaning of food	Globalization is challenged as the only legitimate scale of the food system. It should be regionalized to allow for resource circularization in closed loops

we consider how eco-economy, the integrated territorial agri-food paradigm and circular economy all share a common goal in terms of reorienting existing ways of operating the economy and reordering associated economic structures. A second dimension relates to how the reorientation and reordering is pursued. We find that there is a marked difference in approach between circular economy and the two other conceptualizations regarding which actors are included as collaborators and legitimate interlocutors in defining desirable futures.

The third dimension we address is related to the scalar politics we discern as present in the three approaches. In this respect we find that all three approaches envision an agro-food system that is oriented around different forms of re-localization of food provisioning and consumption, however we argue that whereas the eco-economy and the integrated territorial paradigm remains prescriptive in terms of the appropriate scale for agro-food systems. Circular economy on the other hand maintains a more open approach in terms of defining the appropriate scale according to principles of circularization of nutrients.

Problem Diagnosis and Enabling Desirable Agro Futures

In both the conceptualization of the 'eco-economy' and 'integrated territorial agri-food paradigm' alternative food networks, short food supply chains and local food strategies (at city or regional level) are conceived as central elements and are

explicitly associated with a move towards sustainability. Alternative food networks and other initiatives that seek to challenge the current agro-food system that are perceived as nexuses around which new attitudes, values, demands and practices are being articulated and performed. It is argued in the case of the integrated territorial agri-food paradigm that it has *'the (potential) capacity to contribute to sustainable regional development'* (Wiskerke 2009, p. 382) and that emerging alternative food geographies are regaining relevance and importance as the focal and starting point for sustainable development (Wiskerke 2009, p. 383). Furthermore it is mentioned that by integrating food in planning *'a whole range of action research and design activities can be devised'* (Wiskerke 2009, p. 384). In the case of the rural eco-economy approach, it is emphasized that the purpose of the approach is to explore *'the potential of rural areas to contribute to sustainability by recasting their relationships with the increasingly contested carbon-based economy'* (Kitchen and Marsden 2009, p. 273). Through synthesizing different theoretical areas, a *'conceptual basis for an integrative model of rural development'* (Kitchen and Marsden 2009, p. 273) is provided, thus addressing the need for conceptual road maps which can guide the reintegration of *'the agricultural, rural and urban in new and innovative ways'* (Kitchen and Marsden 2009, p. 275). A related contribution within the field of eco-economy emphasize that both bio-economy and eco-economy identify *'different pathways for development and unfold different notions of time, space and place'* (Horlings et al. 2010, p. 1). Furthermore, it is emphasized that there is a need to *'taking forward a new rural development paradigm, as a new assemblage of approaches, ideas and concepts that can profoundly shift our framing of rural development in ways that really ecologically modernises rural space. Such framing can begin to contribute to the double dividend of raising local and regional incomes and activity at the same time as contributing a multifunctional role in delivering sustainability to the wider urban as well as rural public'* (Kitchen and Marsden 2009, p. 291).

Circular economy has been less focused on the specific role of agro-food, and this arena has only recently found its way into debates within the field. However, different organizations, institutions and businesses/corporations are beginning to investigate the opportunities of working with circular economy in relation to the biological cycle as well—and not least the potential synergies between cycles. Among these various actors it is widely recognized that the agro-food system is facing a confluence of pressures related to increasing demand from growing, and more, affluent populations, intensified competition for land, water and energy and the effects of climate change. As a consequence the regenerative services provided by agriculture, arguably, becomes ever more central in a future of limited access to non-renewable resources and the significance of agriculture as a provider of energy and essential resources for industry will most certainly increase (Ambler-Edwards et al. 2009; Lee et al. 2012), even as food security remains an issue to address. Therefore, within the circular economy, agro-food system is envisioned to be transformed *'using circular models that mimic natural systems to reduce both external inputs and waste'* (Pimbert 2012). In this vision agricultural production is managed in closed loops and synergies with for example industrial production are achieved by co-location and innovations in product and process design.

Enacting Different Futures Based on Different Scalar Politics

The three approaches considered here exhibits different attributes regarding how they envision enacting possible futures. In terms of scalar politics the notions of the eco-economy and the integrated territorial agri-food paradigm have highlighted how development involves different spatial logics, and a politics related to defining the spatial. In the case of the integrated territorial agri-food paradigm, ‘placeless’ foodscapes are counterposed with ‘spatially bound consumer-producer relations’. In the case of the eco-economy, the territory is framed as an alternative spatial scale on which to organize rural–urban relations. In that regard, both notions conceive agro-food development as being inherently contested by different logics. As noted above, circular economy is less prescriptive regarding the specific scalar politics, but uses a broad notion of circulation to suggest a move toward a regionalization of food provisioning. However, as argued by a recent interrogation of circular economy (Gregson et al. 2015), one of the important questions to address is ‘what form of politics lies behind this increasingly moral European market in resource recovery’ (the latter being the context in question) (Gregson et al. 2015, p. 235). One of the points made by Gregson and colleagues is that circular economy also faces issues of conflicting spatial logics, one example being the challenge of turning waste into a resource, which is hampered by current EU markets for waste recovery. The possible implication for circular economy is that it might benefit from embracing a structured process of inquiry into the normative dimensions of agro-food development. In this respect the eco-economy and the integrated territorial paradigm are more clearly developed.

It can be argued that the notions of the eco-economy and the territorially integrated agri-food paradigm invoke a certain position with regards to the scale at which possible food economies should be embedded. The re-localization of food and agriculture are constructed as desirable ends towards which societies should strive, and the two constructs thus advocate a certain mode of scalar politics (MacKinnon 2011; Van Lieshout et al. in press). In the conceptualization of circular economy this stance towards scalar politics is less rigid; here localization of food and agriculture is emphasized as a means towards a more sustainable agro-food system, but—as indicated by the inclusion of various agri-industrial corporations—the notion of circular economy appears to retain openness towards interactions between different meanings and interpretations and a pragmatic attention to the questions of which scale is appropriate as this becomes a matter to be settled in each case rather than being prescribed beforehand. This constitutes a marked difference between the different approaches.

Who Gets to Define Agro-Food Futures

Of the three agro-food imaginaries we have discussed here there is no question that circular economy is the most influential in terms of the number of individual actors, institutions, agencies and organizations that are actively using the term and are relating to the concept. Circular economy is distinguished by a significant degree of momentum and as we have shown increasingly circular economy is also finding

application in relation to agriculture and food production and thus is actively beginning to shape questions related to agro-food futures. Circular economy is distinguished by emphasizing collaborations and partnerships with established industry actors, as outlined above. With regards to the eco-economy and the integrated territorial agri-food paradigm, they are not characterized by a similar momentum with regards to establishing partnerships with actors outside academia. It can thus be argued, that an important progression towards enabling futures, would be to establish collaborations where the normative dimensions regarding agro-food development are addressed such that issues around scalar politics are not 'naturalized' and kept exclusive to those parties who hold the "correct" views. A potentially fruitful line of inquiry in relation to circular economy is the role of '*everyday spaces and quotidian modes of resource practice*' (Hobson 2016, p. 9), however this remains underexplored in circular economy debates. Hobson also argues that an approach to '*locating and fostering spaces of activism stands in contrast to those that predetermine what can be and is labelled as political around the issues of sustainable production and consumption*' (Hobson 2016, p. 12).

Conclusion

In this paper we have argued that agro-food imaginaries have great implications for remaking agro-food futures. The models, as such, do not predict, nor determine the future, but they structure our contemporary decision making by emphasizing various elements and including different actors, thereby influencing what futures we may envision.

We have presented three approaches to conceptualizing agro-food futures—the eco-economy, the integrated territorial agri-food paradigm and circular economy. In the case of the first two conceptualizations they have been included as examples of alternative agro-food imaginaries that have been discussed in the agro-food studies literature. In the case of circular economy we argue that this increasingly influential approach remains unexplored in terms of its potential as an agro-food imaginary. We find that with respect to reorienting and reconfiguring economic structures and relations all three approaches share a common goal, but circular economy stands out in relation to the actors that are included by, for example, emphasizing collaborations and partnerships with extant agro-food businesses. In relation to the scalar politics invoked by these three agro-food imaginaries we find that the eco-economy and the integrated territorial paradigm share a prescriptive notion of scale in relation to agro-food futures. In this regard we find that circular economy retains a more open approach based on its central principles of resource circulation.

Earlier in this paper the work around the notion of food utopias was highlighted as an important emerging approach within agro-food studies (Stock et al. 2015). A key point from this approach is that '*Rather than a narrow logic around food, utopias helps us to loosen the boundaries on whose ideas matter around food*' (Stock et al. 2015). This is helpful because it points out the necessity of establishing ways of interacting that integrates rather than excludes. Notions related to enactive scholarship and co-experimentation has been discussed as ways to enhance

interactions that involves academic knowledge in relation to the issue of agro-food futures. It can be argued, that in order to enhance the potential for co-experimentation and enactive scholarship, it should be a concern to reach a broader, more varied and influential group of actors. It is in this respect that we have found it prudent to consider the potentials offered by the increasingly influential ideas around circular economy.

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