Sharing is caring : the role of culture in the transformative capacity and continuation of agri-food networks

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Abstract

During the last several decades, inter-organizational collaboration in the food sector has emerged to tackle complex problems such as sustainability. However, in practice, these networks often either fall short of their goal or disband. Therefore, we investigate the role of culture within these networks to gain insights into the transformative capacity and (dis)continuation of such agri-food networks. Although agri-food networks are a common research topic in transition studies, our understanding of the role that culture plays in them can be improved. To better understand culture in agri-food networks, we compare eight cases. Results indicate that a shared culture affect the development and continuation of these innovative networks. Despite the intention of many agri-food networks to transform the agri-food system, they tend to reproduce it and effect incremental rather than radical changes. The degree of such changes was found to be related to the cultural (dis)similarities between the agri-food network and the agri-food system.

Keywords: Agri-food networks; culture; transformative capacity; values, norms, narratives and practices; agri-food system

Highlights:
- Shared culture is shaped through narratives, values and practices
- A shared culture is an essential element of the (dis)continuation of agri-food networks
- Inclusive values positively influence the functioning of agri-food networks
- Hybrid types of culture have the highest transformative capacity

1 Introduction

45   Agri-food systems have become increasingly complex with many interconnected structures and processes of
46   production, processing and provisioning. They can be considered as human-environmental systems shaped by
47   natural (e.g. soil, water), social (e.g. consumer groups, NGOs) and economic (e.g. farmers' association) systems
48   (Francis et al., 2003; Lamine, 2011; Lowe et al., 2008). These systems are confronted with complex sustainability
49   challenges that require collective solutions and actions, as well as system innovations (Dicks et al., 2013; Fischer
50   et al., 2012; Hubeau et al., 2017b; Ingram et al., 2015; Klerkx et al., 2010). Agri-food networks are fully embedded
51   in the agri-food system, which in turn is fully embedded in the socio-ecological system. Following Provan and
52   Kenis (2008), we define agri-food networks as networks consisting of at least three organizations that aim to
53   achieve a collective goal. Within agri-food networks, the different organizations may pursue "a mutual interest
54   while also (…) retaining separate interests" (Cropper et al. 2008: 9). Often, these networks are characterized by
55   new types of organizations. Further, they may originate as a reaction against business-as-usual agri-food practices
56   and intend to either transform the dominant regime in the direction of sustainability or to foster innovation and
57   change (Bui et al., 2016; Darnhofer et al., 2010; Hubeau et al., 2017b; Ingram et al., 2015; Luederitz et al., 2016;
58   Schiefer et al., 2015; Sengers et al., 2016). We consciously choose the term agri-food networks instead of
59   'alternative food networks' as agri-food networks can be characterized as either alternative, conventional or a
60   hybrid form, as illustrated below.

61   Based on a literature review (Bos et al., 2013; Bos and Brown, 2012; Hermans et al., 2013; Hubeau et al., 2017b;
62   Luederitz et al., 2016; Porter et al., 2015; Sengers et al., 2016; Turnheim et al., 2015) and our own experiences,
63   we find that agri-food networks often either fail to reach their goal or cease to exist before the desired change or
64   transformation has been realized. To reach their full transformative capacity, agri-food networks must have a solid
65   societal embedding (Audet et al., 2017; Deuten et al., 1997; Geels et al., 2007; Roep and Wiskerke, 2010; Sonnino
66   and Marsden, 2006; Wirth et al., 2013; Wu and Pullman, 2015). Deuten et al. (1997) identify three relevant
67   environments regarding societal embedding: (i) the business environment, which integrates innovations into
68   markets, (ii) the regulatory environment, which requires innovations to respect the rules and standards set by
69   government agencies or sectoral bodies, and (iii) the cultural environment, which requests that innovations
70   conform to conventional narratives, beliefs and norms. Moreover, Hubeau et al. (2017b) identify several crucial
71   contextual factors for the (long-term) success of agri-food networks, such as mutual trust and frequent interaction.
72   Although different studies about the cultural aspects in relation to innovation and transformation processes exist
73   (see e.g. Bergek et al., 2008; Geels et al., 2007; Geels and Verhees, 2011; Jacobsson and Lauber, 2006; Lovell,
74   2008), the main emphasis often remains on the business and regulatory environment (Geels and Verhees, 2011;
75   Wu and Pullman, 2015). We believe, however, that the role of culture in this context could be more explicitly
76   addressed. In addition, we now observe that whereas some new ideas are quickly incorporated by regime actors
77   and successfully initiate incremental changes within the agri-food regime, other ideas are confronted with strong
78   resistance (Diaz et al., 2013; Ingram, 2018; Ingram et al., 2015).

79   Culture has been previously studied in different branches of literature, such as social network analysis (e.g. Breiger
80   and Puetz, 2014), alternative agri-food networks (e.g. Roep and Wiskerke, 2010), transition studies (e.g. Geels
81   and Verhees, 2011) and supply chain management (e.g. Fernández-Esquinas et al., 2017). In the context of both
82   agri-food networks and transition studies, culture is often studied as one of many factors to characterize niches
83   (Schot and Geels, 2008 or Rossi, 2017) or to characterize the environment in which niche-regime interactions
84   occur (Bui et al., 2016 or Diaz et al., 2013). However, a substantive part of research in the agri-food sector refers
85   to consumer culture (Spaargaren, 2011) or food culture (Rossi, 2017) and less to the culture shaped by the actors
86   as combination of shared narratives, norm, values and practices. Overall, literature on culture in an agri-food
87   context is fragmented and an explicit focus is rather hard to find, especially within network literature. Our study
88   therefore aims to deepen the theoretical and especially the empirical understanding of the role of culture in agri-
89   food networks. We aim to contribute to knowledge about the behavior of actors in networks. In addition, as other
90   researchers (Büschgens et al., 2013; Fernández-Esquinas et al., 2017; Turró et al., 2014) have identified the role
91   of culture as a key for innovation, we believe that by analyzing the role of culture in agri-food networks, we can
92   generate a better understanding of the transformative capacity and (dis)continuation of these agri-food networks.
93   Transformative capacity refers to the capability to respond to changes and take new paths of sustainable

94 development (Koopmans, 2018). Although our analysis focuses on culture, we do acknowledge the role of other
95 aspects such as technology, power, politics and other institutional aspects. More specifically, we aim to address
96 the following two research questions: (i) What is the role of culture in the continuation of agri-food networks?
97 and (ii) Does culture co-determine the transformative capacity of agri-food networks?

98 We address the above research questions based on an explorative comparative analysis of eight case studies; six
99 of them have continued and two ceased their activities. We first address the current theoretical and empirical
100 insights on culture in agri-food networks and transformation studies (section 2). Section 3 describes the research
101 methods introducing the case study analysis and comparative approach. Section 4 briefly describes the case studies
102 and section 5 discusses the results in light of both research questions. Finally, section 6 discusses the results in
103 relation to the wider literature on culture and transformation processes and presents our final conclusions.

104   2 Culture in transformation processes

105 Culture is often conceptualized as a combination of various cognitive elements shaped through social learning
106 processes and knowledge sharing. Based on other authors (Crossley, 2015; Fuhse, 2009; Pachucki and Breiger,
107 2010) and for the purpose of this paper, we broadly define culture as referring to narratives, values and norms,
108 and everyday practices. We conceptualize culture as inherently relational, meaning that narratives, values and
109 practices only contribute to a collective culture when they are shared among actors (Crossley, 2015). Previous
110 research suggests that culture influences the development and impact of innovations (e.g. Geels and Verhees 2011;
111 Wirth et al. 2013; Turró et al. 2014). As an element of culture, narratives are the stories told by actors about events
112 and practices. These stories include their perceptions, beliefs, intentions and actions, and situate them in a certain
113 context. Actors exchange stories with each other to share and learn from one another, and to ask for
114 understandings, explanations and interpretations (Bruner, 1991; Czarniawska, 2000; Ingram et al., 2016; Wirth,
115 1996). Based on previous research by different authors (Heberlein, 2012; Spaargaren, 2011; Strengers, 2010;
116 White, 1992; Williams, 1979; Wirth et al., 2013), we briefly define narratives, values, norms and practices.
117 Narratives reflect the beliefs, values and norms that actors adhere to as well as their practices. Values refer to
118 criteria of desirability (e.g., preferences, moral obligations and goals) and reflect how individuals assess things
119 and experiences (e.g., as good or bad, wanted or unwanted) (White, 1992; Williams, 1979; Wirth et al., 2013).
120 Values offer directions for behavior and decisions and are general standards. In contrast, norms are specific
121 guidelines and specify how things should be done. Norms can take forms such as demands, rules, claims and
122 expectations. Values and norms are tightly interwoven and most norms emerge from values (White, 1992;
123 Williams, 1979; Wirth et al., 2013). Therefore, in the remainder of this paper, we refer to values as incorporating
124 both values and norms. Finally, our definition also includes practices, which are constituted from knowledge,
125 shared understandings, and material infrastructures (Spaargaren, 2011; Strengers, 2010). This focus on practices
126 helps us to understand why actors behave in a certain way, and how practices are organized within networks. The
127 reason to explicitly include practices is because cultural aspects are often reflected in the practices of organizations
128 because culture is also related to practical skills, knowledge and everyday routines (Fernández-Esquinas et al.,
129 2017). As a consequence, several cultural aspects of organizations could be overlooked when only analyzing
130 values. In contrast, narratives of agri-food networks can arise outside of the network and then be included in the
131 practices of these networks. While we recognize that culture also includes other elements besides those defined
132 here, such as beliefs, knowledge and social learning, we do not explicitly use these elements in our
133 conceptualization of culture. For example, beliefs are related to values and are also incorporated within narratives
134 and practices. Hence, we only consider the beliefs of respondents as far as they are part of their narratives and
135 practices (López and Cuervo-Arango, 2008; Stern, 2000).

136 When organizations in a network share the same culture, it is easier to agree on shared interpretations and to
137 develop shared understandings (Bruner, 1991; Ingram et al., 2014; Wirth, 1996). This is not to say that cultural
138 diversity is bad or undesirable, as diversity can help avoid cultural lock-ins. Cultural heterogeneity can be an
139 added value to a network and may also strengthen the capacity for innovation (Whelan, 2015). However, too much
140 cultural heterogeneity or opposition can also inhibit collective efforts and solutions. It is believed that a certain
141 balance and common understanding needs to be established (Hubeau et al., 2018, 2017a; Ingram, 2018; Whelan,

142 2015). Since sustainability is a normative, subjective and evolving concept (Grosskurth and Rotmans, 2005;
143 Hermans et al., 2011), there is not one possible pathway nor one "sustainable" system state of the agri-food system
144 (Hubeau et al., 2017a). We broadly conceptualize sustainability following the Brundtland definition
145 "Development that meets the needs of the present generation without compromising the ability of future
146 generations to meet their own needs" and recognize its context- and case dependency (WCED, 1987). Because
147 the shift towards sustainability requires collective efforts and actions, a shared culture can be seen as an essential
148 element of agri-food networks. It can generate unity within agri-food networks and supply a coherent belief system
149 upon which individual and collective actors can base their individual and collective actions (Raeymaeckers and
150 Dierckx, 2012; Tsai and Ghoshal, 1998).

151 We contend that the multilevel perspective (MLP) can offer a useful starting point to study the role of culture in
152 sustainability transformations as its practical applicability has already been demonstrated (e.g. Bui et al., 2016;
153 Geels and Verhees, 2011). Within the MLP, transformations are analyzed as an interplay among three levels
154 (Geels, 2011, 2002). First, the macro-level or "the landscape" is an exogenous environment that is largely beyond
155 the influence of regime and niche actors; examples are global policy measures or climate change. The meso-level
156 or "regime" forms the deep structure that ensures stability of systems, such as the conventional agri-food system.
157 More specifically, the regime refers to a set of rules, such as lifestyles and institutional arrangements, which serve
158 to reproduce the system by orienting the activities of social actors. Finally, the micro-level or "niches" refers to
159 new ways to address societal needs. Niches are novelties that deviate from the usual, often unsustainable, ways of
160 organizing (Geels, 2011).

161 The MLP is often used to study niche-regime interactions (Diaz et al., 2013; Ingram et al., 2015; Smink et al.,
162 2015) or niche formation processes (Hermans et al., 2013; Kemp et al., 1998). In previous studies, culture is
163 mostly studied as one of several elements influencing transformation processes (Erez and Gati, 2004; Whelan,
164 2015; Wirth et al., 2013; Wu and Pullman, 2015). In this paper, we explicitly focus on culture as an important
165 element to better understand and explain the transformative capacity and continuation of agri-food networks.
166 Although we believe that the MLP is useful in this regard, we do suggest some adaptations. We distinguish culture
167 as a diffuse concept, similar to how other researchers (Avelino et al., 2017; Haan and Rotmans, 2011) distinguish
168 a 'niche-regime' level, namely an additional level with characteristics from both the regime and niche levels. At
169 this level, agri-food networks could be established as stable niche-innovations or mini-regimes. In other words,
170 agri-food networks are characterized as small regimes parallel to the agri-food regime that contain elements
171 similar to the regime as well as elements contrasting the regime with regards to culture. This more diffuse
172 application of the MLP fits better with the study of the diversity of agri-food networks. Agri-food networks may
173 have very different objectives, e.g. development of new products vs. reduction of import dependency; initiators,
174 i.e., civil society and regime actors; actors, e.g. industry and research; or activities, e.g. food production or
175 reconnecting producers and consumers. Moreover, they may operate at different scales such as a network with
176 three organizations or a network with ten. This approach to the multilevel perspective and the position of culture
177 within it is used in other study areas in similar ways (Erez and Gati, 2004; Whelan, 2015; Wirth et al., 2013; Wu
178 and Pullman, 2015). Therefore, in this paper, we consider culture as a diffuse concept shaped by interactions and
179 relations within and among the different levels. For analytical purposes, we distinguish five levels of culture: the
180 culture related to i) the landscape; ii) the regime; iii) agri-food networks; iv) the network member-organizations;
181 and v) the individuals within the member-organizations (Figure 1). At the landscape level, we place dominant
182 societal cultures that are largely beyond the influence of any actor. At the level of the regime, the dominant culture
183 represents the culture that is shared within the dominant "conventional" agri-food regime. At this level, culture
184 can be translated into policy measures and public actions. At the level of the agri-food network, the shared culture
185 is developed through the interactions and relations of the network members (the focus of this paper). At the level
186 of the member-organizations, culture refers to each organization. Finally, at the level of the individuals, culture
187 refers to the cultural assumptions of individual people that are formed through their relationships and interactions
188 in everyday life. Among these five levels of culture, various interactions are possible. Figure 1 illustrates our
189 conceptualization of culture within the MLP. Our analysis includes different levels of culture. Mostly we focus
190 on the agri-food network culture and its relation to the agri-food system culture, namely the regime culture.
191 However, we also take elements of member-organizational and even individual culture into account (as in Fuhse
192 2009; Whelan 2015; Wu and Pullman 2015). We therefore aim to study culture in a holistic perspective.
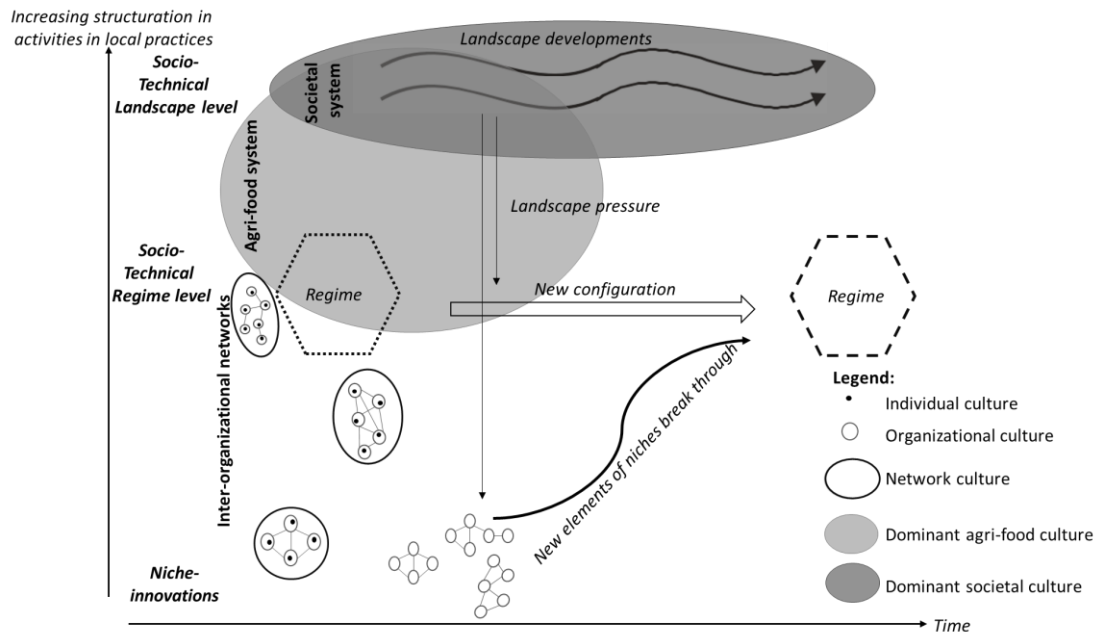
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Figure 1: Conceptualization of culture within multilevel perspective (adapted from Geels, 2011)

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196   3 Research methods

197 Case studies are rich in context, provide insights into specific cultures of selected networks, and help to understand
198 processes through which network culture influences the agri-food networks and their relation to the broader agri-
199 food system (Yin, 2003). Therefore, we have investigated the role of culture for the transformative capacity and
200 continuation of agri-food networks through an explorative comparative case study design.

201 During each step of the analysis, different forms of triangulation were used to validate the results (Golafshani,
202 2003; Koro-Ljungberg, 2008). Data triangulation was ensured by using data from different data sources such as
203 interviews with diverse network members, internal reports and emails. Methodological triangulation was
204 performed by the use of different methods to collect and analyze data, such as interviews, document analysis and
205 literature. Triangulation of researchers was guaranteed by conducting the research by at least two researchers who
206 both interpreted, analyzed and discussed the complete empirical analysis.

207   **3.1 Case study selection**
208 In the case selection process, our goal was to select a diverse set of agri-food networks operating in the same
209 context. Therefore, the selected cases range from small to large, from local to national, and from newly emerging
210 to well-established networks. This enabled a comparison of the role of culture across different types of agri-food
211 networks. To assure some degree of comparability, we used three selection criteria: i) all cases were located within
212 Flanders, the northern part of Belgium, ii) each of the selected agri-food networks originated as a reaction against
213 the business-as usual practice of the regime, and iii) the agri-food networks consisted of at least three organizations
214 aiming to achieve a collective goal such as a new product development. As all cases were located within Flanders,
215 the studied agri-food networks were subject to the same (legislative, political) context and interacted with the
216 same Flemish agri-food regime. As a result, the dominant societal and dominant agri-food system cultures were
217 similar and comparable for each case (see Figure 1). Specifically, the eight case studies[1] were *Visioning* (case 1),
218 *Local Soybeans* (case 2), *Sustainable Catering* (case 3), *LOKAAL* (case 4), *Belgium Savors* (case 5), *Farmers'*
219 *Co-op* (case 6), *Business-to-Consumer (B2C) Platform* (case 7), and *Organic Pesto* (case 8).

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[1] We use pseudonyms to protect the identity of the networks, organizations and individuals that participated in the research
(cfr. Borgatti and Molina 2003).

5

3.2 Multi-method case analysis

We conducted a case study analysis for each agri-food network separately. The case studies were multi-method case studies as evidenced by the wide range of employed methods such as interviews and document analysis. Two researchers discussed the interview guides prior to conducting the interviews, which improved the comparability of the data collected across the two research projects. Specifically, the study was based on 76 in-depth interviews between April 2015 and November 2016. Table 1 gives an overview of all interviews, the timing, the number and type of interviews. Other data sources included website articles, focus groups, partnership agreements, private e-mail conservations among the researchers and network members, media articles, information on social media, leaflets and brochures, policy documents of the network, internal reports and learning workshops.

Table 1: Name and objective of case study and type and timing of interviews

Case	Name	Objectives	Interviews
1	*Visioning*	Identification of shared transformation pathways in Flemish agri-food system and the development of strategic, action and communication plans	May 2015 - 9 in-depth interviews: Farmers' association (1) - Input supplier (1) - Industry association (2) - Producers (1) - Distributor (1) - Policy (1) - NGO (2)
2	*Local Soybeans*	Production, processing and consumption of locally-grown soybeans for food and feed	April and July 2015 - 9 in-depth interviews: Producers (2) - Processors (4) - Distributor (1) - Input supplier (1) - Research institute (1)
3	*Sustainable Catering*	Socially sustainable catering at a hospital including healthy, local foods and increasing visibility of local producers	April and July 2015 – 6 in-depth interviews: Caterer (1) - NGO (2) - Farmers' association (2) – Industry association (1)
4	*LOKAAL*	Local distribution of local and sustainable food in a short chain model and a community of producers and consumers	July 2014 to April 2015 - 2 exploratory interviews: NGO (1) – network coordinator (1) July to August 2015 - 15 in-depth interviews: network coordinator (1) – NGO (1) – Producers (8) – Consumers (2)- civil society organizations (3)
5	*Belgium Savors*	Global export of Belgian food products and exchange of related knowledge	January to May 2016 - 2 exploratory interviews: network coordinator (1) – producer (1) May to July 2016 - 6 in-depth: producers (6)
6	*Farmers' Co-op*	Securing the market position of horticultural producers, assisting to develop viable business by producing high quality products	January to May 2016 – 1 exploratory interview: produce auction (1) October to November 2016 - 17 in-depth interviews: produce auctions (4) – producers (11), umbrella organization (1) – research center (1)
7	*B2C Platform*	Shop, pick and delivery of local products to care-dependent consumers	April and July 2015 - 5 in-depth interviews: Farmers' association (1) - Logistical organization (1) - Advisors (1) - Distributors (1) - Regional office (1)
8	*Organic Pesto*	Valorization of organic surpluses into a new marketable product, a zucchini pesto	April and July 2015 - 4 in-depth interviews: Organic farmers' association (2) - processor (1) - Research institute (1)

The case study analysis provided insights into the shared culture within agri-food networks, namely how culture is developed and shared. In practice, by analyzing the stories of the individual network members, we gained access to the narratives, values and practices applied within a whole network. All interviews were transcribed to the letter ("literatim"; Franzosi 1998) and the data were analyzed in NVIVO using an inductive approach which combined open and axial coding (Strauss and Corbin, 1998). This allowed us to conduct a thematic analysis in which we focused on their *narratives*, or their stories about network objectives; their *values*, or what network members

237 believe to be desirable; and their *practices*, or processes and structures of network coordination. We followed the
238 common approach to thematic analyses of narratives by focusing on the content of the stories told and not on the
239 exact wording used (Riessman, 2001). Where possible, however, we did use the respondents' words to name the
240 values, norms and narratives. After analyzing the narratives and identifying the values and practices for each
241 respondent separately, we compared the stories within an agri-food network to assess the network culture that was
242 actually shared by the members. In other words, the shared culture and the strength to which members fully align
243 with this culture provided insights into the degree of similarity among the network members' narratives, values
244 and practices (Pachucki and Breiger, 2010).

3.3 Comparative analysis

247 The comparative analysis of the eight case studies is the main focus of this paper. The analysis consisted of two
248 parts: (i) a cross-case analysis to study the role of culture for the continuation of agri-food networks, and (ii) a
249 biaxial categorization to study the transformative capacity of agri-food networks. First, the role of culture in the
250 continuation of agri-food networks was analyzed by performing a cross-case comparison. We started by
251 comparing the content of the eight shared cultures and the processes through which the eight networks each have
252 developed their own shared culture. Using these insights, we analyzed how culture affects the functioning and
253 organization of the network.

254 Second, to understand which factors affect the transformative capacity of the cases, we performed a biaxial
255 categorization. This categorization was an iterative process: first the researchers categorized them (both separately
256 and together) and then discussed the categorization, repeating this process until a consensus was reached. The first
257 axis compared the agri-food network cultures with the agri-food system culture. The agri-food system culture was
258 divided into the conventional culture of the agri-food regime and the alternative culture of the agri-food niches.
259 We recognize that the alternative-conventional dualism does not reflect the complexity of the agri-food reality
260 (Morgan et al., 2006; Murdoch, 1997; Sonnino and Marsden, 2006). However, both in scientific literature and in
261 the context of the Flemish agri-food system, this duality is often used for analysis, communication and discussion
262 purposes. Therefore, we used this duality for analytical purposes while also recognizing and discussing the
263 complexity of the agri-food reality in networks. Specifically, we compared each case with the values and practices
264 of the conventional and alternative culture derived from literature (Table 2). The practices were split into (i)
265 decision-making practices for governing the network, and (ii) the type of production practices used to execute
266 agri-food processes. Since narratives reflected both values and practices, these were not included as a separate
267 element in the analysis. For some cases this analysis was straightforward because their shared culture clearly
268 aligned with the conventional or alternative culture, while other cases combined cultural assumptions from both.
269 The second axis categorized the level of system change. This level was divided into three sublevels: (i)
270 reproduction without system changes, (ii) potential transformation without system changes but the possibility of
271 it happening in the near future, and (iii) transformation in which either incremental or radical system changes have
272 occurred. The categorization was based on the results of the case studies and discussed among different
273 researchers.

274 *Table 2: Description of the conventional and alternative culture of the Flemish agri-food regime (based on a*
275 *literature review: Crivits, 2016; Mathijs and Relaes, 2012; Vanderplanken et al., 2016; Watts et al., 2005; Wilson, 2001)*

Cultural characteristics	Conventional culture	Alternative culture
Narratives	Stories about productivism and globalization	Stories about spatial and social embeddedness
Values	Industrialization Specialization Economic viability Efficiency	Reciprocity with nature Equity Locality Inclusion

| Practices | Intensive, industrialized farming techniques
Large-scale, export-oriented businesses
Traditional tandem of agricultural ministries and farmers' unions with a corporate relationship.
Limited involvement of conservation lobbies, NGOs and consumers in policy making.
Agri-food supply chain actors develop solutions to sustainability challenges (R&D solutions) | Less intensive and more agro-ecological practices
Local market opportunities
Traditional power structures are transformed to include conservation lobbies, NGOs and consumers in policy making.

Reciprocal relations among consumers, producers and other actors |

276

277 4 Case study description

278 The first case (Table 3), which we call *Visioning*, is a large network of actors from distinct backgrounds. The
279 network was mainly led by agri-food supply chain actors. Their objective was to identify shared transformation
280 pathways and to develop a strategic action plan to initiate a transformation towards sustainability. *Visioning* had
281 a "strongly shared" culture, meaning that the same culture is shared by most or even all members of the agri-food
282 network (Whelan, 2015). The shared culture was based on the narrative of collaboration, or taking collective
283 action to realize collective goals. Their focus was on changing production processes. The narrative included values
284 of collectivity by acting as one group and in the interest of the majority, a commitment by spending time and
285 energy on something you believe in, learning (as knowledge and skills were acquired by experience), and openness
286 as reflected by transparency and tolerance for diverse opinions and viewpoints. Sustainability was perceived as
287 ending the ongoing depletion of natural and human resources. These values were introduced in the network's
288 practices of using consensus-based decision making processes to formulate their vision, together with a strategic
289 action plan, shared ownership of the network, and multi-actor processes.

290 *Local Soybeans*, case 2, is an agri-food network of 10 organizations. Their main goal was to produce, process and
291 distribute locally-grown soybeans for food and feed without any loss of quality or nutritional value. The culture
292 was strongly shared among all network members. The shared culture was based on the narratives of local food
293 supply chain and sustainable production processes, which correspond with the shared values of commitment; in
294 other words, all members had the same goal, were willing to take risks and formed relationships in close
295 collaboration among organizations with specific rights and responsibilities. Other values were learning valuing
296 collaboration and experimentation as being more important than success. The value of 'local', where all
297 organizations are located in a certain region, is shared, as well as 'sustainability', which is perceived as preserving
298 natural resources and reducing import dependency. Trust is the last shared value. These values led to shared
299 practices such as consensus-based decision making, chain-wide collaboration, and a shared ownership of the
300 network.

301 *Sustainable Catering* (case 3) aims to transform a hospital catering service to become more sustainable. A
302 secondary goal was to increase the visibility of local producers by (re)connecting producers and consumers. The
303 shared culture was strong and based upon the narrative of local, sustainable catering with the shared values of
304 *community*, by connecting producers and consumers; *local,* by buying local, seasonal products; and *learning*, as
305 knowledge and expertise were exchanged. The value of *sustainability* was conceptualized as buying locally-
306 produced, fresh products and acknowledging the effort of the producers. *Trust* was seen as important, as the
307 members felt they could rely upon each other. These shared values led to shared practices such as lead governance
308 and chain-wide collaboration.

309 Case 4, LOKAAL, is a producer organization. The network was governed collectively by 10 organizations. The
310 primary objective of LOKAAL was to bring local and sustainable food products to local consumers. A second
311 objective was to communicate with consumers, governments and diverse media about the social and ecological
312 importance of sustainable food consumption and production, and to promote short food chains. Within LOKAAL,
313 all network members (and even external connections) shared the network culture. This strongly shared culture
314 was based on a shared narrative about short food chains, which includes values of *equity*, meaning a fair price for
315 producers and consumers; *equality*, in which one member has one vote; *local*, meaning within the same province
316 and community by building informal, reciprocal relations among producers and consumers. These shared values

ensured a sense of kinship and resulted in shared practices such as inclusive decision-making processes, shared ownership and localized production processes.

Case 5, *Belgium Savors*, is a network that unites 26 small and medium-sized enterprises (SMEs) that produce regional food products. *Belgium Savors* was governed in a rather top-down manner by the founder of the network, a traditional food supply chain actor. The founder limited the involvement of others in decision-making practices. The network's primary aim was to promote and market Belgian regional food products abroad. The secondary aim of *Belgium Savors* was to facilitate and enable the SMEs to develop a global market, as most of the affiliated SMEs did not have the capacity nor size to organize export on their own. The founder had developed the network culture and managed its dispersion top-down, which implied that the network members only passively shared the same network culture. The shared culture of *Belgium Savors* built on the shared narrative about the Belgian food culture. Included in this narrative are values of *tradition* with artisanal or time-honored production processes, *expertise*, and *passion,* with pride in the home country and its food. These values mainly pertain to the production practices of the network members.

Farmers' Co-op (case 6) is a cooperative that unites horticultural producers. Its aim was to enable its members to develop and maintain viable businesses by improving their market position when dealing with (inter)national buyers. As a traditional cooperative, *Farmers' Co-op* was owned by its members, a group of about 250 businesses, mostly farmers. The network was governed by a board of representatives who are selected from, and elected by, the network members. The shared culture of *Farmers' Co-op* was based on the narrative about the cooperative philosophy, which incorporated values of *collectivity* by acting in the interest of the majority; *equality,* in that each member had one vote, and *openness*, with a focus on transparency and tolerance of differing opinions. The values of equality and openness resulted in decision-making processes in which consensus was the norm. With regard to production practices, standardized, large-scale, industrialized processes were preferred.

Case 7, *B2C Platform* (Business-to-consumer platform) is a network that ceased to exist during the time of data collection. Their main objective was to shop, pick and deliver local products to care-dependent consumers. More specifically, the network aimed to develop a short supply chain for home delivery of fresh and processed products from local farms using cooled transportation. The network culture was based upon the shared narrative of short food supply chains and the shared values of local within a small region, learning while experimenting with new types of organization, and professionalism, namely the development of an economic feasible and efficient supply chain management. The practices were lead governance in which the network was mainly managed by one organization that coordinated the main activities and made decisions, and chain-wide collaboration. The shared culture was developed top-down and was weakly shared: most network members recognized the shared culture but did not translate it into practice.

Finally, case 8, *Organic Pesto,* is a network of seven organizations. The network stopped its activities during the two years of data collection. The network's main objective was to valorize organic surpluses of the production process into a new marketable product, namely an organic pesto. The culture was based on the shared narrative of organic production processes and organic product development. In addition, the most important shared value was exploration to find new ways of marketing products. The role of one lead organization was therefore complemented by attention for chain-wide collaboration. Because of this lead governance structure, the network culture was dispersed top-down and was only shared among a small subset of members who were closest to the lead organization. Some network members shared the culture while others opposed it. The culture was therefore weakly shared. Table 3 represents the network composition and the shared culture described by its narratives, values and practices of each case study.

Table 3: Network composition and shared culture within the case studies

Case	Network composition	Shared narrative	Shared values	Shared practices

1 *Visioning*	Farmers' associations (2) Input suppliers (6) Industry associations (2) Producers (19) Food processors (19) Distributors (6) Policy actor (7) NGOs (7) Researchers (7)	Collaboration to take collective action Focus on practice	Collectivity Commitment Learning Openness Sustainability	Shared decision making Network is owned by members Transdisciplinary process Sustainability experiments Consensus-based decisions
2 *Local Soybeans*	Producers (2) Processors (4) Input supplier Distributor Research institutes	Local food supply chain Sustainable production	Commitment Learning Locality Sustainability Trust	Shared decision making Network is owned by members Chain-wide collaboration Consensus-based decisions
3 *Sustainable Catering*	Caterer (9) NGO (2) Farmers' association Agricultural cooperative Industry association	Sustainable catering Locality	Community Locality Learning Sustainability Trust	Lead governance Chain-wide collaboration
4 *LOKAAL*	Producers (9) NGO (1) Suppliers (13) Consumers (+30)	Short food supply chain	Community Equity Equality Locality	Shared decision making Consensus-based decisions Network is owned by members Limiting the number of intermediaries Geographic network boundaries
5 *Belgium Savors*	Producers (26)	Belgian food culture	Expertise Passion Traditional	Lead governance Trust based on expertise Inclusion based on expertise & traditions
6 *Farmers' Co-op*	Producers (>250) Research (1)	Cooperative philosophy	Collectivity Equality Openness	One member-one vote Inclusive governance processes Consensus-based decisions Network is owned by members
7* *B2C Platform*	Farmers' association Logistics organizations (2) Advisors (3) Distributors (2) Producers (7) Regional office	Short supply chain	Locality Learning Professionalization	Lead governance Chain-wide collaboration
8* *Organic Pesto*	Farmers' association Organic farmers (10) Food processor Organic distributor Logistics manager Research institute Certifier	Organic agriculture New product development	Exploration	Lead governance Chain-wide collaboration

360   *Agri-food networks that stopped activities during the period of data collection

361   5 Results and discussion

362   This section presents our findings regarding the two research questions, namely (i) what is the role of culture in
363   the continuation of agri-food networks?, and (ii) does culture co-determine the transformative capacity of agri-
364   food networks? Further, we discuss our findings compared with other research and literature.

365   **5.1 The role of culture in the continuation of agri-food networks**

366   With regard to the continuation of agri-food networks, our analysis illustrated that a shared culture is essential for
367   agri-food networks to develop and continue. Specifically, we found that networks with a strongly shared culture
368   were more likely to continue whereas those with a weakly shared culture were unlikely to survive. Our analysis

369 revealed that culture is shared differently within the eight agri-food networks that we studied. In most cases, i.e.
370 in *Visioning* (case 1), *Local Soybeans* (case 2), *Sustainable Catering* (case 3), *LOKAAL* (case 4), *Belgium Savors*
371 (case 5), and *Farmers' Co-op* (case 6), we can speak of a strongly shared culture as a majority of network members
372 share and rely on the same narratives, values and practices. In other words, the majority of network members
373 internalized the network values and norms, related to the same narrative and acted accordingly. For instance, in
374 *Sustainable Catering* (case 3), all interviewees told similar stories about the objectives, possible solutions, values
375 and practices of the network. Also, in case 1 (*Visioning*), all network members defined 'collaboration' as the
376 collective effort of agri-food supply chain actors in order to achieve their common objectives acknowledging their
377 differences such as expertise and viewpoints.

378 In contrast, we found that emerging agri-food networks with weakly shared cultures did not continue as illustrated
379 in case 7 (*B2C Platform)* and case 8 (*Organic Pesto)*. Although other factors can also influence the discontinuation
380 of agri-food networks, in these cases there are strong indications that the lack of a shared culture caused the
381 network to discontinue. The network members clearly stated the lack of a shared vision, shared narrative and/or
382 shared practices as the main reason why they could not resolve certain challenges and difficulties. In these cases,
383 only a minority or a small subgroup of network members identified themselves with the shared narratives, values
384 and practices. For instance, within the network of *Organic Pesto* (case 8), only a minority of network members
385 shared the narrative of organic agriculture. This led to internal disagreements about which type of production
386 process needed to be developed. Because of these disagreements, the processor was unwilling to take the financial
387 risks that were necessary to become organic-certified as there was no guarantee that the future production would
388 require this investment. Although some studies identify cultural clashes as a driver for innovation (e.g. Crossley,
389 2015; Pekkarinen et al., 2011), the lack of an overarching shared culture within the agri-food network can also
390 prove to be a major shortcoming for the further development and existence of the network. Our results illustrated
391 that a cultural clash among member-organizations in new emerging networks leads to disagreements, conflicting
392 values and narratives and that conflicting practices result in the discontinuation of the network. This confirms the
393 observations of other researchers (Borch and Arthur, 1995; Ingram et al., 2015).

394 At the same time, a strongly shared culture may also have pitfalls. For instance, the enthusiasm and excitement
395 that often characterizes idea development and the initial stages of innovation journeys can erroneously give
396 members the idea that new network members immediately share the same expectations (McPherson et al., 2001).
397 Moreover, the absence of diverging perspectives and conflict may even cause collective blindness (Gu et al., 2008;
398 Janssen et al., 2006; McPherson et al., 2001). While a shared culture decreases the number of misunderstandings
399 and creates a mutual understanding among network members, cultural assumptions can be hard to 'unlearn' once
400 they are established. This can result in certain rigidities that reduce the network's responsiveness to change and
401 make it more difficult to reframe common expectations. This increases the risk of a cultural lock-in (Geels and
402 Schot, 2007; Kauffeld-monz, 2010; Roep and Wiskerke, 2010). In case 4 (*LOKAAL*), we observed such a cultural
403 lock-in. The shared culture emerged out of long-standing, dense, trust-based relations, but cultural homophily
404 made the network members blind to new opportunities and new information, and they became adverse to diverging
405 perspectives. To date, no major negative consequences have been observed, but in the long term, this lock-in could
406 hamper the development of the network.

407 Second, we found that inclusive values positively influence the network continuation. Table 3 illustrates that
408 although each network had its own specific culture and a different focus and goal, there were observable
409 similarities concerning narratives, values and practices. Values such as collectivity, commitment and trust seem
410 to occur more within continuing networks and thus seem to positively influence agri-food network continuation.
411 These values were geared towards uniting all network members; they indicated the belief that collective gains are
412 more important than individual benefits. For instance, in *Visioning* (case 1), the network members interacted and
413 collaborated with the aim of finding common innovation opportunities and undertaking collective action. In
414 realizing these objectives, they were guided by values of collectivity and commitment. As a result, they preferred
415 collective instead of individual solutions as well as decision-making processes in which each member had a say.
416 Furthermore, network members of *Visioning* expressed their commitment by investing ample time and energy in
417 the network with   no certainty of returns. For instance, several meetings were held to identify shared
418 transformation pathways without any guarantee that these would lead to concrete actions.

Trust also appeared to be important for continuation. In several cases, network members stated that investments such as time, energy, expertise, only made sense if they have trust in each other. Within networks that valued trust (case 2 – *Local Soybeans* and case 3 – *Sustainable Catering*), members explicitly relied upon each other, which resulted in the pooling of risks. As a consequence, network members were confident to take risks, as they believed that everyone acted in the best interest of the network and fulfilled their tasks accordingly. For instance, the farmers of *Local Soybeans* (case 2) took the risk to cultivate soybeans at field scale for the first time in Flanders. They stated explicitly that the trust among the network members gave them confidence to take this risk. Also, they felt that all the network members worked together to solve unexpected problems and challenges. In sum, we observed that certain values occurred to set aside competitive feelings and individual differences and to act in the best interest of the network. Our analysis is consistent with previous research (Fulmer and Gelfand, 2012; Gall and Schroder, 2006; McAllister, 1995; McPherson et al., 2001) in the sense that cultural similarity and certain shared values of partnership such as commitment, trust or collectivity can positively influence network continuation. It develops trusting relations, limits the chances of misinterpretation, improves understanding and enables network members to identify with one another. Previous research has also identified these values as success factors in the continuation of social innovations (Hubeau et al., 2017b; Hudnurkar et al., 2014; Luederitz et al., 2016; Schmid et al., 2016). Despite the obvious importance of continuously safeguarding an existing shared culture and shared values, at the initial stage of emerging agri-food networks, the development of a shared culture could be even more important to increase the chances of continuation (Rotmans and Loorbach, 2008). By developing shared narratives and making values explicit early on, conflicts and misunderstandings can be avoided.

Last, we found that the type of process taken to develop a shared culture had no impact on network continuation. Within the eight cases we identified two pathways of culture development. Network members could either co-develop a shared culture by interacting with each other through a collective process (cases 2, 3, 4, 6, 7, 8), as happens in shared participant-governed networks (Provan and Kenis, 2008); or network members could be taken up into a network with a predetermined shared culture. For instance, a top-down process by one organization (case 5) or by a small group of leading organizations (case 1) identified as lead-organization-governed networks (Provan and Kenis, 2008). LOKAAL (case 4) is a good example of network development through a collective process. Most of the network members already knew each other prior to the start of the network, which enabled them to co-develop a shared culture in a trusting environment. As a result, they were able to launch the network based on a clear and explicit vision. In contrast, the culture of *Belgium Savors* (case 5) was developed top-down by a lead organization. The lead organization developed a very clear vision for the network, its objectives and the desired culture, before including other network members. Network members were then taken up into the network based on their compatibility with the predetermined culture. No explicit influence of network development was found in relation to the continuation agri-food networks.

Overall, our case study analysis confirmed that the existence of a shared culture positively influences the continuation of agri-food networks. This positive influence was determined by both the extent of members sharing the network culture and the content of the shared culture based on the shared values.

5.2 Transformative capacity of agri-food networks

Here we discuss the impact of culture on the transformative capacity of agri-food networks by analyzing the interaction between the studied agri-food networks and the dominant agri-food system. In Figure 2, the result of the biaxial categorization is shown in a matrix. The vertical axis indicates whether the shared their main culture is more close to an alternative culture than to the more conventional culture of the agri-food regime. The horizontal axis indicates the level of transformative capacity of the agri-food network: reproduction of the dominant system, potential transformation, or transformation.

Culture	Level of change	Status quo	Potential transformation	Transformation
Conventional culture	Values	6		7
	Decision making process	6		1 2 7
	Production practices	6	5	2 7
Alternative culture	Values	4 8	3 5	1 2
	Decision making process	4 8	3 5	
	Production practices	4 8	3	1

Figure 2: Positioning of agri-food networks studied (for explanation of the numbering see Table 1) on two axes: vertical axis = alternative vs. conventional culture; and horizontal axis = level of transformative power of agri-food networks

Two agri-food networks, *B2C Platform* (case 7) and *Farmers' Co-op* (case 6) shared a culture similar to the dominant conventional culture of the agri-food regime with regard to their values, the actors involved in decision making processes, and the types of production processes. The main difference was that *B2C Platform* was a new emerging network that discontinued after 20 months, and *Farmers' Co-op* has been an established agri-food network for decades. In its emerging phase, *Farmers' Co-op* changed the conventional agri-food system by introducing a new type of organization, namely a cooperative. Today, however, *Farmers' Co-op* had no longer the intention to transform the agri-food regime and instead became part of it. Case 7 emerged as reaction against the current long supply chains. However, the *B2C Platform* only realized small incremental changes within the agri-food system, such as their successful lobbying for changes to the Flemish legislation regarding short supply chains. Prior to this change, the policy defined short supply chains as a direct marketing relationship between farmers and consumers. The *B2C Platform* successfully affected the redefinition of short supply chains in the policy, which now makes it possible to involve an additional intermediary for distribution in short supply chains such as a courier or postal worker. While this realization illustrated the transformative capacity of the agri-food network, this change might not be desired from another perspective, such as reconnecting consumers and producers. The similarity of the network's culture to that of the conventional regime resulted in changes that are aligned with the dominant agri-food system culture.

In three other cases - *Sustainable Catering* (case 3), *LOKAAL* (case 4) and *Organic Pesto* (case 8) - the shared culture aligned with the alternative culture of the agri-food regime concerning values, decision-making process and production practices. For instance, case 4 was strongly locally oriented and equity was a central value, case 3 involved farmers and NGOs in their decision making processes, and case 8 aligned with agro-ecological practices. Based on our analysis, we concluded that all these cases resulted in either a reproduction of or a potential transformation of the agri-food system. Cases 3 and 8 actively intended to transform the conventional agri-food system but so far have not succeeded. *Sustainable Catering* (case 3) aimed to transform the agri-food regime in the sense that local producers would be recognized and supply chains are shortened to reconnect the producers and consumers. The network members faced multiple challenges, however. For example, the caterer would like to connect producers and consumers by giving the producers a name and a face. Hence, the suppliers refused to be transparent about their producers, as they are afraid that this will undermine their own position in the supply chain. In other words, the broader agri-food network lacked a culture of trust. At the time of the analysis, no change had yet occurred but the network was still ambitious about their goal and still believed in the potential for success. *Organic Pesto* (case 8) also aimed to transform the agri-food system in the sense that yield surpluses and

498 imperfectly-shaped vegetables were also processed into valuable products and that the food industry was able to
499 start ad hoc production processes (in case of overproduction). However, case 8 stopped due to internal issues
500 before any change could be made (see above).

502 The other cases, *Visioning* (case 1), *Local Soybeans* (case 2) and *Belgium Savors* (case 5), were classified as mixed
503 or hybrid forms of culture. They were hybrid in the sense that they adopt the alternative discourse and values of
504 the alternative vision on the agri-food system, but the actors involved in the decision-making processes (case 1)
505 or the production practices resembled the dominant conventional culture (cases 2 and 5). The production processes
506 ranged from alternative (*Visioning*) to conventional (*Local Soybeans* and *Belgium Savors*). Two of these hybrid
507 types of culture (cases 1 and 2) did achieve an opening for small incremental changes, while case 5 had the
508 potential to change the conventional agri-food system. For instance, *Visioning* (case 1) developed a strategic action
509 plan with conventional actors who were trying to involve alternative actors such as NGOs. This resulted in the
510 formulation of actions with new types of production processes such as collaboration across the whole supply
511 chain, involvement of alternative actors in visioning processes, and a fair income for all agri-food supply chain
512 actors. The agri-food network of *Local Soybeans* (case 2) effected a change in legislation that approves new
513 pesticides for soybeans. In case 5, *Belgium Savors,* we observed that the conventional actors were important in
514 achieving these incremental changes by giving local SMEs a platform to export their local products outside the
515 conventional supply chain. In other words, in the cases studied here, networks with a hybrid culture had more
516 potential to realize changes to the conventional agri-food system because they can use their similarities with the
517 system to create an opening for change. This result confirms previous studies investigating other factors of niche-
518 regime interactions stating that niches are more likely to influence the dominant regime if some degree of
519 compatibility or a symbiotic relation exists with the dominant regime (Bui et al., 2016; Geels, 2011; Ingram et al.,
520 2015; Knickel et al., 2009; Smith, 2006). We therefore agree with other scholars who have identified the
521 importance of actors operating in the space between niches and regime (Berkhout et al., 2010; Diaz et al., 2013;
522 Smink et al., 2015; Whelan, 2015).

523 Despite the small sample of agri-food networks studied here, we did see some indication that hybrid types of agri-
524 food networks that include cultural elements of both the conventional and the alternative system had more
525 transformative capacity for creating incremental changes within the agri-food system towards sustainability
526 compared to agri-food networks that fully aligned with either the alternative or dominant agri-food culture. More
527 case studies are needed to confirm this proposition. Within our analysis, however, only incremental changes at
528 the margins of the conventional agri-food regime were observed. In other words, only gradual transformations of
529 the regime occurred through the involvement of new actors and the successfully embedding of their ideas in policy
530 measures and actions, which confirms Bui et al. (2016). This may also confirm the argument that a transition of
531 the agri-food system may require more radical change and a radically new culture (Avelino et al., 2017; Hermans
532 et al., 2013; Klerkx et al., 2010; Levidow et al., 2014; Smith, 2007, 2006). In the current analysis we did not focus
533 on the distinction between incremental and radical changes.

534   6 Conclusions

535 Agri-food systems are increasingly under pressure due to various challenges such as sustainability. Agri-food
536 networks arise as a reaction to those pressures. Because the role of culture within these agri-food networks has
537 been underexposed, we performed a cross-case analysis of eight case studies to improve insights and
538 understanding about the role of culture within the transformative capacity and the development and continuation
539 of agri-food networks. Culture was broadly defined as the combination of narratives, values, norms and practices.
540 Our case study analysis gave some useful insights into the cultural aspects of the interaction and interdependencies
541 between agri-food networks and the conventional and alternative regime.

542 First, regarding the continuation and development of agri-food networks, our findings confirmed that i) a shared
543 culture is an essential element; ii) inclusive values such as trust, collectivity and commitment positively influence
544 the strength of agri-food networks; and iii) the process of developing a culture has no influence on the strength or
545 weakness of a shared culture. Moreover, two agri-food networks (cases 7 and 8) ceased their activities during data

546 collection. The inclusion of two discontinued agri-food networks gave us the opportunity to compare the
547 difference in strength and content (i.e. type of values, practices and narratives) of a shared culture. We observed
548 that newly emerging agri-food networks (< 5 years) are less stable and more sensitive to cultural differences and
549 cultural clashes compared to more established agri-food networks. In more established networks, formal rules and
550 norms were more explicitly described. Second, regarding the transformative capacity of agri-food networks, our
551 findings revealed that hybrid types of culture have the highest potential to create changes in the conventional agri-
552 food systems and that the inclusion of regime actors or actors in the space between niches and regimes can
553 positively influence their impact and scale of change, which also confirms other research (Avelino et al., 2017;
554 Ingram, 2018; Smink et al., 2015).

555 Although our study only focused on culture - which we represent as a diffuse concept - we acknowledge that the
556 process to promote system change is more complex and generally non-linear. For instance, we do recognize the
557 role of social learning, experimenting and knowledge sharing as important elements of agri-food network
558 developments (Ingram, 2018; Knickel et al., 2009). Although studied learning or knowledge exchange were not
559 explicitly mentioned, they were included within the values and description of the agri-food networks (e.g. the
560 importance of learning as a shared value). Overall, our study illustrated the usefulness of devoting sufficient time,
561 resources and attention to the development of a shared culture when establishing, developing, governing or
562 participating in newly emerging agri-food networks.

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