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Juliette Young, Simon Calla, Lou Lécuyer

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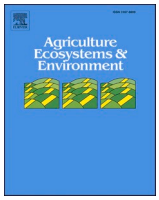

Just and sustainable transformed agricultural landscapes: An analysis based on local food actors' ideal visions of agriculture

J.C. Young *, S. Calla, L. Lécuyer

Agroécologie, INRAE, Institut Agro Dijon, Université de Bourgogne Franche-Comté, Dijon, France

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ABSTRACT

Societal and policy trends are leading to major demands on food systems, including a transformation towards more sustainable and resilient farming systems. Research is increasingly highlighting the importance of considering the landscape scale in such transformations, with the understanding that such an approach will require agricultural landscape design informed through trans-disciplinary approaches. Despite a number of sustainability transformations advocated in the scientific literature, there may, however, be very different views amongst actors of the food chain, from producers to consumers, over what such a transformed landscape should look like, leading to potential social conflicts and lack of progress towards transformative change. This has led authors to suggest a need to understand better the visions of a transformed agriculture from the perspectives of food system actors, including rural communities and farmers. This paper contributes to this debate by analysing stakeholder visions based on a case study in Bourgogne Franche-Comté (France) with three study sites involving: agriculture and water management near Auxerre, apiculture-agriculture in the Jura, and viticulture near Macon. Using the results of 55 interviews that included a 'miracle question' over what an ideal agriculture might look like, five ideal visions were identified: a recognised agriculture; a diverse agriculture; an anchored agriculture; a predictable agriculture; and a technological agriculture. Building on the differences and commonalities of the different visions, the results allow for the identification of areas of consensus, and also, where there are irreconcilable values and worldviews underpinning the views, how to address them. The process of visioning can be an important approach to promote greater understanding of different stakeholders' visions and transformation towards greater sustainability, especially when the resulting visions become the starting point of participatory processes and outcomes at the landscape scale.

1. Introduction

In light of its role in climate change (IPCC, 2019), biodiversity loss (IPBES, 2019), and social-ecological vulnerabilities (Bennett et al., 2021; Rasmussen et al., 2018), agriculture is increasingly considered as central to profound changes toward sustainability at multiple scales and organisational levels (Feola, 2015; Scoones et al., 2020), commonly referred to as "sustainability transformations" (Heyen and Wolff, 2019). A number of different pathways towards sustainability transformation have been suggested in the scientific literature, such as integrated pest management or organic agriculture, or the 'sustainable intensification of agriculture' that prioritises production whilst reducing the environmental impacts of agriculture. Such pathways have been promoted and/or critiqued, for example authors have argued that these pathways perpetuate business-as-usual (Altieri, 2012; Pimbert, 2015), or criticise them for their lack of consensus over meaning, lack of specificity regarding the rationale, indicators, farm types and scale for which they are proposed (Petersen and Snapp, 2015; Rockström et al., 2017).

This paper, rather than focussing on the pros and cons of sustainability pathways already identified in the literature, focusses on recent suggestions relating to the mismatch between scientific suggestions of transformed agriculture, and the concerns, rights and needs of people working and living in and with agriculture (Bennett et al., 2019; Kleijn et al., 2019; Velten et al., 2015; Young et al., 2022). The argument put forward is that transformations in agriculture should include the different views amongst actors of the food chain, from different contexts, with different knowledges, norms and values (Dentoni et al., 2017; Patterson et al., 2017) in order to develop different 'agricultural transformation' pathways (what is to be transformed and how?) as well as embracing the ambiguity of 'sustainable agriculture' (into what should

* Corresponding author.
E-mail address: juliette.young@inrae.fr (J.C. Young).

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it be transformed?) (Dentoni et al., 2017; Hassanein, 2003; Schulz and Siriwardane, 2015). From a very practical perspective, such an understanding could highlight the reasons behind current rejections by food system actors of approaches aimed at transformation (Young et al., 2022), as well as the identification of areas of consensus, and also, where there are irreconcilable values and worldviews, how to address them.

To answer those questions will require novel methods that allow researchers to engage with and integrate the understanding from a range of food system actors, including rural communities and farmers, that are currently often neglected in the transformation discourse (Young et al., 2022). One essential component will be the capacity of food system actors to imagine alternative, sustainable, and equitable realities, placing imagination as a prerequisite to just transformations (Moore and Milkoreit, 2020). Imagination in this context is defined as "the interdependent cognitive and comprehensive social processes that generate shared understandings of the present and visions of possible future states of the world" (Moore and Milkoreit, 2020, pp2). Different authors have highlighted an 'imagination gap' in current methodologies, that has, in turn, limited innovative ways of navigating and co-envisioning more sustainable pathways through an uncertain future (Bendor, 2018; Pereira et al., 2020). Scenario development, as an alternative to modelling that aims to predict what will happen in the future, is a potential method that explores potential future trajectories of a system through social imagination (Miller, 2007; Heugens and van Oosterhout, 2001). Scenarios describe how the future may unfold, based on coherent and internally consistent assumptions about interacting drivers of change (Millennium Ecosystem Assessment, 2005). However, some authors have suggested that many of the existing scenarios for biodiversity and ecosystem services follow an archetypal approach that does not make full use of the potential power of social imaginaries (Bennett et al., 2016). Co-producing visions can be an approach that can trigger, involve and elicit more imaginative processes. Visions are defined as "an ideal image of the future which is drawn upon ethical reflection and beyond the limits of actual political and economic constraints" (Gebhard et al., 2015, p 497). Visioning differs from scenarios in that visions are normative expressions (i.e., how the future should unfold, rather than how it could unfold) based on the aspirations and beliefs of participants (Colloff et al., 2021). By allowing people to be unconstrained by their current situation, visions can highlight what matters for them, including their underlying values and worldviews. Visions are also different from dreams, in that they can be a catalyst for action towards the image of the future, thereby identifying what people are willing to invest, and the trade-offs that might be needed, to reach their visions. As such, visions are an important first step in a transformation process, through the identification of what is desirable, and what needs to be done to make visions feasible.

Visioning is used in this research as a way to understand the transformation(s) that people living in or with agriculture would like to see –as a first step in a landscape-scale participatory process. In allowing people to think outside their situational context, visions can be valuable in an agricultural context by enabling stakeholders, for example farmers, to think beyond their individual context, i.e. beyond the scale of their farm, to wider scales such as the landscape or territory. Indeed, from an agricultural transformational change perspective, the importance of considering the landscape scale rather than in-field farming practices is being increasingly advocated (Jeanneret et al., 2021), with the understanding that such an approach will require agricultural landscape design informed through trans-disciplinary approaches (Landis, 2017; McKee et al., 2015) that consider stakeholder input and acceptability as well as reflexive governance at multiple scales (Marsden, 2013).

Taking this as a starting point, the paper starts with a presentation of the approach of developing visions based on interviews in a case study in France, before presenting the five visions held by food system actors, including their commonalities and differences, and the distribution of the different visions among interviewees. The results provide some answers to why current efforts to change agriculture can lead to social conflicts and lack of progress towards transformative change (Skrimizea et al., 2020; Lécuyer et al., 2022) and how to address these seemingly irreconcilable values and worldviews. We conclude with a reflexion on visions as part of a wider process of just and sustainable agricultural transformations.

2. Materials and methods

2.1. Case study

Our case study was based in the Bourgogne Franche-Comté (BFC) region in the east of France with three territories or study sites that display a range of types of agriculture (arable farming, apiculture and viticulture) and approaches (organic, soil conservation, reasoned) as well as farmers working as individuals or as part of cooperatives (Fig. 1). BFC covers 47,800 km^2, making it the fifth largest region of France, and of the least populated ones (59 inhabitants/km^2). Agriculture covers almost half of the BFC and includes arable land, grasslands, dairy and livestock (mainly cattle) production, viticulture, and polyculture. The total production value of the agricultural sector is €5.6 billion, 37 % of which is for wine production, followed by crop production (18 %), cattle production (14 %) and dairy production (13 %) (Agreste, 2019).

Study site 1, around the towns of Dole, Besançon and Vesoul, centres around beekeepers and (other) farmers in a context of dominant polyculture-livestock. BFC is the 5th largest beekeeping region in France with over 4000 beekeepers (professional and amateurs) and 105,000 hives (Agreste, 2019). Study site 2 is around the Auxerrois water catchment area. The area includes many arable farms, with farmers practicing organic farming, soil conservation agriculture and conventional agriculture with agri-environmental measures (Calla et al., 2022a). Study site 3, around the towns of Chalon-sur-Saone and Macon, focusses on viticulture which is the main production activity. This area has developed both organic and traditional viticulture and operates both as individual vineyards and cooperatives.

2.2. Interviewee selection

Based on a grey literature review and initial exploratory interviews with key regional actors, three collaborators, one for each study site, were identified (see Calla et al., 2022b for more detail on this process). These were organisations in each case studies that were considered by regional actors as being central in terms of the case study dynamics. Once these collaborators identified potential interviewees, a snowball sampling approach (where interviewee suggest others, and so on) was used to reach more interviewees. Snowball sampling was useful in gaining access to less well represented groups such as farmers – facilitating the identification of interviewees and initiating contact. All interviewees were engaged in, cared about or were directly impacted by agricultural practices in the study sites. Interviewees represented a diversity of interests and socio-cultural aspects within (and across) the three study sites and included individuals who felt marginalised from decision-making processes (often at the EU or national scales) affecting local farming practices. It is important to highlight that the aim of this sampling strategy was not to seek a representative sample, but rather hear from a group of people reflecting a broad range of perspectives and views, especially from those groups that are often not heard in public discourses.

The profiles of the interviewees are summarised in the Supplementary Material (Box S2). A total of 55 interviews were filmed from July to October 2020: 21 interviews for study site 1, 17 for study site 2, and 17 for study site 3 (see Table 1). Considering that the appropriate sample size in qualitative research is determined by data saturation (Patton, 2002), these interviewees were found to be sufficient for the needs of each case. Our sample was heavily biased towards men (with only 12 women), with an average age of 50 (with 25 interviewees aged between 18 and 49, 15 being over 50, and 5 with no information). The interviews

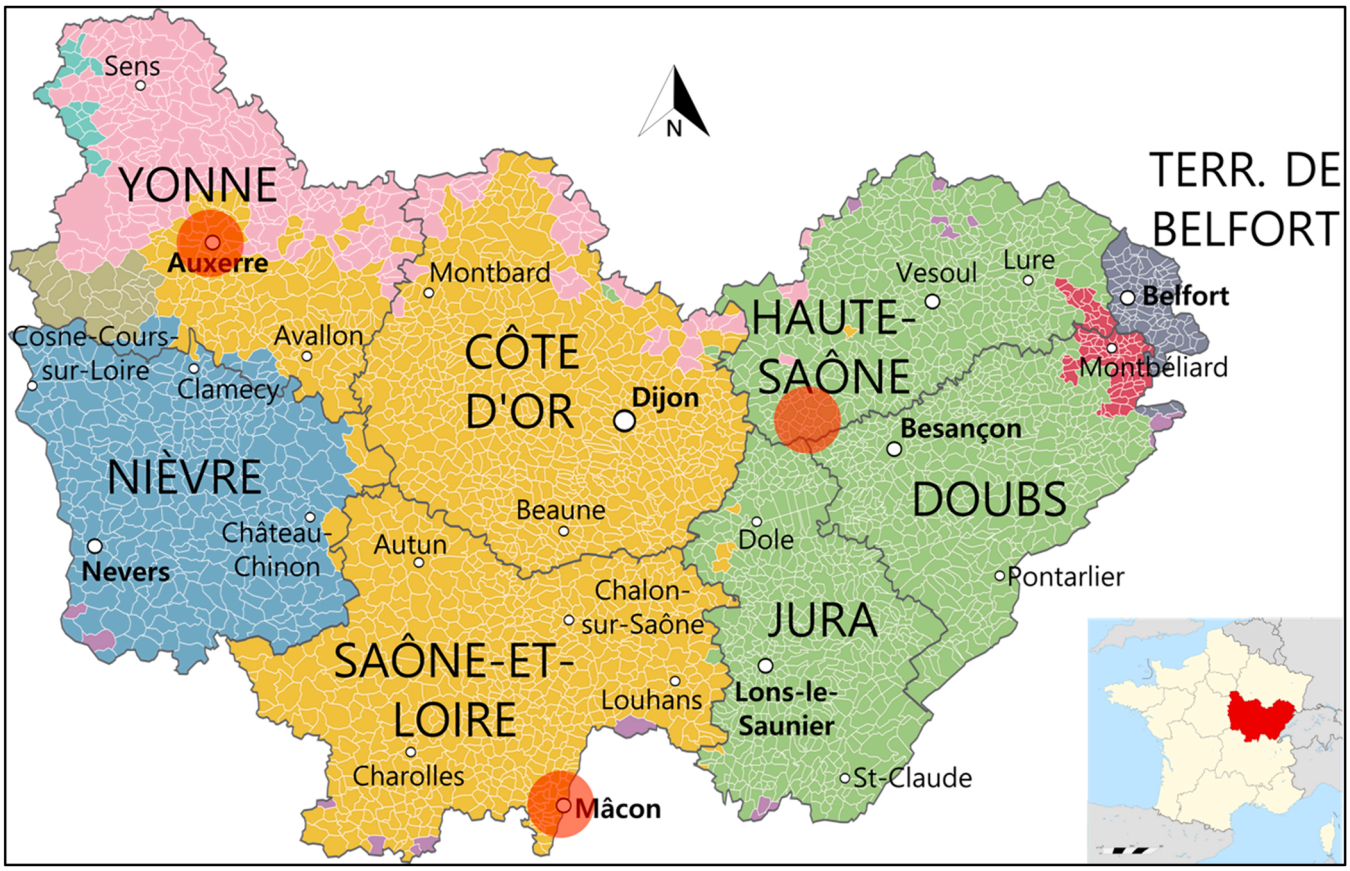

Fig. 1. Map of Bourgogne Franche-Comté region of France and the administrative departments, with the locations of the three study sites (red dots). Source: Authors.

Table 1
Codes used to identify interviewees in the three study sites. The first part refers to the occupation of people we interviewed (Tech for Technician/Consultant; Bee for beekeeper; Far for arable farmer; Wine for wine producer; Elec for elected official; and Asso for associative representative) – these are numbered sequentially. The second part refers to the study site (Study site 1, 2 or 3).

Code	Occupation	Study site	N
Tech1/S1 to Tech5/S1	Technicians/Consultants	Study site 1	5
Bee1/S1 to Bee11/S1	Beekeepers	Study site 1	11
Far1/S1 to Far5/S1	Arable farmers	Study site 1	5
Tech1/S2 to Tech6/S2	Technicians/Consultants	Study site 2	6
Far1/S2 to Far7/S2	Arable farmers	Study site 2	7
Wine1/S2	Wine producer	Study site 2	1
Elec1/S2 to Elec2/S2	Elected official	Study site 2	2
Asso1/S2	Associative representative	Study site 2	1
Tech1/S3 to Tech3/S3	Technicians/Consultants	Study site 3	3
Wine1/S3 to Wine7/S3	Wine producers	Study site 3	7
Asso1/S3 to Asso6/S3	Associative representatives	Study site 3	6
Elec1/S3	Elected official	Study site 3	1
			55

lasted for an average of one hour each and were conducted in French. The interviews were carried out with ethical clearances obtained and prior consent given.

2.3. The miracle question and its analysis

The research followed a research design aimed at collecting qualitative data through an integration of methods consisting of filmed interviews and workshops (Calla et al., 2022b). Interviews were carried out with stakeholders to understand discourses around agricultural transformation using a semi-structured interview guide – i.e., the questions were all asked, but often in a different order or with additional questions to supplement answers, depending on each interview (see Supplementary Material, Box S1) (Young et al., 2018). As part of the filmed interview, interviewees were asked a 'miracle question' (de Shazer, 1985). The miracle question allows a shift in how interviewees think, allowing interviewees to imagine a reality and bring it to life through solutions they can implement (de Shazer et al., 2007). The miracle question was asked after a few more general questions, to ensure that interviewees were comfortable with the setup of the interview. The question was introduced by interviewers as a slightly unusual one, and asked in the following way:

> *"Imagine that, after your normal working day, you go to bed and during the night a miracle happens that results in a transformed and ideal agriculture. The slight oddity is that no one tells you that the miracle has happened. How do you know this miracle has happened? What does the miracle look like?"*

The transcriptions of the interviews were corrected by the authors and imported into New NVivo (QSR International Pty) software for analysis. The interviewees' answers to the miracle question were analysed using a grounded theory approach (Glaser, 1992), where the ideas or concepts emerge from the data rather than being pre-determined from existing literature or theory. The transcripts were analysed by the authors, breaking down the data and coded according to the ideas and concepts identified. To mitigate individual researcher bias and increase consistency, multiple authors coded the same transcripts independently (inter-coder comparison) until an acceptable level of agreement was achieved (Landis and Koch, 1977).

Commonalities and differences were analysed according to key themes identified in the literature related to sustainable agricultural transformations, namely the purposes of sustainable agriculture (Caron

et al., 2018), level of transformation (cultural, structural, relational, individual) (Skrimizea et al., 2020; Young et al., 2022) and relationships to nature (Silvasti, 2003); but also themes that emerged in our data repeatedly including links between the visions and the past. Distributions of visions were analysed by crossing the characteristics of the narratives proposed by the actors we met with the case study, the profession or the type of agriculture practiced. More specifically, the percentages presented in the tables below refer to the number of times a given cross-reference appears in our corpus. This type of analysis was chosen as it seemed the most appropriate in giving an account of what our interviewees considered important and why. Finally, it should be highlighted that interviewees sometimes associated themselves with several ideal visions. Therefore, because the coding work was done in such a way as to identify all the elements that make up the different narratives, the same individual can be found in several ideal visions, and these are not necessarily exclusive of each other.

3. Results

The "miracle question" worked well in the majority of interviews (52 interviews), with only 3 interviewees either not able, or choosing not to answer the miracle question. Following the analysis, the visions of an ideal agriculture that emerged from interviewees' answers to the miracle question were as follows:

- Recognised agriculture: A fulfilled, valued and recognised agriculture, including better understanding of agriculture and its societal value, institutional support, and productive agriculture, "*that farmers be proud of their profession*" (Wine6/S3);
- Diverse agriculture: Smaller, more diverse and respectful agriculture, including an agriculture more in tune with the environment, "*alive in its diversity*" (Bee9/S1);
- Anchored agriculture: A more localised agriculture, including improved relationships between neighbours, "*the link between farmers and the rest of the population is restored*" (Tech3/S1);
- Predictable agriculture: An agriculture with ideal or predictable environmental conditions, "*a climate that is always the same*" (Wine7/S3); and
- Technological agriculture: An agriculture that builds on scientific and technological inputs, "*science is the ideal*" (Bee1/S1).

3.1. Recognised agriculture

According to many interviewees, an ideal vision of agriculture was one where farmers were recognised and valued by society for their products, and for the way they produced these. For one wine producer, a way of achieving this could start simply with increased sales and recognised quality of his wine "*one morning I could come here and there would be no more wine to sell, it would all be sold. […] our wines are really known worldwide and are recognised for their quality and that we don't have any sales problems and that we are established in the long term*" (Wine2/S3). For other farmers, this recognition came from a general need for greater financial security for their work "*the miracle in agriculture, well, it would be that all the farmers in France earn their living. That there be no more suicides in agriculture, that there be no more families torn apart, that there be no more inheritance problems, that there be no more agri-bashing. That farmers be proud of their profession, and be proud to pass it on to their children, to their wives, to their husbands […] that they not be ashamed of their profession, that they not be ashamed of not being able to feed their children properly. That they could live with dignity from their work: that would be the miracle I think that would happen in France*" (Wine6/S3). As part of the above, the farmer highlights a number of key issues he sees currently linked to poor remuneration, including mental health and social conflicts between farmers and between farmers and other sections of society, leading to a loss of dignity and pride in their work and profession. These pressures were so strong for some farmers interviewed that they currently felt trapped in the current situation and an ideal situation would be one where they felt free: "*I'm liberated. That's what it's all about, that the general public recognises that we make quality products, that we don't do just anything, that we spend a lot of time working. It's a permanent concern to make quality products. And then remunerative prices, which is what we deserve*." (Far2/S2).

A farm advisor expressed this as a very simple wish, of seeing "*a farmer walks past my windows, he's smiling, you can see that he's happy to do his work, that this day will bring him money to support his family*" (Tech3/S1). Another saw an ideal agriculture where "*there would be more happiness around me, it seems to me, that people would be smiling more, more cooperative, more willing to share the products they produce themselves, because we all have different interests between those who make bread, those who make honey*. […] *I would observe something more fulfilling, happier, brighter than what we are experiencing today, that's it*" (Bee9/S1). For some farmers, such a valued and recognised farming needed the support of institutions that, in the first instance, listened to the concerns and constraints of farmers: "*That would be good. It's true that, yes, this person* [from the departmental directorate] *would come and walk around the fields with us, rather than making three clicks on the computer. That would be nice*." (Far4/S2).

3.2. Diverse agriculture

A second vision of agriculture was around a smaller scale agriculture more respectful of its surroundings. A first component was the need for smaller and more diverse farms. For one interviewee, the ideal agriculture was one where landscapes were completely transformed "*the first thing that jumps out at me is the landscape, with hedges, either on the edge of the plots, maybe smaller plots. In any case, it's really a modification of the landscape*" (Tech 1/S2). The theme of smaller fields was recurrent, and was not necessarily linked to a return to the past, but a re-adaptation to counter current challenges such as climate change and the changing social make-up of farming, with increasingly large farms to increase the potential for profits. The size of farms was also linked to diversity of crops and mixed farming systems. For one interviewee, the ideal agriculture was one with "*smaller fields and more products. We have to stop having 500 ha fields of wheat for productivity reasons. We need to grow thirty hectares of wheat, thirty hectares of rapeseed, thirty hectares of maize, flax or whatever*" (Asso3/S3). The increased diversification was also highlighted by another interviewee, who argued that "*we wanted to standardise agriculture, I think, and in fact agriculture must be diversified. Not everyone can produce the same thing everywhere and we have to be able to readapt agriculture to each territory and to each farmer*" (Tech2/S1).

In addition to a greater diversity of crops, adapted to each area, other interviewees highlight more biodiversity in farming with "*trees in the middle of the fields and hedges, and animals in the fields, and no big bare expanses, with bare earth and, there you go, grassland. It would be a bit like the Garden of Eden, if you like*" (Bee5/S1). For another, she pictured "*insects, birds, birdsong, frogs, flowers. flowers everywhere*" (Bee3/S1). Other highlighted the vision of more biodiversity, linked to greater productivity and greater self-regulation: "*I would like it to be where biodiversity can regain its place in our system. So, when I open the shutters there's a lot more greenery, vegetation and as a result, there's more verticality, there are more trees. There's more noise* […], i.e. *more bird noise. You can hear the* [bee] *foraging several metres away and finally, in fact, as you get closer, you can see that the bees are in whole fields of flowers. Flowers that are actually used by farmers. So there are a lot of legumes. There are many crop associations, with basic crops: cereals, barley,* etc. *I call the beekeepers, and they tell me that honey production is exploding since this morning.* […] *And then, finally, in the evening, the farmers say that there is a little less production, but they have also seen fewer pests. So we can imagine that in an ideal world, there is self-regulation*" (Tech1/S1).

This did not, however, mean a return to the past in the eyes of many interviewees. Indeed, one farmer argued that "*we've often been accused of*

wanting to return to the agriculture of the Middle Ages, that's not our vision in fact, we want to return to an agriculture that is respectful of the environment with the means we have today, that is to say technical and technological means and all the rest" (Tech3/S2).

This transition towards greater diversity in crops, the landscape and biodiversity required a rethink in terms of the framing of nature, as an ally rather than an enemy, and a rethink of the relationship between the human and non-human in agricultural landscapes according to some interviewees. One interviewee argued that the ideal vision would mean getting "*back to a little bit of peace with the living, the whole dimension of life* […] *from the microscopic to the macroscopic. It can affect many, many, many things*" (Bee9/S1). For another interview, this meant a radical change in the current structure: "*we have to* […] *put man back in his place and not on top of a pyramid, but in a global system, in our planet, on the soil, on the environment*" (Far4/S1).

3.3. Anchored agriculture

A third ideal vision emerged around a more localised agriculture. Components of this vision included an emphasis on rebuilding the social links in the countryside, with more farms and farmers, and a more dynamic rural life. One interviewee imagined a situation where "*I have neighbours who are farmers, more of them, who take their children to school, in the next village or almost in the village because there are more children, and so we've recreated classes in the countryside"* (Far3/S1). This link between rural inhabitants is also mentioned in terms of links between farmers, with one famer emphasising a greater collaboration "*And then I'll meet my neighbour or meet three or four guys who come to help me or who ask me if it's possible to do something in a corner of the farm. And so this could lead to meetings, perhaps each one managing his own little part of the estate and then we meet regularly to organise the work, to find out where things stand, who needs a hand, who is up to date and who is going to go and sell or deliver to the shop and then carry on with the projects for transformation or other projects together"* (Far1/S2).

Another component of this localised agriculture vision was shorter supply chains, with more food produced and consumed locally: "*I see people going to the village square, where there is a market with about ten producers, the local farmers who bring their products, their cheeses, their meats, their vegetables, which the local consumers come to buy*" (Far3/S1). This aspect of shorter supply chains was seen as closely linked to the reconnect between farming and other members of society: "*I can see my neighbour fetching his milk can from the farm and preparing vegetables for lunch that he got from his basket from the village market. It's also the social and economic aspect that I would put forward, because it's one of the major problems today, that the farmer makes a living from his job and that the link between farmers and the rest of the population is restored*" (Tech3/S1).

3.4. Predictable agriculture

A fourth vision revolved around an agriculture in which the climate was ideal, "*that it rains and that it's sunny when we need it*" (Far2/S1), and fewer meteorological hazards such as hail and frost: "*a climate that is always the same: never hails, never frosts, never heats up early in the year*. […] *It's the beginning of paradise*" ((Wine7/S3).

However, all interviewees acknowledged what one interview saw as "*the danger that is coming,* i.e. *climate change, water scarcity, food issues*" (Tech1/S2). The vision therefore entailed not being "*subjected to climatic conditions*" especially when "*in complicated regions like mine, we are immediately affected by the slightest disturbance*" (Far3/S2). One interviewee summarised his ideal agriculture as one where "*global warming would simply no longer be there* (…). *That we have seasons that resemble seasons, that we have no more excess heat like we have, no more snow in winter, no more excess water, well that would be quite good. For the whole planet I mean, not just for us*" (Far2/S1).

Other interviewees were already thinking of management responses to climate change, for example growing different species, and moving towards different practices, including agroforestry: "*I would like to see trees planted in the fields. I would like agroforestry. It works in the Midi and we soon have the Midi climate*. […] *I think we need to transform our fields with rows of trees, which shade the crops we're growing at the moment. It would be nice if my plain was covered with trees, deciduous trees of course. The leaves fall, fertilise the soil, there are bugs, it provides shade and it fetches water deep down with the roots, so that's good*" (Asso1/S2).

3.5. Technological agriculture

A final ideal vision of agriculture was built around inputs from science and technology. As one interviewee put it: "*the ideal is research and development. Science is the ideal. The ideal is science and means, because answers will have to be found, because nature is not a heavenly world*" (Bee1/S1). Most of the inputs into this vision were linked to pest and weed management. For a wine producer, his ideal vision was that alternatives would be found to pesticides: "*a major step would be to no longer treat, because we don't like it*" (Wine4/S3). This was reflected in the words of a beekeeper, whose ideal was that "*they have found a miracle product that will treat everything without harming the bees*" (Bee10/S1). One interview was optimistic that technological advances would be able to help reach this vision: "*the ideal way to manage it would be technology. Yes, sprayers that can see the weeds, destroy them, just the weeds and not the rest. I think we'll get there. In a few years, but it will come*" (Far2/S1).

3.6. Commonalities among and differences between the visions

The five visions identified shared certain commonalities. For example, all interviewees agreed on the main objective of agriculture being the production of food for human populations (no vision reflected a landscape with no agriculture or for other purposes such as the production of energy). Because it is primarily shared by all visions, this point has been excluded from our summary (see Table 2), the objective of which is to show the existence of nuances – more than radical opposition. The main other commonalities are as follows:

- Concerning the secondary objective of agriculture: the "Recognised", "Predictable" and "Technological" visions have in common the focus on farmer wellbeing; "Diverse" and "Technological" come together around effects in environmental results; and "Anchored" aims above all to develop local relations.
- Concerning the level of transformation: "Diverse", "Predictable" and "Technological" believe this should go through the structural level, while "Recognised" and "Anchored" are focussed on the cultural and relational level.
- Concerning the relationship to nature: "Predictable" and "Technological" come together around the idea that nature entails constraints imposed on individuals; while "Recognised, "Anchored" and "Diverse", respectively express that farmers should be recognised as people who nurture nature, nature is a living space, and nature is an ally.
- No visions shared the same relationship to the past
- Concerning the links with the transition pathways, we generally observe two trends. The first, which would consist of a systemic restructuring, brings together the "Recognised", "Anchored" and "Diverse" visions; and the second, which would pass through an adaptive change driven by technology, regroups the "Predicable" and "Technological" visions.

3.7. Distribution of identified visions

Among the five visions drawn from our analyses and presented above, those which were most often developed were "Recognised" (38 %) and "Diverse" (35 %). The viticulture case study reflects the tendency observed among the three case studies, but we observe a clear difference between the case study on beekeeping, where the "diverse" vision is

Table 2
Commonalities and differences among the 5 ideal visions of agriculture.

Visions of agriculture	Recognised	Diverse	Anchored	Predictable	Technological
Secondary outcome or purpose	Farmer wellbeing	Environmental outcomes	Local relationships	Farmer wellbeing	Environmental outcomes and farmer wellbeing
Major level of transformation	Cultural	Individual and structural	Relational	Structural	Structural
Relationships toward nature	Farmers must be recognised as people who nurture nature	Nature as an ally and need to accept inconveniences	Nature as a space to live and thrive	Nature as a set of constraints imposed on individuals	Nature as a set of constraints imposed on individuals
Perception of the past	Farmers better represented in the population	Complementary agricultural activities promoting the balance of the environment	Proximity and link between the inhabitants of rural worlds	More regularity, fewer hazards	Past as a time of hardship and a lack of knowledge
Link to transition pathways	Innovative or systemic re-structuring	Innovative or systemic re-structuring	Innovative or systemic re-structuring	Technology-driven adaptive change	Technology-driven adaptive change

mainly present (44%) whereas the dominant vision in the water management case study is "recognised" (53 %) (Table 3).

Such a distribution is also found when we look at the visions developed by respondents according to their occupations. Thus, the "recognised" vision is deployed more by arable farmers (47 %) and wine producers (60 %) while beekeepers are a majority to describe a "diverse" agriculture (53 %) (Table 4). It is also interesting to note that we find this dichotomy between, on the one hand, elected officials who seem more concerned with issues of "recognised" agriculture (100 %) than association representatives for whom it is above all important to develop a "diverse" agriculture (64 %). Finally, these two visions are found in almost equal proportions in the interviews with technicians.

To finish, because the incentives given to agriculture to become more sustainable primarily concern the farmers, we also wanted to know if the latter developed the same visions according to their use of pesticides. From this point of view, we again found the dichotomy between, on the one hand, an ideal vision essentially revolving around recognition among farmers using pesticides (42 % for conventional farmers and 67 % for those engaged in soil conservation), and on the other, an ideal vision focused on diversity among farmers engaged in organic farming (43 %) (Table 5).

4. Discussion

Through the use of a miracle question as part of a semi-structured interview with 55 respondents, we identified five visions of an ideal agriculture: Recognised, Diverse, Anchored, Predictable and Technological – thereby adding alternative narratives to the dominant production-oriented ones (Skrimizea et al., 2020; Pereira et al., 2018; Raudsepp-Hearne et al., 2020). The five visions were pathways towards an ideal agricultural system, as identified by interviewees – with no prompting from the interviewer.

The work of collecting and analysing visions was used as a first step of a participatory process: the visions were shown as a film during workshops with local stakeholders and formed an opportunity to build a connection and understanding between local actors (Pereira et al., 2019; Westley et al., 2019; Wyborn et al., 2020), and form a starting point for dialogue on transformative change beyond individual farm-level scales (Calla et al., 2022b). The visioning process, as proposed in this paper, can therefore be used by practitioners more widely as a first step in landscape-scale participatory processes, allowing landscape level food system actors to imagine an alternative future, building on collective memories to select what they wanted to keep or change, and then to work together on commonalities while still recognising and exploring differences. Each of these opportunities of visioning are unpacked below, including some of the limitations of the approach.

Table 3
Visions across the different study cases.

Study cases Visions	Beekeeping (n = 21)	Water management (n = 17)	Viticulture (n = 17)	Total (n = 55)
Recognised	19 %	53 %	40 %	**38 %**
Diverse	44 %	26 %	36 %	**35 %**
Anchored	17 %	12 %	16 %	**15 %**
Predictable	11 %	7 %	4 %	**8 %**
Technological	9 %	2 %	4 %	**5 %**
Total	**100 %**	**100 %**	**100 %**	**100 %**

The process of visioning allowed landscape scale food system actors to tap in the power of imagination. By keeping the question completely open, and talking about 'an ideal agriculture', interviewees were free to interpret this in any way they liked, and develop their capacity to use their imagination as future thinking, or "prospection" (Moore and Milkoreit, 2020). The miracle question was useful in this regard, by allowing interviewees to think outside their usual framework (de Shazer, 1985), identifying pathways that were realistic, often very detailed and spanning different scales (from individual to relational, structural and cultural transformations) (Calla et al., 2022b). As such, the miracle question allowed interviewees to discuss the vision based on different aspects of an ideal agriculture, including individual changes (rethinking their link with nature), improved relationships, understanding between and recognition from food system actors (farmers, neighbours, consumers, policy-makers), structural support (e.g. scientific or technological input, institutional support), and cultural shifts (achieving a balance between productive agriculture and a smaller scale, more diverse and localised agriculture) (Young et al., 2022). It is important to highlight here a potential limitation of the process of visioning when using it as a practical tool to work toward transformation, which is the risk that it leads to utopian visions. In other studies, the decoupling of visions with the actual present led people to disconnect from visions, whether the latter were overly optimistic or pessimistic (Moore and Milkoreit, 2020). However, in this study, only one vision was considered utopian (the predictable vision, in which the wish is to control the climate) and was used instead to ask what would be the best pathways to adapt to those aspect that could not be changed. Moreover, transformation processes seek to create systemic change that require decisive breaks from past and present states that might be considered utopian by some actors (e.g., the end of the liberal states or the end of the industrialised agriculture). Their creative dimension instead is likely to stimulate new social and political dynamics (Cossette-Trudel, 2010; Riss, 2021), allowing actors to more easily imagine those possible futures and to invest in them.

Another practical advantage of visioning as part of a participatory process was the potential for building on collective memories to select what landscape scale food actors wanted to keep or change. Previous authors have identified cognitive barriers as a limitation of visioning, i.e. that people focus only on what is feasible or possible within their context (present or past), thereby perpetuating the status quo, as a challenge in visioning processes (Pinto-Correia et al., 2014). This may be explained to some extent by recent studies that show that constructing scenes of the future or new experiences (Gilbert and Wilson, 2007; Szpunar et al., 2018; Szpunar et al., 2014) share a common brain mechanism with

Table 4
Visions across different interviewee categories.

Occupations Visions	Farmer (n = 12)	Beekeeper (n = 11)	Wine producer (n = 8)	Technician (n = 14)	Association representative (n = 7)	Elected official (n = 3)	Total (n = 55)
Recognised	47 %	18 %	60 %	39 %	20 %	100 %	**38 %**
Diverse	9 %	53 %	12 %	42 %	64 %	0 %	**35 %**
Anchored	18 %	12 %	16 %	17 %	12 %	0 %	**15 %**
Predictable	21 %	6 %	8 %	3 %	0 %	0 %	**8 %**
Technological	6 %	12 %	4 %	0 %	4 %	0 %	**5 %**
Total	**100 %**	**100 %**	**100 %**	**100 %**	**100 %**	**100 %**	**100 %**

Table 5
Visions across different agriculture types.

Type of agriculture Visions	Conventional farming (n = 20)	Organic farming (n = 6)	Soil conservation farming (n = 3)	Total (n = 29)
Recognised	42 %	27 %	67 %	**38 %**
Diverse	18 %	43 %	0 %	**26 %**
Anchored	13 %	23 %	0 %	**16 %**
Predictable	16 %	3 %	33 %	**13 %**
Technological	11 %	3 %	0 %	**8 %**
Total	**100 %**	**100 %**	**100 %**	**100 %**

memory (Mullally and Maguire, 2014). The link between imagination and memories raises important questions for the role of imagination in transformative change, that might be limited by the "source material" provided by (collective) memory and experience. In this study, each vision had a distinct link to the past – not necessarily a return to the past, however, but where visions were built with elements of the past (e.g., elements of pre-modernisation landscapes such as smaller fields and hedges). Instead of perceiving it as a limitation to participants' capacity to imagine a different future, it depicted here how participants took a critical perspective on the effects of modernisation on agriculture, which should be acknowledged and included in discussions on the future transformation of agriculture in order not to replicate existing inequalities. While being aware of the potential cognitive barrier, what is important is to understand what part of the visioning come from "source material" from memory and what can we learn from it. We then argue, similarly to other authors (Marzec, 2018; Pereira et al., 2019), that visioning process that build and expand imagination are necessary to move away from the domination of scientific rational and complement other scenario-based assessments and not neglect the social function of the imaginary.

From a practical perspective, understanding what might drive the differences and commonalities of the different visions can help practitioners advance landscape-scale transformation of agriculture towards greater sustainability, especially when these visions become the starting point of landscape scale participatory processes and outcomes. The issue of common ground has been suggested as part of participatory processes, to support the development of trust and norms of reciprocity among actors, strengthening the potential for future cooperation (Lecuyer et al., 2018). Our study shows that all visions have production as their primary focus, implying that future scenarios that push toward a multiple use landscape where agriculture plays a minor role compared to energy production, for example, might lead to social conflict (see Lécuyer et al., 2022). While not the most represented in the vision, the anchored vision is almost evenly distributed among our different groups (as also found by Pinto-Correia et al., 2014 – who defined this as the need to reinvigorate rural communities), and might be used to start the conversation among different actors on a common basis.

While common ground can help to start the discussion, it is still important to look at the differences among the visions to capture the plurality of knowledge systems, cultures and worldviews, and values of the diverse interest groups (Bennett et al., 2019). In our study, visions varied in terms of their secondary focus, ranging from farmer wellbeing (in the recognised and predictable agriculture visions) to improved local relationships (anchored vision) and environmental outcomes (biodiverse and technological visions). They also varied in their relationship to nature, with two main groups: one where nature was seen as imposing constraints on individuals (in the predictable and technological visions); and another where nature was seen as an ally (in the recognised, anchored and diverse visions). To some extent, these visions also reflected the current pathways identified in the literature, i.e. step-wise technology-driven change that follows the bio-economic paradigm of agri-food development (technological and to a lesser extent predictable visions) versus innovative and systemic re-structuring (recognised, anchored and biodiverse visions). However, visions differed accordingly to our case study context (polyculture-livestock farming, large arable crops, viticulture), and the occupations and types of agriculture practiced. For example, elected representatives focussed on achieving a recognised agriculture, while associative representatives put more emphasis on the diverse vision of agriculture, potentially highlighting the different agendas behind the visions. If power imbalances exist between those actors, this might result in one vision being favoured at the cost of other alternative visions supported by more marginalised actors (Blythe et al., 2018) – and again could explain potential social conflicts with those marginalised actors not wanting to buy in to the dominant pathway. This difference of emphasis between the recognised and diverse visions also appeared between organic and soil conservation farmers, raising the importance of ensuring a balance between those who participate in defining a just transformation.

The importance of understanding the different visions of just and sustainable agricultural transformation is linked to the understanding that visions are a result of personal relationships and networks, group memberships, political and economic institutions, or social norms that shape each individual. This partly explains why shifting from one pathway to another, for example from a pathway that prioritises production to another more sustainable pathway can lead to conflicting situations (Skrimizea et al., 2020; Lécuyer et al., 2022). In effect, changing pathways entails challenging one's visions, norms, and values. It is not necessarily a question of making a clean sweep of the past (see above), but it nevertheless requires conceding to certain breaks - in terms of professional practices, identity building or social networks for example (Beghuin et al., 2019). To reach a positive and just transformation in agriculture would then require the need to understand and acknowledge all socio-ecological characteristics within a landscape and identifying and integrating marginalized actors (producers, workers and consumers) to ensure more equitable participation and outcomes for all.

5. Conclusion

To conclude, the visioning exercise using a miracle question in this study identified five broad visions, distributed according to the agricultural contexts (polyculture-livestock farming, arable crops, viticulture), the types of actors (farmers, beekeepers, wine producers, technicians, association representatives, elected officials) and the types of agriculture practiced (conventional, organic, soil conservation). Based on the use of the visioning in this study, such a process can contribute to transformational change by initiating dialogue that in turn inspires creative thinking and joint action (Gebhard et al., 2015).

Imagination has been recognised to support transformative agency (Moore and Milkoreit, 2020) and as such, visions can be a key starting point to opening up or creating bottom-up 'windows of opportunity' that can shift from one dominant pathways to other, more sustainable ones (Skrimizea et al., 2020). While visioning alone will not be sufficient, we argue that as part of a participatory process, visioning can be a powerful tool in shifting social norms, values and worldviews within a transformative space (Bennett et al., 2019).

Ethical approval

Ethical approval for the interviews carried out as part of this research was awarded from the Comité d'Ethique sur les Recherches of the Université de Bourgogne Franche-Comté , approval reference CERUBFC 2021–06-15–017-2.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Juliette Young reports financial support was provided by French National Research Agency.

Data availability

Data will be made available on request.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.agee.2022.108236.

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