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Title: Addressing the diversity of visions of ecologization in research and in support to agroecological transitions.

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Abstract

Agroecology is increasingly recognized as a relevant framework for envisioning the transition of agriculture and food systems, but is often tackled in a dualistic perspective opposing strong or radical visions of agroecology to weak or incremental ones. This article is based on a collective, reflexive and comparative analysis of eight research projects dealing with agroecological transitions at the scale of farming systems and agrifood systems. Each project brought together a diversity of actors having different visions of ecologization. The aim of this article is to describe how and with what benefits this diversity of visions was addressed in the projects. We show that taking into account the diversity of visions is necessary for *understanding* agroecological transitions, and that beyond this, sharing this diversity among the concerned actors is necessary for *accompanying* them in an inclusive way and, under certain conditions, enrich transition pathways. We also show the need to adopt analytical approaches to characterize the visions along with participatory action-research approaches allowing to share them and support transitions. Finally, the collective and reflexive process we carried out for this article also enabled the researchers to situate their projects and themselves with regard to their role in the agro-ecological transitions.

Keywords : action-research, system co-design, organic farming, transition pathways, stakeholders perspectives

1 1. Introduction

2 Agroecology has gained considerable legitimacy in recent years. In the academic world, it is tackled by an
3 increasing diversity of researchers and disciplines (Mason et al. 2021; Ollivier et Bellon 2021). It is the subject of
4 specific public policies in various countries and is increasingly recognized by major international institutions as a
5 relevant framework for considering the transition of agriculture and food systems, and for achieving sustainable
6 development goals (FAO 2018; HLPE 2009). Unlike Organic Agriculture, agroecology is not defined by codified
7 legal rules (such as the exclusion of synthetic chemical inputs), but rather by general principles (FAO 2018; HLPE
8 2009; Altieri et Rosset 1996). Faced with a diversity of conceptions and struggles to define agroecology (Norder et
9 al. 2016; Giraldo et Rosset 2018), much of this agroecological literature adopts a normative and dichotomous
10 perspective, based on oppositions about agricultural models, types of techniques, the place of farmers, the scales
11 to be considered, etc. This leads to dualistic oppositions on agroecology such as weak versus strong (López-i-
12 Gelats et al. 2016; Duru, Therond, Fares 2015), soft versus hard (Dalgaard, Hutchings, et Porter 2003), technical
13 versus political (de Molina 2013), co-opted (by corporate actors or governments) versus peasant or social
14 movements' (Rivera-Ferre 2018; Holt-Giménez et Altieri 2013) and, regarding agroecological research as such,
15 conforming versus transformative approaches (Levidow, Pimbert, et Vanloqueren 2014). When it comes to
16 agroecological transitions (AETs), many approaches favor a gradual or stages perspective, based on degrees and
17 steps, mostly inspired by the agricultural sciences. They have given rise to diverse frameworks aimed at analysing
18 and assessing transition processes (Mottet et al. 2020; Barrios et al. 2020; Petersen et al. 2020) and also lead to
19 dualistic readings of transition or change, opposing for example reformist versus revolutionary (Giraldo et McCune
20 2019), substitution versus redesign (Hill et MacRae 1996), incremental versus radical (Berthet et al. 2016), and
21 reductionist versus systemic (Anderson et al. 2019). While the role of visions and imaginaries has been tackled in
22 the literature dealing with transitions in other sectors, such as the energy industry (Sgouridis et al. 2022; Longhurst
23 et Chilvers 2019), the actual diversity of visions of agroecology and AETs – “visions” being the term we choose to
24 use here to encompass both the conception (epistemic perspective) and aim (of a future, a desirable way forward
25 embodying values; an axiological perspective) – is often overlooked and/or reduced to such dualistic readings.

26 In the social sciences, the importance of values and visions is more present on the ground that transition processes
27 cannot be explained solely by individual, macro-structural or technical determinants. Conflicting values about

28 appropriate types of agriculture strongly influence whether or not farmers adopt agroecological methods (Meek
29 2016; Masson et al. 2021). The multiple meanings and viewpoints over agroecology have long been widely
30 acknowledged (Buttel 2004; Norder et al. 2016; Magda et al. 2019). Works focusing on the controversies between
31 different visions of agroecology at play in institutionalization processes, do justice to this diversity of visions of the
32 AET (Lamine 2017; Montenegro de Wit et Iles 2016). Other works, for example in “critical food system education”,
33 suggest a 'tolerance for pluralism' of visions (Edelman et al. 2014). However, these approaches, mainly rooted in
34 an analytical perspective, do not address the link between these visions and the changes in practices that make
35 the transition concrete, an aspect that is doubtlessly necessary when it comes to support AETs.

36 Concerning the concrete changes in practices, the growing legitimacy of participatory research approaches –
37 participation has become a motto and a directive of sorts, appearing often in calls for projects, for example – has
38 led to an emphasis on taking into account the diversity of actors concerned by the issue at stake. Given the
39 significant lack of references and knowledge on innovative and complex agroecosystems that rely on ecological
40 processes and diversification, participatory approaches to innovative system design have for instance extensively
41 been developed to bring together both scientific and technical knowledge, as well as feedbacks and experiences
42 from various backgrounds (Berthet et al. 2016). Beyond farmers' participation, other actors of the agricultural
43 knowledge system, such as advisors, trainers, experimenters, scientists, and/or of the agri-food system such as
44 food processors, sales managers, consumers, etc. are also often included (Meynard et al. 2017). Recent works
45 have shown that the hybridization of heterogeneous knowledge during such co-design processes has in fact proven
46 constructive in making new propositions, and finding compromises to design innovative systems (Barcellini, Prost,
47 et Cerf 2015; Penvern, Chieze, et Simon 2018), especially in cases where actors' interests and/or points of view
48 may diverge (Prost et al. 2017).

49 Nonetheless, participatory approaches often reduce the diversity of visions to that of the categories of actors and
50 their role in the socio-technical system at stake. Taking the relationship with functional biodiversity as an example,
51 several studies highlight the variety of farmers' visions and expectations towards functional biodiversity (Kelemen
52 et al. 2013; Howard et al. 2018) resulting in specific attitudes, decision criteria and practices towards functional
53 biodiversity (Cardona et al. 2021; Penvern et al. 2019). Therefore, a major challenge to support functional

54 biodiversity-based systems and, more generally, agroecological systems, is to account for this variety of visions,
55 and not to design one solution that may fit to all, but several in response to specific contexts.

56 The need to characterize and collectively acknowledge the diversity of visions is at the heart of companion modeling
57 approaches. This participatory approach uses modeling tools to create a dialogue between various stakeholders
58 (including researchers) and achieve a shared understanding about a common problem in complex social–ecological
59 systems (Étienne 2014). In this approach, the explicit recognition of the diversity of visions makes it possible to
60 address conflictual situations generated for instance by the management of common spaces or resources (Barnaud
61 et al. 2014). Great importance is therefore attached to the "representativeness" of stakeholders and an important
62 work of characterization of the context and visions is carried out beforehand (Mathevet et al. 2014). The visions are
63 called upon to enrich each other with the objective of building a common representation. However these approaches
64 are still not widely applied to AETs.

65 In this article, our objective is to focus on how the diversity of visions is addressed in research projects, and to what
66 extent it does or does not enable more inclusive AETs and the enrichment of transition pathways. To do this, eight
67 research projects were compared in which the dual task of identifying and sharing visions has been carried out, or
68 not, and to varying degrees. These projects involved researchers from the same laboratory in southern France,
69 whose encompassing work object is the transition of agriculture and food systems. They fall either exclusively under
70 an analytical posture or, for the most part, under both an analytical posture and a transformative, action research
71 one. An action research posture leads to involve an extended peer community (Popa, Guillermin, et
72 Dedeurwaerdere 2015) in a collaborative definition, implementation and interpretation of research (Méndez et al.
73 2017; Méndez, Bacon, et Cohen 2013). In continuity with these works, we will show that action-research
74 approaches dealing with agroecological transitions suppose a critical analysis of power relations, lock-in and
75 exclusion effects (Pimbert et al. 2017; Masson et al. 2021), thus indeed combining analytical and transformative
76 stances.

77 After the presentation of our material and methods in section 2, the cases are described in the Results section,
78 following a demonstrative logic in which each argument is supported by two case studies chosen as the most
79 exemplary ones. In the first part of this section, we show why the recognition of the diversity of visions is a necessity
80 for inclusive AETs. In the second part, we show the value of sharing the diversity of visions, firstly to explore and

81 support a diversity of transition pathways, and secondly to favor the enrichment of these pathways through cross-
82 learning between actors. We come back in the Discussion section to the conditions needed if this sharing of visions
83 is to help enriching the transition pathways.

84

85

86 **2. Materials and methods**

87 Interested in studying the benefits of addressing the diversity of visions in projects dealing with AETs, a group of
88 researchers from the same team, working on different research projects, most of which had little connection initially,
89 carried out a collective and reflexive comparison of eight of their projects, chosen to represent different objectives,
90 duration, research approaches and methods, as stakeholders and local actors were either observed or involved in
91 the processes (Table 1).

92 Following an iterative process, the cases were described as narratives, shared within the collective, and discussed
93 in order to compare : (i) the processes at play and the methods used to address the diversity of visions; (2) the
94 benefits and the conditions to address the diversity of visions and enrich agroecological transition pathways. The
95 drafting of the manuscript, meetings of the first author with each case holder, and successive cross-readings finally
96 made it possible to structure, synthesize and stabilize the analysis in the form of the present article. This process
97 allowed us to develop our arguments around the need and conditions for addressing the diversity of visions and
98 enriching agroecological transition pathways. To respect their coherence, the case studies are described as a whole
99 and the most exemplary one was chosen to develop each argument.

Project acronym	Objectives of the project/actors studied	Duration	Type of research approach and methods	Stakeholders/local actors “observed” or involved in the research process	Reference
Agricultural Youtube	Analysing how farmers display their agricultural practices to the general public	3 years	Analytical : network analysis and ethnographic surveys (observation, videos analysis and semi-structured interviews)	Researcher (sociologist) AgriYouTubers and virtual communities observed	Rénier et al. 2022
EcoOrchard	Promote the consideration of functional biodiversity in organic orchards	3 years	Analytical (agronomic interviews) and participatory research (Focus group)	Researchers (entomologists, agronomists and sociologist) with farmers, technicians and advisors	Penvern et al. 2019; Cardona et al. 2021
Provence Verte	Relocate production and link it to consumption through local food governance	2 years	Analytical: ethnographic survey (participant observation and semi-structured interviews)	Researcher (sociologist) Local stakeholders (mostly farmers, associations, organic farming development actors) observed	Tuscano 2022 Hubeau et al. 2021
Vergers Pâturés	Promote and develop associations between breeders and producers of perennial crops	2 years	Analytical (ethnographic interviews) and Action-research (participant observation, seminar and workshops)	Researchers (agronomists and sociologist), with development actors and a farmer	Paut et al. 2021
Vergers Durables	Tracking innovations and co-designing sustainable orchards	10 years	Action-research (agronomic interviews, participant observation, seminars and workshops)	Farmers, experimenters, advisors, researchers, and teachers, from several disciplines	Penvern et al. 2012; Capitaine et al. 2016
CIVAM	Exploration and implementation of sustainable soil management by diversified vegetable producers	4 years	Analytical (interviews and participant observation)	Researcher (sociologist) Facilitator and vegetable growers observed	Ollivier 2022

OBSTAE	Analyze collective dynamics of AETs	3 years	Analytical (interviews and participant observation) and participatory research (seminars)	Researchers, farmers and facilitators of the involved groups	Lamine et al. 2021
L'assiette et le territoire	Shared understanding of agri-food transition processes, and social experimentation	3 years	Action-research (collective inquiry) partly building on previous studies.	Researchers and 4 local actors (local authorities and associative networks) in co-ordination, plus 25 various actors	https://www.assiette-territoire.com/ Lamine et al. 2022

100 Table 1: Factual description of the eight research projects chosen as case studies; listed in order of appearance in the text.

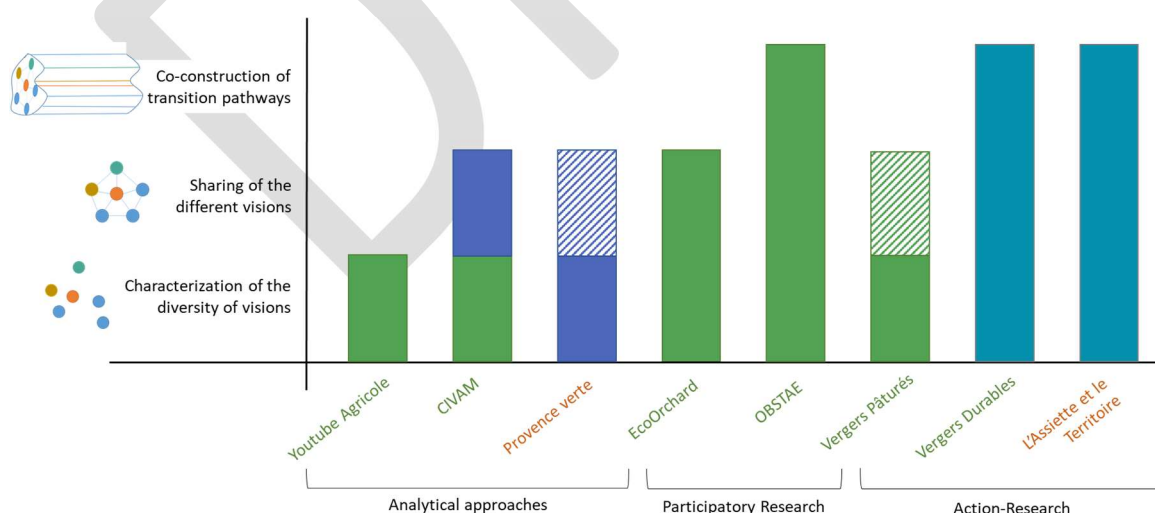
101 To illustrate the diversity of situations put to the test in our comparative study, the figure positions each project in
 102 terms of:

103 - approaches and research postures (horizontal axis), according to a gradient of participation of actors and
 104 researchers in the project. We distinguish between analytical postures where actors are observed, participatory
 105 research where they are associated, and action-research postures where actors co-construct the research
 106 questions with researchers, knowing that an analytical posture is by definition always present.

107 - the degree of visions recognition (vertical axis), according to the extent to which the diversity of visions was taken
 108 into account to support AETs in the research project. We distinguished three degrees in the work of recognizing
 109 the diversity of visions: characterization, sharing and co-construction of the AETs. All projects proceeded to
 110 characterize the diversity of visions, and one did not aim to go beyond this (Youtube). While the initial intention was
 111 to share them, two projects failed to do so (Provence Verte and Vergers Pâturés). Finally, three projects went so
 112 far as to use this diversity of visions to co-construct AETs (OBSTAE, Vergers Durables, L'Assiette et le Territoire).

113 - focus of the study (colour of the project's name), with projects focusing either on agricultural systems or on
 114 territorial agri-food systems.

115



116

117 Figure: Positioning of the 8 case studies according to the research approaches with a gradient of researcher and
 118 actors involvement in the project (on the horizontal axis), and according to the degree of the process of recognition
 119 of visions (on the ordinate). This process was either initiated by researchers (green), stakeholders (blue) or co-

120 constructed (turquoise) and carried out quite extensively (solid) or only partially (hatched). By way of example, the
121 researcher's work in the "CIVAM" project enabled the characterization of the diversity of visions brought together
122 in the group of farmers, while the sharing of these visions during farm visits and meetings was done at the initiative
123 of the stakeholders. The names of the projects at the scale of the agricultural system appear in green, those at the
124 scale of the territorial agri-food system in orange.

125

126

127 **3.Results**

128 First of all, the comparison of the cases highlighted that visions were expressed differently depending on the actors
129 and the objects of study. These visions could correspond to different perceptions, expectations and values that the
130 actors have of AETs, in their "ecological" dimension – e.g. with respect to functional biodiversity – but also in terms
131 of the agricultural and agri-food models to be achieved. They also reflected different ways of achieving them, of
132 projecting oneself in time with a diversity of paths and trajectories, some incremental and others more disruptive.
133 In all cases, the visions were embedded in a singular socio-technical context.

134 The comparison of our case studies then enabled us to identify two major results that will structure this section:
135 firstly, that recognizing the diversity of visions is a necessity for inclusive AETs, and secondly, that this process
136 enriches the transition pathways.

137

138 **3.1. Recognizing the diversity of visions is a necessity for inclusive AETs**

139 Our analysis of the case studies first shows the need to recognize the diversity of visions, based on two main
140 arguments developed below : (1) there was an actual diversity of visions, at times even for the same individual; and
141 (2) failure to recognize them collectively can limit the reach of the project and the inclusiveness of the AETs.

142

143 **3.1.1. A diversity of visions exists as is showed by analytical approaches**

144

145 **The Agricultural YouTube: a discussion space to defend diversified visions of ecologization**

146 The case study on the Agricultural YouTube is based on an analytical posture, where the researcher was in a
147 position of non-participating observation. In this project, a network analysis was applied to the relations between
148 more than 500 YouTube channels and initially allowed to identify the existence of several groups of channels.
149 Ethnographic analyses of the videos then showed that these groups expressed different visions of the ecologization
150 of agricultural practices. Thus, the community of “*Agri-youtubeurs*” was formed following a logic of informational
151 engagement (Cardon et Granjon 2013); in order to defend a profession that they consider unfairly criticized for its
152 practices by the mainstream media and certain environmentalist associations. For its members, it is a matter of
153 displaying their agricultural practices in the terms of a situated agroecology, even when these practices are
154 controversial. This is the case, in particular, with videos of *Agri-youtubeurs* practicing soil conservation agriculture
155 who justified the use of glyphosate as it allows them to continue planting intercropping cover crops without having
156 to disturb the soil mechanically. Another group highlighted by the network analysis is that of channels publishing
157 content related to the *market gardening on living soil*¹. Some of these actors claimed to be “critical organic growers”,
158 and use YouTube as a “platform” to promote a specific horticultural model, that of no-till farming with permanent
159 cover, whose principles can sometimes contradict those of organic agriculture. In this case, actors used YouTube
160 to differentiate their vision from that of the organic farming movement in the name of an ecological principle (no-
161 till).

162

163 **EcoOrchard: A diversity of visions of functional biodiversity needing specific approaches and support** 164 **tools.**

165 The work carried out within the framework of the European project “EcoOrchard”, combining an analytical approach
166 with participatory research, has highlighted four different attitudes among the 125 fruit growers interviewed in the 9
167 partner countries – mostly practicing organic farming – towards functional biodiversity (*wait-and-see*, *naturalist*,

¹ A recent French farmer-led movement called “Maraîchage sur Sol Vivant (MSV)” that gathers market gardeners to develop agroecological cropping practices that place soil at heart of their cropping systems

168 *regulation and multifunctional*). Consequently, the way in which the 24 techniques identified as favorable to
169 functional biodiversity were implemented also differed (Penvern et al. 2019). These different attitudes also
170 explained the commitment of farmers to agroecological principles. Farmers with a more "passive" approach and
171 with no particular expectations regarding biodiversity did not implement specific practices, whereas farmers with a
172 multifunctional approach to biodiversity expressed a diversity of expectations and implemented a large number of
173 techniques, to the point of fully redesigning their farm. This work also shows that these attitudes can coexist within
174 the same individual and the same technique, and that they can evolve over time. This diversity of visions of
175 biodiversity (or of multiple biodiversities) among farmers, is seldom taken into account by scientists and
176 development actors (advisors, experimenters), giving way to an inadequacy of tools and forms of support. This is
177 particularly true for farmers' day-to-day management, which can imply the implementation of monitoring methods
178 and the adjustment of practices and of the farm. Workshops organized in 3 of the 9 partner countries and bringing
179 together development actors, farmers and researchers (Cardona et al. 2021) have shown that, if we monitoring
180 programs are to be produced in line with the ideas and needs of farmers and advisors, it is not enough to consider
181 only the pest regulation services of functional biodiversity, and the protocol must be adapted to farmers' visions to
182 support inclusive AETs.

183

184 Through their analytical posture, these two cases illustrate the diversity of visions that coexist in the real world and
185 the work needed to characterize them. While in the first case the visions are expressed by the farmers themselves
186 through videos – it could also have been through membership in farmers' groups or associations – in the second
187 case, these visions are "erased" or discrete, and could only be identified by means of elicitation through research.
188 In both cases, analytical approaches were necessary to characterize this diversity of visions.

189

190 **3.1.2. Neglecting to share the diversity of visions of AET can limit the reach of initiatives in relation to the**
191 **initial ambitions**

192

193 **Provence Verte: An initiated but interrupted sharing of visions that limits the inclusiveness of the AET**
194 **project.**

195 This research studied the process of elaboration of a Territorial Food Project (*Projet Alimentaire Territorial*, PAT),
196 a public-action instrument governed by the National Program for Food (*Programme National de l'Alimentation*,
197 French Ministry of Agriculture) set up by *Provence Verte* inter-municipal authority. The research involved an
198 analytical posture. Ethnographic surveys made it possible to analyze the process of implementation of the PAT, by
199 combining a participant observation approach during 9 formal meetings and intermediate exchanges, with
200 comprehensive in-depth interviews with 13 actors involved in the process (Tuscano 2022).

201 The institutional framework demands a "diagnostic" component from every PAT, followed by an "operational" one.
202 The first phase consists of a consultation process aimed at bringing out or orienting the project's operational
203 ambitions. In this case, some fifteen actors (the number varied from session to session) of the territory were involved
204 in the construction of the project and in the diagnosis phase. They were mainly agricultural support structures,
205 coming in particular from organic agriculture, as well as organizations with explicit ecological commitments. The
206 choice of involved actors stemmed from partnerships already consolidated during previous initiatives. A process of
207 sharing visions was initiated at the beginning of this "diagnosis" phase through the organization of several meetings.
208 This work, initiated by a facilitator with little experience in participatory methods, was met with criticism from the
209 actors. A year and a half into the diagnosis, it had nevertheless made it possible to analyze the major needs and
210 to prioritize the areas of intervention (school catering, support to new farmers, structuring of local chains, etc.).
211 However, the facilitator changed during the diagnosis phase, the project (particularly the facilitation methods)
212 evolved, and the process of sharing was not continued during the rest of the diagnosis nor taken into account for
213 the operational phase. In other words, the actors were ultimately engaged more in consultation than in co-
214 construction, which limited their commitment to the project and, in consequence, the ambitions of the territorial AET.

215

216 **Vergers Pâturés: A diversity of visions of the transition that reveals itself along the way.**

217 The "Depasse" project was supported by PEI-AGRI, a European scheme funding "multi-actor" projects to facilitate
218 the transfer of innovation and knowledge, in this particular case on the territorial association between breeders and

219 growers for the grazing of perennial crops. Although the project mainly supported development structures
220 (managers of protected areas, associations representing producers and herders on grazing land), researchers got
221 strongly involved in the project alongside these, with the aim of understanding the obstacles and levers to the
222 implementation of this association. Originally, the project was based on an approach combining seminars and
223 survey work to include a diversity of situations and farmer profiles (fruit growers, winegrowers, olive growers and
224 livestock breeders). The goal was to closely involve farmers in the process of producing knowledge on these
225 associations and to invite them to join in and experiment with this practice. This approach, developed by the
226 researchers, was quickly subject to misunderstandings by the development actors, who had not invested
227 themselves much in the project during the set-up phase but took a leading role in the operational phase. The
228 misunderstandings made it possible to become aware of two gaps that existed: on the one hand, the researchers'
229 will to produce knowledge *with* and *from* specific experiences regarding the conditions for these associations to
230 take place, by intervening as little as possible in their implementation by the farmers; on the other hand, the more
231 directive and operational vision of development actors, wishing to manage the associations between herders and
232 farmers, by imposing their technical tools such as grazing plans or conventions, and without taking into account the
233 farmers' visions. As the project began to wither, a space for dialogue emerged during which the present parties
234 were able to clarify and expose their visions of both the project and the type of support they wished to implement.
235 This situation allowed the researchers to become aware of the discrepancy between what they had imagined (the
236 project submitted) and the way in which the operational actors had planned to use it, and therefore of the failure to
237 collaborate. While the project had started from the presupposition that a common vision was shared, it was a crisis
238 situation in the collaboration that led to the clarification of the visions held by stakeholders (and not a deliberate
239 wish to identify them).

240

241 These two cases, although very different, show the need to recognize the diversity of visions (beforehand and
242 throughout the process) for the success of projects. While in the first case the sharing of visions was initially
243 orchestrated by the project's facilitator, the researcher's observations showed that this was not followed by effects,
244 due to a lack of continuity in the conduct of the project. In the second case, the sharing was done too late and
245 resulted in strong tensions and ultimately a reorientation of the project.

246

247 **3.2. Sharing the diversity of visions enriches transition pathways**

248

249 In this second part, we argue that the benefits of recognizing and sharing the diversity of visions to enrich
250 agroecological transition pathways : first because sharing visions makes it possible to envision and assess a
251 diversity of agricultural models and paths; second thanks to cross-learning processes between researchers and
252 actors that support the exploration of transition pathways.

253

254 **3.2.1. A process of sharing enables the collective recognition of the diversity of visions and paths**

255

256 **Vergers Durables: Sharing permits the recognition of a diversity of properties and models of sustainable**
257 **orchards.**

258 The *Vergers Durables* (Sustainable Orchards) group, created in 2008, is a participatory research network (led by
259 INRAE researchers), bringing together a diversity of actors and disciplines with the initial objective of defining what
260 a sustainable orchard could be. All of its 24 members shared the desire to move away from the conventional
261 production scheme to explore innovative alternatives. Faced with the difficulty of defining a common set of
262 specifications for the properties of a sustainable orchard, the researchers facilitating the group began to work (after
263 four years) on the characterization of the diversity of experiences and perceptions of each of the participants
264 regarding what a sustainable orchard could be (Penvern et al. 2012). Several working sessions were organized:

265 - Semi-directive interviews were conducted in order to characterize the diversity of experiences and paths (types
266 of orchard explored, and experimented).

267 - Workshops in groups (3) and in pairs (1) to share the different visions that each individual had of a sustainable
268 orchard: while some placed fruits at the center of the system, others placed agriculture or even their family or
269 couple's lives.

270 - Workshops (5) for the co-design and evaluation of new orchards, where each actor brought his or her own values:
271 some put the economic viability of the farm as imperative, while others were more concerned with the working
272 hours or the pleasure of working in the orchards.

273 This sharing process allowed recognizing a diversity of levers, models and evaluation criteria. Four models were
274 thus characterized (a technological orchard, a horticultural orchard, an orchard with grazing, and an ecological one)
275 and filtered through a broad spectrum of properties of what a sustainable orchard should be and, in doing so, to
276 enrich the very definition of what a "sustainable" orchard implies (Capitaine et al. 2016). In order to capitalize on
277 this work, a book project was initiated to "cross views", and thus to benefit from the 10 years of work. Unfortunately,
278 this book project never took form, due to a lack of resources and of continuity in the facilitation. Wishing to reach
279 more traditional audiences and to include more farmers in a AET, as well as to comply with funding calls'
280 requirements, the projects that subsequently emerged within the Vergers Durables group targeted on the use of
281 functional biodiversity (see the EcoOrchard project above), on vegetable orchards and/or orchards with grazing
282 (i.e., the DEPASSE project above). Moments of exchange were planned in the projects that followed but the farmers
283 of the original group did not find themselves fitting in anymore.

284

285 **CIVAM: Sharing leads to a separation of trajectories within a group of vegetable producers**

286 In this project, a group of vegetable producers with different visions, brought together by CIVAM – an alternative
287 extension organization – to explore and experiment with new sustainable soil management practices, was analyzed
288 based on interviews and participant observation. In its initial intention, the group's project was very open. As some
289 of the farmers did not know each other, more than half of the project consisted of collective farm visits where the
290 farmers expressed, discovered and discussed a variety of visions of their practices, goals and potential desire for
291 change. On this basis, the researcher could identify three visions of diversified farming which gradually made
292 explicit and which made it possible to clarify the producers' commitments:

293 - Conventional growers (a minority), with little diversification and a wish to solve specific problems of soil diseases
294 and technical blockages in terms of chemical treatment. These farmers were there "to have a look".

295 - Organic growers who routinely practiced the local technical model for diversified vegetable farming, designated
296 as "intensive organic vegetable production". These growers were interested in reflecting on and improving their soil
297 management practices, but they came as curious visitors, for the most part without a clear desire to change their
298 practices.

299 - Organic enthusiasts, often young neo-peasants, who were looking to go beyond the previous models, whether
300 conventional or intensive organic, to reduce their impact on soil health and the environment in general. They were
301 testing low-impact soil management practices, and formed the core of the group.

302 Despite an often-stated wish to bring together different visions, the sharing of visions created a separation of
303 trajectories within the collective, and so the plurality of the group could not be maintained. The conventional
304 growers, not finding rapid solutions to their problems and not convinced by the technical radicalism of others,
305 gradually left, while some of the organic vegetable producers were not willing or able to get involved in the reflection
306 and implementation of practical changes. The collective thus tightened around the core of most invested ones,
307 bearers of a reforming vision of "intensive organic vegetable production". This tightening allowed to get out of a
308 certain inertia and to engage an operationalization of their action through various changes in practices and within
309 a collective organization recognized by the State (a GIEE: Group of Interest for the Economy and the Environment²).
310 This group's experience has more broadly inspired development actors within the framework of a subsequent
311 project on small vegetable farms in Southeast France, thus generalizing the practice of individualized peasant
312 experimentation created in the project to support AET. Moreover, despite the separation, the sharing of experiences
313 also allowed for the initiation of a reflexive process for all, conventional and organic vegetable growers, which could
314 eventually lead to change for some.

315

316 Whether initiated by the researchers or by the collective itself, these two processes of characterization and sharing
317 of the diversity of visions have made it possible to explore not only a diversity of aims but also a diversity of transition
318 paths or – put differently – of manners of changing. The recognition of this diversity can lead, however, to splits

² Translator's note: in French, *Groupement d'intérêt économique et environnemental*.

319 when the objectives of the collective projects do not coincide with the aims or the timing of certain members. This
320 raises questions on the degree of diversity that these projects can bring together.

321

322 **3.2.2. A process of sharing enables enriched and inclusive transition pathways**

323

324 **OBSTAE: An observatory of agroecological transitions in the making, based on researchers and actors'** 325 **sharing processes**

326 The OBSTAE project, carried out within a participatory research approach, brought together a dozen researchers
327 and 16 sixteen farmers' (or multiactors) groups having won the *Mobilisation Collective pour l'Agro-Ecologie* call
328 (MCAE, Collective Mobilisation for Agroecology) from the French Ministry of Agriculture³. The project aimed to
329 create interactions between these 16 sixteen collectives (all developing AET projects, including the CIVAM one,
330 described above), as well as with researchers and ministry officials (Barbier, Lamine, et Couix 2022; Lamine et al.
331 2021). The project allowed to conduct:

332 - An analytical work of identification/characterization of the diversity of intra-group visions, based on interviews and
333 participant observation in the groups on the visions of ecologization and agroecology, and an inter-group
334 comparison carried out by the researchers.

335 - Exchanges and sharing processes within five seminars associating researchers and groups' members (farmers
336 and facilitators).

337 This allowed the creation of an observatory of not only agroecological transitions but also, and along the way, of
338 recognition and legitimization trajectories within and among the collectives. The sharing processes, through
339 exchanges during the various workshops and co-writing processes (some chapters of the final book being co-
340 authored by researchers and group members together) that supported and strengthened arguments, have
341 supported the legitimization of models whose degree of ecologization was more contested than others (such as

³ a call for proposals, one of the first public action instruments of the agroecological policy launched in France in 2012, designed as an exploratory measure in view of the launch of the aforementioned GIEEs, introduced by law in France in 2014

342 conservation agriculture in comparison to organic agriculture). This went along with debates on their respective
343 "performances". Although the 16 groups have taken part to the activities in different degrees, these exchanges
344 have always brought reflexivity and elements of positioning (in relation to other collectives) that reassured them in
345 their own transition project. For example, almost all of them have gone on to create a GIEE to support their
346 transition. Paradoxically, this process of legitimization and exchange also generated frustrations when, for example,
347 one of the groups found itself ineligible for State funding due to its legal structure not being controlled by the farmers
348 (a mandatory criterion).

349

350 **L'Assiette et le Territoire: A combination of methods to initiate a transition at the scale of a territorial agri-** 351 **food system**

352 The action research project *L'Assiette et le Territoire* (2019-2021, coordinated by INRAE and four local actors –
353 coming from NGOs and local authorities) was conceived with the objective of contributing to supporting the AET
354 process at the scale of a territorial agri-food system, based on an approach aimed at facilitating knowledge
355 construction, exchange and multi-actor experimentation. This began with a shared work on the past and present
356 trajectory of the food system and continued with studies and experiments involving researchers and actors on
357 focused themes such as collective catering, support to new farmers, and equity of access to food. The project was
358 structured around a "plenary" group of 25 people, whose composition was thought out so as to include a diversity
359 of actors (research, farmers, civil society, agricultural movements) and to associate *representative* actors
360 ("stakeholders" representing their organization) as well as "*concerned*" ones – affected by the issue, although not
361 representing any organization (Lamine 2018). The goal was to gather people without a habit of working all together;
362 with different (and sometimes even contradictory) points of view; and some of whom were at times in competition
363 for access to resources. This group conducted:

364 - A work of documentation analysis and interviews (on the trajectory and on other topics) that allowed to characterize
365 the diversity of visions – in particular those that may have clashed along the trajectory (between, for example, a
366 vision more focused on products' valorization, and one more focused on the issues of support to new farmers and
367 social inclusion).

368 - A collective discussion of the results from this work within the group, which allowed to bring together this diversity
369 of visions, and to collectively write a manifesto that recognizes it (<https://www.assiette-territoire.com/manifeste>).

370 - Targeted collective experimentations that allowed for concretely and modestly initiating a transition process.

371 This project is part of a larger portfolio of work, past and ongoing, conducted by the team on different territories.
372 The analysis produced on the trajectory and governance is thus enriched for local actors through direct exchanges
373 with other territories (as was the case with OBSTAE already presented). The actors were also mobilized in forms
374 of collective inquiry (e.g., written description of specific cases, collective work on forms of land provision for the
375 support to new farmers, identification of key initiatives in collective catering). Although the effects of this project in
376 terms of actions and concrete transition remain modest given its very small budget, it has made it possible to reach
377 a shared recognition of the diversity of visions and the divergences, which did not prevent the affirmation of common
378 principles shared in the collective manifesto). It also had a very concrete influence on public action projects (the
379 aforementioned PAT) that emerged around the same time to implement the transition (with larger budgets!),
380 particularly in terms of recognizing the diversity of initiatives and visions at play in the territory and including them
381 in these institutional projects.

382

383 These two action-research initiatives overlap with the actors' projects. They created original dynamics of exchange,
384 co-production of knowledge, reflexivity and concrete experimentation that supported the collectives' transition. The
385 first case illustrates the possibility of sharing a wide variety of visions, some of which were in principle incompatible.
386 The second case especially illustrates the positive impacts that this sharing can have beyond the project, in time
387 or in other initiatives, especially in terms of inclusiveness..

388

389

390 **4. Discussion**

391 Our cross-case analysis has shown the benefits of sharing the diversity of visions for the analysis and support of
392 AETs. In the case of agricultural systems, it allows to consider a diversity of systems or models, to explore a diversity

393 of levers and conditions for their implementation, as well as to conduct collective system design and evaluation in
394 which each actor expresses his or her visions and expectations (Vergers Durables). It also allows to take into
395 account a diversity of postures regarding change (CIVAM) and to adapt support programs to enable a diversity of
396 transition paths (EcoOrchard). In the case of agri-food systems, the work of identifying and sharing visions allowed
397 to collectively recognize the diversity of initiatives as the expression of the diversity of visions at work in the
398 territories concerned (Provence Verte), and to have it recognized in further projects implemented by other actors
399 (l'Assiette et le Territoire), thus enriching the transition pathways.

400 While many frameworks are aimed at analyzing and assessing transition processes in objective terms, especially
401 through indicators (Mottet et al. 2020; Barrios et al. 2020; Petersen et al. 2020), our results show the benefits of
402 carrying out a reflexive and qualitative appraisal of the way the diversity of visions is addressed, in the perspective
403 of understanding this diversity and enriching rather than assessing transition pathways. This enrichment can be
404 discrete, fostering learning or ways of thinking rather than concrete action, and may take time before it can be
405 appreciated. In the long term, the recognition of the diversity of visions (and therefore of potential divergences)
406 would thus allow limiting the effects of dual and dichotomous opposition between models of agriculture and would,
407 on the contrary, favor not just their coexistence but also their coevolution. This has already been described, for
408 example, in work showing the benefits of considering the different movements or *perspectives* of organic farming
409 (Zagata, Uhnak, et Hrabák 2021), or the influence of a "plural" organic agriculture, embodied by different forms or
410 versions, on the so-called conventional agriculture at the local level (Lamine 2017).

411

412 Our cross-case analysis also allowed us to identify a number of conditions (not always met in our cases) for this
413 enrichment to take place.

414 The first of these conditions - present or lacking in our cases - concerns the participants' commitment. It
415 presupposes that people are available and willing to engage in such a sharing process and that there is time to
416 build a relationship of trust, a vocabulary and a common frame of reference between these participants. The
417 construction of such trust can be facilitated by shared affinities (Vergers Durables, Agricultural Youtube), or by the
418 history of their relationships (Provence Verte, CIVAM). As shown by Masson et al. (2021), participatory action

419 research can mobilize long term collaborations despite differing visions. Oftentimes, there is a *de facto* risk-taking
420 at the beginning, and trust is built over the course of the project because people with different visions become
421 aware of the value of sharing (l'Assiette et le Territoire). Of course, such participatory approaches have to remain
422 attentive to the possible asymmetries of power that can be created among participants (Barnaud et al. 2014),
423 exclusion effects (Prové, de Krom, et Dessein 2019) and to the feeling of "co-optation" or "misappropriation of
424 tools", or even of a loss of control over what is shared.

425

426 A second condition deals with facilitation, and refers as much to human resources, skills and methods, as to
427 administrative and financial resources. Our analysis shows the importance of describing and sharing the diversity
428 of visions; of avoiding exclusion effects, of legitimizing each point of view and creating debate to enrich the transition
429 pathways. Identifying stakeholders, their different points of view and their contexts, whether it is done through
430 analytical stances or action-research, requires time and human resources (Birner et al. 2009; Berthet et al. 2016).
431 Regarding skills, this joins a long-standing debate in the literature (Chambers, Pacey, et Thrupp 1989; Kindon,
432 Pain, et Kesby 2007; Goulet 2013) – as well as among actors – on the need to move away from prescriptive and
433 "top-down" postures, which are still dominant in agricultural extension systems, to facilitation postures centered on
434 the elicitation of farmers' knowledge and visions, or even to postures of knowledge co-construction and knowledge
435 dialogues, as is increasingly advocated in recent work on AET (Rosset et al. 2019; Anderson, Maughan, et Pimbert
436 2019; Kalaitzoglou et al. 2021; Méndez, Bacon, et Cohen 2013).

437 As we have seen, sharing visions can be laborious insofar as it takes place in several stages that must be
438 orchestrated in continuity, lest breaking up the entire process (e.g., Provence Verte, Vergers Pâturés) or inducing
439 major bifurcations (CIVAM). The framework and resources offered by the funded projects appear to be facilitating
440 conditions, but they remain limited in time and in their scope of action. Maintaining continuity implies thinking in
441 terms of long-term arrangements and articulating sources of funding over time, either simultaneously or sequentially
442 (Schultz 2013). The trend towards project proliferation (Sjöblom et Godenhjelm 2009) necessarily generates
443 "coordination costs" and a risk of dispersion of the collective and of the action (Hubert et Louvel 2012). On the
444 contrary, more informal forms of collective action exist and may be just as rich from the point of view of actual
445 transition pathways (Vergers Durables). They do not have administrative and financial resources but are also freed

446 from the constraints associated with them, thus having more flexibility in the action and its timing. Independently of
447 the institutional and cognitive frameworks of agricultural development, the analysis of YouTube highlights,
448 incidentally, the role that videos sharing and social media platform can also play as spaces for communication in
449 the legitimization of practices and the recognition of the agro-ecological knowledge of the actors.

450

451 A third condition that also holds in all of our cases, concerns the size and composition of the groups. The need to
452 circumscribe it appears as inevitable, as is the case even in the world of YouTube communities (that one could
453 imagine without limits), that circumscribe themselves through mutual recognition. It also seems unrealistic to think
454 that one can take into account all the visions of the actors concerned by the issue of transition, namely within a
455 territory (Provence Verte). Such a broadening can endanger or interrupt the enrichment dynamic (Kalaitzoglou et
456 al. 2021). In the case of the CIVAM project, the narrowing of visions appears as a condition for moving on to the
457 operationalization of change, even at the expense of part of the group. To a lesser extent, the thematic focus and
458 the broadening of the audiences involved in the projects that followed from the Vergers Durables group also
459 happened at the expense of the group's life. The narrowing of visions, conversely, could increase the reach of the
460 AET's ambition, insofar as the project's identity would be easier to carry, more fluid to act upon, and more visible
461 for external actors. Our analysis suggests that there may be different types of "collectives" involved : those that
462 allow the diversity of visions to be debated and others, more circumscribed, more conducive to action, knowing that
463 the collectives can be modulated according to different timeframes. In the case of l'Assiette et le Territoire, the
464 enrichment is expressed in the projects that were set up later by the local authorities, on smaller geographical
465 scales. The challenge for the action-research collective then became to continue to act as a forum for debate and
466 exchange between the different visions present in the territory and those articulated by these operational projects.
467 In connection with the previous questions of facilitation capacities and articulation between projects, the collective
468 also discussed and stated in a collective manifesto the challenge of maintaining a diversity of project designs in
469 order to avoid a certain homogenization in the methods of diagnosis and in the leadership. .

470

471 A final condition concerns the need to articulate research approaches to support the sharing of visions and enrich
472 transition pathways. As the Figure illustrates, all the projects adopted an analytical approach to identify and
473 characterize the diversity of visions. Some articulated this in a larger approach including participatory research to
474 carry out a process of sharing and recognition of the diversity of visions (OBSTAE, EcoOrchard) or action-research
475 to initiate and accompany the co-construction of transition pathways (Vergers Durables, l'Assiette et le Territoire).
476 Whether they are on the actors' or researchers' initiative, the projects also involved different and complementary
477 methods. In all of our cases, the work of identification and characterization of the diversity of visions is supported
478 by qualitative studies, semi-directive interviews, video analysis (YouTube), or the observation of collective moments
479 as well as exchanges and debates between actors around their visions. Those that also conduct a process of
480 sharing to favor the recognition of this diversity of visions relied on workshops and seminars associating researchers
481 and actors. Finally, those that go all the way to supporting and even initiating a process of AET, in addition to the
482 said methods, combined targeted experimentation and/or co-design, thus allowing the development of a collective
483 inquiry process (in the sense of J. Dewey (Slimi et al. 2021)) involving actors and researchers, on the effects of
484 these experiments and co-designs.

485 This analysis was limited to 8 case studies, all carried out within the same research laboratory. It would be
486 interesting to test our collective, reflexive and comparative approach to other case studies, research approaches
487 and methodologies. Modelisation approaches in which highly analytical models are also used in participatory
488 approaches to companion modeling (Étienne 2014) could be of particular interest. In these approaches, enrichment
489 processes and conditions may differ, not least because of the decisive role played by models and their
490 representational capacities. Our analysis would also benefit from being based on cases with longer time-span, or
491 returning to our case studies in a few years, so as to delve deeper into the conditions for enriching agroecological
492 transition pathways; processes that necessarily take time.

493

494

495

496 **5.Conclusion**

497

498 The cross-analysis of these eight cases reveals the general interest of going beyond dichotomous or hierarchical
499 perspectives on agroecology and AET such as strong or weak, political or technical, etc., so as to account for the
500 real multiplicity of visions, linked to specific socio-technical situations, and to encourage a process of recognition of
501 the diversity of visions, thus fostering enriched and inclusive AETs. This process must involve processes of
502 identification and characterization for which analytical approaches are necessary, and of exchange within the
503 groups of actors concerned. Among the conditions identified in this article, the timing of the initiatives organized
504 with the actors is decisive in order to allow their adjustment to different contexts and to build trust among actors.
505 Unfortunately, the general tendency to "project proliferation" tends to make this necessary continuity difficult.

506 Beyond the results of the comparison of these eight cases, our work generated a collective and cross-reflexivity
507 process that allowed the group of researchers involved in this analysis and in the writing of this article to better
508 situate themselves in the different degrees of recognition and sharing of the diversity of visions. Our analysis also
509 showed how, at the scale of this group of researchers, the different positions shed light on and complement one
510 another. The meticulous analysis of visions made possible by an analytical posture supports the action-research
511 mechanisms. We can thus conclude from this collective and reflexive re-reading, that there is a benefit in articulating
512 different research and action-research mechanisms and that this comparative analysis also functions as a forum
513 for debate between different types of mechanisms and thus on the "meta-visions" or visions of the researchers
514 themselves as to their own role in the AET.

515

516

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