agroecology transect

Deliverable D5.3

DynAEs description and qualitative analysis of their key factors of success or failure

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SUMMARY

Deliverable D5.3 is related to Task 5.1 of Agroecology-TRANSECT (WP5). The objective of the task is three-fold. First, it aims to characterise the diversity of agroecological initiatives called DynAEs (dynamic agroecological systems). Second, it aims to identify factors tending to positively or negatively influence their scaling out. Last, it aims to explore how DynAEs characteristics increase or decrease the influence of these factors. To reach these objectives, the task was divided in two parts.

For the first part, DynAEs were invited to answer an online survey about their internal and contextual characteristics and their respective influences on their development. 89 DynAEs across Europe answered this survey and the results were quantitatively analysed to list factors of success and failure, build a statistical clustering-based typology capturing the diversity of DynAEs. Thereafter, factors of success and failure were linked to these types (clusters).

The analysis of survey results firstly allowed to set a general portrait of the DynAEs. In most cases, they involve farmers, have agricultural production among their income generating economic activities, mainly have vegetables and horticultural products, cereals and fruits among their agricultural productions (animal productions are less represented than crop productions), are located close enough to urban areas and markets, do not declare receiving subsidies and rely on their own private funds. Regarding the agroecological principles (Wezel et al., 2020), they tend to consider principles related to agroecosystems (such as soil health and biodiversity), rather than principles related socio-economic and value chain aspects (such as fairness, participation and governance).

For the typology, only the most relevant variables in explaining the diversity of the dataset were kept and used in an agglomerative hierarchical clustering based on a Gower distance matrix. The typology thus considered the variables linked to (1 and 2) the main type and number of market channels used, (3), the (eligibility to a) certification, (4) the main source of funding, (5) the availability of workforce, (6) the diversity of income generating economic activities, (7) the representation of women, (8) the level of education of the farmers, (9 and 10) the main type and diversity of the inputs which depend on external suppliers, (11) the main agricultural production and (12) the main type of actor involved. The clustering yielded 4 clusters:

- Cluster 1 is nicknamed “Mainstream System Anchored Initiatives” and is characterised by the lack of work force, the use of long market channels with a lot of intermediaries, the low representation of women and the lower level of education of farmers in comparison to other clusters.
- Cluster 2 is nicknamed “Support Initiatives" and mostly includes DynAEs for which (commercial) agricultural production is not the core activity.
- Cluster 3 is nicknamed “Research Driven Initiatives” and is mainly characterised by a high involvement of researchers in comparison to other clusters.
- Cluster 4 is nicknamed “Community Anchored Initiatives” and particularly stands out because of the use of direct market channels to sell agricultural products, more equality in gender representation, the focus on the production of vegetables and horticultural products, the financial independence, the high (self-evaluated) agroecological score and the tendency to act at the food system level.

For the factors of success and failure, DynAEs were asked to rate their perceptions of how their characteristics and contextual factors influence their implementation, maintenance, and growth. The analysis of the results highlighted the following influential factors: (1) type of market channel used (2) gender representation amongst the DynAEs’ actors (3) distance to cities, (4) level of education of farmers, (5) habits of consumers, (6) evolution of temperature, (7) evolution of the frequency of extreme weather events, (8) age of rural and farming population, (9) distance to markets, (10) availability of workforce, (11) evolution of the availability of lands, (12) evolution of the availability of freshwater and (13) evolution of rainfall amount. The main observations about these factors are that the DynAEs tend to be positively influenced by the use of short market channels, the equality of gender representation or the overrepresentation of women, the proximity to cities and markets and

the high level of education of farmers involved in the DynAE. On the other hand, DynAEs tend to be negatively influenced by climate change related events such as the increase of temperature and the increase of the frequency of extreme weather events, by the lack of workforce and the decrease of the availability of land. We also noted a differentiated influence of these factors on some clusters. DynAEs which do not have agricultural production and the commercialisation of agricultural products at the core of their activities (clusters 2 and 3) are less influenced by factors which are highly related to these activities (such as the habits of consumers or the availability of land). Some DynAEs of cluster 2 also report a positive influence of the increase of temperature and frequency of extreme weather events. Finally, while DynAEs in cluster 1 and 4 both focus on agricultural production, they are differently influenced by some of the environmental factors.

The second part of the task consisted in performing in-depth interviews of 11 DynAEs belonging to the 4 clusters and covering a diversity of countries. The interviews questioned the involved actors and their relationships as well as the factors of success and failure. These interviews were based on the results from the online survey and on the methodology used in Task 4.1 (*"Mapping of the Innovation Hubs socio-technical systems",* see deliverable D4.1).

The interviewed DynAEs are (1) a Finnish Living Lab linked to an European project, which mainly aims at fostering local and sustainable food system in the city, (2) a Hungarian association focused on the conservation of agrobiodiversity through the promotion of ancient and neglected plant species, (3) a Swedish organisation promoting carbon storage in agricultural soils by linking companies with farmers involved in regenerative farming, (4) a Slovenian European project case study with a focus on the transition towards the use of sustainable plant protection products, (5) a Belgian collective reviving local cereal production for traditional beer production, (6) a Polish project centred on biodynamic farming and community development through the mobilisation of research, education and employment of people with disabilities, (7) an experimental farm of a French research center with crop-livestock system in marshland, with production, biodiversity preservation and water resource management objectives, (8) an Italian private pilot farm implementing organic and regenerative agriculture practices and aiming to develop into an agroecological school with agritourism activities, (9) an European project case study based in Italy testing diversification options of traditional durum wheat production, (10) an European multi-actor project focusing on the upcycling of agri-food waste through innovative valorisation processes in Spain and (11) a Greek social cooperative aiming at promoting healthy and traditional agriculture and food practices. The interviews aim to (1) deepen the understanding of the factors of success and failure identified thanks to the survey and (2) discuss additional factors of success and failure (notably regarding factors related to the organisation of DynAEs, society, policy and administration, the dominant regime, crisis situations, and effects of agroecology).

The results obtained through this approach are rooted in dialogue with stakeholders from various initiatives, reflecting their own perceptions. The findings highlighted in the interviews are, for the most part, consistent with the results presented in the first part of the task. For example, they confirm widely shared challenges such as the aging rural population. Or for precise clusters the distance toward factors related to agricultural production, as the initiative themselves are indirectly connected to agricultural production. Aligned with the objective of this phase, the interviews also provided an opportunity to explore the factors contributing to the success or failure of these initiatives, offering a deeper understanding. For instance, while climate change is often seen as a challenge, it can also be perceived as a positive factor because it raises public awareness of some initiatives and legitimizes their activities. Another key insight was the emphasis on higher levels of education within initiatives, which highlight benefits such as the involvement of researchers with international connections, the integration of innovative practices, or the adoption of co-innovation approaches enabling new governance models for projects. That said, some results diverged from the trends identified in the first phase. For instance, for one stakeholder, being located far from urban areas is positive, while some initiatives did not experience significant challenges related to labor shortages. However, such findings remain limited.

Authors/Teams involved

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1. Introduction

Deliverable D5.3 is related to Task 5.1 of Agroecology-TRANSECT. Work Package 5 (WP5) of the project addresses the characterisation and scaling out of agroecological practices at the European level. Task 5.1 is part of this WP and is more specifically dedicated to the **characterisation of a large diversity of dynamic agroecological systems (DynAEs) and the identification of their biophysical and socioeconomic factors of success and failure**.

As highlighted in Figure 1, Task 5.1 was divided in two parts:

a) Part 1: Quantitative analysis of data from a survey filled by DynAEs

b) Part 2: Qualitative analysis of in-depth interviews with a sub-sample of DynAEs

The results of the task are:

a) A **list of key factors of success and failure** and a **typology of DynAEs** (results 1 and 2).

b) A **description of the links between the key factors and DynAEs types** (result 3) derived from the quantitative analysis of results 1 and 2 and from the qualitative approach based on the in-depth interviews.

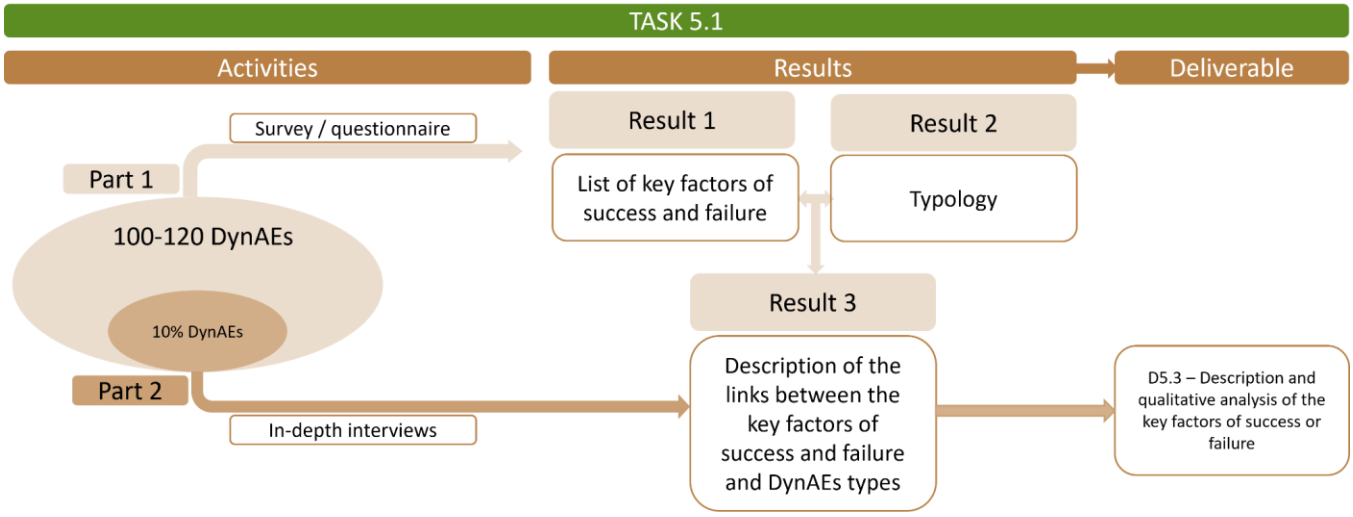


Figure 1 - Methodology of Task 5.1 and main results

Linking the factors of success and failure to the typology aims to highlight if some types of DynAEs are differently influenced by some of these factors and how.

A **DynAE** has been defined as **any kind of initiative implementing or directly supporting the implementation of agroecological practices at the agroecosystem level**, which does not exclude that they might also act or have an impact at the food system level. This includes research activities, farms, farmers' networks, approaches of co-creation and exchange of knowledge, businesses, education, training and awareness-raising activities, living labs, … However, it does not include movements, associations or organisations solely dedicated to lobbying or activism in favour of the development of agroecology.

Factors of success and failure have been defined as **factors positively or negatively influencing the implementation, operation, maintenance, extension or multiplication** of DynAEs. They are used as synonyms of “levers and barriers” which are terms used within Agroecology-TRANSECT.

2. Methodological approach

Task 5.1 focuses on studying the DynAEs, which have been identified through European research projects on agroecology[1] (case studies, field trials, living labs, …), the knowledge and networks of the project's partners and by researching initiatives on the internet. They have been pre-selected while ensuring the coverage of a **diversity of European countries (European Union, Switzerland and the United Kingdom), production systems, sectors of activity and involved actors**. The alignment with the principles of agroecology was also checked (Wezel et al., 2020). DynAEs also include 10 of the Innovation Hubs (IHs) of the project.

For **Part 1**, data was collected using an **online survey**. Its development involved a non-systematic literature review to identify the relevant biophysical and socioeconomic factors to consider to achieve our goals: characterise the DynAEs, build a typology and identify factors of success and failure. A first version of the survey was shared with the pre-identified DynAEs by email and using the websites and social media of Agroecology TRANSECT's partners. Based on the first results and feedback from the respondents, a second version of the survey was released without compromising the capacity to analyse the results of both versions together. This second version was shared within the networks of the project's partners, with the IHs and using the websites and social media of the partners.
Details about the development of the survey, its content, its dissemination and the collected raw anonymised data can be found in deliverable D5.1 (*Interactive database of anonymous data of the DynAEs across Europe*) and on Zenodo[2].
The methodologies and statistical techniques used to analyse the dataset are detailed in the next sections.

Part 2 of the study involved conducting **in-depth interviews** with a subsample of the initiatives that had responded to the online survey. This subsample was selected on a voluntary basis, with efforts made to ensure a broad representation of initiatives across the typology developed in Part 1, as well as geographical distribution across Europe. In total, 11 DynAEs were selected for these interviews, which is over the minimum of 10 initiatives set as a project objective.

The primary objective of this phase was to conduct a qualitative analysis of their key factors of success and failure. To achieve this, the interview methodology was grounded in the literature review carried out in Part 1, which informed the development of the interview questions and the themes explored in the semi-structured interviews. Additionally, the methodology drew on the approach used in Task 4.1, which employed semi-structured interviews to build detailed portraits of each IH involved in the project. As in this task, to obtain a diversity of viewpoints on the initiative, a minimum of 2 stakeholders for each DynAE were interviewed. We obtain a total of 29 interviews considered in the analysis, which is over the minimum of 20 interviews set as a project objective.

The interviews were divided into two main sections. The first focused on the **stakeholders and the relationships they maintain**, with the aim of gaining a deeper understanding of the social context

[1] Projects mentioned in Agroecology-TRANSECT's DoA and reported in the public database of the project AE4EU (https://zenodo.org/record/7248937#.Y2OMvoSZNPY).

[2] https://zenodo.org/records/10728033/files/Database_survey_for_DynAEs%5B1%5D.xlsx?download=1

surrounding each initiative. This part was inspired by the approach used in Task 4.1. The second, and most important part of the interview explored the **factors of success and failure** as perceived by the interviewees in relation to the implementation, operation, maintenance, extension, or multiplication of their initiatives. To guide the discussions and maintain coherence with the broader project, the same dimensions used in the survey were applied here: built environment, economy and markets, society and culture, knowledge and information, natural environment, policy and governance, and organisation and activities. These semi-structured interviews were embedded in the specific socio-economic and biophysical contexts of each DynAE within its respective European region.

3. Part 1 : Survey-based approach

3.1. Description of Dynamic Agroecological Systems (DynAEs)

Data from 89 DynAEs were collected using the online survey. They are in 20 countries of the European Union (82 DynAEs), Switzerland (2 DynAEs), the United Kingdom (4 DynAEs) and Serbia (1 DynAE), and cover a diversity of bio-geographical regions (see Figure 2 and Figure 3).

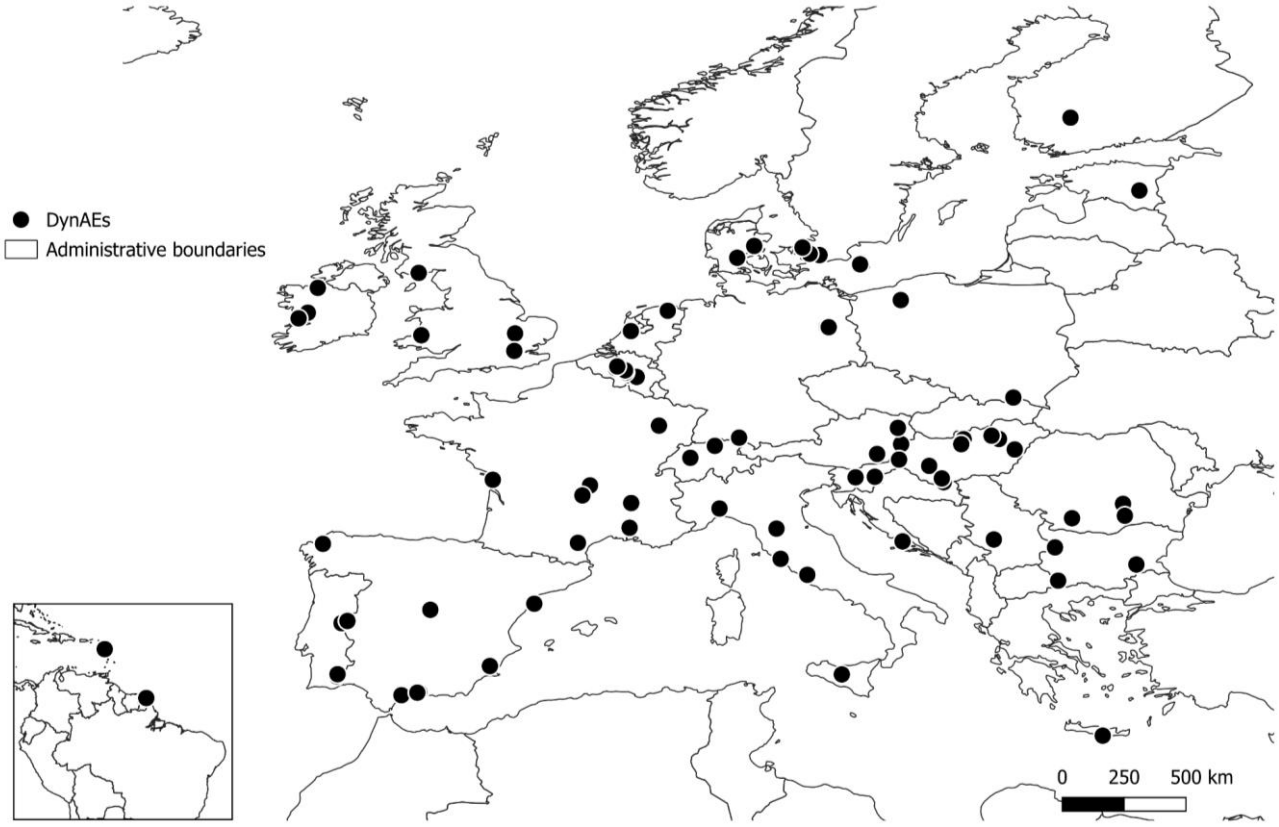


Figure 2 - Geographical distribution of DynAEs

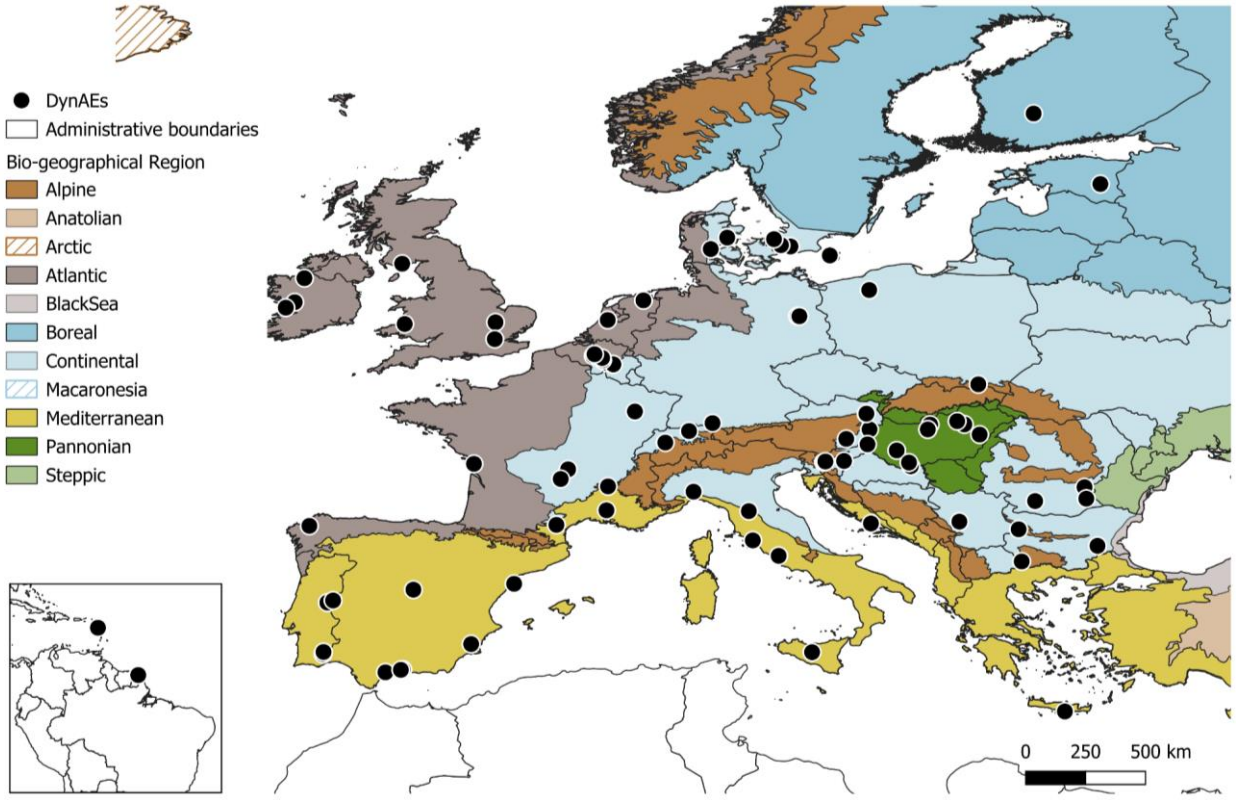


Figure 3 - Geographical distribution of DynAEs within the bio-geographical regions[3]

The survey was filled by the DynAEs and the answers thus reflect their own perceptions, and more specifically the perceptions of the respondents. We know that during the second round of data collection (36 DynAEs), the **respondents** were researchers (38,89%), farmers (33,33%), advisors (13,89%), civil society representatives (13,89%), consumers (11,11%), education sector representatives (2,78%), land managers (2,78%) and wholesalers and distributors (2,78%). The respondents either filled the survey alone or with other people, and only one survey was submitted for each DynAE. We unfortunately have no information about the profile of the respondents of the 53 DynAEs who answered our online survey during the first round of data collection because this question was not yet included in the survey.

The results of the survey are summarised in Annex 1 and 2. From these results, we learn that all DynAEs share some commonalities and general trends.

First, almost all of them involve **farmers** (92,13%) and a great share also involve **researchers** (68,54%) although all the pre-identified types of actors are represented (see Figure 4). The large representation of farmers was expected as only initiatives having a link with the practice of agroecology at the agroecosystem level were targeted. Also, the overrepresentation of researchers might be a consequence of a selection bias, as many DynAEs were identified through research projects and researchers networks.

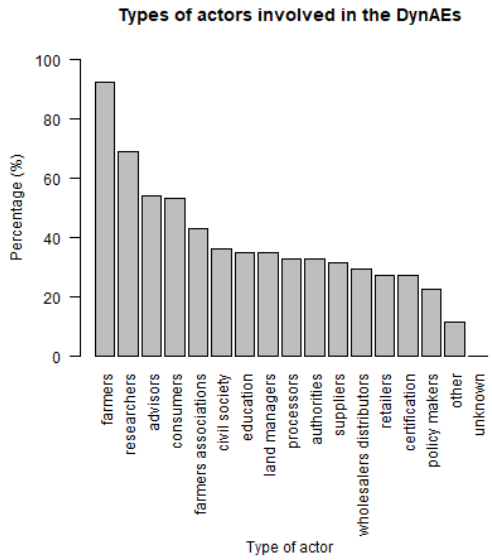
[3] Official delineations used in the Habitats Directive (92/43/EEC) (https://www.eea.europa.eu/en/datahub/datahubitem-view/11db8d14-f167-4cd5-9205-95638dfd96)

Almost all DynAEs have **agricultural production** as an **income generating economic activity** (85,39%) and we can even say that, in most cases, this is their main[4] economic activity (70,79%). All the types of economic activities explored through the survey are represented in our DynAEs sample (see Figure 5).

Looking at the agricultural productions, once again all the types explored through the survey are represented in our sample (see Figure 6) as main or secondary productions. However, looking at the **vegetables and horticultural products** and **cereals** stand out as **main agricultural productions** (respectively 26,97%, and 17,98%), which means that the other types tend to be secondary productions.

They are mostly located **close enough to cities and markets** (66,29%). Most of them also declared that they **do not receive subsidies** (73,03%) and they tend to rely on their own private funds (65,17%) (see Figure 8). Other common characteristics are the fact that **resources** used by the DynAEs are mainly **owned by private individuals** (61,80%), that they tend to be governed by **informal rules and processes** (65,17%) and that they declare acting at the **food system level** (51,69%). DynAEs use all kinds of market channels (see Figure 7) although **direct sale to consumers** (64,04%) and **sale through short supply chains** (51,69%) dominate. They mostly depend on external suppliers for energy (58,43%), seeds (57,30%), material (49,44%), fertilisers (43,82%, 39) and plant protection products (43,82%), probably due to the fact that animal production is less represented in our sample (see Figure 6).

[4] When respondents had the opportunity to select more than one option for a question, they were also asked to choose the main one/most represented. This is what we will refer to when talking about the main market channel, main source of funding, main source of income, main subsidy,main type of input, main agricultural production and main type of actor in this document.



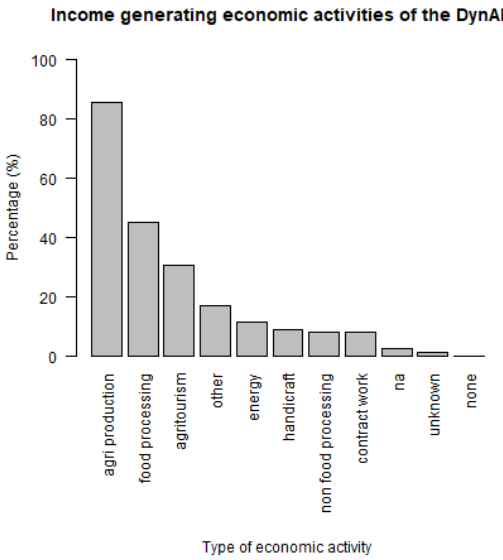
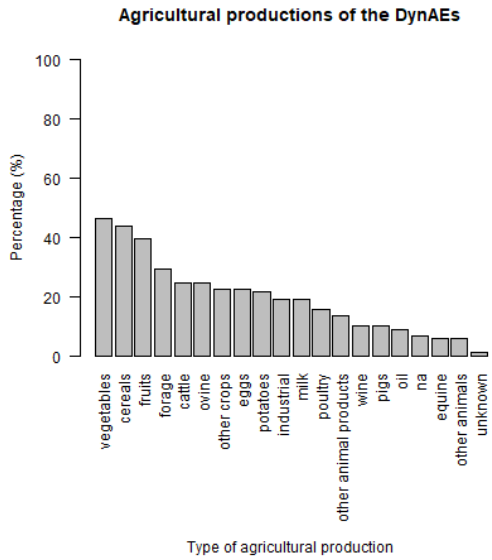


Figure 4 and 5 - Types of actors involved in the DynAEs. Farmers is the most represented type of actors (92,13%), followed by researchers (68,54%), advisors (53,93), consumers (52,81%), farmers associations (42,70%), civil society (35,96%), land managers (34,83%), processors (32,58%), authorities (32,58%), suppliers (31,46%), wholesalers/distributors (29,21%), retailers (26,97%), certification organisms (26,97%) and policy makers (22,47%). 11,24% of the DynAEs mentioned other types of actors which include tourism, transitioners, hobby gardeners, naturalists, industry, students and interns. Income generating economic activities of the DynAEs. Agricultural production is by far the most represented economic activity (85,39%). The other economic activities are, in order of importance, the processing of food products (44,94%), agritourism (30,34%), other types of economic activities (16,85% - this includes research and education), energy production (11,24%), handicraft (8,99%), processing of non food products and contractual work (7,87%). This question did not apply to 2,25% of the DynAEs ("na") which means that they do not have income generating economic activities. 1,12% could not answer the question ("unknown").



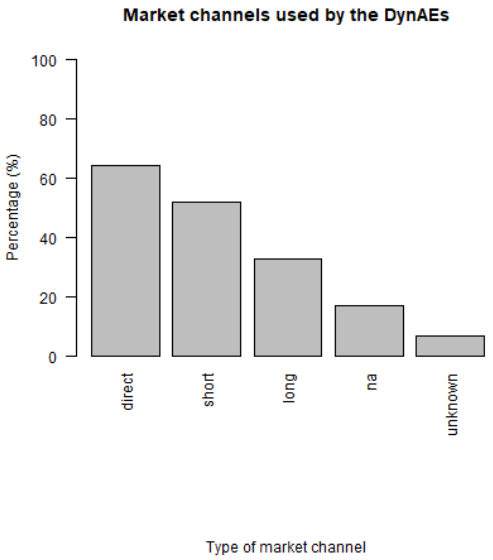
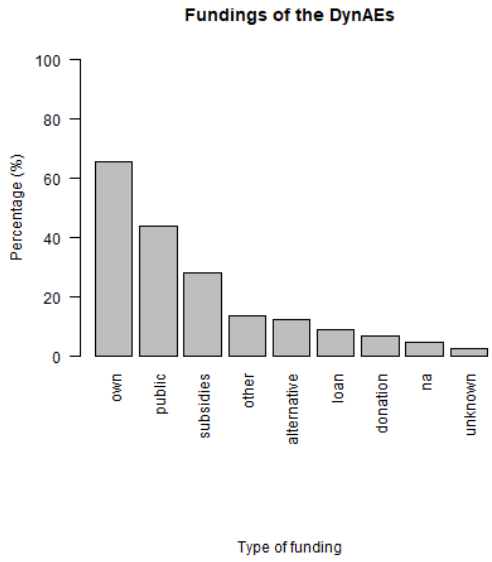


Figure 6 and 7 - Agricultural productions of the DynAEs by order of importance: vegetables and horticultural products (46,07%), cereals (43,82%), fruits (39,33%), forage (29,21%), cattle (24,72%), sheeps and goats (24,72%), eggs (22,47%), potatoes (21,35%), industrial crops (19,10%), milk (19,10%), poultry (15,73%), vineyards and pigs (10,11%), olive oil (8,99%) and horses (5,62%). Other crops (22,47%), other animal products (13,48%) and other animals (5,62%) not available in the survey's options are also represented. This question dis not apply to 6,74% of the DynAEs ("na"), which suggests that they do not have any agricultural production activity. 1,12% could not answer the

question ("unknown"). Market channels used by the DynAEs to sell their production in order of importance: direct sale to consumers (64,04%), sale through short supply chains (51,69%) and sale through long supply chains (32,58%). For 16,85% of the DynAEs, this question did not apply ("na") which suggests that they have no commercialisation activity . 6,74% could not answer the question ("unknown").



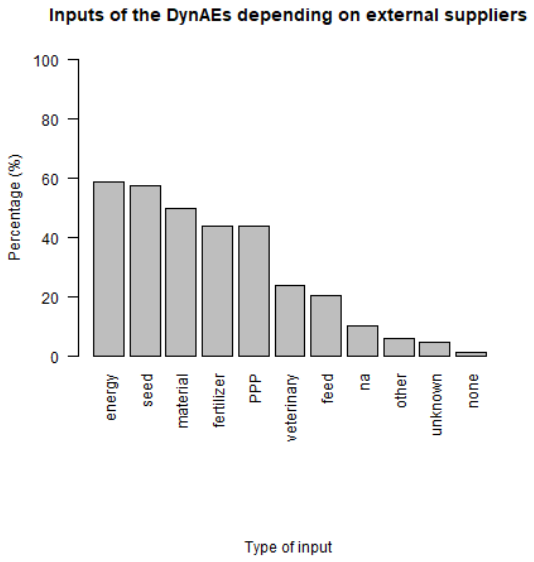


Figure 8 and 9 - Fundings of the DynAEs in order of importance: own private fund (65,17%), public fund (43,82%), subsidies (28,09%), alternative fund-raising (12,36%), loan from a financial institution (8,99%) and donation (6,74%). 13,48% of DynAEs rely on other types of funding, not mentioned in the available options of the survey. This includes European research funding and project funding. This question did not apply ("na") to 4,49% of the DynAEs, which suggests that they do not rely on any external funding. 2,25% could not answer the question ("unknown"). Inputs used by the DynAEs that depend on external suppliers by order of importance: energy (58,43%), seeds (57,30%), material and infrastructure (49,44%), fertiliser (43,82%), plant protection products (43,82%), veterinary products (23,60%) and feed (20,22%). 5,62% of DynAEs depend on external suppliers for other types of inputs not suggested in the survey's options (seedlings). This question did not apply to 10,11% of the DynAEs ("na"), which suggests that they do not use inputs. 4,49% could not answer the question ("unknown"). 1,12% do not depend on external suppliers for their inputs ("none").

Regarding the consideration of **agroecological principles** (see Table 1), general observations are that the principles “Soil health” (mean = 4,22) and “Biodiversity” (mean = 4,29) tend to have highest scores across all initiatives, while the principles “Fairness - livelihoods” (mean = 3,42), “Participation” (mean = 3,25) and “Land and natural resource governance” (mean = 3,01) tend to have the lowest scores. We also analysed the correlation between these principles (see Figure 10). We have observed that (1) the “Fairness” principles are positively correlated with each other, (2) the “Recycling” principles are positively correlated with each other, (3) the “Biodiversity” principle is positively correlated with the “Synergy” and “Soil health” principles, and (4) the “Fairness” principles, and more specifically those linked to distribution networks and livelihoods, are positively correlated with the ”Social values and diets” principle

Table 1 - Agroecologial principles (according to Wezel et al.(2020)) that have been considered in the survey. Respondents were asked to give a note between 1 and 5 to each principle depending on how much they consider the principle in their DynAE.

Principle	Description

Recycling	**Local renewable resources**	Use of local renewable resources
	Closed Cycles	Close resources' cycles
Input reduction	**Reduced dependency**	Reduce or eliminate dependency on purchased inputs
	Self-sufficiency	Increase self-sufficiency
Soil health		Secure and enhance soil health and functioning
Animal health		Ensure animal health and welfare
Biodiversity		Maintain and enhance natural and on-farm biodiversity
Synergy		Enhance interaction and synergy amongst the elements of the agroecosystem
Economic diversification		Diversify on-farm incomes
Co-creation of knowledge		Enhance co-creation and horizontal sharing of knowledge, especially amongst farmers
Social values and diets		Provide healthy, diversified, seasonally and culturally appropriate diets
Fairness	**Livelihoods**	Support dignified and robust livelihoods, especially for small scale producers
	Distribution networks	Promote fair and short distribution networks
	Local economies	Embed into local economies
Land and natural resource governance		Strengthen institutional arrangements regarding land and natural resources governance
Participation		Encourage social organisation and greater participation in decision-making

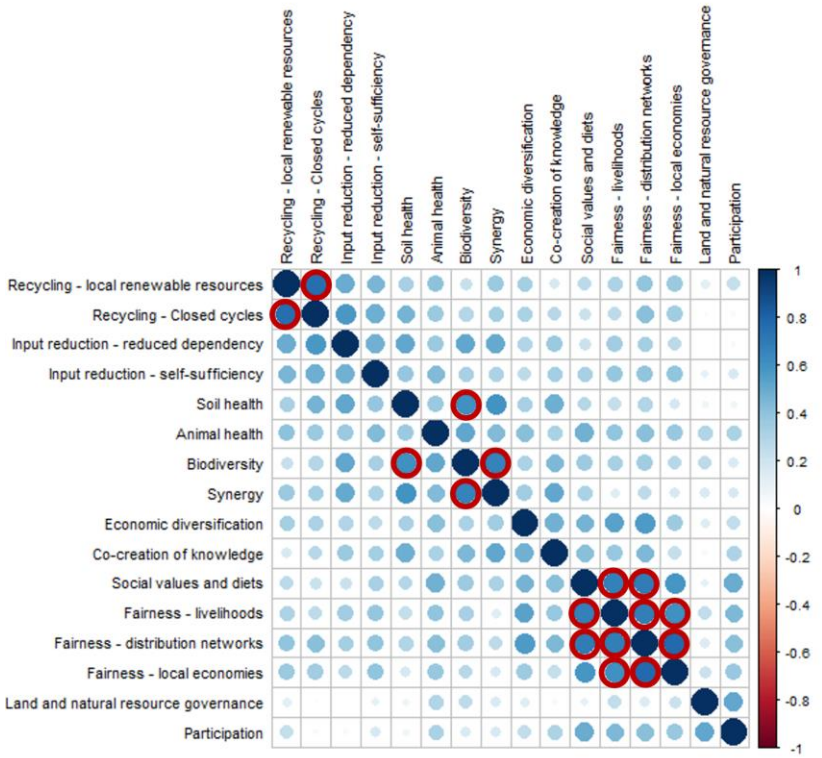


Figure 10 - Correlation matrix highlighting the correlations between the considered agroecological principles. The highest correlation coefficients (between 0,60 and 0,80) are circled in red.

3.2. Typology of DynAEs

A **typology** can be defined as "*a **method** to identify […] diversity by ordering or classifying reality*" (Daloğlu et al., cited by Escobar et al., 2019), or as "*an **organised system** of types*" (Collier et al., 2012). **Types** divide the population into groups based on the **variables** characterising the **individuals** that make it up (Fieldsend et al., 2019). As stated by Fieldsend et al. (2019), the individuals "*within a type have to be as similar as possible (internal heterogeneity on the 'level of the type') while the differences between the types have to be as strong as possible (external heterogeneity on the 'level of the typology'*"").

The **result** of a typology process depends on the objective and on the methodological choices such as the study's scale, data collection method, variables selection and data-reduction and clustering techniques used (Alvarez et al., 2018).

Our typology **methodology** is partly based on the framework of Alvarez et al. (2018). It involves a preliminary data analysis to identify key discriminating variables for the typology, reducing the number of variables while preserving dataset variability. Hair et al. (cited by Alvarez et al., 2018) suggest a minimum one-to-five ratio between the number of variables and the number of individuals. Accordingly, variables with an extreme number of "unknown" responses, low variability, or low significance in explaining dataset variability (based on a Factor Analysis of Mixed Data, FAMD) were excluded before clustering.

FAMD is a multivariate analysis method allowing to reduce the number of considered dimensions. These new dimensions are called **factors**. FAMD handles mixed datasets (quantitative and qualitative data). We used the function FAMD[5] (`FactoMineR` package) for our analysis. Missing data were handled using single imputation with the `imputeFAMD`[6] R function (`missMDA` package). This function replaces missing data by estimates which are based on a FAMD, more specifically "*on the similarity between individuals and on the relationships between variables*" (Audigier et al., 2016).

An **agglomerative hierarchical clustering algorithm** based on a **Gower distance matrix** was used for the typology. A distance matrix is used to assess the similarity between individuals or variables. Gower distance is suitable for mixed datasets as it calculates a distance for each variable based on its type (qualitative, binary or quantitative) and then calculates an average as a global distance (Legendre & Legendre, 2012; San Martin, 2018). This matrix was calculated using the R function `daisy`[7] (`cluster` package). Clustering was then performed on this matrix using the `hclust`[8] R function (`stats` package). It progressively grouped individuals from n clusters to one single cluster. The result was plotted as a **dendrogram** with nested clusters.
The optimal number of clusters is subjective and depends on the method used for clustering. Still it was assessed using the **elbow and average silhouette methods**. The elbow method aims to minimise the variation within the cluster (minimisation of the within-cluster sum of square (WSS)). The average silhouette method aims to maximise the silhouette width which is an indicator of how well individuals

[5] https://www.rdocumentation.org/packages/FactoMineR/versions/2.9/topics/FAMD
[6] https://www.rdocumentation.org/packages/missMDA/versions/1.19/topics/imputeFAMD
[7] https://www.rdocumentation.org/packages/cluster/versions/2.1.6/topics/daisy
[8] https://www.rdocumentation.org/packages/stats/versions/3.6.2/topics/hclust

fit into their clusters ('Determining The Optimal Number Of Clusters', n.d.; *RPubs - Clustering Mixed Data*, n.d.; San Martin, 2018).
Finally, the clustering results were explored (1) using **statistical tests** to identify which variables significantly vary between the clusters (Fisher's test for qualitative variables and Kruskal-Wallis test for quantitative variables) and (2) analysing **graphical outputs** of the distribution of the variables by cluster.

3.2.1. Clustering results

The survey included 28 variables that were initially meant to be used for clustering (see Table 2).

Table 2 - Set of variables initially meant to be used for clustering

#	Variable name	Description
1	principles_score	Average score for self-assessment of the initiative's commitment to the 13 agroecological principles (Wezel et al., 2020)
2	rank1_market_channels	Main market channel used by the initiative
3	number_market_channels	Number of market channels used by the initiative
4	certification	(Eligibility to a) certification of the initiative
5	rank1_funding	Main source of funding of the initiative
6	number_funding	Number of sources of funding of the initiative
7	work_force	Description of the availability of workforce within the initiative in relation to its needs
8	customers_income	Perception of the level of income of most of the customers of the initiative
9	rank1_source_income	Main income generating activity of the initiative
10	number_source_income	Number of income generating activities of the initiative
11	women	Share of women within the initiative
12	rank1_subsidies	Main type of subsidy received by the initiative
13	number_subsidies	Number of types of subsidies received by the initiative
14	resources_ownership	Main owner of the natural resources (including water and land) used by the initiative
15	farmers_education	Level of education of most of the farmers involved in the initiative
16	rank1_inputs_dependence	Main type of input for which the initiative depends on external suppliers
17	number_inputs_dependence	Number of types of inputs for which the initiative depends on external suppliers
18	rank1_farms_outputs	Main type of agricultural production of the initiative
19	number_farms_outputs	Number of types of agricultural productions of the initiative
20	dist_cities	Perception of the distance between the initiative and cities
21	dist_markets	Perception of the distance between the initiative and markets
22	governance_formality	Formality of the way the rules are set, decisions taken and activities planned within the initiative
23	proportion_governance_inclusivity	Proportion of the initiative's actors involved in decision making processes
24	rank1_actors	Main type of actor involved in the initiative
25	number_actors	Number of types of actors involved in the initiative
26	farmers	Involvement of farmers in the initiatives
27	farms	Number of farms involved in the initiative
28	scale	Highest scale of action of the initiative

Preliminary data exploration allowed to identify 6 variables that could be removed:

- Variable with an extreme number of “unknown” responses (see Figure 4):
  - customers_income (number of “unknown” responses = 18 out of 89)

- Variables with a low variability
  - rank1_source_income (70,79% have agricultural production as main source of income)
  - rank1_subsidies and number_subsidies (73,03% do not receive subsidies)
  - farmers (93,26% involve farmers)
  - resources_ownership (61,80% use resources owned by private individuals).

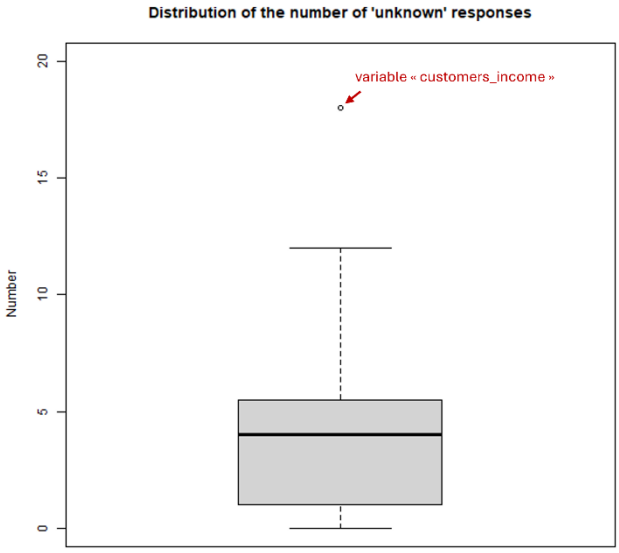


Figure 11 - Distribution of the number of "unknown" ("I don't know") responses. We can see that customers_income is an extreme value, with 18 unknown responses.

Figure 11 - Distribution of the number of “unknown” (“I don’t know”) responses. We can see that customers_income is an extreme value, with 18 unknown responses.

We performed FAMD on the remaining variables. The results (see Annex 4) allowed us to identify **12 variables** which are the most relevant explaining the variability of the dataset (see Table 3), thus allowing to significantly reduce the number of considered variables for clustering.

Table 3 - Final set of variables used for clustering

#	Variable name	Description
1	rank1_market_channels	Main market channel used by the initiative
2	number_market_channels	Number of market channels used by the initiative
3	certification	(Eligibility to a) certification of the initiative
4	rank1_funding	Main source of funding of the initiative
5	work_force	Description of the availability of workforce within the initiative in relation to its needs
6	number_source_income	Number of income generating activities of the initiative
7	women	Share of women within the initiative
8	farmers_education	Level of education of most of the farmers involved in the initiative
9	rank1_inputs_dependence	Main type of input for which the initiative depends on external suppliers
10	number_inputs_dependence	Number of types of inputs for which the initiative depends on external suppliers
11	rank1_farms_outputs	Main type of agricultural production of the initiative
12	rank1_actors	Main type of actor involved in the initiative

We estimated the optimal number of clusters and performed clustering using these 12 variables only.
For the optimal number of clusters, the average silhouette width method yielded 3 to 6 clusters, while the elbow method yielded 4 clusters . This trend was confirmed by the clustering dendrogram which yielded an optimal number of clusters between 2 and 4. Results for **2, 3 and 4 clusters** were thus explored to identify their key characteristics and choose a suitable and interpretable number of clusters, using both statistical tests and graphical outputs. In the end, this analysis led us to divide the initiatives into **4 clusters** described in the following section. All the details of the clustering analysis results can be found in Annex 5.

3.2.2. Description of types/clusters

The clustering results are shown in Figure 12 as a dendrogram with nested clusters.
First, the clustering divides the DynAEs in 2 groups, which includes a group that stands out particularly because of its **main market channel** (direct sale), **gender representation** (equality), **main agricultural production** (vegetables and horticultural products), its **financial independence** (high diversity of economic activities and high reliance on their own private funds), its high **agroecological score** and tendency to act at the **food system level** (cluster 4). The second group is made of DynAEs from clusters 1, 3 and 4 with mixed profiles but whose main commonality is the main type of funding (public funds).
Then, it divides the second group into 2 additional groups: a group of DynAEs **involved in agricultural production** (clusters 1 and 3) and a group of DynAEs **for which (commercial) agricultural production is not the core activity** (cluster 2).
The remaining DynAEs (clusters 1 and 3) are then divided into 2 groups that differentiate in terms of the main market channel used (long market channels dominate in cluster 1), **availability of workforce** (lack of work force in cluster 1 vs enough work force in cluster 3), gender representation (minority of women in cluster 1), the **certification** (certification and eligibility to certification dominates in cluster 3), **level of education of farmers** (lower level in cluster 1), the **involvement of researchers** (researchers are the main actors in cluster 3), and the agroecological score (higher in cluster 3). Generic descriptions of the clusters can be found in Table 4 and Table 5.

These descriptions highlight the main characteristics of the DynAEs that make up the clusters. However, within each cluster, there are DynAEs that may not fully align with these characteristics and could even be considered as exceptions.

The geographical distribution of the clusters can be found in Figure 13.

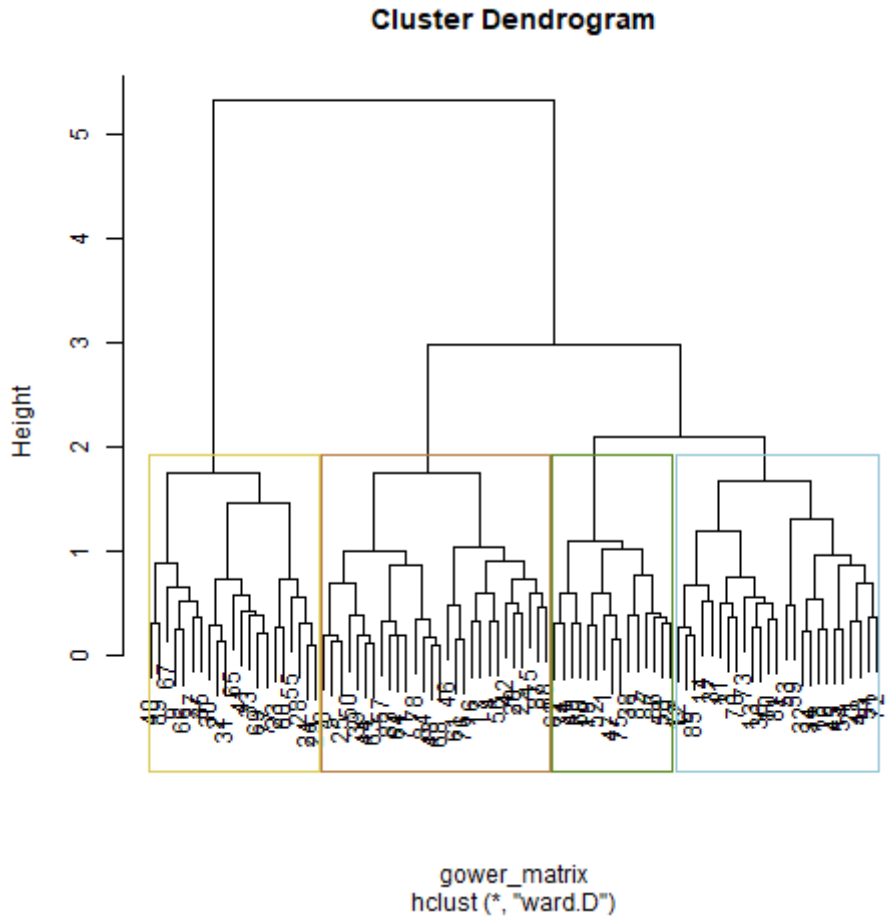


Figure 12 - Cluster dendrogram for 4 clusters resulting from the hierarchical clustering based on a Gower's distance matrix. Cluster 1 is highlighted in blue, cluster 2 in brown, cluster 3 in green and cluster 4 in yellow. The heights of the dendrogram branches reflect the distances between the clusters. Cluster 1 is thus very distinct from the 3 other clusters, while clusters 3 and 1 are the most similar. Also, when considering only 2 clusters, cluster 4 is already forming a cluster of it own, while clusters 1, 2 and 3 are gathered in the same cluster.

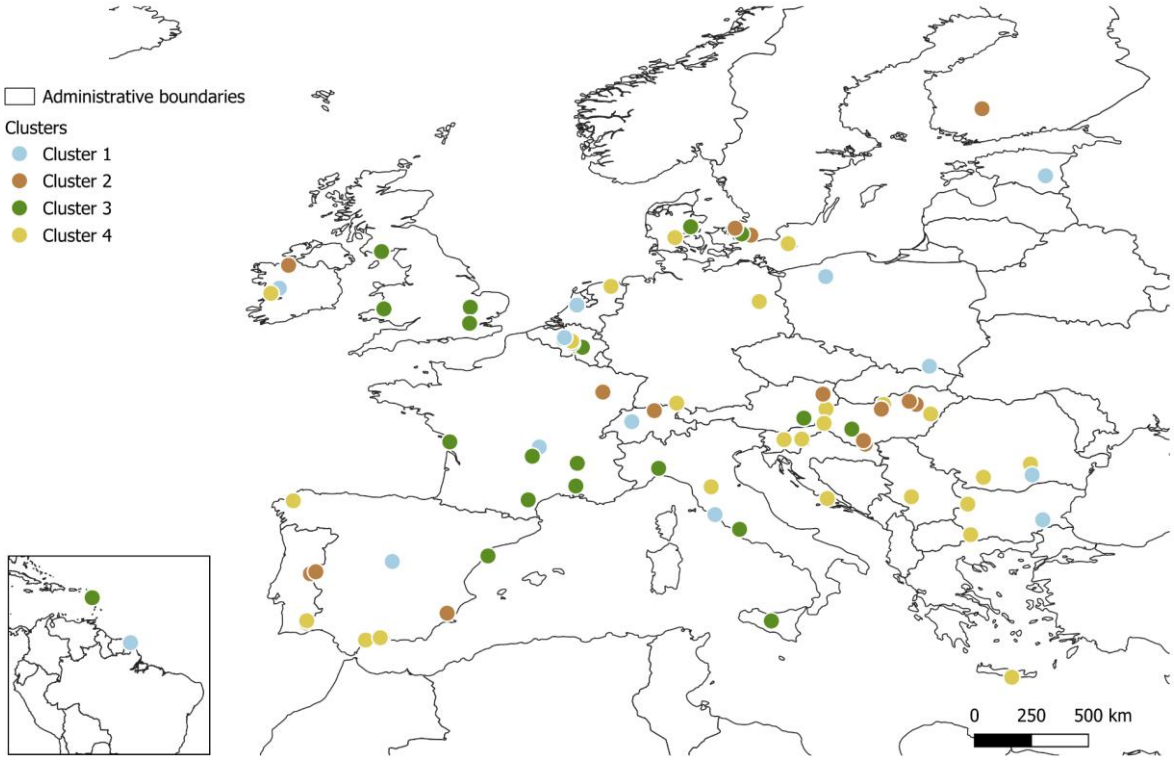
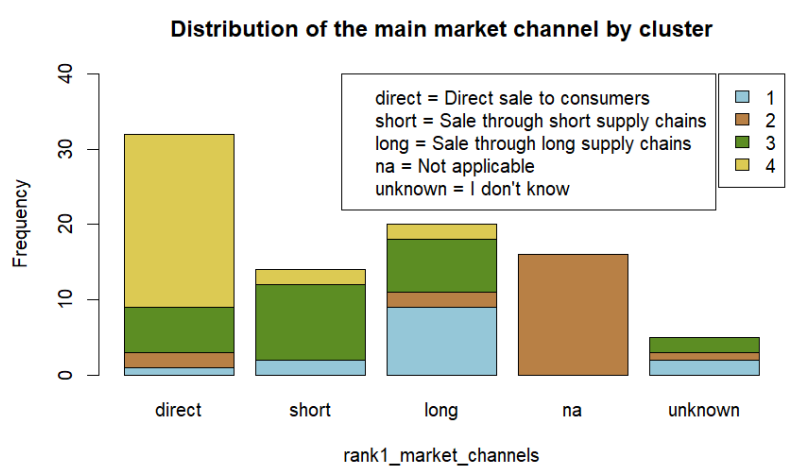
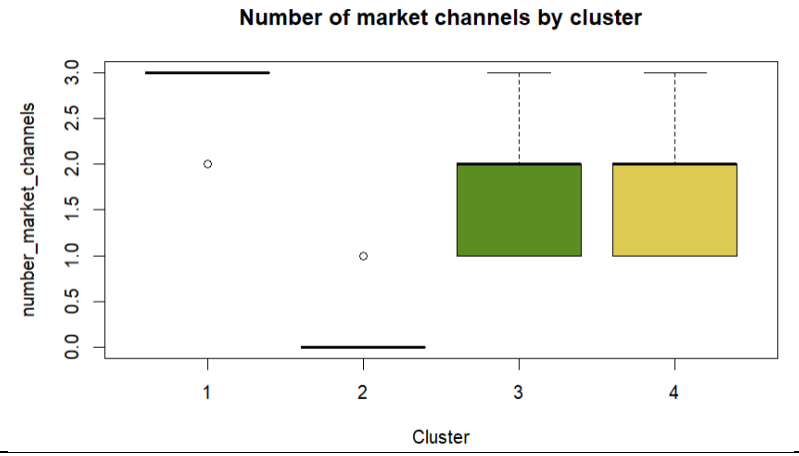


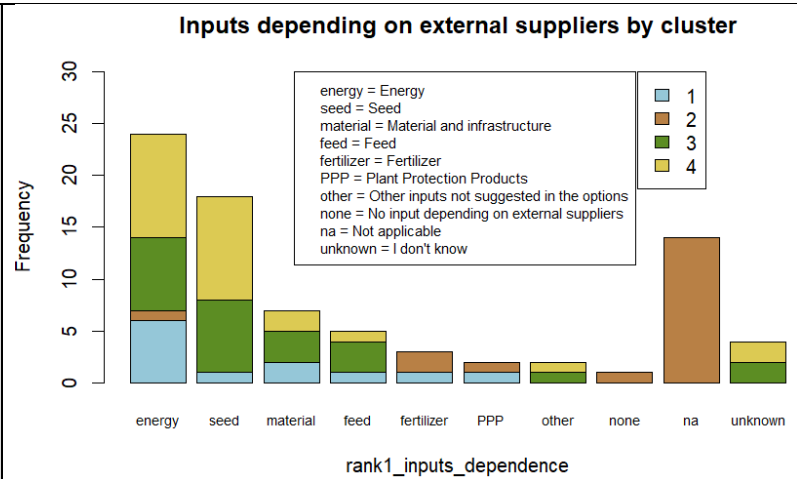
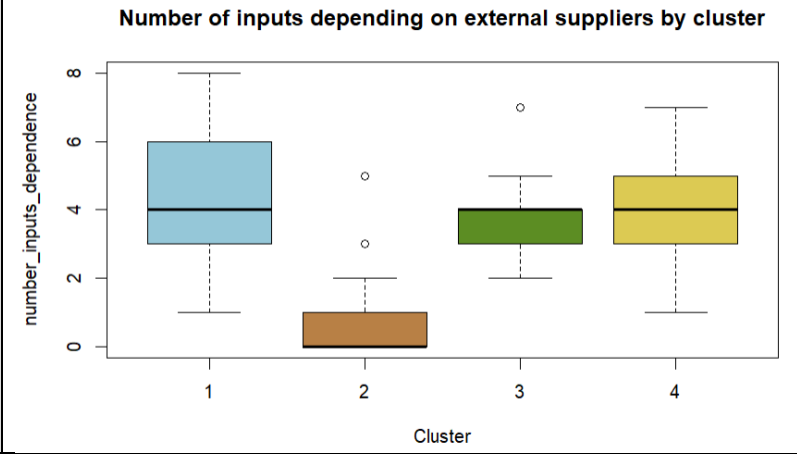
Figure 13 - Geographical distribution of the clusters

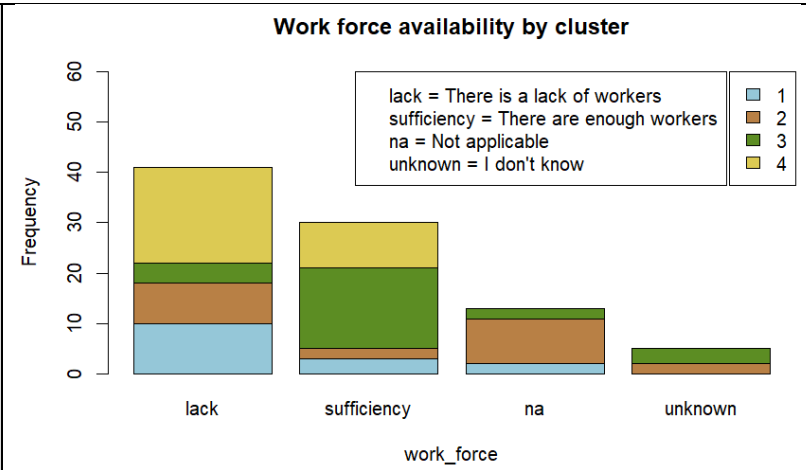
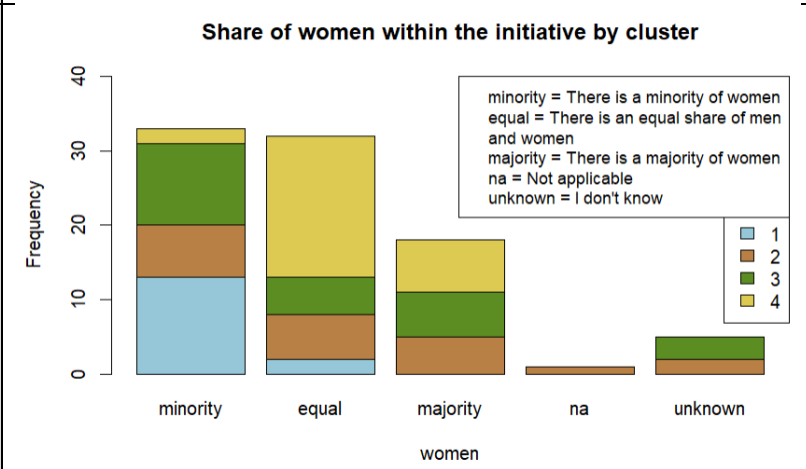
Table 4 - Generic description of the clusters

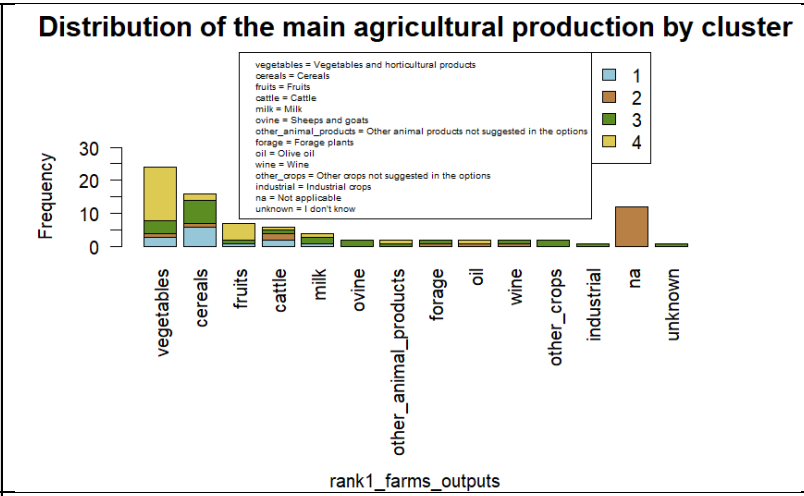
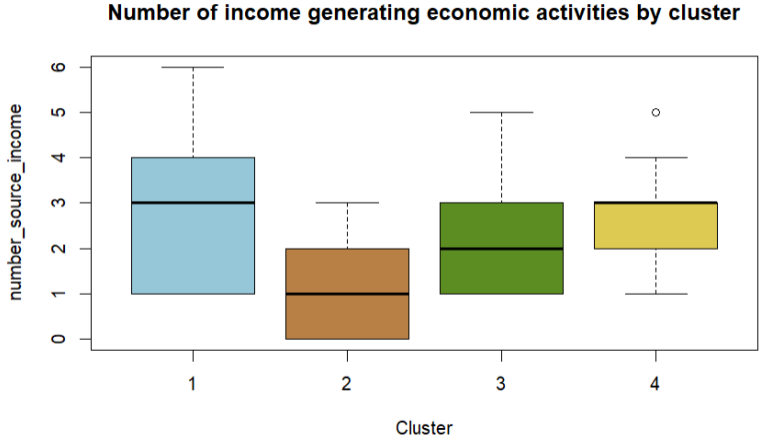
	Nickname	Description
Cluster 1	Mainstream System Anchored Initiatives	Cluster 1 is characterised by initiatives involved in agricultural production. They tend to use a diversity of market channels (all 3 options - direct, short and long) but their main market channels are long ones. They mainly rely on their own private funds or on public funds. In most cases, **they experience a lack of workforce**. They mostly depend on external suppliers for energy. Most of them produce **cereals**, vegetables and cattle. They are more diversified (in terms of types of agricultural productions) than cluster 3. There **is a minority of women**. **Farmers tend to have a middle level of education**. The main actors are farmers. They tend to be close to markets but equally close to and far from cities. They are mostly active at the farm level. **They tend to have lower agroecological scores than in other clusters.**
Cluster 2	Support Initiatives	Cluster 2 is characterised by initiatives that **do not have (commercial) agricultural production as a core activity** (no market channels used, no dependence on external suppliers for inputs, no agricultural production), but that still **have focus on agricultural production and food system related topics.** More specifically, these initiatives mostly **involve both researchers and farmers**. The farmers have their own agricultural production activities, but the initiative they are involved in with other actors is not meant to produce and commercialise agricultural products. Therefore, in comparison to other clusters where agricultural production dominates as the main source of income, DynAes in cluster 2 seem to **mostly rely on other sources of income and on external funding**. They mainly rely on public funds, their own private funds and other types of funding. Most of them encounter a lack of workforce or consider that this matter does not apply to them. Farmers involved in these initiatives tend to have a high level of education. They tend to be close to markets and cities or could not answer the question.
Cluster 3	Research Driven Initiatives	Cluster 3 is characterised by initiatives involved in agricultural production. They tend to use 2 types of market channels (short market channels, followed by long and direct market channels). They mainly have 1 source of income (economic activity), sometimes 2 or 3. They mainly depend on external suppliers for energy and seeds and rely on their own funds or on public funds. **They have enough work force**. Their main agricultural productions are **cereals**, followed by vegetables. **Most of them are certified**. In most cases, there is a minority of women. **Farmers tend to have a high level of education. Main actors are researchers**, followed by farmers. Their agricultural productions are less diversified than in clusters 1 and 4. They are close to markets and cities. They are mostly active at the farm and food system level. **They also tend to have higher agroecological scores.**
Cluster 4	Community Anchored Initiatives	Cluster 4 is characterised by initiatives involved in agricultural production. Most of them use **1 or 2 different market channels (direct market channels alone or along with another option)**. They tend to be **more diversified than the other clusters in terms of sources of income**/economic activities. They tend to depend on external suppliers for energy and seeds. **They mostly rely on their own private funds**. They tend to encounter a lack of workforce although in some cases there is enough work force. **Their main agricultural productions are vegetables and horticultural products**, followed by fruits. They are more diversified (in terms of types of agricultural productions) than cluster 3. Almost all of them are certified or eligible for certification. In most cases, **there is an equal share of men and women, and sometimes a majority of women**. Farmers have a middle to high level of education. The main actors are farmers, followed by consumers. They tend to be close to markets and cities, a trend that is more evident than in cluster 1. They also tend to have **higher agroecological scores**. Most of them are active at the **food system level**.

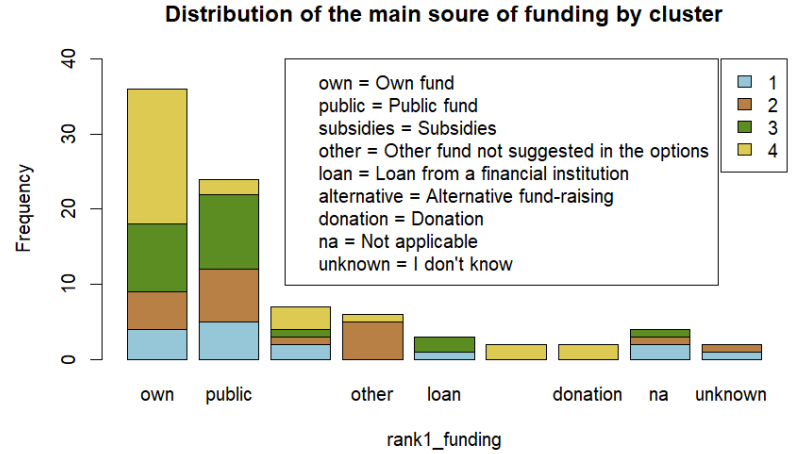
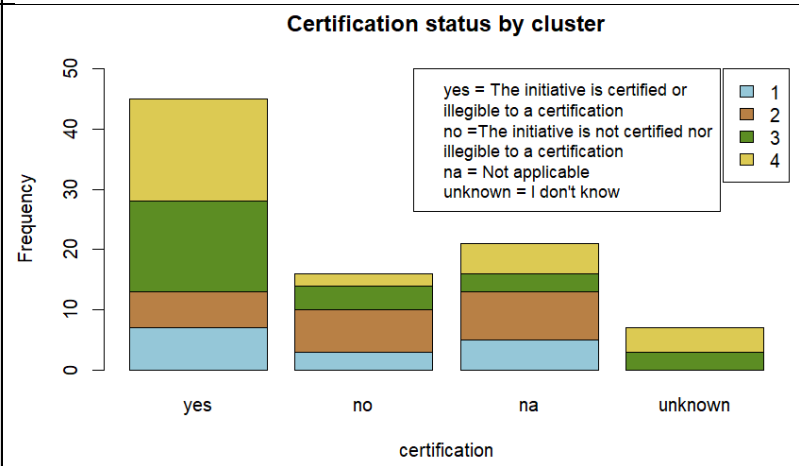
Table 5 - Detailed description of the clusters for the relevant variables

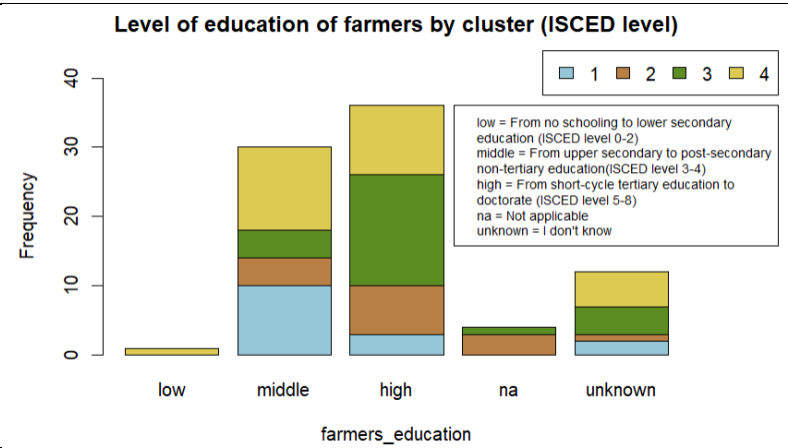
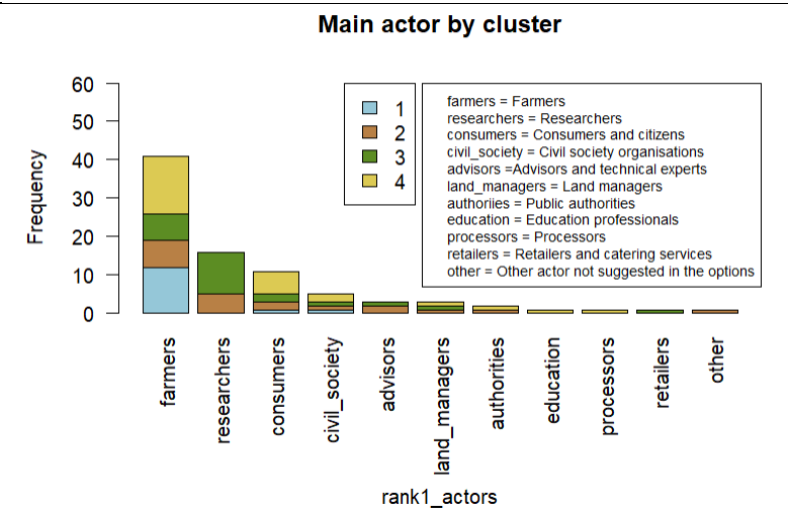
Variable	Graph	Cluster 1 (n=15; 16,85%)	Cluster 2 (n=21; 23,60%)	Cluster 3 (n=25; 28,09%)	Cluster 4 (n=28; 31,46%)
rank1_market_channels		Long (60%)	Not applicable (76,19%)	Short (40%) > long (28%) > direct (24%)	Direct (82,14%)
number_market_channels		3 (66,67%)	Not applicable (80,95%)	2 (44%)	1 (46,43%) or 2 (42,86%)

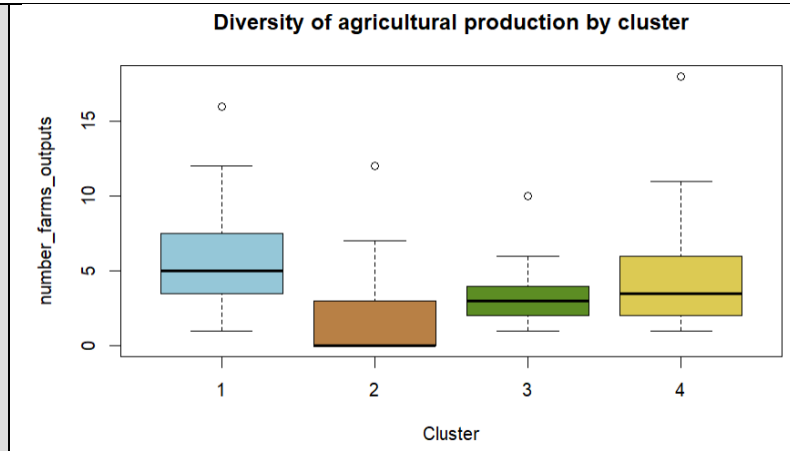
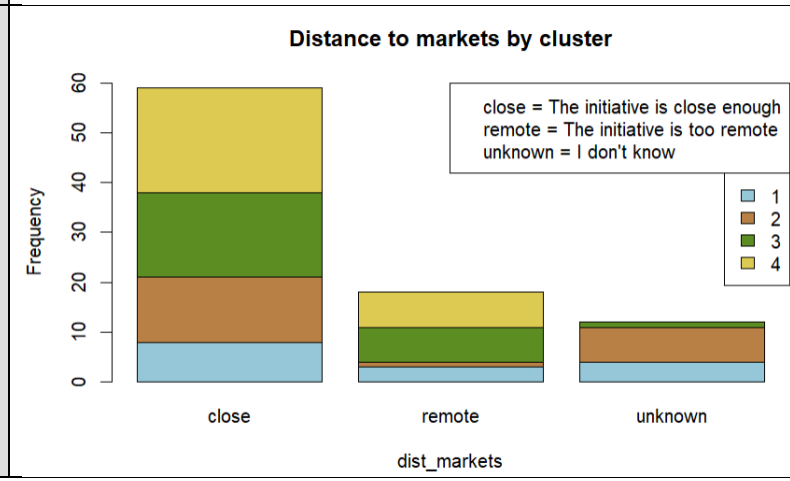
	rank1_inputs_ dependence		Energy (40%)	Not applicable (76,19%)	Energy (28%) and seeds (28%)	Energy (35,71%) and seeds (35,71%)
	number_inputs_ dependence		No specific trend	Not applicable (76,19%)	4 (36%) > 3 (28%) > 2 (16%)	3 (17,86%), 4 (32,14%) or 5 (14,29%)

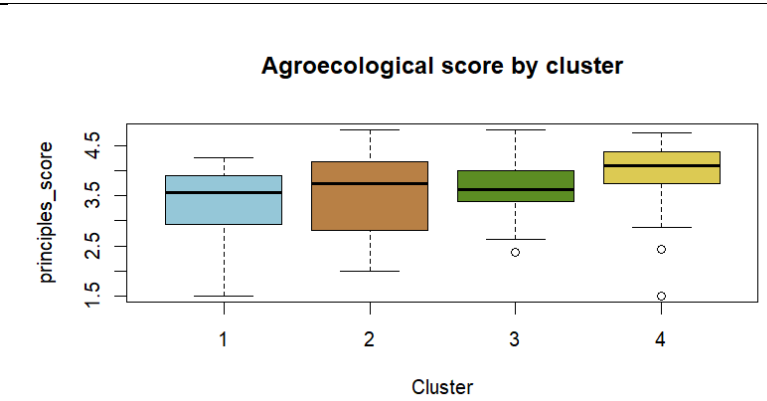
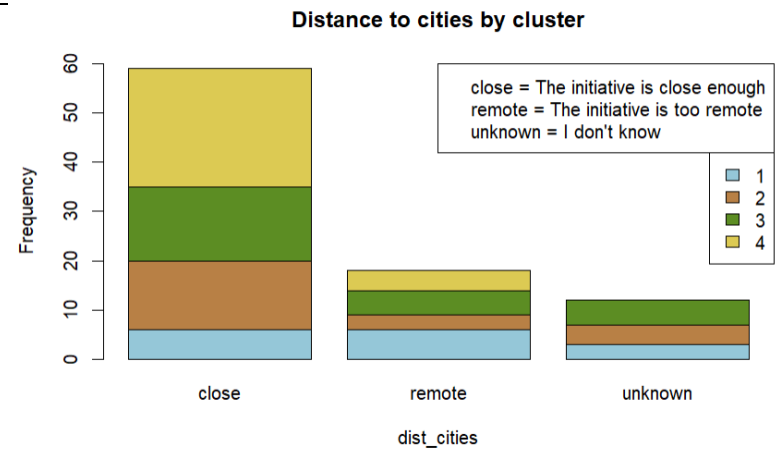
	work_force		Lack (66,67%)	Not applicable (42,86%) or lack (38,10%)	Sufficiency (64%)	Lack (67,86%) > sufficiency (32,14%)
	women		Minority (86,67%)	No specific trend	Minority (44%) > majority (24%) > equality (20%)	Equality (67,86%)

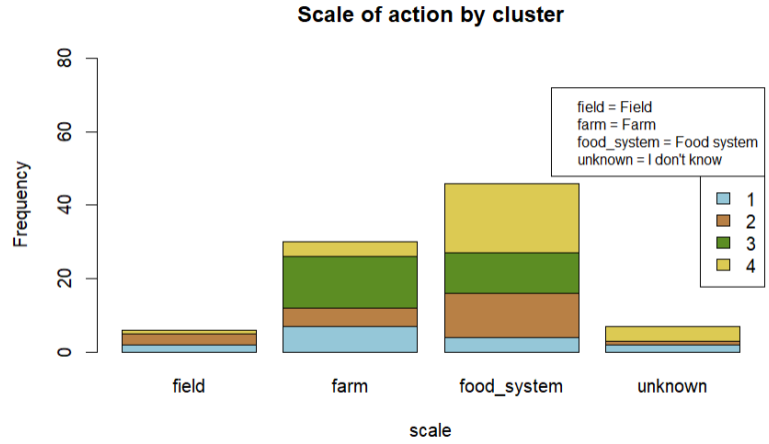
	rank1_farms_outputs		Cereals (40%)	Not applicable (57,14%)	Cereals (28%)	Vegetables (27,14%)
	number_source_income		No specific trend	Not applicable (38,10%) or 1 (19,05%), 2 (23,81%) or 3 (14,29%)	1 (40%) > 2 (28%) > 3 (20%)	3 (35,71%) > 2 (25%) > 1 (21,43%)

	rank1_funding		Public funds (33,33%) or own private funds (26,67%)	Public funds (33,33%), own private funds (23,81%) or other sources of funding (23,81%)	Public funds (40%) or own private funds (36%)	Own private funds (64,29%)
	certification		No specific trend	No specific trend	Yes (60%)	Yes (60,71%)

	farmers_education		Middle (66,67%)	High (33,33%)	High (64%)	Middle (42,86%) to high (35,71%)
	rank1_actors		Farmers (80%)	Farmers (33,33%) and researchers (23,81%)	Researchers (44%) > farmers (28%)	Farmers (53,57%) > consumers (21,43%)

	number_farms_outputs		More diversified than cluster 3 (min=0; max=16; median=5; mean=5,93; sd=4,18)	Not applicable (57,14%)	Less diversified (min=1; max=10; median=3; mean=3,46; sd=2,41)	More diversified than cluster 3 (min=1; max=18; median=3,5; mean=4,61; sd=3,79)
	dist_markets		Close (53,33%)	Close (61,90%)	Close (68%)	Close (75%)

	principles _score		Lowest (min=1,5; max=4,25; median=3,56; mean=3,38; sd=0,75)	Higher than cluster 1 (min=2; max=4,81; median=3,75; mean=3,56; sd=0,93)	Higher than clusters 1 and 2 (min=2,38; max=4,81; median=3,63; mean=3,71; sd=0,58)	Higher than other clusters (min=1,5; max=4,75; median=4,09; mean=3,95; sd=0,70)
	dist_cities		Close (40%) or remote (40%)	Close (66,67%)	Close (60%)	Close (85,71%)

	scale		Farm (46,67%) > food system (26,67%)	Food system (57,14%)	Farm (56%) > food system (44%)	Food system (67,86%)

3.3. Factors of success and failure

A literature review on factors influencing agroecological practices (Barnes et al., 2022; Blanch-Ramirez et al., 2022; Mozzato et al., 2018; Petersen et al., 2020; Plumecocq et al., 2018; Schoonhoven & Runhaar, 2018), innovation diffusion (Keppler, 2019), initiatives (Fieldsend et al., 2019), agroecological transition (Anderson et al., 2019; Ferguson et al., 2019; Rahmanian et al., 2016; Schoonhoven & Runhaar, 2018), and food system transition (Baret & Antier, 2021) informed the selection of factors to include in the survey (see Table 6). These factors have been gathered into larger dimensions defined by the CRA-W team and inspired by Nesheim et al. (2015): built environment, economy & markets, society & culture, knowledge & information, natural environment, policy & governance and organisation & activities.

In the online survey, DynAEs were asked to rate their perceptions of **how their characteristics and contextual factors influence their implementation, maintenance, and growth** using a Likert scale (see Table 7). The distribution of the answers for each factor of influence were then analysed using graphs and statistical tests.

Table 6 - List of considered variables for the identification of factors of success and failure in the survey

#	Dimension	Variable name	Description

1	Organisation and activities	influence_actors_type	Perceived influence of the main type of actor of the initiative
2	Built environment	influence_farms_outputs_diversity	Perceived influence of the number of agricultural productions of the initiative
3		influence_inputs_dependence	Perceived influence of the main type of input depending on external suppliers
4		influence_dist_cities	Perceived influence of the distance to cities of the initiative
5		influence_dist_markets	Perceived influence of the distance to markets of the initiative
6	Economy & markets	influence_market_channels	Perceived influence of the main market channel used by the initiative
7		influence_funding	Perceived influence of the main type of funding of the initiative
8		influence_work_force	Perceived influence of the availability of workforce within the initiative
9		influence_customers_income	Perceived influence of the level of income of the initiative's customers
10		influence_source_income	Perceived influence of the main income generating economic activity of the initiative
11	Society & culture	influence_women	Perceived influence of the share of women within the initiative
12		influence_statements_consumers_habits_ct	Perceived influence of the habits of consumers
13		influence_statements_population_ct	Perceived influence of the population density
14		influence_statements_age_ct	Perceived influence of the rural and farming population age
15	Knowledge & information	influence_farmers_education	Perceived influence of the level of education of the farmers involved in the initiative
16	Natural environment	influence_land_ct	Perceived influence of the evolution of the availability of land
17		influence_water_ct	Perceived influence of the evolution of the availability of ground and surface water
18		influence_rainfall_ct	Perceived influence of the evolution of the precipitation amount
19		influence_temperature_ct	Perceived influence of the evolution of mean temperature
20		influence_extreme_weather_ct	Perceived influence of the evolution of the frequency of extreme weather events (droughts, floods, heat and cold waves, fires, storms, …)
21		influence_statements_topo_ct	Perceived influence of the topography
22		influence_statements_soil_ct	Perceived influence of the soil properties and fertility

Table 7 - Likert scale used in the online survey to assess the respondents' perception of the influence of their own characteristics and of contextual factors

negative	Has a negative influence
possibly_negative	May have a negative influence
neutral	Has no influence

possibly_positive	May have a positive influence
positive	Has a positive influence
unknown	I don't know

The perceived influences were then linked to the reported characteristics of the DynAEs and contextual factors to identify specific conditions that tend to negatively or positively influence the DynAEs. Therefore, in addition to the variables mentioned in Table 1, the online survey also questioned the **perceived recent evolution of some contextual factors** using a Likert scale (see Table 8 and Table 9).

Table 8 - Variables related to the evolution of some contextual factors linked to the natural environment, which were included in the online survey to identify specific conditions negatively or positively influencing the DynAEs

#	Dimension	Variable name	Description
1	Natural environment	evolution_land_ct	Perceived evolution of the availability of land
2		evolution_water_ct	Perceived evolution of the availability of ground and surface water
3		evolution_rainfall_ct	Perceived evolution of the precipitation amount
4		evolution_temperature_ct	Perceived evolution of the mean temperature
5		evolution_extreme_weather_ct	Perceived evolution of the frequency of extreme weather events (droughts, floods, heat and cold waves, fires, storms, …)

Table 9 - Likert scale used in the online survey to assess the respondents' perception of the evolution of contextual factors linked to the natural environment

decrease	Decreased
possible_decrease	May have decreased
unchanged	Stayed the same
possible_increase	May have increased
increase	Increased
unknown	I don't know

The analysis of the survey's answers for the factors of success and failure firstly allowed us to identify **factors that positively influence most of the DynAEs** (more than 50% of the 89 DynAEs answering "possibly positive" or "positive" influence). These factors are the main type of actor involved in the DynAEs (95,51%), the diversity of agricultural production (70,79%) and the main income generating economic activity (65,17%) (variables 1, 2 and 10 from Table 5). This basically means that whatever the DynAEs conditions for these variables, they seem to consider their situation as being positive. As an example, whatever the level of agricultural diversity, DynAEs seem to consider it as being positive for their out scaling.

Also, we missed information for the variable related to the level of income of the customers (variable 9 in Table 6) because of too many "unknown" responses (25,84%).

For the remaining explored factors, we observed quite a diversity of answers which might imply that we could identify **specific conditions negatively or positively influencing the out-scaling of DynAEs**. On this basis, the final list of factors of success and failure, identified thanks to graphical analysis and Fisher tests of independence, are reported in Table 9, while no particular condition influencing the DynAEs was

identified for the variables linked to the dependence on external suppliers for inputs and to the main source of funding (variables 3 and 7 in Table 6).

Some outputs of this analysis are quite straightforward, such as the fact that **being close enough to cities is mostly seen as positive** and being too far from cities is seen as negative. There are however some results that are worth highlighting. Firstly, it is only for DynAEs selling their production using long market channels that the type of market channel used has a negative influence, while shorter market channels are predominantly seen as positive. This highlights the importance of the **development of shorter market channels**. We also identified that **gender representation equality matters** for the out-scaling of agroecology and even that the role of women is predominant as a minority of women is mostly seen as negative while having a majority of women is seen as positive. Another highlight is the **importance of the level of education of the farmers** involved in DynAEs, as the higher the level of education, the more often a positive influence is reported. **Habits of consumers** have also been identified as being influential, although our survey did not allow us to identify what are the consuming habits with a positive influence and the ones with a negative influence.
For the contextual factors linked to the natural environment, topography is not key while the **soil fertility is mostly seen as positive**, even though the survey does not allow us to know the underlying soil fertility conditions. Also, some DynAEs reported **a positive impact of hotter weather and of more frequent extreme weather events**, factors that could be linked to climate change. Moreover, while climate change spirals out of control, bringing more extreme weather events in its wake, a **decrease of the frequency of extreme weather events was also reported** by some DynAEs and this was perceived as negatively influencing them. These are unexpected outputs that are worth being explored more deeply.
Another surprising output is the fact that the population density does not seem to affect the development of the DynAEs while the distance to cities, which is linked to the population density, has an influence. This could suggest that there are **other factors linked to urban areas that are relevant in explaining their influence.** Finally, the **age of rural and farming populations** seems to have a negative influence on agroecology out scaling.

Table 10 - List of identified factors of success and failure and the specific conditions linked to it. The sign "-" denotes a negative influence,"/" denotes a neutral influence, "+" denotes a positive influence, "(-)" denotes a possible negative influence (slight trend), "(+)" denotes a possible positive influence (slight trend). For each variables' modalities, the percentage of observations for each level of influence is mentioned between brackets. For the sake of readability, the answers "has a negative influence" and "may have a negative influence" have been gathered under "negative". Likewise, the answers "has a positive influence" and "may have a positive influence" have been gathered under "positive". For some variables, the modalities are "not available" because the information was not asked in the survey.

Question in the survey	Dimension	Description	Variable name	Modality	Influence				Comments
					negative (-)	neutral (/)	positive (+)	unknown (?)	
How would you describe the distance from your initiative and its farms to cities ? How do you think the distance of your initiative from cities influences it?	Built environment	Distance of the initiative from cities	dist_cities	close	(6,78%)	(16,95%)	+ (76,27%)	(0%)	Being far from cities is mostly seen as negative while being close to cities is seen as positive.
				remote	- (66,67%)	(11,11%)	(11,12%)	(11,11%)	
How would you describe the distance from your initiative and its farms to markets ? How do you think the distance of your initiative and its farms from markets influences it?		Distance of the initiative from markets	dist_markets	close	(5,08%)	(25,42%)	+ (67,80%)	(1,69%)	Being far from markets is seen as negative while being close to markets is mostly seen as positive.
				remote	- (77,78%)	(0%)	(22,22%)	(0%)	
Which one is the most used market channel ? What do you think is	Economy & markets	Main market channel used by the initiative	rank1_market_channels	direct	(0%)	(0%)	+ (100%)	(0%)	The use of direct and short market channels is seen as positive while there are mixed feelings about the
				short	(0%)	(0%)	+ (92,31%)	(7,69%)	

the influence of the main sales channels used by your initiative and its farms ?				long	- (27,78%)	(11,11%)	+ (44,44%)	(16,67%)	use of long market channels (negative or positive).
How would you describe the availability of workers within your initiative in relation to your needs ? How do you think the availability of workers influences your initiative?		Availability of workforce in the initiative	work_force	lack	- (87,81%)	(2,44%)	(4,88%)	(4,88%)	The lack of work force seems to be seen as negative while the sufficiency of workforce seems to be seen as positive.
				sufficiency	(6,67%)	(23,33%)	+ (23,33%)	(46,67%)	
What share of your initiative's actors are women ? How do you think the share of women within your initiative influences it ?	Society & culture	Share of women within the initiative	women	minority	- (27,27%)	/ (39,39%)	(12,12%)	(21,21%)	There are mixed feelings about having a minority of women in an initiative (negative or neutral), while equality in the representation of men and women or having a majority of women seems to be seen as positive.
				equality	(0%)	(18,75%)	+ (78,13%)	(3,13%)	
				majority	(5,56%)	(5,56%)	+ (66,66%)	(22,22%)	
You will have a list of statements regarding your local context. Please rate them according to how you think they influence your initiative : the diets and eating habits of citizens		Consumers' habits	statements_consumers_habits_ct	Not available	(-) (39,33%)	(12,36%)	(+) (38,20%)	(10,11%)	The consumers' habits are seen as both possibly negative and possibly positive, even though we do not know what are the related habits. There is no strong trend towards a negative or positive influence but this highlights that the consumers habits are influential.

You will have a list of statements regarding your local context. Please rate them according to how you think they influence your initiative : population density		Population density	statements_population_ct	Not available	(-) (25,85%)	/ (22,47%)	(+) (32,59%)	(19,10%)	The population density is sometimes seen as both possibly negative and possibly positive, but the most obvious trend is the neutral influence. We can also note a high proportion of unknown answers. However we do not know what the associated population density conditions are.
You will have a list of statements regarding your local context. Please rate them according to how you think they influence your initiative : rural and farming population age		Age of rural population	statements_age_ct	Not available	- (52,80%)	(17,98%)	(8,99%)	(20,22%)	The age of farmers is mostly seen as negative, even though we do not know what are the associated age characteristics of the population.
What is the level of education of most of the farmers involved in your initiative? How do you think their level of education influences the farms and your initiative?	Knowledge & information	Level of education of most farmers of the initiative	farmers_education	low	- (100%)	(0%)	(0%)	(0%)	The higher the level of education of farmers, the more it seems to be positive for the initiative.
				middle	- (20%)	/ (20%)	+ (53,33%)	(6,67%)	
				high	(2,78%)	(11,11%)	+ (83,33%)	(2,78%)	
How would you describe the evolution of the following environmental conditions in your	Natural environment	Evolution of the availability of land	evolution_land_ct	decrease	- (57,14%)	(21,43%)	(14,29%)	(7,14%)	An increase in the availability of land seems to be positive while a decrease seems to be seen as negative. No change in the availability of land
				possible_decrease	- (15,38%)	(15,38%)	(15,38%)	(7,69%)	
				unchanged	(3,85%)	/ (61,54%)	(23,08%)	(11,54%)	

initiative's immediate environment in recent years? : Availability of land How do you think the fact that the availability of land decreased/stayed the same/increased influences your initiative?				possible_increase	(15,38%)	(7,69%)	+ (76,92%)	(0%)	seems to be seen as neutral.
				increase	(8,33%)	(0%)	+ (91,67%)	(0%)	
How would you describe the evolution of the following environmental conditions in your initiative's immediate environment in recent years? : Availability of ground and surface water How do you think the fact that the availability of ground and surface water decreased/stayed the same/increased influences your initiative?		Evolution of the availability of ground and surface water	evolution_water_ct	decrease	- (84,21%)	(5,26%)	(10,52%)	(0%)	A decrease in the availability of ground and surface water resources seems to be seen as negative while an increase seems to be seen as positive. There are mixed feelings about no change in the availability of water resources (neutral or positive).
				possible_decrease	- (78,56%)	(3,57%)	(10,71%)	(0%)	
				unchanged	(3,85%)	/ (46,15%)	+ (34,61%)	(15,38%)	
				possible_increase	(0%)	(0%)	(100%)	(0%)	
				increase	(0%)	(0%)	+ (100%)	(0%)	
How would you describe the evolution of the following		Evolution of precipitation amount	evolution_rainfall_ct	decrease	- (80%)	(6,67%)	(10%)	(3,33%)	A decrease in precipitation amount seems to be seen as negative while there are mixed feelings about an

environmental conditions in your initiative's immediate environment in recent years? : Precipitation amount How do you think the fact that the precipiation amount decreased/stayed the same/increased influences your initiative?				possible_decrease	- (78,26%)	(8,70%)	(13,05%)	(0%)	increase (positive or negative). No change in the precipitation amount is seen as neutral.
				unchanged	(0%)	(66,67%)	(13,33%)	(20%)	
				possible_increase	- (40%)	(0%)	+ (60%)	(0%)	
				increase	- (37,50%)	(12,50%)	+ (50%)	(0%)	
How would you describe the evolution of the following environmental conditions in your initiative's immediate environment in recent years? : Temperature How do you think the fact that temperature decreased/stayed the		Evolution of temperature	evolution_temperature_ct	possible_decrease	(0%)	(0%)	(100%)	(0%)	An increase of temperature is mostly seen as negative, although in some rare cases it is seen as positive. Almost no initiatives reported a decrease of temperature (2 DynAEs only) and the only initiatives reporting that evolution saw this as being positive. No change is seen as neutral.
				unchanged	(12,50%)	/ (68,75%)	(12,50%)	(6,25%)	
				possible_increase	- (57,69%)	(3,85%)	(+) (26,92%)	(11,54%)	

same/increased influences your initiative?				increase	- (65,79%)	(7,89%)	(15,78%)	(10,53%)	
How would you describe the evolution of the following environmental conditions in your initiative's immediate environment in recent years? : Extreme weather events frequency (droughts, floods, heat and cold waves, fires, storms...) How do you think the fact that the frequency of extreme weather events decreased/stayed the same/increased influences your initiative?		Evolution of extreme weather events frequency	evolution_extreme_weather_ct	possible_decrease	- (100%)	(0%)	(0%)	(0%)	An increase of the frequency of extreme weather events is mostly seen as negative, although in some rare cases, it is seen as being positive. In some rare cases, a possible decrease of the frequency of extreme weather events was reported and mostly seen as negative.
				unchanged	(8,33%)	/ (66,67%)	(8,33%)	(16,67%)	
				possible_increase	- (63,64%)	(9,09%)	(+) (22,73%)	(4,55%)	
				increase	- (75,52%)	(4,08%)	(16,32%)	(4,08%)	
You will have a list of statements regarding your local context. Please rate them according to how you think they influence your initiative : the relief, slope and elevation		Topography	statements_topo_ct	Not available	(21,34%)	/ (31,46%)	(29,22%)	(17,98%)	The topography mostly has a neutral influence, even though we do not know what are the associated topography conditions. We can also note a high proportion of unknown answers.

You will have a list of statements regarding your local context. Please rate them according to how you think they influence your initiative : the soil properties and fertility		Soil fertility	statements _soil_ct	Not available	(-) (23,59%)	(7,87%)	+ (56,18%)	(12,36%)	The soil fertility mostly has a positive influence, even though we do not know what are the associated soil's fertility conditions.

As mentioned above, it was not always possible to identify the underlying contextual conditions that positively or negatively influence the DynAEs because this information was not available in the online survey. For example, we observed that the age of the rural population has a negative influence but we do not know which age has this negative influence. Moreover, although the respondents have been asked about the evolution of some contextual factors such as the evolution of temperature and frequency of extreme weather events, this is only based on their own perception that might be biassed. For these reasons, **we explored some of these contextual factors using external databases and the gps coordinates of the DynAEs to see if specific conditions positively or negatively influencing DynAEs' out-scaling could be identified.** The main results are that (1) the higher the percentage of population exposed to extreme weather events, the more negative the influence, (2) the higher the availability of freshwater, the more positive the influence, (3) a mean annual precipitation below 650 mm tends to have a negative influence, (4) the closer to a city, the more positive the influence (with a possible threshold at 6,46 km), (5) an access to market index[9] below 0,302 may have a negative influence and (6) high population densities tend to have an "extreme" positive or negative influence.

[9] The market access index ranges from 0 to 1 and is based on the cost of travelling to cities, which includes the distance, time and monetary cost.

4. Part 2: Interview-based approach

The second part of the methodology (in-depth interviews) aimed to **deepen the understanding of the factors of success and failure in a qualitative way.** To do so, a major part of the interview was devoted to **explicitly identifying and discussing those factors**. The type of question asked was directly based on the definition of factors of success and failure used in this task (see section 3.3.). Here are the main questions asked: *"What helped/fostered the development, the regular activities or transition of the initiative? What blocked/slowed down the development, the regular activities or transition of the initiative?"* To guide the discussion, the different dimensions defined through literature review and use in the survey (see section 3.3.) were explored with the interviewees to help them identify the main factors. Those were based on their own perceptions and experiences within the initiative.

4.1. Description of interviewed DynAEs

To proceed with **this second part** of the methodological approach developed, a representative sample of approximately **10% of the DynAE** was required. The aim was to strike a balance: the sample needed to be large enough to provide a representative cross-section of the entire DynAE group, yet small enough to maintain the feasibility of this more intensive approach, given the limited availability of DynAEs. 18 initiatives expressed interest in participating in the interview process on a voluntary basis. Ultimately, **11 DynAEs** were selected firstly for their representativity of the typology diversity and secondly for their geographical distribution (see figure 14).

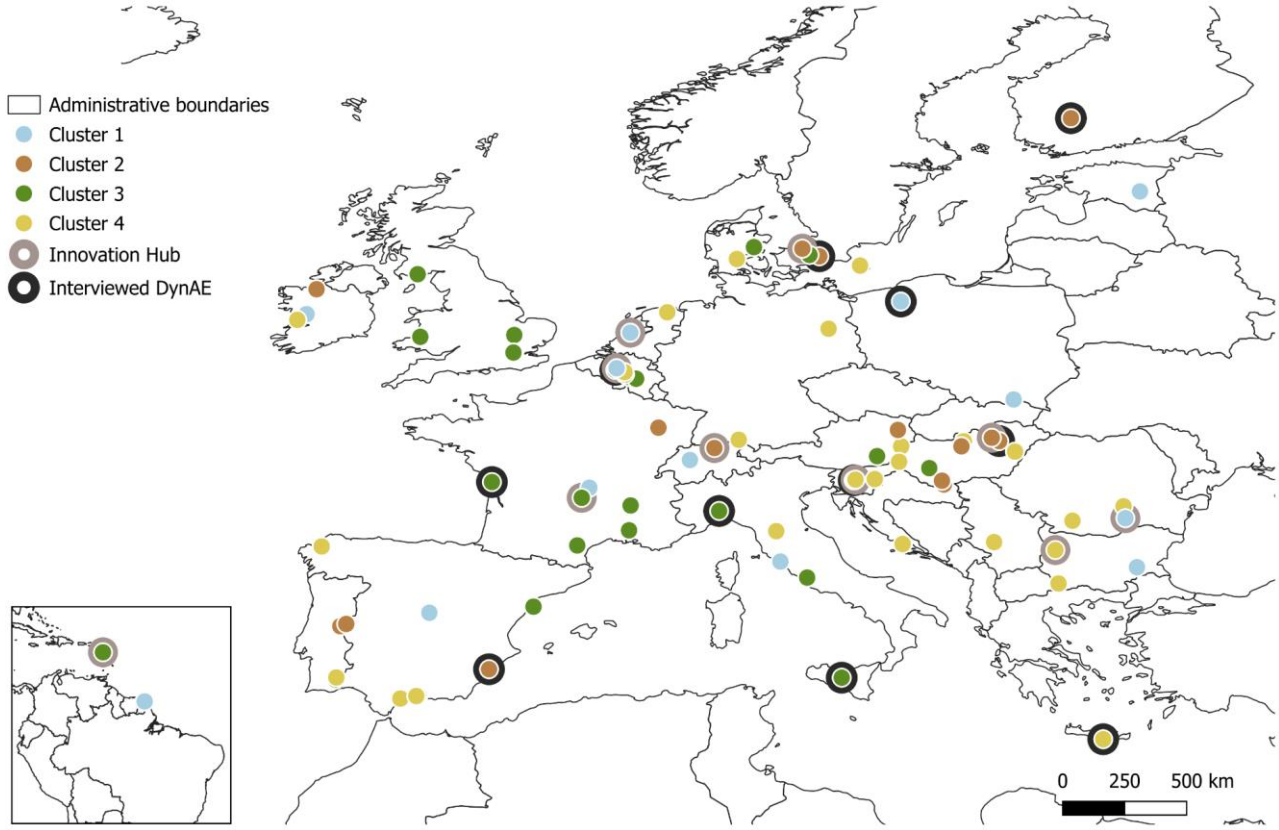


Figure 14 - Geographical distribution of DynAEs who took part in semi-directed in-depth interviews and assigned clusters. Innovation Hubs are also considered as DynAEs. They filled the survey and were interviewed in the framework of Task 4.1 of the project (Mapping of the IHs socio-technical systems - Deliverable 4.1).

The 11 DynAEs selected for interviews are spread across **10 different European countries**, expanding the geographical scope of the project. Notably, these interviews introduced 5 new countries that were not covered by the selection of Innovation Hubs (IHs), thereby enhancing the diversity of the initiatives examined.

These DynAEs represent a wide range of agroecological initiatives, each reflecting distinct forms and realities of agroecology in practice. To provide a clear context for their analysis, each DynAE interviewed is briefly described hereafter. These descriptions are based on information shared directly by the initiatives during the interviews, as well as additional details found in other documents or websites provided by the participants.

4.1.1. Finnish DynAE - Tampere's Living Lab in FUSILLI Project

The FUSILLI Project, funded by the European Union under the Horizon 2020 call, has introduced 70 Innovation Actions aimed at transforming the food system in cities. It started in 2021 and these actions cover various stages of the food system, including governance, production, distribution, consumption, and waste management, and are being implemented through Living Lab activities during the project's timeline. Tampere, a city in Finland, is one of the participants in the project, developing its own Living

Lab. Tampere, with a population of 240,000 residents, is a dynamic and growing city known for its innovation and sustainability initiatives. As a hub for students and forward-thinking ideas, the city offers an ideal environment for testing new concepts under Living Lab and test bed conditions.
Food production is also a visible part of Tampere's urban landscape, where residents actively engage in growing food in allotment gardens, garden plots, and even in their own backyards. Additionally, research and innovative product and concept development are taking place in collaboration with Tampere University of Applied Sciences (TAMK) students, local companies, and public sector actors. Among the key initiatives in Tampere's Living Lab is the development of a community kitchen, which fosters local food consumption and tries to foster development of local consumption for schools of the city. The Living Lab is also working closely with AhlmanEdu, a private school foundation that provides technical training in various fields, including agriculture. The school operates its own gardens and livestock production, focusing on local breeds, contributing further to the city's sustainable food ecosystem.

4.1.2. Hungarian DynAE - Magház Association

Initiated in 2012, Magház Association is focused on the conservation of agrobiodiversity in Hungary. Their mission encompasses promoting ancient and neglected plant species, fostering small-scale seed-saving and breeding techniques, boosting small-scale plant production through agroecological principles and advocating for the rights and interests of farmers as breeders. By organising seed swaps and creating a network for knowledge sharing, they aim to empower hobby gardeners, vegetable growers, subsistence farmers, and others interested in chemical-free cultivation (Magház Egyesület, n.d.).

4.1.3. Swedish DynAE - Svensk Kolinlagring

Svensk Kolinlagring is an organisation that connects stakeholders to promote carbon storage in Swedish agricultural soils. In particular, they link companies and businesses willing to invest in carbon sequestration with farmers committed to improving their soil. Launched in 2019, they have since grown into an independent organisation (Svensk Kolinlagring, n.d.). The DynAE can also be viewed as a knowledge network, engaging a wide range of stakeholders - farmers, researchers, advisors, and others - around the topic of regenerative farming.

4.1.4. Slovenian DynAE - Slovenian case study in SPRINT project

The SPRINT (Sustainable Plant Protection Transition) project is part of the Horizon 2020 program, funded by the European Union. The project aims to make a valuable contribution to the assessment of integrated risks and impacts related to Plant Protection Products (PPP).
SPRINT's primary goal is to develop a Global Health Risk Assessment Toolbox that evaluates the effects of PPPs on the health of ecosystems, plants, animals, and humans (EPAH). By adopting a multi-actor approach, the project not only seeks to inform but also promote the development of innovative transition pathways. This approach involves collaboration between scientists, farmers, and citizens.
The distribution and impacts of PPPs on EPAH health will be assessed through 11 case study sites (CSS). One of these CSS is located in Slovenia, where efforts focus on two key areas. The first involves

researching and promoting sustainable fruit production practices to reduce dependency on synthetic pesticides. This includes testing resistant fruit varieties, using plant-based pesticide sprays, and emphasising soil health.
The second area of the Slovenian case study concerns livestock production, primarily for dairy products. The research focuses on farms transitioning to organic systems or those based mainly on hay to reduce the use of synthetic pesticide and fertiliser. These farms are undergoing technical changes at the farm level to support sustainable agricultural practices.

4.1.5. Belgian DynAE - Granennetwerk Pajottenland

The Granennetwerk Pajottenland (which can be translated by The Pajot Cereal Collective), established in 2018, aims to revive traditional local cereal production in the Pajottenland region of Belgium. This initiative arose from a desire to reconnect farmers, bakers, and brewers within a regional network, countering the effects of industrial agriculture and fostering a sustainable agroecological system. The collective, hosted by brewery 3 Fonteinen and led by agro-ecologist coordinator Van den Abeele, works to cultivate old wheat landraces that had largely disappeared due to modern farming practices focused on high yields and uniformity. The dozen farmers within the collective not only produce grain but also produce and exchange new knowledge on organic grains in a region that had hardly produced any malting barley for a long time. They also work on fair contracts for their grains, emphasising quality and flavour in their products. Through this initiative, the Granennetwerk Pajottenland not only seeks to enhance the taste of local beers but also aims to restore a deep-rooted connection between the land and its agricultural practices, ensuring that local cereals serve as a foundation for traditional regional produce.

4.1.6. Polish DynAE - Juchowo Village Project

The Juchowo Village Project, initiated in 2001 in the northwest of Poland, is an initiative centred on biodynamic farming and community development. The project comprises a foundation that owns all the land (1,900 ha of which 1,600 ha of cultivated area), machinery and animals, and an agricultural company responsible for farming operations. Its activities include biodynamic agriculture, educational programs, employment opportunities for people with disabilities and the project also has a small research unit.

4.1.7. French DynAE - Transi’marsh

The Transi'marsh initiative is primarily an experiment conducted by INRAE at an experimental unit located in Charente-Maritime, on the French west coast. This initiative encompasses a polyculture-livestock system spanning 160 hectares of marshland, which includes 110 hectares of natural pasture and 50 hectares of drained crops. The system features a rustic breed of beef cattle, known as "la Maraîchine," along with a diverse range of plant productions, particularly cereals and protein crops. Agroecology is emphasised within this project to facilitate a transition that not only enhances plant and animal production but also preserves both wild and agricultural biodiversity, all while ensuring effective water management.

4.1.8. Italian DynAE - Case Study 9 in DiverIMPACTS project

The initiative, part of the European Horizon 2020 project DiverIMPACTS, operates as a case study based in Sicily, Italy. DiverIMPACTS, funded by the European Union, aims primarily to unlock the full potential of crop diversification to enhance productivity, provide valuable ecosystem services, and develop resource-efficient, sustainable value chains. Within DiverIMPACTS, the approach involves learning from existing diversification experiences through ten dedicated experimental studies that measure impacts and provide support to 25 multi-actor case studies in their transition processes. This particular initiative, DiverIMPACTS Case Study 9, focuses on diversifying traditional durum wheat production in Sicily. The study explores a range of additional crops, with industrial hemp as an innovative choice. The project team works closely with a small group of durum wheat farmers who seek viable crop diversification options, supporting them in developing and testing alternative farming practices.

4.1.9. Italian DynAE - Cascina Romanengo

Cascina Romanengo is an initiative launched in 2021, centered around a farm of nearly 80 hectares, soon organic certified, that grows a variety of crops, including winter cereals, legumes, and forage. It incorporates practices from organic and regenerative agriculture, such as composting, use of manure, cover crops, flower strips, and diversified crop rotations. The aim is to develop this pilot farm into an agroecology school while also offering agritourism opportunities. The project is already in contact with universities for research and experimentation. Privately funded by an investor, the initiative is also linked to a former sweet shop in Genoa, aiming to promote its future production of fruits and flowers. To run the farm, employed farmers collaborate closely with the farm management and agronomy researchers.

4.1.10. Spanish DynAE - Agro2Circular

Agro2Circular, funded under the Horizon 2020 program, is a pioneering EU project focused on upcycling agri-food waste through innovative valorization processes. This initiative enables high extraction yields of bioactive compounds with the required purity and stability for use in the development of new food, cosmetic, and nutraceutical formulations. The project brings together a diverse range of stakeholders, including researchers, communication experts, administrative bodies, private sector representatives, and associations, fostering a true multi-actor collaboration. Agro2Circular adopts a circular approach centered on a multidimensional model designed to facilitate the adoption and scalability of systemic territorial solutions. This model is sustainable, regenerative, inclusive, and fair, aiming to strengthen urban and regional economies. The initiative will first be implemented in the Spanish region of Murcia, serving as a pilot, and subsequently replicated in Italy and Lithuania.

4.1.11. Greek DynAE - Melitakes / Agroktima Asterousia

Melitakes is an initiative based on the island of Crete, organized as a social cooperative with the aim of promoting agriculture and food practices that are both healthy and deeply rooted in Greek traditions. Its agricultural production follows agroecological principles, including the reduction of chemical inputs and the use of organic fertilizers. These practices are designed to respect both humanity and the environment while ensuring fair compensation for farmers. The initiative is closely linked to Agroktima Asterousia, a structure led by a key member of the project. Together, they also focus on developing agritourism as a way to communicate their philosophy. Agritourism serves as a bridge, connecting high-quality local production with people from around the world and fostering meaningful exchanges. In addition to its agricultural and tourism activities, Melitakes maintains strong ties with research institutions in Greece and internationally. The initiative regularly welcomes students, creating opportunities to exchange knowledge on sustainable agricultural practices and high-quality food production. This multifaceted approach reflects the initiative's commitment to sustainability, cultural heritage, and community engagement.

4.2. Link between typology and interviewed DynAEs

If we look more closely at the interviewed DynAE Juchowo project, DynAE of Poland, is part of the **Cluster 1** (see section 3.2.2.). As mentioned in the cluster description above, this initiative is involved in agricultural production through Juchowo Farm engaged in biodynamic agriculture (1,900 ha of which 1,600 ha of cultivated area, livestock and crops). This project uses diverse market channels with an on-farm small shop or online sales, but also with big companies or supermarkets. As other initiatives in the first cluster it relies on funding from a private foundation. While no specific lack of workforce was mentioned in the interviews, the region's underpopulation and the ongoing loss of young people were highlighted as significant concerns. Except for the members of the different boards (advisory, foundation, supervisory boards), the main actors are farm employees with a relatively low level of education. This initiative is situated far from cities and markets, in a remote region.

Based on the results of the clustering, Tampere's Living Lab is part of the **Cluster 2**, named 'Support Initiatives'. This Living Lab is in contact with agricultural production through the various urban farming activities it's fostering. But, like the other initiatives of Cluster 2, it does not fully rely on its agricultural production as it is mainly funded by Horizon 2020 project call. The initiative is mainly made up of project leaders or researchers from the city and other partners, which may suggest a higher level of education. And as the project is oriented to urban farming, it takes place in the city but fosters also the consumption of larger Pirkanmaa region products.

In line with the characteristics of **Cluster 2**, Magház Association is not directly involved in agricultural production. Currently, Magház does not have any sources of income and relies on external funding, primarily from participation in research projects. While the lack of labour was not explicitly mentioned during interviews, the members of Magház generally have a high level of education. The association is primarily composed of small-scale producers and collaborates closely with research institutes such as ÖMKi, AgriCulti, ESSRG and NÖDIK. Magház members and hubs are spread throughout Hungary.

In the same cluster, Svensk Kolinlagring, Swedish DynAE, is in line with the description of it. This non-profit organisation is not directly involved in agricultural production and relies on external funding. They experience no particular lack of workforce, except in finding appropriate advisors due to the knowledge gap on this topic. The DynAE include advisors and researchers and collaborate with similar profiles outside the main organization, but the focus remains on farmers with various profiles and sizes. Geographically speaking, this initiative is dispersed across Sweden.

Regarding the first characteristic of **Cluster 2**, although the SPRINT project as a whole is not directly involved in agricultural production, this is partially not the case for the Slovenian case study. Some of the farms involved in this case study produce and sell their products through real market channels. However, it is important to note that the SPRINT project, as part of the Horizon 2020 program, is mainly funded by public funds. There is no specific mention of a workforce shortage in the project. Since this is a multi-actor project that includes researchers, the education level of at least some of the stakeholders is high. Other key actors involved with researchers are also farmers, as in the previous initiatives mentioned in this cluster.

Agro2Circular is part of **Cluster 2** regarding typology built in the first phase of the approach. Even if individual farmers are not directly members of the consortium, cooperative of farmers and farmer association are part of it. The project includes more broadly a multi-stakeholder consortium with researcher centres, universities, private companies, etc. The core activity of the initiative is research with practical application, mainly funded by the European Commission under the Horizon 2020 call.

The **Cluster 3** is represented here first by Granennetwerk Pajottenland. It is fully involved in agricultural production and sells the beer production in short channels in Belgium as well as longer channels all around the world. The Belgian DynAE is directly linked to a brewery and is funded by this important private stakeholder. It relies on external suppliers for energy, but not for seeds as the aim of the collective is to develop landraces. This initiative fits with the cluster's description because of its cereal production to produce beer. Furthermore, these cereals go through a certification process and the collective event tries to help conventional farmers in this process. The main stakeholders involved are the farmers and the brewery, but a professor from agroecology research also plays an important role.

Another initiative that falls within the **third cluster** is the French initiative Transi'marsh. This initiative has successfully developed the processing and local sales sector for its animal productions and is working towards the same goal for its plant productions, which are currently sold through more conventional market channels. The experiment is part of a research unit of INRAE, but it also secures funding through public project calls as well as from the sale of its products, which enter genuine market channels. The workforce is largely composed of researchers from both agricultural fields and those with expertise in water and biodiversity. According to interviewees, there is a strong appeal for young researchers in this regard. As mentioned for most initiatives of this cluster, the experiment is certified organic.

As with other initiatives in **Cluster 3**, the DiverIMPACTS Case Study on durum wheat diversification is directly involved in agricultural production, with farmers at the heart of the initiative. Each farmer tailors their own market channels, which may involve longer supply chains for durum wheat, while local markets for hemp flour and oil are also being explored as potential diversification sources. Like other Horizon 2020 projects, this case study receives European funding, mainly supporting researchers and experimental activities, whereas farmers largely rely on agricultural production for income, with part of

it managed organically. Despite the project's workforce being sufficient, interviews highlight a broader need for skilled labour on farms. Within the group of farmers, there is a trend toward higher education, with the main actors being researchers and farmers, some of whom also represent agricultural associations or unions.

Cascina Romanengo is an initiative categorized under **Cluster 3** and goes along with the common type of initiative in this cluster. Like other initiatives in this cluster, it focuses primarily on agricultural production. Although the initiative leans toward selling through short supply chains, more conventional resale channels are also used. Initially funded by a private investor, the project now also relies on the sale of its current production to sustain itself. One of its main outputs is the cultivation of cereals, particularly spelt and barley. Researchers play a significant role in the Cascina Romanengo project, and the other actors involved, particularly in farm management, tend to have a high level of education. As mentioned in cluster 3 description, the initiative's activities are primarily concentrated at the farm level but carry ambitions to eventually influence the broader food system, continuously striving to align with deeper agroecological principles.

The Melitakes initiative is part of **Cluster 4**, as defined by the typology established during the initial phase of this research based on the questionnaire. As is typical for this cluster, the initiative relies on diverse marketing channels. They focus on developing short supply chains, particularly by promoting agritourism on the island. At the same time, they are also working on creating slightly longer chains but still with minimal intermediaries, aimed at reaching international markets with the e-market for instance. Unlike many similar initiatives, Melitakes does not rely on public funding. Instead, it is self-funded through revenues generated by its diversified activities. The initiative is currently seeking additional members. Consistent with the characteristics of Cluster 4, this recruitment process is challenging, as it requires alignment with the cooperative's vision and the project's overarching goals. Which highlights the difficulty finding labor in the region. Women are present within the initiative, although gender parity does not appear to have been achieved. This observation aligns with feedback from an interviewee, who highlighted a broader lack of gender equity in Crete's agricultural sector. The initiative benefits from its proximity to cities like Heraklion, which serves as a driver for both research and commerce. However, Melitakes also values its distance from urban areas, allowing it to operate on unpolluted land. Although agricultural production is a central focus, Melitakes also addresses the broader food system by working on high-quality food practices and leveraging tourism. With the ambition to grow as a model initiative, Melitakes aims to share its vision more broadly and inspire others in the process.

4.3. Factors of success and failure of interviewed DynAEs

Generally speaking, the interviews provided an opportunity to deepen the understanding of the factors of success. But the semi-directed interviews also facilitated dialog, uncovering a greater diversity of factors of success and failure compared to the survey. All those factors are gathered for each DynAE in the Annex 6 and sorted according to the dimensions they mainly refer to (it is often possible to associate them with different dimensions).

5. Linking the factors of success and failure with the typology

The final part of our work consisted in questioning if the factors of success and failure are linked to the typology. In other words, **is the influence of the identified factors of success and failure different between the clusters**? If so, **what are the characteristics of the clusters that could explain these differences**? To answer these questions, we analysed graphical outputs, used statistical tests to highlight significant differences between clusters and complemented the analysis with the outputs from the interviews.

5.1. Survey-based general results

The links between the factors of success and failure, the clusters and their characteristics are summarised in Annex 3. Some observations are worth being highlighted.

First, the **DynAEs which do not have agricultural production and the commercialisation of agricultural products at the core of their activities are less influenced by factors which are highly linked to these activities** (habits of consumers, age of farmers and rural population, population density, freshwater availability, rainfall amounts, mean temperature and frequency of extreme weather events). This is of course particularly true for cluster 2 whose main characteristic is the low involvement in agricultural production activities, but to some extent this also concerns cluster 3, perhaps because of the high level of involvement of researchers which might suggest that these DynAEs are mainly geared towards research-oriented agricultural production rather than consumption- and commercialisation-oriented agricultural production.
In cluster 2 we also observe unexpected influences of some environmental factors. Indeed, **some DynAEs of cluster 2 report a positive influence of the increase of temperature and frequency of extreme weather events** even though these environmental changes tend to negatively influence the DynAEs.

Another observation is that **the differentiated influence between clusters is often clearly explained by their specific characteristics directly linked to these influencing factors**. For example, when we look at the availability of workers, only clusters 3 and 4 significantly reported having enough workers. That is directly reflected in the reported positive influence of the factor linked to the availability of workforce in these clusters, while clusters 1 and 2 are negatively influenced because of the experienced lack of workforce. This also applies to the distance to cities (some DynAEs in cluster 1 tend to be far from cities and this negatively influences them while other clusters are positively influenced by their proximity to cities), to the equality of gender representation within the DynAEs (only cluster 1 is strongly characterised by a lack of representation of women and this is reflected by the fact that they are not positively influenced by this factor) and to the level of education of farmers (farmers with a high level of education are only underrepresented in cluster 1, which is reflected by the negative influence of this factor in the cluster).

DynAEs in cluster 1 and 4 both focus on agricultural production, but they are differently influenced by some of the environmental factors. Looking at the availability of ground and surface water resources, we can see that although both clusters experience the same conditions (decrease or no change of the availability of freshwater), cluster 1 seems to be more strongly negatively influenced. Also, the precipitation amount negatively influences both clusters, but they experience different conditions, as DynAEs in cluster 4 mostly report a decrease of precipitation and DynAEs of cluster 1 report all kinds of situations (decrease, increase and no change). A strong negative influence of the temperature's increase on cluster 4 is also noted. Finally, cluster 1 is negatively influenced by the fact that the availability of land remained the same in the past few years, while cluster 4 is positively influenced although it experiences both no change and a decrease in the availability of land. This is an unexpected result as, considering the previous results on the factors of success and failure, we would have expected initiatives experiencing a decrease in the land availability to be negatively influenced. A hypothesis is that these differentiated influences between both clusters could be explained by different sensitivities to these factors due to their different core agricultural productions (cereals in cluster 1 vs vegetables and horticultural products in cluster 4).
In addition to the unexpected observations mentioned above, we can question the positive influence of topography reported in cluster 2 despite the cluster's disconnection to agricultural production. The negative influence of the distance to markets in cluster 1 is also questionable as this cluster mostly reported being close enough to markets, a situation that is globally rated as positive by the DynAEs.

Finally, we can observe that DynAEs were sometimes unable to position themselves in relation to the influence of factors (answer "I don't know**"). This phenomenon is much less marked in cluster 4, where the DynAEs seem to have stronger opinions.**

In the next sections, we will explore deeper the factors of success and failure for each cluster, also building on the observations from the interviews related to the relevant dimensions.

5.2. Cluster 1

Cluster 1 includes 15 DynAEs, 1 of which accepted to be interviewed in the framework of Task 5.1 and 3 of which are Innovation Hubs interviewed in the framework of Task 4.1. Thus, it should be noted that this cluster can only be illustrated here through the reality of a single DynAE interviewed.

Table 22 - Factors of success and failure in cluster 1. The sign "-" denotes a negative influence,"/" denotes a neutral influence, "+" denotes a positive influence, "?" denotes an unknown influence, "(-)" denotes a possible negative influence (slight trend), "(+)" denotes a possible positive influence (slight trend). For each variable, the percentage of observations for each level of influence is mentioned between brackets. For the sake of readability, the answers "has a negative influence" and "may have a negative influence" have been gathered under "negative". Likewise, the answers "has a positive influence" and "may have a positive influence" have been gathered under "positive". For some variables, the modalities are "not available" because the information was not asked in the survey.

CLUSTER 1								
Dimension	**Description**	**Variable name**	**Influence**				**Modality**	**Comment**
			negative (-)	**neutral (/)**	**positive (+)**	**unknown (?)**		
Built environment	Distance of the initiative from cities	dist_cities	- (26,67%)	/ (13,33%)	+ (33,33%)	? (26,67%)	close or remote	
	Distance of the initiative from markets	dist_markets	- (20%)	/ (13,33%)	+ (33,33%)	? (33,33%)	close	
Economy & markets	Main market channel used by the initiative	rank1_market_channels	(-) (26,67%)	(6,67%)	+ (40%)	? (26,67%)	long	A positive influence is generally linked to short and direct market channels.
	Availability of workforce within the initiative	work_force	- (76,92%)	(7,69%)	(15,38%)	(0%)	lack	A negative influence is generally related to a lack of work force.
Society & culture	Share of women within the initiative	women	(26,67%)	/ (46,67%)	(13,34%)	(13,33%)	minority	
	Consumers habits	statements_consumers_habits_ct	- (53,33%)	/ (13,33%)	(26,67%)	(6,67%)	Not available	
	Population density	statements_population_ct	- (33,33%)	/ (20%)	(+) (26,6%)	? (20%)	Not available	
	Rural population age	staements_age_ct	- (60%)	(6,67%)	(0%)	? (33,33%)	Not available	
Knowledge and information	Level of education of farmers	farmers_education	- (20%)	/ (13,33%)	+ (40%)	? (26,67%)	middle	
	Evolution of the availability of land	evolution_land_ct	- (33,34%)	/ (33,33%)	(20%)	(13,33%)	unchanged	A negative influence is generally linked to a decrease of the availability of land.

Natural environment	Evolution of the availability of freshwater resources	evolution_water_ct	- (53,33%)	(20%)	(13,33%)	(13,33%)	decrease, unchanged	A negative influence is generally linked to a decrease of the availability of ground and surface water resources.
	Evolution of rainfall amount	evolution_rainfall_ct	- (60%)	(13,33%)	(6,67%)	(20%)	decrease, unchanged, increase, unknown	A negative influence is generally linked to a decrease of the precipitation amount, and sometimes to an increase.
	Evolution of temperature	evolution_temperature_ct	- (46,67%)	/ (26,67%)	(0%)	? (26,67%)	unchanged, increase	A negative influence is generally linked to an increase of the temperature.
	Evolution of extreme weather events frequency	evolution_extreme_weather_ct	- (60%)	(13,33%)	(0%)	? (26,67%)	increase, unchanged	A negative influence is generally linked to an increase of the frequency of extreme weather events.
	Topography (elevation and slope)	statements_topo_ct	(-) (40%)	/ (26,67%)	(13,34%)	? (20%)	Not available	
	Soil fertility	statements_soil_ct	- (40%)	(13,33%)	+ (40%)	(6,67%)	Not available	

5.2.1. Built environment

The survey results do not reveal a clear trend regarding factors related to distance from both cities and markets (see table 22). However, the interviews highlight a negative perception of being located in a remote region.

- **Distance of the initiative from cities**

For the Juchowo Village Project, being located far from cities is seen as a disadvantage for several reasons. First, the lack of nearby universities means that young people are leaving the area and often don't return, as highlighted in the following quote:

> "*Well, we don't have a local university because we are really located in the middle of nowhere so it's 150 kilometres to go to any bigger place with universities. This is another challenge because young people are moving away uh and they never come back*"

Additionally, as mentioned earlier, being remote makes it difficult to access markets, as wealthier consumers who are more likely to buy DynAE products are mostly found in cities, as highlighted below:

> "*We also tried to do that, but as we have no big cities around, it didn't work out because the costs of transportation and, and were too high and our, our offer was not good enough or bright enough to, to have regular clients buying our, I don't know, milk, eggs and, and vegetables."* Or "*the ecological shops, the little organic shops, are developing mostly in big cities for people who are really conscious of they want to buy only those special high quality or ecological products*."

However, it has also been noted by the same initiative that being in the countryside allows for agricultural activities that wouldn't be possible in urban areas.

- **Distance of the initiative from markets**

As previously mentioned and highlighted by a quote, the Juchowo Village Project's distance from markets has been highlighted as a factor of failure due to the associated increased difficulty in selling their products.

5.2.2. Economy and markets

The survey highlighted that positive influence is generally associated with short and direct market channels (see table 22). The interviews confirm the challenges faced by the DynAE in operating within longer, more conventional chains. While also struggling with short market channels due to its isolation. Regarding the workforce, the quantitative results show a clear trend of shortage, which is quite logically perceived as a negative factor (see table 22). This is illustrated in the interview by a less motivated workforce, particularly towards the biodynamic agriculture practiced within the initiative.

- **Main market channel used by the initiative**

The Juchowo Village Project, being far from cities and located in a particularly poor and sparsely populated area, faces low demand for its products nearby. To address this issue, they are using various market channels, such as online sales, selling to larger companies and processing facilities, and reaching visitors in the area.

> *"In bigger cities and you have no problem with the market at all in bigger cities, […] where people are also wealthy you have also the more wealthy part of society, and they don't care so much if something is a little bit more, or even more than a little bit, more expensive. The region our project is situated in is a very poor region, so it's very sparsely populated, very few people living here, you just don't have the people, you don't have the number of people you need. So, we need to do online sales, and we need to sell it to bigger companies and processing facilities because there's hardly anybody here. And those people who are here, most of them don't have the money. So, because you ask who is our consumer… It's very often visitors. And of course it's also some locals but the main part is not local"*

However, as highlighted in the quote below, this initiative faces challenges related to its market channel choices due to competition from large brands like Lidl and Carrefour. These brands also follow eco-friendly trends for certain products but have much lower logistics costs, allowing them to sell their products at lower prices.

> "*But the big markets like Lidl and so on, they also know that there is a trend of ecological. And Carrefour and Lidl, they also have their eco products. So, we play in two different leagues. For us, it is all the logistic connected with delivering small amounts to small shops, very expensive. So, the products, the final prices are high. And for the big players like Carrefour, starting with BioCarrefour, the logistics and everything is just a peanut. They have all the possibilities to make products cheaper*."

- **Availability of workforce in the initiative**

For the Juchowo Village Project, a challenge regarding the workforce is the difficulty in finding employees who are genuinely motivated to work within the DynAE. As mentioned in the citation below, it seems that employees stay primarily due to the lack of other job opportunities in the area:

> "*…among the average employees […] they are employed here because there are no other jobs so of course some of them like doing it but if we had, let's say, a car factory here, they would just work in a car factory and they wouldn't pack their things and move to a place where they can do biodynamic agriculture because it's not what they are wanting most in their lives*."

5.2.3. Society and culture

The dimension reflecting the society and culture surrounding the initiatives reveals, in the survey, a source of predominantly negative factors (see table 22). This is clearly expressed in the interview, highlighting negative aspects such as consumption habits favoring cheap food, a sparsely populated and aging region. However, on the consumer habits side, there is also a positive factor mentioned: the tendency of part of the population to choose healthy products with a positive environmental impact, like those offered by the interviewed DynAE.

- **Consumers habits**

The Juchowo Village Project observes two trends in consumers habits. On one hand, a significant portion of consumers is leaning towards cheaper products, especially during crises like COVID and the Russia-Ukraine war. Since DynAE's products are generally more expensive,

these consumers are not interested in buying them. On the other hand, a segment of consumers, being health and environmentally conscious, tends to choose high-quality products.

> *"Well, consumers probably there are two contradicting directions, so many consumers just have less money left to spend it. I don't like this at all that our products are quite expensive, but they are […] But consumers in times of several crises rather go for cheaper products. But of course, on the other hand there are some consumers who are very concerned about health and high quality and environment and high-quality products so we also have those".*

- **Population density**

The Juchowo Village Project's location in a very sparsely populated area is seen as a disadvantage, negatively affecting the sales of their products, as highlighted in some interview extracts above.

- **Age of rural population**

As mentioned above, young people are leaving the area where Juchowo is located because of the lack of nearby universities.

5.2.4. Knowledge and information

No clear trend emerges from the survey regarding the dimension of knowledge and information (see table 22).

- **Level of education of most farmers of the initiative**

In the Juchowo Village Project, farm employees have a relatively low level of education, mainly due to a lack of time for training and the absence of education-related activities within the Juchowo Village Project until now. It appears that, to further develop educational activities within the DynAE, farm employees would need to receive time to do it. And adopt a more holistic vision of their work seems a potential educational development for the initiative.

> "*But coming back to your question if there are employees who are engaged in education and so on… We have very few. And this is for two reasons. It's because they don't have the time to do it or they are not given the time maybe, I should put it like this, they are not given the time to do it. And we didn't have very many of such activities so far, which keeps changing*" Or "*And if we want to*

further develop all the educational things and vocational training, we also need more knowledge and a higher level of knowledge among the everyday employees who are doing the physical work. Of course they know what they are doing but […] they don't take a very holistic approach to what is taking place here and I think we need it if we want to keep it work"

5.2.5. Natural environment

The dimension related to the natural environment showed, in this cluster, a rather negative view from the DynAEs who responded to the survey, whether concerning temperature changes, precipitation, extreme weather events, or access to freshwater, as well as access to agricultural land (see Table 22). Regarding the latter factor, the interviewed DynAE also sees it as a challenging context for farmers. And the same DynAE identifies climate change as a key challenge, alongside other issues previously mentioned.

- **Evolution of the availability of land**

Various challenges related to the availability of land were mentioned by the Juchowo Village Project. Firstly, the issue of public tenders complicates access to land. Additionally, individuals outside of agriculture are purchasing land as a profitable investment, as highlighted below:

"of course, there are people who don't even plan to farm the land, but they just have the money, and they know that land is a perfect allocation of money"

Furthermore, many farmers rely on rented land, which increases uncertainty about the future, as they often do not know if they will be able to keep it for the following year.

"…some farmers who farm let's say 200 hectares but only 50 hectares is their own land and 150 is hired with rented land, which tends to be difficult because they never know if they can keep it the next year"

- **Evolution of precipitation amount; Evolution of temperature; Evolution of extreme weather events frequency**

Climate change impacts agricultural activities for the Juchowo Village project, notably due to reduced rainfall, increased droughts, temperature fluctuations and stronger winds.

> *"Climate change definitely is a challenge. It's a challenge for our initiative it's a challenge for everybody, that's what the farmers I talked to in spring, everybody said this. Well this year we are happy with the rainfall, but we are rather threatened by drought and heat. So, climate change is a challenge."*

- **Soil fertility**

For the Juchowo Village Project, the soil presents a major challenge due to its sandy texture and low organic matter content, which worsens the impact of climate change. However, certain adaptation strategies have been mentioned to address these poor soil conditions, such as growing suitable crops (e.g., buckwheat, adapted cereal varieties, chickpeas, and permanent grasslands), as well as using compost and crop rotation to improve soil health.

> *"Soil also is a challenge because […] it's a post glacial region which means that it's very sandy, it's just poor sandy soil by nature. So, it adds something to the challenge of climate change, because in those sandy soil you can never have enough rain, and it also doesn't contain too much organic matter. […] So, agriculture is limited by nature. On the other hand, of course, you can adapt to it and grow crops which are better adapted to these conditions."*

5.3. Cluster 2

Cluster 2 includes 21 DynAEs, 5 of which were interviewed in the framework of Task 5.1 and 3 of which are Innovation Hubs interviewed in the framework of Task 4.1.

Table 23 - Factors of success and failure in cluster 2. The sign "-" denotes a negative influence,"/" denotes a neutral influence, "+" denotes a positive influence, "?" denotes an unknown influence, "(-)" denotes a possible negative influence (slight trend), "(+)" denotes a possible positive influence (slight trend). For each variable, the percentage of observations for each level of influence is mentioned between brackets. For the sake of readability, the answers "has a negative influence" and "may have a negative influence" have been gathered under "negative". Likewise, the answers "has a positive influence" and "may have a positive influence" have been gathered under "positive". For some variables, the modalities are "not available" because the information was not asked in the survey.

CLUSTER 2								
Dimension	**Description**	**Variable name**	**Influence**				**Modality**	**Comment**
			negative (-)	**neutral (/)**	**positive (+)**	**unknown (?)**		
Built environment	Distance of the initiative from cities	dist_cities	(9,52%)	/ (23,81%)	+ (42,86%)	? (23,81%)	close	A positive influence is generally linked to being close to cities.
	Distance of the initiative from markets	dist_markets	(14,28%)	/ (23,81%)	+ (28,58%)	? (33,33%)	close	A positive influence is generally linked to being close to markets.
Economy & markets	Main market channel used by the initiative	rank1_market_channels	(-) (20%)	(0%)	+ (60%)	? (20%)	not applicable, long or direct when applicable	A positive influence is generally linked to short and direct market channels.
	Availability of workforce within the initiative	work_force	- (58,33%)	(0%)	(25%)	(16,67%)	not applicable or lack	A negative influence is generally related to a lack of work force.
Society & culture	Share of women within the initiative	women	(10%)	/ (20%)	+ (35%)	? (35%)	no specific trend	A positive influence is generally linked to the equality of representation of men and women or to an overrepresentation of women.
	Consumers habits	statements_consumers_habits_ct	- (23,81%)	/ (28,57%)	+ (28,57%)	? (19,05%)	Not available	
	Population density	statements_population_ct	(0%)	/ (42,86%)	(23,81%)	? (33,33%)	Not available	
	Rural population age	staements_age_ct	- (33,33%)	/ (28,57%)	(9,52%)	? (28,57%)	Not available	
Knowledge and information	Level of education of farmers	farmers_education	(8,33%)	(0%)	+ (83,34%)	(8,33%)	not applicable, middle, high	A positive influence is generally linked to a higher level of education of farmers.
	Evolution of the availability of land	evolution_land_ct	(14,28%)	/ (28,57%)	(23,81%)	? (33,33%)	unchanged, unknown	

Natural environment	Evolution of the availability of freshwater resources	evolution_water_ct	(14,29%)	(14,29%)	+ (38,10%)	? (33,33%)	decrease, unchanged, unknown	
	Evolution of rainfall amount	evolution_rainfall_ct	- (23,81%)	/ (14,29%)	+ (38,10%)	? (23,81%)	decrease, unchanged, increase, unknown	
	Evolution of temperature	evolution_temperature_ct	- (23,81%)	/ (14,29%)	+ (38,10%)	? (23,81%)	increase	
	Evolution of extreme weather events frequency	evolution_extreme_weather_ct	- (33,33%)	/ (23,81%)	+ (23,81%)	? (19,05%)	increase	
	Topography (elevation and slope)	statements_topo_ct	(4,76%)	/ (33,33%)	+ (23,81%)	? (38,10%)	Not available	
	Soil fertility	statements_soil_ct	(9,52%)	(9,52%)	+ (57,14%)	? (23,81%)	Not available	

5.3.1. Built environment

The results for Cluster 2 obtained from the survey show a close proximity between the initiatives and their markets, such as cities (see table 23). This is identified as a success factor for this cluster, which is also reflected in the interviews.

- **Distance of the initiative from cities or markets**

For an interviewee of Tampere, the initiative being in a city is an advantage, as highlighted in the survey. In particular because the town has markets where citizens can buy fresh local produce directly.

> *"We have these marketplaces where you can buy fresh products and market hall here. So some will go there and buy their groceries there,…"*

Magház association is fairly scattered throughout Hungary. However, during the interviews, it was noted that being close to a major city, such as Budapest, and particularly in a wealthy region, is advantageous for the marketing of agroecological products:

> *"And it's the biggest market because it's the rich suburbs of Budapest. There's simply not enough of us in the sense. So I think whatever it's our mind to, there is market for what we produce. I think I'm also lucky I'm close to Budapest, but nobody really has problems with this."*

For Slovenian case study in SPRINT project, even if no explicit reference to distance to markets or cities, the willingness to develop innovative short channels may explain this proximity seen as a positive element.

> *"It was a bit of a challenge because we then developed the milk dispenser itself and the whole automated market system. But it took off, it boosted sales, we sold 100 liters of milk a day. They didn't believe me."*

One aspect being researched in the Spanish initiative is the upcycling of plastics. To reuse this plastic, it is necessary to collect it, which represents a significant challenge given the extensive agricultural areas involved in its use. In this context the market targeted by the circular approach is very widespread.

> *"I would say more [challenge in terms of] logistics. […] Murcia is not very big, but even though we have the Campo de Cartagena, the fields of Cartagena, which I am right now. It can be big enough to be very costly to collect all the plastics. Yeah, it is a challenge."*

5.3.2. Economy and markets

Various marketing channels are utilized and developed by agroecological initiatives. This is the case for this cluster, according to the survey results (see table 23). The interviews, as the survey, highlighted short supply chains as a positive factor. Though this is counterbalanced in an interview by certain disadvantages of selling local products, such as higher pricing. A lack of workforce is also highlighted, as in the previous cluster. This is reflected in the interviews by a shortage of technical labor as well as a lack of adequate agricultural advisors.

- **Main market channel used by the initiative**

Even if the Finnish Living Lab has no direct agricultural production compound, its main goal is to promote local food production and consumption. For example, AhlmanEdu works on a mark of origin for regional products.

> *"So what we managed to do in collaboration with some other project in Ahlman is to develop this mark of origin, you know, that the food that is being grown is from this region. And we had around 30 producers…"*

However, an interviewee from Magház association noted that, following a discussion with a farmer relying on Community-Supported Agriculture (CSA) from the association, this type of market channel faces certain difficulties due to the economic situation of the population and the fact that CSA systems are generally more expensive than traditional market channels, illustrated in the following quote:

> "*But now that I was talking this weekend to another CSA farmer, she said that now they are really struggling because people have less money. And this kind of system is a bit more expensive than going into a supermarket. So people are not willing to give out more money than necessary on food*."

Similarly, the factor relating to the market channel used is not a factor of success or failure for Svensk Kolinlagring, given that they themselves are not directly in contact with consumers. As mentioned in the quote below, the farmers themselves are in contact with consumers, but not DynAE itself:

> "*That's actually not a prioritised group [consumers] for us because we work more in…, you know, of course, that the farmers then meet the consumers. So, some of them have their own farming shops or they sell their products into small... But we have decided that this is not a group that we want to work with because that's up to the farmers*."

Slovenian case study highlighted that the model put forward in this type of initiative is building short circuits, although more conventional marketing channels are still the norm.

> *"It was a bit of a challenge because we then developed the milk dispenser itself and the whole automated market system. But it took off, it boosted sales, we sold 100 litres of milk a day. They didn't believe me."*

Agro2Circular primarily focuses on the circular economy for large-scale producers who mainly produce for export. This translates also through the members of the consortium as illustrated in the next quote.

> *"It is a cluster or association of exporters because a lot of the production in the region is devoted to export to the north of Europe."*

- **Availability of workforce in the initiative**

Svensk Kolinlagring identified two types of challenges related to the workforce within the DynAE. First, it appears difficult to find people with the knowledge and skills to work on farms, a challenge compounded by the ageing farmer population and their growing need for labour. However, being a frontrunner farmer seems to make them more attractive to potential workers. This is illustrated below:

> *"I think the farmers have, all of them have issues finding people that have the knowledge to work on the farms. And I mean, farmers are aging, they need help and it's really hard to find good people. But I would also say that the farmers that are really frontrunners, they also have a name, so I think they are more attractive. If you are looking for a job, it's more interesting to work there than working at some farms that hasn't done any progress."*

Additionally, the Swedish DynAE itself is also facing challenges related to workforce availability, particularly in finding advisors, mainly due to a lack of knowledge, as illustrated below:

> *"For us, yes, it is hard [finding workforce]. For example, it's hard to find an advisor. If we would like to hire another advisor, they don't exist because the knowledge doesn't exist. So, it's always like, okay, so the ones knowing the most are the farmers or us. So that is really hard."*

Interviewed actors in the Slovenian DynAE see a shift in the interest in young people that study more and are less interested in hard work bringing low incomes, as in agriculture.

> *"There's simply no manpower. Because people study a lot these days. And there's no more knowledge, but they've studied so much they don't want to work anymore. All they think about is where they're going to go, how they're going to have fun. Values have changed so much. They've gone in a different direction […] Agricultural incomes are too low to pay people, and people's lifestyles in general have changed."*

5.3.3. Society and culture

While the survey suggests a tendency to view better representation as a factor of success for the initiative (see table 23), the interviews reveal a reality that is often more challenging, with the sector remaining predominantly male-dominated.

- **Consumers habits**

The mixed feelings expressed in the survey may be highlighted by the experience in Tampere. Due to the shift to local and fresh products for local schools, the students expressed their dissatisfaction. But by taking their opinion into account, they seem to find tastier recipes for

students. Regarding consumer habits, the results are mixed both in the survey and the interviews, which highlight significant challenges for innovative solutions. Finally, the aging population is consistently seen as a current challenge in both approaches, and thus viewed rather negatively.

> *"Well there were some problems with the quality of the food, because they did change […] Well we try to get students engaged also, so we could get their opinion on what is good and what they are not liking so much, so we could make more tasty recipes."*

The Swedish DynAE has highlighted a current gap between the choice of crops needed for regenerative farming practices and the expectations of the rest of the supply chain, using legumes as an example below:

> "*That's the biggest challenges… we have to adapt these market chains, for example you grow more legumes in the system, but no one needs legumes*" (Sweden) or "*I think on the whole food system […] plays a big role in reaching these goals because farmers can't do what they want if no one buys their products then it will be*"

In the Slovenian case study, the society and culture seems to bring more factors of failure than factors of success. Among other aspects, the habit of having cheap food or the public opinion which is sometimes negative towards agriculture and its impacts.

> *"I'm also on the town council. And we have these little ones and they're subsidised and I don't know what. So the moms say, yeah, what's so expensive, why don't you order a bigger quantity and get it cheaper? I said, I'd have had an even cheaper snack? you don't give your children a snack for one euro? [...] And what you said was that it has to be cheap. Parents also need to be educated."*

One challenge faced by the Spanish initiative is the psychological barrier created by the idea of consuming "waste", even though these products possess certain valuable properties. Another interviewee highlighted the potential benefit of renaming these materials, for instance, "by-products".

> *"Well, I guess that from the point of view of society sometimes there is also a gap of knowledge. For example, when you are working with wastewater you perceive it like a problem but not like a resource and I guess that it's the same in terms of organic waste. Maybe if you say that you are using in your product remain or waste, people are more like reluctant. So, I guess it is a problem and we have to aware people about the benefits of the use of this type of waste because they are resources. And I guess that it is a challenge that we have to work with"*

- **Share of women within the initiative**

Magház association has a high proportion of women. The only aspect mentioned during the interviews regarding this factor was the sometimes challenging collaboration it creates with other associations that have a higher proportion of men, as illustrated by the following example:

> "*But I was involved with them when I had this project at OMKi to cover that topic also. So I tried to make some links, but it never really worked out. It's more like they have this very… a lot of old men are in that organisation and ours is young and a lot of women and somehow which is... So much, no. Yeah, sometimes it's based on these stupid things that... There is no...*"

About the role of women in agricultural initiatives, even if the survey highlighted positive influence in this cluster, there are still stakeholder interviewed that feel lack of consideration, which is an aspect mentioned by slovenian interviewee.

> *"Women are finding it harder and harder to make their mark in this sector. When someone has a new idea, the man is always right. I'm not talking about you. We've always gotten along very well, but some of our colleagues …"*

The following quote illustrates a non-problematic feeling regarding gender within the initiative, even though gender parity in representation is not always achieved. It is worth noting, however, that all the interviewees from the Spanish initiative are women holding key coordination roles within the project.

> *"No, with gender we have not found a lot of problem with gender. It is true that women are less represented sometimes, but it is not a problem of the region, I mean, or the circular economy specifically."*

- **Rural population age**

An interviewee from the Agro2Circular initiative highlighted the agricultural sector's aging population, a widespread issue across Europe. This challenge is attributed here to the sector's lack of appeal for younger generations.

> *"The agricultural sector has a lot of old men. There is a low generation replacement because the young people are not interested anymore in the agro sector. It's something quite common in Europe, I would say. Because they don't see it as a good income, a good future for them, a good situation. And sometimes when they die, when all people [from a certain location] die, many of this land is bought by very big companies."*

5.3.4. Knowledge and information

The stark results regarding the level of education in the agricultural sector revealed in the survey (see table 23) are well illustrated in the interviews. Having an agricultural education appears to be a positive factor for transition, according to the interviewees.

- **Level of education of most farmers of the initiative**

The high level of education appears to be a factor of success for Magház association for two reasons. First, having a high level of education enables them to be strong partners in research projects, as illustrated below:

> "*…in general, all these research institutes they like us because compared to other farmers I would say we are over-educated in research, like a lot of us are biologists or agroecologists or environmental engineers, so we are I think compared to other farmers quite well suited for research work, like field research in the sense, so they like working with us*"

Second, their high level of education allows them to be effective educators:

> « *That's why we can be such good educators because we understand the context of farming, either from a biology, either from a sociology or environmental*."

Within the Swedish DynAE, the majority of the currently involved farmers are educated and considered "frontrunners." Having informed farmers, willing to experiment, is considered as a factor of success for the DynAE as it facilitates the development of new knowledge around regenerative farming practices within the initiative. Once this knowledge is developed, it will enable better support for less educated farmers in making the transition. This is explained by one of the interviewees in the following quote:

> "*…we work with the front-running farmers. So that's farmers who already have a good idea about this, they want to experiment, they are well-read in and so on. […] we have these front-running farmers. Once we extend this to farmers who are maybe less happy with doing experiments, probably other problems come up. But on the other hand, we will have more knowledge on how to deal with it so I mean that's the idea. Because together we build up a lot of knowledge, we share this knowledge with each other and that makes it also easy of course to include people who may have less knowledge base*"

5.3.5. Natural environment

The results regarding changes in the natural environment are mixed in the survey, a finding that is also reflected in the interviews. Climate change is mentioned both as a factor raising awareness and, unsurprisingly, as a significant threat. And soil fertility emerges as a positive factor in the survey (see table 23), which is also confirmed in the interviews. However, challenges related to the context are highlighted, particularly in the Spanish DynAE, where issues associated with plastic usage are evident.

- **Evolution of precipitation amount; Evolution of temperature; Evolution of extreme weather events frequency**

Climate change can be perceived in various ways by Magház association. On one hand, it was mentioned in an interview that climate change can serve as an opportunity to raise awareness of the importance of agroecological practices:

> « *Climate change is really helping our development (laugh) because farming methods that people learned from the last 40, 50 years, which are more like even in small gardens, often industrial methods, fertiliser and insecticide […], they're not working anymore. So I think also as self-sufficient small scale gardens, but also as farming practices, are really rapidly developing because there is really a strong pressure from climate change, […] we see a very big interest growing in general for organic farming, for regenerative agriculture […] so I would say climate change is of course not good, but when it comes to adaptation, diversity is a source of adaptation and people are seeing that.*"

On the other hand, another interview emphasised the challenges associated with climate change, and its negative impact on precipitation and temperatures, as illustrated by the following quote:

> "*With climate change, it's getting more and more difficult, and some people are living in very arid areas. Where you hardly have any precipitation nowadays. So watering is difficult, but also even if you water, the temperatures are getting so high, and the air humidity is so low that some crops are just not producing seeds*."

The Swedish DynAE also emphasised that the negative impacts of climate change are fostering a shift in mindset among farmers, companies and local politics:

> "*So actually these catastrophes also in the recent 2 years it was quite dry and that helped us a lot to get attention from farmers especially but also from companies […] So it helped us to have this negative impact especially, also the climate change impact that makes people realise something is going on*"

Moreover, climate uncertainty is a challenging factor for farmers in the Swedish DynAE, as illustrated below:

> *"…one of the key challenges is also, of course, the climate. When a farmer wants to do this transition and the weather is so uncertain, it's also an uncertainty for the success. Because so it could be things that could have, that would have worked 10 years ago, doesn't work now. So, it's very seasonal. I mean, we have these seasonal challenges. This year we have a lot of rain, maybe too much rain. We have like coming in like these really heavy rains coming in several times a week, hailstorms, et cetera. We have 19,000 thunder strikes yesterday in this area. It's just like crazy. So, it's, I would say the climate is already a challenge."*

The frequency of extreme weather events, such as droughts, is seen as changing and seen as a factor of failure by the Slovenian case study. It reduces production and puts the agroecosystem at risk.

> *"It was above all the year before last that had an impact, the drought that caught us a little unprepared. Then we didn't feed the cows as well. And that's where the problem lies. You can't buy protein, energy and a bit of straw, you put it in and it's good. But that's not the case. You really have to plan for the long term."*

In the Finnish context of Tampere living lab, global warming may be seen in some places as an opportunity, for example in cold places where new crops and species may be cultivated. But the temperature is not the only component to a successful crop, so doubts are present.

> *"On the other hand, Finland is getting warmer and warmer, so there is also talk about, you know, you couldn't grow, for example, any type of nuts in Finland 10 years ago, but now you can, or peaches, for example, or in the landscaping sector they're trying to, they're experimenting now with more southern species of trees, like beech, things like that. So yeah, we could say that it's positive, but I don't know."*

- **Soil fertility**

In Hungary, for Magház association, soil fertility seems to not be a limiting factor, as illustrated below:

> *"… the soil in general is very good. In Hungary, of course, there are places where it's less nutritious, but then you will use some manure."*

One issue addressed within the Spanish project is the reuse of plastics. One of the motivations for this is the lack of waste collection, which ultimately leads to soil contamination.

> *"Also the problem of the plastics in the soils. If you go to the fields here around, you will find a lot of plastic pieces on the soil that are not correctly collected, because of that barrier that they have to be collected field by field. And the logistics can be very complex. So, it is contaminated."*

For the stakeholders of the Slovenian case study in SPRINT project, soil fertility is seen as an important and positive element in their agroecosystems, as highlighted in the survey.

> *"It's the ideal solution. Manure is excellent. Where it's compacted, where there's deep litter, it's already good. [...] It's true, however, that the less mineral fertiliser we use - and this should be professionally proven - the more microorganisms there are in the soil, and therefore the more nutrients available. [...] But fungi are a very important indicator, because they fundamentally increase fertility. In fact, they establish links between plants and are able to obtain nutrients from elsewhere and transport them to the plant."*

5.4. Cluster 3

Cluster 3 includes 25 DynAEs, 4 of which were interviewed in the framework of Task 5.1 and 2 of which are Innovation Hubs interviewed in the framework of Task 4.1.

Table 24 - Factors of success and failure in cluster 3. The sign "-" denotes a negative influence,"/" denotes a neutral influence, "+" denotes a positive influence, "?" denotes an unknown influence, "(-)" denotes a possible negative influence (slight trend), "(+)" denotes a possible positive influence (slight trend). For each variable, the percentage of observations for each level of influence is mentioned between brackets. For the sake of readability, the answers "has a negative influence" and "may have a negative influence" have been gathered under "negative". Likewise, the answers "has a positive influence" and "may have a positive influence" have been gathered under "positive". For some variables, the modalities are "not available" because the information was not asked in the survey.

CLUSTER 3								
Dimension	**Description**	**Variable name**	**Influence**				**Modality**	**Comment**
			negative (-)	**neutral (/)**	**positive (+)**	**unknown (?)**		
Built environment	Distance of the initiative from cities	dist_cities	(-) (24%)	(12%)	+ (44%)	? (20%)	close	A positive influence is generally linked to being close to cities.
	Distance of the initiative from markets	dist_markets	(-) (24%)	/ (24%)	+ (48%)	(4%)	close	A positive influence is generally linked to being close to markets.
Economy & markets	Main market channel used by the initiative	rank1_market_channels	(4%)	(8%)	+ (72%)	(16%)	short > long > direct	A positive influence is generally linked to short and direct market channels.
	Availability of workforce within the initiative	work_force	(21,74%)	/ (26,09%)	+ (39,13%)	(13,04%)	sufficiency	A positive influence is generally linked to enough work force.
Society & culture	Share of women within the initiative	women	(12%)	/ (16%)	+ (48%)	? (24%)	minority > equality > majority	A positive influence is generally linked to the equality of representation of men and women or to an overrepresentation of women.
	Consumers habits	statements_consumers_habits_ct	- (32%)	/ (12%)	+ (44%)	? (12%)	Not available	
	Population density	statements_population_ct	(-) (24%)	/ (20%)	+ (40%)	(16%)	Not available	
	Rural population age	staements_age_ct	- (52%)	/ (24%)	(12%)	(12%)	Not available	
Knowledge and information	Level of education of farmers	farmers_education	(4,17%)	(16,67%)	+ (58,33%)	(20,83%)	high	A positive influence is generally linked to a higher level of education of farmers.
Natural environment	Evolution of the availability of land	evolution_land_ct	(20%)	/ (32%)	(32%)	(16%)	decrease, unchanged, increase	

	Evolution of the availability of freshwater resources	evolution_water_ct	- (52%)	/ (24%)	(8%)	(16%)	decrease, unchanged	A negative influence is generally linked to a decrease of the availability of surface and ground water resources.
	Evolution of rainfall amount	evolution_rainfall_ct	- (56%)	/ (24%)	(8%)	(12%)	decrease, unchanged	A negative influence is generally linked to a decrease of the amount of rainfall.
	Evolution of temperature	evolution_temperature_ct	- (56%)	/ (20%)	(8%)	(16%)	increase	A negative influence is generally linked to an increase of temperature.
	Evolution of extreme weather events frequency	evolution_extreme_weather_ct	- (68%)	(12%)	(20%)	(0%)	increase	A negative influence is generally linked to an increase of the frequency of extreme weather events.
	Topography (elevation and slope)	statements_topo_ct	- (24%)	/ (32%)	+ (28%)	? (16%)	Not available	
	Soil fertility	statements_soil_ct	(24%)	(8%)	+ (56%)	(12%)	Not available	

5.4.1. Built environment

Being close to cities, as well as their markets, is highlighted as a positive factor in the survey (see table 24). This is illustrated in the interviews, also with one reverse example with a remote initiative, which complicates its activities.

- **Distance of the initiative from cities**

Working with various schools and universities is one of the activities of the Transi'marsh experiment. Collaboration with institutions from different French cities highlights a sufficient level of accessibility.

> *"We also collaborate with agricultural schools, including an agricultural school in Angers, as well as one in Bordeaux, Bordeaux Sciences Agro and ESA of Angers."*

One of the interviewees in the Italian DynAE, located in Sicily, about diversification highlights the infrastructure issue. In his context he feels a disconnection to the main roads and an infrastructural desert.

> *"Yeah, lack of infrastructure is a compliment in my area. We are in an infrastructural desert. I'm quite far from the cities. I'm very bad connected with the main roads. In the central part of Sicily, but actually in many rural areas all along mountains"*

The other Italian DynAE, Cascina Romanengo, mentions its location as a positive factor. Indeed, it is located between three major Italian cities, which provides opportunities for marketing networks and also the potential to better valorize their production.

> *"Proximity to three major Italian cities offers potential for development, particularly in agro-tourism and catering to an urban population willing to pay a premium price for high-quality products."*

- **Distance of the initiative from the markets**

The French initiative sells all of its meat production through local channels, which shows that it has successfully found sufficient markets nearby.

> *"As for the meat, I already mentioned that we sell everything locally, so we work with all the actors along the chain, from slaughter to butchering. We collaborate with two butchering workshops, and then, of course, with all our buyers—from consumers who come directly to the farm to our partnerships with collective catering services."*

5.4.2. Economy and markets

In contrast to the other clusters, the workforce stands out as a success factor in the survey, with a workforce that appears to be sufficiently available (see table 24). However, the interviewees do not hesitate to mention the recruitment difficulties, which seem to be widespread for technical jobs.

- **Main market channel used by the initiative**

The Transi'marsh initiative currently sells its products across different markets. While its animal production is sold through local channels, its plant production is currently directed toward conventional channels. However, the goal is to also develop local sales channels for these plant products.

> *"It's important to note that almost 100% of animal production is sold directly and locally. Therefore, one of Transi'marsh's goals is also to establish and develop local direct sales for plant production."*

In DiverIMPACTS Case Study 9, market channels vary from one farmer to another. However, diversification efforts have led to the production of hemp, for instance, being directed toward short and innovative channels due to the absence of a conventional market.

> *"Well, market was crucial, but then you, of course, conventional farmers have a reference market, which is basically the commodity market in our case. Organic farmers had a different kind of market. They were more looking at short local value chains or e-commerce. So the reference markets were very different, depending on the, not only the farm orientation, but also the alternatives to durum wheat."*

- **Availability of workforce in the initiative**

A large portion of the workers in the French experiment are researchers, and an additional need for labour has been met, highlighting a certain appeal for this type of position.

> *"For example, our unit director is a specialist in water management, which we didn't have before, and that's very important for us in this environment. We also welcomed a young agronomy engineer who joined last September. So, we are, in fact, attracting new talent."* (Transi'marsh)

Two of the interviewees of Italian DynAE insist on the lack of specialised workers in the region, as well as in Italy or even Europe. One reason highlighted is the lack of appeal surrounding the farming profession, which is still perceived as a job of the past in the collective mindset.

> *"It's important to also have a hand worker. But there is a huge lack of professionalised worker that could, for example, drive modern tractors, that could program the activities on diversified farms, that could handle the complexity, for example, of a rural tourism, that could handle the complexity of, for example, wine making process, or the complexity of a modern greenhouse."*

> *"So the worker that made the practical work normally are strangers. But at the beginning there could be some problem about communication, about the regularity of these people, and for a farmer, the owner of a farm, to have some contact for the worker. It's also difficult for the owner because there is a lot of bureaucracy, there is a lot of tax on. So, at the end, I don't know, he has to pay 25, 22 euros. But for the worker, he receives, I don't know, 10, 12 euros."*

5.4.3. Society and culture

Consumer habits, which are reflected as being divided between success and failure factors in the survey results (see table 24), are similarly highlighted in the interviews, with challenges related to the valorization of production. As in previous clusters, the difficulty in attracting young people, leading to an aging population, is also highlighted and emerges in interviews and as a negative factor in the survey results.

- **Consumers habits**

As in other initiatives, we see here in Italian DynAE that the issue of labor is challenging and generally perceived as a negative factor. However, it is worth noting that the interviewee mainly referred to the broader context in which they operate, as the initiative itself was not directly affected by this issue.

> *"The main challenge is that our products and this kind of production is not valorized enough. […] There is not a citizen that are disposed to spend more for more healthy products. So this is the main challenge for us because we use another kind of production or other practice, but at the end, the valorization of the products is the same"*

- **Rural population age**

In the Italian case study of the DiverIMPACTS project, the group of participating farmers spans various age groups, leading to differing attitudes toward innovation within the group.

> *"And so they were more prone to open to novelties and to explore new opportunities and to engage with something that was not necessarily part of previous experience. And this was also true in relation to the, let's say, age divide. So the younger farmers were more, let's say, explorative in attitude"*

In the other Italian initiative, the issue of age was also discussed during the interview. The interviewee highlighted the difficulty of attracting young people to the sector.

"Yes, in agriculture. Normally in summer you have to work also in Sunday. Saturday. So young people prefer to do something else. So the worker that made the practical works normally are strangers."

5.4.4. Knowledge and information

This cluster is also characterized by a relatively high level of education among farmers, which emerges as a positive factor in the survey (see table 24). The interview conducted with a DynAE also highlights this as a positive element.

- **Level of education of most farmers of the initiative**

A high level of education appears to be the norm in Case Study 9 of the DiverIMPACTS project.

"In my association, I think we have a very high level of cultural heritage and formation. 80% of our farmers in our young farm association is graduated, so we are a very lucky community."

5.4.5. Natural environment

The responses to questions related to changes in the natural environment predominantly reveal factors of failure for the initiatives (see table 24). Whether concerning precipitation, temperature, water availability, or extreme events, the interviews also confirmed these issues as current and urgent. Conversely, soil is seen as a success factor (see table 24), with significant importance attributed to this component in the agroecosystem, according to the interviewed initiatives. Even if heritage of past practices regarding soil may bring some challenges.

- **Evolution of the availability of land**

Availability of land is seen as a burden by an interviewed stakeholder in Cascina Romanengo, presenting a dual issue: on the one hand, the difficulty of obtaining land, and on the other hand, the problem of abandoned land.

"It's one of the biggest problem in Italy and Europe in general, because there is no access for land. This is true in intensive rich agricultural area, but it's also true in mountain and rural area. It is a paradox because the land has been abandoned but still the old

owner does not want to sell the land. So, there is a kind of abandonment of the land. So, in the last 10 years almost 40% of the south, the agricultural area has been lost in Italy so quite a lot there. There is a let's say a reforestation but it's not a good fact because the reforestation is the result of abandonment it's not a city culture project, so this is not good at all in general and the cost of the land are extremely high so for a youth that want to not start a new project in a cultural activity basically this is the most difficult challenge"

- **Evolution of the availability of freshwater resources**

The Transi'marsh initiative, as its name suggests, is located in the marshes on the French west coast. While water is abundant in winter, it becomes scarce in summer, leaving the plots vulnerable to drought episodes.

"Yes, exactly. It's a bit like a sponge; in winter, the sponge is saturated, while in summer, it's completely dry. We need to replenish it to ensure that the ditches retain water and serve as barriers for the animals."

- **Evolution of rainfall amount**

An interviewee from the DynAE Transi'marsh highlights the difficulties brought about by climate change. The rainfall prevents certain autumn plantings, disrupting production and ultimately making it challenging to establish a local supply chain.

"With the climatic uncertainties, we are significantly affected [...] I arrived in the fall of 2019, and conditions were wet, so we didn't do any autumn planting. This poses a problem for our goal of developing a local direct sales sector. In the fall of 2020, it was still wet, and we again did not manage to plant in autumn. That's why I say it's complicated. If we could maintain consistency in our production over a longer period, it would be easy to establish direct sales and develop a customer base. But right now, it's challenging."

"So, we face quite a few constraints due to our choice of organic farming, along with increasingly prevalent climatic uncertainties. I think everyone has experienced this, one year, we had an extremely dry season in 2022. In 2023, things were manageable, but this winter (2023-2024), we couldn't plant much because it rained so heavily. This had already happened three years prior. Each year, we have to adapt to these uncertainties."

Climate change emerges as a negative factor that can complicate experimentation. This is particularly true for the Case Study located in Sicily, which is experiencing increasingly severe droughts that adversely affect agricultural production.

> *"...and then, of course, one huge barrier is the climate crisis. So this is generating a lot of uncertainties and a lot of failures at farm level. [...] This 2023-2024 season was dramatically affected by a very severe drought in Sicily, particularly over winter and early spring, which means that it implied almost complete failure of wheat in most of Sicily"*

Initiatives in the south are quite familiar with drought. However, even though this phenomenon is common, it appears to be intensifying, as noted by a stakeholder from the Cascina Romanengo initiative

> *"It's changing, the precipitation in general are lower than 20 years ago for instance"*

On the contrary, some years can be exceptionally rainy, more than usual. This was illustrated by a stakeholder from the same initiative, who reflected on a particularly rainy spring they were actually facing.

> *"This spring there is too much water, I think it's one of the first days of the sun since April, I think? No, March. In addition, during the winter there was no snow, basically, also in this area where normally there was snow, and the temperature was higher than normal, but I think it's like if there is just one season, not winter, spring, but more or less the same season since January."*

- **Evolution of extreme weather events frequency**

The frequency of rainfall is a significant aspect of climate change. Especially in the Mediterranean context as in Case Study 9 of DiverIMPACTS. Not only can it be rare, but when it does occur, it may be more concentrated and intense, generating floods and erosion, which also impacts agricultural production.

> *"General speaking drought, because we had fewer and more concentrated rain patterns, including floods. We experienced a flooding event, a very big one, flooding event in Eastern Sicily during our case study, which damaged one of the farms, well, seriously, one of the farms that were involved in the case study."*

Again, in the context of the DynAE situated in northern Italy the observations are quite similar. Extreme events are becoming more frequent, particularly with droughts being more prevalent than before. This makes the climate unpredictable, yet there is a clear will to find agronomic solutions, particularly through crop variety selection.

"Climate change is a crisis and what we are observing is an instability of climate. Last year in this period there was a big drought, a very very drought. This year there is an exceeding amount of water, not predictable. So that's why what we are working is on genetic diversity and diversification of species in order to improve resilience in the farm. So that the farm can react and can adapt to the climate unpredictability"

- **Soil fertility**

Soil appears as a resilience factor in one of the Italian DynAEs, particularly regarding its organic matter content. However, this does not seem to be a miracle solution when extreme conditions appear.

"Yeah, once again, yes and no, in the sense that yes, those farm who invest in soil organic matter have greater resilience. This is also true in our case, we witnessed that in Sicily. But when you have very extreme conditions like this year, this is not even true. I mean, it helps, but this is not the silver bullet."

The issue of soil remains central for initiatives that work directly on farming practices in the field, as is the case with the Cascina Romanengo initiative. In this particular case, they highlight a soil that is challenging to work with due to its natural characteristics, but also because the previous production had negative effects on it.

"Here, we have really bad soil, the organic matter is low. Those are heavy soil, so it's difficult for drainage. And in another part you have really big rocks. When you work on this soil, it's really hard. It's difficult. Also because they arrive from 30, 40 years, where they worked just with the same crops, so there is no organic matter, there is no micro-biological life, so they're not good soil to work. So this is a challenge, and also the different part of the farm are really different."

5.5. Cluster 4

Cluster 4 includes 28 DynAEs, 1 of which was interviewed in the framework of Task 5.1 and 2 of which are Innovation Hubs interviewed in the framework of Task 4.1.

Table 25 - Factors of success and failure in cluster 4. The sign "-" denotes a negative influence,"/" denotes a neutral influence, "+" denotes a positive influence, "?" denotes an unknown influence, "(-)" denotes a possible negative influence (slight trend), "(+)" denotes a possible positive influence (slight trend). For each variable, the percentage of observations for each level of influence is mentioned between brackets. For the sake of readability, the answers "has a negative influence" and "may have a negative influence" have been gathered under "negative". Likewise, the answers "has a positive influence" and "may have a positive influence" have been gathered under "positive". For some variables, the modalities are "not available" because the information was not asked in the survey.

CLUSTER 4								
Dimension	**Description**	**Variable name**	**Influence**				**Modality**	**Comment**
			negative (-)	**neutral (/)**	**positive (+)**	**unknown (?)**		
Built environment	Distance of the initiative from cities	dist_cities	(14,28%)	(7,14%)	+ (78,57%)	(0%)	close	A positive influence is generally linked to being close to cities.
	Distance of the initiative from markets	dist_markets	(17,85%)	(7,14%)	+ (75%)	(0%)	close	A positive influence is generally linked to being close to markets.
Economy & markets	Main market channel used by the initiative	rank1_market_channels	(0%)	(0%)	+ (96,43%)	(3,57%)	direct	A positive influence is generally linked to short and direct market channels.
	Availability of workforce within the initiative	work_force	- (57,15%)	(3,57%)	+ (39,29%)	(0%)	lack > sufficiency	A positive influence is generally linked to enough work force while a negative influence is generally linked to enough work force.
Society & culture	Share of women within the initiative	women	(3,57%)	(17,86%)	+ (71,43%)	(7,14%)	equality	A positive influence is generally linked to the equality of representation of men and women or to an overrepresentation of women.
	Consumers habits	statements_consumers_habits_ct	(-) (50%)	0%)	(+) (46,42%)	(3,57%)	Not available	
	Population density	statements_population_ct	- (42,86%)	(10,71%)	+ (35,72%)	(10,71%)	Not available	
	Rural population age	staements_age_ct	- (64,29%)	(10,71%)	(10,71%)	(14,29%)	Not available	
Knowledge and information	Level of education of farmers	farmers_education	(10,71%)	(14,29%)	+ (57,14%)	(17,86%)	middle, high	A positive influence is generally linked to a higher level of education of farmers.
	Evolution of the availability of land	evolution_land_ct	(25%)	(10,71%)	+ (53,57%)	(10,71%)	decrease, unchanged, unknown	A positive influence is generally linked to an increase of the availability of land.

Natural environment	Evolution of the availability of freshwater resources	evolution_water_ct	- (53,57%)	(7,14%)	+ (35,71%)	(3,57%)	decrease, unchanged	A negative influence is generally linked to a decrease of the availability of surface and ground water resources.
	Evolution of rainfall amount	evolution_rainfall_ct	- (67,86%)	(14,29%)	(14,28%)	(3,57%)	decrease	A negative influence is generally linked to a decrease of the amount of rainfall.
	Evolution of temperature	evolution_temperature_ct	- (57,14%)	(10,71%)	(25%)	(7,14%)	unchanged, increase	A negative influence is generally linked to an increase of temperature.
	Evolution of extreme weather events frequency	evolution_extreme_weather_ct	- (75%)	(7,14%)	(14,28%)	(3,57%)	increase	A negative influence is generally linked to an increase of the frequency of extreme weather events.
	Topograhy (elevation and slope)	statements_topo_ct	(-) (21,43%)	/ (32,14%)	(+) (42,85%)	(3,57%)	Not available	
	Soil fertility	statements_soil_ct	(25%)	(3,57%)	+ (64,29%)	(7,14%)	Not available	

5.5.1. Built environment

A short distance to markets and cities emerges as a success factor in the survey (see table 25), which is also illustrated in the interviews. However, one interviewed initiative considers it positive to have enough distance with cities, as this allows for a relatively preserved environment.

- **Distance of the initiative from cities**

Next quote from an interview with a stakeholder from Melitakes initiative highlights the choice to be apart from the city. This person mentions the quality of the soil, especially regarding the presence of synthetic products.

> *"I am really happy about the place I am I wouldn't like to change it to go to a bigger closer bigger city or whatever because the main reason is that the environment is clean of chemicals. […] I exchanged his 50 part of the 50 hectares most of the hectares in the valley down with more hectares and growth in the mountain why? Because in the valley the environment was full of chemicals of the neighbors so here it's better for me."*

5.5.2. Economy and markets

The survey responses indicate that the initiatives mainly focus on short supply chains, which an overwhelming majority associates as a factor of success (see table 25). The interview also highlights an initiative oriented towards direct channels, even though these can involve longer distances through the use of online direct sales platforms. Regarding the workforce, the survey results are more divided (see table 25). However, in the interviews, the issue of labor shortages appears to remain universally present.

- **Main market channel used by the initiative**

The marketing channels within the initiative on the island of Crete are highly diversified, but remain mainly short. They strive to build a local network of consumers around them, sell directly through their own restaurant, and also tap into international markets through the use of the internet.

> *"We try with different ways to approach them. For example, one way was to create a net of people who live in Heraklion and they can order, depending on what we can offer, we can sell, they make their order. So, let's say one or twice per week we put this product in the car, we drive to Heraklion and we make home deliveries. That is one way. And the most basic way and what we like to develop more is to invite people to come here, where they can eat or even if they don't want to eat or have a coffee and relax, just to go and buy straight like a shop. The e-shop is another idea."*

For the initiative in Crete the development of agrotourism is an important part. It's not only seen as a novel way to bring income but also to bring transformative change in the sector through environmental awareness.

> *"It is essential to emphasize the transformative potential of agritourism on farms. By sharing their expertise with tourists interested in sustainable practices and agroecology, farmers can diversify their income streams and enhance the sustainability of their operations. This approach not only benefits the farmers financially but also contributes to broader environmental awareness and the promotion of sustainable agricultural methods."*

- **Availability of workforce in the initiative**

The Greek initiative mention that there is enthusiasm for their initiative. But still it may be challenging to find people who are willing to work, especially do the manual work on field.

> *"The truth is that it's not easy to find the right people though we have already many applications. I mean there are still many people who like to join us most of them we are sure that they have our philosophy so they can join the group now how effective their work will be we have to be careful. […] It's very very hard to find people who want who likes like to work in the land"*

5.5.3. Society and culture

The survey highlights gender parity within the initiative as a factor of success (see table 25). At contrary, the interviewed initiative reflects a context where women are underrepresented. Population density, on the other hand, is primarily identified as a failure factor in the survey (see table 25). The interviews provide a possible explanation: for this initiative located far from cities, a decline in the rural population is experienced negatively.

- **Share of women within the initiative**

In the Greek agricultural sector, and particularly in Crete, women appear to be in minority. According to the interviewee, this imbalance can be traced back to tradition.

> *"Like the role of women in Crete is very… they're not so present. […] It's also very important to have business women that brings a different perspective. I saw a lot of men involved in agriculture and very few like women and most of the time they come from other countries that are like developing farmers based on permaculture principles or agroecology. And so I think there is, yeah, like a problem with the tradition."*

- **Population density and rural population age**

The population density seems to decrease in the countryside from one interviewee in the Greek initiative. Starting from the schools where the number of children decreases. But also, with the houses that are increasingly dedicated to vacation.

"Yes, there was a very good moment that it looks like that our area was going to start to get better again. Now it goes down and it's creeping down. In my village, I will tell you just to have an idea about schools. How many children are in school. When I was at the school in my village, we were about around 80 to 90 children. In primary school. Now, they are about 20. So can you understand what will happen in a year, it goes to zero then. And when you go to zero, life goes. It's also something that people mentioned in Greece that even when people build a house, it may be people from outside that just build a house for vacation or for something like that. And now all the new biggest houses here for vacation."

5.5.4. Natural environment

As in previous clusters, the initiative highlight changes in the natural environment mainly as a factor of failure (see table 25). However, the specific context of the interviewed initiative mainly focuses on the availability of fresh water which emerges as a dominant issue. Same tendency as with other clusters to see the soil fertility as a factor of success (see table 25). But again specific problems seem to bring challenges to this factor in the interviewed initiative.

- **Evolution of the availability of land**

Fragmented plots of land appear to be common in Crete, largely due to the tradition of inheriting small parcels for subsistence farming.

"For many thousand years in Creta you cannot go to supermarket. So one father with five children he takes there two olive trees, two olive tree to one guy and two olive tree to another. Because there are the places different from the other place down. Because this place have water. Because many reasons. Also, because they wanted to have fair distribution. So you distribute for many years like this and after... […] So that's why it's separate. And now it's a heritage."

- **Evolution of the availability of freshwater resources**

One stakeholder highlights the issue of diminishing freshwater resources, which appears to affect both surface and groundwater within the context of the initiative in Crete.

"Everything is dry. What we really need now is construction to keep the water in the dam. This is what we really need now. Yes, because we need water on the fields and even the wild nature animals, they have really big problem now. I have some places where I bring my bees and even when I take my bees from these places, because there is no water anywhere. […] Some years, many years ago, the water was about, let's say, 10, maybe meters underground. Now, people go with the drill to even 250, or even 300 meters down to find water. And even so down, they don't find water. Also, in some places, the sea started to go into the freshwater. And the big problem is that if the sea comes into the underground rivers, it will never come out again."

- **Evolution of precipitation amount; Evolution of temperature; Evolution of extreme weather events frequency**

When the interviews were conducted (spring 2024), the stakeholders highlighted a particularly severe drought and heatwave season, which fuelled discussions and concerns. The main issues identified were related to crop production. However, a beekeeper also expressed significant concern about honey production, as well as the survival of the bees, as illustrated in the second quote below.

"He has many people in mind that they could talk about Melitakes, but he has already contacted them. But most of them they are really busy. They are busy outside. No, because there is a very strange heat these days. And plants are really suffering. Because it's not only the temperature that is very high, it's also the solar radiation that is stronger. And the plants are really suffering. We also had some problems with our plants. Tomorrow that we go up and I will show you the field, you will see by yourself the problem. So now everybody is trying to protect his culture. So they are busy in their field. […] It happened before. Yes, but maybe one time per 20 years. Now it happened one time per 5 years, per 3 years."

"Yes, this summer, so the flowers, they don't have power to give their nectar. So, the nectar is our honey. So that means that the produce will be very low, and the bees are in very big danger. […] I think we are going to be in honey, maybe 90 percent less than last year. And I'm afraid that we are going to lose about 70 percent of our hives."

- **Soil fertility**

One interviewee highlights the good quality of the soils. But a growing problem appears with increase of grazing by sheep and goats in Crete which causes some issues to the system.

"[The soil] is rich because you have a lot of sun and you have every time the grass that grown and after this is soil. But last year we had a problem with goats and with sheep. For this year, it completely destroyed many things in this system. So many problems appear, it's not easy."

5.6. Summary of factors of success and failure and links to typology

Generally speaking, the interviews allowed to (1) deepen the understanding of the factors of success and failure identified thanks to the survey and (2) discuss additional factors of success and failure. Furthermore, it allowed us to further explore the differences observed between the clusters.

(1) Short and direct **market channels** tend to have a positive influence on the DynAEs, but long and highly competitive market channels where farmers are in a "price-taker" position tend to dominate. Combining these shorter market channels with other market opportunities (e.g. through major retailers), as observed in clusters **3** and **4**, is a way to diversify and gain visibility. Novel products and new value chains are also opportunities, although DynAEs also have to face the lack of such opportunities, the lack of structured value chains for these products, the **geographical difficulty to access markets and cities** (which is the case for some DynAEs in **cluster 2**) for DynAEs located in remote and underpopulated areas and the difficulty to scale out niche productions. The volatility of the market and the difficulties of the organic market have also been mentioned as factors of failure. These factors tend to be less relevant in influencing **cluster 2** as marketing of agricultural products and link to consumers are not part of their core activities.

The **habits of consumers** also positively or negatively influence the DynAEs, depending on the underlying consuming habits. Many DynAEs mentioned the lack of will or ability of consumers to pay higher prices for food products and services. This difficulty could be linked to the way food products are perceived compared to other commodities, the lack of interest for and awareness about agroecological and novel food products, the tastes of consumers and the levels of income of consumers that directly affect their capacity to pay for more expensive products. This factor is highly linked to the distance to cities as wealthy consumers tend to be located in cities. Again, this factor tends to have less influence on the DynAEs in **cluster 2**.

Certification can be a way to make locally grown and sustainable food products recognizable and valorized, but it can also be a burden because of the certification requirements and the transition time required. This is particularly relevant for clusters **3** and **4** where most DynAEs are certified.

The **lack of workforce**, as experienced by most DynAEs in clusters **1** and **4**, has a negative influence on the DynAEs. This lack of workforce is caused and/or reinforced by the high cost of workforce, the lack of interest for agricultural jobs (notably caused by the growing level of education of young people and the change of lifestyle), the lack of relevant skills and expertise, the lack of motivation, commitment and cohesion, and the **ageing of farmers** (while young farmers greater flexibility regarding transition has been highlighted). This issue results in a lack of time and availability within the DynAEs to carry on the day-to-day operations and innovate. Relying on volunteers to overcome this situation could be an option, although this is sometimes perceived as a burden rather than a help. Furthermore, as agriculture is a weather-dependent activity, managing employees schedules can be challenging in this context. For DynAEs in **cluster 3**, who tend to rely mostly on researchers, this factor might be less problematic due to the attractivity of research jobs.

The way DynAEs are governed also has an influence, depending on the efficiency of decision making processes. For example, over-democratised governance with a lack of leadership can lead to inefficiency, while balanced participative approaches and structured decision making can be more efficient. The informal governance processes that have been observed in most DynAEs across all clusters might thus be detrimental, depending on the exact way it is implemented and structured. On the other hand, formal governance processes are less represented in our sample and we thus might lack visibility on the influence of such cases in our study.

In terms of **DynAEs funding scheme**, external funding (such as public funds or funds from private companies) can help in mitigating the financial risks of innovation, counter-balancing the lack of secured and stable financial resources that hinders the activities of the DynAEs. When DynAEs generate their own income, as in **cluster 4**, fair incomes, higher prices of products and diversification of economic activities have been mentioned as supporting factors. This might suggest that the economic diversification observed in **cluster 4** could tend to support their ability to mainly rely on their own private funds.

The **multi-actor nature of a DynAE**, which is dominant across all clusters, also has an influence, as collaboration with and support from other actors and projects (such as associations, researchers, citizens, farmers, advisors, farmers unions, …) can support their development, notably by enhancing multiple actors involvement and interest, allowing knowledge creation and exchange and mutualisation of means. Creating dialog with opponents is also key. Still DynAEs sometimes struggle with the fact that farmers contributing to projects are not compensated nor paid for their work, and with the individualist mindsets and reluctance to change from some farmers. The geographical dispersion of involved actors can also have a negative influence on the capacity to meet (in opposition to the eased access to partnerships in cities), as well as the language barrier when it comes to communicating with international partners.

Although **diversification of agricultural productions** and economic activities can be an opportunity to adapt to climate change, enhance biodiversity and access new market opportunities, it can also be a challenge in terms of economic efficiency and management complexity, although this can be mitigated by some kind of production collaboration between farmers. Agritourism was often mentioned as an opportunity to diversify and gain visibility. Diversification of crops is challenged by the lack of (structured) value chains and consumers' demand. Of course, this factor is less relevant in **cluster 2**. We can also wonder if the fact that both clusters **1** and **4** are more diversified (in terms of agricultural production) could be related to their focus on income-generating agricultural production.

DynAEs are also influenced by their **dependence on external inputs**, notably because of their cost, (un)availability and (un)suitability. But the implementation of some agroecological practices, such as the use of resistant breeds, reducing use of synthetic fertilizers or pesticides, can be an opportunity to reduce the dependence on inputs.

Access to land has also been identified as an influencing factor. Difficulties in accessing agricultural lands can be overcome by political measures such as renting urban parcel lots to citizens for gardening. These difficulties can be reinforced by the high price of land, the

underprotection of agricultural lands which are diverted to other purposes or used as a way to invest money, and the occurrence of polluted soils. Also, when farmers have an access to land for their activities, the uncertainty of farm land use and ownership has a negative influence. Lastly, in some contexts, the difficulty to access land faces the paradoxical situation of abandoned lands.

Climate change has a three-fold effect. First of all, meteorological events and changes in seasons' dynamics caused by climate change make production activities more complicated and uncertain, also causing additional production costs. This is particularly true and relevant for DynAEs having a focus on agricultural production (**clusters 1**, **3** and **4**). On the other hand, it can also be seized as an opportunity through adaptation, for example by growing new crops in a given region. Finally, climate change raises awareness and creates interest for agroecology, which is reported as a key opportunity for DynAEs in **cluster 2**.

(2) The additional factors of success and failure that have been identified thanks to the interviews include factors related to the organisation of the DynAE, society, policy and administration, the dominant regime, crisis situations, and effects of agroecology.

A **formal acknowledgment** of a DynAE can have a positive influence, notably by legitimating it and making its activities understandable. This can be further supported by media attention, partnerships, communication and labelling,

The level of **awareness and information of society** (citizens, consumers, companies, media, …) to agroecology-related topics in comparison to other topics also has an influence, notably on the image of agriculture. Society stakeholders are also influenced by their own (mis)beliefs and opinions that shape their actions. Maybe DynAEs who tend to engage more with civil society and consumers, such as in **cluster 4**, are more likely to make the most out of this factor.

Existing **local, national or European policies (including the CAP)** can either block, enable or burden the DynAEs, notably because of the marginal consideration of some topics related to agroecology contrasting with the focus on economic growth and globalised markets. This can be reinforced (or levered) by the holistic, long-term and participative nature of policy making process, the level of complexity of administration and bureaucracy, the political (in)stability, the respective levels of influence of private companies, farmers associations and unions, and NGOs, the ideological narratives and the political agendas. A lack of involvement and commitment of policy makers has also been reported by the DynAEs, in particular at the national and European levels.

In the **current regime**, some systems and actors tend to dominate at the expense of alternative systems and actors who might already suffer from scepticism from some actors.

Crisis situations (such as COVID19 pandemic, biodiversity loss, economic crisis, war, ...) disrupting the current system can either foster change and new practices, or block them.

Negative short-term results or agronomic challenges of agroecological practices are sometimes reported by the DynAEs, hindering the effort to generate evidence and **knowledge** about the long term positive effects of agroecology while fuelling scepticism and fears about agroecology. This can be reinforced by the diverging opinions on the practices to be

implemented, but mitigated by knowledge sharing or advisory support for instance. However, it is also important to mention the reported agronomic opportunities and successes of such practices that in turn provide evidence of positive effects of agroecology, more importantly at the local level. These positive results could be used as levers through decision support and monitoring tools aimed at farmers. Still, we should emphasise the fact that positive results from trials and experiments might be less relevant to some stakeholders in comparison to results observed in realistic conditions. Practices which are implemented based on ideology and beliefs rather than evidence can also harm the image of agroecology.

6. Conclusion

Our work focused on agroecological dynamics called DynAEs. Although our studied sample was not intended to be representative of the full diversity of agroecology in Europe, it is nevertheless worth highlighting its coverage of various soil, climate and socio-economic contexts. The DynAEs' profiles are diverse, ranging from farms to experimental sites, and from local collectives to European project living labs. They cover a diversity of production systems, involved actors and action mechanisms.

The general traits of the DynAEs regarding how they address the agroecological principles highlight the dominant focus on principles related to agroecosystems, maybe at the expense of principles related to socio-economic and value chain aspects. This focus might put forward that agroecological transition automatically implies a rethink of the production systems, or reflect incremental changes to production systems rather than transformational changes (when referring to the levels of food transition) (Biovision, n.d.; Gliessman, 2016).
Also, the over-representation of some types of agricultural productions (vegetables and horticultural products, cereals and fruits) raises a question: is there any possibility that some sectors are less likely to transition towards agroecology and why?

From a methodological perspective, the combination of an online survey and in-depth interviews allowed us to use both quantitative and qualitative approaches, resulting in a deeper descriptive approach. In particular, this allowed to deepen the understanding of how and why the factors of success and failure identified in the survey influence the DynAEs, and to identify additional factors which are notably related to the organisation of DynAEs, society, policy and administration, the dominant regime, crisis situations, and effects of agroecology.

The clustering performed on our DynAEs' sample puts a spotlight on the diversity of DynAEs. It is otherwise important to bear in mind that it only reflects a specific point of view on reality: the considered variables, the final number of clusters retained and the statistical approach have an impact on the final clustering result.

Regarding the factors of success and failure, it is important to note that they are interlinked and interdependent. For instance, the distance to cities, distance to markets, type of market channels used/available, consumers habits and population density are strongly linked. More specifically, climate change is interconnected with many other environmental factors that can make adaptation to climate change much more challenging.

To further support the out-scaling of agroecology and the transition towards agroecology in such initiatives, the results of this work will be shared throughout individual reports and factsheets for the DynAEs. Furthermore, efforts will be made to connect the interested DynAEs with other DynAEs from the same cluster, with the same relevant characteristics or facing the same factors of failure. It is also planned to combine these outcomes with other outcomes of the project to better inform relevant stakeholders such as policy makers, researchers and practitioners.

7. Bibliography

Alvarez, S., Timler, C. J., Michalscheck, M., Paas, W., Descheemaeker, K., Tittonell, P., Andersson, J. A., & Groot, J. C. J. (2018). Capturing farm diversity with hypothesis-based typologies: An innovative methodological framework for farming system typology development. *PLOS ONE*, *13*(5), e0194757. https://doi.org/10.1371/journal.pone.0194757

Anderson, C. R., Bruil, J., Chappell, M. J., Kiss, C., & Pimbert, M. P. (2019). From Transition to Domains of Transformation: Getting to Sustainable and Just Food Systems through Agroecology. *Sustainability*, *11*(19), 5272. https://doi.org/10.3390/su11195272

Baret, P. V., & Antier, C. (2021). Chapitre 14—Penser la diversité des trajectoires de transition. In *Coexistence et confrontation des modèles agricoles et alimentaires: Un nouveau paradigme du développement territorial?* (Versailles: Éditions Quae). https://books.openedition.org/quae/pdf/40305

Barnes, A. P., Thompson, B., & Toma, L. (2022). Finding the ecological farmer: A farmer typology to understand ecological practice adoption within Europe. *Current Research in Environmental Sustainability*, *4*, 100125. https://doi.org/10.1016/j.crsust.2022.100125

Biovision. (n.d.). 13 principles of agroecology. 13 principles of agroecology. Retrieved 19 December 2024, from https://www.agroecology-pool.org/13aeprinciples/

Blanch-Ramirez, J., Calvet-Mir, L., Aceituno-Mata, L., & Benyei, P. (2022). Climate change in the Catalan Pyrenees intersects with socioeconomic factors to shape crop diversity and management. *Agronomy for Sustainable Development*, *42*(5), 91. https://doi.org/10.1007/s13593-022-00806-3

Collier, D., LaPorte, J., & Seawright, J. (2012). Putting Typologies to Work: Concept Formation, Measurement, and Analytic Rigor. *Political Research Quarterly*, *65*(1), 217–232. https://doi.org/10.1177/1065912912437162

Determining The Optimal Number Of Clusters: 3 Must Know Methods. (n.d.). *Datanovia*. Retrieved 24 September 2024, from https://www.datanovia.com/en/lessons/determining-the-optimal-number-of-clusters-3-must-know-methods/

Escobar, N., Romero, N. J., & Jaramillo, C. I. (2019). *Typology of small producers in transition to agroecological production* [PDF]. 517.7Kb. https://doi.org/10.15159/AR.19.221

Ferguson, B. G., Maya, M. A., Giraldo, O., Terán Giménez Cacho, M. M. y, Morales, H., & Rosset, P. (2019). Special issue editorial: What do we mean by agroecological scaling? *Agroecology and Sustainable Food Systems*, *43*(7–8), 722–723. https://doi.org/10.1080/21683565.2019.1630908

Fieldsend, A., Szabolcs, B., Magnus Fuglestad, E., & Eszter, V. (2019). *D3.4 Typology of interactive innovation project approaches*. LIAISON. https://liaison2020.eu/wp-content/uploads/2022/02/LIAISON-Deliverable-3.4-Typology-of-interactive-innovation-project-approaches.pdf

Gliessman, S. (2016). Transforming food systems with agroecology. Agroecology and Sustainable Food Systems, 40(3), 187–189. https://doi.org/10.1080/21683565.2015.1130765

Keppler, D. (2019). Characterisation of Innovations within the Multi-Level Perspective with Diffusion Typology of Innovations: A Fruitful Combination. *Journal of Innovation Management*, *7*(2), 15–37. https://doi.org/10.24840/2183-0606_007.002_0003

Legendre, L., & Legendre, P. (2012). *Numerical ecology*. Elsevier.

Mozzato, D., Gatto, P., Defrancesco, E., Bortolini, L., Pirotti, F., Pisani, E., & Sartori, L. (2018). The Role of Factors Affecting the Adoption of Environmentally Friendly Farming Practices: Can

Geographical Context and Time Explain the Differences Emerging from Literature? *Sustainability*, *10*(9), 3101. https://doi.org/10.3390/su10093101

Nesheim, M. C., Oria, M., & Yih, P. T. (Eds.). (2015). *A framework for assessing effects of the food system*. National Academies Press.

Petersen, P., Silveira, L., Bianconi Fernandes, G., & Gomes de Almeida, S. (2020). *Lume: A method for the economic-ecological analysis of agroecosystems*. Reclaiming Diversity & Citizenship.

Plumecocq, G., Debril, T., Duru, M., Magrini, M.-B., Sarthou, J.-P., & Therond, O. (2018). Caractérisation socio-économique des formes d'agriculture durable. *Économie Rurale*, *363*, 99–120. https://doi.org/10.4000/economierurale.5430

Rahmanian, M., Gomez, J., Bannò, L., & Meybeck, A. (2016, June). *What types of markets to support agroecology? Reflections from the FAO agroecology symposia*. https://www.researchgate.net/profile/Alexandre-Meybeck-2/publication/328772879_What_types_of_markets_to_support_agroecology_Reflections_from_the_FAO_agroecology_symposia/links/5be213e6299bf1124fbf24b0/What-types-of-markets-to-support-agroecology-Reflections-from-the-FAO-agroecology-symposia.pdf?origin=publication_detail

RPubs—Clustering mixed data. (n.d.). Retrieved 24 September 2024, from https://rpubs.com/Przemyslaw_Mazurek/579984

San Martin, G. (2018, September 25). *Similarities and distances*.

Schoonhoven, Y., & Runhaar, H. (2018). Conditions for the adoption of agro-ecological farming practices: A holistic framework illustrated with the case of almond farming in Andalusia. *International Journal of Agricultural Sustainability*, *16*(6), 442–454. https://doi.org/10.1080/14735903.2018.1537664

Wezel, A., Herren, B. G., Kerr, R. B., Barrios, E., Gonçalves, A. L. R., & Sinclair, F. (2020). Agroecological principles and elements and their implications for transitioning to sustainable food systems. A review. *Agronomy for Sustainable Development*, *40*(6), 40. https://doi.org/10.1007/s13593-020-00646

Annex 1 – Summary of the survey's results (qualitative variables)

Variable	Modality	n	%
Market channels used by the initiative	Direct sale to consumers (on-farm sale or catering, farmers' markets, home delivery, relay point, food buying groups…)	57	64,04%
	Sale through short supply chains (direct sale to a retailer such as another producer or cooperative, shop, supermarket, catering service, online shop…)	46	51,69%
	Sale through long supply chains (direct sale to a wholesaler or agrifood company)	29	32,58%
	Not applicable	15	16,85%
	Unknown	6	6,74%
Main market channel used by the initiative	Direct sale to consumers (on-farm sale or catering, farmers' markets, home delivery, relay point, food buying groups…)	32	35,96%
	Sale through short supply chains (direct sale to a retailer such as another producer or cooperative, shop, supermarket, catering service, online shop…)	14	15,73%
	Sale through long supply chains (direct sale to a wholesaler or agrifood company)	20	22,47%
	Not applicable	16	17,98%
	Unknown	5	5,62%
	NA (missing data)	2	2,25%
Certification status/eligibility to certification of the initiative	Yes	45	50,56%
	No	16	17,98%
	Not applicable	21	23,60%
	Unknown	7	7,87%
Sources of funding of the initiative	Own fund	58	65,17%
	Public fund	39	43,82%
	Donation	6	6,74%
	Alternative fund-raising	11	12,36%
	Loan from a financial institution	8	8,99%
	Subsidies	25	28,09%
	Other	12	13,48%
	Not applicable	4	4,49%
	Unknown	2	2,25%
Main source of funding of the initiative	Own fund	36	40,45%
	Public fund	24	26,97%
	Donation	2	2,25%
	Alternative fund-raising	2	2,25%
	Loan from a financial institution	3	3,37%
	Subsidies	7	7,87%

	Other	6	6,74%
	Not applicable	4	4,49%
	Unknown	2	2,25%
	NA (missing data)	3	3,37%
Availability of workforce within the initiative	Lack of workers	41	46,07%
	Enough workers	30	33,71%
	Not applicable	13	14,61%
	Unknown	5	5,62%
Level of income of most of the initiative's customers	Low income level	3	3,37%
	Middle income level	40	44,94%
	High income level	10	11,24%
	Not applicable	18	20,22%
	Unknown	18	20,22%
Income generating economic activities of the initiative	Agricultural production	76	85,39%
	Agri-tourism (accommodation, catering, leisure activities, …)	27	30,34%
	Handicraft	8	8,99%
	Processing of food products	40	44,94%
	Processing of non-food products	7	7,87%
	Energy production	10	11,24%
	Contractual work	7	7,87%
	None	0	0,00%
	Other	15	16,85%
	Not applicable	2	2,25%
	Unknown	1	1,12%
Main income generating economic activity of the initiative	Agricultural production	63	70,79%
	Agri-tourism (accommodation, catering, leisure activities, …)	3	3,37%
	Handicraft	0	0,00%
	Processing of food products	5	5,62%
	Processing of non-food products	0	0,00%
	Energy production	0	0,00%
	Contractual work	1	1,12%
	None	0	0,00%
	Other	7	7,87%
	Unknown	0	0,00%
	NA (missing data)	10	11,24%
Share of women within the initiative	Minority of women	33	37,08%
	Equal share of men and women	32	35,96%
	Majority of women	18	20,22%
	Not applicable	1	1,12%
	Unknown	5	5,62%
Subsidies received by the initiative	Basic payment per hectare	16	17,98%
	Support to offset the cost of providing environmental public goods that are not remunerated by the market	4	4,49%

	Payment for young farmers	8	8,99%
	Support for the first hectares of farmland	4	4,49%
	Support in areas with natural constraints	4	4,49%
	Coupled support for production, granted in respect of certain areas or types of farming for economic and/or social reasons	6	6,74%
	Payment for small farmers	1	1,12%
	Aids for the development of farms and businesses	4	4,49%
	Subsidies for organic farming	11	12,36%
	Payments linked to Natura 2000 and the Water Framework Directive	3	3,37%
	Animal welfare payments	3	3,37%
	Payments for forest, environmental and climate services and forest conservation	1	1,12%
	Payments linked to agri-environmental-climate measures (AECM)	8	8,99%
	Other	8	8,99%
	Not applicable	66	74,15%
	Unknown	4	4,49%
Main subsidy received by the initiative	Basic payment per hectare	11	12,36%
	Support to offset the cost of providing environmental public goods that are not remunerated by the market	0	0,00%
	Payment for young farmers	1	1,12%
	Support for the first hectares of farmland	0	0,00%
	Support in areas with natural constraints	0	0,00%
	Coupled support for production, granted in respect of certain areas or types of farming for economic and/or social reasons	0	0,00%
	Payment for small farmers	0	0,00%
	Aids for the development of farms and businesses	0	0,00%
	Subsidies for organic farming	4	4,49%
	Payments linked to Natura 2000 and the Water Framework Directive	0	0,00%
	Animal welfare payments	0	0,00%
	Payments for forest, environmental and climate services and forest conservation	0	0,00%
	Payments linked to agri-environmental-climate measures (AECM)	0	0,00%
	Other	3	3,37%
	Not applicable	65	73,03%
	Unknown	4	4,49%
	NA (missing data)	1	1,12%
Ownership of resources used by the initiative	Private individuals	55	61,80%
	Communities	8	8,99%

	Public authorities	8	8,99%
	No ownership	0	0,00%
	Not applicable*	14	15,73%
	Unknown	4	4,49%
Level of education of farmers	From no schooling to lower secondary education	1	1,12%
	From upper secondary to post-secondary non-tertiary education	30	33,71%
	From short-cycle tertiary education to doctorate	36	40,45%
	Not applicable	4	4,49%
	Unknown	12	13,48%
	NA (missing data)	6	6,74%
Types of **inputs** for which the initiative depends on external suppliers	Seed	51	57,30%
	Feed	18	20,22%
	Energy	52	58,43%
	Fertiliser	39	43,82%
	Plant protection products	39	43,82%
	Veterinary products	21	23,60%
	Material	44	49,44%
	None of them	1	1,12%
	Not applicable	9	10,11%
	Other	5	5,62%
	Unknown	4	4,49%
Main type of input for which the initiative depends on external suppliers	Seed	18	20,22%
	Feed	5	5,62%
	Energy	24	26,97%
	Fertiliser	3	3,37%
	Plant protection products	2	2,25%
	Veterinary products	0	0,00%
	Material	7	7,87%
	None of them	1	1,12%
	Not applicable	14	15,73%
	Other	2	2,25%
	Unknown	4	4,49%
	NA (missing data)	9	10,11%
Agricultural productions of the initiative	Cereals (wheat, spelt, rye,meslin, barley, oats, maize, rice, …)	39	17,98%
	Industrial crops (oil seeds, oleaginous fruits, protein crops, raw tobacco, sugar beet, …)	17	43,82%
	Forage plants	26	19,10%
	Vegetables and horticultural products	41	29,21%
	Potatoes	19	46,07%
	Fruits	35	21,35%
	Wine	9	39,33%

	Olive oil	8	10,11%
	Other crops	20	8,99%
	Cattle	22	22,47%
	Pigs	9	24,72%
	Equine	5	10,11%
	Sheep and goats	22	22,47%
	Poultry	14	15,73%
	Other animals	5	10,11%
	Milk	17	19,10%
	Eggs	20	8,99%
	Other animal products	12	13,48%
	Not applicable	6	6,74%
	Unknown	1	1,12%
Main agricultural production of the initiative	Cereals (wheat, spelt, rye,meslin, barley, oats, maize, rice, …)	16	17,98%
	Industrial crops (oil seeds, oleaginous fruits, protein crops, raw tobacco, sugar beet, …)	1	1,12%
	Forage plants	2	2,25%
	Vegetables and horticultural products	24	26,97%
	Potatoes	1	1,12%
	Fruits	7	7,87%
	Wine	2	2,25%
	Olive oil	2	2,25%
	Other crops	2	2,25%
	Cattle	6	6,74%
	Pigs	0	0,00%
	Equine	0	0,00%
	Sheep and goats	2	2,25%
	Poultry	0	0,00%
	Other animals	0	0,00%
	Milk	4	4,49%
	Eggs	0	0,00%
	Other animal products	2	2,25%
	Not applicable	12	13,48%
	Unknown	1	1,12%
	NA (missing data)	5	5,62%
Distance to cities	Close enough	59	66,29%
	Too remote	18	20,22%
	Unknown	12	13,48%
Distance to markets	Close enough	59	66,29%
	Too remote	18	20,22%
	Unknown	12	13,48%
	Formal rules and processes	29	32,58%

Formality of governance within the initiative	Informal rules and processes	58	65,17%
	Unknown	2	2,25%
Types of **actors** involved in the initiative	Farmers	82	92,13%
	Suppliers (farm's inputs suppliers, services providers, …)	28	31,46%
	Wholesalers and distributors (businesses buying food/agricultural products in large quantities from producers/businesses and selling them to other businesses)	26	29,21%
	Retailers (grocery stores, local shops, …) and catering services (restaurants, …)	24	26,97%
	Consumers and citizens	47	52,81%
	Processors (businesses or farms transforming agricultural products into processed food products)	29	32,58%
	Researchers	61	68,54%
	Advisors and technical experts (public or private advisory services, external experts, …)	48	53,93%
	Education professionals (schools, universities, training centres, …)	31	34,83%
	Land managers (land owners, natural reserves, …)	31	34,83%
	Certification bodies	24	26,97%
	Policy makers	20	22,47%
	Public authorities (bodies or officers administrating aspects of public life and executing the law)	29	32,58%
	Civil society organisations (NGOs, citizen's or professional associations, trade unions, …)	32	35,96%
	Farmers' associations	38	42,70%
	Other	10	11,24%
	Unknown	0	0,00%
Main type of actor involved in the initiative	Farmers	41	46,07%
	Suppliers (farm's inputs suppliers, services providers, …)	0	0,00%
	Wholesalers and distributors (businesses buying food/agricultural products in large quantities from producers/businesses and selling them to other businesses)	0	0,00%
	Retailers (grocery stores, local shops, …) and catering services (restaurants, …)	1	1,12%
	Consumers and citizens	11	12,36%
	Processors (businesses or farms transforming agricultural products into processed food products)	1	1,12%

	Researchers	16	17,98%
	Advisors and technical experts (public or private advisory services, external experts, …)	3	3,37%
	Education professionals (schools, universities, training centres, …)	1	1,12%
	Land managers (land owners, natural reserves, …)	3	3,37%
	Certification bodies	0	0,00%
	Policy makers	0	0,00%
	Public authorities (bodies or officers administrating aspects of public life and executing the law)	2	2,25%
	Civil society organisations (NGOs, citizen's or professional associations, trade unions, …)	5	5,62%
	Farmers' associations	0	0,00%
	Other	1	1,12%
	Unknown	0	0,00%
	NA (missing data)	4	4,49%
Presence of farmers within the initiative	Yes	83	93,26%
	No	6	6,74%
Highest **scale of action** of the initiative	Field level	6	6,74%
	Farm level	30	33,71%
	Food system level	46	51,69%
	Unknown	7	7,87%

Annex 2 – Summary of the survey's results characterising the DynAEs (quantitative variables)

Variable	Min	1st quartile	Median	3rd quartile	Max	Mean	Standard deviation	n	NA
Agroecological score of the initiative for principle "Recycling - Use of local renewable resources"	1	3	4	5	5	3,57	1,34	89	0
Agroecological score of the initiative for principle "Recycling - Close of resources' cycles"	1	3	4	4	5	3,54	1,23	89	0
Agroecological score of the initiative for principle "Input reduction - Reduce or eliminate dependency on purchased inputs"	1	3	4	5	5	3,81	1,12	89	0
Agroecological score of the initiative for principle "Input reduction - Increase self-sufficiency"	1	3	4	5	5	3,88	0,99	89	0
Agroecological score of the initiative for principle "Soil health - Secure and enhance soil health and functioning"	1	4	5	5	5	4,22	1,07	89	0
Agroecological score of the initiative for principle "Animal health - Ensure animal health and welfare"	1	3	4	5	5	3,48	1,38	89	0
Agroecological score of the initiative for principle "Biodiversity - Maintain and enhance natural and on-farm biodiversity"	1	4	5	5	5	4,29	0,97	89	0
Agroecological score of the initiative for principle "Synergy - Enhance interaction and synergy amongst the elements of the agroecosystem"	1	4	4	5	5	4,22	0,95	89	0

Agroecological score of the initiative for principle "Economic diversification - Diversify on-farm incomes"	1	2	4	5	5	3,46	1,31	89	0
Agroecological score of the initiative for principle "Co-creation of knowledge - Enhance co-creation and horizontal sharing of knowledge, especially amongst farmers"	1	3	4	5	5	3,92	1,11	89	0
Agroecological score of the initiative for principle "Social values and diets - Provide healthy, diversified, seasonally and culturally appropriate diets"	1	3	4	5	5	3,66	1,41	89	0
Agroecological score of the initiative for principle "Fairness - Support dignified and robust livelihoods, especially for small scale producers"	1	3	3	4	5	3,42	1,23	89	0
Agroecological score of the initiative for principle "Fairness - Promote fair and short distribution networks"	1	3	4	5	5	3,69	1,39	89	0
Agroecological score of the initiative for principle "Fairness - Embed into local economies"	1	3	4	5	5	3,65	1,31	89	0
Agroecological score of the initiative for principle "Land and natural resource governance - Strengthen institutional arrangements regarding land and natural resources governance"	1	2	3	4	5	3,01	1,28	89	0
Agroecological score of the initiative for principle "Participation - Encourage social	1	2	3	4	5	3,25	1,25	89	0

organisation and greater participation in decision-making"									
Average agroecological score of the initiative (for all 13 principles)	1,50	3,25	3,81	4,19	4,81	3,69	0,76	89	0
Diversity of **market channels** used by the initiative	1,00	1,00	2,00	3,00	3,00	1,93	0,78	68	21
Diversity of **sources of funding** of the initiative	1,00	1,00	2,00	2,00	5,00	1,92	0,99	83	6
Diversity of **sources of income** of the initiative	1,00	1,00	2,00	3,00	6,00	2,36	1,22	80	9
Diversity of **subsidies** received by the initiative	1,00	2,00	3,00	5,00	9,00	3,84	2,54	19	70
Diversity of **types of inputs** for which the initiative depends on external suppliers	1,00	3,00	4,00	5,00	8,00	3,84	1,53	70	19
Diversity of **agricultural productions** of the initiative	1,00	2,00	3,00	6,00	18,00	4,47	3,50	76	13
Inclusion of actors in governance of the initiative	0,07	0,26	0,50	0,67	1,00	0,49	0,28	87	2
Diversity of **actors** involved in the initiative	1,00	4,00	6,00	8,00	14,00	6,29	3,12	89	0
Number of **farms** in the initiative	0,00	1,00	4,00	15,00	12534,00	246,70	1437,09	81	8

Annex 3 – Factors of success and failure by cluster. The sign "-" denotes a negative influence,"/" denotes a neutral influence, "+" denotes a positive influence, "?" denotes an unknown influence, "(-)" denotes a possible negative influence (slight trend), "(+)" denotes a possible positive influence (slight trend).

Question in the survey	Dimension	Description	Variable name	Cluster	Influence				Modality	Comment
					negative (-)	neutral (/)	positive (+)	unknown (?)		
How would you describe the distance from your initiative and its farms to cities ? How do you think the distance of your initiative from cities influences it?	Built environment	Distance of the initiative from cities	dist_cities	1	- (26,67%)	/ (13,33%)	+ (33,33%)	? (26,67%)	close or remote	There are mixed feelings in cluster 1 (negative, neutral, positive, unknown), cluster 2 (neutral, positive, unknown) and cluster 3 (neutral positive, unknown). Cluster 4 is positively influenced (which is generally linked to being close to cities).
				2	(9,52%)	/ (23,81%)	+ (42,86%)	? (23,81%)	close	
				3	(-) (24%)	(12%)	+ (44%)	? (20%)	close	
				4	(14,28%)	(7,14%)	+ (78,57%)	(0%)	close	
How would you describe the distance from your initiative and its farms to markets ? How do you think the distance of your initiative and its farms from markets influences it?		Distance of the initiative from markets	dist_markets	1	- (20%)	/ (13,33%)	+ (33,33%)	? (33,33%)	close	There are mixed feelings in cluster 1 (negative, neutral, positive, unknown), cluster 2 (neutral, positive, unknown) and cluster 3 (neutral, positive). Cluster 4 is positively influenced (which is generally linked to being close to markets).
				2	(14,28%)	/ (23,81%)	+ (28,58%)	? (33,33%)	close	
				3	(-) (24%)	/ (24%)	+ (48%)	(4%)	close	
				4	(17,85%)	(7,14%)	+ (75%)	(0%)	close	
Which one is the most used market channel ? What do you think is the influence of the	Economy & markets	Main market channel used by the initiative	rank1_market_channels	1	(-) (26,67%)	(6,67%)	+ (40%)	? (26,67%)	long	There are mixed feelings in cluster 1 (possibly negative, positive, unknown) and cluster 2 (possibly negative, positive, unknown). Clusters 3 and 4 are positively influenced (which is generally linked to direct and short market
				2	(-) (20%)	(0%)	+ (60%)	? (20%)	not applicable, long or direct when applicable	
				3	(4%)	(8%)	+ (72%)	(16%)	short > long > direct	

main sales channels used by your initiative and its farms ?				4	(0%)	(0%)	+ (96,43%)	(3,57%)	direct	channels, and sometimes to long market channels).
How would you describe the availability of workers within your initiative in relation to your needs ? How do you think the availability of workers influences your initiative?		Availability of workforce within the initiative	work_force	1	- (76,92%)	(7,69%)	(15,38%)	(0%)	lack	Clusters 1 and 2 are negatively influenced (which is generally linked to a lack of work force). There are mixed feelings in cluster 3 (neutral, positive) and cluster 4 (negative, positive).
				2	- (58,33%)	(0%)	(25%)	(16,67%)	not applicable or lack	
				3	(21,74%)	/ (26,09%)	+ (39,13%)	(13,04%)	sufficiency	
				4	- (57,15%)	(3,57%)	+ (39,29%)	(0%)	lack > sufficiency	
What share of your initiative's actors are women ? How do you think the share of women within your initiative influences it ?	Society & culture	Share of women within the initiative	women	1	(26,67%)	/ (46,67%)	(13,34%)	(13,33%)	minority	The influence on cluster 1 is neutral. There are mixed feelings in cluster 2 and 3 (neutral, positive, unknown). Cluster 4 is positively influenced (which is generally linked to equality of the representation of men and women and to having a majority of women).
				2	(10%)	/ (20%)	+ (35%)	? (35%)	no specific trend	
				3	(12%)	/ (16%)	+ (48%)	? (24%)	minority > equality > majority	
				4	(3,57%)	(17,86%)	+ (71,43%)	(7,14%)	equality	
You will have a list of statements regarding your local context. Please rate them according to how you think they influence your initiative : the diets and eating habits of citizens		Consumers habits	statements_consumers_habits_ct	1	- (53,33%)	/ (13,33%)	(26,67%)	(6,67%)		The influence on cluster 1 is neutral to negative. There are mixed feelings in cluster 2 (negative, neutral, possibly positive, unknown - with a slight trend toward a neutral influence), cluster 3 (negative, neutral, positive, unknown) and cluster 4 (possibly negative, possibly positive).
				2	- (23,81%)	/ (28,57%)	+ (28,57%)	? (19,05%)		
				3	- (32%)	/ (12%)	+ (44%)	? (12%)		
				4	(-) (50%)	0%)	(+) (46,42%)	(3,57%)		
You will have a list of statements regarding your		Population density	statements_population_ct	1	- (33,33%)	/ (20%)	(+) (26,6%)	? (20%)		There are mixed feelings in cluster 1 (negative, neutral, possibly positive, unknown), cluster 3 (possibly negative, neutral, possibly positive, unknown -
				2	(0%)	/ (42,86%)	(23,81%)	? (33,33%)		

local context. Please rate them according to how you think they influence your initiative : population density				3	(-) (24%)	/ (20%)	+ (40%)	(16%)		with a slight trend toward a neutral influence) and cluster 4 (negative, positive). Influence on cluster 2 is neutral or unknown.
				4	- (42,86%)	(10,71%)	+ (35,72%)	(10,71%)		
You will have a list of statements regarding your local context. Please rate them according to how you think they influence your initiative : rural and farming population age		Rural population age	staements_age_ct	1	- (60%)	(6,67%)	(0%)	? (33,33%)		Cluster 1 is negatively influenced or the influence is unknown. There are mixed feelings in cluster 2 (negative, neutral or unknown) and cluster 3 (negative, neutral). Cluster 4 is negatively influenced.
				2	- (33,33%)	/ (28,57%)	(9,52%)	? (28,57%)		
				3	- (52%)	/ (24%)	(12%)	(12%)		
				4	- (64,29%)	(10,71%)	(10,71%)	(14,29%)		
What is the level of education of most of the farmers involved in your initiative? How do you think their level of education influences the farms and your initiative?	Knowledge and information	Level of education of farmers	farmers_education	1	- (20%)	/ (13,33%)	+ (40%)	? (26,67%)	middle	There are mixed feelings in cluster 1 (negative, neutral, positive, unknown). Cluster 2, 3 and 4 are positively influence d(which is generally linked to a middle to high level of education).
				2	(8,33%)	(0%)	+ (83,34%)	(8,33%)	not applicable, middle, high	
				3	(4,17%)	(16,67%)	+ (58,33%)	(20,83%)	high	
				4	(10,71%)	(14,29%)	+ (57,14%)	(17,86%)	middle, high	
How would you describe the evolution of the following environmental conditions in your initiative's immediate environment in recent years? : Availability of land	Natural environment	Evolution of the availability of land	evolution_land_ct	1	- (33,34%)	/ (33,33%)	(20%)	(13,33%)	unchanged	There are mixed feelings in cluster 1 (negative, neutral) and cluster 2 (neutral, unknown). Influence on cluster 3 is neutral. Cluster 4 is positively influenced.
				2	(14,28%)	/ (28,57%)	(23,81%)	? (33,33%)	unchanged, unknown	
				3	(20%)	/ (32%)	(32%)	(16%)	decrease, unchanged, increase	
				4	(25%)	(10,71%)	+ (53,57%)	(10,71%)	decrease, unchanged, unknown	

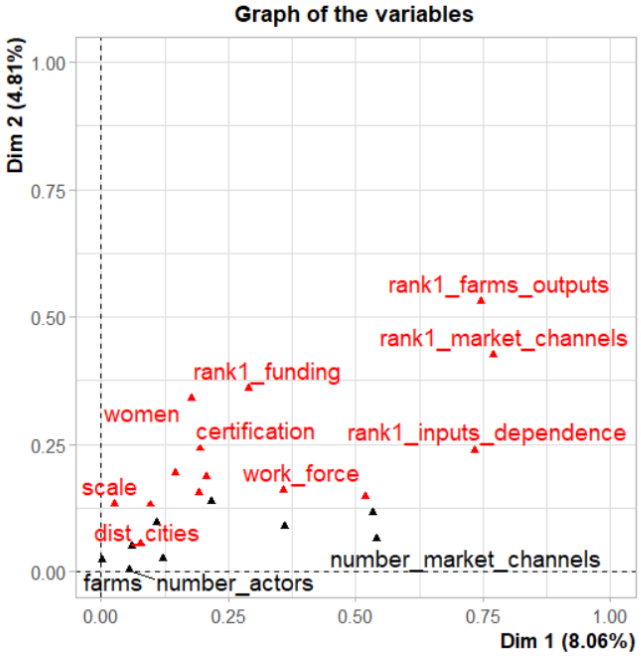
How do you think the fact that the availability of land decreased/stayed the same/increased influences your initiative?										
How would you describe the evolution of the following environmental conditions in your initiative's immediate environment in recent years? : Availability of ground and surface water How do you think the fact that the availability of ground and surface water decreased/stayed the same/increased influences your initiative?		Evolution of the availability of freshwater resources	evolution_water_ct	1	- (53,33%)	(20%)	(13,33%)	(13,33%)	decrease, unchanged	Cluster 1 is negatively influenced (which is generally linked to a decrease of the availability of ground and surface water resources). There are mixed feelings in cluster 2 (neutral, positive, unknown), cluster 3 (negative, neutral) and cluster 4 (negative, positive).
				2	(14,29%)	(14,29%)	+ (38,10%)	? (33,33%)	decrease, unchanged, unknown	
				3	- (52%)	/ (24%)	(8%)	(16%)	decrease, unchanged	
				4	- (53,57%)	(7,14%)	+ (35,71%)	(3,57%)	decrease, unchanged	
How would you describe the evolution of the following environmental conditions in your initiative's immediate environment in recent years? : Precipitation amount		Evolution of rainfall amount	evolution_rainfall_ct	1	- (60%)	(13,33%)	(6,67%)	(20%)	decrease, unchanged, increase, unknown	Cluster 1 is negatively influenced (which is generally linked to a decrease of the precipitation mount, and sometimes to an increase). There are mixed feelings in cluster 2 (negative, neutral, positive, unknown) and cluster 3 (negative, neutral). Cluster 4 is negatively influenced.
				2	- (23,81%)	/ (14,29%)	+ (38,10%)	? (23,81%)	decrease, unchanged, increase, unknown	
				3	- (56%)	/ (24%)	(8%)	(12%)	decrease, unchanged	
				4	- (67,86%)	(14,29%)	(14,28%)	(3,57%)	decrease	

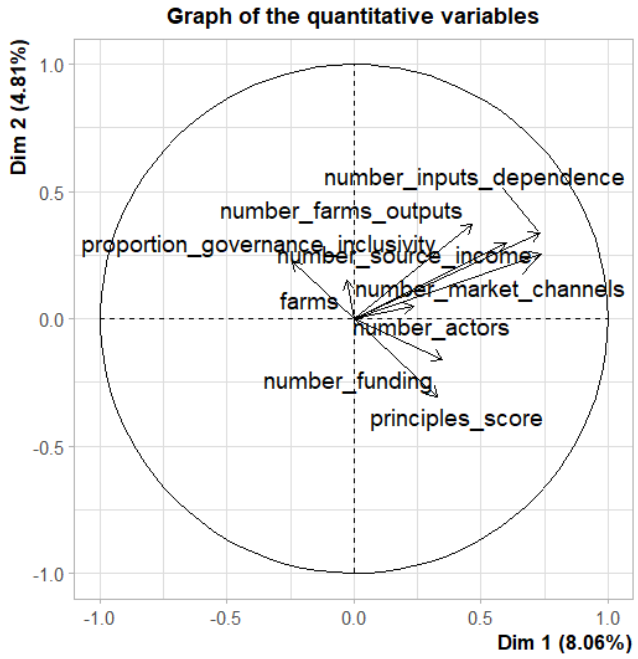
How do you think the fact that the precipiation amount decreased/stayed the same/increased influences your initiative?										
How would you describe the evolution of the following environmental conditions in your initiative's immediate environment in recent years? : Temperature How do you think the fact that temperature decreased/stayed the same/increased influences your initiative?		Evolution of temperature	evolution_temperature_ct	1	- (46,67%)	/ (26,67%)	(0%)	? (26,67%)	unchanged, increase	There are mixed feelings in cluster 1 (negative, neutral, unknown), cluster 2 (negative, neutral, positive - with a slight trend toward a positive influence) and cluster 3 (negative, neutral, unknown). There is a slight trend toward a negative influence in cluster 4 (which is generally linked to an increase of temperature).
				2	- (23,81%)	/ (14,29%)	+ (38,10%)	? (23,81%)	increase	
				3	- (56%)	/ (20%)	(8%)	(16%)	increase	
				4	- (57,14%)	(10,71%)	(25%)	(7,14%)	unchanged, increase	
How would you describe the evolution of the following environmental conditions in your initiative's immediate environment in recent years? : Extreme weather events frequency (droughts, floods, heat and cold waves,		Evolution of extreme weather events frequency	evolution_extreme_weather_ct	1	- (60%)	(13,33%)	(0%)	? (26,67%)	increase, unchanged	Cluster 1 is negatively influenced, or the influence is unknown. There are mixed feelings in cluster 2 (negative, neutral, positive or unknown). Clusters 3 and 4 are negatively influenced (which is generally linked to an increase of the frequency of extreme weather events and sometimes to a decrease).
				2	- (33,33%)	/ (23,81%)	+ (23,81%)	? (19,05%)	increase	
				3	- (68%)	(12%)	(20%)	(0%)	increase	
				4	- (75%)	(7,14%)	(14,28%)	(3,57%)	increase	

fires, storms...) How do you think the fact that the frequency of extreme weather events decreased/staye d the same/increased influences your initiative?										
You will have a list of statements regarding your local context. Please rate them according to how you think they influence your initiative : the relief, slope and elevation		Topograhy (elevation and slope)	statements_topo_ct	1	(-) (40%)	/ (26,67%)	(13,34%)	? (20%)		There are mixed feelings in cluster 1 (possibly negative, neutral, unknown), cluster 2 (neutral, positive, unknown), cluster 3 (negative, neutral, possibly positive, unknown - with a slight trend toward a neutral influence) and cluster 4 (possibly negative, neutral, possibly positive - with a slight trend toward a neutral influence).
				2	(4,76%)	/ (33,33%)	+ (23,81%)	? (38,10%)		
				3	- (24%)	/ (32%)	+ (28%)	? (16%)		
				4	(-) (21,43%)	/ (32,14%)	(+) (42,85%)	(3,57%)		
You will have a list of statements regarding your local context. Please rate them according to how you think they influence your initiative : the soil properties and fertility		Soil fertility	statements_soil_ct	1	- (40%)	(13,33%)	+ (40%)	(6,67%)		There are mixed feelings in cluster 1 (possibly negative, positive). Cluster 2 is positively influenced or the influence is unknown. Cluster 3 and 4 are positively influenced.
				2	(9,52%)	(9,52%)	+ (57,14%)	? (23,81%)		
				3	(24%)	(8%)	+ (56%)	(12%)		
				4	(25%)	(3,57%)	+ (64,29%)	(7,14%)		

Annex 4 - FAMD results for the reduction of the number of considered variables

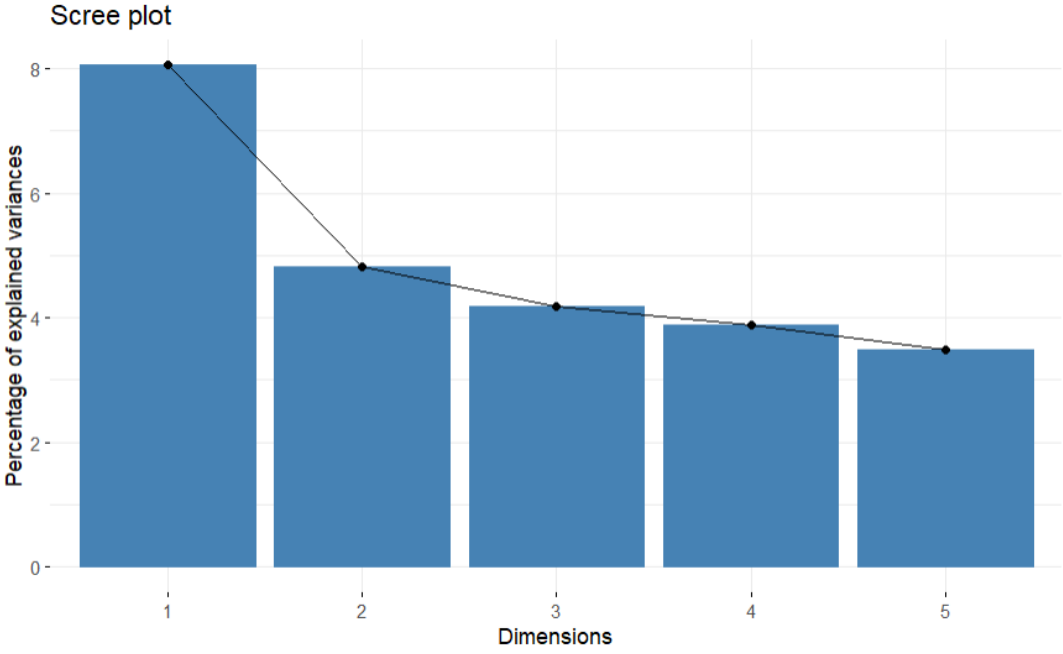
The first graph represents all the variables as points in a new space defined by the two first dimensions from the FAMD. Variables close to the right edge of the graph contribute the most to defining dimension 1, while variables close to the upper edge of the graph contribute the most to defining dimension 2. In our case, the variables rank1_farms_outputs, rank1_market_channels and rank1_inputs_dependence contribute the most in defining dimension 1, while rank1_farm_outputs contributes the most in defining dimension 2. The second graph represents the quantitative variables as arrows in a new space defined by the two first dimensions from the FAMD. The longer an arrow and the more it is parallel to an axis, the more the corresponding variable contributes to define the dimension represented by the axis. In our case, the variables number_market_channels, number_source_income, number_inputs_dependence and number_farms_outputs contribute the most in defining dimension 1.





The number of dimensions to consider has been determined using different criteria:

- Catell criterion : based on the scree plot below, keep the number of dimensions before the "elbow" → according to this criterion, we should keep 1 dimension
- Kaiser criterion: keep a number of dimensions so that the percentage of variance explained by the dimension is above 100%/number of variables (>4,35 in our case), which means keeping dimensions explaining more variability than the initial variables → according to this criterion, we should keep 2 dimensions



Finally, we analysed the absolute contributions. Relative contributions are considered high if contrib > 100%/number variables (>4,35 in our case). Based on the table below, we can see that:

- For dimension 1, the variables with an absolute contribution over the threshold are number_market_channels, number_source_income,

number_inputs_dependence, rank1_market_channels, rank1_funding, work_force, rank1_inputs_dependence and rank1_farms_outputs.

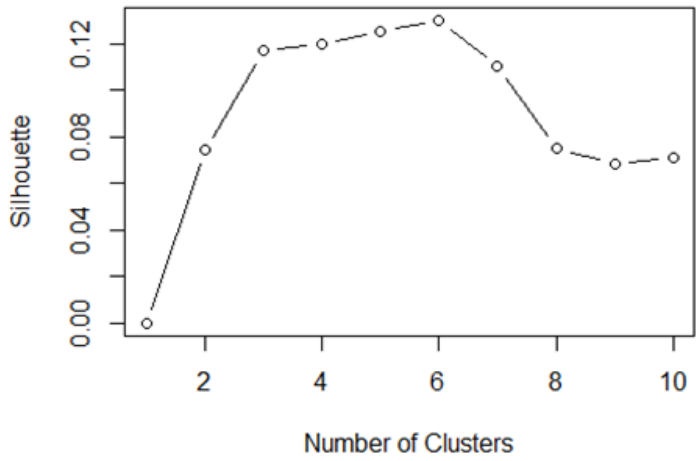
- For dimension 2, the variables with an absolute contribution over the threshold are rank1_market_channels,certification, rank1_funding, women, farmers_education, rank1_inputs_dependence, rank1_farms_outputs and rank1_actors.

These variables are probably the most relevant to characterise the diversity of our data set as they contribute the most to the construction of the new dimensions from the analysis.

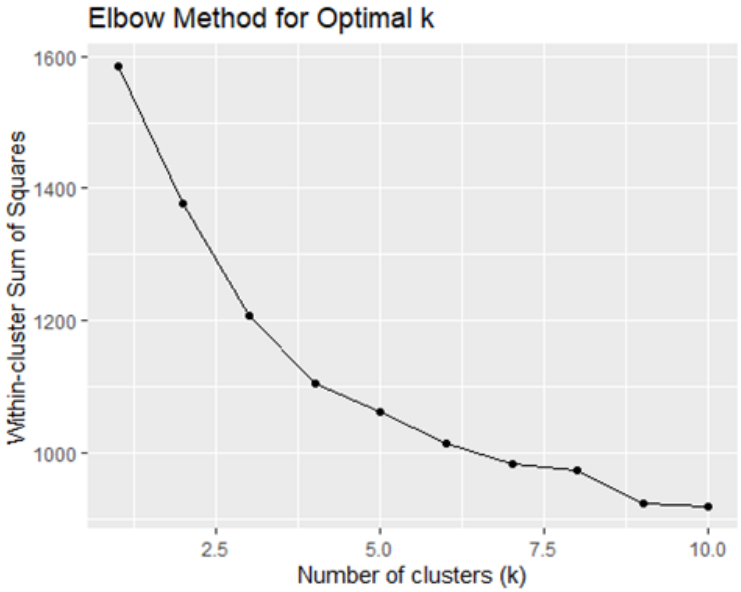
```
Contrib values of the considered variables
                                  Dim. 1      Dim. 2
principles_score                 1.6544072  2.44187481
number_market_channels           8.2787991  1.66713337
number_funding                   1.8602830  0.66294027
number_source_income             5.5044653  2.25574261
number_inputs_dependence         8.1761377  2.94261712
number_farms_outputs             3.3119021  3.55372791
proportion_governance_inclusivity 0.9217563  1.30471022
number_actors                    0.8485952  0.06373228
farms                            0.0125963  0.59177040
rank1_market_channels           11.7840816 10.91196790
certification                    2.9868406  6.19512384
rank1_funding                    4.4448386  9.20371208
work_force                       5.4695548  4.06864879
customers_income                 7.9453136  3.77791399
women                            2.6972493  8.751553936
farmers_education                2.2408281  4.97227752
rank1_inputs_dependence         11.2430051  6.12039277
rank1_farms_outputs             11.4099170 13.61119132
dist_cities                      1.1909156  1.41426993
dist_markets                     2.9479443  3.97252495
governance_formality             1.4863998  3.37671226
rank1_actors                     3.1748030  4.75718617
scale                            0.4093665  3.38227556
```

Annex 5 - Details of clustering results

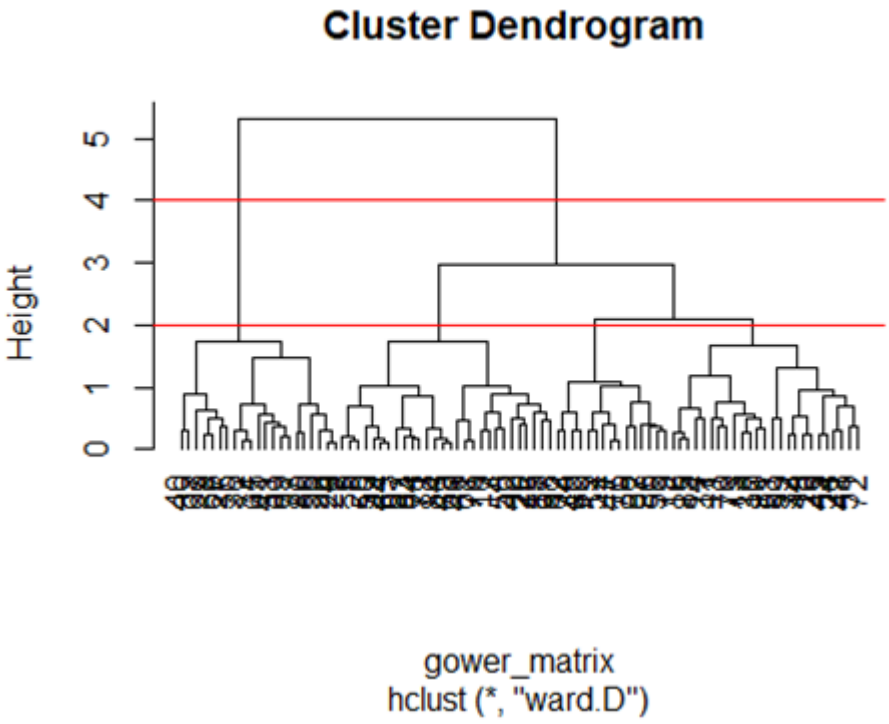
The first graph represents the results of the **silhouette width method**, more specifically the silhouette width value as a function of the number of clusters. We can see that we have high values of the silhouette width for 3, 4, 5 and 6 clusters, with a maxim at 6 clusters but with a gentle slope only between 3 and 6 clusters, which reflects a slow increase of the value of the silhouette width with the increase of the number of clusters, while the slope between 1 and 3 clusters is steep. The silhouette width value starts to decrease from 6 clusters onwards. This first method yields an **optimal number of clusters between 3 and 6**.



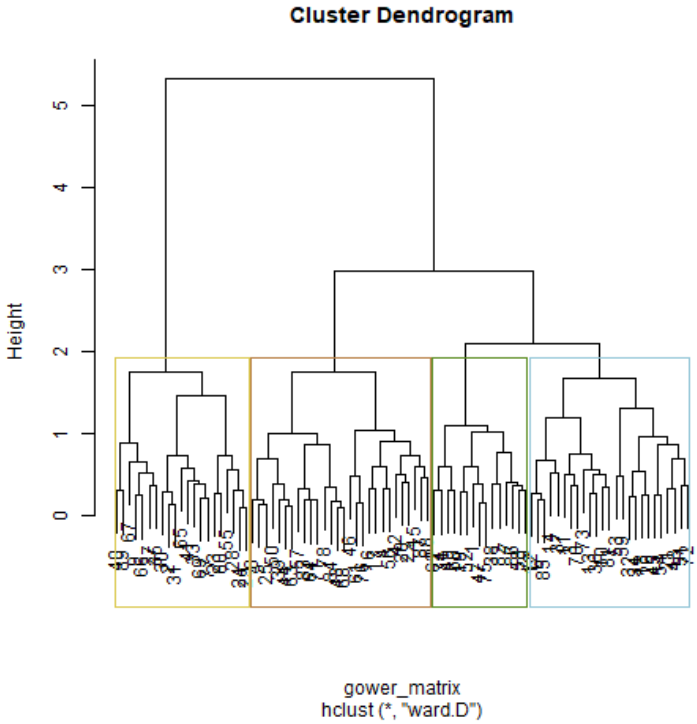
The second graph represents the results of the **elbow method**, more specifically the within cluster sum of squares as a function of the number of clusters. We can see that we have an elbow at 4 clusters, although it is not a very obvious one. This second method yields **4 as the optimal number of clusters**.



The next graph represents the results of the **hierarchical clustering** as a **dendrogram**. It can also be used to define the optimal number of clusters by cutting the dendrogram at the level of the longest branch (red lines on the graph) as the longer the branch is, the more distinct the clusters are. This method yields **2 to 4 clusters as an optimal number.**



Finally, the last graph represents the **4 final clusters** in a dendrogram resulting from the hierarchical clustering based on a Gower's distance matrix. Cluster 1 is highlighted in blue, cluster 2 in brown, cluster 3 in green and cluster 4 in yellow. The heights of the dendrogram branches reflect the distances between the clusters. Cluster 1 is thus very distinct from the 3 other clusters, while clusters 3 and 1 are the most similar. Also, when considering only 2 clusters, cluster 4 is already forming a cluster of its own, while clusters 1, 2 and 3 are gathered in the same cluster.



Annex 6 - Complete list of factors of success and failures emerging from interview for each DynAE

Factors of success and failure of Finnish DynAE – Tampere's Living Lab in FUSILLI project (cluster 2)

Table 11: Factors of success and failure for Tampere's Living Lab in FUSILLI project (Finland), according to the different dimensions.

	Factors of failure	Factors of success
Economy and markets	● The main national system in Finland is based on long channels, which lets no room for other systems ● Local product of the initiative usually costs more than supermarket food which can make it difficult for citizens to buy ● Lack of budget foreseen in the project for anything else than staff costs ● Covid crisis which led to close the dairy activity of AhlmanEdu which was a good tool to promote local food	● Synergy with other project to mutualize costs ● Presence of marketplaces to sell and buy fresh products grown locally ● Development of a mark of origin for Pirkanmaa region products
Society and culture	● Difficulty in reaching people who are not already interested in urban food and local production ● Lack of interest for agricultural jobs in Finland ● Difficulty for students to accept new taste of food made with fresh and local products	● Part of society is very interested in local production and different activities ● Dialog with students to find the tastier recipes for them with fresh and local products
Built environment / infrastructure	● New logistic needs to have locally grown and cooked food for schools	● Presence of parcel lots to rent in the city for the citizens ● Presence of market hall in the city available for local producers
Natural environment	● Slower composting process in winter ● Clay/silt soil in the region that gets hard and dry fast due to lack of structure ● No real "spring", feeling that the season jumps directly from winter to summer which reduces the amount of water available due to reduction of snow melting period.	● Environmental characteristics seen as a context to understand and not as an issue from the agroecological perspective ● Make proper compost to have a good soil amendment for fertility, soil structure and soil habitat ● Global warming seen as an opportunity to have new species and crops thanks to longer growing season
Knowledge and information		● Educational path in primary school in Tampere to teach where food comes from and how to cook it properly ● Presence of a showcase garden in Ahlman school to teach agroecological practices as compost or no dig

		● Educating chefs on local food production to foster collaboration with local restaurant ● Dissemination on results of showcase garden to national or even international people through teaching or making publication
Policy and governance	● Difficulty to compost in urban area due to legislative reason ● Long discussion in the city of Tampere to find the right person to take in charge the local production and consumption topic ● Lack of room for short channels due to dominant political attitude at national level	● The city of Tampere has been searching the way to participate in the development of a local food system ● Signature of the Milan Urban Food Policy that give a framework and objective to the development of a local food system in urban area
Organisation and activities	● Challenging to bring importance of compost to showcase garden in AhlmanEdu ● Difficulty to fully collaborate between all partners that may bring missing touching points in the project	● Communication and promotion of different activities organised in different places of the city that bring awareness to the citizens ● City of Tampere that coordinate the project and is basically a connection to all the others ● AhlmanEdu which brings its network to the project

Factors of success and failure of the Hungarian DynAE – Magház association (cluster 2)

Table 12: Factors of success and failure for Magház association (Hungary), according to the different dimensions.

	Factors of failure	Factors of success
Economy and markets	• Increasing diversity of products challenges economic efficiency • Difficulty to produce seeds in Hungary at a reasonable price, due to high production costs and cheaper competition abroad • Challenges in fitting the organisation's development and professionalisation within the country's economic limitations	• Strong market potential for DynAE's producers due to the limited number of small-scale agroecological farmers in Hungary • Subsidies from projects for the diversity of production
Society and culture	• Seed rights and EU legislation get less media attention compared to gardening practices • Organic seed traders promote fear around seed swaps, claiming they spread viruses • Lack of interest of people in learning how to save seeds • Slowness of building trust with actors (e.g. ministries, gene bank…) and overcoming initial scepticism • Long-term abandonment of traditional varieties and seed-saving habits in Hungary and lack of small vegetable garden practices • Lack of people willing to take action for agrobiodiversity in Hungary	• Increased public awareness about alternative solutions and techniques about agrobiodiversity and seed saving • Increased interest in self-sufficient, urban gardening, along with a movement away from cities lead to a significant increase in seed swaps after COVID in Hungary • Hungarian radio morning gardening programs provide a space for Magház activities to fit into media programs • Climate change is driving interest in small-scale, agroecological farming practices, increasing awareness of crop diversity and rapid development • Building trust with actors (e.g. ministry, gene bank) through demonstrating commitment to improving and broadening the system, rather than diminishing quality or avoiding oversight • Hungary's strong tradition in seed production provides a foundation, even if conventional industrial approach is not adaptable for home gardening
Built environment / infrastructure	• High cost of machines related to seed saving on farms • Lack of central place and facilities easily accessible for all members of the association • Larger scale seed production requires advanced facilities (e.g. for cleaning and packaging), as current small-scale techniques are very time-consuming • Challenges in maintaining plant health with organic methods, along with high costs of performing necessary plant health tests	• Use of plastic tunnels to create a microclimate more suitable for plants and counter climate change effects

Natural environment	• Climate change complicates production due to water scarcity and high temperatures	• Soil fertility
Knowledge and information	• The co-creation aspect of the Horizon project is challenging due to the need for constant adaptation and addressing new questions, differing from the rigid academic systems they are used to • Lack of time of practitioners (being overworked, juggling with many tasks, experiments and idea) to invest in knowledge sharing activities	• Strong communication tools (i.e. booklet, online platforms) enable the DynAE to provide information and reach audiences beyond the network • Participation of DynAE members in events expands outreach beyond the network and share of knowledge • EU-funded projects increase DynAE (international) network • Collaboration with research institutions offers external professional support to the DynAE • One DynAE member's education from WUR enables her to navigate the co-creation dynamics of Horizon project effectively • The high level of education among DynAE members enables them to be effective educators • The highly qualified DynAE members, consisting of biologists, agroecologists, and environmental engineers, attracts collaborations with research institutes, as they are qualified for field research
Policy and governance	• Legal issues prevent seed sales, limiting income opportunities for farmers • Seed topic is marginal in current Hungarian policy • Limited influence of European environmental NGOs compared to large corporations like Bayer-Monsanto • EU plant health regulations and seed testing are burdensome for small farms with diverse varieties • Difficulty in establishing an association in Hungary constrained the structuration of the DynAE • Quantity limitations prevent marketing larger seed quantities without strict procedures, limiting the centralization of facilities • Requirement for farmers to meet specific seed quality standards reduces their interest in participating in the DynAE	• Formal acknowledgment of the DynAE by the Hungarian Ministry of agriculture • As an income source, the association is reframed as a social enterprise, focusing on education and knowledge-sharing (e.g. through an online platform and garden workshops), rather than seed sales • National Gene Bank (NBGK) supports the DynAE cause • Preserving heirloom varieties and traditions aligns with the current nationalistic narrative • Seed saving aligns with current EU strategy (AE, farm to fork, local food system development…) • Relatively good regulatory situation in Hungary for agrobiodiversity • Transformation of an inactive association into the DynAE association to avoid administrative procedures
Organisation and activities	• The lack of a legal entity made it difficult to formalise the network • Reliance on volunteers made it difficult to maintain long-term cohesion	• Participation in EU projects offers funding and a formal framework for activities, supporting the DynAE's organisational development and professionalisation

	● Lack of central budget of the DynAE limited communication, reaching of new people and DynAE organisational development ● Decision making process being over-democratised made it inefficient ● The initial group's lack of skills in developing a business model hindered progress and outreach for some years ● Early lack of leadership within the team limited the team expansion to avoid less suitable members ● Lack of people with enough time to commit to the DynAE development at the start	● Many volunteers' hours allowed organisational development of the DynAE throughout the years ● High DynAE core members commitment, inner motivation and enthusiasm ● Strong trust among the core group of members at the creation of the association ● Booklet publication effectively legitimised the DynAE beyond its network ● Collaboration with other institutions helped the DynAE attracting new members ● Transitioning to a more structured organisational model with clear responsibilities allowing quicker everyday decisions ● Focusing the association on hobby gardeners at the start enabled the recruitment of enthusiastic individuals interested in seed saving ● Expansion of the DynAE including more individuals who are available to contribute

Factors of success and failure of the Swedish DynAE – Svensk Kolinlagring (cluster 2)

Table 13: Factors of success and failure for Svensk Kolinlagring (Sweden), according to the different dimensions.

	Factors of failure	Factors of success
Economy and markets	• Lack of financing for farmers to innovate and fail (they are only getting finance for what they produce) • High cost of the development of the program (and they do not want to rely on external investors as the DynAE is not for profit) • Competition with for profit competitors on the market • A lack of diversity and competition in the food system (e.g., processing, purchasing, and selling) creates vulnerability and makes it difficult to implement change due to the dominance of a few large actors • Difficulty finding people who have the knowledge to work on the farms • The current design of policies, industries and economic settings favor larger farms, which makes it more challenging for small farms to create a profitable business model • Possible temporary yield reduction for farmers transitioning to regenerative farming • Difficulty securing funding for DynAE's development initiatives Market chains are not adapted to regenerative farming practices (e.g., the inclusion of peas in crop rotations or other wheat varieties)	• Existence of companies willing to fund the project of transformation • Recognition by insurance companies of the strategic value in supporting transformation of farms (mitigate long-term risks and enhance financial viability) • DynAE (through the transformation package and carbon credit system) provides farmers with the opportunity to innovate and fail by financing their efforts (and learning from their failures) • Being frontrunner farmers make them more attractive for hiring farm labour • Public funding of the DynAE • Increase system-wide profitability, in particular by lowering input costs
Society and culture	• Resistance of big actors in the food system to change (as it would make farmers more self-sufficient and reduce their reliance on inputs, leading to lower sales) • Resistance of older stakeholders to change (seeing it as a personal failure after investing their careers in the current system) • Ageing farmers need help, but finding support is difficult • Scepticism from researchers about carbon credits (partly due to the prevalence of scams in the scheme)	• Interest from farmers for DynAE topic • Interest and enthusiasm from the market and general public for DynAE topic • Crisis situations (climate change, biodiversity, economy of farmers…) support raising awareness about the need for change • Convert some opponents into allies by engaging them in open discussions, understanding their perspectives, and fostering friendly relationships • The label of a living lab facilitates communication with a broader audience (relatable term + allows them to emphasise their focus on regenerative farming rather than just carbon credits, which are merely a means to an end)

Built environment / infrastructure	• Sweden's large size poses challenges for visits due to long distances between farmers • Lack of infrastructure ("dirty room") for laying collected soil	
Natural environment	• Uncertainty of climate reinforce uncertainty of success for farmers	
Knowledge and information	• Lack of resources to analyse all the data produced on the farms • Lack of acknowledgement from research community for the need of a major shift in farming, opting instead for "sustainable intensification" • Lack of adequate support to farmers from advisors (notably due to advisor's fear providing advice that may lead to failure, often opting for the safest options or the lack of time of advisors from large firms for research and inspiration due to billing for their hours) • Lack of general knowledge from the public on agriculture • Lack of knowledge on regenerative agriculture in Sweden (the ones knowing the most are the farmers or DynAE actors) (also makes it difficult for hiring advisors) • Lack of standard, reliable data on regenerative farming in Sweden • Lack of learning of sustainable practices in the current knowledge streams all over the food system (at least as an economic scheme)	• Collaboration with researchers to analyse data produced within the initiative • DynAE acting as a "knowledge network", offering farmers various options for inspiration without dictating actions and claiming to know the answer, allowing them to make their own decisions and develop knowledge together • DynAE learning from farmers experiences (success and failures) (makes them able to give better advice) • Private advisors (one person firm instead of advisory firms) have more time to read, study and get inspiration • Abundance of data indicating a negative trajectory supports the argument for the need for change • Collaborating with different types of stakeholders and across borders helps fill the knowledge gap • Farmers spread across the country enable the DynAE to learn from diverse regions • Education courses given by the DynAE to share knowledge on regenerative farming (to advisors, farmers, general public…) • Knowledge exchange among farmers
Policy and governance	• Carbon credit system is uncertain • The Swedish Board of Agriculture prefers minimal work, resulting in slow progress and a lack of innovation • The right-wing government in Sweden favours business as usual and sustainable intensification • Lack of knowledge on agriculture from the Minister in charge of agriculture in Sweden	• Participation in projects as a way to have a political impact

	● The main farmer association in Sweden protects the meat industry and conventional practices, showing little support for the DynAE project, despite its potential impact ● Intense lobbyism from major companies involved in carbon credits promotes selling credits through input reduction ● The CAP is a major restrictor (directing subsidies toward unsustainable farming practices, outcompeting potentially more profitable alternatives, and promoting large-scale farming and monoculture)	
Organisation and activities	● Challenges in the measurement and validation of the on-farm impact ● The nationwide dispersion of DynAE members makes it challenging to keep everyone fully informed without over-reliance on lengthy online meetings ● Innovation projects, unlike research projects, require a fast pace, multitasking, quick decision-making, and the ability to adapt constantly to change ● Co-financing requirements for funding (as a company) limit ability to pursue research and collaboration opportunities ● Soil sampling is a time consuming, logistically challenging and exhausting activity	● Close collaboration and great involvement of farmers from the start ● As a not-for-profit organisation, DynAE offers a more objective perspective, making them relevant for media interviews, especially as the first initiative on this topic ● Collaboration with other organisations having similar objectives ● The transformation package offers greater flexibility for agreements between farmers and companies compared to carbon credits ● Farmers receive compensation for their longer contributions to DynAE activities to prevent stakeholder fatigue ● Inclusivity through guiding principles, rather than directives, accommodates the diverse farming systems, knowledge, and preferences of individuals

Factors of success and failure of the Slovenian DynAE – Slovenian case study in SPRINT project (cluster 2)

Table 14: Factors of success and failure for Slovenian case study in SPRINT project (Slovenia), according to the different dimensions.

	Factors of failure	Factors of success
Economy and markets	● Food is too cheap and no longer valuable, so people consider organic food as too expansive ● Large share of household budget no longer allocated to food ● Developed product trade and difficulty in seeing a return to the past ● Farmers are "price takers" that can't negotiate the conditions of their contracts ● Input price fluctuations ● Be organised in cooperatives with other farmers to easier access subsidies, storage facilities, etc. ● Need to change the role of the cooperatives that have business plan mainly on input sales ● Reduced yields in organic farming ● Price is more important to consumers than quality or the positive impact of a product. ● Investment needed to change the farm and its infrastructure for the new farming system ● Lack of tangible impact of money invested in calls for projects on agriculture	● Unfair competition from products imported from outside the European Union, which do not comply with the same standards in terms of pesticide use ● Reduce the amounts of inputs not needed to maximise the gain ● Develop independence of the farm to free themselves from the need to buy inputs and sell part of their production ● As an extensive farm, having same income with higher price due to organic production ● Rely on integrated livestock and crop production to be more flexible in term of part for internal use and for sales ● Organic pasture farming reduces the need and cost for medicine, veterinary and feed ● Keeping same yields for more ecological production ● Develop innovative short sale channels to maximise the gain ● Cooperate with other producers to compensate for small-scale production variations
Society and culture	● Fear of not be able to feed the planet due to yield loss in organic agriculture ● Consumer habit of cheap food all year long ● People don't really see the difference with organic food, even if it changes a lot for the agricultural system ● Lifestyles have changed and the agricultural sector is no longer attractive, for example young people which make longer study	● Open farms to foster direct exchange with consumers to learn how to use products and how they are produced ● Slovenia has a favourable context for change seeing environment and actual farming system

	● NGO and conventional farmers in opposition with lack of dialog ● Agriculture has a negative connotation in the media, which in particular diminishes young people's interest in studying this topic ● Lack of support from colleagues in innovative ecological trial ● Difficulty for women to be heard in the agricultural sector ● Part of public opinion that emphasises reducing meat consumption rather than changing production methods.	
Built environment / infrastructure	● Current varieties with higher yields are less resistant to diseases ● Lack of protection for farmland, which can be transformed into roads, railroads, shopping centres, housing estates, etc. ● No pesticide solutions that fit more for small scale farming than huge intensive farms due to need of quick action of new pests appears and higher risks ● Mainstream infrastructure not suitable for organic production (storage, processing, etc.)	● Current crop protection products are less dangerous and used in smaller quantities ● Using mechanical weeding with proper technology instead of spraying products ● Reduce soil tillage and use of proper tool for good soil quality ● Using simpler tools to reduce soil tillage and energy needed ● Organise the farm and its infrastructures to meet the criteria of calls for tender and thus obtain subsidies
Natural environment	● Difficulty to make test for production without pesticide in conventional context ● Wild animals that cause huge damage and are protected by environmentalists ● The impact of drought must be anticipated well in advance on a forage self-sufficient farm ● More hot days in summer that arms the fruit production	● Reduced soil tillage and organic manure foster biologic activity in the soil, included fungi which are positive for crop ● Higher humus content provides a better response to rainfall, especially in the event of heavy rainfall. ● Short channels to reduce carbon emission ● Use frost-resistant varieties to minimise risks
Knowledge and information	● Difficulty to make test for production without pesticide in conventional context ● Lack of knowledge and experts with practical knowledge in agricultural sector; especially for organic agriculture ● Lack of funding for agricultural school, and problem in the way it is financed (too cheap, which give a low value to this study)	● Successful trials of organic varieties and farming practices (reduction of pesticide, rotation, cover crops, etc.) ● Presence of advisors to help farmers in their development and transition ● Use more knowledge to reduce inputs, for example the push-pull method to reduce pesticide use ● Reducing pesticides by using resistant varieties, plant stimulators and organic plant protector

	● Organic agriculture need more knowledge and presence to follow the production and eventual pests ● Emergence of new pests specific to organic farming ● Divergence in practices to promote by experts, for example between organic and conservation agriculture ● Lack of research into the relevance of agricultural education to global challenges and tomorrow's farming methods ● Older advisors that are not open to organic agriculture ● Lack of willingness for farmers to collectively organise in a cooperative due to past experiences	
Policy and governance	● Presence of lobbying for long distribution channels which hinders development of short channels ● High pressure of bureaucracy on farmers work ● National ministry of agriculture that foster participatory research and recognise its benefits ● Lack of willingness to change policies for more self-sufficiency and independence due to international policies that relies on globalised markets and GDP growth ● Policy system that relies on short term effect and lack long term vision ● Seeing the results of European projects, or farmers, that are not reflected in the policies put in place ● Lack of funding for organic from actual Slovenian policies in term of allocation of CAP funds ● Lack of funding for long-term follow-up rather than short-term projects ● Lack of consideration for farmers' consultative opinions in policies enacted	● Foster holistic solution by having dialog between politics with different competences ● Feeling that dialog for pesticide reduction integrated in the CAP is well on track
Organisation and activities	● Lack of actors, as advisors or experts, that accept to take the risk to advise using less pesticides to the farmers	● Promote the development of non-formal education places ● Project that foster network of farming to exchange and learn together about innovative agricultural practices

		• Develop a connected group with different skills and for greater influence in dialogue with public authorities

Factors of success and failure of the Belgian DynAE – Granennetwerk Pajottenland (cluster 3)

Table 15: Factors of success and failure for Granennetwerk Pajottenland (Belgium), according to the different dimensions.

	Factors of failure	Factors of success
Economy and markets	• Cereal, and especially organic cereal is a competitive market with fluctuant prices which may add pressure to the network • High price of the produced beers, especially in the bar and restaurant • Direct funding to pioneers risks altering their nature, as their financial situation sometimes drive their pioneer role • High market and land price competition in Flanders • Lack of funds from research field, especially for farmers as they are often not directly paid for their work in participatory research • Fluctuant trend for craft beers makes it a volatile market partially dependent on exportation • Presence of initiative with big industries, banks chemicals producers who follow the money but don't have the soul of agroecology • Rising cost and risk for the brewery • Covid-19 health crisis that lower sales in brewery sector and demand for cereals from network • The sorting and storage facilities owned by the brewery	• Partial reliance on local distribution channels with stakeholders that understand and support the whole project • The organic producers have in general less investment and inputs • Cereal is a very small part of the beer price, which lead to small impact of cereal price variation • Having a demand from a public of enthusiasts who are sensitive to the history of 3 Fonteinen and the network • Fair income for farmers in particular through innovative contractualization for share of risks in the value chain

Society and culture	• Coordinator from outside the agricultural sector and the region • Lack of awareness of public that few Belgian beers contain Belgian cereals • In Flanders, farmers have a rather individualistic mindset • Tradition of brewing lambic beer that was nearly lost as it's not competitive to conventional beer • Sometimes division between conventional and organic producers, because they feel different • Complicated to communicate easily on the network story to broad audience	• Farmers feel a similar identity to the historic brewer of 3 Fonteinen • Interest of part of the consumers to products with local history and/or organic certification • Presence of farmers from Flanders and Wallonia in the network, even if very divided agricultural sector in Belgium
Built environment / infrastructure	• Local and small-scale production requires to have specific sorting and storage facilities	• The brewery takes over sorting, storage and quality check • Founding an emerging small scale malthouse in Belgium and an industrial malthouse with more flexibility in Germany
Natural environment	• Climate change with more extreme condition of rain and temperature • Alternative agricultural practices give more variability to yield and to the required quality for malting barley	• Use of adapted old varieties, population and organic varieties with winter and springs cereals • Local pedoclimatic conditions adapted for cereals and seen as living ally • Having stability in the environment you are producing as farmer • Cereal straw incorporated into the soil maintains or increases the carbon content • Use of adapted agricultural practices (weed management, fertilization management, etc.) to lower the agricultural risk
Knowledge and information	• Not only building a new value chain in term of economy, but also producing know-how and inspiration for other structure • Peer-to-peer learning of new farming practices for better production • Presence of bilingual researchers coming from ULB (university of Brussels) which facilitate exchange between both community and bring new knowledge to network	• Difficulty to change the position of advisor from "expert" to "facilitator" of knowledge exchange • Lack of organic farming in Flanders, especially cereals of which malting barley • ack of knowledge about agroecology in Flemish universities, especially about social, political or economic aspects

	• Having association as Boeren Forum that act as community university and knowledge sharing space	
Policy and governance	• AFSCA (Agence Fédérale pour la Sécurité de la Chaîne Alimentaire) made to avoid abuse in term of food security in industry that is now blocking small scale production (example of mycotoxins in lambic production) • Lack of assurance for the farmer that new policies will remain the same, which can be problematic for the long-term adaptation of her/his system • Neoliberalism, market deregulation and free trade agreements bring difficulties to small scale farmers, amplified by the shift to the right in parliament (European policy moves to the right that block a radical change of the European policies) • Lack of room for agroecological initiatives as Flanders focuses its agronomic policy on industry and export products • Presence of Boerenbond as dominant agricultural union with control on the entire sector and pushing for industrial model	• Importance of keeping bridges between different movements as FJA, FWA and FUGEA to maintain emancipatory capacity of smaller ones
Organization and activities	• Coordinator handle most of network tasks and contacts which reduce participation of farmers • Lack of time and initiative from farmers • Lack of independence of the network on the brewery (no official status outside of it, and there is no implication of another brewery in the network) • Brewery conversion to organic goes faster than predicted plans, which excludes some conventional farmers who are not yet in transition	• Presence of researchers in the network that bring knowledge and foster exchanges • Pre-existence of informal contacts, places or networks with alternative agricultural practices to start the network • Coordinator engage as full-time by 3 Fonteinen to coordinate the network • Presence of pioneer farmers that try new practices and accept to fail • Farmer Fields Schools approach: Organization of field visits and meetings with farmers as experts • Increased trust between network stakeholders • The project starts with coordinator' master thesis which allows the brewery to know the reality of farmers and understand their difficulties

		• Participative creation of the network, its functioning and activities, by meeting with the farmers • Some farmers convert to organic farming • Multi-actor project by gathering farmers, researchers and a brewery that bring diverse knowledge and perspective • Project with both organic and conventional farmers in the network

Factors of success and failure of the Polish DynAE – Juchowo Village Project (cluster 1)

Table 16: Factors of success and failure for Juchowo Village Project (Poland), according to the different dimensions.

	Factors of failure	Factors of success
Economy and markets	• Financial challenges faced by the DynAE due to market disruptions after COVID and Russia-Ukraine war, which led to rising costs (living, energy etc.) and a decline in consumer demand • Low consumer demand in the sparsely populated and economically disadvantaged rural region where the DynAE is located • High transportation costs and a limited products offer (season for fresh fruit and vegetables rather short in Poland) challenge access distant markets • Competition from large supermarkets (e.g., Carrefour and Lidl), which offer cheaper ecological products due to more efficient logistics • Challenges in balancing commercial viability with the financial freedom provided by the supportive partners	• Diversified sales channels, including visitors, online sales, larger companies, and processing facilities • Having a supportive partner provides financial flexibility • Growing organic product market in Poland, in contrast to declining demand in other countries • Increased visibility through selling Jushowo Farm brand via major retailers has helped reach more consumers • Poland's large domestic market offers significant growth potential • Shifting from reliance on Demeter certification to building on a distinct brand identity
Society and culture	• Consumers opting for cheaper products during crises (e.g., COVID, Ukraine-Russia war) • Loss of young people moving away from the region, with few returning • Difficulty for Polish population to collaborate • Limited communication with conventional sectors and challenges in explaining anthroposophical concepts (e.g. influence of cosmos, spiritual powers supporting…), limiting media engagement • International partners fail to engage local Polish stakeholders as equals, creating a "postcolonial" dynamic and communication gaps	• Collaboration with schools to raise student awareness and introduce them to research and science • Health- and environment-conscious consumers choosing high-quality products • Enhancing the landscape (e.g., through agroforestry) supports the region to be more attractive

Built environment / infrastructure	• Lack of infrastructure for processing agricultural products in the region since 1989 (e.g., slaughterhouses, dairies), coupled with insufficient product volume to attract buyers • Inadequate road infrastructure complicates access to the region • Underinvestment in machinery and lack of education on maintaining modern equipment, with few centres for technical support	• Some EU funding allocated to the (re-)establishment of processing infrastructure
Natural environment	• Land availability issues (public tenders, non-farmers buying land, and uncertainty for tenant farmers) • Climate change impacts agricultural activities (reduced rainfall, droughts, temperature fluctuations, stronger winds…) • Poor sandy soil with low organic matter • Water scarcity, with high costs of irrigation using diesel or electric pumps	• Adaptation to poor soil by growing suitable crops (e.g. buckwheat, adapted varieties of cereals, chickpeas, and permanent grasslands) • Use of compost and crop rotation to improve soil health
Knowledge and information	• Lack of human resources to bridge research and education and enhance on-farm research • Poor quality agricultural advisory services, focusing on funding rather than practical advice • Board members lack a deep understanding of ecological issues • Insufficient knowledge and education among employees , with a lack of a holistic approach to further develop education/vocational training within the DynAE • Researchers, being too specialised, tend to lack a holistic perspective, which hinders innovation scaling • International advisors do not attempt to speak Polish	• Enhancing collaboration between research and education by offering thesis topics to students
Policy and governance		• Poland is investing in training and capacity building for agricultural advisors due to increased awareness of advisory issues • Growing interest from national policymakers in organic farming, along with increased subsidies • Agroforestry payments, introduced in 2023, are becoming increasingly important • The EU has provided several beneficial opportunities for Poland

Organisation and activities	• Lack of motivation among some employees, who work there due to limited job opportunities, not by passion for biodynamic agriculture • Complicated governance structure with many layers and unclear decision-making • Lack of capacity to attract relevant stakeholders to the project • Over-focus on daily problems limits opportunities for fruitful cooperation. • Perception within DynAE that university researchers won't understand biodynamic farming hinders deeper collaboration • Difficulty in taking full responsibility for the project with a realistic vision • Welcoming volunteers is seen as a burden by many DynAE members rather than support • Challenges for the management to find new ways of financing in times of reduced support by sponsors	• The village of Jushowo is an ideal starting point for change, given the challenging conditions of the 1990s • Participation in agricultural fairs helps connect with clients and new stakeholders.

Factors of success and failure of the French DynAE – Transi'marsh (cluster 3)

Table 17: Factors of success and failure for Transi'marsh (France), according to the different dimensions.

	Factors of failure	Factors of success
Economy and markets	• At the start of the experiment, sold to a conventional livestock dealer who criticized the way the experiment was conducted, which prevented also to know the final destination of the livestock • Difficulty in achieving consistent production due to climatic uncertainties and the challenges of production in marshes, which hinders the development of local supply chains	• Include production from the experimental farm in real proximity commercialization channels and consider this in the experiment as such which allows to make the most of the production of meat from hardy breeds that would fall outside industrial criteria otherwise • Choice of the local breed that fits well with the extensive system economy (0.6 livestock units per hectare), with low inputs, in agroecological transition and harsh climatic conditions • Increasing number of workers and students in the experiment due to new funding, reflecting an interest in this type of initiative • Management succeeded in securing the necessary funding for the infrastructures and machinery required for the experiment
Society and culture	• Experimentation is not always well perceived by farmers who are sceptical about organic farming in the context of marshes • The multiple crop failures can be discouraging and increase farmers' scepticism	• Invite schoolchildren and students to the experimental farm to train them in agro-ecological transition • Open regularly the experimental farm to visit of farmers but also broader public and open dialog on experimental farm activities and agroecological transition • To have built an experimental farm that corresponds to the aspirations of the public which in turn gives positive feedback • Dialogue with the public facilitated by the production of outreach brochures, video materials and with production of reports by regional media • Demonstrating that production is possible under those difficult conditions in organic farming can be a real driver to encourage this mode of production

Built environment / infrastructure	• Many failed crops due to specific pedoclimatic conditions of the marsh, organic farming practices and practices to foster biodiversity • Difficulty managing weed due to organic production methods (without the use of glyphosate) • Lack of interest from agricultural contractors to travel for small, diversified production plots • Possibility of submerged banks or storms that flood marshland crops	• Inputs reduction, as pharmaceutical products or dietary supplements, by using local breed of cow adapted to marsh conditions • Use of heirloom or population varieties to better cover the soil against weeds and reduce the need for weeding • Purchase of equipment to increase autonomy in seeding, weeding, harvesting, sorting, and storage
Natural environment	• Very clayey soil that is difficult to work with, preventing mechanical weeding from around November to April, which makes working in the marsh challenging, especially in organic agriculture • Increased frequency of droughts that jeopardize the health of crops • Periods of intense rainfall limit the ability to work in the fields • Political discussions about maintaining the marsh banks, which may have consequences on agricultural land	• Control the fate of animals on the farm and after production to improve animal welfare but also relation between men and animals • Reduce the farm's greenhouse gas emissions and increase the production for human consumption by decreasing the herd size and the proportion of crops dedicated to livestock • Use of cover crops to work on soil structure in depth in a context of low tillage • Improvement of biodiversity through the establishment of flowering strips, crop rotation with high diversity, the presence of agroforestry in the experiment, minimally cultivated grass strips and all decisions on the management of the farm are taken by the prism of biodiversity • Marsh context seen as a “framework” rather than as a “blocking constraint”
Knowledge and information	• Lack of expertise in sociology and public policy within the research unit	• Gathering of experts with a different background in the INRAE team (geologists, technicians, agronomists, water managers…) to work in a transdisciplinary approach and gather multiple network • Occasional contact with agricultural advisors on tested innovations • Various collaboration with schools and universities that promote the initiative and the agroecological transition
Policy and governance	• Lack of expertise in sociology and public policy within the research unit	• Experimental farm co-designed at beginning with farmers to better reflect the region's agricultural reality and willingness to develop it further for next years • Involve scientists of the experiment in territorial projects to meet with institutional stakeholders and benefit from regional funds • Invite institutional stakeholders to the farm or participate in external events to engage in discussions with them

Organization and activities	• The reduction of inputs, the transition to organic farming, and the focus on biodiversity have caused value conflicts within the experimental farm team through its history	• Regional project attracts local media and spotlights experimental farm to the public • Presence of 2 associations and a network of farmers around the Maraîchine breed that enables its preservation and development

Factors of success and failure of the Italian DynAE – Case Study 9 in DiverIMPACTS project (cluster 3)

Table 18: Factors of success and failure for Case Study 9 in DiverIMPACTS project (Italy), according to the different dimensions.

	Factors of failure	**Factors of success**
Economy and markets	• Too rapid and hasty development by some actors in the hemp cultivation sector, for example the Canadian funded project for CBD extraction, which discouraged some hemp growers • Hemp cultivation represents only a niche in terms of production compared to the total durum wheat cultivation, making it a diversification solution that cannot be scaled out to all farms • Difficult situation for markets, particularly the organic market, which hinders farmers' innovation and exploration of new opportunities • Lack of a structured supply chain for new crops like hemp, making commercialization challenging • Lack of skilled workers to perform the often complex tasks required on a modern farm	• Presence of a family farm in the network operating a local cooperative with a mill, which has enabled the launch of their own transformation and commercial network for hemp oil and flour • Synergy with a project for the development of hemp cultivation for CBD extraction, funded by a Canadian chemical company • Novel crop that open new possibilities of value chain giving opportunity for new income for the farmer and new research topics • Opportunities offered by short supply chains to sell hemp production, even in the absence of a larger value chain • Promising organic market period that stimulates diversification
Society and culture	• Fears and concerns surrounding hemp production hinder the scaling up of hemp cultivation • Agriculture is often seen as an outdated or old-fashioned profession rather than a cutting-edge field with modern technology • Difficulty in communication aspects because hemp is seen as a substitute product for cannabis and not as a normal product for part of citizens	• Development of several associations to promote hemp cultivation despite the limited number of farms cultivating hemp • Part of the farmers are open to trying new approaches to the agricultural system, primarily those practicing organic farming and young farmers • Interest in hemp cultivation as a superfood due to its various nutritional properties

	• Part of organic and biodynamic agriculture that is based on ideology more than on sustainability results • All changes are seen as strange in the agricultural sector which hindered interest for diversification	
Built environment / infrastructure	• Lack of specialized machinery for hemp cultivation, particularly for harvesting, but also for milling • Lack of interest for hemp crop residues, whether for fibre due to economic reasons or the rest of the plant, which complicates the preparation for the next crop of compost on the field • Lack of alternatives for crop in rotation with durum wheat which leads to short rotations or even monoculture • Lack of infrastructure and connection to main roads in rural region remote from city centers	• Limited availability of hemp seeds in Italy, leading to sourcing from abroad, with potential delivery issues
Natural environment	• Increase in drought episodes that severely jeopardize crops in the region, both conventional and organic • Presence of extreme rainfall that causes flooding and damages crops as well as farms • Episodes of rising temperatures in spring that hinder proper grain filling and decrease cereal yields • Higher carbon impact due to soil tillage in organic farming, resulting from mechanical rather than chemical weeding • Erosion and desertification due to drought and concentrated rainfall events and linked to intense soil tillage practices which are common • Climate change help to be more focus on environmentally friendly practices	• Use of intercrops and legumes in the crop rotation as support for cultivation, particularly to capture atmospheric nitrogen
Knowledge and information	• A knowledge gap exists in terms of agroecological understanding, which limits the development of alternative solutions • Use of generic indicators to assess agroecology that doesn't reflect reality of a context • Positive effect of hemp cultivation on organic matter and water content of the soil	• Contacts within the DiverIMPACTS project facilitate knowledge exchange and have enabled research on the development of a value chain for hemp cultivation in Sicily by a Belgian university • Novel crop that open new research topics • Research on the new market for hemp products that investigate feasibility for farmers before doing it

	• Lack of access to reliable information for the common farmers despite the easy access to internet	• Lack of a tool for farmer to directly visualize the impact of management choices on farm sustainability, such as a dashboard or an application
Policy and governance	• Regulatory prescription regarding hemp cultivation that leads to complicate management of crop, especially production or reuse of seeds on farm • Decision of the actual government to ban once again the hemp cultivation due to supposed risk to production with THC abuse • Lack of room for farmers in the policy-making process • Perception of a lack of interest and coordination of European research in light of the significant amount of allocated funding and materials produced • Lack of incentives from the CAP and is insufficiently results-based, focusing more on methods than outcomes, like for organic farming	• Regulatory change which provides an opportunity to develop industrial hemp cultivation and open the case study to new crop rotation, stakeholders and hypothesis for research • Exemption granted by the minister to facilitate hemp seed production by the case study under the supervision of FIRAB and CREA • Some members of the case study are members or leaders in farmers unions which help to make the link with political aspects and represent the interests of farmers and hemp cultivator • Results of DiverIMPACTS open discussion and allows scientific lobbying to add the diversification theme in the strategy plan build by the group in charge of the research within Italian ministry of agriculture
Organization and activities	• Difficulty to achieve the same level of commitment from farmers as from researchers, as researchers are paid for the time spent working on the project, which is different for farmers • Difficulty to align the group's mindset regarding the co-innovation approach, as it was new for all the farmers and many of the researchers	• Presence of a Sicilian researcher to help connect with farmers and expand the network of farmers • Co-innovation activities within the DiverIMPACTS project that enable the development of the case study

Factors of success and failure of Italian DynAE – Cascina Romanengo (cluster 3)

Table 19: Factors of success and failure for Cascina Romanengo (Italy), according to the different dimensions.

	Factors of failure	**Factors of success**
Economy and markets	• Risk of being an unrealistic model of farm due to the different source of funding from other local farms which rely only on selling their farm produce • Costs and investments associated to the launch of diversified farm with agroecological practices • Direct selling of smaller quantities that needs several markets to sell divers production • The organic production market is struggling, notably due to the Ukrainian crisis • Lack of workforce in Italy that accepts to work in agricultural sector	• Funds provided by a private investor which allow to invest, design an agroecological system de novo and take risks • New crops integrated to the system which are an opportunity to reach new markets • Proximity to three major Italian cities offers potential for development, particularly in agro-tourism and catering to an urban population able to pay more for high-quality products • Link with actual sweetshop and future restaurant and hotel related to Romanengo project, which is an opportunity to directly transform and sell production of the farm but also promote the whole project
Society and culture	• Some local farmers perceive the farm as an unrealistic model within the local context. • Consumers are not willing to pay more for food, which prevents fully capitalizing on differentiated production	• Collaboration with 4 farms in the region with same vision to start trials outside the main farm of the project • Opportunity to be a pioneer in agroecological production if the system shows good results in a few years

Built environment / infrastructure	• Lack of animal compound in the system which will bring coherence to the agroecosystem • More complexity to manage a farm with diversified production • Trials of various agroecological practices sometimes lead to crop failures, the emergence of diseases, or pest infestations.	• Presence of farmer in the project with own machinery and company to do part of the agricultural work in the initiative • Possibility to collaborate with other farmer to have access to a specific machine or buy it if needed
Natural environment	• Difficulty to predict the weather as each year may be very contrasted in term of temperature and precipitation with regular extreme event • Bad soil around the farm with lack of organic matter, presence of rocks, lack of biological life and heterogeneity between the different parcels • The lack of seasonality disrupts the agroecosystem in place system, with for instance a warm winter and a following cold spring • Long and intense episodes of rainfall jeopardize the crops in place • Climate change crisis that put pressure on the system and requires mitigation approach • Droughts period with higher and longer heat waves that damage the crops	• Diversification of crop to try to adapt in a context of climate change in quest of the adapted crop to the conditions • Enhance biodiversity to face the global issues • On farm trials to find the best agroecological practices to adapt to the climate change • Buil long term relationship with the worker and farmers to gain trust and have fair exchange
Knowledge and information	• Other farmers of the region are not aware of agroecology and sceptical about this approach which make challenging to convince them that another way of doing agriculture is possible • Lack of other similar project to compare and inspire in term of structure and management of the initiative	• Provide a concrete example of a farm that operates with diversified crop rotations, the inclusion of legumes, the use of cover crops, and other agroecological practices • Presence of one experimented farmer originating locally to have contact with local stakeholders including other farmers and the knowledge of local pedoclimatic context • Collaborate with university to start trials in the field to find best adapted variety to the local conditions and objectify the effect of agroecological practices • Presence of researchers in a scientific board with national and international connexions to bring practices but also contacts with other

		farmers, researchers, buyers, public entities, etc, and which play a key role at launch of the project • Most of workers of the farm were already involved in agroecological approach and the one that didn't were very flexible to integrate this approach • Presence of agronomists inside the initiative with a wide view of agroecology and lot of knowledge • Collaboration with foreign university to have the tools and models to implement relevant agroecological crop rotation
Policy and governance	• Lack of subsidies or incentives to balance the investment needed and lost foreseen when starting agroecological production	• Good contact with public bodies, for instance the municipality but also a public office, which bring support to organize event and share communication • Use climate change as a lever to request help from Europe to solve the responsibility of agriculture to this global issue
Organization and activities	• Challenge of finding balance between the different stakeholders of the farm related to their backgrounds and experience • Difficulties to coordinate and prioritise the agricultural tasks between agronomists, manager and farmer • Difficulty in organizing the schedule for each worker on the farm, particularly due to the unpredictable nature of the weather, which impacts agricultural tasks • Further steps need to be done for full coherence regarding for instance food provided during events, recycling bins, etc.	• Organize open farm days and courses to invite other stakeholders as farmers or researchers to show results and interact • Active collaboration with 3 other local farms to collaborate and exchange machines, techniques and knowledge • Diversity of actors that run the farm from agronomic, research but also management perspective that bring different expertise • The owner's objectives are clearly identified by the workers, providing a long-term vision • Regular meeting with whole management team to discuss various aspects of the farm and the whole project

Factors of success and failure of Spanish DynAE – Agro2Circular (cluster 2)

Table 20: Factors of success and failure for Agro2Circular (Spain), according to the different dimensions.

	Factors of failure	**Factors of success**
Economy and markets	• Higher costs for upcycled material compared to conventional one, related to the costs of circular aspects and innovative processes • Circular economy funds that are dedicated to specific aspects which are not accessible for all companies, especially the smaller ones • Logistic needs to gather the waste spread at different level bring extra cost to final product • Difficulty to compete on long value chains with other international actors that have less environmental engagements. • Risk for Europe's competitiveness if no regulations include requirements that are identical for products coming from outside the EU	• Use and transform the end waste of food industry to produce the bioplastics needed for packing industry which compile with circular economy principle • Selling residues or by-products helps reduce the costs for waste management • Gaining a new source of value through the sale of residues or by-products
Society and culture	• Possible lack of acceptance from society to consume residues or what was considered as waste • Over-simplified narrative on plastic as bad product, may hinder the dialog on the right use • Lack of willingness for young generation to work in agricultural sector due to lack of attractiveness of the sector • Digital barrier to engage some people	• Willingness of society to have more sustainable products • Considering social aspect in the project, for example labour condition or gender equality • Communication and dissemination activity to promote circular economy to citizens at regional national and European level

Built environment / infrastructure	• Difficulty to recycle multilayer plastic use on field or for food packing • Technical challenge to obtain the required qualities for the developed products which adds delay to the project • Difficulty for smaller companies to have the right technological equipment for some circular economy solutions • Agricultural waste at consumer and retailers but also to some extent at producer level are to spread to be used in circular economy solutions compared to industry level • Lack of proper logistics for plastic collection which led to plastic contamination of the fields • Technical challenge due to the development of new and innovative technologies during the project • Difficulty of investing in the equipment and infrastructure necessary for research and amortizing these investments, particularly because the economic returns materialize over the long term • A waste collection process that, when used as a co-product, is more demanding in terms of sanitary standards	• Presence of plenty of technical infrastructures as research centres or spin-offs to implement research and development • Development of standards and analytical parameters to characterize extracts from residues and facilitate their marketability
Natural environment		• Development of processes that are less demanding in water and energy • treatment of wastewater and its reuse in irrigation to reduce the impact in an area often affected by water scarcity

Knowledge and information	• Part of the people see European projects and institutions as far from their reality so not very accessible • Difficulties to scale up the laboratory processes to industrial level and to scale up Life Cycle Assessment results • Lack of specific material or training for the coordination of large, multi-actor research and innovation projects with numerous partners	• Technical processes that are well known to bring solutions for circular economy regarding food waste and bioplastic • Presence of European Association of Regional Development Agencies that try to bring learning of various European projects at the regional level • Activities with local schools to promote circular economy to young public • Producing deliverables on lessons learned, guidance, training materials regarding circular economy for the public knowledge
Policy and governance	• Lack of time of regional ministry of agriculture to take active part in the project regarding other multiple tasks outside the project they have • Policy and regulation barrier to implement a circular strategy in the region of Murcia that should be in place since 2018 • Some residues are considered as waste by legal taxonomy which hindered the market development for those • Difficulty to engage policy maker at various level except at local or regional level, but then with lack of impact on those higher level • Difficulty to change legal status of wastes to become secondary raw materials	• Presence of regional agency that takes part in the project and acts as a public service • Policymaker at local level that are well involved
Organization and activities	• Challenging to replicate the model built in Murcia to Italy and Lithuania, which is planned in the project, due to differences in terms of crops, regulations, governance, etc. • Challenging to gather a multi-actor consortium with a high number of stakeholders, define their roles and develop the project • Difficulty to involve small scale companies that don't have their own research department and are more focused on short-term viability • Challenging to work with partners from different organizations, with different locations and with different native languages resulting in using English but with different level of language proficiency • Partners who lack familiarity with research practices and consequently face greater challenges in drafting scientific reports in the format required by the European Commission • Challenging to coordinate work between projects and establish links and networking opportunities between them, particularly due to a lack of time • Lack of time dedicated to communication and networking in the project's human resources foreseen	• Transdisciplinary approach mixing researchers, companies and other stakeholders that bring wide panel of expertise • Consortium member that focuses on business plan and legal protection for the technologies and products developed • Working with the commission on a digital passport for the products

Factors of success and failure of the Greek DynAE – Melitakes (cluster 4)

Table 21: Factors of success and failure for Melitkes (Greece), according to the different dimensions.

	Factors of failure	**Factors of success**
Economy and markets	• Lack of financial support for student internship program or other collaboration activities with Greek University, especially after 20 crisis and austerity • Expansive products due to hard work for high quality in low inputs context which bring needs for dialog with consumers to tell the story of the initiative and of the products • Increasing price of inputs for farmers • Difficulty for small company to survive within a capitalist system that favours larger structures	• Contact with Cretan living abroad or foreign Cretan products enthusiasts who buy the products of the initiative • Development of short channels and delivery to sell products directly to consumers • Development of e-shop and delivery for abroad • Build a network with other stakeholders to offset the small size of the cooperative in an unfavourable context • Development of agrotourism as a new source of income for the farmers
Society and culture	• Motivation behind the creation of this initiative stems primarily from the family history of one of the founding members, deeply connected to agriculture and their personal experience in rural life from a young age, with the preservation and transmission of heirloom seeds across generations • Feeling alone as a farmer and struggle to connect to other farmers or cooperatives because it's time consuming • Conflict between farmers regarding exact borders of each field, even between brothers after inheriting a field • Seeing the farm as a holistic entity that must remain healthy, encompassing animals, plants, humans, and the environment, in alignment with the One Health approach	• Contact with local media and journalists to promote the initiative as a point of interest for tourism • Act as an example for society, not by telling people how an agroecological system works, but by demonstrating it in action

Built environment / infrastructure	• Fields are highly fragmented due to the legacy of past agriculture, which was primarily focused on subsistence farming • Difficult access to land, with some polluted soil • Lack of infrastructure to contain water for the summer period, like dams • Remote location of Crete Island, which requires travel by plane or ferry to access it	
Natural environment	• Intensification of heatwaves, more severe than usual, impacting crops as well as pollinators like bees which reduces crop production but also honey production • In low inputs context, need to take care of soil, plants, pest management, etc. more carefully • Reduction of freshwater availability, from surface water as groundwater to irrigate fields	• For 14 years, school visits to explain agriculture and the agroecological production methods used in the initiative • Internship of students from Greece and abroad to exchange about agriculture or cooking • Use of robust and local varieties to be adapted to the context and reduce water demands and development of those variety in tough conditions to enhance this adaptability • Enhancing biodiversity on-field and outside of it to foster synergies between organisms in the system • Natural beauty of the island with sea, sun and beautiful places which attract tourism
Knowledge and information	• Lack of solution for reducing impacts of climate change on agricultural sector, from crops to bees	• Exchange with scientists and practitioner from abroad that give more weight to their approach for the local people • Support from advisors for on-field issues and dialog for agroecological practices
Policy and governance	• Need to recruit new member in the cooperative at the core of the initiative as it requests legally minimum 5 members • Lack of commitment from politicians to transform words into action, especially after a visit from minister: they got on the farm and promise some further exchange later, but nothing happened • Feel no room for developing agroecology even if the knowledge and experience are present in the initiative • Lack of stability in the regulation from one government to the next one which makes it difficult to shape the system for long run • Feeling unfair distribution of European subsidies due to national regulation	• Support from the local and regional organization

	• Feeling lack of consideration from Europe for urgent situation in south of Europe regarding climate change	
Organization and activities	• Challenging to find new members for the cooperative that have the same vision of agriculture than actual members • Language barriers for some members of the initiative who do not speak English, particularly in relation to international or tourism-related activities	• Initiative brings together members with diverse skills, creating a synergy that drives its success • Collaboration with local farmers with same philosophy as the initiative who bring their products to the initiative and visibility in exchange • Organization of seed festival for seed swap, but also with seminars for knowledge exchange • Cooperation and exchange with similar groups and association in Greece and abroad • Presence of partner specialized in the development of agrotourism to promote the activity of the initiative in a professional way