LIFT

Low-Input Farming and Territories – Integrating knowledge for improving ecosystem based farming

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Interactions with stakeholders on farm typology

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DELIVERABLE D1.2

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About the LIFT research project

Ecological approaches to farming practices are gaining interest across Europe. As this interest grows there is a pressing need to assess the potential contributions these practices may make, the contexts in which they function and their attractiveness to farmers as potential adopters. In particular, ecological agriculture must be assessed against the aim of promoting the improved performance and sustainability of farms, rural environment, rural societies and economies, together.

The overall goal of LIFT is to identify the potential benefits of the adoption of ecological farming in the European Union (EU) and to understand how socio-economic and policy factors impact the adoption, performance and sustainability of ecological farming at various scales, from the level of the single farm to that of a territory.

To meet this goal, LIFT will assess the determinants of adoption of ecological approaches, and evaluate the performance and overall sustainability of these approaches in comparison to more conventional agriculture across a range of farm systems and geographic scales. LIFT will also develop new private arrangements and policy instruments that could improve the adoption and subsequent performance and sustainability of the rural nexus. For this, LIFT will suggest an innovative framework for multi-scale sustainability assessment aimed at identifying critical paths toward the adoption of ecological approaches to enhance public goods and ecosystem services delivery. This will be achieved through the integration of transdisciplinary scientific knowledge and stakeholder expertise to co-develop innovative decision-support tools.

The project will inform and support EU priorities relating to agriculture and the environment in order to promote the performance and sustainability of the combined rural system. At least 30 case studies will be performed in order to reflect the enormous variety in the socio-economic and bio-physical conditions for agriculture across the EU.

Project consortium

No.	Participant organisation name	Country
1	**INRAE – Institut National de Recherche pour l'Agriculture, l'Alimentation et l'Environnement**	**FR**
2	VetAgro Sup – Institut d'enseignement supérieur et de recherche en alimentation, santé animale, sciences agronomiques et de l'environnement	FR
3	SRUC – Scotland's Rural College	UK
4	Teagasc – Agriculture and Food Development Authority	IE
5	KU Leuven – Katholieke Universiteit Leuven	BE
6	SLU – Sveriges Lantbruksuniversitet	SE
7	UNIBO – Alma Mater Studiorum – Universita di Bologna	IT
8	BOKU – Universitaet fuer Bodenkultur Wien	AT
9	UBO – Rheinische Friedrich-Wilhelms – Universitat Bonn	DE
10	JRC – Joint Research Centre – European Commission	BE
11	IAE-AR – Institute of Agricultural Economics	RO
12	MTA KRTK – Magyar Tudományos Akadémia Közgazdaság – és Regionális Tudományi Kutatóközpont	HU
13	IRWiR PAN – Instytut Rozwoju Wsi i Rolnictwa Polskiej Akademii Nauk	PL
14	DEMETER – Hellinikos Georgikos Organismos – DIMITRA	GR
15	UNIKENT – University of Kent	UK
16	IT – INRAE Transfert S.A.	FR
17	ECOZEPT Deutschland	DE

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List of acronyms and abbreviations

AEM: Agro-Environmental Measures

CAP: Common Agricultural Policy

GDP: Gross Domestic Product

GMO: Genetically Modified Organism

ha: hectares

NPK: nitrogen, phosphorus and potassium

NUTS: Nomenclature of Territorial Units for Statistics

PDO: Protected Designation of Origin

UAA: Utilised Agricultural Area

1 Summary

This deliverable D1.2 of the LIFT project forms the second phase in the establishment of the LIFT farm typology depending on ecological practices. The purpose was to gather the opinion of local stakeholders in different case studies, in order to understand the current state of existing typologies and to collect their recommendations for the development of the LIFT typology that was initiated with a literature review in LIFT Deliverable D1.1. The qualitative study in the current deliverable D1.2 was carried out using face-to-face interviews or workshops with two or three stakeholders. A diversity of stakeholders was interviewed through a qualitative questionnaire. Twenty one stakeholders from five different case study areas participated.

Four major themes were covered during the interviews: 1) typologies that stakeholders know, use and design; 2) stakeholders' opinion on the practices that should be considered to capture the degree of ecological farming; 3) stakeholders' interest in a user-friendly tool to assign a farm to a farming system through a specific typology of ecological practices; and 4) stakeholders' opinion on the LIFT typology. This study reveals key elements to integrate in the development of the LIFT typology and the LIFT typology-tool. For example, all stakeholders recognised in their area one or more farming systems proposed by the LIFT typology, but also indicated that it is difficult to use this typology as it is, given the potential overlaps between different systems. They suggested the use of summary indicators e.g. taking into account the use of fossil energy.

2 Introduction

Interactions with stakeholders on farm typology presented in this deliverable D1.2 are part of Task 1.2 in LIFT workpackage (WP) 1. WP1 aims to provide the framework for farm typologies to be used in the LIFT project and beyond, and to develop a user-friendly typology tool assigning farms to specific farming systems based on information on the degree of uptake of ecological practices. This is necessary in order to study for example the determinants of the adoption of these practices. The LIFT typology will be used in other WPs (besides WP2, in WP3, WP4 and WP5 as well) to evaluate and compare the performance and overall sustainability of farming systems across different levels of incorporation of ecological approaches. The LIFT typology will finally be materialised into a typology-tool that will assign a farm to a system depending on the level of incorporation of ecological approaches.

Task 1.2, reported here, was designed to investigate the perceptions of various local stakeholders involved at different levels (professional, institutional or political) and able to have an opinion on ecological practices. The literature review (see LIFT deliverable D1.1) provided the foundation of the framework of a typology, taking into account existing typologies and nomenclatures about the degree to which farmers adopt ecological practices. However, local stakeholders could have developed specific typologies in line with their objectives and in accordance to their own context (pedo-climatic conditions, the main agricultural productions, the political and economic conditions...). Therefore, it is important to investigate the opinion of local stakeholders. They may have an alternative (or complementary) understanding of practices (or indicators) to capture the degree of ecological practices in different production systems (i.e. crop, livestock or mixed systems), in relation to principles and nomenclatures coming from the literature review. These interactions with local stakeholders must be consistent with other interactions all along the LIFT project such as annual stakeholders' workshops, large-scale farmer survey and qualitative interviews.

The results of this study are presented in sections 4 and 5, preceded by a description of the guidelines and the questionnaire targeted to stakeholders.

3 Methodology to collect stakeholders' opinions

This study was based on semi-structured interviews of local stakeholders from different organisations in several case study areas to collect their opinions on:

- What types of typologies they know, use and design
- Features and practices included in each type according to the different agricultural productions (crop and livestock systems)
- The LIFT typology proposed in LIFT Deliverable D1.1 with 6 main farming systems: conventional, conservative, low-input, integrated, organic and agroecological agriculture
- Their need for a typology-tool which could be used by advisors, farmers, various representatives and themselves.

These four core questions served to define the stakeholders' interview and structure the questionnaire.

3.1 Composition of the panel

In order to complement results from the literature review in LIFT deliverable D1.1, stakeholders interviewed should be interested in ecological practices in farms and should have a good knowledge on main practices in local farming systems.

For this, we focused on organisations and companies in close relationship with farms, whose stakeholders may have opinions on the typology. Among types of stakeholders as defined in LIFT milestone MS27 (Zawalinska and Krupin, 2018), we proposed to interview with priority:

- **Farmers representatives**
  - Farmers
  - Unions and trades
  - Farm production groups
  - Regional or local chambers
- **Up- and downstream companies**
  - Commercial companies
  - Cooperatives
- **Governments and local administrations**
  - Organic certification services
  - Local departments or services of Ministries for Food and Agriculture
  - Regional and local councils and administrations
- **Others**
  - Technical and economic advisors from technical or economic institutes or organisations

Through this panel, the goal was to capture different experiences and perceptions of professionals about the evolution of more ecologically sound farming and production systems. Stakeholders interviewed should provide a picture of current and common contexts in different European areas.

LIFT scientific partners involved in this task were asked to carry out interviews in their case study areas: UNIBO for Emilia-Romagna in Italy, SLU for Middle and South, then North areas in Sweden, IAE-AR for Suceava in Romania and VetAgro Sup for Puy-de-Dôme in France.

Furthermore, Table 1 provides some sample requirements to select stakeholders to improve the representativeness of this survey.

Table 1: Sample requirements for selecting stakeholders in each case study area

In terms of farming types	To catch a diversity and complementarity of opinions, the number of stakeholders interviewed depends on the diversity of local farming types in a case study area and could be at least 2-3 per type of farming: crop, livestock and others.
In terms of function of interviewees	The stakeholders' roles could vary from farmer representative, technical and/or financial advisor, salesman or local administration officer.
In terms of knowledge and skills	These stakeholders must be in close connection with the case study area of each country (geographic area and topics of local agricultural production and farming systems).

For this phase, a purposeful sample could be selected by LIFT scientists per area and stakeholder type for a first contact by email and/or phone to present the project and aims of the survey. Stakeholders agreeing to be interviewed felt concerned about the subject of ecological practices and also about farm typology for ecological practices.

3.2 Data collection

3.2.1 Interview methodologies

To collect stakeholder opinions, two methodologies were proposed:

1/ A workshop with 2 or 3 stakeholders together.

2/ Individual interview of approximately 1 hour with each stakeholder, by phone or face to face.

Regardless of the selected methodology, questions are similar and opinions should be collected individually per stakeholder.

Each approach presents both pros and cons. Individual interviews mean that a deep investigation can be carried out with a specific stakeholder who might feel freer to express his/her opinion, while workshops can bring various stakeholders' opinions together, enabling them to learn from each others' opinions and add new arguments.

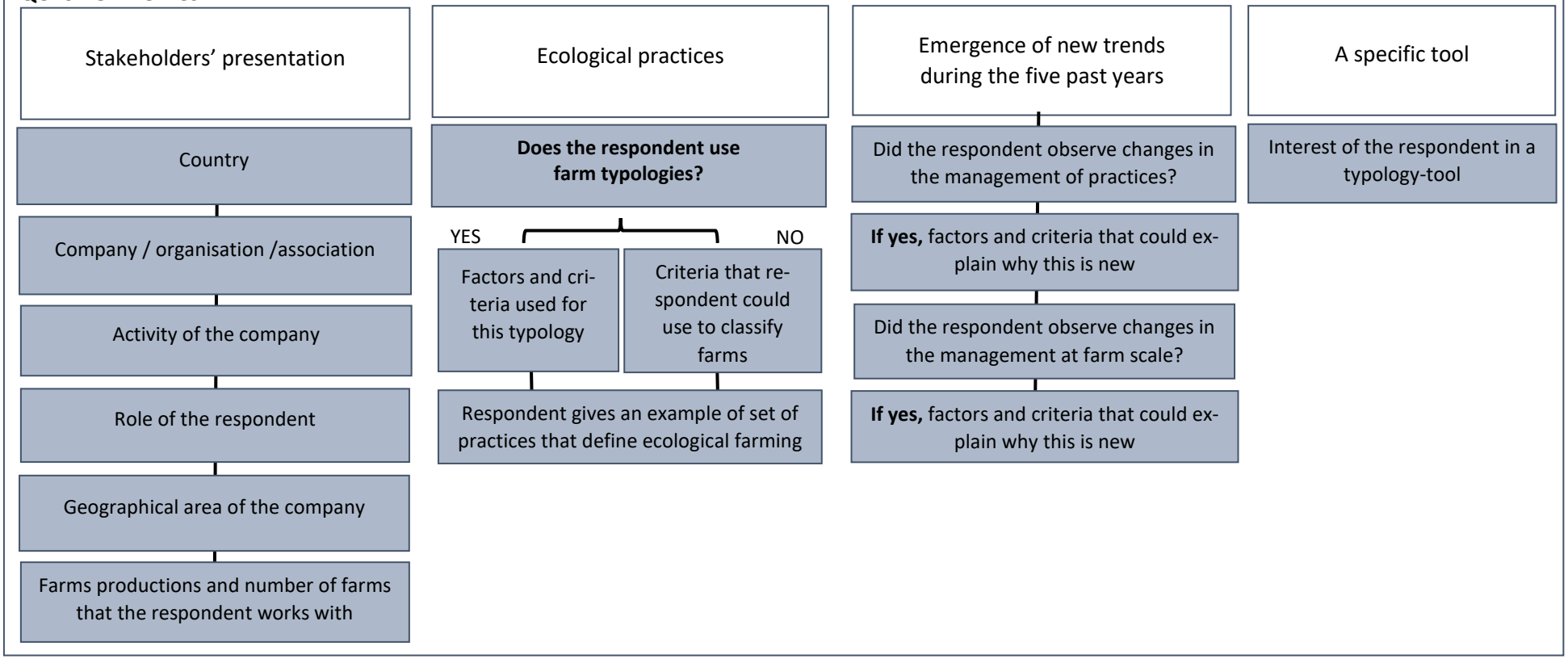
3.2.2 Questionnaire

A semi structured interview guide was elaborated in collaboration with LIFT partners involved in this task based on open questions to allow the widest expression of stakeholder's opinions (see Appendix). In particular, one question about the LIFT typology, which included the definition of different types of ecological practices, was asked at the end of the interview only, to avoid any bias in stakeholders' answers. The graph below (Figure 1) presents the organisation of the subsequent phases of the interview.

INTRODUCTION

LIFT researchers present the aim of the LIFT project and, in particular, the objective of establishing a farm typology to characterise different degrees of adoption of ecological practices in different farming systems. Ecological practices are explained in the light of the definitions provided in LIFT deliverable D1.1.

QUESTION TOPICS



OPINION ON THE LIFT TYPOLOGY

At the end of the interview, a presentation of the LIFT typology is finally carried out to collect opinions of stakeholders about the farming systems of the LIFT typology**: conservation agriculture, low-input farming system, integrated farming system, organic and biodynamic farming system, agroecology**.

Figure 1: Organisation of the questionnaire

To know the role of interviewed stakeholders in agriculture, questions were asked about their company: activity, location and action area; about their function (manager, advisor or other) and the main productions of farms that they work with.

Subsequently, open questions were asked on their use and knowledge about ecological typology and their need on this issue. They were also asked about the new trends that they observed in their area. Ecological practice was defined to stakeholders as environmentally friendly practice or low input practice.

At the end of the interview, the five main farming systems identified in the LIFT typology (D1.1), were presented to stakeholders. This presentation was summarised (Table 2) and based on definitions retained in the abstract of deliverable D1.1. Each interviewer could provide more details on these definitions if needed by stakeholders. After this presentation, stakeholders were asked if they could recognise these types in their study areas.

Table 2: Definition of LIFT farming types used in interview (extract from Rega et al., 2018)

- **Conservation agriculture**: The primary focus is on the preservation of soil quality and properties through alternative tillage strategies. A key feature is the revision or reduction of soil disturbance through tilling and crop rotation.
- **Low-input farming systems**: This terminology is used in a variety of ways in the literature, with input intensity being regarded as the amount of input (e.g. kg nitrogen or kg pesticide active matter) or the frequency of intervention per area and time unit. Low-input farming system and extensive farming system are sometimes being used to refer to the same thing.
- **Integrated farming system:** In general, integrated farming system is often used to refer to systems which fall between conventional and organic farming. Integrated farming systems are thus distinctive from conventional farming practice in that sustainability is at the core of the objectives, as is the case in organic systems. However, unlike organic farming, integrated farming systems can still utilise inorganic inputs, albeit at lower levels or used in a less systematic way than those of conventional systems.
- **Organic and biodynamic farming systems**: Within the European Union (EU), organic farming is defined as a holistic production management system which promotes and enhances agroecosystem health, including biodiversity, biological cycles, and soil biological activity. Like organic farming, biodynamic farming uses no synthetic chemical fertilisers and pesticides, and instead emphasises building up the soil with compost additions and animal and green manures, controlling pests naturally, rotating crops, and diversifying crops and livestock.
- **Agroecology:** Agroecology can be considered jointly as a science, a practice and a social movement. As a practice, it is based on sustainable use of local renewable resources, local farmers' knowledge and priorities, wise use of biodiversity to provide ecosystem services and resilience, and solutions that provide multiple benefits (environmental, economic, social) from local to global. The main aim of agroecological faming systems is to mimic as much as possible the functioning of natural ecosystems, minimising the reliance on off-farm inputs and thus closing the cycle of matter and energy flows entailed in production ensuring the long-term sustainability of the agroecosystem.

3.2.3 Data analysis

To process our data and discuss collected opinions, we conducted the analysis in two phases:

1) A short presentation of the context and specificities of each case study area in terms of pedo-climatic context and main agricultural productions and the way stakeholders' opinions were collected in each area.
2) A short presentation of stakeholders interviewed in each area according to their role in the agricultural sector, followed by a cross analysis common to all case study areas about stakeholders' opinion on the ecological typology and qualitative factors that could influence these opinions.

4 Agricultural features of case study areas and methodologies of stakeholders' interview in these areas

This step characterises the pedo-climatic context of interviews in each case study area. In the 5 case studies, a description was provided by LIFT partners on the location of the area in its national context, main features about geography, climate, soil types with main elements on population and socio-economic context. These elements introduce the main agricultural productions in each area and specificities of the farming systems (crop and/or livestock productions) according to pedo-climatic conditions.

4.1 In Emilia-Romagna (Italy)

Emilia-Romagna lies in the north-eastern part of Italy, with an area of 22,453 km² (7.4 % of Italy's total area). Lowlands prevail, covering about 47% of the region's area, while the rest of the area is occupied by hills (28%) and mountains (25%). With a bit less than 4.5 million inhabitants, Emilia-Romagna has an average density of 198.5 inhabitants / km² with higher density in lowlands (267 in average). In 2013 (Istat-6° General Agricultural Census), the region gathered 64,480 farms (that is to say 4.4 % of Italian total farms) with 16 hectares (ha) being the average utilised agricultural area (UAA) per farm. Main agricultural outputs were 45% livestock production, 41% fruit and vegetables then 14% cereals and industrial crops. The types of farming concerned by this study are field crops, and fruit and vegetables.

4.2 In Sweden

Agriculture in Sweden differs by regions. This is due to different soils and different climate zones, with many parts of the country being more suitable to forestry. It makes more economic sense to dedicate land to forestry than agriculture in the northern and mountainous parts of the country. The southern tip of Sweden is the most agriculturally productive. Sweden has quite short growing seasons in most parts of the country that limit the varieties used and the productivity of agriculture, but the south has the longest growing season. Wheat, rapeseed and other oil plants, and sugar beet are common in southern Sweden, while barley and oats are more important further north.

Thus, in this study, due to the great agricultural differences between the North on the one hand, and the South and Middle of Sweden on the other hand, the two regions were distinguished. Nonetheless,

in both regions, the main production types are: field crops, dairy, beef, pig and poultry and mixed crop-livestock.

4.3 In Suceava (Romania)

Suceava county lies in the north-eastern part of Romania (figure 2), with an area of 8,553 km² (3.6% of the country's area). The mountainous landscape prevails, covering about 60% of the county's area, while the rest of the area is occupied by plateaus and plains. Suceava county has a rich hydrographic network and a variety of soil types. There are 2 national parks and 22 natural reserves in this county. Out of 755,094 inhabitants in the county, 56% lived in rural areas in 2018. Suceava is one of the poorest counties of Romania, with a gross domestic product (GDP) of 4,918 Euro/inhabitant (the national average was 8,600 Euro/capita in 2016, INSSE, 2019).

The natural environment offers the possibility for the development of a diversified agriculture, yet this potential is not fully used. The agricultural land accounts for 41% (347,632 ha), while forest land covers 53% (453,661 ha). In terms of land use categories, the area is divided between crop area (52%) and pastures and hayfields (47%). The agricultural land is mainly farmed by small-sized farms with an average size of 2.49 ha. Suceava county is in the top ten counties with areas cultivated under organic farming system (7,555 ha, representing 2% of total agricultural area, INSSE, 2019). The crop structure follows the landform pattern: thus, in the plain and hilly areas, grains are mostly cultivated (maize and wheat), while in the high hills and mountainous area, fodder crops are mainly grown. Suceava county has long tradition and favourable conditions for raising cattle and sheep. Yields are low, both in the crop and livestock production sectors, as a consequence of the environmental conditions, aged labour force, etc.

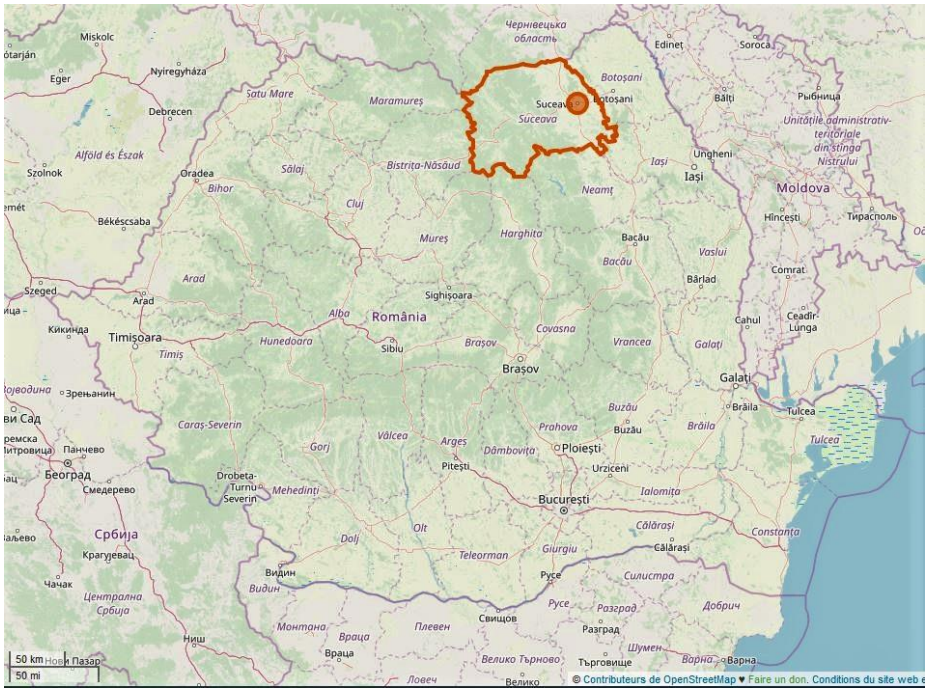


Figure 2: Suceava county in Romania
Source: map created with www.openstreetmap.org

4.4 In Puy de Dôme (France)

Puy-de-Dôme region is located in the centre of France, and covers an area of 7,970 km^2 (figure 3). The population density is around 82 inhabitants/km^2, a bit lower than 119, the national average in France (DRAAF Auvergne-Rhône-Alpes, 2019). The region is made up of volcanic highlands in the west, a sedimentary plain in the middle and highlands in the east (figure 3). The climate is semi-continental. The mountainous landscape in the West generates a Foehn effect that greatly reduces rainfall in the plain, with an average of 573 mm per year for the 2000-2018 period. The average temperature range is moderate (difference of 16.4 °C between the average temperature of the hottest and coldest month) but extreme events can occur, especially during the summer with periods of several days with temperature above 40°C. Periods of drought and heat waves are the main factors limiting crop yields in the plain. Hills, mainly between 600 and 1,000 m in altitude, are rainier, especially in the west of the region.
Forest covers 36% of the total area of the region (DRAAF Auvergne-Rhône-Alpes, 2019). The agricultural area covers 50% of the region, among which 60% of permanent grassland and 40% of arable land. Agriculture represents 2.7% of the local employment, a bit more than the national average of 2.3%. The region counts 7,377 farms, with an average size around 54 ha. Main farms are beef cattle specialised farms (24% of the regions' farms) and field crop specialised farms (24%), then dairy cattle specialised farms (17%). Other farms (35 % of the region's farms) are mixed livestock farms or mixed crop and livestock farms.

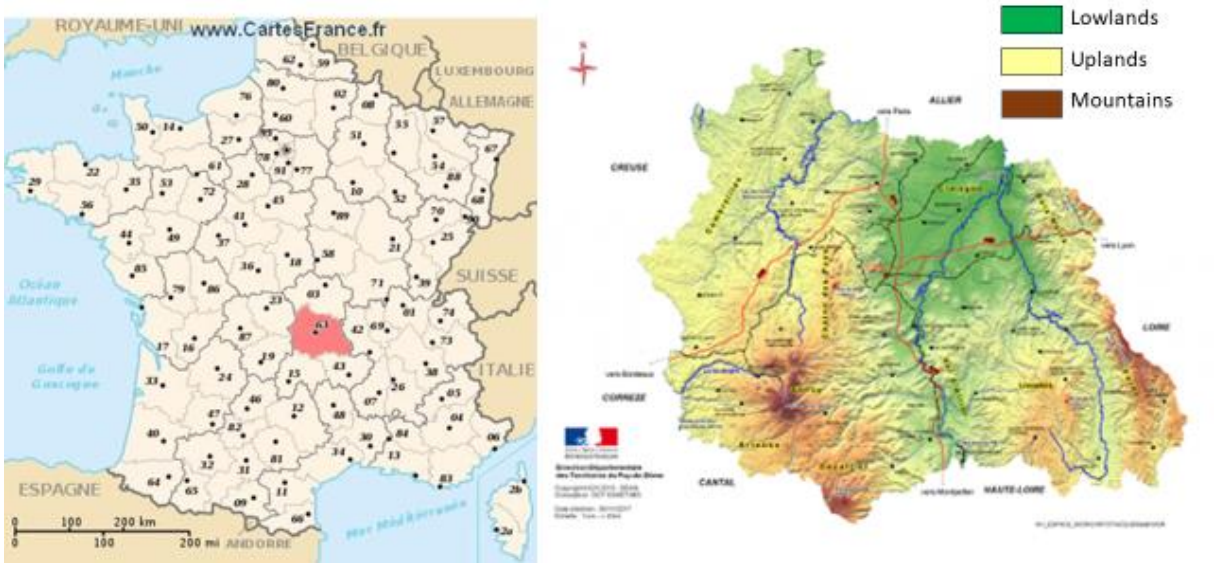


Figure 3: Location and physical map of the case study area of Puy-de-Dôme (France)
Sources: www.CartesFrance.fr and www.puy-de-dome.gouv.fr

In the middle of Puy-de-Dôme, the Limagne plain is a sedimentary plain of about 100,000 ha near the city of Clermont-Ferrand at an average altitude of 350 m. The plain was formed by the collapse of the continental crust 40 million years ago. The calcareous sediments deposited during a submergence period then evolved into different soil types depending on their location and the degree of alteration of the parent rock. Nowadays, the area is mainly cultivated by arable farms. Their size, smaller than the national average for arable farms, was partly due to the presence of high value-added crops such as

winter wheat with high protein content for bakery, corn for seed production and sugar beet. The other main crops on the plain are grain corn, sunflower and barley.

At the east and the west of the area, two mountainous landscapes (between 600 and 1,400 m of altitude) are mainly associated with the breeding of dairy or suckling cattle on grasslands around the plain. While straw transfers from arable to livestock farms are frequent, the transport of livestock manure is much rarer due to logistical constraints.

4.5 Descriptive summary of the interview processes

The way to collect stakeholders' opinions varied according to the area. In 3 countries, Italy, Sweden and Romania, stakeholders were interviewed during workshops where the number of stakeholders could vary between 2 to 5 (Table 3). In France, each stakeholder was consulted during an individual face-to-face interview. Only one methodology was carried out per case study area.

Table 3: Organisation of interviews in each case studies

Case study area	**Workshop**		**Individual interviews**
	Number of workshops	Total number of interviewed stakeholders	Number of stakeholders
Emilia-Romagna (Italy)	1	2	
North areas (Sweden)	1	2	
Plain areas in South and Middle (Sweden)	1	2	
Suceava (Romania)	2	10	
Puy-de-Dôme (France			5

5 Analysis of stakeholders' opinions

5.1 Diversity of interviewed stakeholders

A total of 21 stakeholders were interviewed in five different case study areas (Table 4).

Whatever the location, stakeholders from government and local administrations are mainly represented (11), followed by farmers' representatives (3) and up- and downstream companies (2). The 4 remaining stakeholders represented other organisations such as economic agencies or environmental associations. Interviewed stakeholders worked mainly at the level of the case study area. Except the Emilia-Romagna region in Italy, which corresponds to a European NUTS (Nomenclature of Territorial Units for Statistics) 2 region, all other case study areas in Sweden, Romania and France are NUTS 3 regions. As opinions may vary with the territorial level of stakeholder roles, table 4 shows that 13 stakeholders worked on NUTS 3 areas or smaller areas, and 8 stakeholders worked on larger regions

as NUTS 2 in Italy and in France or other specific areas such as river basins or mountainous areas in Romania and France respectively.

When stakeholders were asked about the type of farms that they worked with, all types of crop and livestock productions were covered (table 4). Some stakeholders worked on a specific production, such as a farmer representative who was a consultant for dairy farms in Romania, while other stakeholders worked for different agricultural productions, such as a salesman in a commercial company for equipment for crops and livestock production, in the same area. Representatives of administrations worked mainly for a panel of different productions in their area. Therefore, the panel of these interviewed stakeholders covered all production types studied in the LIFT project. Livestock production was more quoted (28 times) than crop production (20). Mixed crop-livestock farming was also common in the 5 case study areas studied in this task.

5.2 Typologies used by stakeholders and their integration of ecological aspects

5.2.1 Stakeholders' use of a typology

When stakeholders were asked the question: "Does your activity require the use of a typology to characterise different degrees of adoption of ecological practices in farms that you work with?", only 19 stakeholders answered the question, while the 2 answers missing came from stakeholders of up- and downstream companies (Table 5).

Of these 19 responses, 12 stakeholders answered that they used such a classification and they mainly referred to the organic certification. Out of these 12 answers, 9 cited organic production systems (organic agriculture, certified organic, organic farming) as a strong element to discriminate farm types. Interviewed stakeholders were unanimous to relate organic practices as well-known references relevant for all productions because of clear rules written in the standard specifications.

After organic certification, stakeholders quoted farmer management and types of practices. In particular, they noticed that crop and livestock mixed farming could be a good strategy to ensure more ecological practices in a farm due to complementarity between these types of production. But this association of different productions was not directly mentioned by stakeholders as an ecological practice.

Only 4 stakeholders referred to practices. In Emilia-Romagna, a manager of the rural development program quoted the integrated pest management as a way to provide subsidies to farms. In France, a manager of the development program for Protected Designation of Origin (PDO) cheese produced in mountains, grounded the farm typology on the management of farmers to preserve environmental services of grasslands. But there was a strong disparity across countries about the use of an ecological typology. Swedish stakeholders used mainly a classification (3 out of 4 stakeholders). Romanian stakeholders, more numerous and with various activities, were more differentiated (5 out of 8 stakeholders answering this question). There were no specific trends per types of stakeholders and/or territorial level of activity.

Table 4: Presentation of features of key stakeholders according to their expertise and their location

Stakeholders' type	Territorial level of activities	Main type of production in farms that they worked with										Total number of stakeholders per case study area	Total number of stakeholders per type and territorial level
		FC Field Crop	FV Fruit and Vegetables	PC Permanent Crops	D Dairy	B Beef	GS Goat and Sheep	P Pig and Poultry	MP Multi Purpose breed	M Mixed crop-livestock	AF Agro Forestry		
Farmers and farmers' representatives	NUTS 3 area or smaller		1 nS		2 R	1 nS	1 nS 1 R			2 R		**1 nS** **2 R**	3
	Larger area											**0**	
Up- and downstream companies	NUTS 3 area or smaller				1 R							**1 R**	2
	Larger area	1 R	1 R	1 R	1 R					1 R	1 R	**1 R**	
Government and local administration	NUTS 3 area or smaller	1 nS 1 sS 2 R 1 F	2R	2R	1 nS 2 sS 2 R 1 F	1 nS 1 sS 1 F	1 R	1 nS 1 sS	1 F	1 nS 1 sS 2 R 1 F		**1 nS** **2 sS** **3 R** **1 F**	7
	Larger area	1 F 2 I	2 I		1 F	1 F	1 R		1 F	2 R 1 F	1 R	**1 R** **1 F** **2 I**	4
Other	NUTS 3 area or smaller	1 R	1 R		2 R		1 R			2 R		**2 R**	2
	Larger area	2 F			1 F					1 F		**3 F**	3
TOTAL		10	7	3	14	5	5	2	2	14	2	21	

I for Italy, nS for North Sweden, sS for middle and south Sweden, R for Romania and F for France

Table 5: Use of an ecological farm typology according to the types of interviewed stakeholders

Stakeholders' type	Territorial level of activities	Number of stakeholders per area	Use of an ecological typology	If yes, type of typology
Farmers and farmers' representatives	NUTS 3 area or smaller	1 nS	YES	organic
		1 R	no	
		1 R	YES	organic
Up- and downstream companies	NUTS 3 area or smaller	1 R	no answer	
	Larger area	1 R	no answer	
Government and local administration	NUTS 3 area or smaller	1 nS	no	
		1 sS	YES	organic
		1 sS	YES	organic
		1 R	no	
		1 R	YES	organic
		1 R	YES	organic
		1 F	no	
	Larger area	1 R	no	
		1 F	no	
		1 I	YES	integrated pest management
		1 I	YES	organic and type of practices
Other	NUTS 3 area or smaller	1 R	YES	organic
		1 R	YES	organic
	Larger area	1 F	no	
		1 F	YES	management strategy of farmers for environmental services of grasslands
		1 F	YES	soil, rotation, pesticide practices
TOTAL		21	12 Yes / 7 no	

I for Italy, nS for North Sweden, sS for midlde and south Sweden, R for Romania and F for France

5.2.2 Other factors to discriminate farm types according to ecological farming

When stakeholders were asked to indicate factors that could discriminate different levels of ecological farming, they quoted various practices and indicators according to their role and to the productions of farms that they worked with. Their propositions could be organised in different points:

1- Land use

A Swedish farmer told it is important to have the best use of agricultural land and not to use for livestock production the land that could fit for human food. At the same time, a representative of administration told that, in North Sweden, grazing animals were useful as they can consume grass which is

not suitable for human consumption. Thus, this stakeholder explained the need for a regional classification of farms.

In fact, livestock breeding is useful to maintain landscape open in non-arable areas (Sweden, Romania and mountainous areas in France). Grazing is useful for preserving grassland and flora and fauna biodiversity. Livestock farming is important to bring organic materials to increase soil fertility, but in these areas, weather conditions reduce spreading period. A low livestock unit per ha and a sufficient capacity of manure storage are important to spread manure on lands without snow and slope, as explained by different stakeholders from Sweden and Romania. In France, a representative of the organisation for the development of PDO cheese production in mountains, proposed a classification based on management that preserves biodiversity in grassland such as, for example, rotational grazing and late mowing of hay to allow the renewal of all types of grass (and, on the contrary, the absence of silage harvesting).

The second factor on land use focuses on the preservation of soil quality through alternative tillage strategies (minimum tillage or conservation tillage for example). It also refers to the use of adapted equipment for seedbed preparation, for application of chemical treatments, such as equipment endowed with high performing systems that ensure the safety of treatment application (self-adjusting control according to wind direction and intensity) with minimum contamination risks. An Italian representative of administration indicated also as criteria the reduction of soil erosion in farms (for example with cover plants between two crops on sloping fields) and improvements of organic matter to maintain soil fertility.

2- Input use intensity

Several stakeholders told about pesticide use and the need to limit the use of chemical substances; maintaining crop health by preventive measures (such as selection of varieties resistant to pests and diseases). They proposed to favour organic pesticides and biological pest control. For this, a French stakeholder working in a chamber of agriculture proposed to use summary indicators such as treatment frequency index for crop production or NPK balance.

These propositions were linked to those from representatives of administration who proposed measures to prevent pollution of water by nitrate, in particular, with a better control of manure storage and spreading in Suceava.

Other stakeholders (Sweden and France) talked about a limited use of fossil energy and plastic.

3- Farm management

The association of crop and livestock productions on the same farm could be a sustainable strategy.

As explained above, a good grassland management preserves biodiversity (France) and open landscape in areas where crops cannot be produced (Sweden and Romania).

Free-range grazing contribute to reduce the complementation of livestock diet with concentrates. The introduction of legumes in the diet could improve animal wellbeing and health, as well as the use of essential oils could reduce impact of antibiotics (France).

The quality of equipment with smart systems for precision agriculture could limit environmental impact as explained in Romania by a salesman for crops or by representatives of firms and administration for livestock, and could limit the use of input as suggested by a representative of administration in Emilia-Romagna.

If Agro-Environmental Measures (AEM) exist in the area, ecological criteria could be based on farmer engagements in these measures as proposed by a French representative of administration.

4- Economic and sustainable performance

A French advisor proposed to base the typology on economic performance, with the definition of 'standard farms' as the average of 'economically efficient' farms. These standard farms could be used, for instance, to simulate the effect of a change in the Common Agricultural Policy (CAP) on practices implemented by farmers.

This idea was also expressed by a French representative of administration who explained that the agro-ecological transition needed the triple performance: economic, environmental and social performance, with a systemic approach of farming.

5- Quality products

Stakeholders were several to tell about ways to produce: low input, extensive breeding, traditional ways, no genetically modified organism (GMO) in relation to the quality of products; but they quoted difficulties to have a clear understanding of labels for specific products. In fact, there were great variations on criteria to label a Protected Designation of Origin (PDO) product. Sometimes the geographical area was sufficient for the labelling, sometimes there was a long list of criteria linked to the way to produce and transform the product and this list varied with the products. For example, there were 5 PDO cheese in Auvergne (region where lies Puy-de-Dôme) and the percentage of hay and grain in the diet of dairy cows varied for each cheese.

Diversity of contexts but similar approaches

According to the diversity of interviewed stakeholders in their location and role, they had diverse propositions to characterise different levels of ecological practices in farms (19 stakeholders out of 21). They expressed different specific criteria and practices adapted to farms that they work with. Nevertheless, there were no important differences between case study areas with similar contexts: this is the case of breeding and grassland in Sweden, Romania and for a part, in France. In particular, we observed similar suggestions from representatives of up- and downstream companies and representatives of administration in the same area, Suceava (Romania) and Puy-de-Dôme (France) for example.

But we also noticed that stakeholders proposed mainly summary and unique indicators at farm level rather than practices, and none of them could propose a combination of practices in spite of the specific question asked. Stakeholders also highlighted difficulties to have homogenous references according to each production system because of the importance of pedo-climatic conditions on intensification levels.

5.2.3 Need for a tool

The question about the need and interest in a tool to characterise farms about their ecological practices, was asked only to 12 stakeholders (60% of the sample), but they all said YES in favour of a common tool.

However, reasons could differ. The most common reason concerned the fact that the organic certification was not sufficient to cover all the diversity of ecological practices and farming systems. Some stakeholders specified that it was necessary to take into account pedo-climatic contexts to elaborate indicators, others would like to have indicators based on the use of fossil energy. The majority would like to have only one system in the typology, to characterise ecological practices, even if they recognise

that local specificities could exist, in particular for livestock production (Suceava in Romania, Puy-de-Dôme in France).

5.3 Stakeholders' opinion on the LIFT typology

Out of the 21 stakeholders interviewed, only 16 of them answered the question on their opinion on the LIFT typology, and 2 stakeholders (from Sweden) stated that the answer was obvious according to their previous discussion (Table 6).

The most known and observed systems were organic and integrated farming systems (noticed 13 and 12 times respectively) and stakeholders could easily define their features.

In particular, in Suceava, 8 stakeholders considered that the integrated farming system was the most common system due to the numerous farms associating crop and livestock production. A representative of farmers explained "this system is the most adequate practices, at their level of development, giving farmers the possibility to have low production costs, to obtain high quality products. There would also be an outlet for these products, unlike the market of ecological products, which was a niche. The integrated system had more benefits compared to the ecological system". In these systems, there was no tillage on arable land and farmers spread only manure and no chemical fertilisers. But, in this same area, another representative of farmers considered these systems as conservation agriculture while a representative of administration defined farming in arable land as "a natural farming system".

In the same way, 2 stakeholders from Puy-de-Dôme recognised that farms that they worked with could belong to the different types as defined by the LIFT typology, but they could not tell in how many. In particular, the technical advisor for crops said "this typology is difficult to use because of the overlap of the different types." 3 other stakeholders from Sweden and Romania also highlighted difficulties to classify farms according to their level of ecological practices: "organic production is not a linear process" and proposed summary indicators based on the use of chemical substances for the control of pest and diseases and on the use of energy (fuel and plastic), as mentioned above.

Low-input farming was quoted only 7 times because stakeholders had more difficulties to define it in the farming systems they know. The same happened for conservation agriculture. Only 2 representatives of administrations quoted agroecological systems.

Globally, stakeholders found this typology difficult to apply to discriminate farms according to ecological practices apart from certified organic agriculture. But even for this type, some stakeholders questioned the suitability of this category for the environment, for example with the non-inclusion of the use of fossil fuels or plastics.

Table 6: LIFT farming systems observed by stakeholders

			Farm types from the LIFT typology found in their area					
Stakeholders' type	**Territorial level of activities**	**Area of stakeholder**	**Agro ecological**	**Organic**	**Integrated farming**	**Low-input farming**	**Conservation agriculture**	**Other criteria / Stakeholders' comments**
Farmers and farmers' representatives	NUTS 3 area or smaller	nS		YES				Regulation for organic production should be stricter and must reduce dependence on fossil fuels and plastic.
		R			YES			
		R		Yes and farms in conversion	YES	YES	YES	
Government and local administration	NUTS 3 area or smaller	nS						More efficient use of energy
		sS		YES				It is difficult to conceptualise organic production as a linear process, i.e. at a scale which leads to increasingly more environmentally friendly production.
		sS		YES				
		R		YES	YES	YES	YES	Differentiation of farms according to the utilisation level of chemical substances for the control of pests and diseases.
		R		YES	YES	YES	YES	
		R		YES	YES			Natural farming system in arable land.
	Larger area	R	YES	YES	YES	YES		
		F	YES	YES	Yes	YES		But in organic systems, a farmer can use a lot of external inputs.
		I		YES	Integrated Pest Management			
Other	NUTS 3 area or smaller	R		YES	YES			It is too much for our area to try and classify farms in terms of agro-ecology, we still have work to do in this respect.
		R			YES			
	Larger area	F		YES	YES	YES	YES	But typology difficult to use (lack of details + overlap of the different types)
		F		YES	YES	YES	YES	No doubt, but I cannot indicate how.
TOTAL		**16**	**2**	**13**	**12**	**7**	**5**	

I for Italy, nS for North Sweden, sS for middle and south Sweden, R for Romania and F for France

5.4 New trends observed by stakeholders

When stakeholders were interviewed about the recent trends observed in the past five years in their area (and/or their country), most of them noted a significant increase of organic practices and the increase of organic certified farms and products, so as to meet, for a part, the growth of the national consumer demands.

They also noted a more efficient use of energy.

Another import factor in the evolution of agriculture was the development of local origin products.

Whatever the productions, they noted a decrease in the use of chemical inputs and an increase in the use of new equipment: lighter and more precise.

Improved management of manure (better storage platforms) was noted in livestock areas with better equipment in Romania.

6 Conclusion

On this panel of 21 stakeholders with different roles in the agricultural sector and coming from 5 different agricultural regions and contexts, we can observe similar opinions.

Stakeholders interviewed all recognise organic farming as an ecological approach, even if some thought that it is not enough because there was no control of external input and use of fossil energy for organic farms. There were also similar opinions on ecological practices according to the same production: crops or livestock. All stakeholders recognised that it is difficult to discriminate farms according to their degree of ecological practices because there were no threshold and no linear evolution, so they proposed summary indicators based on the use of chemical products and fossil energy. For this, they were interested in a simplified typology-tool.

7 Acknowledgements

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8 References

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9 Appendix

Questionnaire

1 Introduction

LIFT researchers present the aim of the LIFT project and in particular the aim of establishing a farm typology to characterise different degree of adoption of ecological practices in different farming systems. Ecological practice is defined to stakeholders as environmentally friendly practice or low input practice. Then the following questions are asked.

2 Stakeholder presentation

Country:

Company/organisation:

Activity of the company/organisation:
Farmers' representative/ government or local administration/ up-and downstream companies/ others:

Function of the interviewee:
Advisor/ manager/ other, indicate it:

What is the geographical area of your company/organisation?

For the interviewee only:

How do you define farms that you work with, in terms of production?

- Choose a production among these main types:
  - FC: field crops
  - FV: fruit and/or vegetables
  - PC: permanent crops, namely wine and/or orchards including olives
  - D: dairy
  - B: beef
  - MP: multipurpose breed
  - GS: goat and/or sheep
  - P: pig and/or poultry
  - M: mixed crop-livestock
  - AF: agro-forestry

How many farms do you work with?

3 Ecological practices

- Does your activity require the use of a typology to characterise different degrees of adoption of ecological practices in farms that you work with?

  <u>If yes</u>,

- What are the factors on the basis of which you classify a farm (i.e. use of inputs, soil management, methods of pest control, …)?

If no,

- Could you mention criteria (specific practices, quantity of fertiliser, use of agrochemicals, etc.) that you would use to discriminate different levels of ecological farming in farms that you work with?

- Could you suggest one or more examples where the combination of practices forms the basis for defining an ecological farming system?

4 New trends

- Did you see changes in management, in the past 5 years, that have brought innovation in the degree of ecologisation:

  - At the scale of individual practices?

  O At the farm scale?

If yes,

- Can you indicate, after describing it in the previous point (3.3.3), why is it new?

5 A specific tool

Would you be interested in a tool that could characterise farms on their degree of ecological practices according to simple indicators you could use regularly?

6 Opinion on the LIFT typology

There are a number of ways to group farming systems based on similarities in their management ethos or ecological farming practices. Our literature review has suggested the following ecological farming practices to define the LIFT typology:

- *Conservation agriculture: The primary focus is on the preservation of soil quality and properties through alternative tillage strategies. A key feature is the revision or reduction of soil disturbance through tilling and crop rotation.*

- *Low-input farming systems: This terminology is used in a variety of ways in the literature, with input intensity being regarded as the amount of input (e.g. kg nitrogen or kg pesticide active matter) or the frequency of intervention per area and time unit. Low-input farming system and extensive farming system are sometimes being used to refer to the same thing.*

- *Integrated farming system: In general, integrated farming system is often used to refer to systems which fall between conventional and organic farming. Integrated farming systems are thus distinctive from conventional farming practice in that sustainability is at the core of the objectives, as is the case in organic systems. However, unlike organic farming, integrated farming systems can still utilise inorganic inputs, albeit at lower levels or used in a less systematic way than those of conventional systems.*

- *Organic and biodynamic farming systems: Within the European Union (EU), organic farming is defined as a holistic production management system which promotes and enhances agroecosystem health, including biodiversity, biological cycles, and soil biological activity. Like organic farming, biodynamic farming uses no synthetic chemical fertilisers and pesticides, and instead emphasises building up the soil with compost additions and animal and green manures, controlling pests naturally, rotating crops, and diversifying crops and livestock.*

- *Agroecology: Agroecology can be considered jointly as a science, a practice and a social movement. As a practice, it is based on sustainable use of local renewable resources, local farmers' knowledge and priorities, wise use of biodiversity to provide ecosystem services and resilience, and solutions that provide multiple benefits (environmental, economic, social) from local to global. The main aim of agroecological faming systems is to mimic as much as possible the functioning of natural ecosystems, minimising the reliance on off-farm inputs and thus closing the cycle of matter and energy flows entailed in production ensuring the long-term sustainability of the agroecosystem.*

Could you tell us if the LIFT typology contains the farm types that you deal with in your work?

7 Last question to develop investigation in each case study

Do you know other people that would be interesting to meet on this subject?