

A comprehensive outlook on the diversity of Agroecological initiatives in Europe

From farming systems to food systems



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The analyses presented in this publication represent solely the views of their authors.



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Agroecology: a common project for Europe encompassing a diversity of initiatives

The call for agroecology in Europe

In Europe, much of the production systems are highly specialized, make massive use of chemical inputs and provide agricultural products to long food chains (food companies, retailers, supermarkets). The statement is that this current system is so locked-in and impacts so much the environment that solutions can only be found in a complete re-design of not only the farming sector, but the whole agri-food chain. It is in this context that transition of agricultural systems to agroecology (AE) has become a major challenge for sustainability of agriculture. In order to explore the feasibility and desirability of such an "agroecological project" for Europe, the *Ten Years*



For Agroecology project (TYFA), led by EFNCP and IDDRI¹ is aiming at building a scenario in which Agroecology has become the dominant agricultural model in Europe.

Agroecology is gaining in importance in the research and policy agenda. It is establishing itself as a common concept for a coalition of NGOs proposing a radical change of European agriculture. One of its main advantages is to propose a holistic change, addressing the real nature of challenges to be addressed, going beyond the current optimisation in the use of inputs while conserving the industrial dynamic of the agri-food system proposed by most private and public actors. AE encompasses environment, rural development, animal welfare and food security concerns. Indeed, its principles allow a comprehensive roadmap for a European agriculture reconciled with nature and consumers and farmers altogether. AE proposes a conceptual frame able to address issues that are addressed separately in conventional farming development.

TYFA: proposing a comprehensive analysis of the diversity of agroecological initiatives in a European outlook

Further studies and grass-root projects give flesh to this concept and demonstrate the feasibility of systemic change beyond existing lock-ins. This requires interest and commitment of the actors of farm and food systems and stands on long-term transitions.

In this report, we aim to provide inspiring examples in situated contexts in order to identify what are the key principles and resources making possible an AE project.

¹ <http://www.efncp.org/news/news20150624.php>

Because AE relies on local resources and integrated in local agroecosystems, we need to move away from any « one size fits all » approach or management recipes. Our approach is on the contrary to start from situated initiatives of AE transition and analyse them to understand the determining factors and elaborate carefully pathways for upscaling.

As a whole, our intention in this document is to contribute to this wider movement in favour of AE in combining two folds:

- Showing the diversity of initiatives taking place in different contexts and aiming at different purposes, with different outcomes at the end;
- Analysing how this diversity can contribute to the development of AE at the European scale, through a typological analysis.

A multifunctional approach: horizontal and vertical perspectives

Farming is not only a matter of producing commodities with the minimum environmental side-effects, as tends to say the dominant agricultural and agrifood actors. Farming gets its full meaning when it is multifunctional, when it is productive — which is its primary function — while at the same time rendering positive amenities on environmental and social aspects. Farming can go much beyond the basic "not harming" that is the ultimate horizon of industrial farming; it can deliver services that no other activity can deliver in terms of local identity, landscape and even meaning of life.

Analysing AE transition initiatives requires then looking at two dimensions of agro-food systems²

- The « vertical » relationships between **agricultural systems and food supply** (security, quality). The challenge here is to ensure food production and quality for people's health and life quality, today and tomorrow.
 - ⇒ Are AE systems productive enough in the European context? Can they feed enough people? What are the necessary changes in agricultural production, food production and consumer habits?
- The « horizontal » relationship between **agricultural systems and the local environment**: landscape, rural dynamism, environmental services, employment, social fabric, etc.
 - ⇒ What type and magnitude of benefits and services can be expected from AE systems? How far are AE initiatives embedded into sustainable local development?"



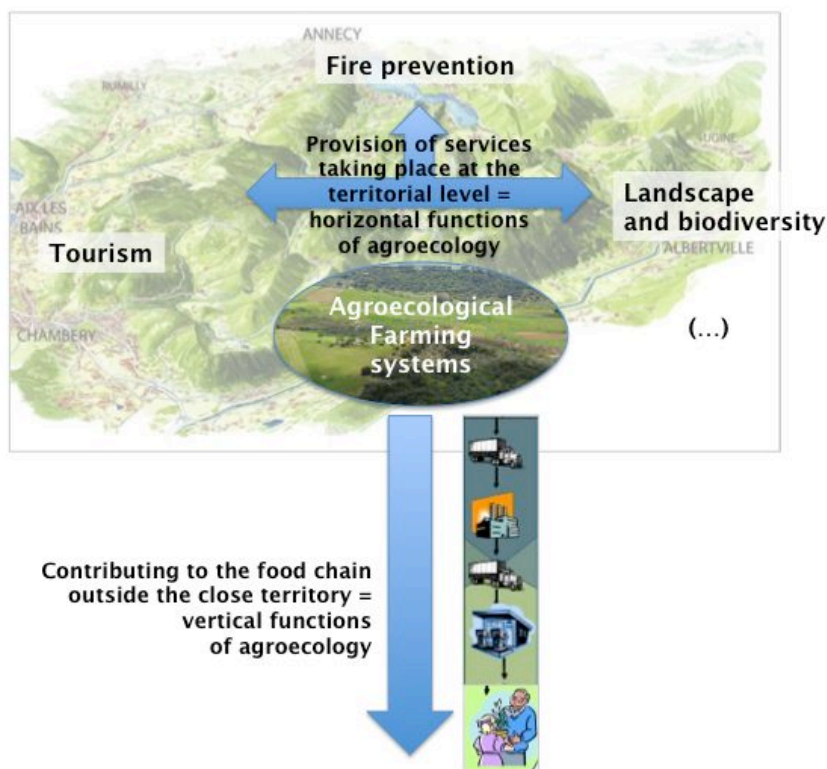
² Poux X., Lumbroso S., Aubert P.M., 2016. Contributing to the European debate on agriculture and environment: relevance and challenges of an agroecological scenario approach.

In these two dimensions, diversity of models may exist, from farming communities strongly involved in local life, producing food for local communities with direct relationships, to professional farmers with very technical approach of AE, selling their products to conventional supply chains connected with supermarkets.

This diversity deserves a careful investigation and must be crossed with the wide **diversity of European agroecosystems**, as well as the **diversity of economic, social, political, cultural contexts** that frames agricultural and food activities.

To understand and give a picture as wide as possible of existing AE initiatives in Europe, our description of AE systems leads to a first assessment of the diversity and potential performances regarding vertical and horizontal outcomes.

The challenge here is to evaluate in what sense the AE initiative is consistent with its environment and what type of services it provides to local and general population. To some points, comparing the AE initiatives would be of limited interest when it comes to compare apples with milk or small farms in Spain with large ones in the UK. On the contrary, highlighting the own strength of each initiative, their local saliency and their potential of development in other contexts could be very rich for thinking the future of agriculture and food. This does not mean that there is no point in comparing different AE initiatives on some criteria. In the same way, comparing AE initiatives with what would take place otherwise can be meaningful. **Our message here is to say that the comparison should be put at the right level. It is also to remind that there is no magic bullet for AE and that no initiative can fully address all the dimensions of multifunctionality. It is the diversity of such initiatives that makes a full contribution to horizontal and vertical challenges.**



Exploring agroecology: what is our approach?

The systematic exploration of the diversity of contexts and rationales of AE practices and alternative food chain is essential to develop a systemic vision of the potential of AE initiatives for the future of agriculture and food. When selecting our cases which all are centred on farming systems, we had in mind a series of criteria that we explicit just below, but it must be said that we did not look for a strict limit that would automatically qualify a case as agroecological — when fulfilling all the criteria — or not.

Covering a diversity of productions and farming systems

The range of productions and contexts is of major importance. At first place, they come from various geographical positions from northern humid and cold climates to southern dry and warm climates of Europe. To be consistent with consumption patterns and respect food regimes, we need to cover the **main agricultural productions**: cereals, oilseed crops, some industrial crops such as sugar beet, animal



© X. Poux

productions (dairy and meat cattle, sheep, goats, pig and poultry), vegetables, fruit trees and vine. The objective of AE is not to change drastically the food regimes, but to make it move towards healthy, tasty and diversified products, in line with the cultural differences across Europe. The European food regimes have strongly evolved since 1950s and are now criticized for health problems such as diabetes or other diseases linked to pesticides residues in food. Food from AE systems should remain

diversified and attractive to consumers and in the same time healthier.

AE farming systems have common key features for the sustainability of food systems. They are based on the **smart use of ecosystem resources**, ensuring nutrient cycling and synergies within ecological processes. Therefore, an agroecology farming system is **not based on exogenous inputs and fossil resources**, or to a very limited extent.

In this line, the selected initiatives represent more than a current “better practices” approach. They constitute concrete examples of a paradigm shift in the way of practicing agriculture and providing food to citizens.

Food chains: long and short, but always respecting AE on the farm

About food chains, direct sales and short supply chains are gaining in importance for AE as many European consumers are looking for local and fresh products and give more importance to their food habits than in the past. They are important part of the picture of agroecological food systems, with reduced share of industrial food, more local and seasonal products, more direct relationships between producers and consumers.

However, our approach also explores long supply chains, which represent the greatest part of food elaboration and commercialization, and that meet the way of living of many citizens today and in the future. Nevertheless, the core issue is that those long supply chains do not impose standards that would radically alter the horizontal functions of agroecology on the ground.

Dynamics: conserving existing AE systems also is on the agenda

When rightly insisting on the need to redesign the food system as a whole, in the way that it leads most farming systems to simply produce commodities, a superficial understanding of agroecology could give the idea that the AE project for Europe means the redesign of *all* present farming systems. This is just neglecting the fact that there are already numerous AE systems, notably in the high nature value areas, in which biodiversity richness is due to the agroecological functioning of local farming systems.

This brings in our analysis the **preservation of virtuous traditional systems**. In such traditional agriculture, practices are often based on no or very few inputs and virtuous management sustaining the production on the long run, but with low production levels compared to intensive farming. The challenge is to guaranty their economic sustainability and the possibility for farmers to have decent life standards (access to health, free time, etc.)³.



This focus on the need to preserve existing AE systems does mean that these situations cover all the range of dynamics at play. Agroecology is also a matter of **paradigm shift in intensive agriculture**. In this case, the challenge is to reintroduce sustainable practices while maintaining the production services and develop the ability of the farmer to manage more complex systems.

We explore both type of context and explain for each case the link to local challenges and saliency of AE systems development, considering three main types of dynamics for farming systems:

- **Preserving farming systems** correspond to the maintenance of traditional agroecological practices.
- **Adapting farming systems** correspond to partly modernized practices or equipment, e.g. using tractors or machinery for technical work but preserving the crop management, land use and landscape close to traditional ones.
- **Redesigning farming systems** correspond to formerly intensive systems that switched to agroecological practices by re-diversifying crop patterns, changing animal breed for more rustic ones, re-introducing grazing or crop-livestock interactions.

³ See H2020 HNV Link for a thematic project addressing the innovation needed in this purpose for High Nature Value farming systems. <http://www.hnvlink.eu/>

The following figure summarizes the range of our approach when crossing the food chain and farming systems dynamics.

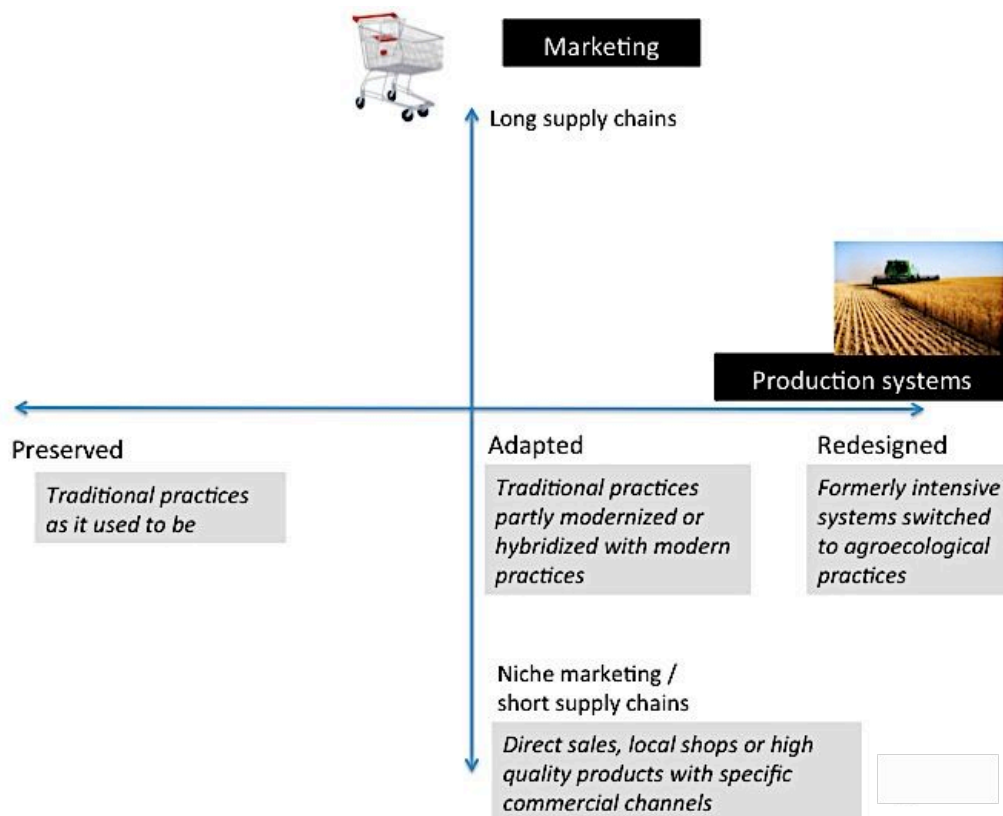


Figure 1: Diversity of explored AE initiatives concerns both production systems and marketing strategies

Considering the variety of motivation behind AE initiatives

Investigated AE initiatives can be of very different natures, resulting from individual or collective mobilization, more or less supported by non-farmers stakeholders or even led by them: researchers, local public authorities, ...

This variety of motivation for agroecology can be determinant in the performances and local relevance of AE farming systems. Understanding and analysing this diversity is part of the picture and also informs ways to initiate and support agroecological transition in farming and food systems.

It must be clear that most cases are individual initiatives or collective, frequently at a relatively small scale. Some reach a sub-regional scale (e.g. Biovallée, Chizé or the Burren), but they still don't change the agricultural development of a whole area. Although they mostly are small dots in a wider mostly dark landscape, we assume that the nature of challenges they face in the management of the farming system and the way they market products can be inspiring at a larger scale. However, it is clear that their upscaling is not a simple matter of "cut and paste". In this document, our intention is to identify the variety of initiatives as a starting point for going further.

Investigation of Agroecological initiatives: Methodology

1 – Consultation of NGOs experts and researchers on sustainable farming

14 experts were consulted to give their advice on interesting CS

2 – Innovation tracking

An open research on the Internet to catch the initiatives that are out of camera.

The selection of CS was made upon:

- (1) the interest of the AE project both in vertical and horizontal dimensions,
- (2) the complementarities of productions, production system, socioeconomic and ecological context to complete the scope of investigation,
- (3) the ability to obtain quality data.

→ 15 Case Studies (CS), among which 5 from research projects, 4 through professional networks, 3 through NGOs or institutional networks, 3 through individual websites.

3 – Understanding and gathering data about CS

Datas about AE systems and performances are gathered through research of documents, project reports, completed for some by interviews with persons involved in the CS.

Each AE initiative has been synthesized in 2 pages presenting the general context, the content of AE projects compared to typical farming systems, and the analysis of AE project functioning, performances and impacts.

Blind spots of the study

Our study does not cover the entire diversity of production systems where agroecology is already implemented and could be developed.

More specifically, much of the countries who are new entrants in EU are under investigated despite rich diversity of agroecosystems and potential for local initiatives. This is due to the difficulty to find documented studies. In countries from Eastern Europe, agroecological production systems could look like in Northern or Central Europe (Austria, Belgium, Germany, etc.) but the socioeconomic and political contexts would change considerably the farming economy, supply chains and food systems. Some principles identified in TYFA case studies could be salient for developing agroecology in Eastern Europe: strengthening farmers' networks, shortening producer-consumer relationships, diversifying and connecting different activities locally.

Similar principles could be envisioned in peri-urban areas where agroecology could be of major interest, as a remaining or promising lever for environmental regulation, social link and food production.

Other blindspots are the specific production systems organized for production of renewable energy. In order to develop biogas or biomass production, some farms could make interesting use of local resources and develop local cooperation that could support development of agroecological practices.

Methodological limits and assumptions

The impacts and performances of AE initiatives are difficult to assess objectively. First, the comparability of data and results is frequently discussable due to non-homogeneous data, qualitative assessment and very different structures of CS (individual vine farm vs. diversified territory are difficult to compare), different degree of achievement of AE transitions (some are quite young projects). For this reason, we conducted mainly an expert analysis, based on the available data (CS were selected in order to give enough information about the farms and their overall rationale).

At a wider level, the CS themselves are not supposed to be generalized as it is in a “copy – paste” rationale. Due to its specificities and the specificities of every other farming systems and contexts around it, an AE project should not be transposed but combined with others at local or regional levels because diversity is needed at many scales. Third, our analytical framework has necessarily a normative dimension and do not take into account the consistency of each CS in its local context, including social background of farming communities and individuals. For these reasons, it makes no sense to assert in a definitive way that one CS would be more interesting than another, or that one should be generalized and the other abandoned. Each shows interesting performances, strong aspects and represents knowledge resources and inspiring practices.

PAGE 1

The context presents the general description of AE projects with place, climate, landscape features, agronomic potential of the area, and the socioeconomic context describing the importance of farming activity in the territory, its social acceptability (e.g. the existence of controversies or social tension around environmental issues), the structure and strength of local markets and supply chains, the land tenure conditions.

A baseline is described, presenting the typical farming systems for the corresponding production, the professional identity of farmers of the area, the typical supply chains and consumer habits. The sustainability issues corresponding to this baseline are described to identify the main issues and how far the AE project presents solutions.

The AE project is presented in four main rubrics: initial steps (the origin and main steps structuring the current project), farming systems (the farm structure and resources), practices and performances and marketing strategies.

Explicit title

Type of CS: *Farm or territory level, redesigned vs. Traditional, to develop vs. To preserve*

ECOLOGICAL CONTEXT

Area: *The place of the project*

Climate: *The main information about local climate*

Landscape: *features of the landscape*

Agronomic potential: *soils type and local conditions, wheat yields can be good indicators*

SOCIOECONOMIC CONTEXT

- Local activity / place of farming
- Social acceptability of farming
- Local markets and supply chains
- Land tenure

BASELINE SITUATION

Typical farming system

Professional identity

Identifies the main features of these categories to describe the baseline.

Supply chain

Consumer habits

The consumer is the public who will finally consume the products

SUSTAINABILITY ISSUES

- Environmental
- Economic
- Social

Identifies the main sustainability issues associated with the baseline production and food systems.

Pictures of the landscape corresponding to the baseline and the AE project.



A Google Earth view illustrates the structure and composition of the landscape

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Agroecological project

Initial steps

Explains briefly the history of the project, where the ideas comes from, the structuration phases and determining events.

Farming systems

Presents the main features of the production systems: elements on size, UAA, working units, level and type of equipment.

Practices and performances

Presents the functioning of production systems, practices and obtained performances (yields) when available.

Marketing

Presents the strategies and practices for marketing products.

PAGE 2

The analysis of AE projects is done through the assessment of performances for six main criteria: production (yields and estimation of quality of products); inputs self-sufficiency; domestic biodiversity; landscape diversity; work management; farm autonomy and economic performance. These performances are assessed qualitatively on the basis of expert judgement of how far the AE project impacts the criteria compared to the baseline situation.

Resources explaining the performances of AE projects are analysed considering three types of resources: work, technical resources, marketing or policy resources.

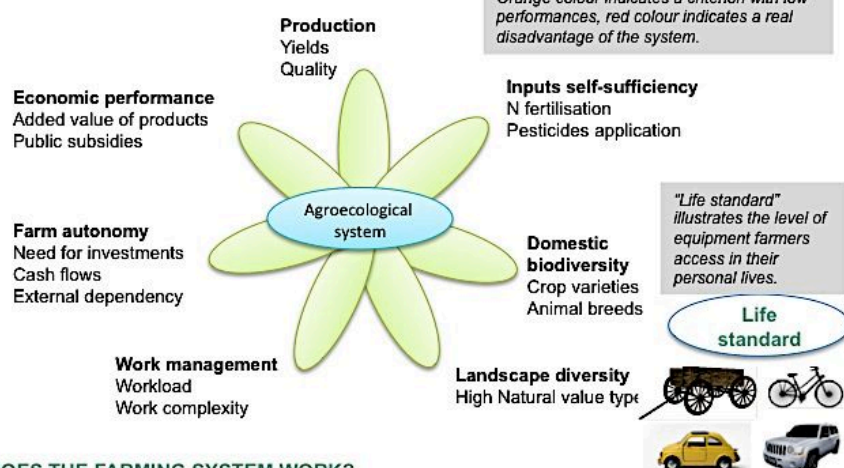
An analysis of the impacts of AE projects on horizontal and vertical dimensions of the agri-food system is also proposed.

The horizontal dimension is analysed through the impacts of AE projects on rural communities, local regulation services and biodiversity, landscape at regional level.

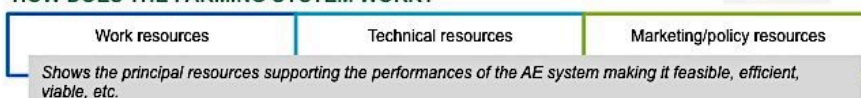
The vertical dimension is analysed through the impacts for farmers, supply chains organisation, consumers and civil society, it is estimated on the basis of the available data and understanding of the AE project.

Explicit title

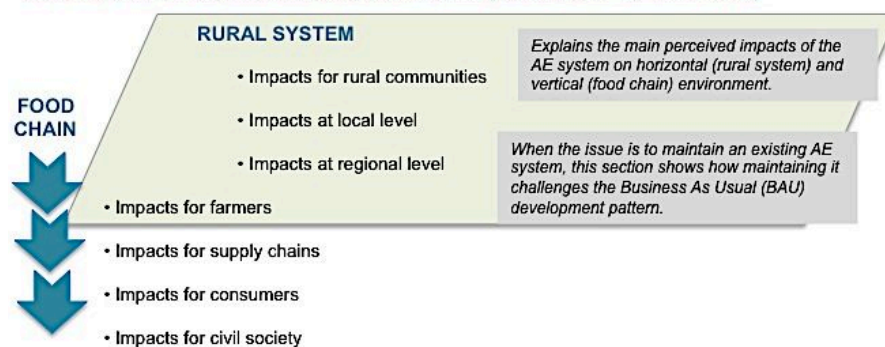
PERFORMANCES OF THE AGROECOLOGICAL SYSTEM



HOW DOES THE FARMING SYSTEM WORK?



IMPACTS ON THE RURAL AND FOOD SYSTEMS (COMPARED TO THE B.A.U.)



IN BRIEF: Describe in few sentences the very nature of the initiative, critical elements of functioning and performances.

Agroecological initiatives: overview

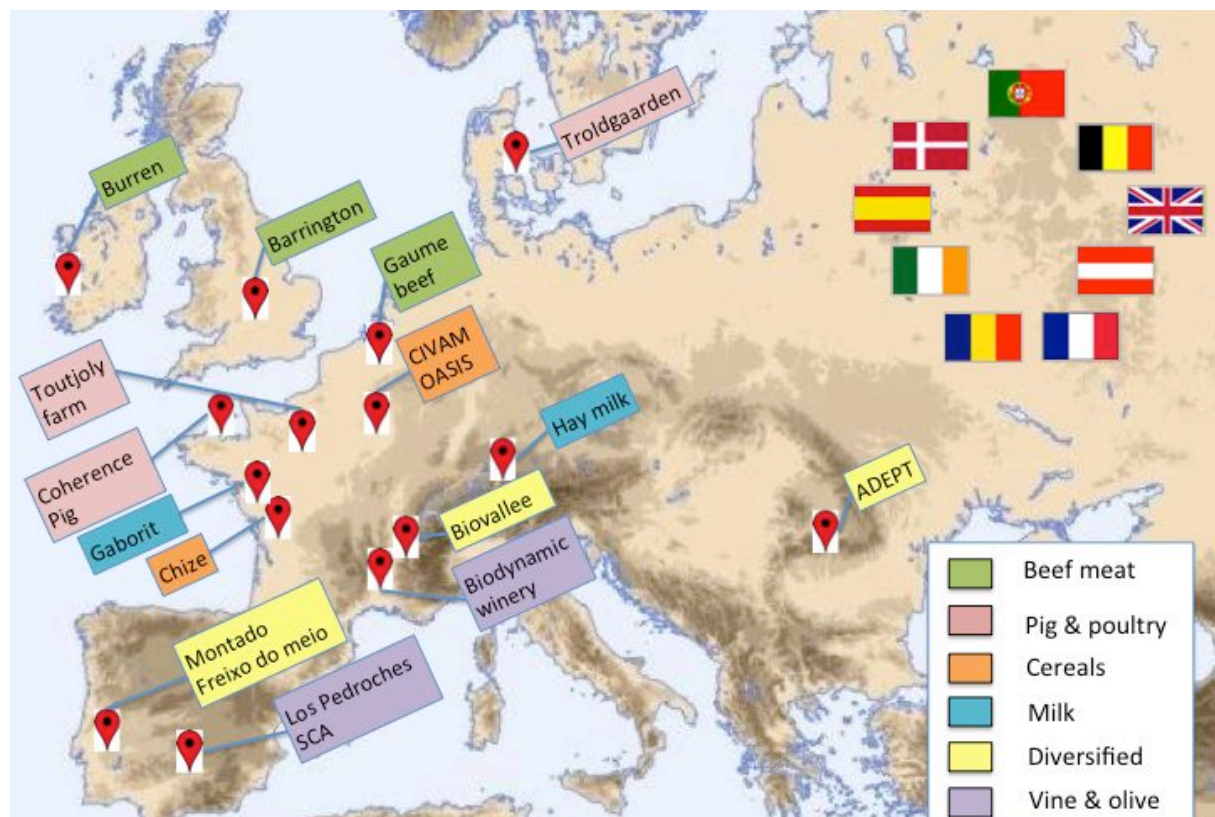


Figure 2: Distribution of investigated Case Studies in Europe and type of production represented

The diversity of CS is much focused on Western Europe, with an over-representation of France (7/15) and 8 other countries with only one CS each.

Remaining blindspots are cereal production in South context, specialized vegetable production (notably in North of Europe as South could be inspired by *diversified territory* CS) and most of the production systems in central and Eastern Europe were it was difficult to identify CS with good level of information.

The 15 CS represent quite well the diversity of possible types of AE systems, with more long supply chains than short ones (6/15), more of “redesigned” type (7) than adapted (5) and preserved (3).

Part of them are certified organic farming (9/15).

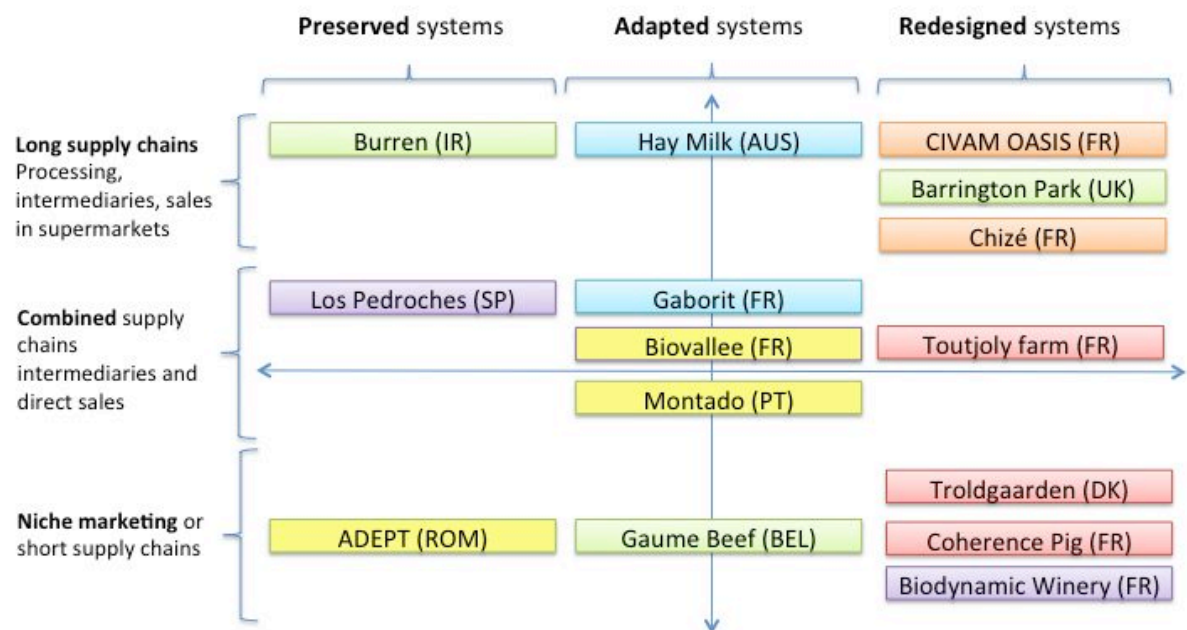


Figure 3: Typology of investigated Case Studies for production systems and marketing strategies

Burren: Extensive grazing on high biodiversity natural areas in Ireland

Type of CS: extensive large scale traditional systems to preserve

ECOLOGICAL CONTEXT

Area: Burren National Park, Ireland

Climate: Temperate, oceanic

Landscape: Karstic hills, mosaic of pastures (0 to 150 m high).

Agronomic potential: humid climate, shallow soils and scattered plots make the area unsuitable for cropping.

SOCIOECONOMIC CONTEXT

- Remote area specialised in tourism and farming. Very little population.
- Farming has now mainly a conservation role where it used to be subsistence farming.
- Supply chains and food industries are out of the National Park.
- CAP reforms encouraging competitiveness threatens the traditional practices of winter grazing and local breed.

BASELINE SITUATION

Typical farming system

30 suckler cows

Professional identity

Professional farmers, specialised in livestock keeping.
Objective: income conservation

Supply chain

Located elsewhere and supplied mainly by mainstream farms.

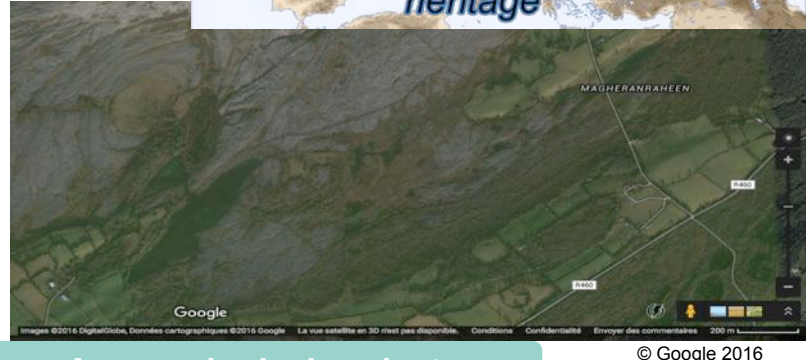
Consumer habits

Local consumption or tourism

SUSTAINABILITY ISSUES

- Environmental: Under-grazing led to degradation of priority habitats. Grazing improves soil quality and in turn water regulation.
- Economic: farmer income is threatened since competing on international markets. Importance of landscape for tourism.
- Social: conservation of traditional knowledge and landscape.

*Role of farming:
With grazing / without*



Agroecological project

Initial steps

The Burren has a long and proud history of farming. The iconic Poul nabrone dolmen, in the central Burren, is now recognised as having been built by some of Ireland's very first farmers some 5,800 years ago.

Cattle, sheep and goats would historically have been the mainstay of the Burren farmer. Today, most Burren farmers keep suckler cows.

Farming systems

30–40 cows average herd size

Young calves sold at around 9 months of age for breeding (females) or for fattening for beef (males).

Practices and performances

- To ensure good, early spring grass, summer fields should be closed off in early Autumn (Sept - Oct) and stock moved to the winterage. Stock should be moved back on to the green land in April or May.
- Livestock density between 0.2 to 0.4 LU/ha depending on the winterage "strength".
- Complements are frequent from mid-January to mid-April and some few around the year. It is composed with local products as far as possible, non GM exclusively: barley (70%, rapeseed meal 20%, molasses cane 7%, minerals 3%).
- Distribution of 2 kg/day for pregnant cows, up to 3 kg/day in last weeks of pregnancy.
- Distribution of 1 – 2 kg per animal per day during the same period for beef.
- Restoration of farm stone walls by use of local labour to facilitate livestock management

Marketing strategy

Burren Beef and Lamb Producers Group Limited was established under BurrenLIFE as a cooperative to produce quality meat from quality environment.

Extensive grazing on high biodiversity natural areas in Ireland

PERFORMANCES OF THE AGROECOLOGICAL SYSTEM

Production

Yields ?
Quality?

Economic performance

Public subsidies sustain such type of farming

Inputs self-sufficiency

No N fertilisation
No Pesticide application
Dual functioning winterage / farmyard (?)

Farm autonomy

Very low production costs, few investments.

Work management

Workload & Work complexity are moderate due to extensive management

Domestic biodiversity

Diversified pastures
Traditional animal breeds

Agroecological system

Life standard

Landscape diversity
High Natural value type 1



WHY DOES IT WORK ?

Work resources

Technical resources
Optimization of grazing and feeding strategies

Economic value adding
Due to conservation programs

IMPACTS ON THE RURAL AND FOOD SYSTEMS (COMPARED TO THE BAU DEVELOPMENT)

RURAL SYSTEM

- Impacts for rural communities: maintenance of local activity
- Impacts at local level: best grazing practices and management of Burrens
- Impacts at regional level: biodiversity and landscape preservation
- Impacts for farmers: opportunity to maintain small scale farms.

FOOD CHAIN

- Impacts for supply chains: Burren Beef and Lamb Producers Group Limited was established under BurrenLIFE as a cooperative to produce quality meat from quality environment.
- Impacts for consumers: availability of specific terroir meat.
- Impacts for civil society: preservation of patrimonial landscape and farming practices.

IN BRIEF: Facing the necessity to intensify their practices for competing on international market, the Burrens farms could be maintained thanks to biodiversity conservation programs. These policies encourage traditional practices and creation of local knowledge to meet both biodiversity conservation and dynamic farming.

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

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Farming for Conservation in the Burren - Sustainable Grazing of Burren Winterage: Burrenlife Best Practice Guide No. 3" Year: 2010 Editor: Burrenlife project No of pages: 9
<http://burrenlife.com/wp-content/uploads/2015/05/4-Best-Practice-Guide-Feeding.pdf>

Barrington: Crop-livestock complementarities for biodiversity and low inputs systems in large England farm

Type of CS: Redesigned large scale system / Farm level

ECOLOGICAL CONTEXT

Area: Costwolds, Oxfordshire, England, UK

Climate: Oceanic

Landscape: plains and moderate hills (150m a.s.l.)

Agronomic potential: shallow rendzine soils, allowing high yields with enough inputs (wheat 9 t/ha)

SOCIOECONOMIC CONTEXT

- Local activity / place of farming: important farming activity, coexisting with other activities.
- Social acceptability of farming: good, few controversies around farming.
- Local markets and supply chains: mainly oriented on long supply chain.
- Land tenure: large land owners renting to farmers. Land is very expensive.

BASELINE SITUATION

Typical farming system: disconnected crop and livestock systems. High inputs use.

Professional identity: farmers are both producers and in charge of landscape preservation.

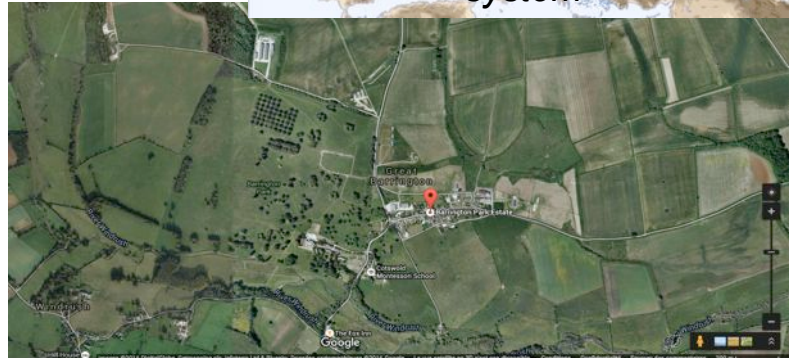
Supply chain: large retailers and long supply chains.

Consumer habits: few local markets but demand for organic products through organic supply chains is increasing.

SUSTAINABILITY ISSUES

- Environmental: water quality issues (herbicides and nitrate mainly)
- Economic: no strong issues.
- Social: development of tourism, preservation of cultural landscapes and stonewalls.

Managing large scale organic system



© Google 2016

Agroecological project

Initial steps

Organic since 1995. Due to the important inputs requirements, farmers were voluntary to convert to organic farming and contract agri-environmental schemes. Motivation stands on a mixed business opportunity and willingness to conserve heritage and landscape.

Farming system

- UAA 2000 ha, 7 workers (manager, 2 drivers, 1 Shepherd, 1 cowherd, casual workers).
- Sheep: 2000 ewes (Lleyn breed).
- Cows: 200 cows (Angus breed).
- Equipment: 350 hp tractor, 2x 200 hp, heavy tools (plough 12 heads), cover crop, harvester.

Practices and performances

- 500 ha Permanent Grasslands, 600 temporary grasslands, 300 ha wheat, 300 oat, 300 barley.

- Crop rotations: Temporary grassland x 2 / Wheat / Oat / Barley with intercropped forage turnip after wheat.
- Soil management: legume crops (clover, sainfoin, lucerne), livestock manure.
- Weed management by long crop rotation
- Pest and diseases management by crop rotation and selection of crop varieties.
- Habitats for biodiversity through hedgerows, grass and wildflower margins, reversion of some arable land to low-input grassland.

Wheat: 5 t/ha (9 t/ha conv.)

Barley: 4,5 t/ha (6 t/ha conv.)

- 500 ewes 140% prolificacy (800 lambs/year), graze exclusively outdoors throughout the year. Lambs born in May, thrived on milk and pasture, sold after 3 months at around 18 kg carcass weight.

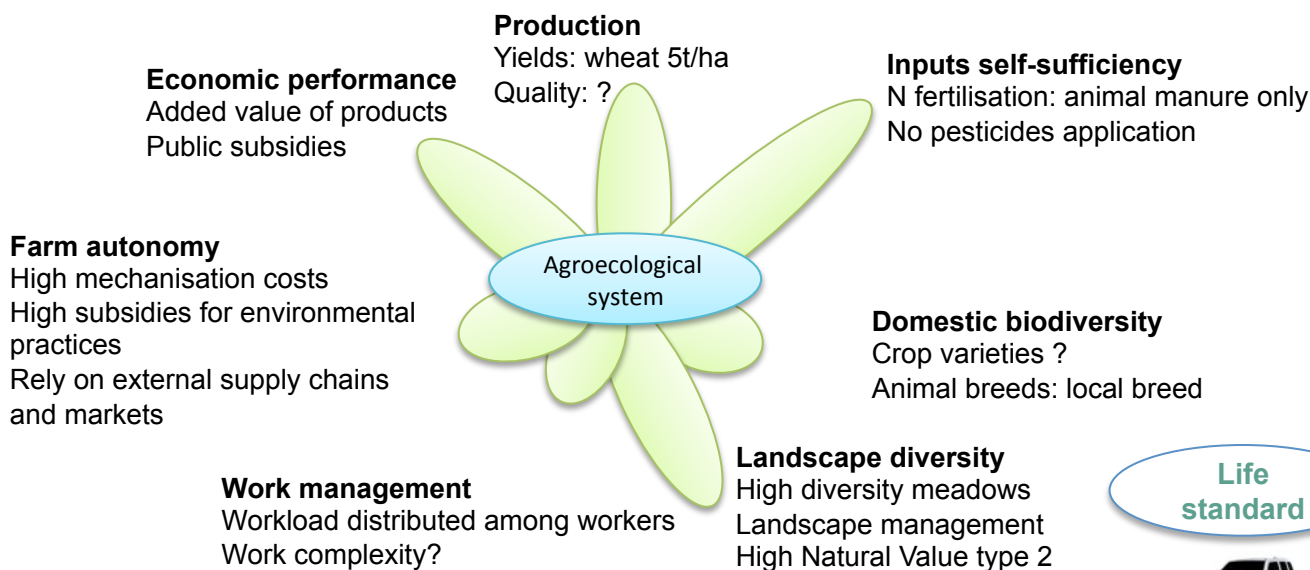
- 150-200 cows, 200 beef/year, graze from spring (April) to October, housed in winter and fed organic silage, hay and home-milled barley, beans and minerals. Beef sold after 2 years at around 300 kg CW.

- Hosting of tourists, events.

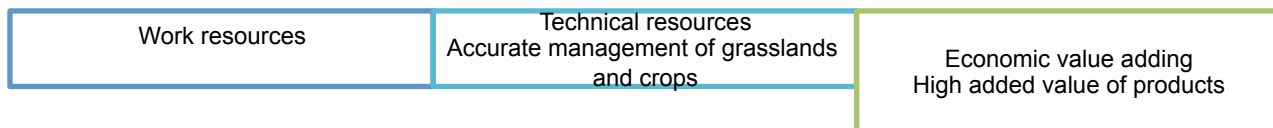


Crop-livestock complementarities for biodiversity and low inputs systems in large England farm

PERFORMANCES OF THE AGROECOLOGICAL SYSTEM



HOW DOES THE FARMING SYSTEM WORK?



IMPACTS ON THE RURAL AND FOOD SYSTEMS



IN BRIEF: *Barrington is a diversified large farm managed with several interconnected enterprises which guarantees good functioning of the ecological system and good production in organic farming. Landscape and heritage are preserved and valued through the tourism activities.*

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

Gaume Beef: New production to value Natura 2000 grasslands and maintain local activity in Belgium

Type of CS: new farming systems to preserve ecological-value areas

ECOLOGICAL CONTEXT

Area: Gaume, south Belgium.

Climate: Oceanic with continental influence

Landscape: Dry forests and grasslands on gentle slopes (200-350 m high).

Agronomic potential: diverse soils dominated by heavy clay soils and few patches of alluvial soils.

SOCIOECONOMIC CONTEXT

- Rural area under city influence, most of population work in other sectors
- Farming is part of conservation of natural value and patrimonial landscapes
- Disappearing supply chains for milk
- Low attractiveness of farming make land accessible except where urbanization occurs

BASELINE SITUATION

• Typical farming system: beef systems with high feed inputs and Blanc Bleu Belge breed

• Professional identity: farmers willing to maintain activity

• Supply chain: well structured meat long chains, supermarkets

• Consumer habits: tender and lean meat

SUSTAINABILITY ISSUES

- Environmental: maintenance of extensive grasslands
- Economic: profitability of farms, existence of supply chain at local level
- Social: collective dynamics among farmers, alternative forms of meat production



Agroecological project

Initial steps

The Gaume Grassland Beef was developed to maintain grassland management and grazing in areas where dairy farming was decreasing due to difficult natural conditions. Researchers involved in agroecology research (GIRAFgroup) looked for innovative approach for N2000 area management. Beef production was seen as a good alternative but could not be based on intensive production systems such as Bleu Blanc Belge breed. Alternative beef systems based on grass was then adapted from dairy systems

Farming systems

- Large farms (150 ha), UAA dominated by grasslands.
- Natura 2000 grasslands are primary for hay making (conservation purpose) but other grasslands can be used also in Gaume Beef to insure access of diverse farmers to the label.
- Farms contract agri-environmental schemes on grassland management.

Practices and performances

- Extensive management: grazing half of the year, hay making as late as possible to favor grassland diversity and flowering of plants.
- Winter meal: beef are fed on hay coming from late-harvested grassland, complemented with concentrates up to 10% of the total feed, and up to 30% the last months of fattening. Concentrates are either produced on farm or purchased in the area and must come from local productions (linen, potatoes, rapeseed, alfalfa, etc.).

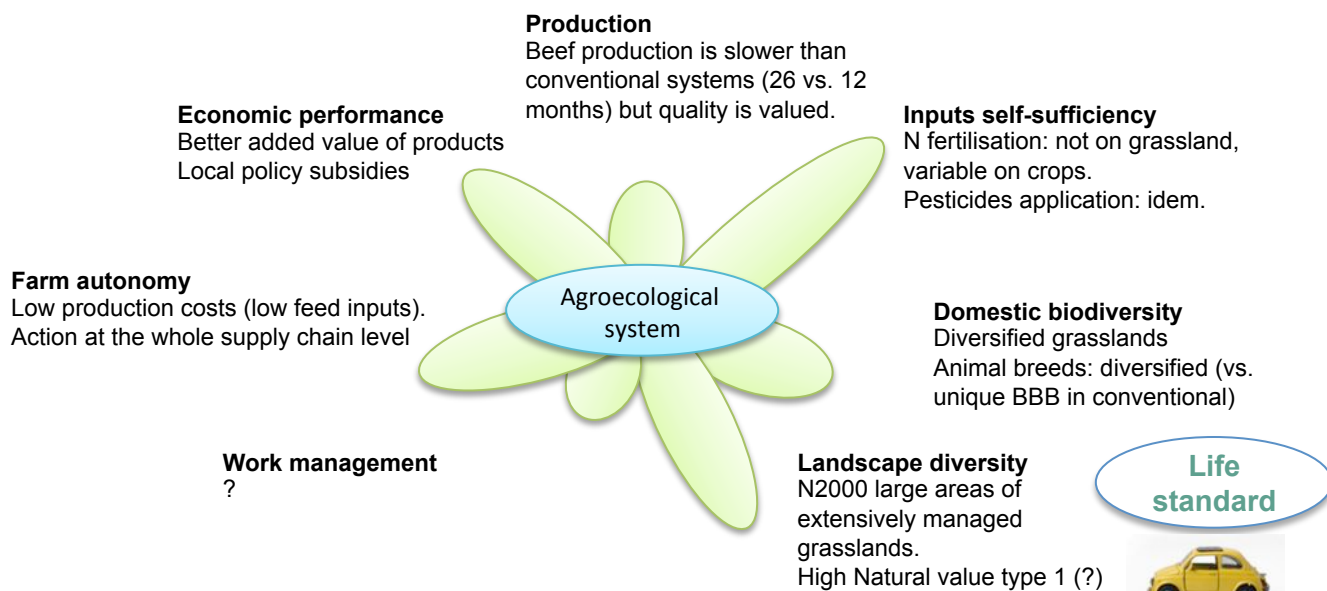
Marketing

- Local cooperatives developed the label « Bœuf des prairies gaumaises » (beef from Gaume grasslands).
- Development of local shops and partnerships for local sales.

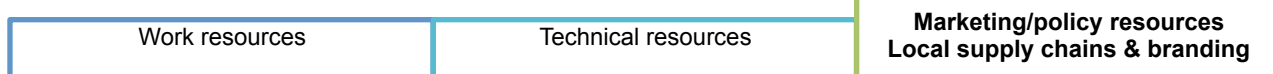


New beef production to value Natura 2000 grasslands and maintain local activity in Belgium

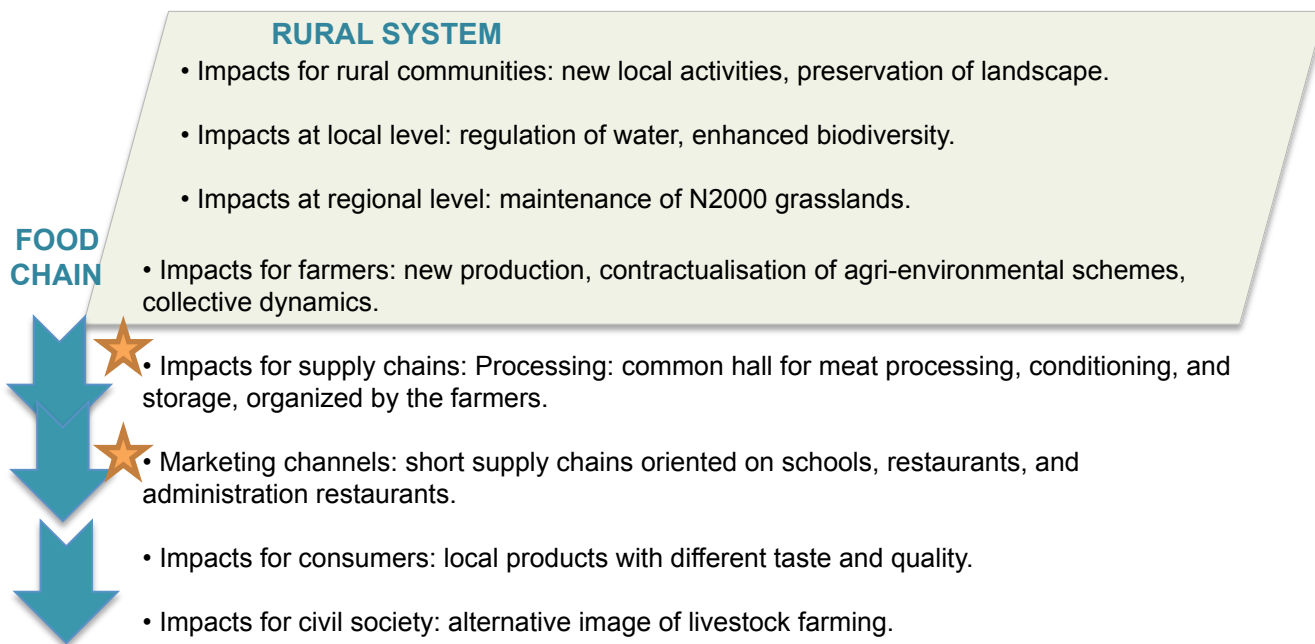
PERFORMANCES OF THE AGROECOLOGICAL SYSTEM



HOW DOES THE FARMING SYSTEM WORK?



IMPACTS ON THE RURAL AND FOOD SYSTEMS



IN BRIEF: Gaume beef started from a research project on N2000 grasslands conservation in a context of milk disappearing. The production chart is designed to product good quality meat and environmental conditions, and commercialisation channels are mainly local.

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

Organic “Hay milk” production to maintain traditional multifunctional systems in Austria

Type of CS: adapted small scale system to develop

ECOLOGICAL CONTEXT

Area: Trumer Lake District, Salzburg, Austria

Climate: Continental mountain climate

Landscape: Gentle hills (400 to 1000 m high), forest and grassland mosaic.

Agronomic potential: good fertility soils but high rainfall and cold climate make cropping inefficient.

SOCIOECONOMIC CONTEXT

Rural area under urban influence.

Farming activities are not the main economic sector but maintain attractive landscapes.

The city of Salzburg attracts many tourists and enables pluriactivity of farmers.

Family farms, owning land for centuries.

Population density: 74.7 pers./km²

“The land is the new quota”: rent prices for land increased dramatically due to pressure on farms to grow.

BASELINE SITUATION

Typical farming system

20 ha lowlands, 11 ha pastures. Parents and daughter working on farm. 8 dairy cows. Grazing, silage and concentrates.

Professional identity

Farmers having different activities, hosting tourists. Farmers community very active and important.

Supply chain

Several cooperatives and companies collecting milk for fresh or cheese making, partly exported.

Consumer habits

Interest for local and organic products. Mainly shopping in supermarkets.

SUSTAINABILITY ISSUES

- Environmental: preserving grasslands and farm activities providers of biodiversity habitats.
- Economic: farm income if no specific added value of products.
- Social: strong identification between farmer and farm. Loss of traditional practices and the end of cooperation between farmers for labour-intensive tasks.



Organics for dynamic rural communities and attractive milk systems



Agroecological project

Initial steps

The network was initiated by 13 farmers in 1996. While the strategy advocated by the mainstream focused on intensifying production to reduce unit production cost, the 13 farmers chose to focus on a specialty product: organic cheese. Their farms were already certified organic, but they faced the challenge to market their milk as organic. Indeed, the organic farmers in the north of Salzburg were dispersed, so that their milk was collected by various dairies, which then processed it together with conventional milk. A regional cheese dairy agreed to collect all their organic milk and produce organic Emmentaler cheese for a supermarket label.

Farming systems

1 farmer, his wife and son, with help of other relatives.
17 dairy cows.
Production 100,000 L (around 6000 L/cow/year)
22 ha of alpine meadows, 8.5 ha of lowland grasslands.
Livestock density is around 0.75 LU/ha.

Practices and performances

Hay making with diversified grasslands in the valley: 3 cuttings/year + grazing in spring and autumn.
Solar drying in barn to allow more flexibility in hay making.

Summer meal: grazing and some hay.
Winter meal: hay and few complements restricted to rapeseed, maize, cereals, faba beans, peas and other raw productions.
Industrial by-products, humid hay and fermented silages are banned.

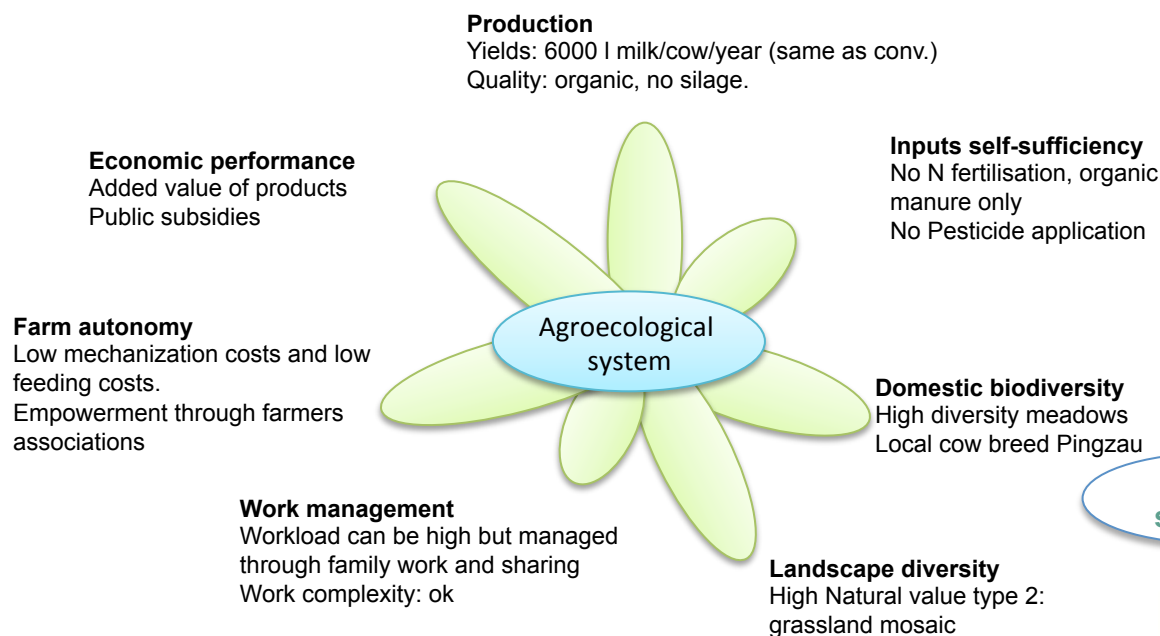
Marketing

Long supply chains (supermarkets) with specific brand for Organic Hay milk and specific promotion.

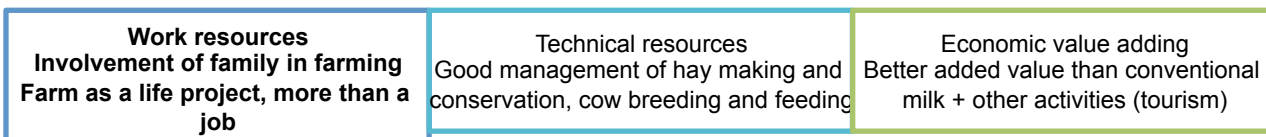


Organic “Hay milk” production to maintain traditional multifunctional systems in Austria

PERFORMANCES OF THE AGROECOLOGICAL SYSTEM



WHY DOES IT WORK ?



IMPACTS ON THE RURAL AND FOOD SYSTEMS



IN BRIEF: *Farmers involved in sustainable management of their environment and community, development of technical practices consistent with the general interest of the region (territorial understanding), to maintain amenities linked to farming.*

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

Gaborit: Farm-based supply chain for quality milk products

Type of CS: Redesigned large scale system to develop

ECOLOGICAL CONTEXT

Area: Maulevrier, Pays de Loire, France

Climate: Oceanic climate

Landscape: gentle slopes (90 to 170 m high), mosaic of crops, grasslands and wetlands.

Agronomic potential: silt-sandy clay, medium to good quality soils (wheat yield around 6 t/ha).

SOCIOECONOMIC CONTEXT

- Rural area under influence of three neighbouring cities (95 hab/km²). Agricultural activities are second job providers after services.

- Interest for organic farming and environment

- Land is scarce but accessible

BASELINE SITUATION

Typical farming system

80 ha, 2 WU, 60 cows Prim'holstein
9500 l/cow/year
1.2 LU/ha
No grazing, milking robot

Professional identity

Technology farming, high skills for production, development of cropping skills

Supply chain

Well structured, concentrated supply chains, connected with food industries

Consumer habits

Mainstream consumption, supermarket shopping

SUSTAINABILITY ISSUES

- Environmental: water quality (water catchment) with eutrophication, nitrate and phosphorus pollution. Intensive management of permanent grasslands.

- Economic: specialization of farms and supply chains reduces the possibility for diversified systems.

- Social: local dynamism, risks for farming communities, animal welfare

Conv. Vs. AE



Agroecological project

Initial steps

The project started from a farmers' couple settled in 1979 on 20 ha farm with 20 Jersey cows, certified organic from the beginning. The project stands on process of milk, initially as butter but rapidly diversified products. In 2000, instead of increasing the farm size, they developed contracts with other farms in order to develop a network to sell other products based on goat milk.

Farming systems of the leader farm

UAA 135 ha, 100 Jersey cows.

4 working units in the family, specialised on farm or processing unit.

20 employees for farm and processing.

Jersey cow is a low-productivity breed but recognized for the high quality of the milk, rustic and human-friendly.

Practices and performances

Cropping system

Temporary Grassland x 5 / Fodder beet / Faba – pea - Alfalfa / Triticale – Oat – wheat (manure spread on cereal mixes).

A solar hoven is used for drying hay.

Dairy cows

Grazing in summer on multispecies grasslands (clover, birdsfoot trefoil, fescue, ray grass, etc.).

Winter meal is grassland hay, cereals and fodder beet produced on farm..

The farm is self-sufficient for dairy cow feed.

Straw bedding produces an important amount of manure.

Milk production is 5000 l/cow/year.

Cows are kept 10 years on farm; their longevity is very high due to an adapted feeding, close care and animal welfare.

Pig production

Fattening pigs with whey obtained from the milk processing (25% of meal), cereals and legume grains from the farm, organic maize.

Marketing strategy

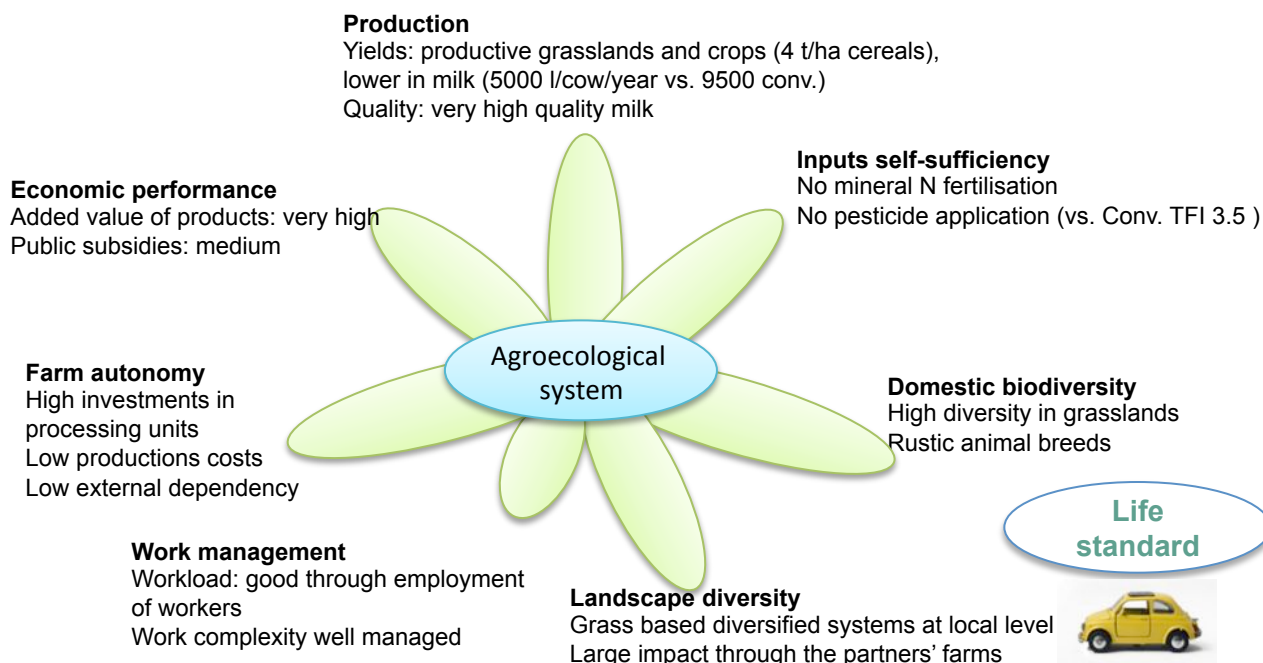
The farm is certified under "Bio Coherence" label, an "upgraded" organic label funded by associations of farmers, supply chains stakeholders and consumers.

Partnerships have been developed with 7 farms producing cow milk, 5 producing goat milk, all within 100 km and processed in Gaborit enterprise.



Farm-based supply chain for quality milk products

PERFORMANCES OF THE AGROECOLOGICAL SYSTEM



WHY DOES IT WORK ?

**Managerial skills for coordinating
employees and network**

Technical resources
Good management and knowledge
of local resources (grass)

Economic value adding
High prices of products
Added value kept on farms

IMPACTS ON THE RURAL AND FOOD SYSTEMS

RURAL SYSTEM

- Impacts for rural communities: local dynamism, maintenance of relatively small farms
- Impacts at local level: no pesticides, no N fertilization, diversified grasslands
- Impacts at regional level: opportunity to upscale organic systems

FOOD CHAIN

- ★ Impacts for farmers: use of local resources, low inputs, no pesticides.
- Impacts for supply chains: alternative supply chain specialized in organic products, but organized as supermarkets
- ★ Impacts for consumers: high quality products but very expensive.
- Impacts for civil society: good image of farming, animal welfare, open farms (schools, public)

IN BRIEF: The Bernard Gaborit farm and company is a very specific combination of self-sufficient organic farming systems relying on connections between crops and animals in a very well-balanced way and farm-based supply chain where products are processed on farm.

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

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<http://www.bernardgaborit.fr/>
<http://www.satoriz.fr/infos-produits/le-meilleur-des-produits-laitiers-entretien-bernard-gaborit/>

Troldgaarden: diversified small-scale farm valuing agroforestry and crop-livestock interactions

Type of CS: Innovative small-scale system to develop

ECOLOGICAL CONTEXT

Area: Troldgaarden, Denmark

Climate: cold-temperate

Landscape: flatlands (0 to 100m) dominated by arable crops, few groves and isolated trees.

Agronomic potential: alluvial soils, deep and fertile (wheat yields 7 t/ha).

SOCIOECONOMIC CONTEXT

- Farming is an important activity despite proximity of towns (density 133 hab./km²).

- Farming is encouraged to tackle environmental issues without social tensions

- Supply chains are well structured with international outlets

- Land price is very high except wetlands.

BASELINE SITUATION

Typical farming system:

200 ha farm producing cereals as cash crop and for feeding indoor pigs or poultry. Modern buildings, 1 or 2 employees.

Professional identity

Specialized farmers with high technical skills

Supply chain

Conventional supply chain, big companies with food industry and supermarket chains connections.

Consumer habits:

Standardized food and mass consumption

SUSTAINABILITY ISSUES

- Environmental: concentrated livestock units result in important nitrate pollution problems. Pesticide pollution is also an important issue for which many efforts have been made to change practices and develop alternative cropping systems and adapted advisory services.

- Economic: dependency to external markets and feed inputs

- Social: image of farmers to civil society is globally good apart for pig producer who are a bit more isolated.



Agroecological project

Initial steps

The smallholding, which includes pig and poultry production is part of the concept 'welfare delicacies'. It is a fairly new initiative within organic meat production in Denmark. It promotes natural and diverse livestock production on small organic farms and was initiated by the Danish Animal Protection Association together with a number of organic smallholders (currently 13 farmers).

Farming systems

- 2 ha, 1 farmer.
- Organic certification since 2010.
- Very few equipment, most of the work hand made or light equipment.

Practices and performances

- Ten sows. All the pigs are outdoors through the whole year. The sows farrow in tents with access to pasture – four sows in each tent.
- The pigs are weaned at 'natural weaning age' at around 12-17 weeks.
- They are slaughtered at around 5-6 months of age and approximately 50 kg liveweight.

- One tent is placed in an agroforestry system with fruit trees (primarily apple), bushes (700 gooseberry plants) and vegetables.

- In total there are 450 trees on approximately 1 ha, 8 m between each row of tree and 4 m between trees within the same row.

- After harvesting of the vegetables (e.g. pumpkins, squash and Jerusalem Artichokes) in autumn and early winter, pregnant or empty sows gain access to the area to forage on leftovers.

Marketing strategies

- All fruit and vegetables are also sold locally.

- The meat is sold in diversified and distinctive cuts directly to consumers and the production is based on seasonal production with farrowing in spring and mating in December-January as 'in nature'. An important idea of 'welfare delicacies' is to test and develop production systems with agroforestry elements, e.g. combined livestock and fruit- or vegetable production.

Diversified small-scale farm valuing crop-livestock interactions

PERFORMANCES OF THE AGROECOLOGICAL SYSTEM

Production

Yields are high enough for farm self-sufficiency in animal feed and selling products.

Land produces crops, fodder and fruits.

Animal production: around 35 pigs/ha (vs. around 100/ha in organic).

Economic performance

High added value of products

Farm autonomy

Very limited investments

Self sufficiency in animal feed

Work management

Workload & Work complexity are high

but estimated satisfying by the farmer.

Landscape diversity

Very locally diversified system

Inputs self-sufficiency

No N fertilisation

No Pesticides application

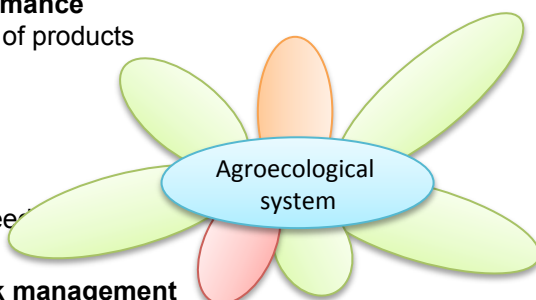
Animal feed based on farm production

Domestic biodiversity

Crop varieties ?

Animal breeds: Black-spotted

Danish pig; black chicken



Life
standard



HOW DOES THE FARMING SYSTEM WORK?

Work resources

High investment of the farmer,
vulnerable

Technical resources

Knowledge and trials on local best
practices

Marketing/policy resources

Local markets allow adding value to the
products

IMPACTS ON THE RURAL AND FOOD SYSTEMS

RURAL SYSTEM

- Impacts for rural communities: development of small-scale activities
- Impacts at local level: local regulation services and biodiversity hotspot

• Impacts for farmers: need for new skills, complex management, labor-intensive but more compatible with values on animal welfare and proximity to nature.

• Impacts for supply chains: direct sales and specialized supply chain within a farmers' network, conventional supply chains excluded from the commercialization.

• Impacts for consumers: direct producer-consumer relationships, farm visit, etc. Local diversified and quality products.

• Impacts for civil society: good image of animal breeding, preservation of domestic biodiversity.

FOOD
CHAIN



IN BRIEF: *Alternative small-scale farm based on the farmers' willing to manage natural and diversified system, managing commercialization through local markets with the development of a brand and a farmers' network.*

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

References

Troldgaarden (2014). Troldgaarden: dyr og mennesker i harmoni. www.troldgaarden.dk
Kongsted, 2014. Initial stakeholder meeting report: agroforestry for organic poultry and pig production in Denmark.
AGFORWARD WP5 Report.



Coherence pig: quality and environmental, localized pig production

Type of CS: Adapted production system oriented on local market

ECOLOGICAL CONTEXT

Area: Saint Brieuc, Brittany, France

Climate: Humid oceanic

Landscape: flatlands with combination of medium arable plots, smaller ones, grasslands with or without surrounding hedges, trees and groves around river beds.

Agronomic potential: deep and fertile soils with good agronomic potentials (wheat yield: 7 t/ha)

SOCIOECONOMIC CONTEXT

- Rural area quite densely populated (63 hab./km²), increasing population, urbanization
- Dynamic agricultural sector, job provider.
- Conflicts on environmental impact of livestock and animal welfare
- Expensive land difficult to access for young farmers.

BASELINE SITUATION

Typical farming system

70 ha, 2.5 WU
Maize, Wh, Bar, Rs.
250 sows, 7000 pigs/y
Export of pig manure

Professional identity

Meat producer, integrated in supply chains, purchasing feed and young animals. Important technical skills.

Supply chain

High density of livestock supply chains, connected with food industries and feed merchants.

Consumer habits

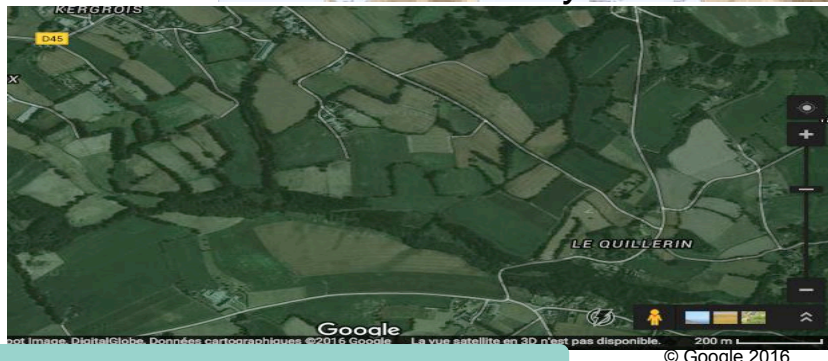
Mainstream consumption (prepared meal and processed products), supermarket shopping.

SUSTAINABILITY ISSUES

- Environmental: nitrate pollution is very high, resulting in "green tides" phenomenon due to eutrophication on coast. High use of pesticides.
- Economic: market instability, low prices.
- Social: pig production has a poor image in civil society, criticized for olfactory nuisance, animal welfare and environment issues. Work conditions are bad for farmers unless they invest (debts).



Alternative pig production in Brittany



Agroecological project

Initial steps

First straw bedding systems appeared in 1990s, in farms who remained of moderate size and with more traditional practices (old buildings). Since 2003, straw-bedding systems were integrated in environmental management schemes and authorized to develop new buildings. They satisfied some conditions for organic certification and Label Rouge (quality label). New local supply chains were developed, driven by the voluntary farmers, butchers and consumer associations. They were supported by local authorities for their potential to reduce nitrate pollution.

Farming system

2 workers.

UAA 42 ha: Oat – legume mixtures: 10 ha, triticale: 5 ha, fodder beet: 1 ha, permanent grasslands: 26 ha.

23 sows kept outdoor.

18 suckler cows.

Animal feed produced on farm, little protein complement is purchased.

Practices and performances

Production: 320 fattened pigs per year, carcass weight 90-95 kg.

Coherence network chart:

Fattening of pigs only on straw bedding, animal density max. 1,5 m² per animal.

Animal feed produced on farm, certified non-GMO, enriched in linen. Herd size is adapted to the available area (for feeding animals and spreading manure).

Use of antibiotics is limited to only specific cases.

Limited spreading of manure to avoid pollutions (140 kgN/ha vs. 170 in conventional systems).

Marketing strategy

Few intermediates, animals are sold to local butcheries organized in a network.



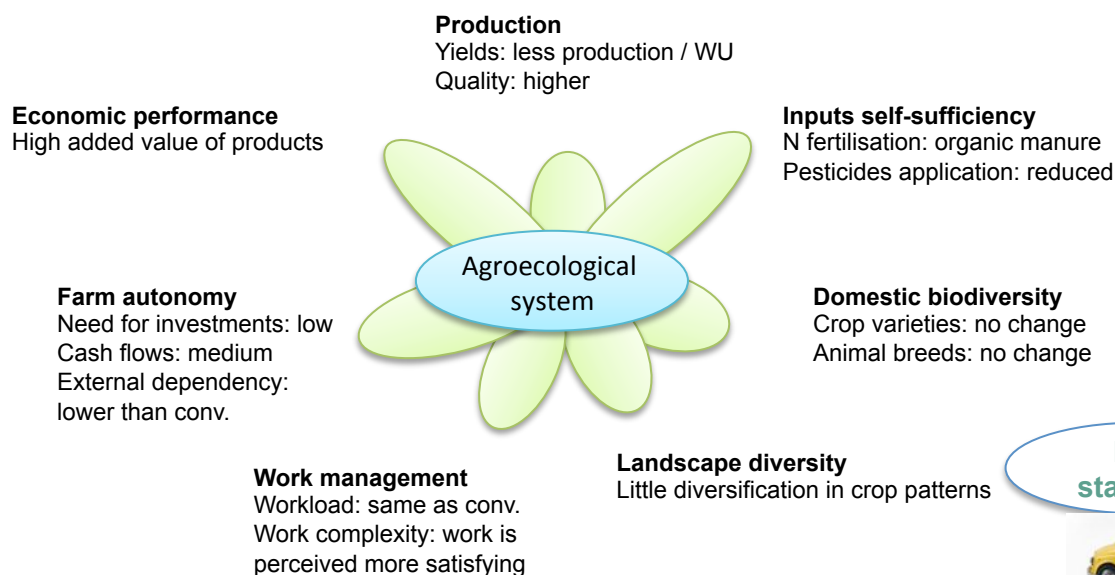
Conventional



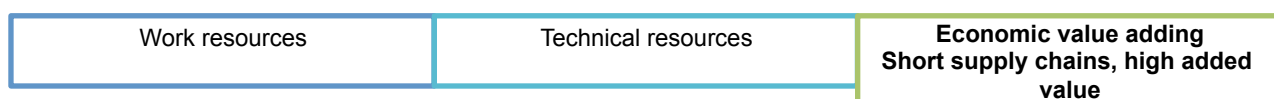
AE project

Quality and environmental, localized pig production

PERFORMANCES OF THE AGROECOLOGICAL SYSTEM



WHY DOES IT WORK ?



IMPACTS ON THE RURAL AND FOOD SYSTEMS

RURAL SYSTEM

- Impacts for rural communities: development of new forms of pig production
- Impacts at local level: straw bedding make manure available for direct spreading in fields without treatment nor exportation of compost, resulting in a better management of soil fertility on the long run (spreading of liquid manure represents only N fertilization, not organic matter).
- Impacts for farmers: work with less animal density, need of organisation for manure management.
- Impacts for supply chains: Pigs are commercialized in different supply chain, either long supply chains under the label "*porc fermier Label Rouge*", or within the Coherence network in direct sales to butchers or short supply chain through the intermediary of "Bretagne Viande Bio" for organic certified products. In the area of Saint Brieuc, two livestock farmers are certified with the Coherence label and sell their products to 13 butchers in Saint Brieuc, in markets or to restaurants.
- Impacts for consumers: availability of local quality products, more expensive than conventional products
- Impacts for civil society: improvement of image of pig production

FOOD CHAIN



IN BRIEF: *alternative pig production, mobilization of farmers to change their practices and organise local commercialisation; straw-bedding system of the Coherence network is much closer to organic farming than conventional one.*

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

References

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- Ramonet Y., Le Gac M., Giteau JL., 2015. Typologie des exploitations de porcs sur litière en Bretagne. Etude Chambre Régionale d'Agriculture de Bretagne, mars 2015.
- Bio Cohérence. Cahier des charges, Octobre 2014.

Toutjoly farm: quality organic poultry based on diversification for self sufficiency

Type of CS: redesigned large scale to develop

ECOLOGICAL CONTEXT

Area: Le Mans, France

Climate: temperate under oceanic influence

Landscape: flatlands with grassland and crop mosaic (90 to 170 m).

Agronomic potential: clay-calcareous soils suitable for crops (wheat yield 7 t/ha).

SOCIOECONOMIC CONTEXT

- Low density rural area (23 hab./km²) mainly oriented on farming activities.
- Social acceptability of farming: no controversies at local level
- Local markets and supply chains: high density of food industries, big companies, mainly standard but also quality products.
- Land is hardly available, expensive.

BASELINE SITUATION

Typical farming system

Indoor poultry fed on imported cereals
Few area of cereals
Short rotations

Professional identity

Professional farming oriented on mass market

Supply chain

Well-structured long supply chains.
Food industries.

Consumer habits

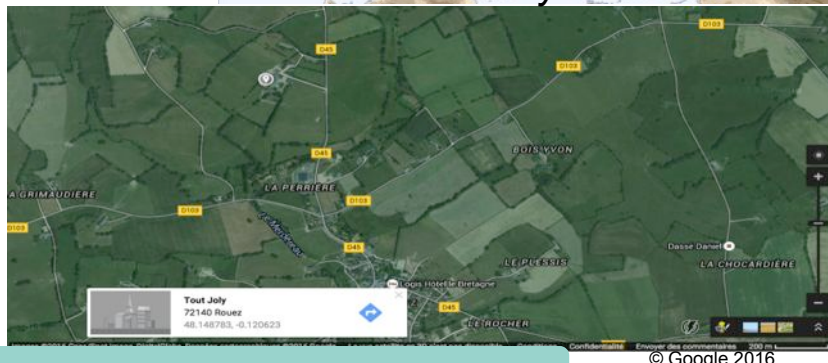
Supermarket
Prepared meal

SUSTAINABILITY ISSUES

- Environmental: important nitrate pollution in Sarthe river and hydric reserves. Pesticides pollution is also a major issue, pesticides residues being regularly found in rivers and water reserves.
- Economic: variability of livestock market, low price for standard poultry and milk.
- Social: water management: water withdrawals for irrigation being more frequent with climate change. Animal welfare in indoor animal production.



Sustainable poultry through mixed livestock systems



Agroecological project

Initial steps

After a modernization phase in 1970s, the former farmers developed a more extensive system based on grass and grazing for milk production (they stop using soyabean in 1989 and concentrates in 2000).

When the son started on the farm in 2002, he continues this trajectory and start organic farming in 2003. He is joint by his wife in 2003, starting processing milk into cheese. His brother joint them in 2015 after working as employee for several years.

Farming system

Mixed farming system. UAA 125 ha dominated by grasslands (mainly permanent grasslands but also a few temporary rotated grasslands) and 45 ha of arable plots.

Three farmers, associated. Organic farming since 2003.
Production of cheese and direct sales on farm.

Practices and performances

60 dairy cows (Brune des Alpes breed)
350.000 to 400.000 l of milk/year (6000 l/cow/year).
Full self-sufficiency for feeding cows.

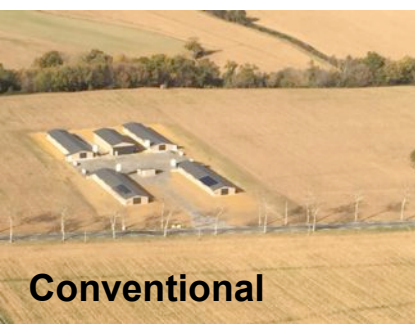
Poultry enterprise, certified organic, fed with local cereals : partly produced on farm and the other part comes from local partners gathered in the « Grains de terroir Bio » network. 36.000 free-range chicken produced per year.

Crops are Wheat, Triticale, maize, oat, faba bean, peas, linen.

Landscape management: 160 km hedgerows were restored on the farm and managed as wood for energy.

Marketing strategies

Direct sales of cheese and poultry on farm and marketing of milk and poultry in long supply chains with high quality labels.



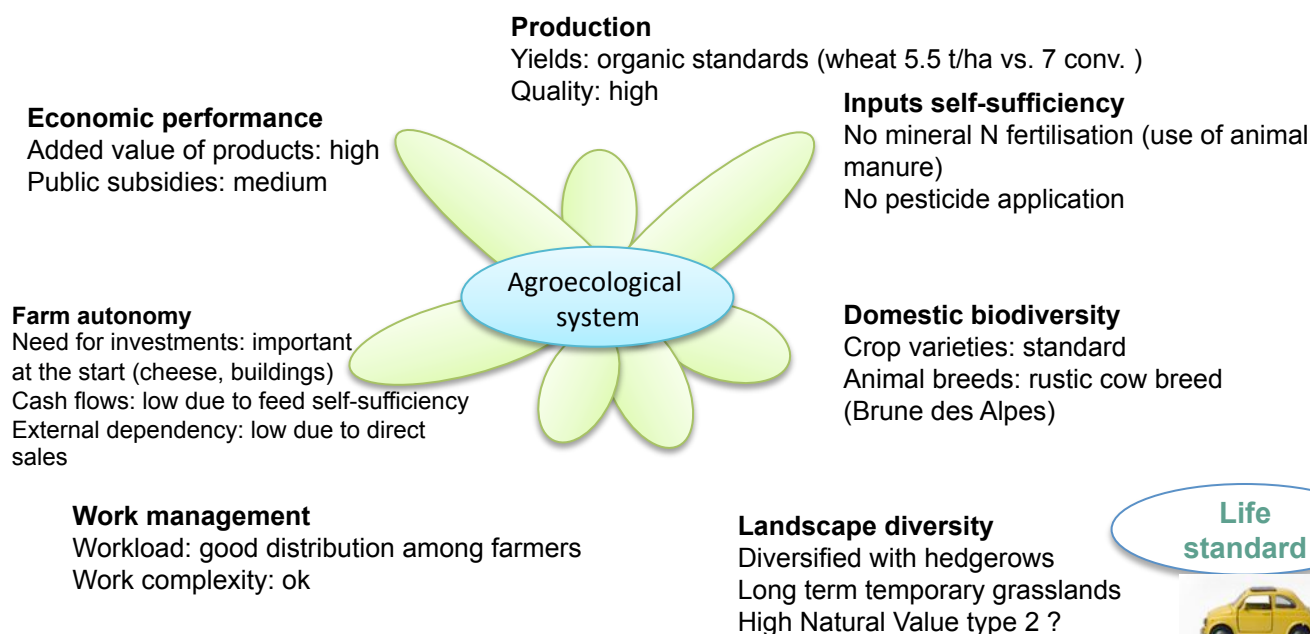
Conventional



AE project

Quality poultry based on self sufficiency

PERFORMANCES OF THE AGROECOLOGICAL SYSTEM



WHY DOES IT WORK ?



IMPACTS ON THE RURAL AND FOOD SYSTEMS



IN BRIEF: *Toutjoly Farm is a farmers' project to develop diversified systems with poultry and dairy cows representing an alternative to industrial production, processing milk and organizing high quality production for labelled marketing or direct sales.*

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

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French Ministry for Agriculture, <http://agriculture.gouv.fr/gaec-de-la-pie-linnovation-locale-et-collaborative>
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Los Pedroches SCA: Cooperative olivarera for local development and sustainable management

Type of CS: traditional system to preserve with new organisation

ECOLOGICAL CONTEXT

Area: Pozoblanco, Los Pedroches valley, Andalucía, Spain.

Climate: Dry mediterranean

Landscape: steep slope hills (400-800 m high), natural bushes and groves around ravines.

Agronomic potential: loamy-sandy soils, shallow and acid.

SOCIOECONOMIC CONTEXT

- Rural area (15 hab./km2) mainly oriented on farming, more or less commercial or semi-subsistence and strongly embedded in the culture.
- Export supply chains for olive and local market for local consumption products
- Land tenure restructured with small properties or rented land

BASELINE SITUATION

Typical farming system

Intensive olive groves
Simplified management with ploughing and pesticides

Professional identity

High technical skills for reaching high production levels

Supply chain

Large retailers

Consumer habits

Export products used in different food industries.

SUSTAINABILITY ISSUES

- Environmental: major problem of soil erosion, in olive groves soils are bare for several months along the year.
- Economic: olive production is strongly vulnerable to price instability, quantity and quality of productions. Strategy of branding products to enter the market.
- Social: risk of desertification and poverty without strong olive activity.



Agroecological project

Initial steps

At the end of the 18th century, the Town council authorised people to hold fields of municipal property, where low hills are abundant, provided that they would plant in it fruit trees, vines and, particularly, olive trees. These ploughs would have been very intense between 1808 and 1823. The development of olive tree groves in these sierras and the great demand of labour that it brought encouraged the construction of some farmhouses in each plot. Properties are now medium sized and organized around the Producers cooperative to access market.

Farming systems

- Local varieties
- Low planting density
- The steep slopes make difficult the use of machinery, so a large number of workers is required.
- The olive tree grove includes also a large number of tree species (holm oak, cork oak, pine, gall oak,...) and of bushes species (rock rose, thyme, mastic tree...) located in intersperse areas of olive tree grove, on borderlines and in areas of steep slope.

Practices and performances

- Between 7 to 10 Kg olives in average for each olive tree (30 kg conv.). Around 200 kg of olive oil per hectare.

Soil management:

- The rich variety of both trees and bushes helps avoid soil loss.
- Grass cover between tree lines avoid substantial runoffs.
- In winter, the olive tree is at rest and weeds are kept for erosion control.
- "weed management" by livestock, especially sheep.
- Harrowing at the end of summer.
- Direct fertilization by livestock manure, application of compost from olive by products.

Pest and disease control

- Only key pests and diseases are managed
- Research on biological regulations, enhanced by biodiversity management
- Insect traps for the olive tree fly.
- Prevention by technical practices such as pruning
- Copper treatment when necessary.

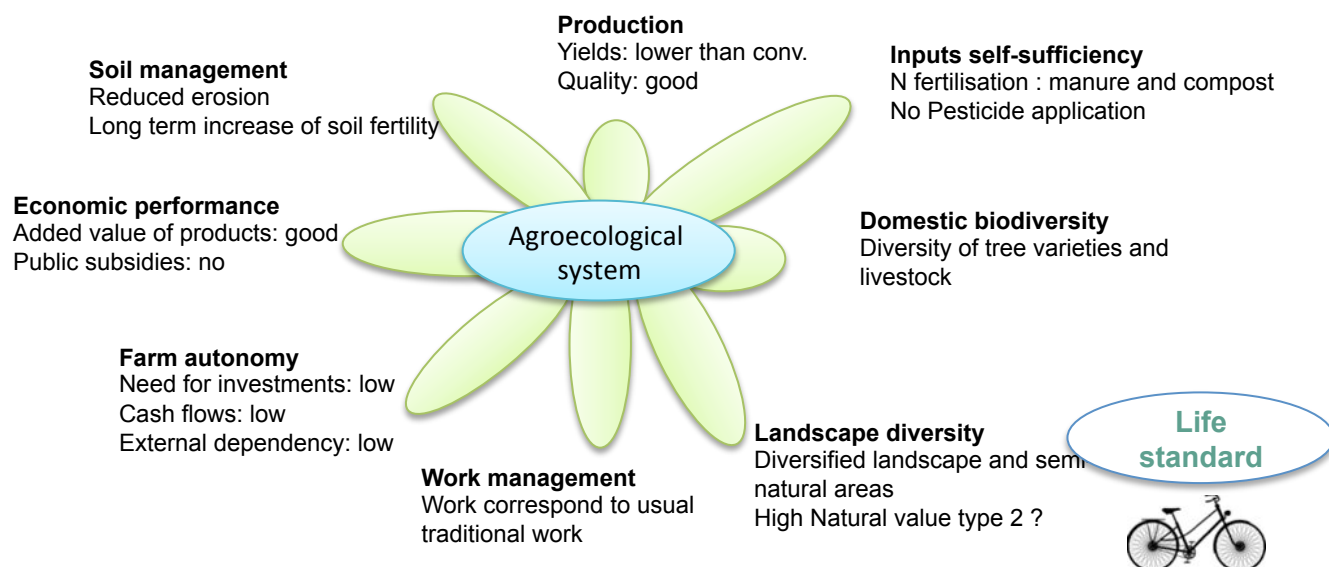
- Use of olive stone as biomass.

Marketing strategy:

Direct sales in the cooperative, local markets and expedition around Spain.

Cooperative olivarera for local development and sustainable management

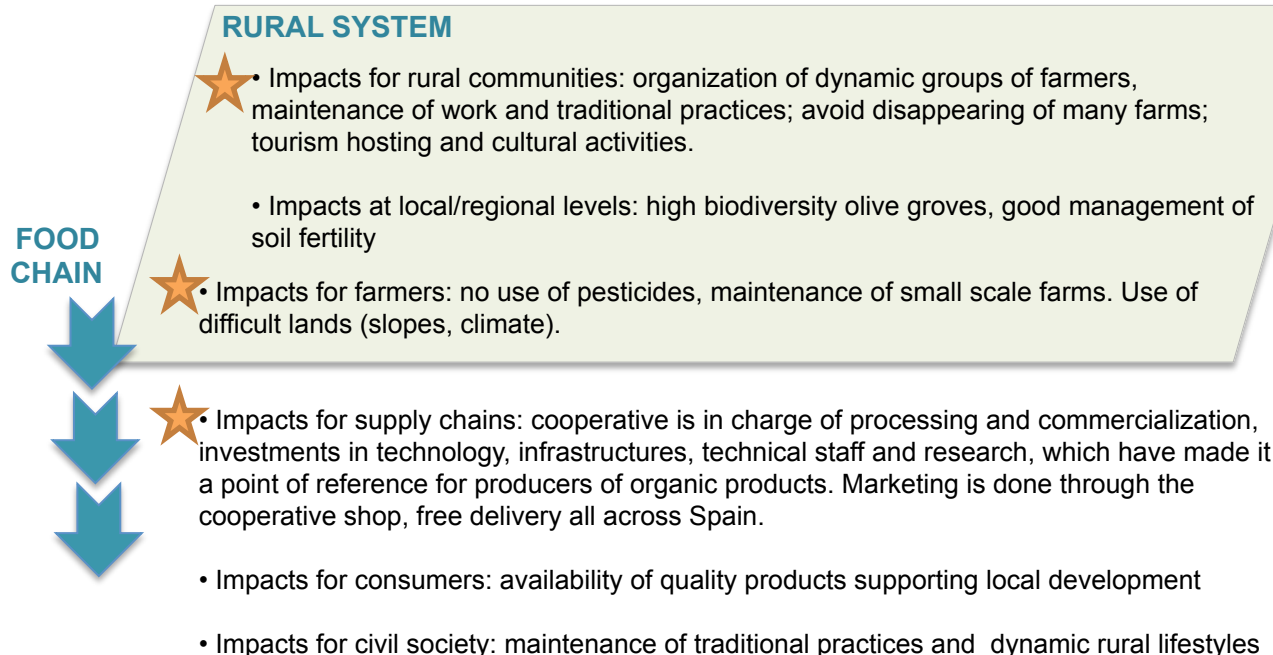
PERFORMANCES OF THE AGROECOLOGICAL SYSTEM



WHY DOES IT WORK ?

Work resources Lots of workers in the area	Technical resources Continuous research to improve management	Economic value adding High added value, direct marketing to cut intermediaries
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IMPACTS ON THE RURAL AND FOOD SYSTEMS



IN BRIEF: Organic, low external input production systems, using sylvopastoralism and natural regulations as sources of soil fertility and biological regulations, and nutrient cycling through composting of by-products. Maintains small scale systems, high employment rates, fair distribution of benefits and investments in local development.

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

A biodynamic winery in Mediterranean area

Type of CS: redesigned large scale system to develop

ECOLOGICAL CONTEXT

Area: Manduel, Costières de Nîmes, France

Climate: Mediterranean

Landscape: open fields on flatlands

Agronomic potential: clay calcareous shallow soils (vine growing mainly)

SOCIOECONOMIC CONTEXT

• Peri-urban area (240 hab./km²)

• Vine growing is locally cultural activity but controversial for environmental issues

• Wine consumption disseminated in France and other countries, some share of oenotourism.

• Few available land and very expensive in GDP areas.

BASELINE SITUATION

Typical farming system:

Intensive production in GDP, high inputs use, yield 55 hl/ha.

Professional identity

built around product quality and typicity with openness on environmental issues

Supply chain:

Well structured and oriented on multiple markets

Consumer habits:

partly standardized appreciation of quality, technical defaults are prohibitive.

SUSTAINABILITY ISSUES

• Environmental: intensive pesticide use (water, air, soil); soil fertility (high erosion); biodiversity; irrigation.

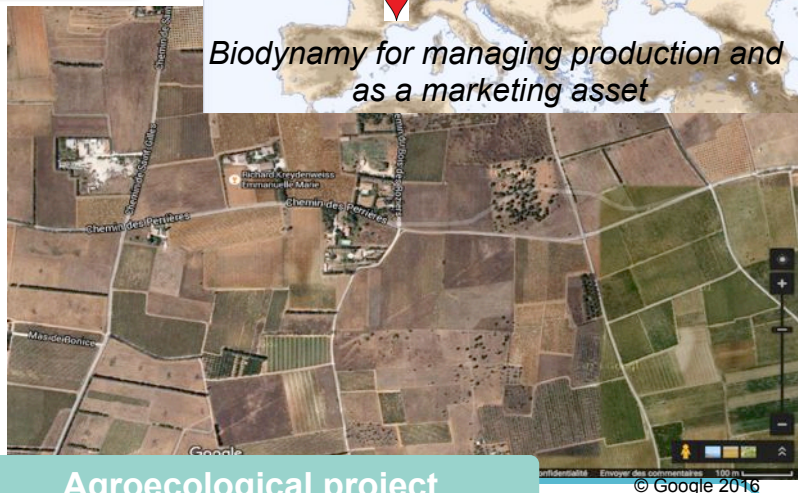
• Economic: resilience in case of production aleas.

• Social: local unemployment; risk of urbanization; work conditions of seasonal workers; controversies on pesticide use.



Conventional

AE project



Agroecological project

Initial steps

Kreydenweiss farm has been launched in 1999 when farmers bought the former domain and converted it to organic and biodynamic farming. Mainly individual investment of farmers.

Farming system

Land: 20 ha

Workforce: farmer, 1 employee, 15 seasonal workers for hand harvesting.

Equipment: vineyard adapted tractors, soil management tools, sprayer, cutting machine.

Biological resources: 4 cepages: Carignan, Syrah, Grenache, Mourvèdre, typical from the Mediterranean terroir and from the GDP. Planting density is 5000 plants/ha.

Practices and performances

The whole production system is based on a good management of soil.

Organic fertilization with compost: 8 to 10 t/ha of vegetal organic compost every 3 or 4 years. Biodynamic preparations are sprayed or put into fields to activate microorganism and act as micro-fertilisation.

Vine health management with biodynamic preparations: tisanes of nettles, horsetails and silice for the plant robustness.

Copper and Sulfur treatments against mildew and powdery mildew, authorized in organic and biodynamic production charts, are practiced every year at a rate of 7 treatments / year and quantity of 2 kg Cu/ha and 3 l S/ha.

Pest management (Eudemis) through spraying of *Bacillus thuringiensis* (Bt) allowed in organic production.

Weed management is done only by mechanical weeding, both between vine rows and under rows. 6 to 10 soil tillage can be necessary to avoid weed concurrency especially in summer.

In autumn grass is kept and remain as soil cover until late spring. Local flora is adapted to the shallow soil and provides flowers for pollinators.

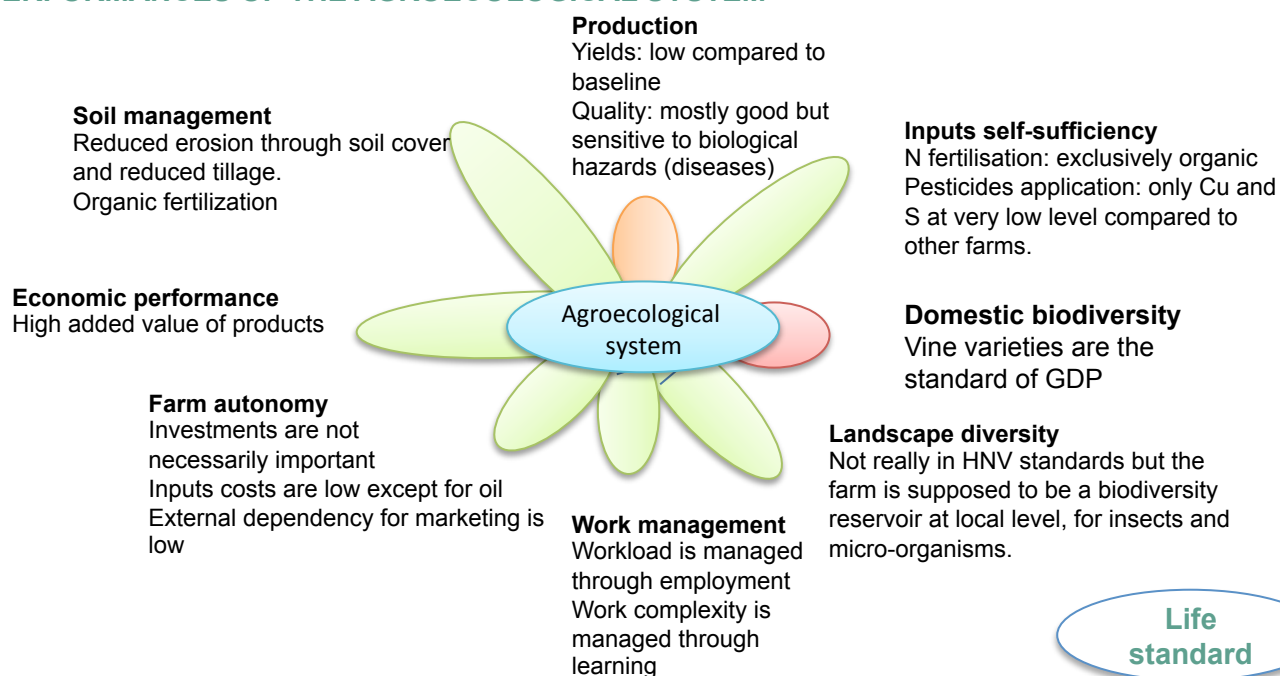
Yields: 30 to 35 hl/ha.

Marketing strategy

Commercialization through specialized supply chains on high quality wine, direct marketing on farm, on professional events or expedition of wine to restaurants and private clients.

A biodynamic winery in Mediterranean area

PERFORMANCES OF THE AGROECOLOGICAL SYSTEM



HOW DOES THE FARMING SYSTEM WORK?



IMPACTS ON THE RURAL AND FOOD SYSTEMS

RURAL SYSTEM

- Impacts for rural communities: few but exemplifies a low-input system in vine production.
- Impacts at local level: local regulation services (water, erosion control) and opportunities for biodiversity (habitats for local fauna and flora especially in winter).
- Impacts for farmers: source of inspiration and knowledge on low-input system.

FOOD CHAIN



- Impacts for supply chains: intermediates of specialized supply chains (wine shops) are present but no commercialization in supermarkets
- Impacts for consumers: availability of environmentally-friendly products at affordable prices (7 to 25 euros/bottle).
- Impacts for civil society: shift in vine production practices.

IN BRIEF: *The biodynamic winery is an individual initiative relying on the motivation and technical knowledge of the winegrower. It supports the development of alternative, sustainable and high-quality wine production.*

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

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Chizé : Diversified cereal plain to preserve biodiversity

Type of CS: redesigned large scale system to develop

ECOLOGICAL CONTEXT

Area: Plain of Niort, France

Climate: Temperate under oceanic influence

Landscape: Chizé forest, mosaic of crops in relatively large plots, tree groves and hedgerows around rivers.

Agronomic potential: soils calcareous marls on limestone, suitable for cereals (wheat yield: 6 t/ha).

SOCIOECONOMIC CONTEXT

- Rural area under urban influence.
- Population density 36 hab./km²
- Rural and urban disconnected
- Strong expectations around environment preservation (NGOs, policies)
- Well-structured, dynamic supply chains
- Expensive land accessible little for farm growth and hardly for young farmers.

BASELINE SITUATION

Typical farming system

100 ha, 1 farmer
Wheat / Sf or Rs
Maize monoculture
Heavy machinery

Professional identity

Specialized farmer,
High technical skills

Supply chain

Well structured supply chains: inputs sellers, cooperatives, seed companies, retailers.

Consumer habits

Mainstream consumption, supermarket shopping

SUSTAINABILITY ISSUES

- Environmental: water quality protection, reduction of water withdrawal for irrigation. Biodiversity conservation (N2000, patrimonial species).
- Economic: risk for performances of farms due to instable dry climate → need for irrigation
- Social: urbanization of lands, price of land

An holistic project for bird and water conservation



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Agroecological project

Initial steps

The research centre CNRS of Chizé is studying biodiversity in the area since more than 20 years. Since 2003, the local cooperative has launched several projects in collaboration with researchers to develop environmentally-friendly farming practices. An agri-environmental scheme has been designed and implemented to preserve the local fauna (Great bustard) and participatory research has been conducted to develop the uptake of the scheme.

Farming systems

- Same structure of farms: 100 ha, 1 farmer.
- More diversified land use: Wheat 22%, Sunflower 16%, Alfalfa 13%, Hemp 12%, Maize 11%, Durum Wheat 9%, Pea 9%, Rapeseed 6%.

Practices and performances

Alternative Crop rotation: Alf x 2 / Rapeseed / Wh / Hemp / Wh / Sf

Alternative maize rotation: Maize / Maize / Hemp.

Fertilization: Wheat 100 kgN/ha (vs. 160 conv.),

Maize 60 kgN/ha (vs. 185 conv.)

Yield: Wheat: 5 t/ha (vs 6 t/ha conv.)

Rapeseed: 2 t/ha

Irrigated maize: 8 t/ha

Treatment Frequency Index: cereal rotation total 2.5 (vs. 4.6 conv.) ;
maize rotation total 2.0.

Estimated honey production: 12200 kg/year (vs. 6500 kg/y conv.)

Biodiversity management: hedges plantation, late harvest of alfalfa, less frequent ploughing.



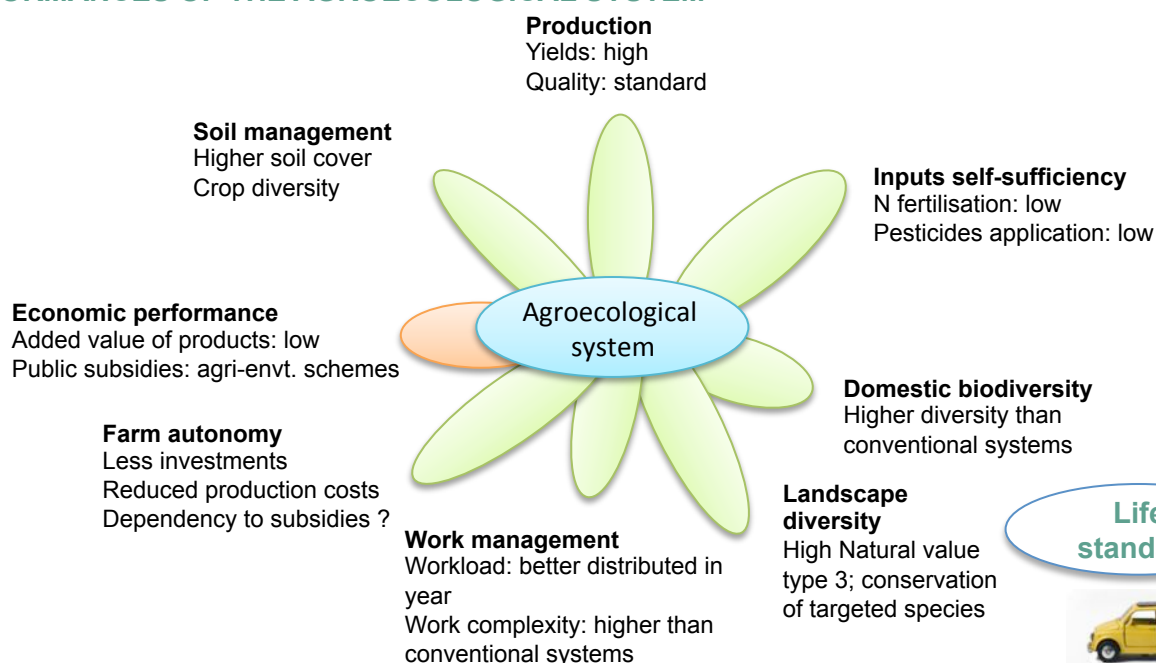
Conventional



AE project

Diversified cereal plain to preserve biodiversity

PERFORMANCES OF THE AGROECOLOGICAL SYSTEM



WHY DOES IT WORK ?

Work resources

Technical resources
Local knowledge for diversity management
Strong commitment of research

Economic value adding
Public subsidies for new crops

IMPACTS ON THE RURAL AND FOOD SYSTEMS

RURAL SYSTEM

- Impacts for rural communities: diversification of landscape, water quality protection
- Impacts at local level: inputs reduction, increased area of temporary grassland with late-harvest, reduced irrigated areas, increased carbon sequestration in soils.
- Impacts at regional level: networks of biodiversity habitats

FOOD CHAIN

★ Impacts for farmers: diversification of crops, less intensive practices, collective organization for exchanges between crop and livestock farmers.

- Impacts for supply chains: quality label for alfalfa but no other specificity in commercialisation: long, standard supply chain.
- Impacts for consumers: no
- Impacts for civil society: better image of farming, conservation of patrimonial species

IN BRIEF: The Chizé case study presents production systems with lower impact on environment, preservation of local biodiversity and diversified landscape, without reducing the levels of production of agricultural products. Food systems are not impacted; products are still commercialized in long standard supply chains which must adapt to diversified products.

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

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CIVAM OASIS: Productive and self-sufficient farming in diversified arable systems in France

Type of CS: Redesigned large scale systems

ECOLOGICAL CONTEXT

Area: Champagne-Ardennes, France
Climate: Temperate, continental influence
Landscape: flat (100 to 200 m high) pen landscape dominated by very large arable plots, few disseminated groves and semi-natural areas.
Agronomic potential: sediment soils composed of marls and chalk, high potential (wheat yield 9.5 t/ha)

SOCIOECONOMIC CONTEXT

- Rural area (15 hab./km2)
- Farming is the main activity
- Price of land is very high
- Few controversies on local agriculture

BASELINE SITUATION

Typical farming system

250 ha, 1 farmer and 1 employee, heavy equipment, short crop rotations, high fertilization and pesticide use.

Professional identity

Farmers consider themselves as producers for mass production, yield as best performance and technical skills.

Supply chain

Well structured, oriented on standard markets, seed and food industries, animal feed supply chains.

Consumer habits

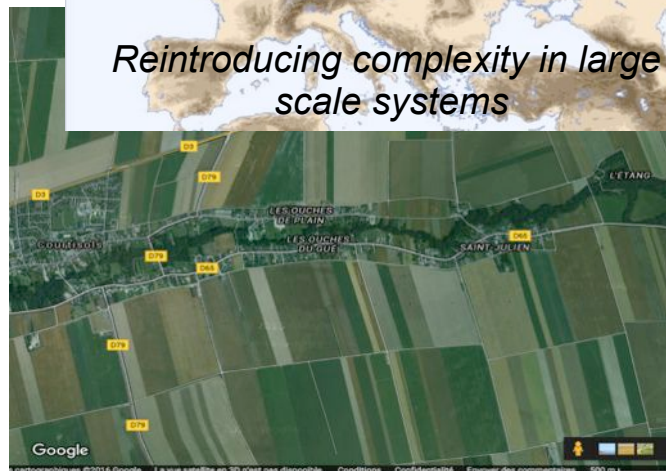
Mainstream consumption habits, supermarket shopping

SUSTAINABILITY ISSUES

- Environmental: soil erosion due to the important rainfalls, regular deep ploughing and bare soils during winter. Water pollution by nitrate and pesticides. Soil organic matter is often very low and absence of organic manure generally threaten soil fertility.
- Economic: important production costs, vulnerability to market fluctuations.
- Social: societal demand to reduce the use of pesticides. Dependency to external markets.



Reintroducing complexity in large scale systems



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Agroecological project

Initial steps

A group of farmers has been built in 2008 around a new farmer settled on his parents' farm. Willing to reduce their dependency on chemical inputs and their impact on the environment, they were looking for new practices and new land management strategies favouring biodiversity. They worked with researchers and farmers from other regions to design new cropping systems.

Farming system of one leader farm

Land: 160 ha.
 Workforce: 1,5 WU
 Equipment: 3 tractors (max. 190 hp), Sprayer (28 m), light soil management equipment, harrows.

Practices and performances

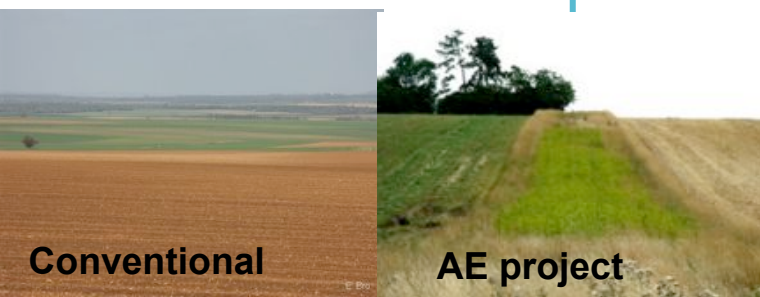
Landscape management: planting 1500 m of hedgerows, grass strips around fields, maintenance of a semi-natural grassland (5 ha) for hay production and habitats for biodiversity and another 1,5 ha of non-cropped area.

Crop rotations: Hemp / Wh / Bar / SB / Wh / Hemp / Wh / Pea / Rapeseed / Wh / Alf x 3 / Wh
 Soil cover: green manures as soil cover, composed of mixtures with legumes.
 Alternative practices such as mechanical weeding, stale seedbed.

Crop	Yield (t/ha) (baseline)	Fertilization (kg N/ha/year)	Number of treatments
Wheat	8.5 (9.5)	180 (230)	2 (6)
Sugar beet	8.5 (9.5)	110 (110)	3 (4)
Rapeseed	3.5 (4)	180 (180)	2,5 (6)
Barley	6 (8)	150 (170)	1,5 (5)
Alfalfa	11 (12.5)	0	0,5 (2)
Peas and Faba	3.2 (-)	0	3
Hemp	7 (-)	110	0

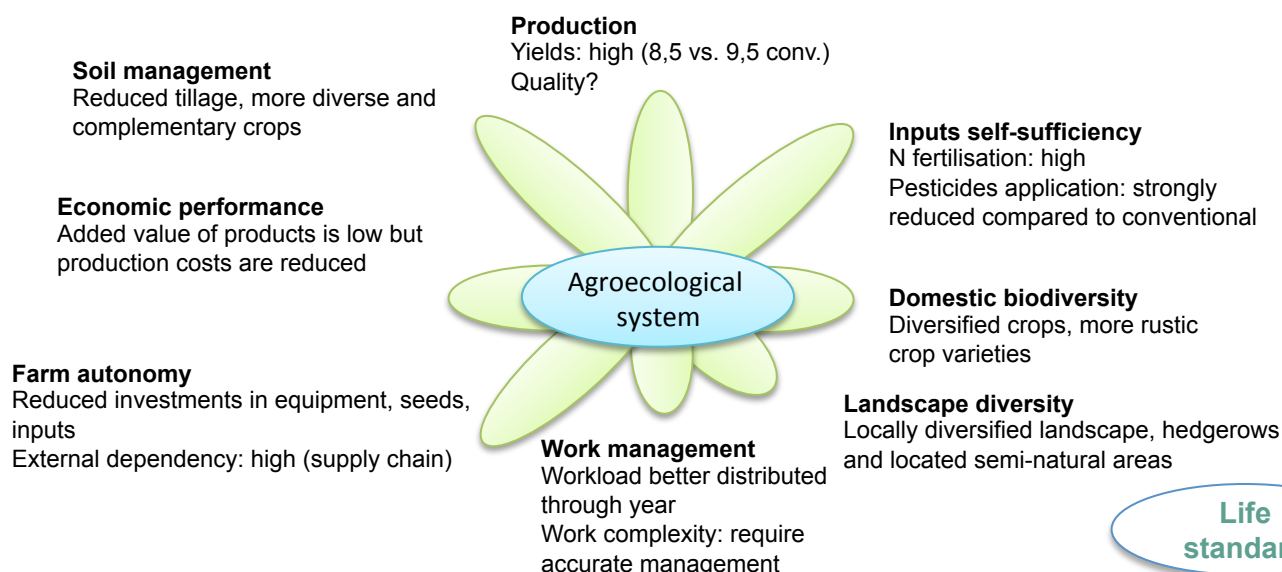
Conventional

AE project

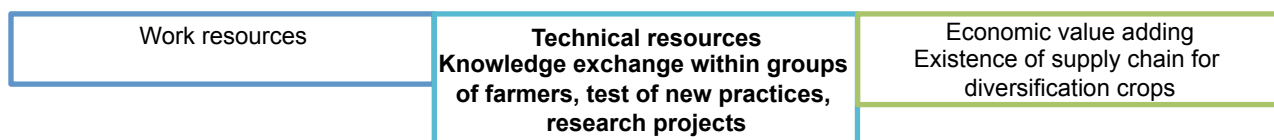


Productive and self-sufficient farming in diversified arable systems in France

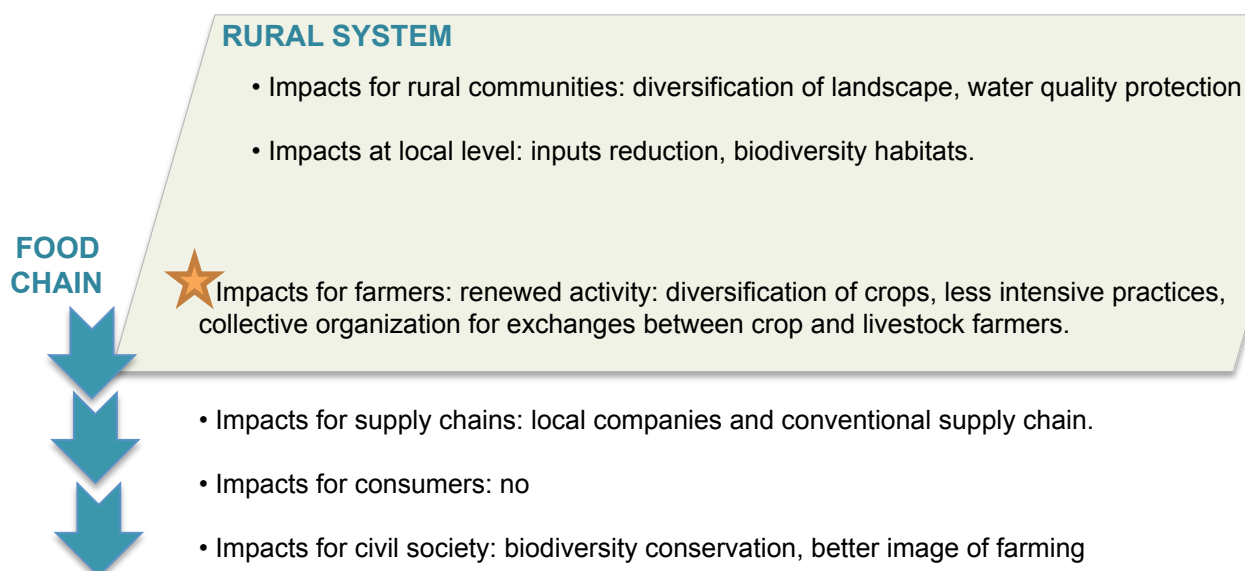
PERFORMANCES OF THE AGROECOLOGICAL SYSTEM



WHY DOES IT WORK ?



IMPACTS ON THE RURAL AND FOOD SYSTEMS



IN BRIEF: Crop production system with associated performances of high production, reduced inputs and environmental impacts, landscaping for biodiversity conservation.

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

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ADEPT: Family farming with diversified system and extensive management in Romania

Type of CS: small-scale traditional systems to preserve

ECOLOGICAL CONTEXT

Area: Saxon villages area, Romania

Climate: continental

Landscape: steep valleys and hills from 600 to 800 m above sea level.

Agronomic potential: lime-rich marls with bands of sand, limestone. Partly fertile soils with brown clays, partly low nutrients.

SOCIOECONOMIC CONTEXT

- Farming is a professional and semi-subsistence activity, supporting minimum life standards.
- Farm communities are aging but still important, keep traditions and strong rural culture alive.
- Supply chain mainly by the local market.
- Land tenure: land price increase with intensification of farming in some areas.

BASELINE SITUATION

Typical farming system
2 ha, 2 working units, diversified

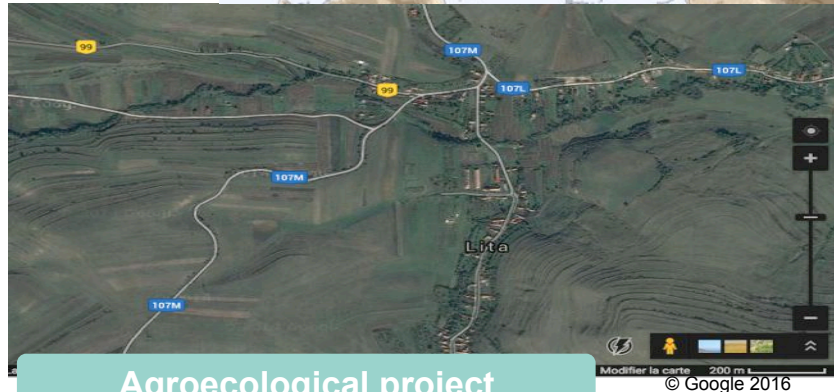
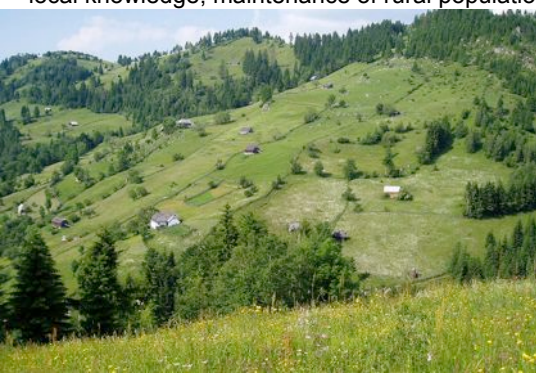
• Professional identity: peasant communities with multiple activities (hand crafting, wood, etc.)

• Supply chains
• Local markets

• Consumer habits: home consumption

SUSTAINABILITY ISSUES

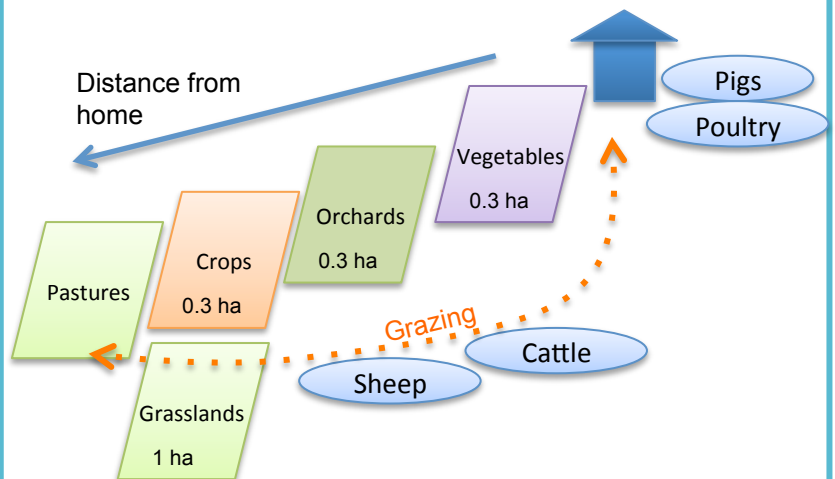
- Environmental: preservation of rich biodiversity of rural landscapes: avoid both intensification and abandonment
- Economic: profitability and development of small farming systems
- Social: preservation of traditional culture and local knowledge, maintenance of rural population



Initial steps

Traditional systems and practices inherited from centuries.

Farming systems



Practices

- Hay meadows: 2 cuts per year, aftermath grazing.
- Communal land grazing, divided between cattle and sheep
- Sheep are grazing half of the year, kept by elected shepherds, on the higher and less rich pastures, 4-6 sheep/ha. Hand-milking 3 times/day.
- Cows are grazing during the day in summer, kept by cowherd and milked 2 times/day.
- Horses are used for field work and transportation of products.
- Weeding done by hoe

Family farming with diversified system and extensive management

PERFORMANCES OF THE AGROECOLOGICAL SYSTEM

Economic performance

Added value of products
Public subsidies

Production

Cows: 600 l milk/year/cow
Crops, vegetables, pigs, poultry ?
Quality: ?

Inputs self-sufficiency

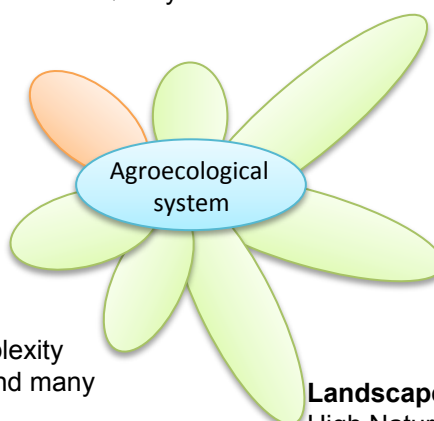
N fertilisation fully organic by farm manure
No pesticide
Animal feed fully produced on farm

Farm autonomy

Low investment in equipment and buildings
Few subsidies

Work management

Workload and work complexity are high due to milking and many hand work



Domestic biodiversity

Crop varieties ?
Animal breeds: local and well adapted to local conditions

Landscape diversity

High Natural value type 2

Life standard



HOW DOES THE FARMING SYSTEM WORK?

Work resources
Important workforce

Technical resources
Local knowledge

Economic value adding

IMPACTS ON THE RURAL AND FOOD SYSTEMS

FOOD CHAIN



RURAL SYSTEM

- Impacts for rural communities: opportunity to maintain rural activity
- Impacts at local level: preservation of landscapes and practices
- Impacts at regional level: C sequestration service, water and climate regulation

• Impacts for farmers: need to develop pluriactivity to improve income
Encouraging local producers to develop a range of traditional food products – cheeses, jams, honey, herbs, etc.

• Impacts for supply chains: working to create and establish a strong 'Saxon Villages' brand image for marketing quality produce from local farms, integrating food production and nature values.

• Impacts for consumers: access to local high quality food

• Impacts for civil society: support to farmers' communities (?)

IN BRIEF: *Traditional peasant systems managing very diverse and integrated systems with high nature value. Changes in socioeconomic context require adapting the economic model to develop added value of products through new supply chains.*

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

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Biovallée, Development of organic systems at territory level for local markets

Type of CS: redesigned systems with local complementarities

ECOLOGICAL CONTEXT

Area: Drôme valley, South-East France

Climate: Mediterranean with mountain influence

Landscape: hilly valley, mediterranean forest steep slopes (90 to 2000 m high).

Agronomic potential: alluvial soils in lowland near rivers with good potentials (wheat yield 6 t/ha), poor soils on slopes.

SOCIOECONOMIC CONTEXT

- Rural area with low-density population (average 30 hab./km²). Farmers represent 15% of the population and 20% of job.

- Active civil society: citizen associations are very numerous and active.

- Disappearing local supply chains

- Moderate pressure on land

BASELINE SITUATION

- **Typical farming system:** concentrated and intensified production systems

- **Professional identity:** producers aiming at preserving added value of production systems

- **Supply chain:** long supply chains without quality label

- **Consumer habits** Standard consumption supermarket shopping

SUSTAINABILITY ISSUES

- Environmental: encroachment of semi-natural areas, loss of biodiversity.

- Economic: disappearing of agricultural supply chains.

- Social: desertification of remote areas



Conventional



AE project



Organising agroecology at a territorial level



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Agroecological project

Initial steps

The project originated from a river management scheme. The environmental project inspired a wider territory project. The objective was established to develop 50% of UAA under organic certification and 80% of the catering with organic and local products. Several stakeholders are committed in the development of organic production and supply chains and in changes in food models. This collective dynamics and structuration of agroecological systems make changes more perennial. Local city councils organized during the 70s to maintain the agriculture of the area through the development of high value production: aromatic and medicinal plants, vine. Newcomers from cities also develop new activities linked to tourism and contribute to the maintenance of attractive landscapes.

Example of organic farming system

30 ha UAA, 1 WU. Complementary poultry enterprise.

- Diversified crop rotations: Soybean/Wheat/Maize
- Shallow tillage (15 cm), no tillage and direct seeding, use of soil cover.
- Combining crops, animals and pastures
- Crop associations
- Soil cover in Winter
- Hedges management and replantation
- Seed management: local selection of varieties
- Manure spreading (obtained from other farms or from poultry enterprise)

Practices and performances

Yields and productive levels

Soybean: 3 t/ha (irrigated) / vs. 4 t/ha conv.

Wheat: 4.5 t/ha / vs. 5.5 conv.

Maize: 10 t/ha (irrigated) / vs. 11.5 t/ha conv.

At territory level:

Favouring cooperation among farmers through collective platforms and small ads to exchange products (crop – livestock interactions, land exchange, etc.).

Favouring young farmers settlement, diversification of farming activities.

Favouring local stakeholders cooperation.

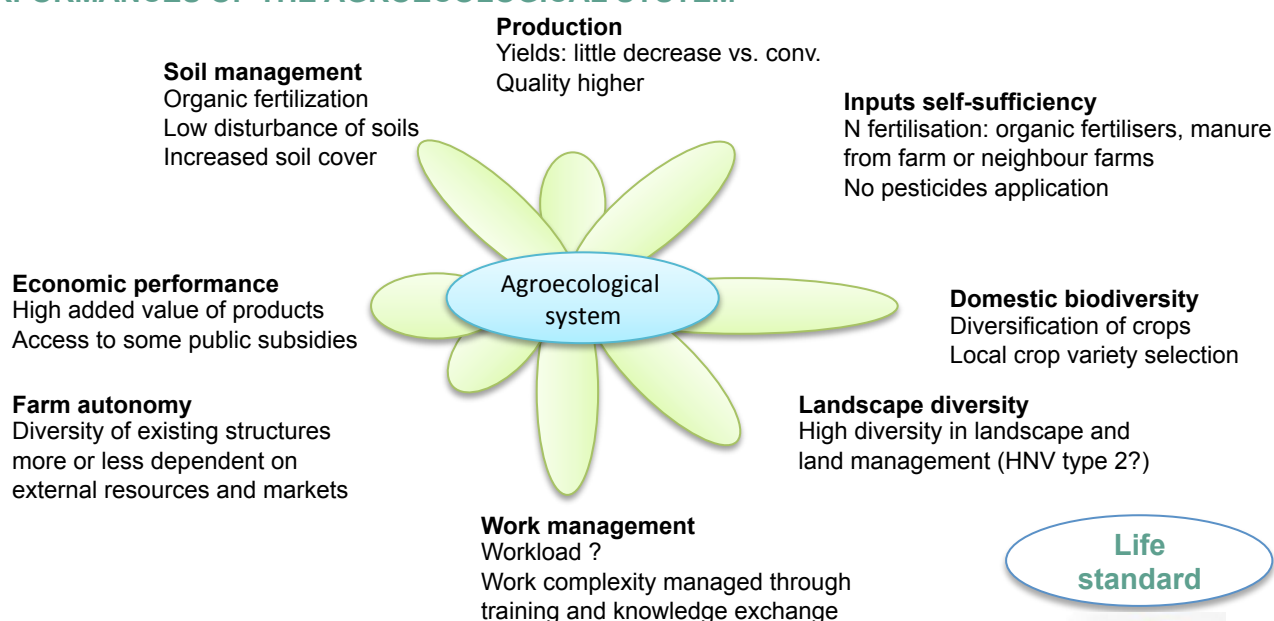
Groups of farmers for employment

Diagnosis of farm mechanization costs

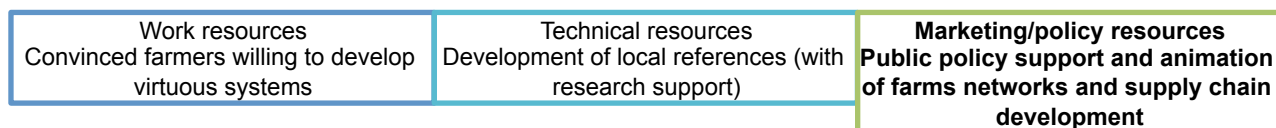
Marketing strategy

Direct sales, local markets and long supply chains with specific commercialization channels (organic specialized chains).

PERFORMANCES OF THE AGROECOLOGICAL SYSTEM



HOW DOES THE FARMING SYSTEM WORK?



IMPACTS ON THE RURAL AND FOOD SYSTEMS



IN BRIEF: *Diversified territory where development of agroecological and organic farming is planned and organized with local authorities, supply chains, farmers and citizen. Alternative systems and supply chains are organized on a large scale.*

This work is part of the TYFA Project supported by the Fondation pour le Progrès de l'Homme

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Freixo Do Meio farm in Montado: a diversified farm managing agroecosystem to optimize the use of local resources and autonomy

Type of CS: Redesigned systems on patrimonial landscape to preserve

ECOLOGICAL CONTEXT

Area: Montemor-o-novo, Alentejo, Portugal

Climate: Mediterranean

Landscape: hills and flatlands, forest and bushes

Agronomic potential: poor soils often shallow and eroded.

SOCIOECONOMIC CONTEXT

- Farming is the traditional activity but threatened by both desertification and intensification of remaining cultivated lands.

- Farming is a crucial pillar for local activity (population density of 15 hab/km²)

- Local markets and supply chains

- Land tenure

BASELINE SITUATION

- Typical farming system: sylvopastoral cattle farm

- Professional identity : coexistence of peasant renting land and owners

- Supply chain: well structured but tend to Decline

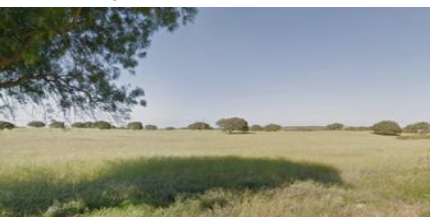
- Consumer habits: home consumption or long food chains

SUSTAINABILITY ISSUES

- Environmental : biodiversity conservation (Natura 2000), regulation of water cycles, sylvopastoral ecosystems are threatened by both abandonment and intensification

- Economic: coupled payment act as incentives for intensification. Too little added value on products

- Social: cultural landscape, identity, lack of shared governance of land.



Agroecological project

Initial steps

After being confiscated in 1974 during the revolution, Herdade do Freixo do Meio (HFM) was returned to the former owners in 1990 and since then tried to bring a new way of managing this heritage guided by the ethics of respect for the people and for the environment, with organic conversion in 2001.

Farming systems

- 440 ha of cork oak and holm oak *Montado* agroforestry systems.
- portions of irrigated land, vineyards, olive groves and biodiverse pastures and enables to produce nearly all the ingredients of the Mediterranean diet with the exceptions of milk and fish.
- Since 2008, HFM acts also as an economic active agent by embracing autonomous but complementary projects that strengthen the system as a whole and increase the amount of products available from the farm. The independent projects include:
 - 4.5 ha aromatic and medicinal garden (2011),
 - 2 ha of a horticulture garden and 5 ha of orchards (2011),
 - free-range chicken production with a movable chicken house(2012)

Activity	Products
Forest production	Cork, Acorn, Pine nuts, Wood, Mushrooms, Wild Fruits
Animal production	Iberian pork, Merino sheep, Serpentine Goat, Barrosão Cattle, Black turkey, Broilers, Eggs...
Crop production	Cereals, Pulses, Vegetable, Aromatics and Medicinal plants.
Fruit productions	Olive, Grapes.
Leisure activities	Restaurant, Visiting, Hunting Tracking Formation.
Processing	Meat, Olive oil, Vegetable processing, Solar Drying, Bread.
Sales	Own shop in Lisbon Market.

Practices and performances

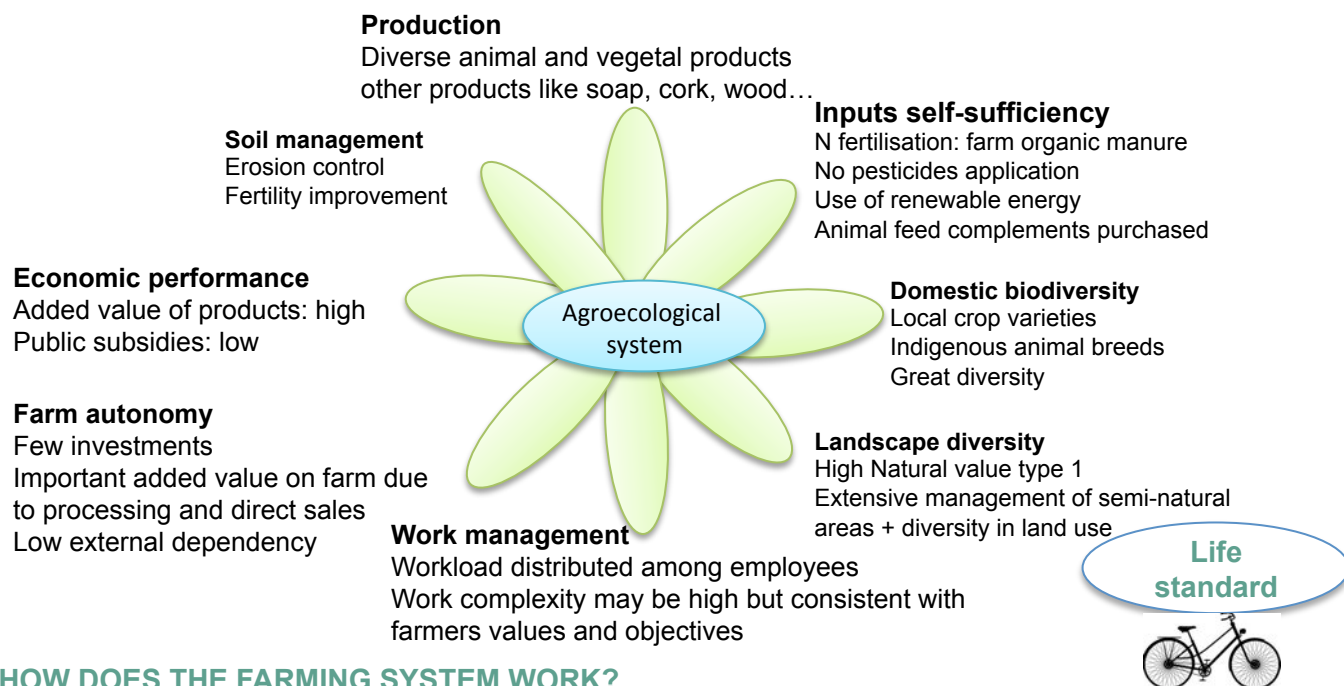
- Diversity of resources: 3 levels agroforestry: trees, bushes, pastures.
- Sequential grazing: cows / sheep / poultry
- Compost making, digging by pigs
- Biodynamic preparations to improve soil fertility, crops and animals health
 - Use of wastes, olive pulp, etc. to feed animals
 - Use of fish powder as complement for feed.
- HFM produces around 300 different products and employs 12 workers directly and 8 through the associate projects. Four times more than the farms located around dedicated to intensive agriculture.

Marketing strategy

- Direct sales on farm, local markets, 1 shop in Lisbon .

A diversified farm managing agroecosystem to optimize the use of local resources and autonomy

PERFORMANCES OF THE AGROECOLOGICAL SYSTEM



HOW DOES THE FARMING SYSTEM WORK?

Work resources Managerial skills, experienced workers	Technical resources Continuous research, breeding	Marketing/policy resources Direct sales, farm shop in town
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IMPACTS ON THE RURAL AND FOOD SYSTEMS

FOOD CHAIN



RURAL SYSTEM

- Impacts for rural communities: local employment and dynamism, tourism
- Impacts at local level: maintenance of dynamic still extensive management of Montado: habitats for biodiversity, local water and erosion regulation.
- Impacts at regional level: high diversity spot and reservoir for wildlife.
- Impacts for farmers: strong autonomy but important knowledge required to manage such diversified system.
- Impacts for supply chains: slaughtering, processing and packaging on farm in local unit
- Impacts for consumers: direct sales on farm, 1 shop in Lisbon . Wide range of products (300): smoked meat, fresh meat, sausages, vegetables (fresh or processed as soups or sauce), fruits, mushrooms, even "acorn coffee".
- Impacts for civil society: educationnal program on rural life and sustainable agriculture, training sessions for students or volunteers, farm visit and tour (pedestrian pathways across the farm).
- Research on nutritional values of acorn and balance of diets.

IN BRIEF: Diversified large farm with accurate management of complementarities between production systems, strong involvement of farmer and workers in their project, connection with local communities, direct marketing.

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Which contribution of the agroecological initiatives to the future of food systems?

Looking at all the CS as a whole, we may define the consequences of AE systems on market issues (the price of products and accessibility for consumer), conservation issues (define by the quality of habitat provided by production systems and the scale of spreading) and society issues (food supply, local identity, rural dynamism, cultural services). Each AE systems should be compared with the baseline defined for each CS. We propose here an attempt of such assessment, based on expert judgement.

For food production, what impact on agricultural yields?

Production of food is a major issue regarding changes in agricultural practices and often used as a hammer argument for intensive systems producing high amounts of food with minimum work inputs and high chemical inputs. The challenge for AE systems is to obtain production levels that would not entail critical shortage in the food market (inducing excessive raise in prices of food due to lower production) while providing high quality products and other benefits at local and global levels.

AE systems are never fully comparable with highly specialized and inputs-intensive conventional systems. When discussing on yield gap between conventional and AE production systems, we may distinguish between three contrasted situations.

- Group A: Redesigned systems partly specialized, structurally comparable with conventional systems. In this group the yield of CS compared to baseline situations shows "yield gaps" of one fifth in average and range from no "loss" to nearly the half in the most unfavourable cases. The use of inputs is much lower than in conventional systems.
- Group B: Redesigned systems where the marketing strategy, quality-oriented, is such that the level of production is not a criterion for the farmer. Yields half compared to baselines, with range from one-third to two-thirds. These AE systems correspond to differentiated market niches.
- Group C: Diversified farming systems strongly differing from conventional ones (e.g. Troldgaarden where one small farm produces in same plots pigs, eggs, vegetables and fruits) or CS situated in contexts where no conventional system would continue food production (e.g. in Burren where high nature value plots would be abandoned without AE management system). Yields are in these cases not comparable to any baseline. However, the contribution of such systems to local and global food production can be very interesting. Diversified systems contribute to supply consumers with a wide range of local products, given that they are all (Montado, ADEPT, Troldgaarden) connected with local consumers. Others (Gaume beef, Burren) manage to produce food on land where it would not be produced in other way.

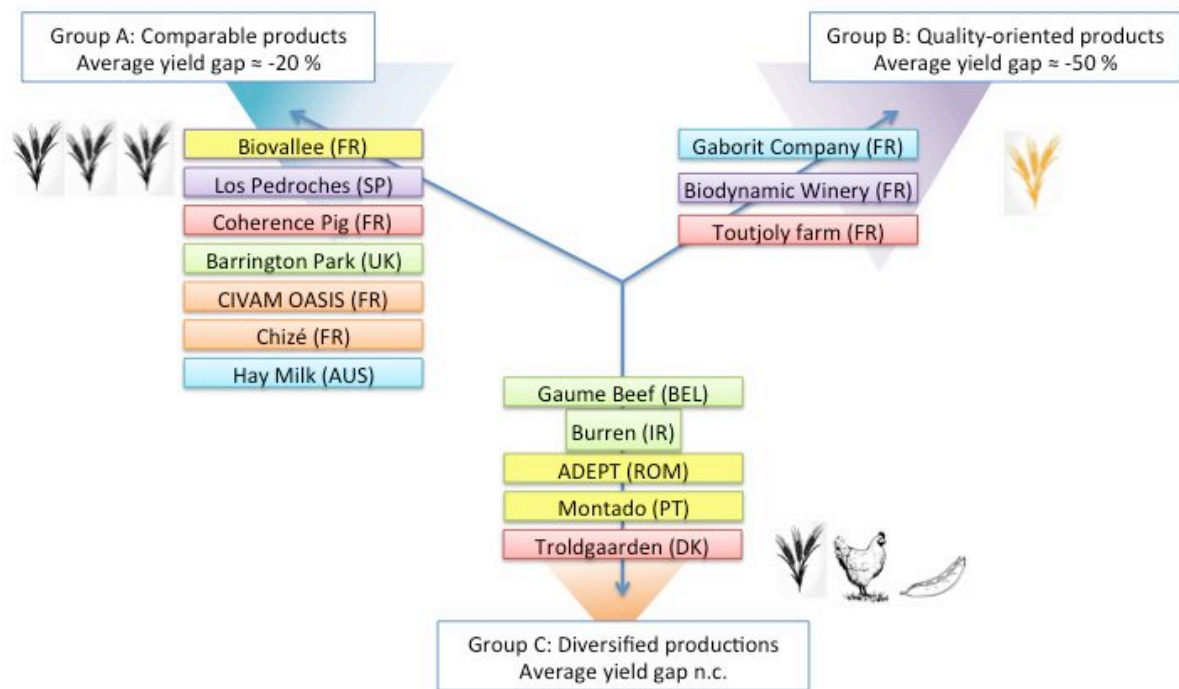


Figure 4: Three groups of CS regarding food production issues

For the consumer, which prices and accessibility of AE products?

Most of the CS shows little increase in prices and good accessibility of products (i.e. that the product goes to the consumer). Some agroecological systems can provide a range of products with little impact on price and consuming habits.

Accessibility is good in 8/15 CS (represented by green arrow pointing up on the Figure 5), meaning that AE products can be found in mass consumption areas (supermarkets in town). It is medium for 5/15 CS (represented by orange arrow pointing straight) in which diverse marketing channels coexist (direct sales, specialized shops, farmers' shops...) but without supermarket commercialization. Accessibility is low for 2/15 CS (represented by red arrow pointing down) in which commercialization channels are very specific, only oriented on local consumption (Trolldgaarden) or niche marketing such as specialized events (Biodynamic winery).

Price of products can be more or less increased: increased by more than 20% compared to the baseline in 3 CS (represented by €€€ in Figure 5), moderately increased, from 10 to 20%, in 9 CS (represented by €€), close to the conventional price in 3 CS (represented by €).

The nature of the products is of major importance. Some products are difficult to produce at high yields with few inputs: perennial crops (fruits, vine and olive trees), vegetables are often highly exposed and sensitive to pests and diseases and require much work for low-input management. The high added value of products and their increase in price is then a necessary condition of farm viability.

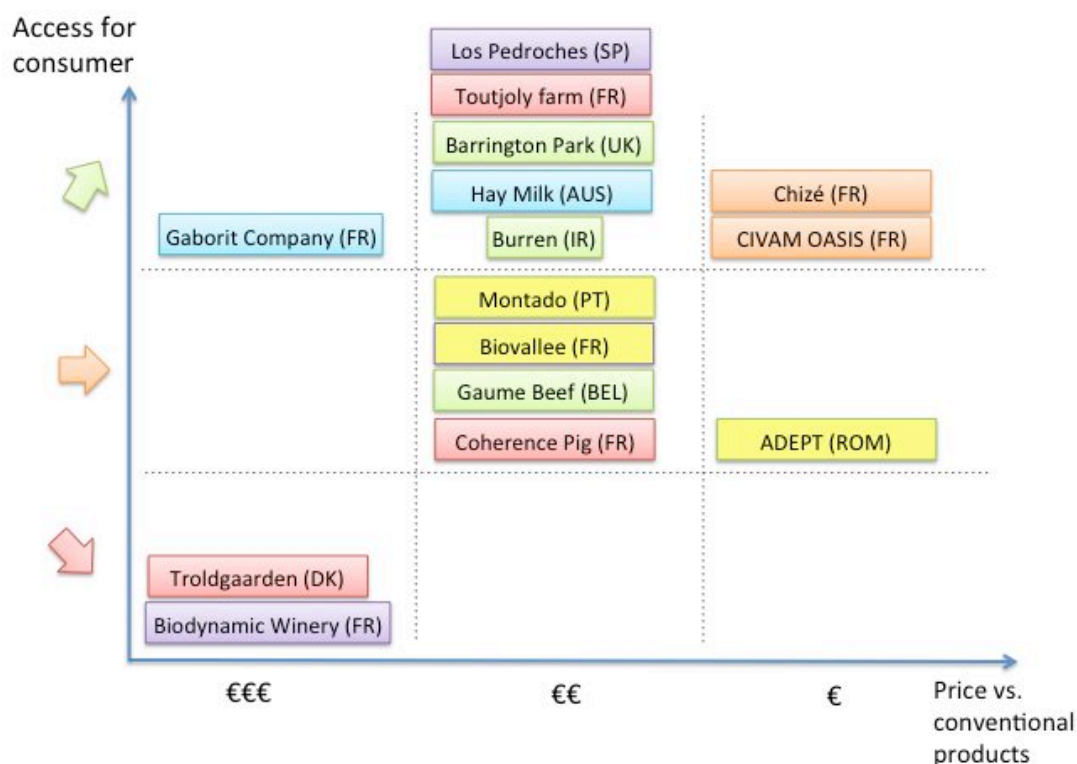


Figure 5: Impacts of Case Studies on accessibility and price of products.

For biodiversity, what potential for conservation?

We assessed qualitatively the impacts of AE initiatives on potential biodiversity conservation. We consider two parameters for biodiversity conservation potential: the quality of habitat - i.e. diversified land use, predominance of semi-natural areas or extensively managed crop areas - and the scale of impact from small farm perimeter to regional level. In this frame, the best trajectory for biodiversity would be to develop farming systems providing high-quality habitats on a large scale.

Four CS developed at territory level (Montado, Hay Milk, ADEPT, Los Pedroches) with strong embeddedness of technical practices in local ecosystems are particularly interesting for biodiversity conservation. The management of landscape elements and adequate practices can allow good impact on biodiversity conservation even in annual crop systems (Chizé, Civam Oasis). Farming systems with high proportion of grasslands extensively managed are also among the best conservation systems (Burren, Gaume Beef, Barrington Park).

On the other side, some CS show little nature conservation potential, due to their inherent nature: conducted on small farms at very local level (Troldgaarden), being based on confined-animals systems (Toutjoly Farm, Coherence Pig) or being in specialized perennial crop (Biodynamic Winery). However, when compared to conventional systems, AE vineyards still seem having a better impact on biodiversity than conventional ones where soil are poorly managed and where massive use of insecticides and fungicides is done. If such systems have limited inherent impact on biodiversity in themselves, they strongly limit off site impacts (pollution) and might even have interesting landscape features.

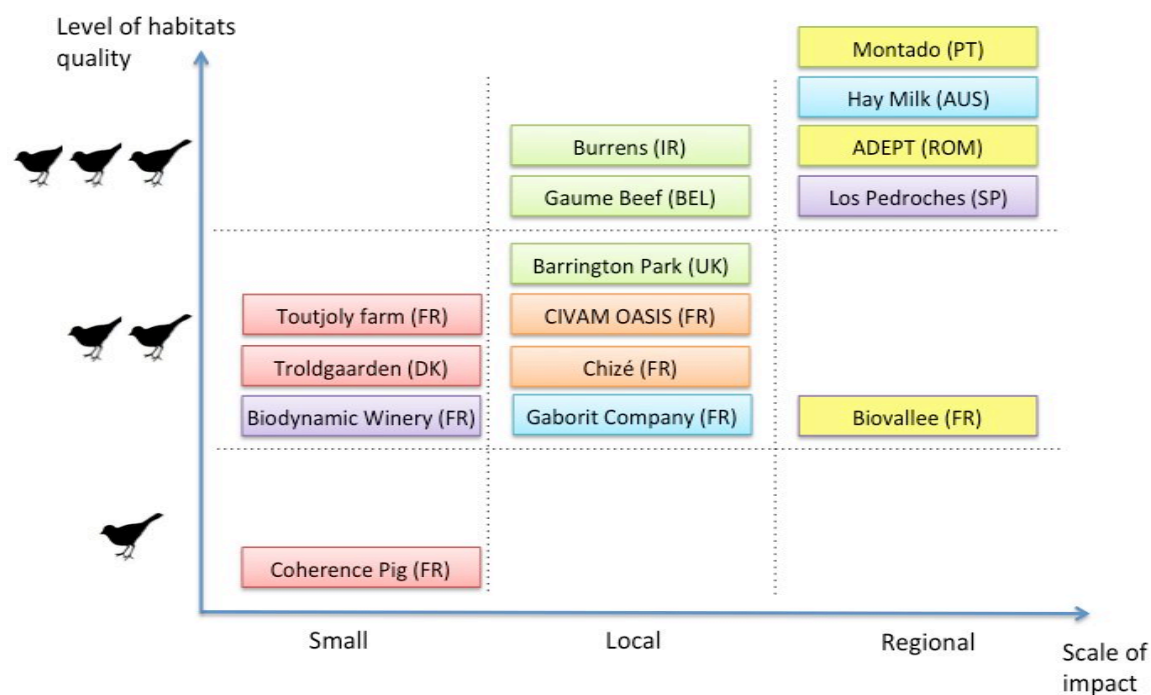


Figure 6: Impact of Case Studies on biodiversity conservation.

What social and economic services of the AE initiatives to society?

Agroecology is expected to support economic and social development of rural communities and global societies. Food production is the first but not only role of agriculture, which contributes to other aspects of economic, cultural and social development of societies.

The services of agriculture to society can then be analysed for the two dimensions of agroecology and food systems:

The vertical dimension of food chain, covering production (restricted to the amount of material produced), supply chains and added value, analysed through the criteria of agricultural yields, local employment in the food sector, supply chain dynamism and generation of added value.

The horizontal dimension of community culture and patrimony, analysed through the criteria of landscape management, identity and animal welfare. Local employment is a more indirect criterion.

Each dimension benefit to diverse categories of stakeholders: farmers, rural consumers, rural workers, urban consumers, rural communities, etc.

We assessed these two dimensions for AE initiatives, by rating qualitatively from -2 (strong degradation of the criterion) to +2 (major improvement of the criterion, 0 being “no impact”) the performance of the AE initiative compared to the baseline, for each criterion (Figure 7).

We distinguish three profiles of CS depending on their performances for horizontal and vertical dimensions.

- Vertical-oriented CS: *Chizé, Civam Oasis, Biodynamic Winery*.

These vertical-oriented CS show good performances for production criterion (i.e. low decrease in production). Local dimensions of economic performances are not better than conventional systems, social performances are also limited excepted for the preservation of landscape. Animal welfare is not rated because these CS have no livestock.

- Horizontal-oriented CS: *Gaume Beef, Trolldgaarden, Los Pedroches, Biovallee, ADEPT, Montado, Hay Milk*.

These horizontal-oriented CS show good performances for most of the criteria. They deeply contribute to local development and the maintenance of dynamic farming activities and communities. Due to the difficulty to compare production levels with any baseline in such CS, we did not attribute any rating for this criterion.

- Intermediate CS: *Coherence Pig, Burren, Barrington, Toutjoly Farm, Gaborit Company*.

These intermediate CS show moderate performances, low for production criterion. They contribute to some extent to local development but are less achieved than the first category, notably for structural reason, e.g. for Coherence Pig the contribution to landscape preservation cannot be very high, as observed for biodiversity conservation purpose.

Agroecological initiatives are promising for rural development for many CS, in particular those with collective dynamics and structuration of local supply chains. Processing of products and direct sales or short supply chain contributes greatly to employment and building of local identity.

Many CS are performing for animal welfare and landscape preservation, in a sense that they build a good image of farming for the consumer and local citizen.

Otherwise, CS can be considered as improving the standard quality of products for either health (reduced pesticides, higher vitamins contents, well-balanced fatty acids, etc.), taste (quality labels or specific typicity) or both.

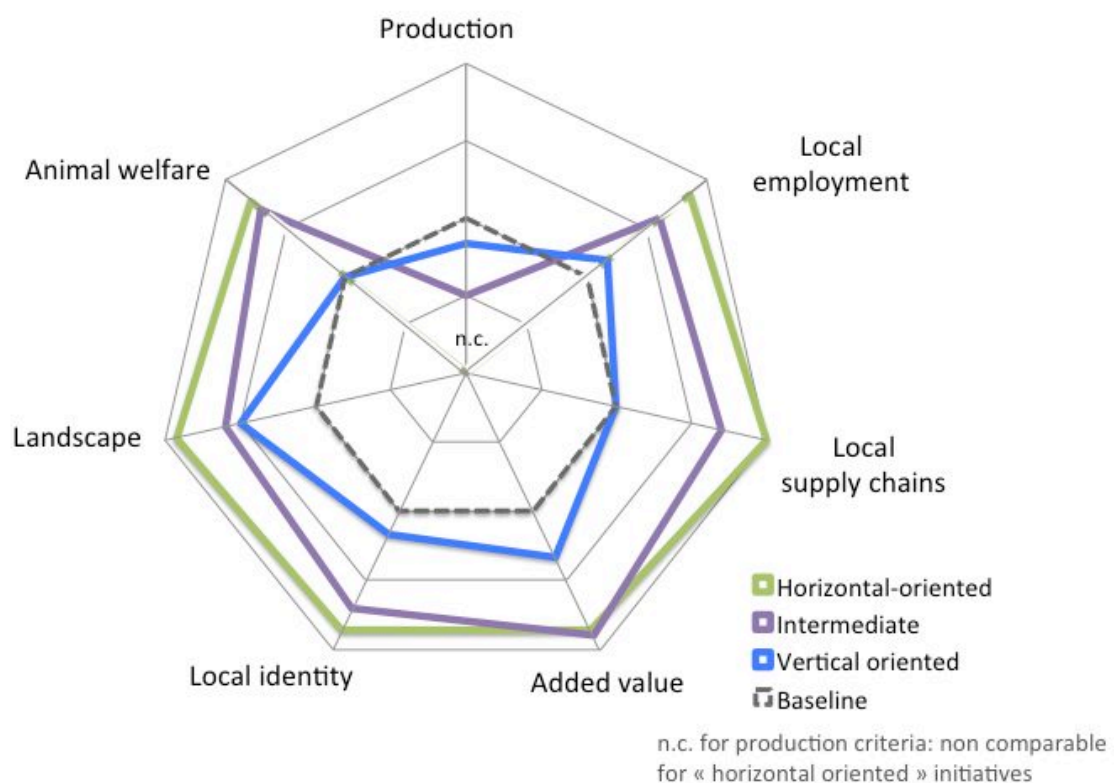


Figure 7: Economic and social performances of CS.

Performances of each category of CS are compared with baseline represented by dotted grey line.

Production criterion is not rated for Horizontal-oriented CS (not comparable, n.c.).

The social factor: a matter of collective dynamics

Agroecological initiatives show the importance of collective dynamics as a success factor. Individual adventures can also be encountered but they are reinforced and supported by relay actors such as groups of farmers or citizen.

Conditions of emergence and success of AE projects appears to be of three main types.

1 - Individual-driven: *Barrington Park, Toutjoly farm, Gaborit company, Troldgaarden, Biodynamic winery.*

Projects at farm level such as Toutjoly farm or Barrington Park rely on the willing of farmers to develop different systems at individual level. Doing this they accept the risk to venture through innovative practices and manage more complex systems. These initiatives come from individual experience of farming with the support of the farmers' family (Toutjoly) or local groups of consumers (Troldgaarden). They might develop networks with similar farmers for knowledge exchange and collective reinsurance and sometimes for further development of the initiatives with collective commercialization strategies (Gaborit, Troldgaarden).

2 – Collective mobilization: *Los Pedroches, Hay Milk, Civam Oasis, Biovallée, Montado, Coherence Pig.*

Farmers' groups or local communities are great melting pots for emergence of Agroecological initiatives, as it facilitates and enhances the individual motivation for change and gives opportunity to share resources, organize complementarities and design the alternative production system as a whole. Necessary development of common rules, governance framework, appears to be factors of reinforcement of such collective initiatives: charts for production (Coherence Pig, Hay Milk), cooperation rules among farmers (Civam Oasis, Los Pedroches), discussion arenas for strategic decision-making (Montado, Civam Oasis). Exchange of knowledge is also very active through these cooperation rooms. Such initiatives organize self-promotion for marketing (advertisement, demonstration events) and to get supports from public authorities (application for public subsidies for innovative projects, recognition as "public interest" initiatives).

3 – Recognition of virtuous systems by external actors: *Burren, Chizé, ADEPT, Gaume Beef, Biovallée.*

These AE initiatives rely on the external intervention of research or environmental institutions who seek their preservation in close cooperation with farms. Researchers and experts have crucial roles as partners for identifying the natural resources and ecological processes to manage (Burren, Chizé). It can also be local authorities willing to value their agroecological assets (Biovallée). Such actors invest time and skills in the co-building of innovative systems or solutions for preserving traditional systems. The identification of local leaders and transfer of the animation of the projects are very crucial phases for the success and longevity of the AE initiatives.

Of course, these categories are not absolute and in many cases, different dynamics are converging. However, it is crucial to understand that there is frequently one social catalyst that coordinate other actors towards a transition dynamic.

The time factor: make it last!

Most of the projects have started more than 10 years ago, temporal continuity being crucial for maturation of ideas and organization of new systems, for people getting to know each other, convincing new farmers, consumers or local authorities of the interest of the project. At each stage the human and social resources mobilized for developing the initiatives comes from different sources and represent the richness of AE initiatives.

Make it work! Grassroot transition success factors

Farming systems more deeply integrated in their territory

The agroecological initiatives show the great importance of integration of farming systems in their territory for developing a range of services.

AE systems develop diverse relationships with other actors of local communities; in first place other farmers for knowledge exchange and cooperation.

Complementarities and collective dynamics between production systems at local level are frequently implemented.

The role of small farms in these complementarities can be crucial, unfortunately such models of farming systems are poorly supported by public policies.

Local authorities can contribute to the development of this cooperation by proposing an adequate frame for farmers to organize together. Sensitize local people, children in first place, to the issues of sustainable farming and food system, is a strategic action to be undertaken urgently. Direct producer – consumer relationships go in this sense but could be better supported, as it is a matter of socioeconomic development.

Research, advisory and development services also play a role in this story, acting as knowledge catalysts and contributing to the commitment of farmers and local communities in sustainability issues, e.g. by providing tools to develop adapted land use and practices for sustainable resource management and landscape preservation.

Food chains more diverse and complementary

The agroecological initiatives appear more or less compatible with current consumption habits. In order to achieve the challenge of developing sustainable food systems, several progresses should be made.

First, current dominant food chain should give more space to agroecological products and encourage agroecological systems, notably by ensuring a fair distribution of added value of products and organizing an active communication on health and taste quality of agroecological products to the consumers. This communication should also be handled by farmers organizations and controlled by independent certification/quality bodies with the help of public authorities.

A second step would be to partly re-localize the food systems by developing alternative food chains, at different scales of organisation. For this, development of on-farm or local processing of agricultural products and direct or semi-direct sales (farmers shops) should be intensified.

Social and technical resources for the development of Agroecology

The performances and consistency of the AE initiatives lie in combination of work, technical and marketing resources. In some CS a synergetic effect can be observed, which explains the good performances of AE systems for most of the criteria.

These good conditions or success factors could be developed elsewhere by upgrading the resources at farm or territory level. Dynamics of empowerment should be implemented for technical resources (knowledge sharing with experienced farmers, collective learning and coaching rather than top-down advice), work resources (facilitating employment, workers training) and marketing resources (training on alternative commercialization, development of local quality labels, communication on quality of products to the public).

Such transition pathways are not all new, most of them exist in our CS. But they should be reinvented every time in each particular context. This adaptive management, making agroecology happen on the ground, is another way to name agroecological innovation.

Epilogue: going beyond the niche

All the initiatives analysed in this document - and all the others taking place in Europe - show that agroecology is already there and that grassroot initiatives, mobilising a lot of energy and skill, are not waiting for policies to happen. However, although it is out of the scope of our analysis, it is clear that upscaling those initiatives would require structural changes in policy making and, more generally, in the way we buy and consume products. The contribution of the proposed outlook is to say: "there is no major technical or organisational obstacle to this when considering the variety of situations and possible productions". Addressing this first step in the debate is critical in the European context. But it is only the first step.

A comprehensive outlook on the diversity of Agroecological initiatives in Europe

Agroecology sets out a vision for future of farming and food systems, based on the management of diversified systems and ecological processes for production issues, and on food chains that do not impose industrial organization to farmers nor consumers. Transition to agroecology requires a good understanding of success stories and already existing initiatives.

Going further than simple description of technical practices and collective dynamics, we propose an in-depth analysis of agroecological initiatives in a diversity of contexts and approaches in Europe. After having precised the criteria of agroecology (low-input farming systems, adapted food chains, etc.), we selected initiatives that cover a wide range of productions (from cereals to meat and other animal products) and food chains (from food industries connected with supermarkets to on-farm process with direct sales at local level).

From the fifteen presented initiatives, we conclude that agroecology can provide food in a sustainable way, with acceptable farm viability, positive impacts on biodiversity ranging from low to very high while guaranteeing accessible, more or less more expansive but healthier products for the consumer.

Our outlook shows that successful initiatives stand on an appropriate local interpretation of the common principles of agroecology. These examples hold valuable lessons for the development of agroecological farming and food chains, strategic issues for the sustainability of European food systems.



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