



## Main actors in the case study area, concerned by the services and dysservices provided by local dairy farming

- Policy makers: Ministry of Agriculture, Fisheries and Food (Spanish Government); *Consellería do Medio Rural* (Regional Ministry of Rural Affairs of Galicia); Provincial councils (for the 4 Galician provinces); Local governments of the 313 municipalities of Galicia.
- Farmer organizations: Unións Agrarias, Asociación Agraria Galega, Sindicato Labrego Galego, FRUGA, Organización de Produtores de Leche.
- Dairy producers organizations: Unión Leiteira Galega, Arolact S. Coop. Galega, Federación Frisona Galega (FEFRIGA), AGACA (Galician Association of Agrifood Cooperatives, which integrates the dairy cooperatives of the region).
- AKIS organisations:
  - o Control bodies of Protected Designations of Origin and Geographical Indications.
  - o Farm Advisory Services: CIAM-AGACAL, Aula de Produtos Lácteos e Tecnoloxías Alimentarias (University of Santiago de Compostela), CETAL, LIGAL, Xenética Fontao, EFA de Fonteboa.
- Specialized Media: *Vaca Pinta*, *AFRIGA*, *Campo Galego*.
- Food chain organisations and milk processing industry:
  - o INLAC (Spanish Interprofessional Dairy Organization).
  - o Main milk processing industries: Lactalis, CAPSA, Leche Celta (Lactogal), Leche Río-Leyma, Feiraco-Clesa (CLUN), Queserías Entrepinares, Nestlé.
- Territory or environmental actors: Regional Ministry of Environment, Territory and Housing. Ecological organizations: ADEGA, Verdegaia. Asociación Galega de Custodia do Territorio.
- Other relevant actors (universities, NGO, consumers, retailers, tourism sector, hunting, fishing and other outdoor activities,):
  - o Universities: University of Santiago de Compostela (Escola Politécnica Superior de Enxeñaría, Facultade de Veterinaria).
  - o Vocational farm training bodies
  - o Foundations: Fundación Juana de Vega
  - o Retailer Organizations: Asociación Española de Distribuidores, Autoservicios y Supermercados.
  - o NGO and associations: Sociedade Galega de Pastos e Forraxes, Asociación Terra e Leite

## Description and key figures

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Galicia is an autonomous region in the North-West of Spain with an area of 29,574 Km<sup>2</sup>, divided into four provinces (Nuts 3): A Coruña, Lugo, Ourense and Pontevedra. The average altitude is 395 meters over the sea level and the maximum height is 2,114 meters. At the Lugo and Ourense provinces, the main area is over 600 m height. Galicia is placed on the western façade of the European continent, bathed by the Gulf Stream. This fact, together with its topography crossed by numerous rivers, determine its climatic variability, ranging from the humid Mediterranean climate type with Atlantic tendency, to the high mountain climate type. In a general way, we can qualify the climate of Galicia as temperate and humid.

In Galicia, most soils develop from acidic siliceous rocks, such as granites, gneisses or schists. The abundance of rainfall causes an intense washing of the soil that leads to an acid pH (4.5-5). Galicia has a rugged orography, so much of the soil is in areas of moderate slope, and therefore is easily eroded. In general, the thickness and degree of evolution of the soils increases progressively from the highlands to the lowlands.

The number of inhabitants was 2,701,743 in 2018, which makes Galicia the 5th Spanish autonomous region in terms of population, with a density of 93.6 inhabitants per km<sup>2</sup>. The 52% are women and 48% men. The population over 65 years old represents 24.9% of total. The unemployment rate reaches 14.4% in 2018. The distribution of employment is as follows: 7.1% Agricultural and fisheries sector, 16.3% Industry, 6.3% Construction and 70.3% Services sector. The Gross Disposable Income per inhabitant in 2018 was 14,019 euros, and the rate of economic and social exclusion reaches 20.3%.

Following the last statistics from 2017, the area covered by arable land is around 14% of the regional surface, and permanent pastures occupy 15%; forest area accounts for 61%, with the remaining 10% accounting for urban and unproductive areas. On the other hand, 391,996.6 hectares, 13.3% of the total area of Galicia, are under a Natural Protection figure. The utilized agricultural area (UAA) that occupy the dairy farms is limited to 8% of the regional surface (183,200 ha).

According to the Farm Structure Survey 2016, Galicia accounts with 8.462 specialised dairy farms, 11% of the total, which own 29.5 % of UAA and 35.2% of LUs. They employ the 18.1% of Annual Work Units (AWU) and generate 38% of the total Standard Output of the agricultural sector.

## Main economic issues in the territory

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The GDP per capita in Galicia in 2017, 22,497 euros, represents 90% of Spanish average, a percentage five tenths higher than in 2016. From the perspective of supply, the most dynamic sectors in 2017 were manufacturing and construction, the most affected by the economic crisis of 2008-2014. The Gross Disposable Income per inhabitant in areas with low population density (ZPP) is only 11,571 euros, compared to a regional average of 14,019 euros. Thus, the rural areas, identified as having low population densities, are those with the greatest weight of mixed income and social benefits over available income. For the whole economy, the labour market is recovering but far away from the level before the crisis. By economic sectors, the one with greater affiliation is the service sector but has a smaller presence in less populated areas. The agricultural and industrial sectors have the highest weight in the sectoral structure of employment in these areas. Economic dynamism, measured by GDP per square kilometre, is lower in rural areas in process of depopulation and higher in urban areas, but also low in active rural areas.

## Main social issues in the territory

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The social aspect considered here is demography and the classification of counties in terms of urban or rural based on demographic, territorial and economic indicators. Following a classification (IGE, 2018) inspired by the Eurostat one (2011), we distinguish: Densely populated areas -ZDP- (990.4 inhabitants/km<sup>2</sup> on average), Intermediate populated areas -ZIP- (225.3 h/km<sup>2</sup>) and Thinly populated areas -ZPP- (with 30.3 h/km<sup>2</sup> on average). We can observe the predominance of Low-Thinly populated areas (ZPP-low, with 20.9 inhabitants per Km<sup>2</sup>, on average) that characterizes the great majority of Galician municipalities. With different dynamics of land use, they have only 14.5% of the regional population. The exception is the Atlantic Coast, where most of the municipalities ZDP, ZIP and High-ZPP areas are concentrated.

The population is characterized by a high ageing index (156.4), higher in the ZPP (276.5), being the average age of the entire population 47 years old (almost 52 years in the ZPP), and the average life expectancy at birth greater than 83 years. The population pyramid is inverted in Galicia but especially in thinly populated areas. In addition, the population is leaving the rural areas concentrating in the heads of counties (ZPP high and ZIP). This abandonment of the population induces a lack of management of the territory, made before by agricultural and breeding activities.

Díaz-Varela et al. (2019) have done a classification of the 53 Galician counties that would help us to describe the main social issues. This classification is based on the following variables: land use, rural-urban gradient, agricultural activity and economic and entrepreneurial dynamism. And result in 4 categories:

- Active Rural counties: with high population density rates and high entrepreneurial density. Pastures for dairy production and non-natural forests are the main land uses.
- Rural in process of abandon: counties where 95% of territory has very low population density rates (Low-ZPP) and at the same time a lack of entrepreneurship activities. One exception is the presence of mineral extraction firms that conforms a little industrial pole.
- Urban-forest counties (UA): the Atlantic Coast with a high degree of urbanization, population dynamism and forest and urban uses of the territory constitutes the main part of this category. At the North, we find very high agricultural yields in contrast with the inland part of this territory where we can see breeding activity but less entrepreneurial presence. Finally, we also include in this category, areas where the expansion of non-natural forests is notorious. Thus, this category includes heterogeneous municipalities: peri-urban and coastal municipalities, as well as high-specialized agricultural and breeding municipalities.
- Urban-Forest-Abandon: here we find two counties placed at the South inland of the autonomous region. Nevertheless, their internal heterogeneity we find a situation of land abandon together with the concentration of population in villages and small towns.

## Main environmental issues in the territory

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Taking as a base the study of Corbelle and Crecente (2014) about the land use dynamics in Galicia, we can describe the main environmental issues in the territory. They distinguish 3 main types:

**Rural urbanized/forested areas.** They are coastal areas where agriculture left place to urban uses. The authors distinguish two types: (1a) where forested areas grow more than urbanization over former culture surfaces and (1b) where the urbanization process is stronger disseminating urban forms in a continuum mix with rural areas. This offers a landscape where constructions, productive forests and intensive agricultural systems (dairy, orchards) are disseminated along the territory. Environmental challenges are derived from this evolution: the urbanization and forestation processes put pressure on high nature value ecosystems (especially coastal ecosystems), intensification and monocultures implies loss of biodiversity and, paradoxically, in the areas where agriculture activity is abandoned the loss of biodiversity and the risk of fires represents important environmental challenges as well.

**Active Rural Areas.** Placed in the centre of Galicia, these areas are characterized by the increasing of Agricultural Utilized Areas (UAA) over other surfaces (shrubs and trees). The dairy activity is mainly located here. Authors distinguish between areas where expansion of agriculture uses are predominant (2a) and areas where breeding (especially dairy) expansion coexists with production forest expansion. Here the landscape is a patchwork of agricultural areas with different degrees of productive intensification, pastures and other cultures; and artificial and natural forests, even with some examples of high nature value. The environmental challenges consist in support the capacity of these agricultural systems for preserving the ecosystem services they provide at the same time that we preserve biodiversity and environmental quality. The excess of dejections and plastic wastes constitute an important negative effect.

**Abandoned Rural Areas.** Placed at the east and southeast of the region, it is formed by areas where shrubs and natural trees have increased in last decades at the expense of former cultures and pastures. Once more, we can distinguish two sub-categories: (3a) areas where the most important evolution was the expansion of natural forests and (3b) where shrubs areas increase the most. This evolution is the consequence of a process of depopulation that is perceived even in the disappearance of the primary production and their industrial related activities. Landscape has experimented changes sometimes permitting the development of natural ecosystems without human disturbances. Nevertheless, the permanence in time of human activities gives shape to particular landscapes with high value now in risk. Thus, the environmental challenge is to protect these landscapes and the ecosystem services provided by them maintaining the human activities in the territory and, in the other hand, preserve the elements of high natural value and their capacity to enhance biodiversity.

## Main agricultural issues in the territory

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Agriculture represents 3.4% of Gross Value Added and 4.3% of employment in the Galician economy, a major importance in comparison with other European countries. Agriculture in addition with processing industry constitutes one of the most relevant value chains in Galicia, especially in inland territories.

In a short period, an important number of farms have disappeared and now only 76,000 thousands remain. A strong process of ageing (1/3 of farmers are more than 55 years old) has accompanied the loss of agricultural employment. In extended areas of rural Galicia, the professional agriculture does not exist and none economic activity replaced agriculture in generating employment.

Agriculture modernization produces a huge disappearance of the number of farms, the diminishing of the UAA managed by farms and a process of land abandonment. In Galicia the UAA represents 21% of total surface meanwhile in the whole State this figure is 47%. The increasing volume of abandoned land or forested land has important consequences in terms of economic and environmental sustainability. In addition, the scarcity of land available for farms remaining in the territory constitutes a limit for their economic viability in a scenario of increasing price volatility.

Work productivity and income per farm in Galician agriculture is under the Regional, State and European average. This fact is explained by a lack of efficiency in the use of available resources linked to the small dimension of farms in terms of UAA.

Galician agriculture is specialized in animal production. The lack of development of vegetable production for human and animal alimentation together with the weakness of the agri-food industry, gives a strong deficit of the external balance for the agri-food sector.

## Main dairy farming systems in the territory

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The evolution of the Galician dairy sector in recent decades has been characterized by a strong reduction in the number of farms, an increase in the productive dimension and a growing intensification, reflected in the increase of the stocking rate (number of animals per hectare) and in the increasing use of feed concentrate. This intensification increases as the size of the farm increases. At the same time, milk production has been concentrated on specialized dairy farms, and the production weight of diversified farms is marginal.

A survey carried out in 2010-2011 on the base of a representative sample of the entire sector in Galicia concluded that two types of systems could be distinguished in a simplified way (Sineiro et al., 2012). The first one, more linked to the territorial base, encompasses a good part of the smaller farms that practices grazing and obtains between 5,000 and 10,000 litres of milk per hectare of UAA. The weight of older farmers who have no successors is greater in this group of farms. The second one, where most of the medium and large farms are located, is more intensive with production of more than 15,000 litres/ha. These farms dedicate a large part of their area to forage maize and use a complete feed ration. In this second group, company holdings are more important.

In recent years, associated with a strong increase in the price of ecological milk, ecological milk farms have multiplied by three, surpassing 100 farms in 2018. According to CRAEGA data, the average size is 40 cows in production. However, we are still talking about a very small percentage of Galician milk production.

# New challenges for dairy sector sustainability in Galicia

**Date of the Workshop:** 20 June 2019

Type of participants	Number of participants
Farmers	2
Technicians/technical support	3
Agri-food industry	1
Municipalities/local communities and administrations	1
Parks/natural official office	1
Universities/agricultural high schools	2
NGO (ecologist)	1
Others (association of agricultural cooperatives)	1
Others (Friesian Cattle Breeders Association)	1
<b>TOTAL</b>	<b>13</b>
Organizers-facilitators (USC team researchers)	5

## Analysis

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> <li>• (SOC) Professional vocation, good training and farmers' capacity of adaptation.</li> <li>• (SOC) Strategic role of the dairy sector in rural development (in the counties considered, inland areas of the northern half of Galicia).</li> <li>• (ECO) Image of Galician milk as a quality product (especially in the Spanish market).</li> <li>• (ECO) Competitive sector in the production of raw milk (dairy farms).</li> <li>• (AGR) Land availability in some counties/ municipalities.</li> <li>• (ENV) Favourable climatic conditions for the dairy production (potential availability of forage resources).</li> </ul>	<ul style="list-style-type: none"> <li>• (SOC) Increasing difficulties in finding labour force for dairy farms.</li> <li>• (SOC) Lack of generational renewal in much of the holdings; high rate of disappearance of dairy farms in recent decades and up to the present.</li> <li>• (ECO) Lack of economic analysis and criteria of farmers when making decisions.</li> <li>• (ECO) Low added value in the Galician processing industry, given its specialization in packaged milk.</li> <li>• (ECO) Low milk prices paid to Galician farmers, compared to neighbouring regions.</li> <li>• (ECO) Weakness and poor functioning of the dairy interprofessional organization.</li> <li>• (AGR / SOC) Land scarcity and difficulties in expanding the area of farms, linked to the lack of planning and regulation of land uses; land fragmentation.</li> <li>• (ENV) Low level of environmental sustainability (in dairy production).</li> </ul> <p>There was no agreement among participants to consider the following aspects as weaknesses (but these issues were pointed out by some of them):</p> <ul style="list-style-type: none"> <li>• (SOC) The lack of a public advising entity for farmers which would not be mediated, conditioned, by commercial interests.</li> <li>• (ECO) Dependence of farms from public supports.</li> </ul>
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• (SOC / ECO) Strengthening of cooperative structures, including their participation in industrial milk processing projects.</li> <li>• (ECO) Short-term improvement of the industrial processing capacity of milk in Galicia, resulting from the ongoing projects.</li> <li>• (ECO) Increasing demand for dairy products.</li> <li>• (ECO / ENV) The reduction of the number of dairy farms offers the possibility of increasing the territorial base of remaining farms to reinforce their (economic and environmental) sustainability.</li> </ul>	<ul style="list-style-type: none"> <li>• - (SOC) The negative perception of animal products consumption and the growing concern for animal welfare.</li> <li>• (SOC) The lack of public policies capable of maintaining or attract population in rural areas (housing, services, amenities...).</li> <li>• (AGR) Risk of a further expansion of eucalyptus and other forest species, which reduce even more the land available for agricultural holdings.</li> <li>• (ENV) Climate change and carbon footprint increment.</li> <li>• (ENV) Contamination of water, and more generally contamination by agro-chemicals overuse.</li> </ul> <p>There was no agreement among participants to consider the following aspect as a threat (but it was pointed out by some of them):</p> <p>(ENV) The possible adoption of drastic environmental policies which do not consider the different local circumstances or conditions</p>

## List of issues

Type	Issue	No. of votes*	Rankings
(SOC)	Spatial and land use planning	8	1 <sup>st</sup>
(ECO)	Redirect public subsidies to meet the real needs of the dairy sector (employment, land, local production, ...)	5	2 <sup>nd</sup>
(SOC)	A communication strategy from the sector to society so that it would be aware of the multifunctionality of dairy production	5	2 <sup>nd</sup>
(SOC)	Improvement of the services and the living conditions for the population in rural areas	5	2 <sup>nd</sup>
(ENV)	Improvement of the environmental aspects of dairy production systems (biodiversity, nitrates, soil erosion, ...)	5	2 <sup>nd</sup>
(ECO)	Strengthening the dairy processing industry of Galicia	3	3 <sup>th</sup>
(ECO)	Investing in quality products and local markets	3	3 <sup>th</sup>
(AGR/ECO/ENV)	Setting up a public advisory service for farmers	3	3 <sup>th</sup>
(ECO)	Strengthening export capacity	2	4 <sup>th</sup>

## Services and dysservices and indicators used to measure them

Category	Description	Indicators	Specific dairy farming systems (if relevant)
Provisioning	Service Conventional milk production	Volume of milk produced, monthly invoicing, agricultural income	Intensive systems
Provisioning	Service Production of differentiated quality milk	Volume of milk produced, monthly invoicing, agricultural income	Extensive systems Organic systems
Provisioning	Service Meat production (fattening calves, fattening finished cows ...)	Number of cattle, meat production, agricultural income	Not relevant
Provisioning	Service Direct supply of processed dairy products (cheeses, yogurt, pasteurized milk, ...)	Volumes produced, income for farms	Not relevant
Provisioning	Service Fodder production	Yields per hectare, economic value	Not relevant
Provisioning	Service Heifers for rearing	Breeding rate (% heifers on total cows)	Not relevant
Rural vitality	Service Direct employment on dairy farms	Number of people working on dairy farms (by type or category) Number of annual work units (AWU)	Not relevant
Rural vitality	Service Employment in the dairy processing industry	Number of jobs in the dairy processing industry located in rural areas	Not relevant
Rural vitality	Service Employment in activities that supply inputs to dairy farms	Number of jobs in these productive branches in rural areas	More important in the intensive systems
Rural vitality	Service Employment generated in other local economic activities by income from dairy production (trade, other services, ...)	Number of jobs in trade and other local services	Not relevant
Rural vitality	Service Economic activity and incomes from dairy production contribute to the maintenance of services (public and private) in these rural areas, stopping or slowing their depopulation	Demographic indicators of dairy production areas, compared to those in other rural areas of inland Galicia	Not relevant
Rural vitality	Service Timetable flexibility in dairy production, which makes it easier to reconcile work and family life than in other sectors		Not relevant
Rural vitality	Dysservice Labour conditions on dairy farms (high workload, absence of holidays and days of rest, ...)	Percentage of dairy farms in which workers do not have annual holidays	Not relevant
Rural vitality	Dysservice Persistence in Galicia of a negative social image of agricultural work, which makes it difficult to maintain or attract young farmers		Not relevant

Rural vitality	Dysservice Deterioration of the rural road network by the machinery of the dairy farms		Stronger in intensive systems
Cultural heritage and quality of life	Service To the extent that the dairy sector helps the settlement of the population with a link to the land, it contributes to the preservation of cultural traditions	Number of popular celebrations	Not relevant
Cultural heritage and quality of life / Environmental	Service Landscape conservation		Not relevant
Cultural heritage and quality of life	Dysservice Problems generated for non- farmers residents and visitors (bad odours, noise, stained paths, ...).		More important in the intensive systems
Environment	Service Cleaning and shaping shrub and forest linked to forest fire prevention. Brake on forest monocultures expansion	Number of forest fires (comparison between dairy production areas and other rural areas of Galicia)	More important in the extensive systems

### **List of Innovative practices likely to improve sustainability and competitiveness of dairy farming**

Innovation title	Factors that prevent the adoption	Types of farms that have developed these practices or that are interesting regarding these innovative practices
<b>Enhancing services</b>		
Development of tourism activities linked to dairy farms		Extensive/ Organic
Precision feeding with the use of additives	Lack of an adequate differentiation of the milk price, distinguishing quality degrees	Intensive
Diversification of the production and the income sources of the dairy farms	Lack of an industrial/ commercial structure that would encourage the development of other activities	All
Creation of a pool of qualified workers for the dairy farms	A bad social image makes it difficult to find workers for farms	All
<b>Reducing dysservices</b>		
To create a certification label that commits to the entire sector and that guarantees environmental quality, traceability, animal welfare, ...	The weakness of interprofessional bodies	All
A continuous campaign enhancing professional values of dairy farmers	Lack of coordination of the sector/Lack of lobbying	All



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