

Pyrenees Study Area for LEDDRA

LOCATION:

The Pyrenees study area is located in the Spanish Central Pyrenees (42° 36' N, 0° 00' E), in the Sobrarbe area (Huesca province, Aragón region). It includes the municipalities of Torla, Broto, Fanlo, Puértolas, Tella-Sin and Bielsa, with 89302 ha (Figure 1), all of them have some of their lands inside the Ordesa and Monte Perdido National Park (PNOMP) and its peripheral protection zone. This national park is the second oldest of Spain and one of the oldest national parks in the world. The declaration date as a national park is from 16 of August of 1918 with an original protection area of 2.100 and posterior expansion in 13 of July Law 52/1982 to 15 608 ha, which including the periphery protection zone cover 19.900 ha.

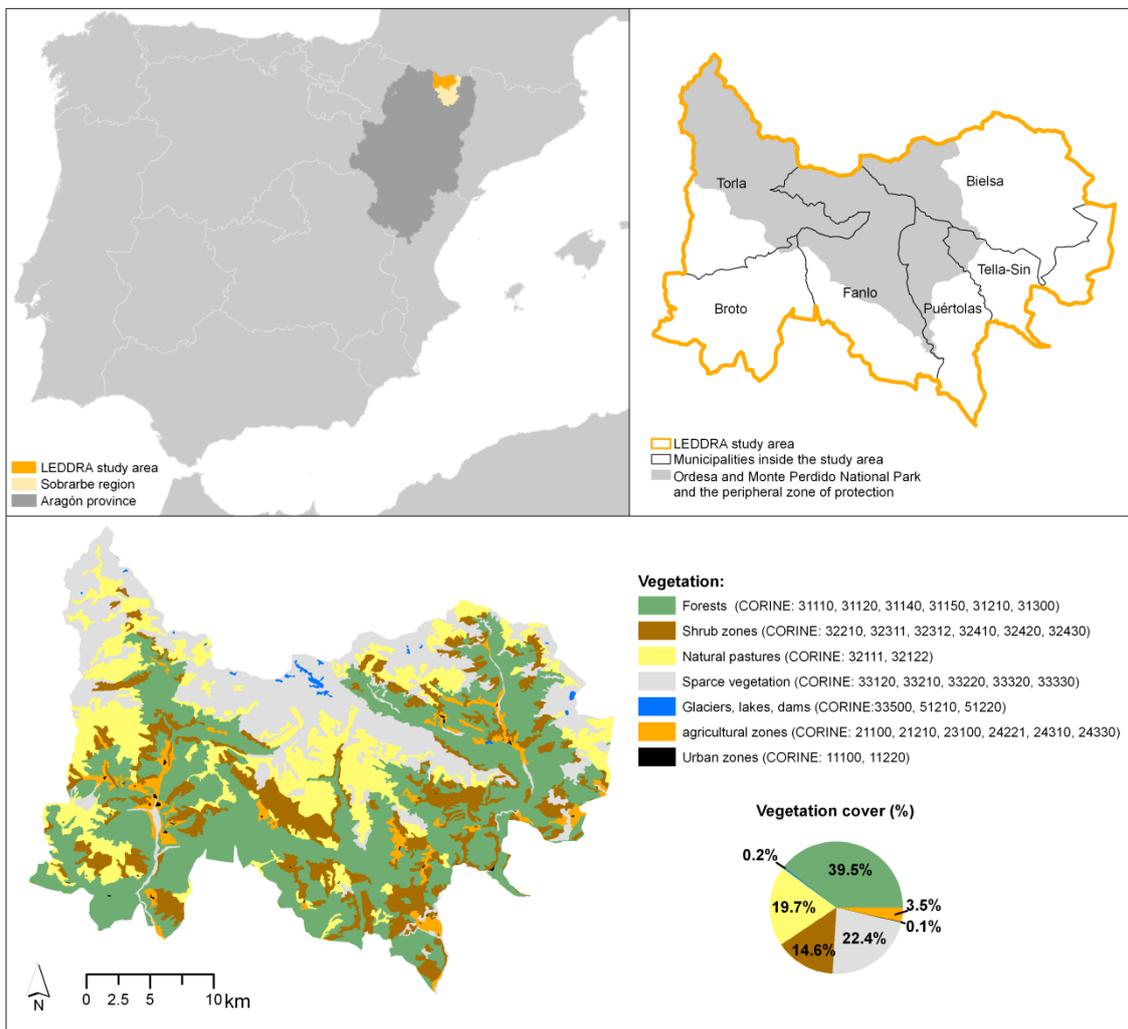


Figure 1. Study area and the CORINE Land Cover map

ENVIRONMENTAL PROFILE:

One of the most determining factors of the history of high valleys of the Sobrarbe has been its persistent isolation until recent times. An injured geography has served to conserve these places, the popular architecture and many ancient traditions. The altitudinal gradient is very remarked in the study area; between 560 in the bottom of the valley and 3.355 m a.s.l. Monte Perdido summit, the highest calcareous mountain in Europa, modulated during thousands of years because of the glaciers and karstification processes.

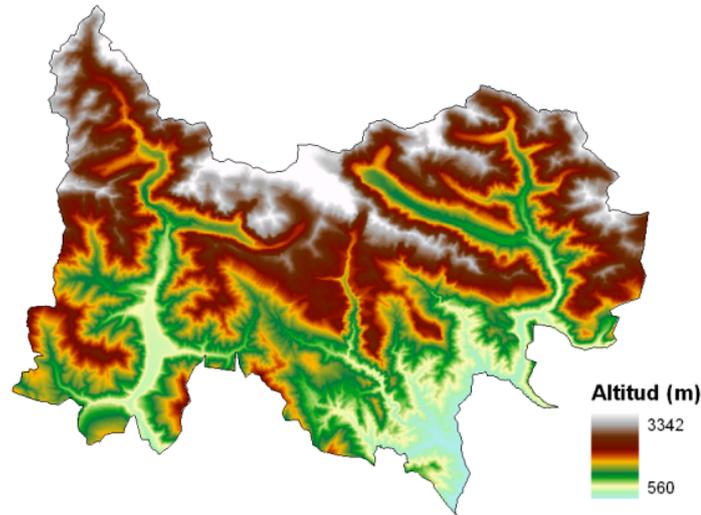


Figure 2. The altitudinal gradient in the study area

The climate of the area can be described as a continental climate with Mediterranean influence. In the Góriz station (2.215 m, 42°40'N, 00°02'E inside the study area), the average annual rainfall was 1.750 mm ranging between 1.100 and 2.500. The average annual temperature is 5°C with the lowest averaged monthly temperature in January is -0.7°C, and the highest average monthly temperature in July was 13.0°C. Snow cover usually persists from the beginning of November to June. But the heavy altitudinal gradient causes that the climate in the valley is very different from that in the top of the mountains, at 2.215 meters. In the Valley average monthly temperature are highest and the snow cover is sporadic.

The vegetation is also influenced by those gradients. In the ±22.5% of the study area, in the highest sites (>2.400 m) and moderate slopes, the vegetation cover is less than 40% with sparse vegetation. Subalpine grasslands actually extend approximately between 1.750 and 2.400 m altitude (±19.7% of the study area). This is the result of anthropogenic disturbance based on grazing and burning combined with to the climate, although, 1.000 years ago forest limit reached 2.000-2.100m. Underneath the subalpine grasslands we found the shrub and forest communities (±14.6% and 39.5 of the study area). The agricultural zones are located in the bottom of de valley, near the town.

DEMOGRAPHIC & SOCIO-ECONOMIC PROFILE:

Population density declined considerably during the last century. Population density is 2 habitantes/km² in 2009, whereas 6 habitantes.km² where living in the area in the 50th. Between 1970 and 1980 the Sobrarbe population declined 55% as a consequence of the emigration of people to the industrialized neighbour areas and the abandonment of rural life. **Figure 3** shows the population dynamic from 1900 to 2009 for the 6 municipalities of our study area.

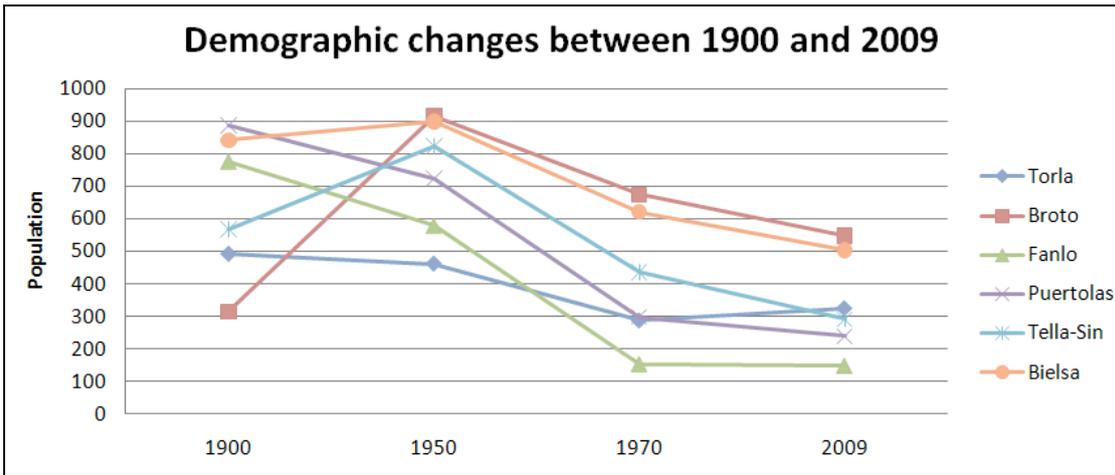


Figure 3. Population in the study area

The traditional economical activity in this mountain area has been centred on agro-silvo-pastoral activities and a reduced artisan industry. During the last decades, this activity has been decreasing and new activities appear in the area that are increasing; tourism, hydroelectric business, and skiing infrastructures. Table 1 presents the main activities in the region. Dominant activities in the area are still agriculture and livestock production, followed by tourism and services.

Table 1. % of the people that work in different activities in the municipalities of the study area

	Torla	Broto	Fanlo	Puertolas	Tella-Sin	Bielsa	
Agriculture and livestock	47.1	45.3	78.8	52.3	10.6	19.8	%
Hotel, restaurants and services	32.8	19.3	9.1	9.2	20.4	35.6	%
Professionals graduated in sciences and engineering	3.9	6.6	-	-	4.4	9.0	%
Specialized workers of the building industry	1.5	6.1	-	10.8	9.7	6.2	%
Specialized workers of the mining and metallurgy	2.5	2.2	-	7.7	11.5	4.5	%
Operators of facilities and machinery	1.5	2.2	-	7.7	4.4	3.4	%
Non specialized workers	-	3.9	-	3.1	15.0	5.1	%
Other works	10.8	14.4	12.1	9.2	23.9	16.4	%

PRINCIPAL LEDD PROBLEM:

The traditional land use is changing and those changes affect the landscape. Agro-silvo-pastoral activity is decreasing and the consequence is the progressive diminution of the grasslands use leading to increase in shrub and forest cover. The Governing Plan of Use and Management of the PNOMP (with is inside the study area) establishes the special protection of the traditional cattle activities with the conservation of grasslands, that have contributed modeling the landscape of the park and to form some of their more characteristic ecosystems, but in this areas we can also observe the woody encroachment on the grassland areas and the negative feedback effect on livestock production which accelerate grazing abandonment. On the contrary, during the last decades, the tourism has been acquiring increasing importance and it represents an important source of income in the local economy. The tourist affluence in the PNOMP, have more than 600.000 annual visitors,

concentrated essentially in Torla, door of the Ordesa valley. The concentration of people and vehicles (with more than 480 daily tourism and 10 buses) caused, years back, multitude of problems in the state of conservation of the park. The mountainous areas around are used for skiing, canyoning, climbing and hiking.

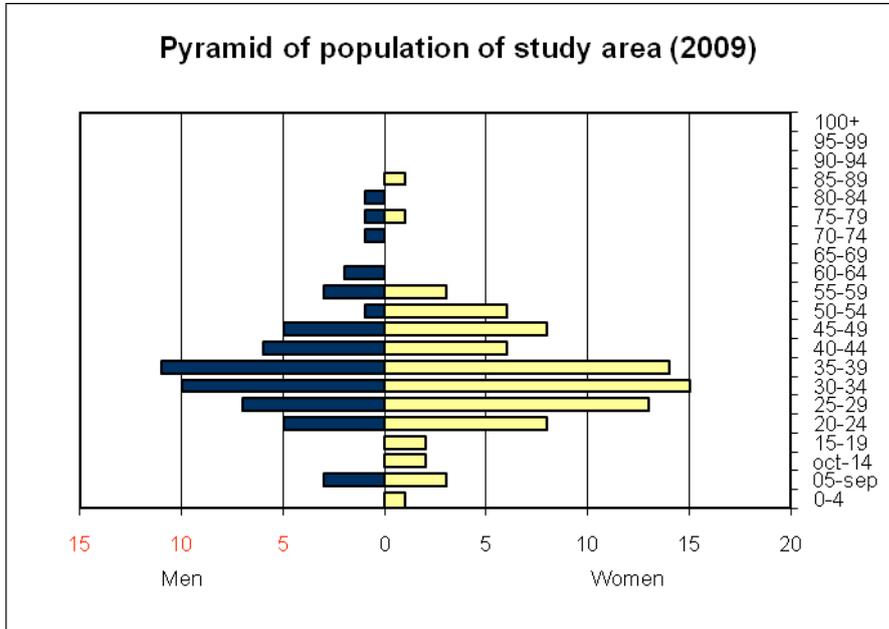


Figure 4. Population structure in the study area in 2009

The population structure corresponds with an aged and regressive population. The population is also sex unbalanced, with there predominance of women over men, contrary of what is expected for rural areas, when the main activities are agriculture and livestock husbandry. According with 2009 information, 75% of the population is dedicated to the sector services.

The per capita rent available for 2007 is ranked in order of size in **Fig. 5**. The Sobrarbe community (including its 19 municipalities **Fig. 6**), which include our study area is the one with the highest value in Aragon region.

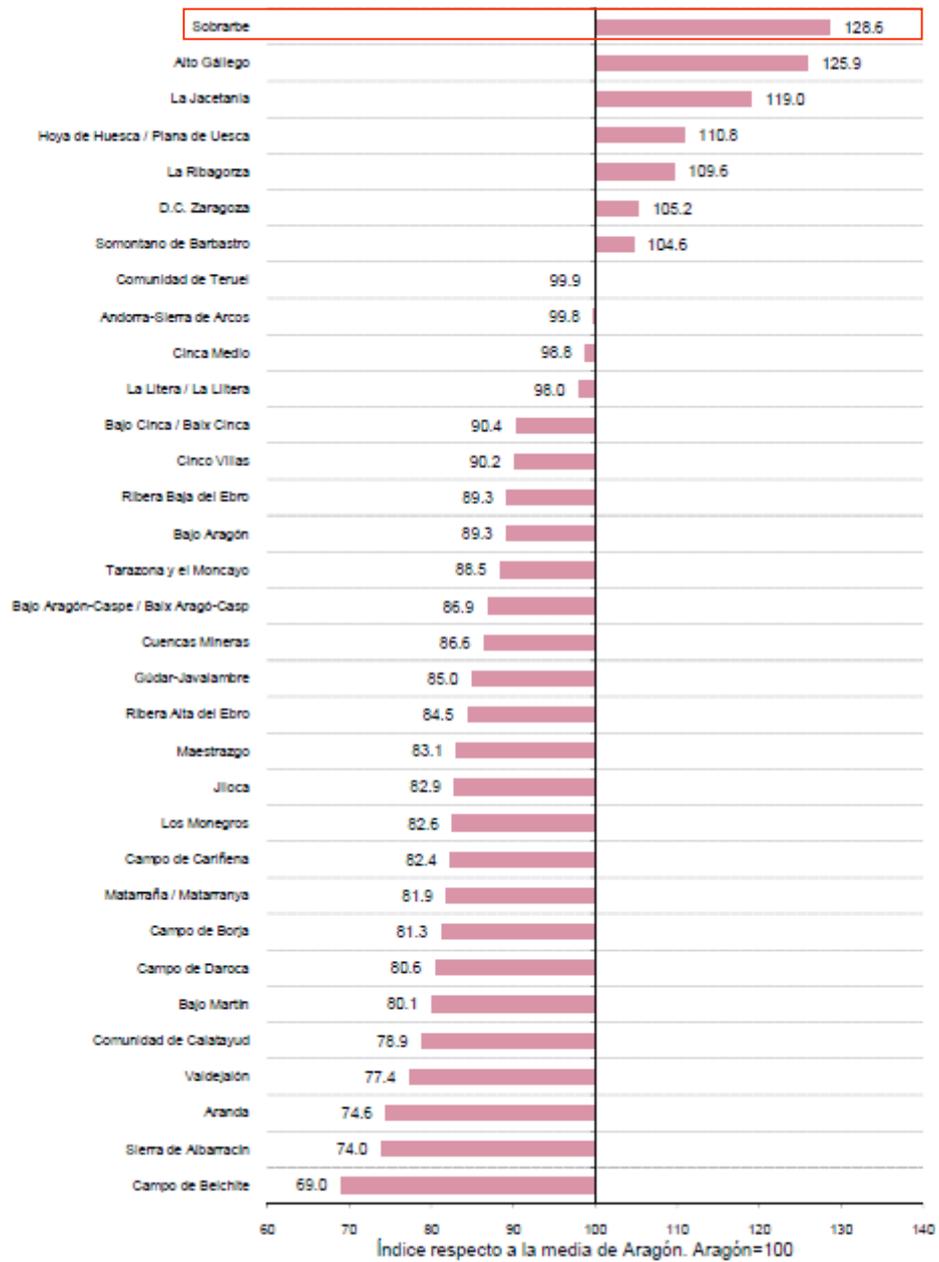


Figure 5. Ranked per capita rent from Aragon communities

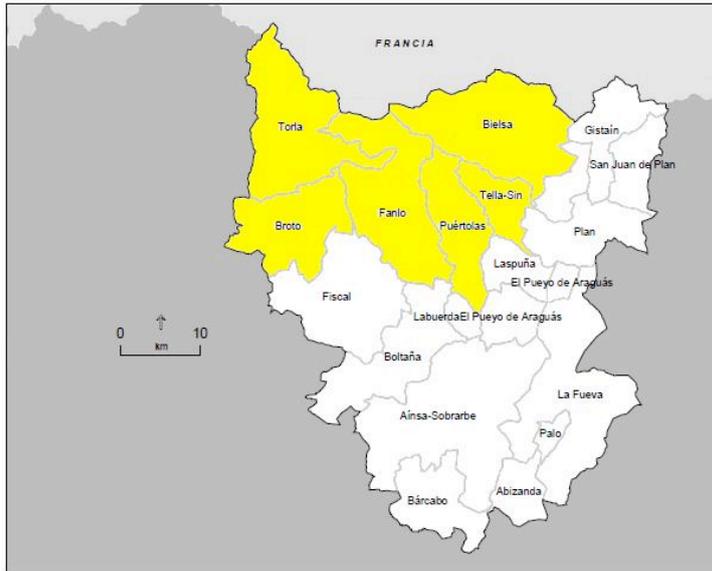


Figure 6. Sobrarbe community

4 of the 6 municipalities of our study area have the greater level of rent. They correspond with the municipalities with greater influence of the PNOMP. Fanlo, municipality traditionally cattle dealer has duplicated to its rent in the last 10 years.

RESPONCES to LEDD:

Main laws affecting the area are:

Law 5/2007 Natural Park Network. 42/2007 Law of Natural Patrimony and Biodiversity. This law establish the regulatory basic regimen for conservation, sustainable use and restoration of natural legacy and biodiversity.

Real decreto 409/1995, from March 17 (Agricultura, Pesca y Alimentación), which establish the Management Plan for the OMPNP (Plan Rector de Uso y Gestión del Parque Nacional de Ordesa y Monte Perdido).

Real decreto 1229/2005, from October 13, which regulate public subsidies in the socio-economic area of influence. They are provided annually to improve infrastructures, cultural and social activities in the rural areas.