

# Catalonian Agriculture

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In Catalonia we can not speak any more of the rural space as an exclusively agrarian space. In wide territories rural space has turned into a multifunctional space where agriculture is one of many activities, and not always the most important. To a morphologically broken space, with great climate contrasts, agriculture has responded by adapting in multiple ways, that, along with the different sociostructural and economic situations results in a wide variety of agricultures, with different developing levels and multiple forms of using land in a contrasting landscape that notably varies at very short distances.

Catalonia represents a 6,32% of the state territory, but has less than the 5% of its surface for cultivation. The cultivated surface is worked on by a 5,4% of the total active state population and from which the 5,7% of the total farmlands and 11,8% of the total agricultural production is obtained.

This is, a highly efficient agriculture and amounts to over half of that of the entire state. This is mainly due to a high technification level applied in a high percentage of farmlands.

More than half a century ago, agriculture was no more that main resource activity of catalonian economy, but the transformation process is much more recent. In less than 20 years, Catalonian agriculture, from being a traditional one, has developed into a modern, widely mechanized and strongly specialized agriculture whose productions follow the changing demand of a continuously developing urban population with growing acquisition powers.

Most of the changes follow the adoption of a new nourishing model in which animal proteins have replaced vegetable proteins and in which low calories food prevails.

First of all we will analyze agriculturals evolution in the last decades stressing next on the new characteristics of the present agriculture, created mainly since the 60's this fast adaptation process towards new orientations in agrarian products demand.

The transformation of agricultural assets into *standard man days* allows us to know the proportion in which farm work is done by the owner himself, his family or by waged labour contracted.

A substantial reduction in the number of wage earning workers has been due to the mechanization of agricultural works, and among other motives because of the imposi-

lity to compete with industrial wages. Thus, a high proportion of work is done by the farmer with the help of his own family. The number of work units per farmland is less than one for the whole Catalonia, although this figure varies notably in different regions, that is, in a high proportion the existing farmlands do not even generate enough work for one person, working full time.

Part time agriculture is a clearly generalized fact mainly in suburban and turistic areas. Only the 53.8% of the total *standard man days* belong to farmers work. A 31,1 belongs to members of the family's help and the rest is waged earning work (15,1%) of which 55,5% is permanent labour, and the rest temporary, the latter appears mainly in woody cultivated areas (fruit trees, olives, vineyards) that usually need additional labour for the harvest which can not be done mechanically.

Livestock production represents more than 65% of the total agrarian production in Catalonia, in some regions, this percentage is even over 80%. As it happens in industrial areas, Catalonia has oriented its agriculture towards livestock production. Most of the agrarian production is at it's service.

## **1. Catalanian agricultural evolution since 1800. Antecedents of the present situation.**

The XIXth century catalonian agriculture is characterized by its scarce dinamism and its extensiveness. The production increase was obtained by the growth of the cultivated surface, rather than by an intensification process.

In spite of the slow introduction of some of the technological knowhow coming from Europe, the improvement of the working instruments and the generalized use of guano from Peru and Antilles. Due to the constant fall of cereal prices the surface where the fallow was practised mormally, withdrew slowly. This withdrawal was produced mainly in the vineyards which gained land due to the constant increase of wine princes, mainly between 1868 and 1880 when phylloxera attacked the french vineyards.

Then, the vineyard surface gained its maximum extension, by converting woods into beds and terraces by ploughing these new lands and making them suitable. The output obtained by these marginal surfaces was scarcely compensated by the high prices. In 1878 phylloxera made its appearance from the North-east of Catalonia, and just in 10 years, it ruined all the vineyards. The recuperation with the new american stems was not possible, because of lack of adaptation, in the antique land of the vineyards and the cereals grew once again and the wood recovered a good part of its old possessions.

Other agricultural products accompanied wine in exportation such as products coming from typically mediterraneum traditional crops of the catalonian field. On one side, the olive tree with very favorable prices until 1860, increased its production in spite of the very low temperatures of the 1st third of the XIX century, on the other side, almond tree and hazel nut planted mainly in the fields of Tarragona and Reus had become its commercial center.

But the olive price fell since 1870 because of the competition in the foreing trade from the italian oil and other vegetable oils from the interior. Other crops acquired increasing importance during the XIXth century like the sugar beetroot, that fell at the end of the century, or the potato that was introduced since the French War (1808-14) in the human diet and rapidly gained importance in the subsisting agricultures, and also in the nearby crowded areas, that is, in the Maresme and Baix Llobregat where the cultivation of various vegetables was growing slowly.

Associated to the cereal crops was sheep, the cattle predominant in Catalonia, that exercised a transient movement among the highland pastures mainly of the Pyrenees area and the cereal growing areas of the interior.

Since 1900, with the increase of irrigated land and the diffusion of the chemical fertilizers, an increase in the performance of crops and cattle slowly substituted sheep. The increase in the number of cattle was produced, on one hand in the urban areas, and on the other, slowly in the Pyrenees where the crops of fodder started to displace the well marked policultivations starting a mountain specialization in productions most suitable to it.

## **1.1 Changes in the First third of the Present Century.**

During the present century's three first decades the cultivated surfaces dropped (43,1% of the total in 1907, 38,6 in 1935). This recession was even more emphasized during the years of the civil war. In 1930, the distribution of the cultivated surface was still dominated by the three main mediterranean crops, wheat the basic cereal in diet, the vineyard and olive as commercial crops that were participants in exportations. The three cultivates totaled a 70% of the cultivated surface, the growth of wheat increased its extension thanks to a protectionist policy in order to face importations, that were even prohibited for some years.

At the same time, some regions diversified their production with new crops. In the irrigated lands of the interior, fruit plantations started and were alternated with cereal crops. In the Maresme area the 1st season's potato production increased and were destined to exportation.

Since the beginning of the century, the active agricultural population dropped while industrialization advanced. In 1900 more than half of the active population still worked in agriculture, but in 1920 it had lost this main role, and in 1930 only a fourth part of the active catalonian population worked in the agrarian sector.

In 1930, even though the main component of the catalonian livestock was sheep, with almost 655.000 heads, cattle increased to 150.000 (56.191 in 1891) while pigs continued to be a complementary livestock with a very poor commercial plan.

## **1.2 The 1936 War and the Autarchic period.**

The 1936-39 war ends this period of change and expansion and in consequence cause a retreat in the catalonian agriculture, that later needed a modernization effort during 1960-70's to be in the same level as european agricultures.

In 1939 mostly all the animal force has disappeared from the land and the lack of fertilizers caused a noticeable fall in profits, worsened by the reduction of the cultivated areas. Even fifteen years after the war was over the 1935 main cereal profits were far from attained.

The active population gains stability as well as the working animal strength slowly and the delay in mecanization is prolonged indefinitely.

During the franquist period, production was directed to wheat and its by-productions with the creation of the National Wheat Service in 1937 to which the farmer had to sell all his harvest except quantities enough for his own needs, at official prices. The wheat shortage after the war, produced a ration in bread purchases that lasted until 1952.

The assurance of having an official purchase price for wheat greater than the price paid for the rest of cereals, made the wheat cultivated surface in Catalonia increase. Until the 60's when meat importation was so significant that the government imposed a change in policy favoring other cereals (barley, oats, corn) credits to acquire fertilizers, seed loans, construction grants and the guarantee of establishment prices.

This event points out the start of a big change in the catalonian agriculture, in the usefulness of the land and the cattle production as well.

### **1.3 1960's Transformations.**

The Stabilization Plan (1959-60) represents a change for the catalonian agriculture and the general economy, the strong industrial growth has diverse consequences for catalonian fields.

First of all, a population exodus takes place. The industrial areas crowded with people, demand an increase of commercial productions which the industry had prolonged and instead dedicated to products of auto-consumption. The industrial population's acquisitive power increased and produced a change in the demand of agrarian products, first in quantity, then in quality demanding fruit and vegetable products as well as animal products.

In Catalonia, the agrarian productions rapidly adapted to this new demand increasing production and using the land in a new way. The intensification was caused by a slow increase in irrigated land, an accelerated mechanization process and the massive contribution of chemical fertilizers. The production change is directed using the land for fodder crops: meadows, cereals, lentils and tuber vegetables to feed animals. The most spectacular change was then produced in cattle raising, oriented to fast consumption as a consequence to the increasing demand of meat products and lactic by-products. This was met with the increase in sheep and also by the new reasonable prices of meat and because of the industrial salaries.

The short cycle intensive cattle raising starts, exploited in industrial ways and by vertical integration systems. In very few years, Catalonia becomes the leading exporter and producer of pigs and poultry's meat to the rest of the state.

A speciality in the agrarian sector was favored in the 60's because of the mechanization growth, the low prices in fuel products and the manufacture of all types of farming machinery in Spain. With this speciality and with the disappearance of the policultives, the irrigated lands intensify their production, producing fruit and vegetables for exportation as well as interior markets.

In 1973 economic recession had repercussion on the catalonian agriculture, favored before by the low prices in the horizontal transportation, though the effects were not seen immediately. The effects have been direct and indirect.

On the whole, a decrease in the growth process has been produced, motivated by the strong effects of the industrial recession. The margin of profits for the farmers has been strongly reduced with the raise of the input prices while the products price does not raise with the same rate.

Spain's recent entry into the EEC is contributing new changes to the catalonian fields which will have to adapt quickly to new regulations and adequate their productions and structure to a new situation.

## 2. The Modernization Process and the Present situation in Catalanian Agriculture.

We will analyze with detail the recent change process in catalonian agriculture, the technical and socio-structural adaptation and the new production orientations, the introduction of changes in the use of land, the reorganization of the farming space, adapting to this new situation.

### 2.1 Social Characteristics

In Catalonia the farmer/land relations adopt various property and farming ways. The number of agricultural exploitations have changed noticeably, the number of people working in agriculture in general.

— Variation extension and fragmentation of exploitations.

Between 1962 and 1982 (1st. and last agrarian census in Spain) the existence of agrarian farmings in Catalonia has varied noticeably, primarily due to racionalized criteria of major autoconsumption farmings in the past years, to a new commercial orientation and production. In 1962, 204.744 farmings were taken census of, in 1972, 146.623 and in 1982, 127.285.

The reduction has clearly affected small farmings by their surface, specially those less than 2 Ha., but in a general way, all those that are less than 10 Ha. This has allowed an increase in surface of the rest of the farmings that has increased proportionally. The average farming rate by surface is now of 6,6 Ha. if pastures are included, and of 5,3 Ha. if they're not.

The territorial distribution changes considerably from one region to another, in the Pyrenees we can find the largest farming surfaces if pastures are included, and on the contrary, the highest medium size is found in the Central Catalanian Depression regions where farmings predominate between 20 and 50 Ha. (See Map 1.3). Generally, farmings are small, from a territorial point of view. To this problem we have to add a strong fragmentation mainly in mountain areas where the number of plots by farming is frequently over 10.

The small territorial base is not caused by the excessive farming divisions, due to the inheritance system applied, as occurs in other spanish regions, because the catalonian system corresponds to German Law and not to the Latin Law as in most Spanish regions.

If we use other criteria to measure the farming size, like the number of workers or the total gross production by farming, the farming distribution varies notably according to its size. In the 1st. case, the biggest farmings are found in the regions where agriculture is most intense, this is in the Maresme, Baix Llobregat or regions where farming is mainly cattle.

In this sense, they agree with major farmings, adopting the criteria of gross production by farming that happens in regions with more cattle farmings. (See Map 1.4).

In Catalonia, direct farming is the most frequent, only in Osona and la Garrotxa, indirect farming covers more than the 50% of cultivated land. Now the most frequent indirect farming is that of renting, that has gained surfaces to partnerships in the last years.

In Catalonia almost all the cultivated land belongs to individuals, since the last centuries desentailed, land belonging to the Church and local communities was expropriated, Communal Council and neighbours property extends at present only in forests and pastu-

re land, because of it this form of property is only found in the Pyrenees regions, in some, in a high per cent of the agrarian surface: Vall d'Aran 96,8%, Pallars Ribagorça 48,4%, Cerdanya and Ripollès 46%.

— Agriculture's active population.

In 1981, in Catalonia, only a 5,8% of the total active population worked in the agrarian sector. The number is situated below the 15% of Spain in general. This was the result of a long neglectful process of the fields in Catalonia, and mainly due to the strong backward situation that started in the 50's and 60's, in the middle of the industrial recovery.

In the beginning of the century half of the active population worked in agriculture, a number not very different from that of the whole State, but since 1910, the backward situation starts and it continued increasing until 1920. During the war and post-war years the situation stagnate, not until the late 50's and 60's, when industrialization in the fields decreases in a continuous way until now, even though in the late years the economic crisis has caused a strong recession in non agrarian activities in need of workers.

Table nº1

CHANGES IN FIGURES OF THE ACTIVE AGRARIAN POPULATION SPAIN AND CATALONIA

Year	Total	SPAIN		Total	CATALONIA	
		% A.P.	Change		% A.P.	Change
1900	4.183.703	63,64		426.808	52,60	
1910	4.220.500	55,67	1,0	373.517	51,46	-12,6
1920	4.555.600	57,21	7,9	335.130	33,53	-10,2
1930	4.040.700	46,06	-21,5	321.245	26,79	- 4,2
1940	4.781.000	51,08	18,3	327.245	26,78	1,8
1950	5.271.000	48,84	10,2	328.382	22,15	0,3
1960	4.696.400	39,74	-11,0	264.623	15,60	-19,4
1970	2.958.725	24,85	-37,1	166.173	8,41	-37,2
1975	2.548.571	20,23	-13,9	145.106	6,33	-13,7
1981	1.968.900	15,10	-22,8	107.778	5,85	-25,8

(Note: % A.P. = Active Population's percentage)

Source: Population census and miscellaneous statistics and trade Directory.

The same time that a strong reduction takes place, the agrarian population has suffered an important change, in its structure as well as in its relation with the activity. The most important characteristic is clearly old fashioned ways seldom with no renovation possibilities. This is stressed by a notorious decomposition among sexes that gives a high masculine rate, and an imposed celibacy in an important sector of men who work in the fields.

This is stressed in less favored areas where a high proportion of the agrarian farmings do not have continuing possibilities. A second change in the qualification of agrarian population has been produced. In the mid 50's a 22% of the employers had wage-earners and they represented a 22% of the total active population in the fields, in 1975 the wage-earners proportion decreased to a 12% and the employers that occupied their services had decreased to a 5,3.

The scarce competition of paid salaries in agriculture, with the fast fields mechanization in the 60's has caused a good number of farmings to be exercised by the employer

with family assistance. From the point of view of the engaged population, agriculture is the main activity in 11 of the 38 catalonian regions, in some of them over a 50% of the total active population (Terra Alta, Garrigues, Pallars Sobirà), on the other extreme in some Catalonian industrial regions, the percentages are so low such as a 2,6 at Baix Llobregat, or a 1,5 at Vallès Occidental.

The active population itself, concentrates in few regions where irrigated land's intensive agriculture, needs a big amount of manpower, this way, we can find that Segrià occupies a 10% of the total agrarian population and the 9 Pyreneean regions put together can't reach this percentage.

## 2.2 Mechanization process and growing technification.

In 1972, more than 15.000 agrarian farmings (10,4% of the totality) used only animal and human force and almost another 10% combined animal and mechanical force.

Animal force in field work had been reduced in one decade, because in 1962 a 46,5% of farms still worked with animal force. In Spain, and Catalonia particularly the 60's are the years of maximum field mechanization and modernization of farms after a long stagnant period caused by the economic autarchy present in the country during the post-war years.

Mechanization replaced the decadent animal force, that had slowly recovered in the 40's and 50's, passing from 46.091 force units in 1940, to 103.717 in 1960, that had been reduced to only 8.462 in 1980.

A growth in the number of tractors was parallel to this reduction, only 3 units were censused in 1946. The number grew slowly until 1960, when their manufacture starts in Spain, and this number grows spectacularly.

Table nº 2

### MECHANIZATION INDEX AND EVOLUTION IN NUMBER OF TRACTORS

Year	Total	SPAIN		CATALONIA		
		Annual Increase	CV/100 ha. of Crops	Total	Annual Increase	CV/100 ha. of Crops
1945	59			3		
1950	12.798	2.548	1,9	1.949	389	1,0
1955	27.671	2.974	4,2	4.575	525	12,9
1960	56.845	5.835	9,9	8.526	790	27,1
1965	147.884	18.208	30,0	23.658	3.026	87,0
1970	259.819	22.387	59,8	36.956	2.659	151,2
1975	379.070	23.850	98,2	49.642	2.501	224,5
1980	523.907	28.967	149,1	59.505	2.003	288,0
1982	562.626	19.359	155,3			

Source: Ministerio de Agricultura: Censos de maquinaria agrícola.

## 2.3 Irrigation.

The mediterranean climate in the major part of Catalonia supposes a stop to the expansion of certain cultivated plants and a good output in many others. The wet Catalonia is limited to a fringe in the Pyrenees and to the not very extensive Eastern sector that receives an annual rainfall of more than 800 mm. Irrigations are old in an important sector of the territory and continue to expand. Actual irrigated lands are possible by individual water obtainment, the more extensive ones are a consequence of collective work that has started by the Romans.

During the Middle Ages, in the X<sup>th</sup> century, we know that collective irrigation systems were done, by construction of by passes for the waters of the rivers Llobregat, Ter, Segre, etc. During the XVII and XVIII centuries, small individual works were done, but they were not enough to irrigate very large surfaces. At the beginnings of the XIX<sup>th</sup> century hydraulic and by-pass works were started.

During this century the main irrigation canals were constructed in the low areas of Llobregat, Ebro, Urgel and Segre rivers. The Catalonia and Aragon canal, the last big by-pass, was inaugurated in 1907. At the beginning of the 40's the irrigated surface covered 180.000 Ha., 211.000 at the beginning of the 60's and 230 in 1970. Figures for 1982 are 225.401 Ha.

In the past years the irrigated surface expansion is mainly done capturing underground waters in an individual way. At present big collective irrigation works are not done any more.

The application of new and each time more sophisticated irrigation techniques, allows water economy, an advantage seldom obtained as its use for agriculture frequently conflicts with other uses which are mainly urban and industrial near populated and turistic centers, mainly along the coast, where abusive extractions of underground waters put at risk the freatic stratum continuity and create saline problems.

The prevalent irrigation techniques are the traditional ones, that is, by gravity. In 1972 an 85% of the irrigated surface used this system, and an 83,4% in 1982. In this last year a 10,5% was irrigated by spraying and a 6,1% by the drip method. Water procedence was mainly superficial: 79,5% and 20,5% underground. Only an 87,8% of the surface has permanent irrigation, in the other 12,1% it's laphazard. The irrigated surface represents an 24,5% of the total cultivated surface.

## 2.4 Agricultural and livestock productions

During the last 3 decades, the changes in the use of ground and the orientation of production in Catalonia have been very strong. Generally, we can talk of an abandone of auto-consumption cultives favoring a growing specialization of farming, withdrawal of the main traditional crops in favor of fodder, vegetable and fruit crops, diminution of policultivations in favour of single cultivations that formed of big specialization areas.

— The uses of land and new orientation of agricultural production.

Since the beginning of the century the cultivated surface has been reduced considerably, from 43% of the total surface, to a 38% in 1930, a 34% in 1940 and a 33% in 1960, similar to the present percentage. More than this reduction in surface, it's interesting to observe the change in quality that has taken place in the use of land and its adaptations to the demand of different products.



In the mid's of the XIX<sup>th</sup> century as we've seen in Catalonia clearly prevailed the so called mediterranean trilogy, vine, wheat and olive tree. Thermophilic crops as vine and olive tree were found in mountain areas in clearly unfavorable conditions and with very low output.

In the beginning of the century, the prevalence of these three crops is still clear even though they've exchanged positions because of the ruin of the vineyards due to phylloxera. They still amount a 75% of the cultivated surface.

At the end of the war, the situation was essentially the same and did not change in the following years, anyway we can appreciate a slow retreat of vine favoring cereals, mainly wheat, because of the protectionist policy towards this cereal, as we've mentioned before.

Since 1960 important and quick changes happen, in 10-15 years the three traditional crops retreat more than 200.000 Ha. and the pasture and fodder crops including cereals start, supported by a price policy and substantial help. At the same time, very big fruit plantations are being carried out deep into the Central Depression area, and vegetable areas expand in Catalonian irrigated lands.

Table n° 3

AGRICULTURALS LAND USE

	SPAIN		CATALONIA		% Catalonia/ Spain
	Hectares	%	Hectares	%	
Pastures	5.203.100	18,8	258.500	19,1	4,9
Cultivated					
grassland	1.456.700	5,2	47.700	3,5	3,2
Cereals	7.452.322	26,9	373.719	27,6	5,0
Legumes (dry)	449.829	1,6	8.200	0,6	0,1
Potatoes	338.277	1,2	20.704	1,5	6,1
Industrial Crops	1.250.696	4,5	7.370	0,5	0,6
Forages	1.281.725	4,6	155.713	11,5	12,1
Vegetables	459.017	1,6	36.484	2,7	7,9
Flowers	2.896	0,1	737	0,1	25,4
Citrus trees	229.223	0,8	4.064	0,3	1,8
Other fruits	862.272	3,1	143.135	10,5	16,6
Vineyards	1.716.923	6,2	103.991	7,6	6,0
Olive trees	2.085.827	7,5	127.590	9,4	6,1
Other tress	117.367	0,4	19.188	1,4	16,3
Fallows	3.809.801	17,2	43.700	3,2	1,1
Total	24.060.000	100,0	1.350.800	100,0	5,6

Source: Ministerio de Agricultura: **Anuario de Estadística Agraria**, 1983

It expands as much in traditional green areas next to big consumption centers (mainly Baix Llobregat, Maresme, Baix Camp) as in the big collective irrigated lands of Baix Ebre and the Central Depression.

During this advance and retreat process other traditional crops clearly loose surface. Some secondary cereals destined to feed working animals like oats and carob tree fall to a great extend. Others, traditionally important in human diet as potatoes or vegetables for grain, loose surfaces very fast in front of the quality change in diet, that clearly substitutes vegetable protein by animal protein. Also another traditional crops like almond tree and hazel tree change their positions due to prices unstability.

Clearly specialized areas in one or two crops are formed, and adapt to the more apt ecological areas. Mechanization and communication improvements eliminate polycultivation and the exclusive need to produce auto-consumption products.

Because of this space specialization thermophile cultivates go back to the south, and this way, vineyards, olive trees, carob tree concentrate in their most meridional position, the two 1st ones around their most important commercialization and industrialization centers.

Cereals, crops with a high mechanization index, expand their surface to the detriment of the anterior cultivations around the plane areas of the Catalonian Central Depression areas, starting with la Segarra, region traditionally called «Catalonia Barn».

Pastures, fodder, corn are the main and often only cultivations in the wet Catalonia, this is, the Pyrenees and the North-oriental sector, where they can grow without irrigation systems.

The transportations improvement breaks the traditional condition in the location of the fruits and vegetables near the market. This way, big irrigated areas can specialize in vegetable or fruit cultivation transforming the big irrigated areas deep in the Central Depression Areas, as the Delta and Baix Ebre areas that are now the biggest areas destined to these crops, while the traditional areas of Maresme and Baix Llobregat have seen their own areas retreat in favor of the urban and industrial growth.

Individually, the crop that occupies bigger surfaces is barley (more than 200.000 Ha.) followed at a long way behind by olive tree, vineyards and wheat.

We can say that the most noticeable tendency is to increase the cultivated surfaces for animal food, and also for fruits and vegetables while the rest of them diminish.

### 3. Livestock's recent changes and present situation

In livestock's evolution during this century, two important changes can be noticed. The step from a moving livestock to a stable one and the appearance and growth of the industrial cattle raising: the first one starts since the beginning of the century but settles completely until the 60's. The second starts in the 60's and has its maximum expansion moment in the 70's.

Table nº 4

#### EVOLUTION IN THE NUMBER OF CATTLE HEADS

Year	Cattle	Sheep	Goats	Horses	Porks
1930	158.144	644.929	191.948	146.458	333.633
1940	111.113	527.856	244.380	51.068	229.361
1960	214.800	690.960	78.139	123.664	404.575
1970	268.800	650.000	41.300	39.837	1.595.795
1982	377.409	738.030	37.936	16.711	3.194.373
% of Spain's					
Total in 1982	13,0	4,5	1,5	2,8	26,5
Slaughtered heads during 1982	277.657	2.072.861	284.847	13.933	6.007.101

Source: Statistics annuaries and various livestock census



Agricultural landscape of Santa Maria de Palautordera (Pre-litoral depression)



Livestock in Pla de Beret (Pyrenees)

The growth of catalonian livestock up to 1935 was struck by civil war. The figures of 1940 are much lower of those of 1930, mainly in working horses that dissapeared and left the fields without their working force.

The postwar year's mess makes figures relative to the 40's and 50's highly contradictory so we refer to 1960, a year in which recovery had already started before the mechanization took off.

The most important changes were produced from 1960 onwards, firstly the sheep livestock production stagnates and even falls down, it's clear that goats livestock also experience a recession since the 50's and also in the 60's (partly due to the laws that limit and cut down its pastures). Horses livestock falls with field mechanization while cattle, pork and poultry farming start being exploited in industrial systems and by means of vertical integration contracts.

With this growth of industrial livestock being intensively exploited, completely separated from the agricultural production end their corresponding areas, meat industry develops at the same time and Catalonia becomes the first meat producer community in Spain with productions that, in 1982 were 33,1% of the total of all species reaching almost 40% in pork and poultry meat, exporting a good part of this production to the rest of the state. Meat production is directed to industrial or direct consumption in different proportions depending on species. While sheep and goat are practically industrialized, 15% of cattle and 46% of pork meat go to transformation industry. The latter has begun an important sausage industry in some regions, mainly Osona and La Garrotxa.

In spite of these high productions, Catalonia imports animals from other spanish regions: mainly cattle from the north mountain border or the peninsula, from where it also imports most of the milk supplies it needs. The difference is that, while alive imported animals frequently and their fattening process in intensive farms in Catalonia, milk is imported with the complete industrial process.

Livestock space distribution is very irregular and in most cases is located in specialized areas for different species. In maps 3,3 and 3,6 we've represented each species percentage (all animals converted to conventional units) by region. We can see how cattle prevails in mountain regions, mainly with pastures and fodder cultivations that in spite of being exploited intensively in a high proportion, have a clear relation with local agricultural production. Central Catalonia is mainly a pork area (it clearly occupies all of the regions of the central catalonian depression area) where cereals are cultivated even if they don't have a direct relation. Poultry farming prevails in the meridional regions of trees and vineyards cultivation without any relation to the agricultural productions in this case. Northwestern regions (and also two in the central depression area) combine different livestock species, mainly pork and cattle. As a result of their importance in livestock unit distribution, only three regions (Segrià, Urgell and Osona) cover more than 25% of the catalonian total.

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## **Explicacions dels mapes**

### **1. SOCIAL AND OPERATIONAL ATTRIBUTES**

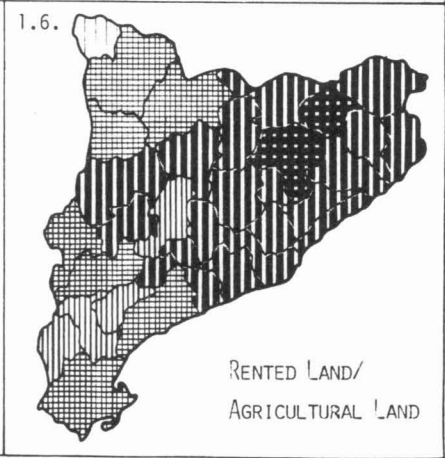
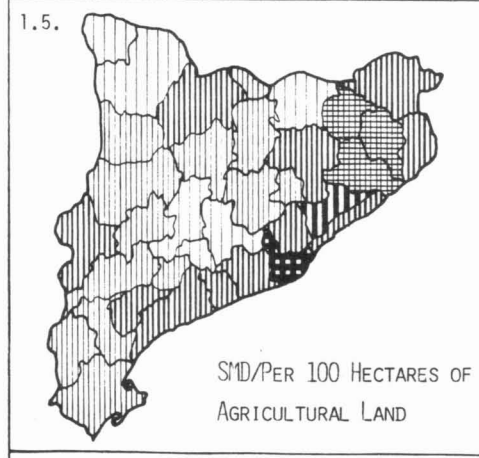
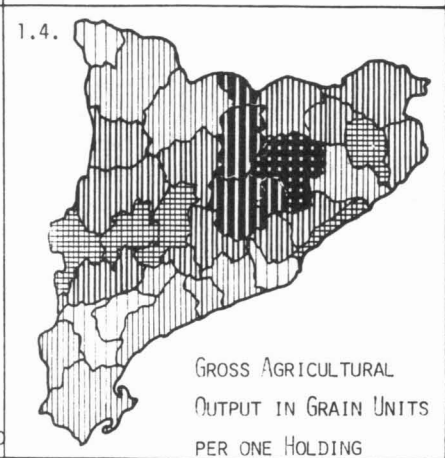
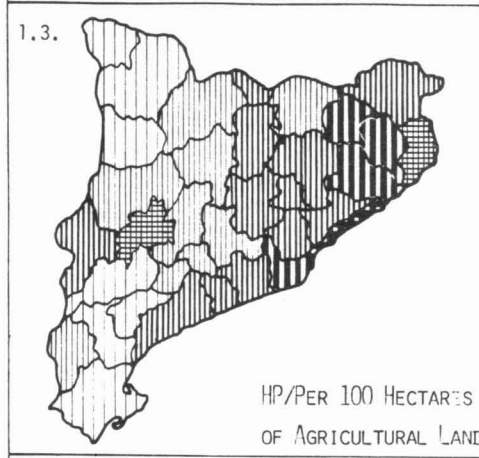
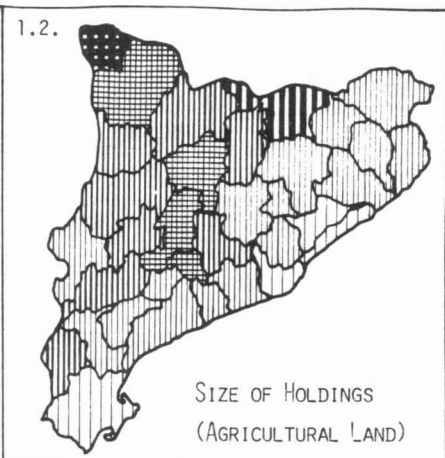
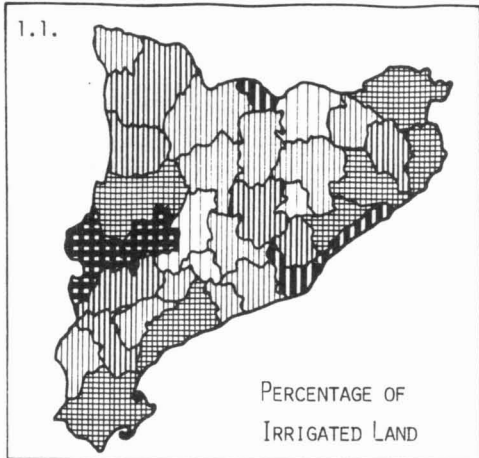
- 1.1. Percentage of Irrigated Land: 1 less than 1%; 2 from 2 to 5%; 3 from 6 to 20%; 4 from 21 to 40%; 5 from 41 to 60%; 6 from 61 to 80%.
- 1.2. Size of Holdings: 1 less than 5 hectares per holding; 2 from 6 to 10; 3 from 10 to 20; 4 from 21 to 30; 5 from 31 to 40; 6 More than 41 hectares.
- 1.3. HP/Per 100 Hectares of Agricultural Land: 1 from 100 to 200 HP; 2 from 201 to 300; 3 from 301 to 400; 4 from 401 to 500; 5 from 501 to 600; 6 more than 601 HP.
- 1.4. Gross Agricultural Output in Grain Units per one Holding: 1 less than 500; 2 from 501 to 1.000; 3 from 1.001 to 1.500; 4 from 1.501 to 2.000; 5 from 2.001 to 3.000; 6 More than 3.001.
- 1.5. Standard Man Days per 100 Hectares of Agricultural Land: 1 Less than 5 SMD; 2 from 6 to 10; 3 from 11 to 15; 4 from 16 to 20; 5 from 21 to 30; 6 from 31 to 40.
- 1.6. Rented land as percentage of the Agricultural Land: 1 less than 1%; 2 from 2 to 5%; 3 from 6 to 10%; 4 from 11 to 25%; 5 from 26 to 50%; 6 more than 51%.

### **2. AGRICULTURE LAND USE**

1. Less than 1%; 2 from 2 to 5%; 3 from 6 to 10%; 4 from 11 to 25%; 5 from 26 to 50%; 6 from 51 to 75%; 7 from 76 to 95%; 7 More than 96%; 80%.

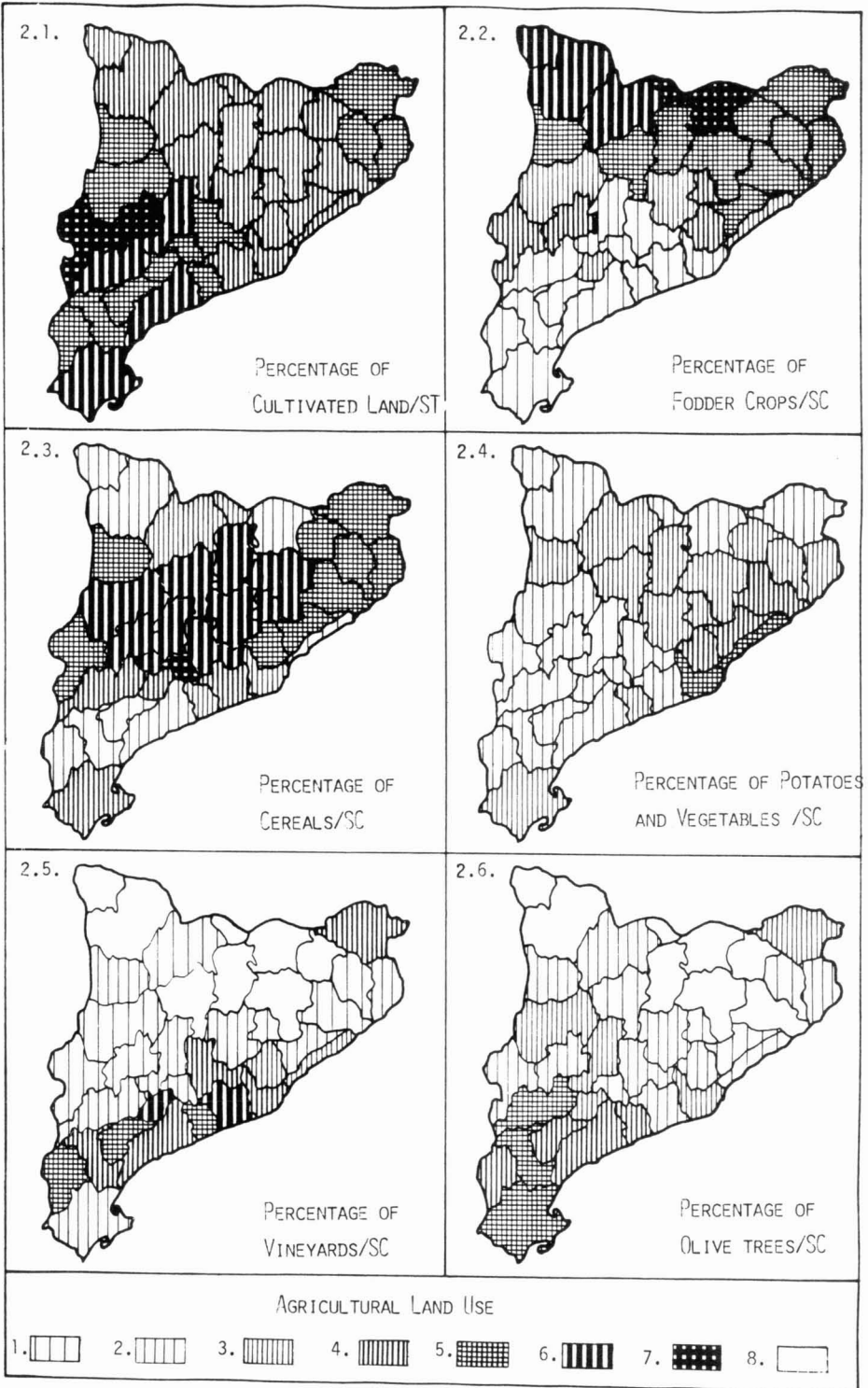
### **3. LIVESTOCK POPULATION AND PRODUCTION**

- 3.1. Animal Products/Agricultural Output: 1 less than 10%; 2 from 11 to 25%; 3 from 26 to 40%; 4 from 41 to 60%, 5 from 61 to 80%; 6 from 81 to 100%.
- 3.2. Percentage of Conventional Animal Units; 3.3. Cattle; 3.4. Sheep; 3.5. Pigs; 3.6. poultry: 1 less than 1%; 2 from 2 to 3%; 3 from 4 to 5%; 4 from 6 to 7%; 5 from 8 to 9%; 6 from 10 to 12%.

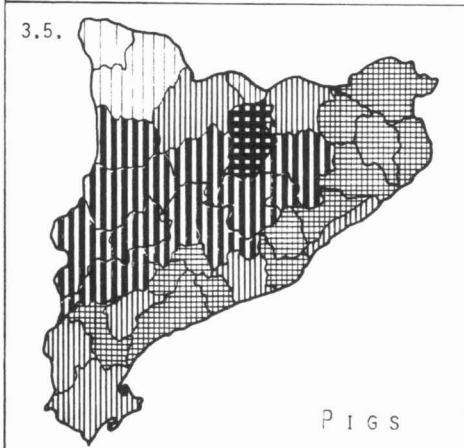
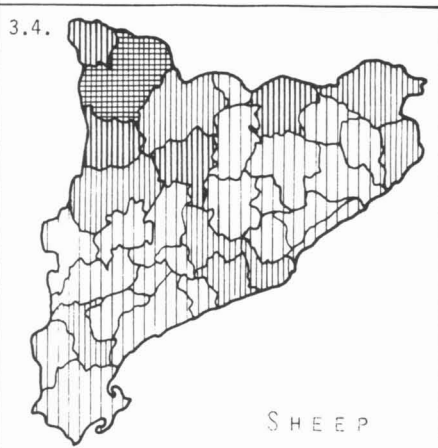
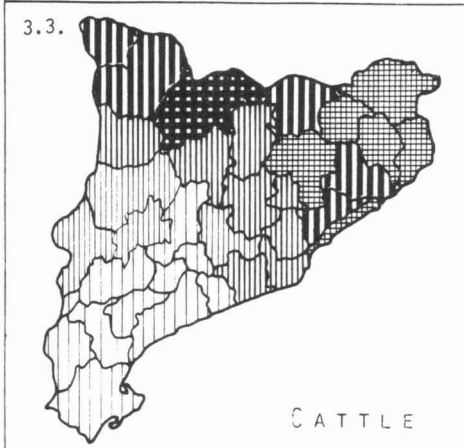
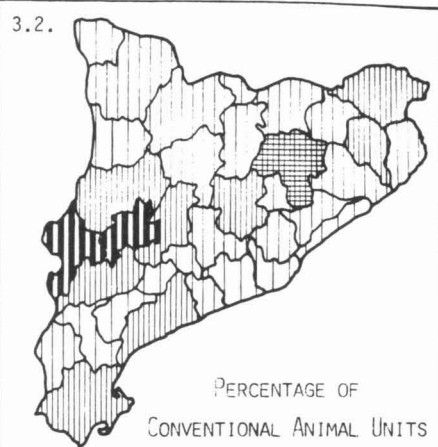
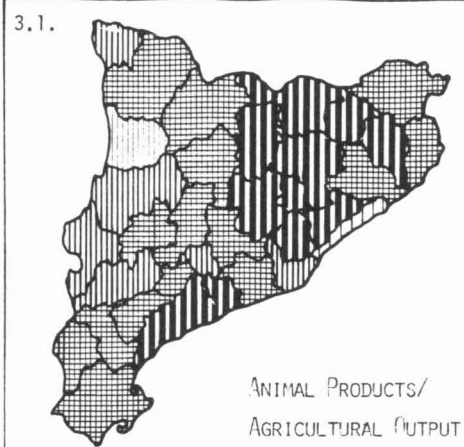


SOCIAL AND OPERATIONAL ATTRIBUTES









LIVESTOCK POPULATION AND PRODUCTION

