

6. Land take by intensive agriculture

Key message

- Intensive agriculture attributes mainly to South of Europe, particularly to Mediterranean region. Outside this region land areas taken by intensive agriculture in most cases are insignificant.
- Considerable increase in proportion of agricultural land farmed intensively can be recorded only in Spain, Portugal and Greece. In other countries this dynamics is negligible and areas of intensive agriculture even tend to decrease.
- Concentration of intensive agriculture in coastal zone is recorded only in Spain. Intensive agriculture does not substantially affect coastal sustainability in the rest of the project partner countries.



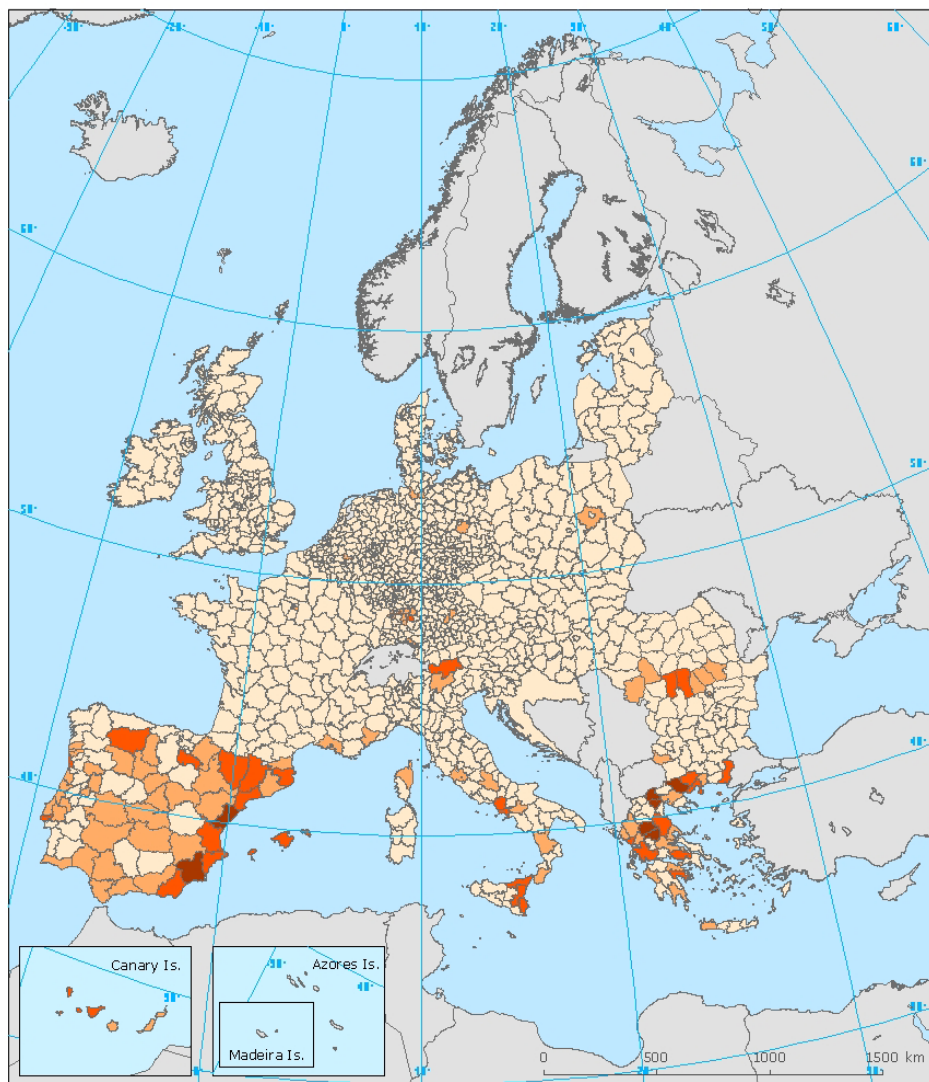
Why monitor land take by intensive agriculture?

Intensive agriculture is an agricultural production system characterized by the significant use of inputs, and seeking to maximize the production. It relies on the use of chemical fertilizers, herbicides, fungicides, insecticides, plant growth regulators, pesticides. It is associated with the increasing use of modern practices and agricultural mechanization.

This indicator shows the proportion of agricultural land which is being managed under intensive systems. It is an aggregation of all pressures on biodiversity resulting from intensive agricultural practices, such as: use of available genetic resources, use of pesticides, use of fertilisers, loss of traditional land use practices, grazing intensity, loss of corridor landscape elements etc.

This indicator has **one** measurement: **Proportion of agricultural land farmed intensively.**

What does the indicator show from European to local level?

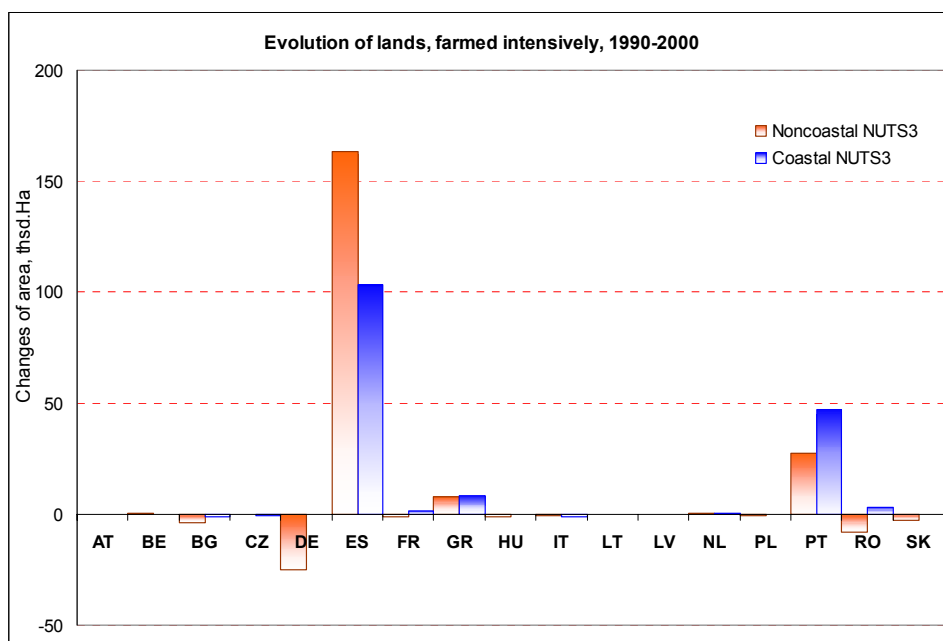


Percentage of agricultural land farmed intensively in relation to the total agricultural areas by NUTS 3

1990

- < 5 %
- 5 - 15 %
- 15 - 30 %
- > 30 %
- No data

Source: CLC1990 (EEA/ETC-TE)



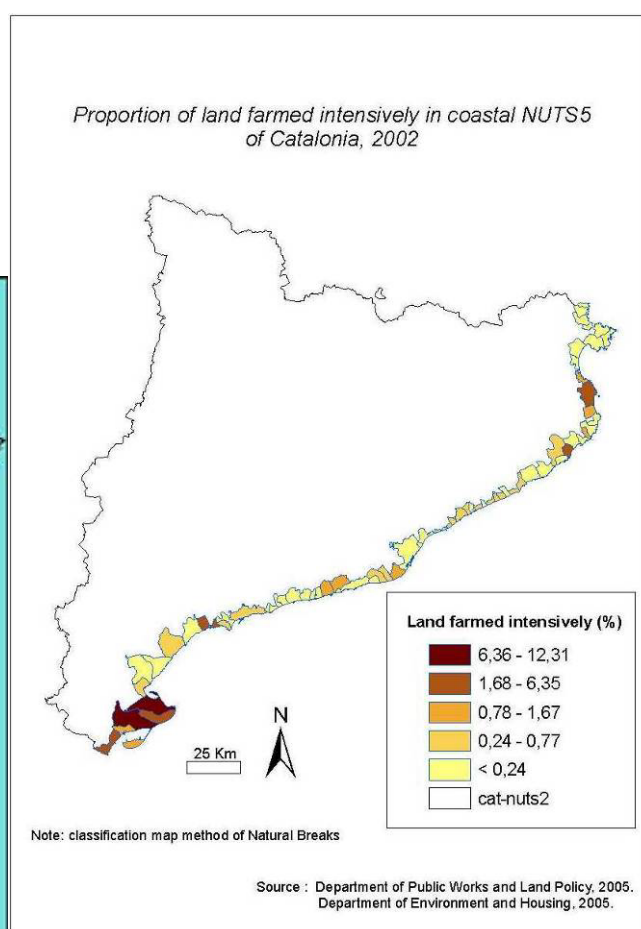
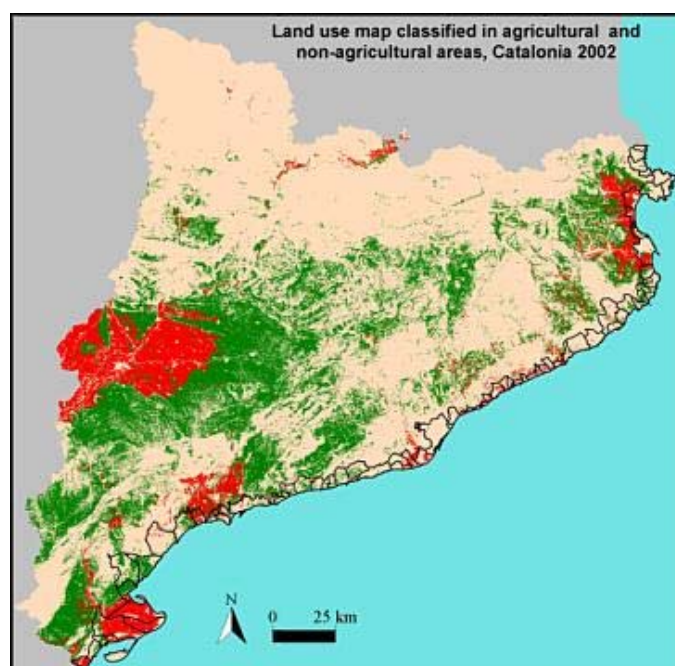
Map of Europe clearly shows areas of intensive agriculture concentration. This is the South of Europe, mainly Mediterranean region: Spain, Greece and South of Italy. Some areas can be found also in Portugal and Romania, while in other countries map does not indicate any considerable evidence of this kind of territories. At the NUTS3 level concentration of intensive agriculture in coastal areas is obvious in Portugal and South of Italy, but particularly – in Spain. In countries with high proportion of agricultural land farmed intensively, expansion is also the highest. In Spain, over the period of 10 years proportion of this type of land in coastal areas has increased more than 2 times, but in hinterland – 2,5 times.

In other areas expansion rate is much lower, but in many places outside the Mediterranean region a decrease in proportion of these lands is recorded. The average dynamics is insignificant and does not exceed few percents over 10 years. Moreover, no systematic difference is recorded between coastal and hinterland territories.

In order to specify the situation, it is appropriate to consider two marginal cases. Map on the previous page shows Spain as a major country of intensive agriculture in Europe. The province of Catalonia can be used as a model of the whole Spain, because it represents tendencies typical to both coastal and hinterland territories. Whereas Latvia resembles to North European countries and intensive agriculture in terms of DEDUCE methodology does not play here a considerable role.

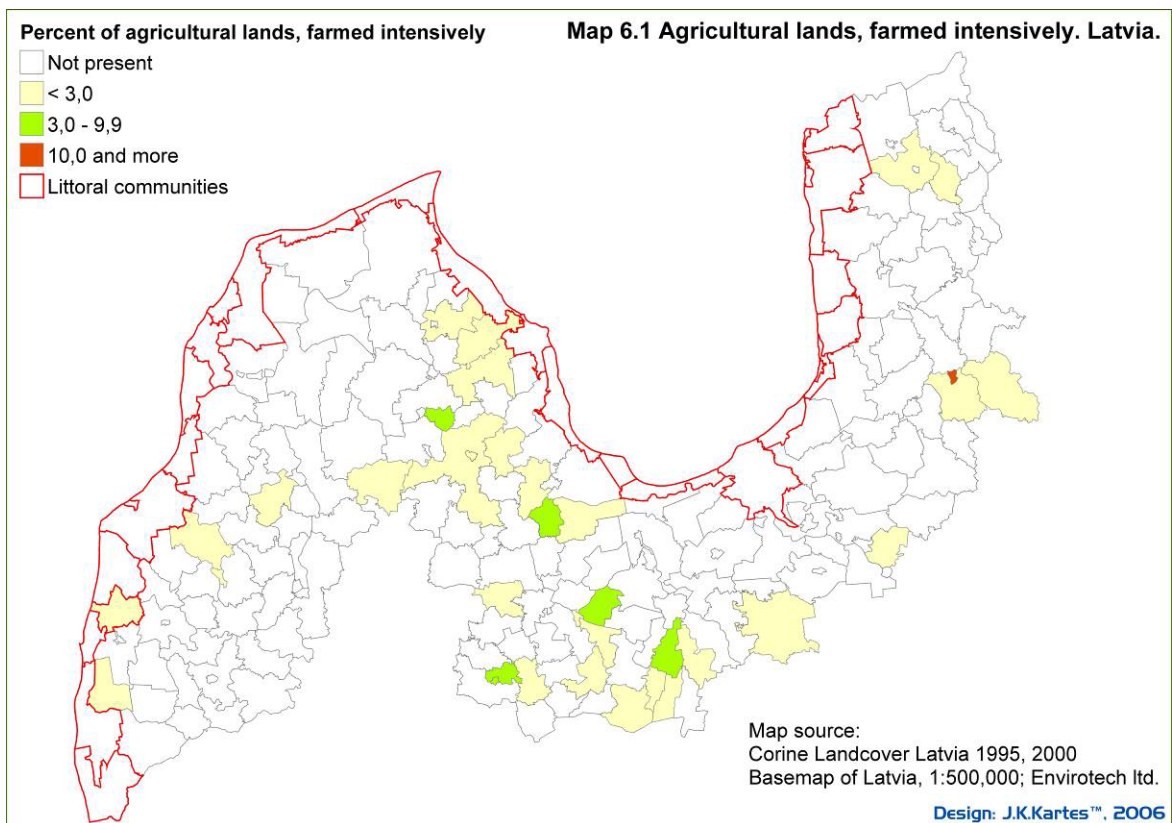
Catalonia, as other territories in Europe, has a tendency to loose agricultural land. Despite of this, data show the territorial distribution of intensive agriculture – it is located in certain areas of Catalonia.

This is the case of the coastal municipalities where intensive agriculture is much more important than in the rest of Catalonia. This is due to a great urban pressure on the coastal zones and the expectation that land occupied by the agriculture has to provide certain profit, and **intensive agriculture is the one which provides much higher profit than extensive.**

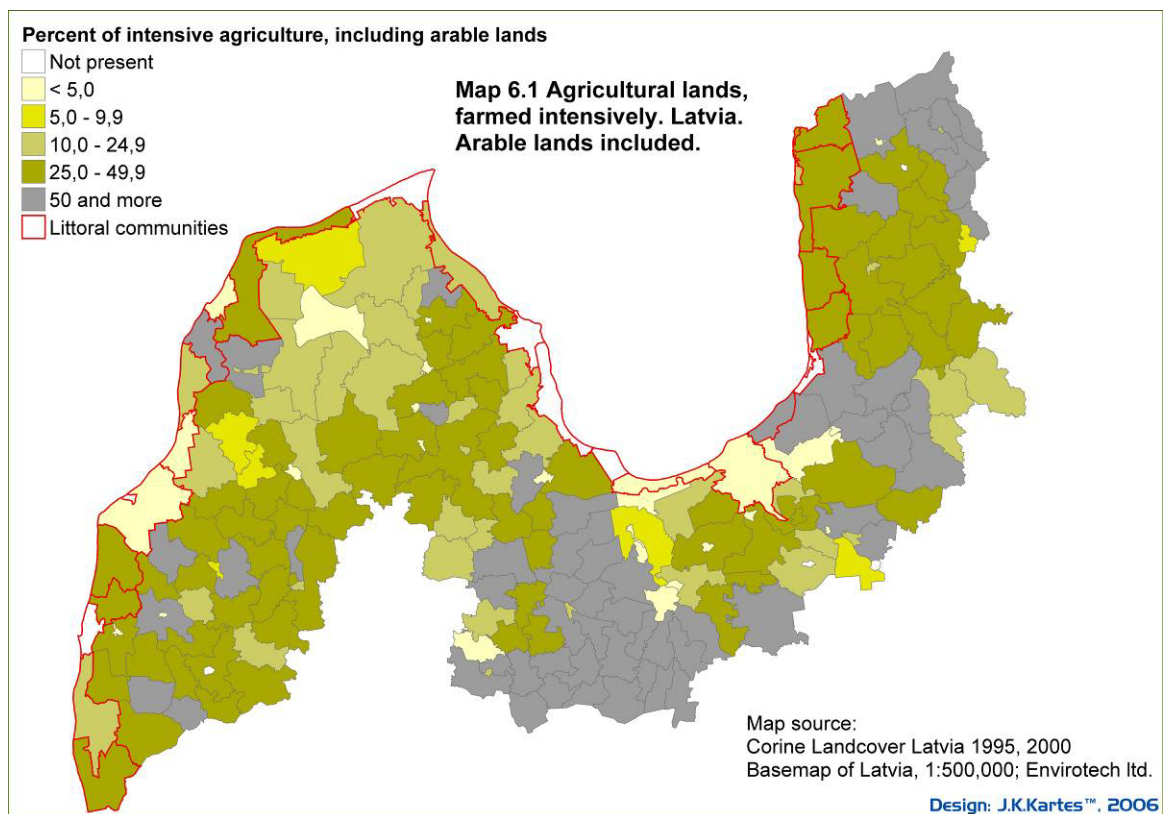


During the period of 1987-2002, a continuous growth of the area of agricultural land farmed intensively took place both at the coast and in non-coastal areas of Catalonia. More than 50 percent of agricultural lands at the coast are cultivated using intensive methods and this trend has been increasing since 1980's. Municipalities of coastal lowlands and deltas register the most important growths.

Situation in Latvia is completely different. Proportion of land farmed intensively in Latvia is insignificant. These areas are located in only one coastal NUTS5 out of twenty five. Most of these territories are located in inland municipalities, however in most territories this kind of land use is not practised at all. Only one land use code out of two defined by the methodology for the intensive agriculture can be found in Latvia - *222 Fruit trees and berry plantations*. It can be declared with certainty that **this kind of land in Latvia from the point of view of loads are farmed far less intensively than for instance arable land**, not included in the methodology.



Main agro-industrial regions of Latvia including arable land are marked and it is evident that they are not concentrated in coastal areas. The main reason is the spatial distribution of land's fertility: poor sandy soils dominating in coastal areas require big investments and are economically disadvantageous for this kind of management.



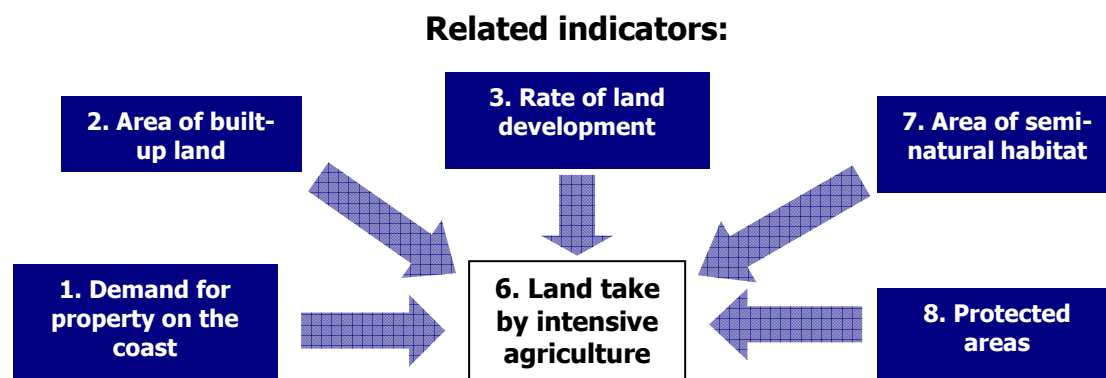
Intensive agriculture, regardless of its minor distribution, tends to decrease. If we consider also arable lands, then decreasing tendency can be observed only on the coast, while the share of arable land in total farmland has even increased over last years. However, it does not mean that total area of arable land increases too.

What are the implications for planning and managing the coastal zone?

Agricultural intensification produces side effects which generate external costs for communities and individuals. Decision makers should ensure shifting these costs back to farmers through regulation, planning and management activities. FAO has identified several such external effects of coastal agricultural activities on coastal ecosystems and other sectors which should be considered in coastal zone planning and management activities. They are:

- agricultural activities normally involve competition for, and degradation of, land and/or water;
- many such effects are harmful as they involve change of conditions to which ecosystems have adapted in each locality;
- damage to coastal ecosystems has wide-ranging implications for the forestry, fisheries, aquaculture and tourism sectors which may directly rely on them for natural resources, and for all coastal activities that gain physical protection from them;
- the impact of changes in coastal agriculture is complex, involving direct and indirect effects of physical, biological, social and economic processes on coastal ecosystems and other sectors;
- many of external effects of coastal agriculture on coastal ecosystems and other sectors are associated with intensification, expansion or marginalization of agricultural activities.

Planners should also carry out environmental impact assessments, with particular emphasis on mentioned effects induced by intensive agriculture. Coastal ecosystems are often vulnerable and can be irreversibly damaged. In application of the precautionary principle, measures to avoid possible detrimental effects of agricultural development on coastal ecosystems agricultural development plans should be featured strongly in coastal areas.



Further work needed

It is necessary to provide more precise definition "intensive agriculture". In many cases lands which are not defined as farmed intensively in fact are farmed even more intensively comparing to those designated as intensively farmed. Mechanic and chemical loads arable lands are exposed to are at least commensurable to analogical loads fruit trees and berry plantations (CLC code 222) are exposed to. Probably it will be quite difficult to find one definition of intensive agriculture equally applicable to both South and North European conditions.

CORINE Landcover resolution might be not sufficient enough for the current definition of intensive agriculture since these areas are often spatially too fragmented and might not be recognizable. Application of national land survey data would be more appropriate. But it is made difficult by the circumstance that not anywhere land survey data are available in a spatial form consequently not allowing applying GIS tools for calculations of indicators. Without them 1 and 10 km buffer zones can not be distinguished. In the case of CLC application, inclusion of arable land in the definition would allow to considerably reduce the relative value of the calculation error.

Data sources

Autonomous University of Barcelona (ETC/TE)

Source: CORINE Landcover, 1990 and 2000.

Government of Catalonia

Source: Department of Environment and Housing, 2005. Department of Public Works and Territorial Policy, 2005. "Land use maps of Catalonia, 1987, 1992, 1997 and 2002".

University of Latvia

Source: CORINE Landcover, 1995 and 2000.

Reliability of the indicator

CORINE Landcover (CLC) data are reliable enough as they are created according to one common and tested methodology in all countries. It is important, that data from different countries are mutually directly comparable. Reliability of the indicator is reduced primarily by the insufficient resolution of CLC. Under the conditions when land properties and types of farming are spatially fragmented, some areas of intensive agriculture might not be detected. Eventual classifying errors, insufficient degree of its detailed elaboration might interfere with ability to show precisely those areas where load factors allow them to define the way of farming there as intensive agriculture.



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