

# LAND



## 2.3

environmental profile of Spain 2012

In May 2012 the Division for Sustainable Development of the UN Department of Economic and Social Affairs (UNDESA) published a study named 'Sustainable land use for the 21st century'. The document recognises that changes in land use and land cover have been the most visible indicator of the human footprint and the most important cause of biodiversity loss and other forms of land degradation. One of the most important changes in land use at a global level arises from the urbanisation process, not due to the size of the occupied surface but to the high resources consumed in urban areas; according to the aforementioned study, cities occupy less than 3% of the land surface of the planet, but account for 78% of carbon emissions, 60% of drinking water use and 76% of industrial wood consumption. For this reason, the study of the evolution in land use and land cover allows for an analysis of the changes and transformations produced in the environment, and to take appropriate decisions in order to adequately manage this limited resource.

The Corine Land Cover (CLC) survey, with editions published in 1990, 2000 and 2006, provides information on the evolution of the land cover and use in the EU. The percentage of artificial surfaces, as an indicator of the urbanisation process of the territory, reveals land use changes, although the percentage of artificial surfaces in Spain represents only approximately 2% of the total surface.



Pending the publication of the CLC 2012 results, an approximation of this indicator – on changes in land cover in Spain – will be given in this publication from the perspective of land use reclassification from rural to urban through land-use planning, according to the methodology of the General Directorate for Cadastre. The process of conversion to artificial surfaces is also analysed, from the perspective of the loss of soils of high agronomic utility.

At the same time, in February 2012, the European Commission presented a report on the application of the Thematic Strategy for Soil Protection, which was adopted in September 2006. This report recognises that more than five years after the approval of the strategy, and in spite of the achievements and actions carried out, there is still no specific legislation on soil nor a common system for soil control and quality protection in Europe.

Due to the importance that the EU gives to continuing research, monitoring and awareness of the state and protection of soil, the steps taken in our country regarding the study of soil erosion are included in this 2012 edition of the Environmental Profile of Spain; the indicator used for soil contamination is once again included, and the available information on the processes of land artificialisation and changes in land use is analysed.

#### KEY MESSAGES

- Between 2006 and 2012 the area of urban land cover in Spain increased by 19%.
- The increased number of industrial and commercial zones during the period 2000-2005 represents a moderate risk of a loss of higher quality agricultural soils.
- Law 22/2011, of 28 July, on Waste and Contaminated Soils establishes the obligation to have a state inventory of contaminated soils; this inventory is being compiled, but the information held by the autonomous communities is disparate and inconsistent.
- In 2012 the works of the National Soil Inventory for the provinces of Palencia and Salamanca (Castile and León) were completed.

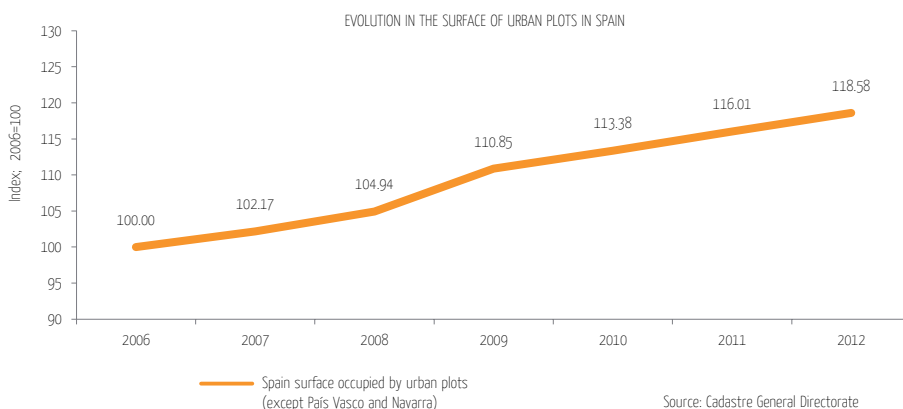
#### INDICATORS

- Changes in land cover: urban surface.
- Increase of artificial surfaces converted from agricultural areas.
- Contaminated soils
- Area affected by erosion

## Changes in land cover: urban surface

*Between 2006 and 2011 the area of urban land cover in Spain increased by 19%.*

Evolution in the surface of urban plots in Spain



According to information from the Directorate-General for Cadastre for 2012, the area of urban plots has increased by 18.58% with respect to 2006 levels, with the indicator (excluding the Basque Country and Navarre) standing at 1,123,134 ha, 2.22% more than in the previous year. These figures indicate that 2.3% of the total surface in Spain in 2012 (excluding the autonomous communities previously mentioned) is occupied by urban land. Breaking this down between constructed and non-constructed urban plots, in 2012 some 500,685 ha were added to the first group and 622,449 ha to the second group, increases of 2.57% and 1.78% respectively.

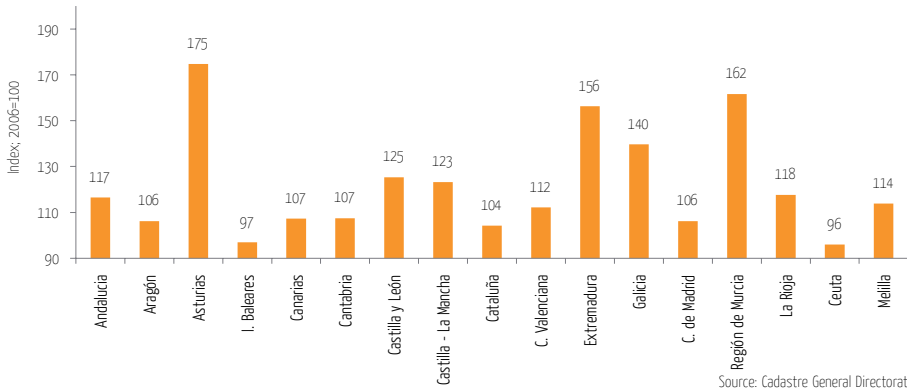
The largest increase recorded in the temporal series took place in 2009, with an increase of 5.64% in the surface of Spain (except the Basque Country and Navarre) occupied by urban plots.

At regional level, the highest growth in 2012 with respect to 2006 levels regarding the percentage of surface occupied by urban plots, occurred in Asturias, followed by Murcia,



Extremadura and Galicia. In just six years these communities increased by 75, 62, 56 and 40%, respectively, their percentages of surface covered by urban plots.

Variation in the occupied surface with respect to 2006 values . Year 2012



#### NOTES

- The Land Registry (*Catastro Inmobiliario*) defines, in its methodology document, surfaces of an urban nature. This can be consulted through the following link: Land Registry Methodology.
- The data for the Basque Country and Navarre are excluded from the scope of this indicator, as they have their own land registry services.

#### SOURCES

- Surface covered by urban plots: Directorate General for Cadastre, 2013. Cadastral statistics. Urban real estate cadastre. Summary by Autonomous Communities and Cadastre Variables.
- Surface of the Autonomous Communities: National Statistics Institute, 2013. INEbase. Physical environment and the environment. Physical Environment. Territory. Population, surface and density by Autonomous Communities and provinces. 2012.

#### FURTHER INFORMATION

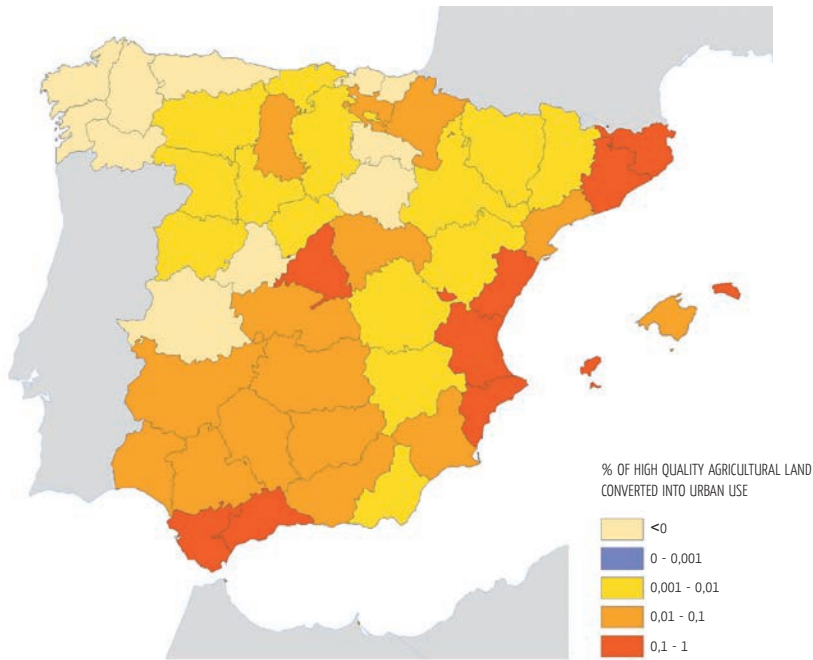
- <http://www.catastro.meh.es>



## Increase of artificial surfaces converted from agricultural areas

*The increase of industrial and commercial surfaces during 2000-2005 poses a moderate risk of high quality agricultural land loss.*

Percentage of high quality agricultural land converted to urban use



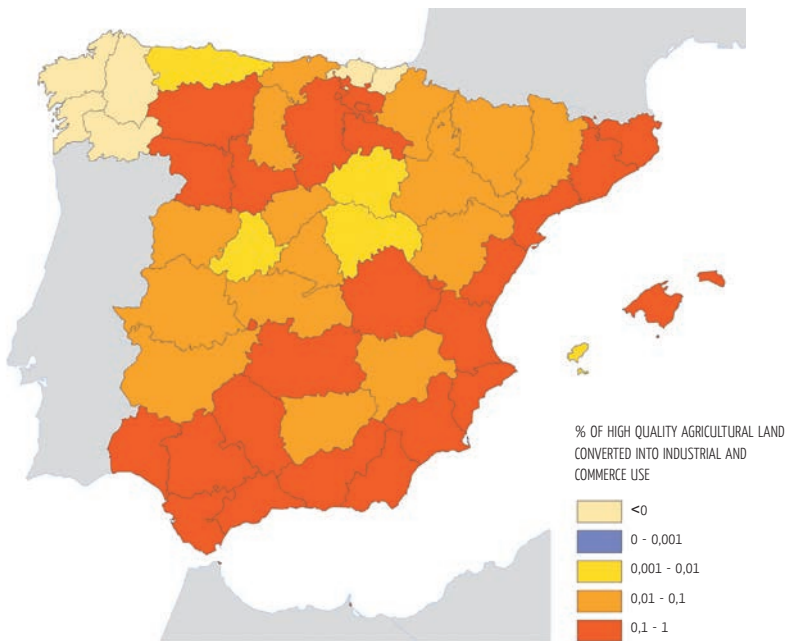
Source: ETCSIA, EEA

Between 2000 and 2005 around 27,000 ha each year were transformed into artificial surface, according to the Corine Land Cover project (editions 2000 and 2006). These changes were undertaken at the expense of agricultural areas (49% of new artificial areas coming from agricultural areas).

The process of artificialisation of land is considered irreversible, so it is deemed to be important to take into account the quality of land undergoing the artificialisation process.

The changes in land use are mainly due to urbanisation and the increase of industrial and commercial surfaces. These changes in land use are more pronounced in the provinces of Barcelona, Valencia, Castellon, Alicante, Girona, Malaga, Cadiz and Madrid. In no case is the loss above 1% of higher quality soils.

Percentage of agricultural land converted into industrial and commercial use



Source: ETCSIA, EEA

The European Thematic Strategy for the Soil Protection identifies soil as a non-renewable natural resource, at least at human scale, and highlights the need to adapt different uses to soil characteristics. In particular, it highlights the need to preserve the best agricultural soils against different pressures, among which the urbanisation process should be highlighted. The processes observed in Spain are reproduced in the rest of Mediterranean countries, although in the north of Italy the percentage of agricultural land that has become artificial surface is greater and exceeds 1%.



#### NOTES

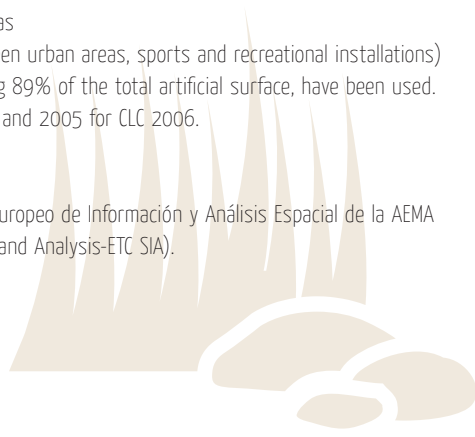
- The quality of the soils has been defined based upon agricultural productivity. To this end, the MARS methodology has been applied, including climatological aspects, limiting factors of production and other physical-technical soil characteristics.
- The Corine Land Cover projects reflect those changes that are equal to, or over, 5 ha. The artificial surfaces are as follows:
  - 1.1 Urban areas (continuous urban areas, discontinuous urban areas)
  - 1.2 Commercial, industrial and transport areas
  - 1.3 Coal mining, landfills and construction areas
  - 1.4 Green artificial, non-agricultural areas (green urban areas, sports and recreational installations)
- In this indicator only 1.1 and 1.2, representing 89% of the total artificial surface, have been used.
- The years of reference are 2000 for CLC 2000 and 2005 for CLC 2006.

#### SOURCES

- Información facilitada por el Centro Temático Europeo de Información y Análisis Espacial de la AEMA (European Topic Centre on Spatial Information and Analysis-ETC SIA).

#### FURTHER INFORMATION

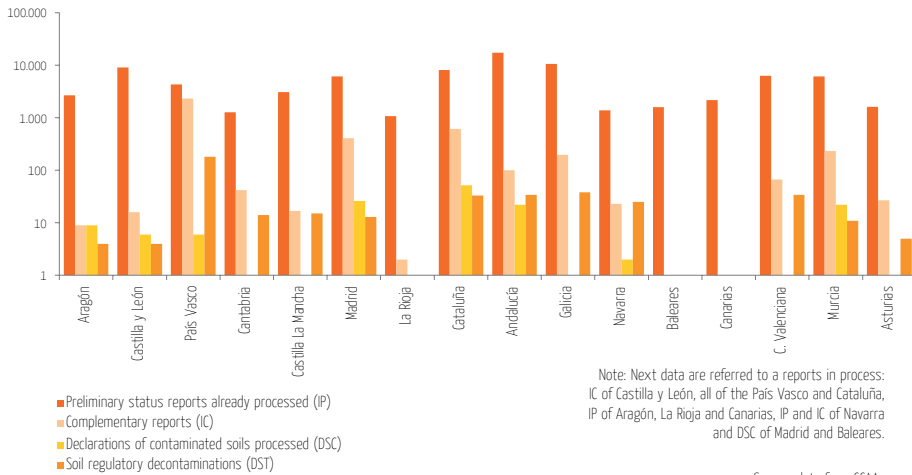
- <http://www.etcisia.uma.es>



## Contaminated soils

*Some autonomous communities have made progress in the declaration of contaminated soils, as well as the compilation of the state inventory of contaminated soils.*

Number of resolved cases on contaminated soils during the period 2005-2011



Law 22/2011, of 28 July, on Waste and Contaminated Soils, maintains the obligation for autonomous communities to declare and delimit contaminated soils within their territorial area, as well as to compile an inventory of such soils. This law also obliges the Ministry of Agriculture, Food and Environment to prepare a state inventory of contaminated soils from data provided by the autonomous communities. On the other hand, the law includes a new instrument to make the management of contaminated soils more flexible, for example by voluntary decontamination.

Royal Decree 9/2005, of 14 January, establishing the list of potentially polluting activities for the land and the criteria and standards for the declaration of contaminated lands, sets out the list of potentially polluting activities for the land and the criteria and standards that govern the conditions under which land will be considered to be contaminated. It also sets out the contents of preliminary status reports (PSR) and provides for the possibility





of seeking complementary reports (characterisations and risk analysis) when the PSR so recommends.

This indicator intends to provide a description of the existing situation in the autonomous communities in relation to the management of contaminated soils; it collates, for the period 2005-2011, the total number of preliminary status reports already processed, the number of complementary reports, the number of declarations of contaminated soils and the number of decontaminations (regulatory and voluntary).

This is information that can be improved with the incorporation of data from the rest of the autonomous communities, as well as the inclusion of other variables that will enrich this synthetic information: number of locations and inventoried surface, nature of contamination, effects on groundwater resources, data relative to decontamination, investments, etc.

Within the EU, a serious lack of information concerning the extension and location of contaminated soils has been detected. This is due mainly to the absence of European legislation that obliges member states to gather this information. According to the 2012 report 'The state of soil in Europe', published by the Joint Research Centre (JRC), there could be around three million sites in Europe where there may be, or have been, potentially soil polluting activities and it is estimated that around 250,000 need urgent decontamination. The report recognised the need to change the legislation to avoid this figure increasing by 50% by 2025.

At the same time, it is important to highlight the potential of appropriate management policies for contaminated soils in order to mitigate other threats to soils, for instance the loss of functionality linked to soil sealing. The document 'Guidelines on best practice to limit, mitigate or compensate soil sealing' of the Commission (SWD (2012) 101 final/2) proposes as a solution for soil sealing the reuse of useless buildings or of abandoned industrial areas. The reuse of old industrial areas, potentially affected by contamination, would reduce the need for continuous consumption of virgin soils, at the same time as, with the appropriate measures, supposing a reduction in the risks to human health and the environment associated with soil contamination.

The Cohesion Policy 2007-2013 has 3,500 million euros for the rehabilitation of industrial sites and contaminated land (SEC (2010) 360 final, Cohesion policy: Strategic report 2010 on the implementation of the programmes 2007-2013). In the new financial period



2014-2020, the Commission proposes, among the priorities of the Cohesion Policy, the improvement of the urban environment (COM (2011) 612 y COM (2011) 614), including the regeneration of old industrial areas. The regions of the member states able to receive funds can utilise them to reuse abandoned or contaminated sites and build on them, rather than sealing virgin soils.

#### NOTES

- Contaminated soils in Spain are regulated by means of Law 22/2011, of 28 July, on Waste and Contaminated Soils, and by Royal Decree 9/2005, of 14 January, establishing the list of potentially polluting activities for the land and the criteria and standards for the declaration of contaminated lands, as well as by the legislative instruments developed by the autonomous communities. Likewise, the National Integrated Waste Plan 2008-2015 (approved by Ministers Council of 26 December 2008) establishes the basic guidelines of the soil protection policy concerning contamination.
- The indicator refers to the number of contaminated land declarations resolved and reports processed.
- For the Basque Country, the data on contaminated land corresponds to land quality declarations.

#### SOURCES

- Information from the autonomous communities gathered by the Sub-Directorate-General for Waste. Directorate-General for Environmental Quality and Assessment and Natural Environment. Ministry of Agriculture, Food and Environment.

#### FURTHER INFORMATION

- <http://www.magrama.gob.es/es>
- [http://ec.europa.eu/environment/soil/sealing\\_guidelines.htm](http://ec.europa.eu/environment/soil/sealing_guidelines.htm)



## Area affected by erosion

*In the year 2012 the work on the National Soil Erosion Inventory for Palencia and Salamanca provinces, within the autonomous community of Castile-Leon, was completed.*

Area affected by erosion (%)

CCAA	With moderate erosion (%)	With medium erosion (%)	With high erosion (%)
Cantabria	59.91	22.39	17.70
Asturias	61.92	21.67	16.42
Navarra	65.64	18.79	15.57
Murcia	66.41	18.13	15.46
La Rioja	65.84	20.43	13.72
Galicia	74.34	13.06	12.61
Balearic Islands	76.62	13.69	9.70
Madrid	81.28	10.89	7.83
Catalonia	54.41	24.86	20.74
Extremadura	83.75	9.81	6.44
Canary Islands	69.25	21.86	8.89
Andalusia	57.61	19.76	22.63
C. Valenciana	70.12	16.04	13.83
Castile-Leon (*)	88.79	8.19	3.02

(\*) Data from Castile-Leon refer to the provinces of Leon, Valladolid, Zamora, Avila, Palencia and Salamanca. Source: MAGRAMA

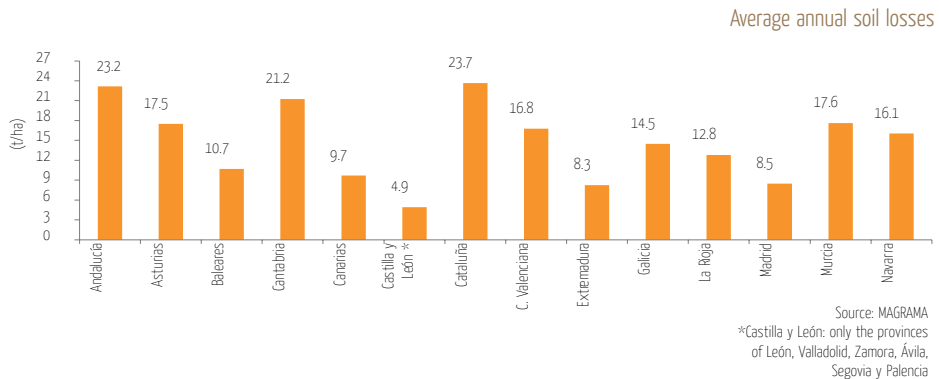
The National Soil Erosion Inventory (INES) has been extended after incorporating two new provinces: Palencia and Salamanca (Castile-Leon). The table shows the percentages of land of each of the different autonomous communities included in the inventory that are affected to varying degrees of erosion. The exception is Castile-Leon, in which the percentage of land affected by erosion refers only to the provinces assessed up to now (Leon, Valladolid, Zamora, Avila, Palencia and Salamanca) with respect to the total surface of the region. This data is the result of the work done between the years 2002 and 2012.

As can be seen from the table, regarding those provinces analysed up to the present and with the exception of Castile-Leon that is still to be completed, Extremadura, Madrid and the Balearic Islands are the regions that have the greatest amount of land suffering from moderate erosive processes. Catalonia and Andalusia head the list of autonomous communities with highly erosive processes.

Looking at the annual average losses of the autonomous communities analysed (except Castile-Leon, that is incomplete), Catalonia, Andalusia and Cantabria present the highest values with 23.67, 23.17 and 21.23 t/ha year. The lowest values are registered in Extremadura and Madrid, with 8.25 and 8.47 t/ha year, respectively.



The difference between the National Soil Erosion Inventory and other works of similar characteristics in which sheet and rill erosion are studied in other European countries is that the Inventory, which uses a detailed scale of 1:50,000, involves both field work, that improves the RUSLE model (an updated version of the 'Universal soil loss equation' – USLE), and study of other types of erosion (riverbank, gully, deep and wind erosion). As such, the inventory constitutes a methodological model for studies of this type throughout Europe.



## NOTES

- The National Soil Erosion Inventory aims, among other objectives, to analyse the erosive processes occurring in Spain and follow their evolution, so as that it is possible to identify those areas that require priority actions to stop those processes.
- The erosion considered in this indicator is 'sheet and rill' erosion. The percentages of land given refer to the total geographical surface of the autonomous community, with the erodible surface that which is susceptible to erosion processes, calculated by deducting artificial surfaces, surface water sheets and wetlands from the geographical surface.
- The Soils Erosion National Inventory put the results of calculation of soil losses because of sheet and rill erosion into the following groups of erosive levels:

1: 0-5 t/ha year	3: 10-25 t/ha year	5: 50- 100 t/ha year	7: >200 t/ha year
2: 5-10 t/ha year	4: 25-50 t/ha year	6: 100-200 t/ha year	

- In the indicator, 'Moderate' soil loss is defined as 0-10 t/ha year, 'intermediate' as 10-25 t/ha year and "High" as over 25 t/ha year.
- The inventory is divided into five sections according to the various types of erosion:
  - Sheet and rill erosion (quantitative estimate of soil loss, performed by applying RUSLE model, Revised Universal Soil Loss Equation)
  - Gully and ravine erosion (identification and demarcation of affected areas)
  - Deep erosion (mass movements) (identification of areas potentially at risk and qualitative classification)
  - Bank erosion (qualitative classification of hydrological units according to their susceptibility to torrential phenomena in their drainage network)
  - Wind erosion (identification and classification of areas potentially at risk)

## SOURCES

- National Soils Erosion Inventory, 2002-2012. Directorate-General for Rural Development and Forestry Policy. Secretariat-General for Agriculture and Food. Ministry of Agriculture, Food and Environment.

## FURTHER INFORMATION

- <http://www.magrama.gob.es/es/biodiversidad/temas/inventarios-nacionales/inventario-nacional-de-erosion-desuelos/default.aspx>