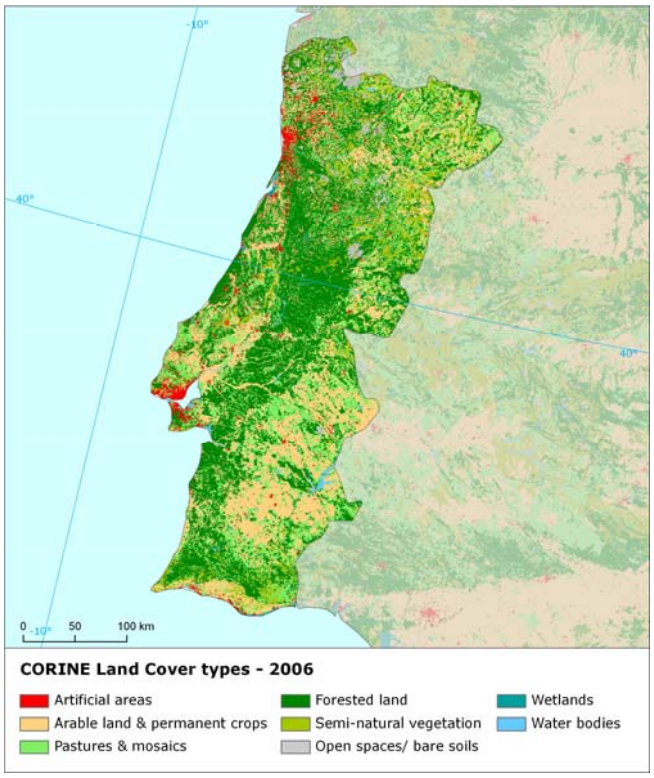
Portugal

Land cover 2006

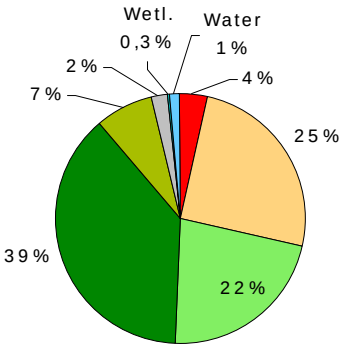
Overview of land cover & change 2000-2006

Portugal is the country with the far highest land cover dynamic in Europe. Moreover, during 2000-2006 the overall land cover change intensity even doubled, compared to the previous period. The main driver of land cover exchange in Portugal is forest creation and management, which is represented mostly by internal conversions between transitional woodland and standing forests with prevailing share of accelerated recent felling and transition. The other most significant drivers of landscape development in Portugal are accelerated withdrawal of farming with woodland creation as well as the changes due to forest and shrub fires (including both natural vegetation consumptions by fires and forest creation over burnt areas). Both arable/crop land and pastures/mosaics have negative balance of net change caused by mentioned accelerated withdrawal of farming with woodland creation. Consumption of semi-natural vegetation is mainly driven by afforestation. On the contrary, there has been observed enormous formation of water bodies, connected with construction of giant Alqueva dam at the border to Spain.
Artificial land take in Portugal has one of highest percentual rates among European countries. Development of artificial areas during 2000-2006 has been driven mostly by accelerated construction and recycling of developed urban areas. On the contrary, the intensity of industrial/commercial sprawl and especially of residential sprawl significantly decreased, compared to the previous period.

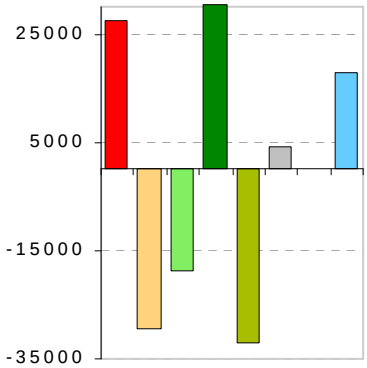


Note: The results presented here are based on a change analysis of 44 land cover types mapped consistently on a 1:100.000 scale across Europe over almost two decades 1990-2006 - see Corine land cover (CLC) programme for details.
Number of years between CLC2000-CLC2006 data for Portugal: 6

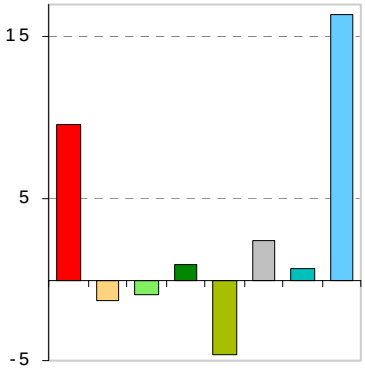
1.1. Land cover 2006 [% of total]



1.2. Net change in land cover 2000-2006 [ha]



1.3. Net change in land cover [% of initial year 2000]



Artificial areas | Arable land & permanent crops | Pastures & mosaics | Forested land
Semi-natural vegetation | Open spaces/ bare soils | Wetlands | Water bodies

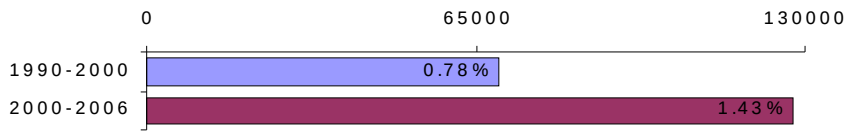
Summary balance table 2000-2006

	Artificial areas	Arable land & permanent crops	Pastures & mosaics	Forested land	Semi-natural vegetation	Open spaces / bare soils	Wetlands	Water bodies	TOTAL [hundreds ha]
Land cover 2000	**2880**	**22680**	**19682**	**34023**	**6926**	**1671**	**286**	**1093**	**89241**
Consumption of initial LC	95	600	341	5940	360	300	0	13	7648
Formation of new LC	370	307	152	6245	40	340	2	193	7648
Net Formation of LC	**275**	**-293**	**-189**	**305**	**-320**	**41**	**2**	**179**	**0**
Net formation as % of initial year	*9.6*	*-1.3*	*-1.0*	*0.9*	*-4.6*	*2.4*	*0.6*	*16.4*	
Total turnover of LC	**464**	**907**	**492**	**12185**	**399**	**640**	**3**	**206**	**15297**
Total turnover as % of initial year	*16.1*	*4.0*	*2.5*	*35.8*	*5.8*	*38.3*	*0.9*	*18.9*	*17.1*
Land cover 2006	**3155**	**22386**	**19494**	**34328**	**6606**	**1711**	**288**	**1273**	**89241**

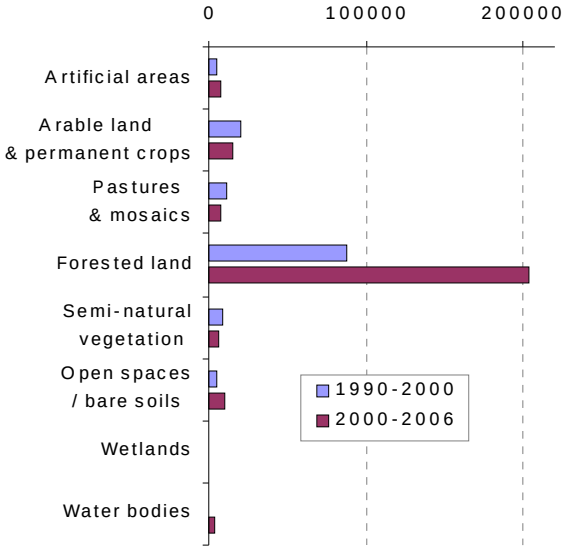
Portugal

Land cover trends comparison 1990-2000 vs. 2000-2006

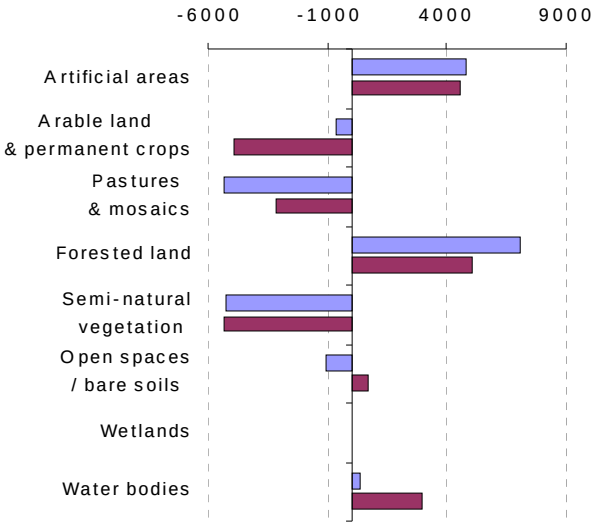
2.4. Annual land cover change [ha/year, % of total area]



2.5. Annual turnover of LC types [ha/year]

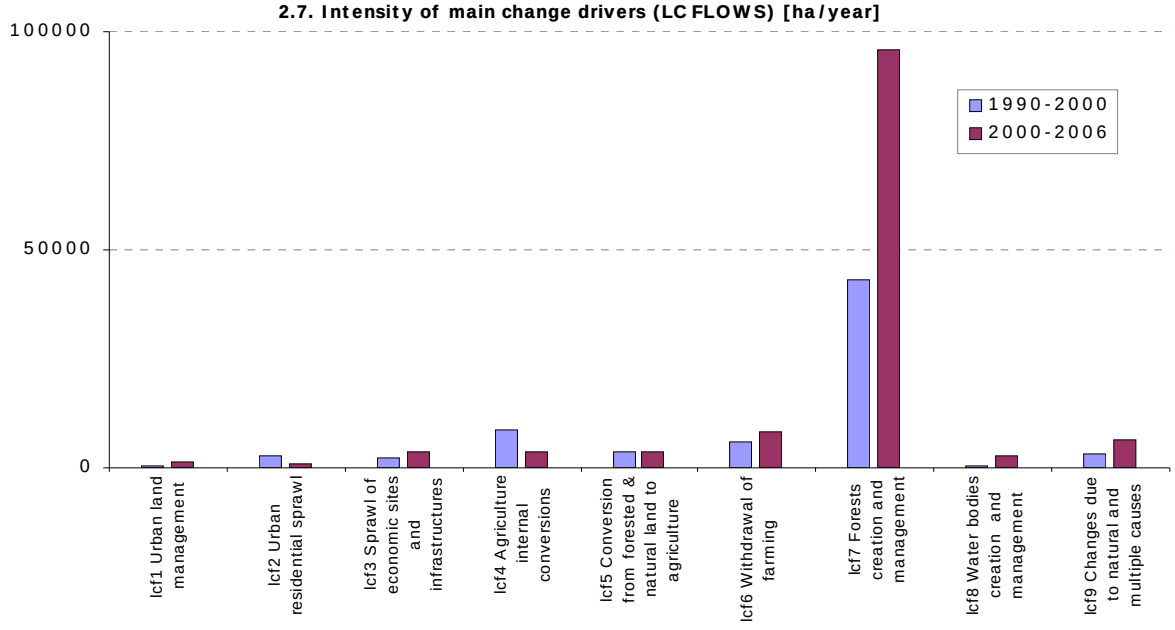


2.6. Net annual change of LC types [ha/year]



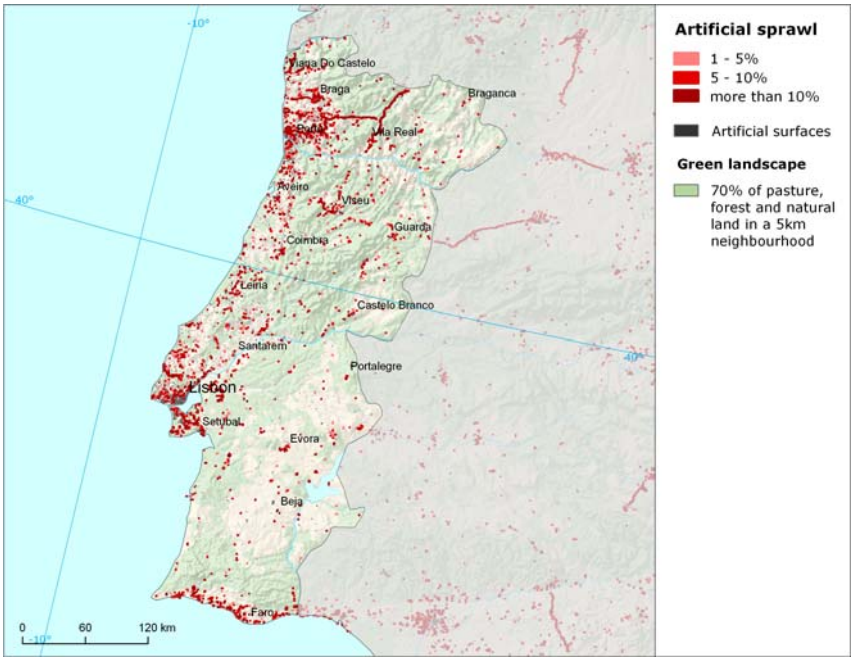
Summary trend figures	1990-2000	2000-2006
Annual land cover change [ha/year]	**69713**	**127473**
Annual land cover change as % of initial year	**0.78%**	**1.43%**
Land uptake by artificial development as mean annual change [ha/year]	4819	4653
Agricultural land uptake by urban and infrastructures development as mean annual change [ha/year]	3338	3244
Net uptake of forests and semi-natural land by agriculture as mean annual change [ha/year]	-2405	-4399
Net conversion from pasture to arable land and permanent crops as mean annual change [ha/year]	1247	180
Forest & other woodland net formation as mean annual change [ha/year]	7095	5086
Dry semi-natural land cover net formation as mean annual change [ha/year]	-5897	-3697
Wetlands & water bodies net formation as mean annual change [ha/year]	384	3018

2.7. Intensity of main change drivers (LC FLOWS) [ha/year]

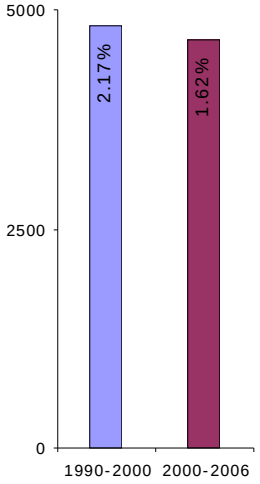


Portugal

Artificial areas



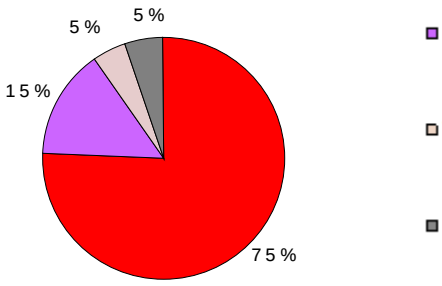
3.8. Artificial land take [ha/year, % of initial year]



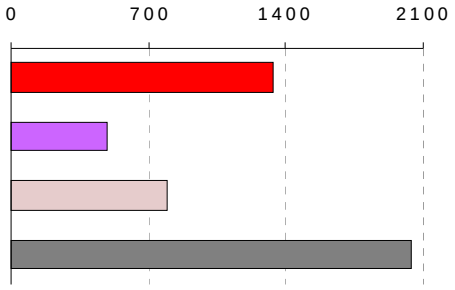
Artificial development driven by construction

Although the intensity of artificial sprawl slightly decreased after year 2000, land take rate in Portugal still remains one of the highest among the European countries. However, the structure of land take has been significantly modified, compared to the previous period. Residential sprawl (22%), which was the main driver during 1990-2000, lost most of its intensity during 2000-2006 and thus the urban development is driven mainly by accelerated construction (36%) and recycling of developed urban land (represented by conversion of construction sites into urban fabric, industrial/commercial units and transport networks). The other accelerated contributors of land take are sprawl of transport networks (17%) and of sport and leisure facilities (7%). Land take in Portugal occurs mostly over forested land (51%) and over agricultural areas (39%) with prevailing share of arable/crop land (26%).
There are three major concentrations of artificial development in Portugal, situated in the surroundings of Porto in the north (the biggest one), in the region of the capital city Lisbon and along southern coastline (Algarve). Significant linear features connected with highway construction occur in the northern part of the country.

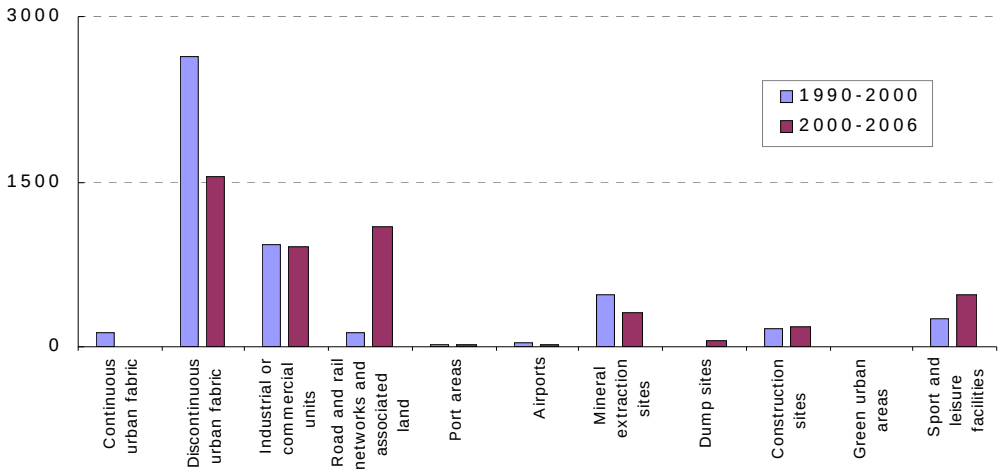
3.9. Artificial surfaces 2006 [% of total area]



3.10. Artificial land take 2000-2006 [ha/year]

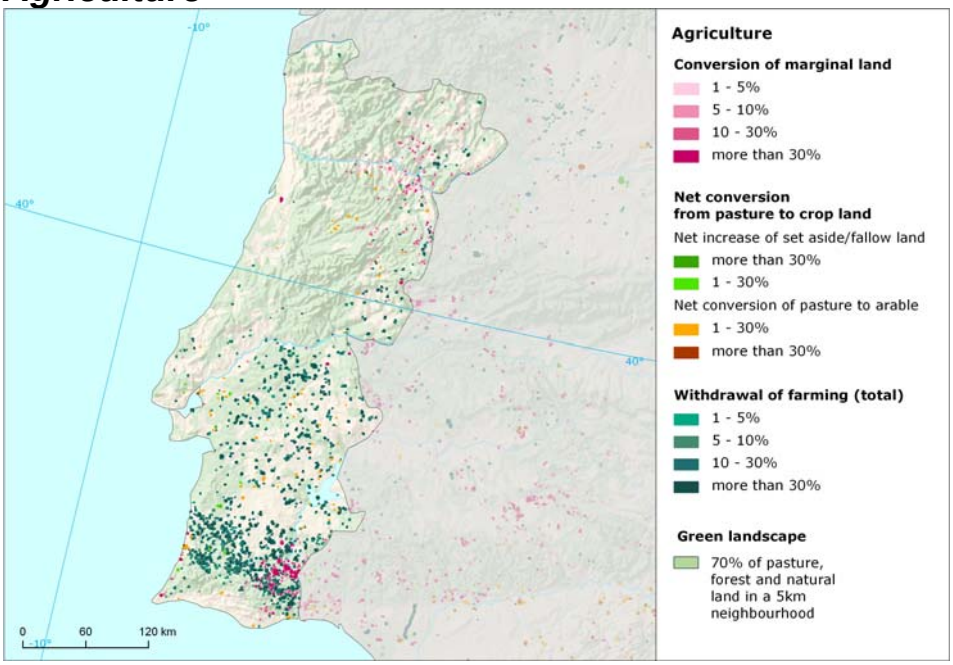


3.11. Mean annual artificial change by class [ha/year]



Portugal

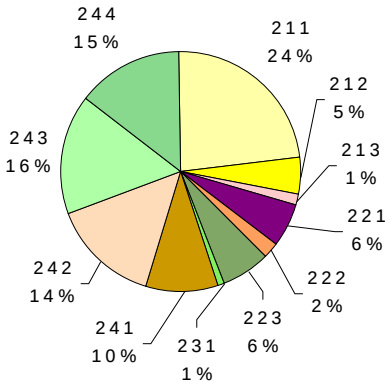
Agriculture



Withdrawal of farming with transitional woodland creation, slow down of internal conversions

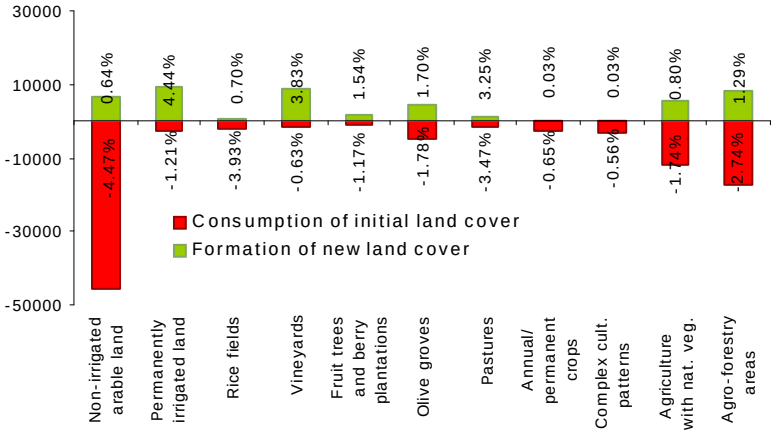
Development of agricultural areas in Portugal in the period 2000-2006 is characterized by accelerated consumption of agricultural land through withdrawal of farming and by slowdown of internal agricultural conversions. All agricultural classes, with the exception of permanently irrigated land and vineyards have negative balance of net change with prevailing consumption of area. Withdrawal of farming with transitional woodland creation is the biggest consumer of agricultural land, followed by creation of water bodies over agricultural areas. On the contrary, there is also significant amount of conversions from forested and other natural or semi-natural land to agriculture.
Conversions from arable or pasture to permanently irrigated land (which were the major drivers of internal agriculture development during 1990-2000) and also conversions between arable and pasture land has decreased and the conversion from arable land to vineyards, orchards or olive grows became the most significant flow among internal agriculture conversions.
Spatially, withdrawal of farming with woodland creation occurs mostly in southern half of the country. There are two main concentrations of conversion of forested and other natural land to agriculture situated in the north-western (Guarda region) and south-western part of Portugal.

4.12. Agricultural areas 2006 [% of total area]

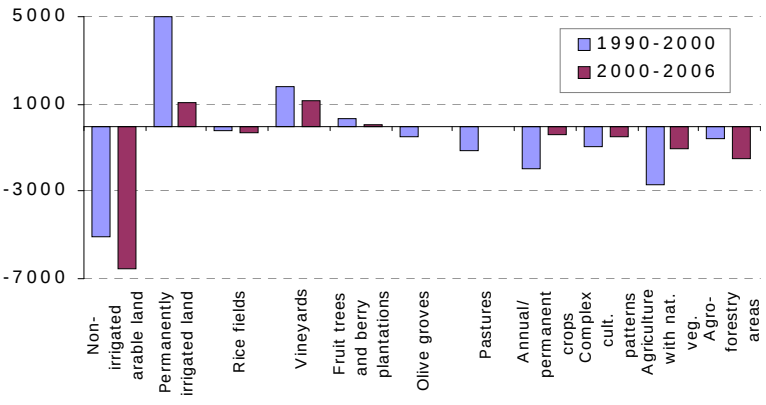


- 211 Non-irrigated arable land
- 212 Permanently irrigated land
- 213 Rice fields
- 221 Vineyards
- 222 Fruit trees and berry plantations
- 223 Olive groves
- 231 Pastures
- 241 Annual crops associated with permanent crops
- 242 Complex cultivation patterns
- 243 Agriculture land with significant areas of natural vegetation
- 244 Agro-forestry areas

4.13. Development of agricultural areas 2000-2006 – detailed balance [ha]

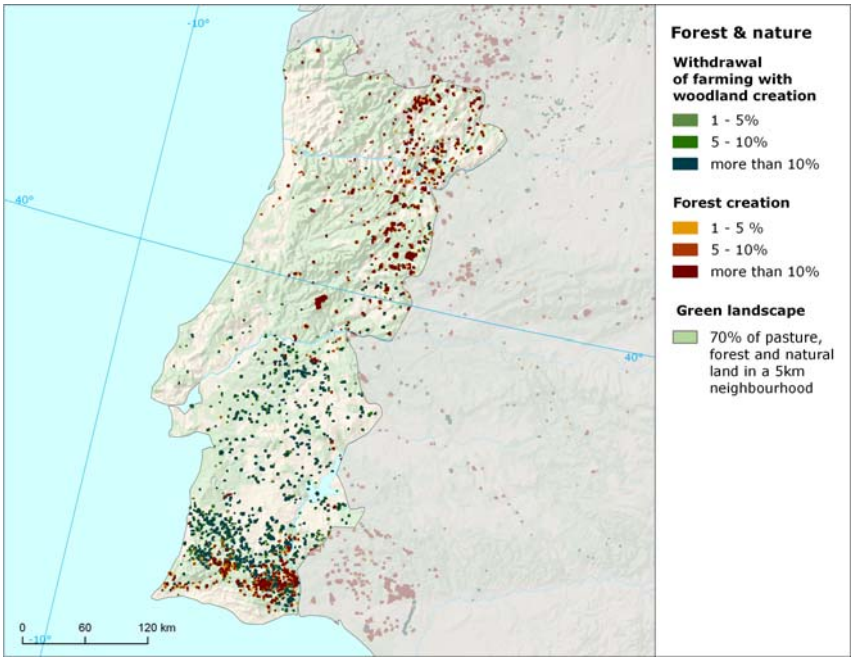


4.14. Mean annual agricultural change by class [ha/year]

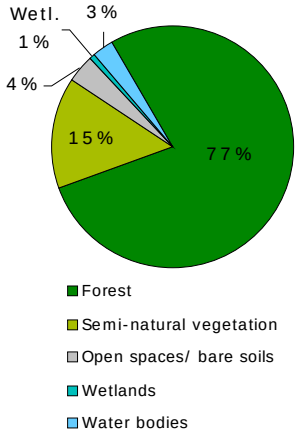


Portugal

Forest & nature



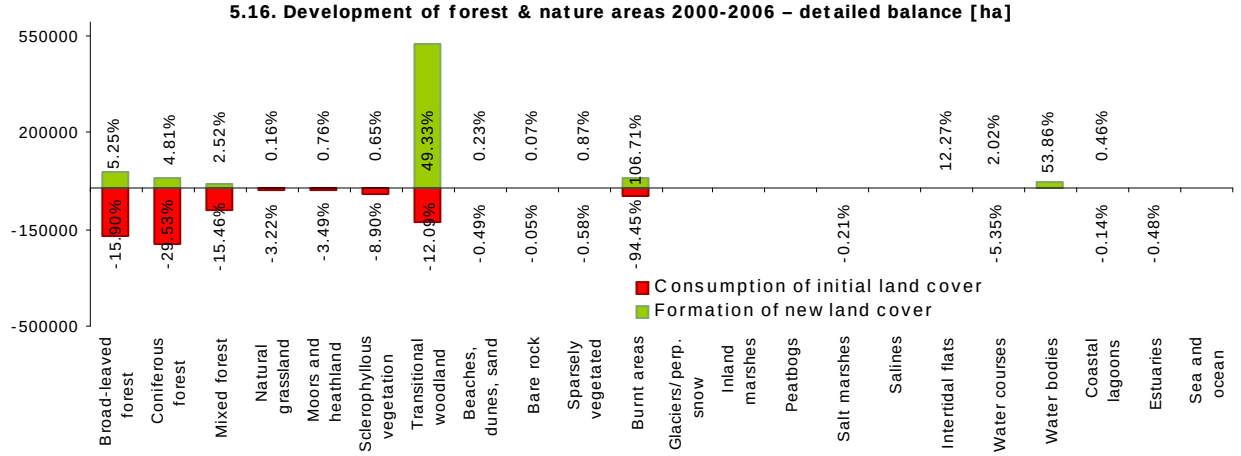
5.15. Forest & nature areas 2006 [% of total area]



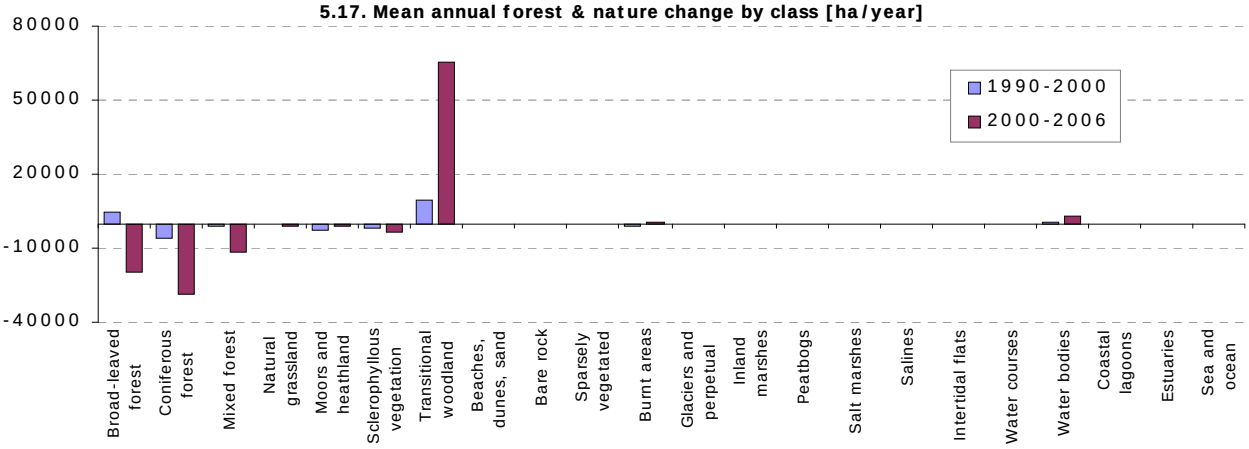
Formation of forested land and water bodies, forest and shrub fires

Besides internal forest conversions due to forestry activities (mainly accelerated recent felling and transition), dynamic of natural landscape in Portugal is driven mainly by formation of forested land through withdrawal of farming or from semi-natural (mostly sclerophyllous) vegetation areas. Other important contributors to natural land development are changes due to forest and shrub fires (represented by both afforestation of burnt areas and consumption of forest/natural vegetation by fires) and water bodies creation (connected with construction of giant Alqueva dam). Woodland creation through withdrawal of farming is situated mostly in southern half of the country. Other forest creation occurs in the north-western (Braganca, Guarda regions) and the south-western parts of Portugal.

5.16. Development of forest & nature areas 2000-2006 – detailed balance [ha]



5.17. Mean annual forest & nature change by class [ha/year]

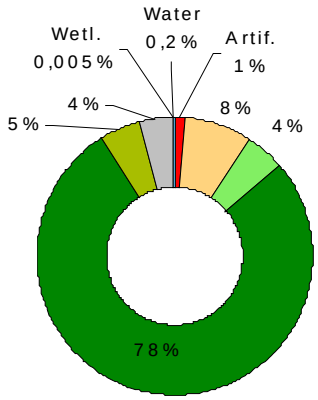


Portugal

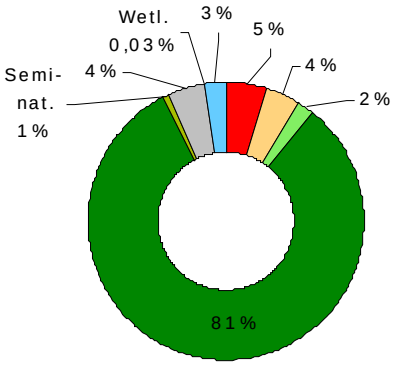
Annex: Land cover flows and trends

Land cover flows 2000-2006

6.18. Consumption of land cover 2000-2006 [% of total change area]

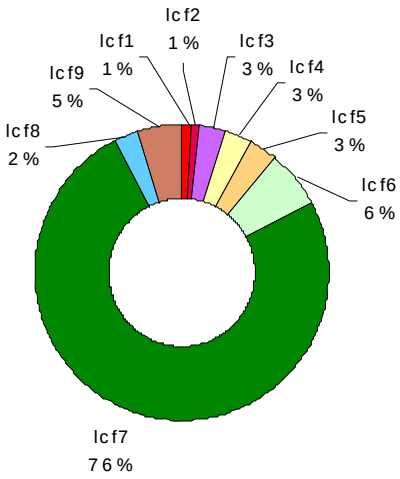


6.19. Formation of land cover 2000-2006 [% of total change area]



Artificial areas | Arable land & permanent crops | Pastures & mosaics | Forested land
Semi-natural vegetation | Open spaces/ bare soils | Wetlands | Water bodies

6.20. Drivers of change (LC FLOWS) 2000-2006 [% of total change area]

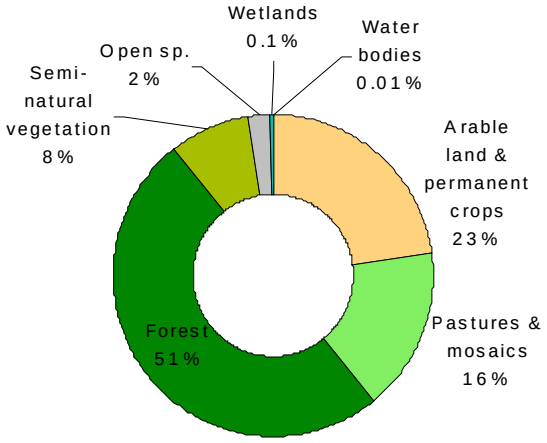


- lcf1 Urban land management
- lcf2 Urban residential sprawl
- lcf3 Sprawl of economic sites and infrastructures
- lcf4 Agriculture internal conversions
- lcf5 Conversion from forested & natural land to agriculture
- lcf6 Withdrawal of farming
- lcf7 Forests creation and management
- lcf8 Water bodies creation and management
- lcf9 Changes due to natural and multiple causes

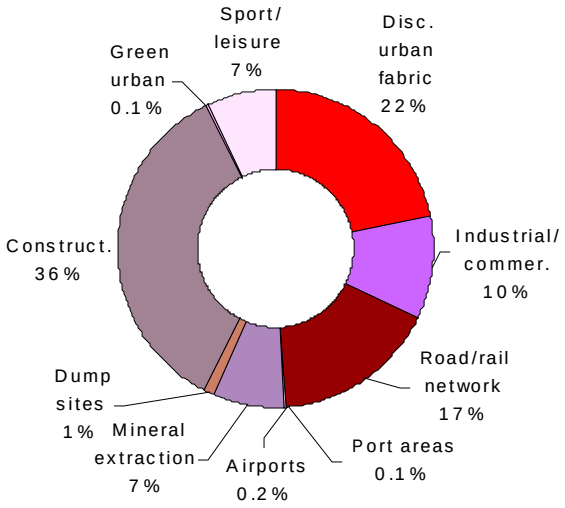
Portugal

Artificial areas

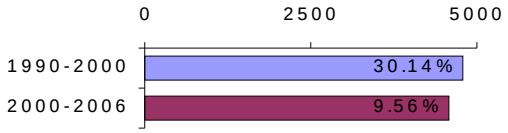
7.21. Consumption by artificial land take 2000-2006 [% of total]



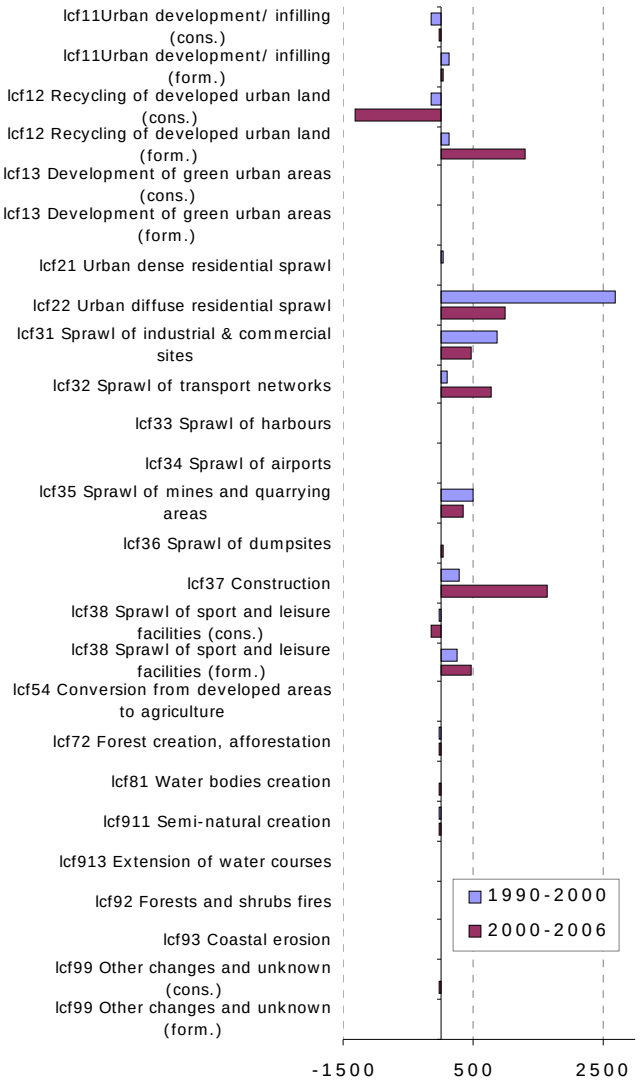
7.22. Formation by artificial land take 2000-2006 [% of total]



7.23. Net formation of artificial area [ha/year, % of initial year]



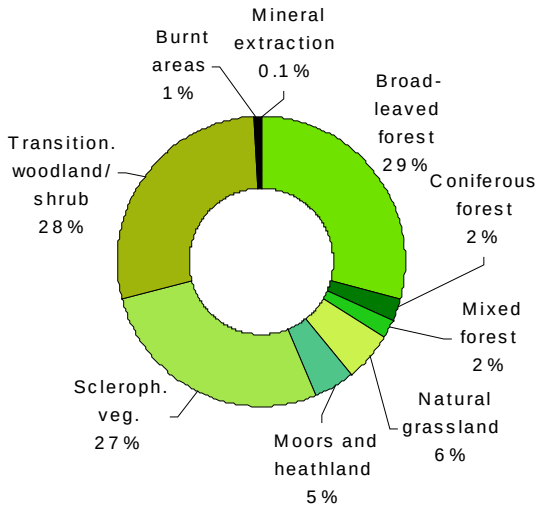
7.24. Artificial development by change drivers (LC FLOWS) [ha/year]



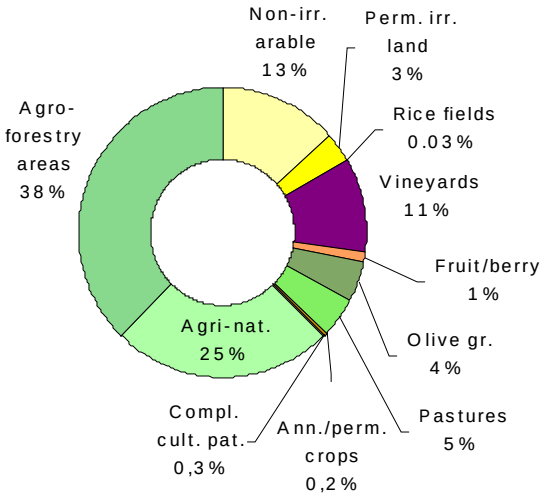
Portugal

Agriculture

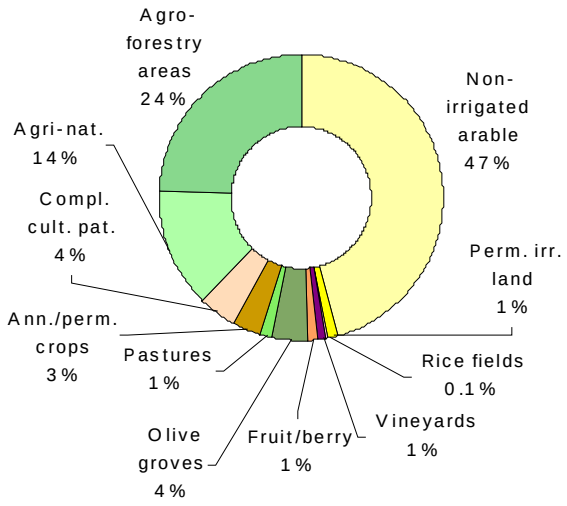
8.25. LC consumed by agriculture 2000-2006 [% of total]



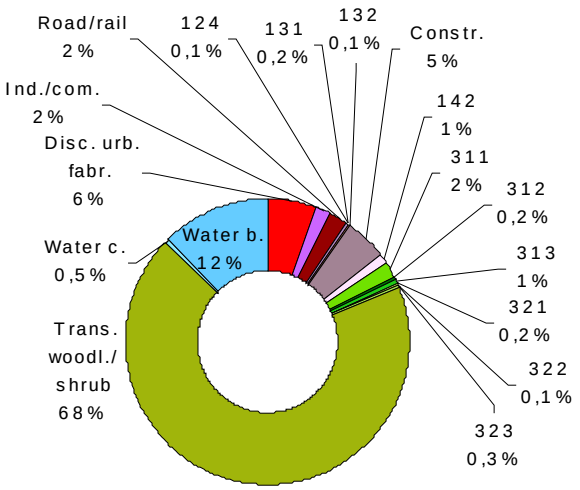
8.26. Formation of agricultural land from non-agriculture 2000-2006 [% of total]



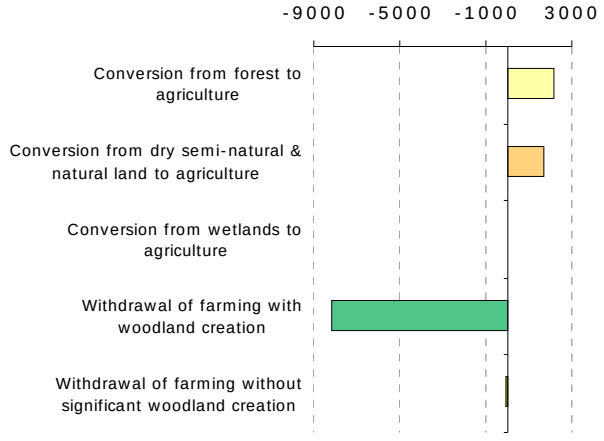
8.27. Consumption of agricultural land by non-agriculture 2000-2006 [% of total]



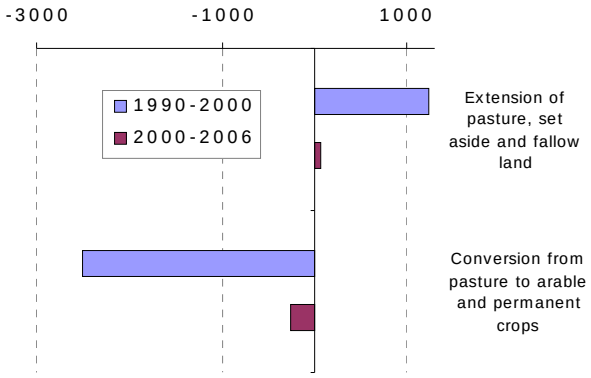
8.28. Formation of non-agricultural land from agriculture 2000-2006 [% of total]



8.29. Main annual conversions between agriculture and forests & semi-natural land 2000-2006 [ha/year]

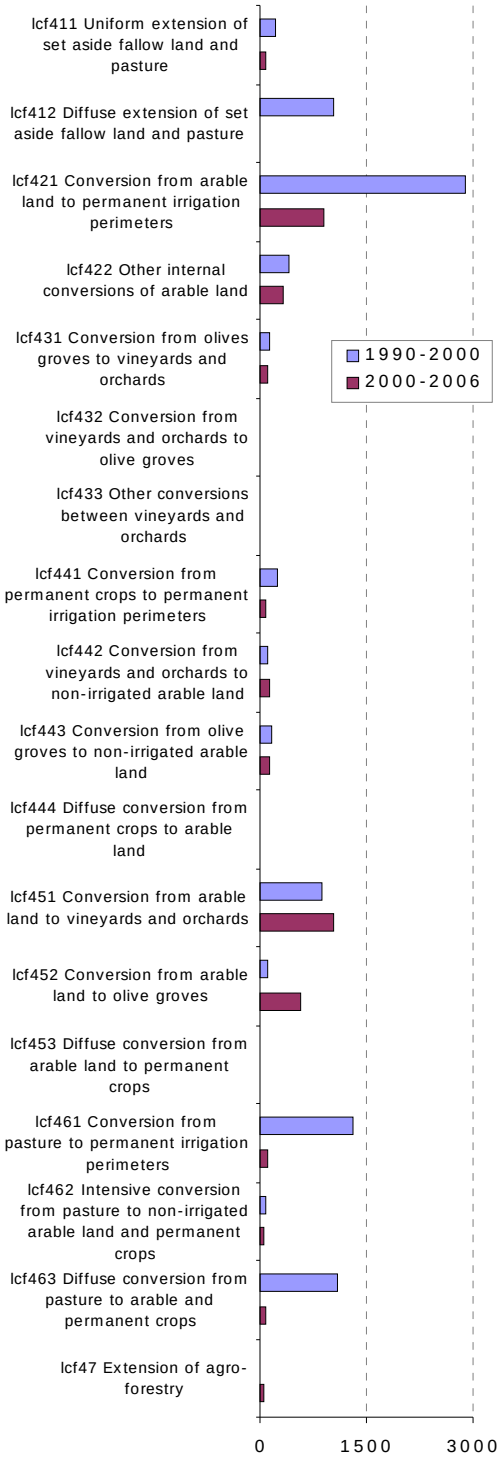


8.30. Mean annual conversion between arable land and pasture [ha/year]

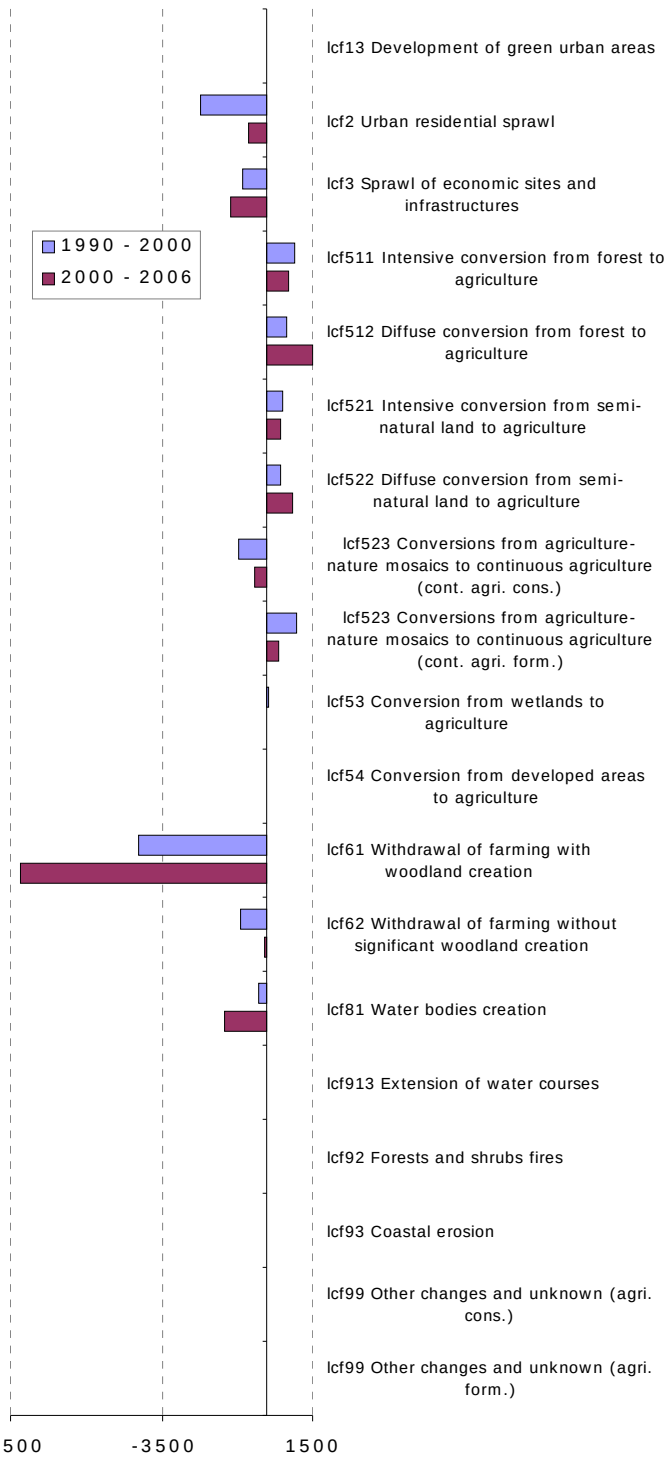


Portugal

9.31. Mean annual agriculture internal conversions [ha/year]



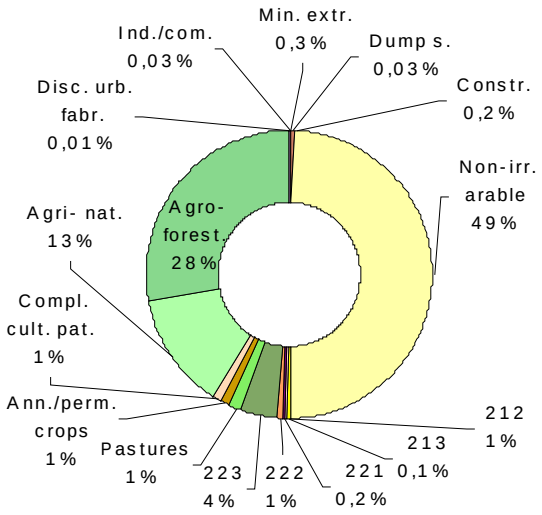
9.32. Mean annual conversions between agriculture and other LC types [ha/year]



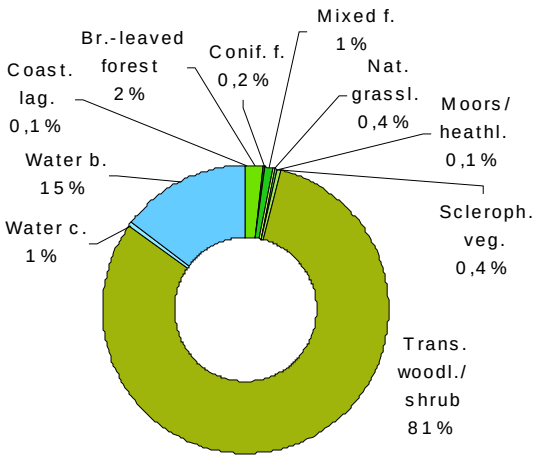
Portugal

Forest & nature

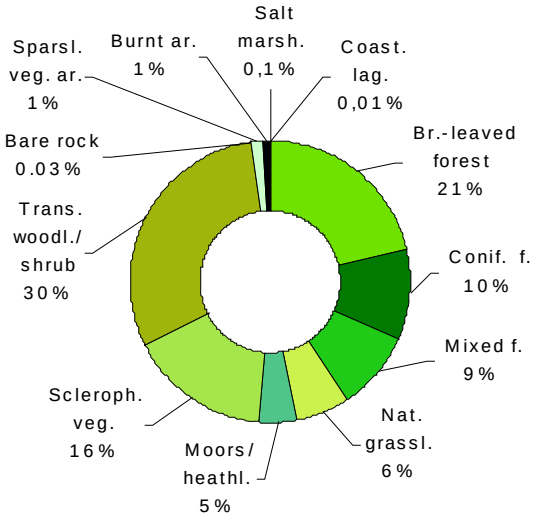
10.33. LC consumed by forest & nature 2000-2006 [% of total]



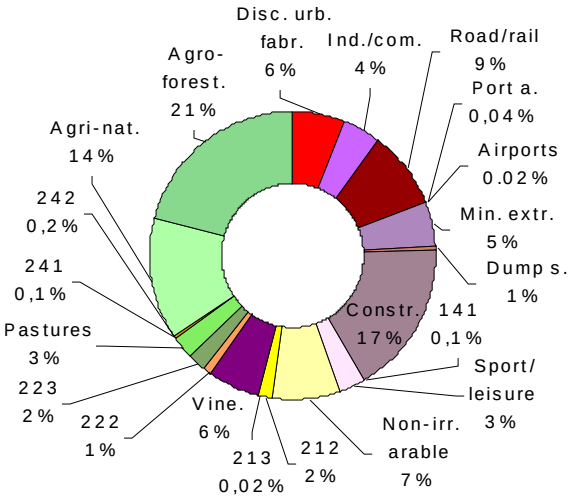
10.34. Formation of forest & nature land from non-forest /nature 2000-2006 [% of total]



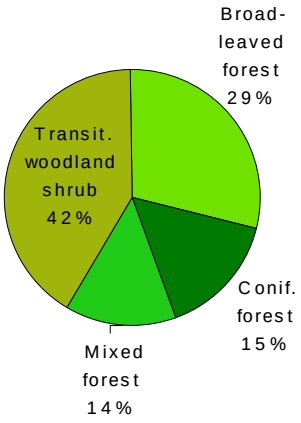
10.35. Consumption of forest & nature land by non-forest /nature 2000-2006 [% of total]



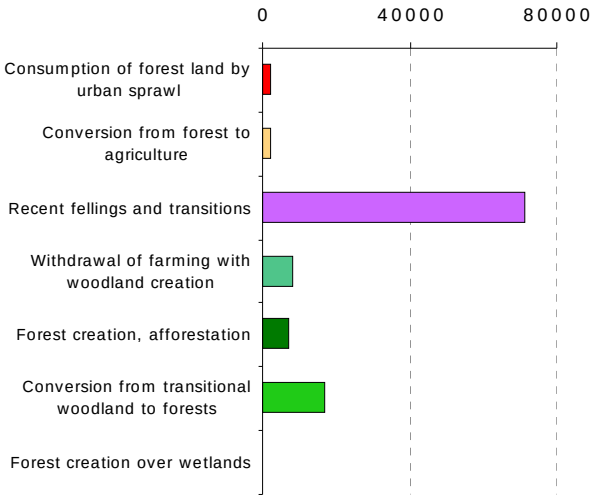
10.36. Formation of non-forest /nature land from forest & nature 2000-2006 [% of total]



10.37. Forested land 2006 [% of total area]

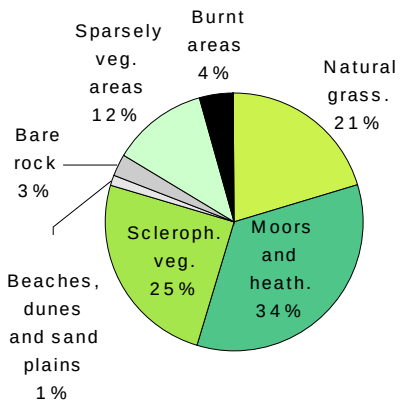


10.38. Main trends in woodland & forests consumption/formation 2000-2006 [ha/year]

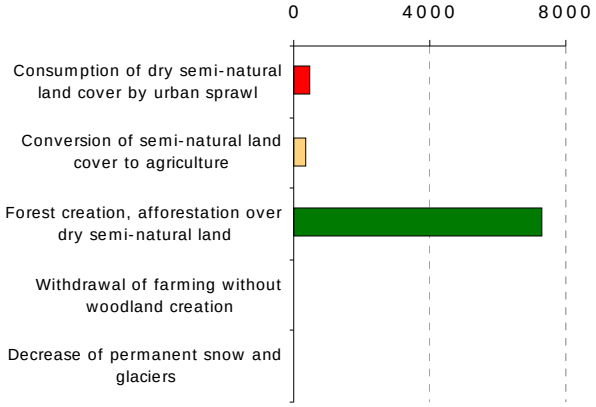


Portugal

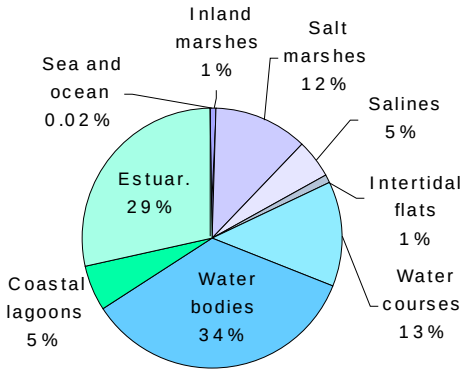
11.39. Dry semi-natural areas 2006 [% of total area]



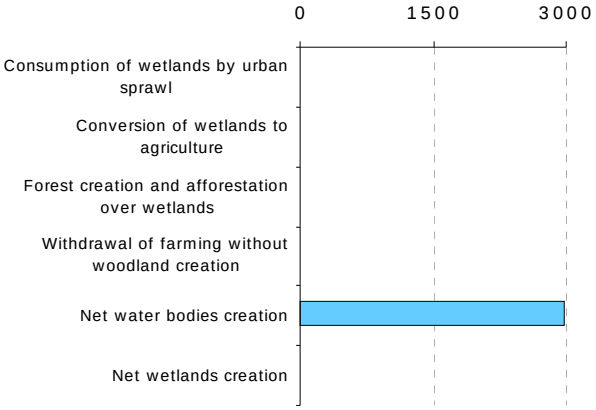
11.40. Main trends in dry semi-natural land consumption/formation 2000-2006 [ha/year]



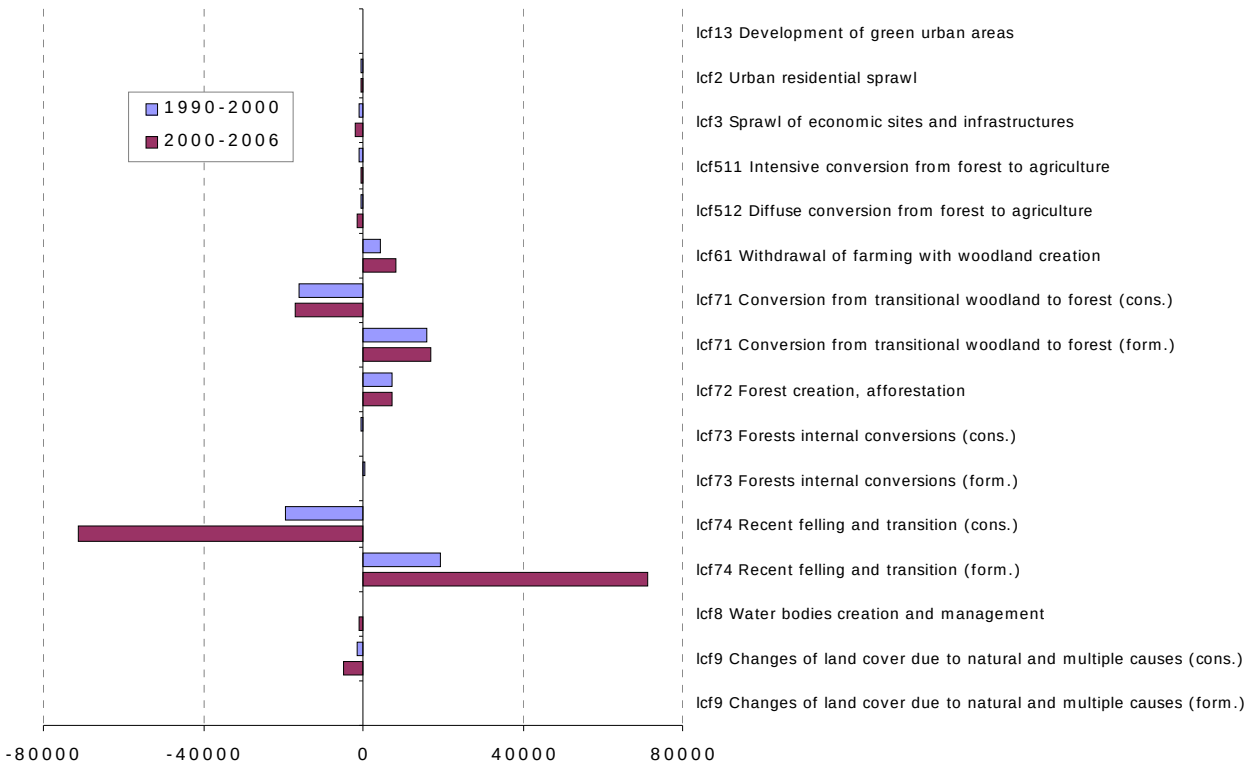
11.41. Wetlands & water 2006 [% of total area]



11.42. Main trends in wetlands & water consumption/formation 2000-2006 [ha/year]

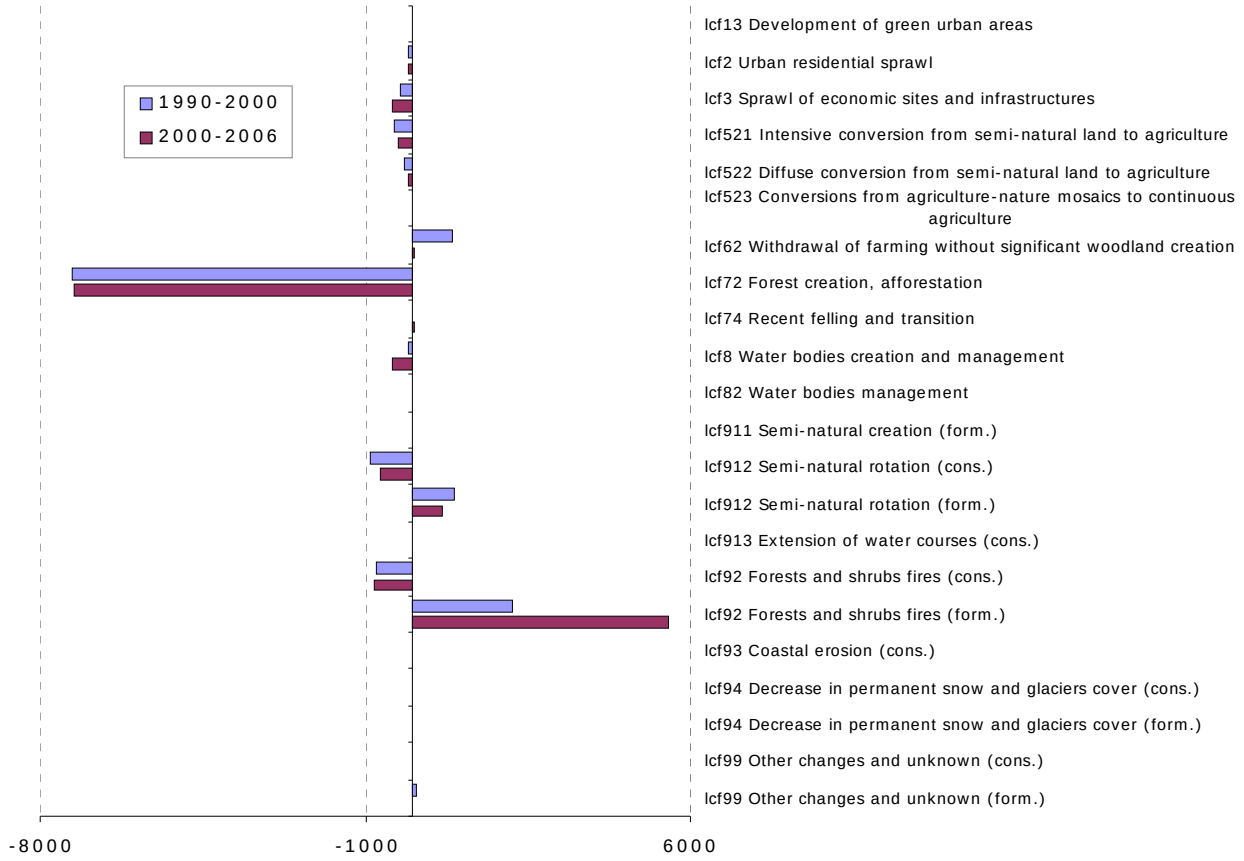


11.43. Mean annual conversions of forest & other woodland [ha/year]

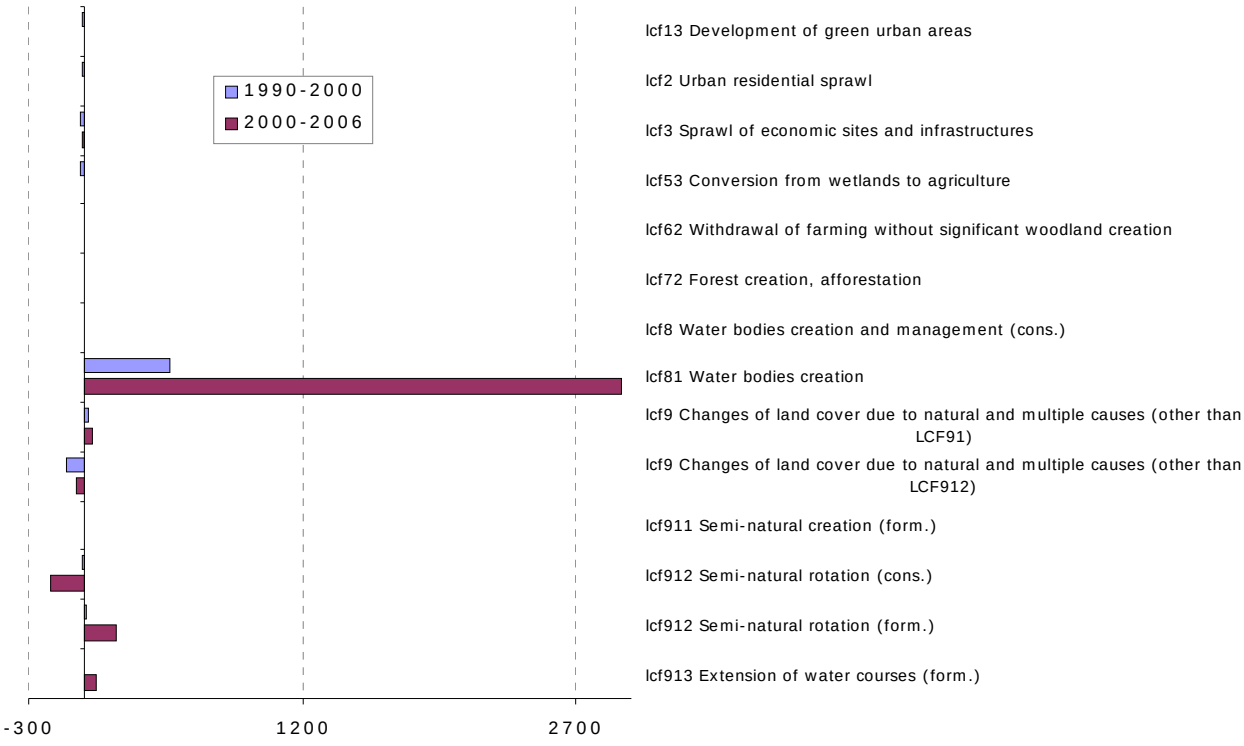


Portugal

12.44. Mean annual conversions of dry semi-natural LC [ha/year]

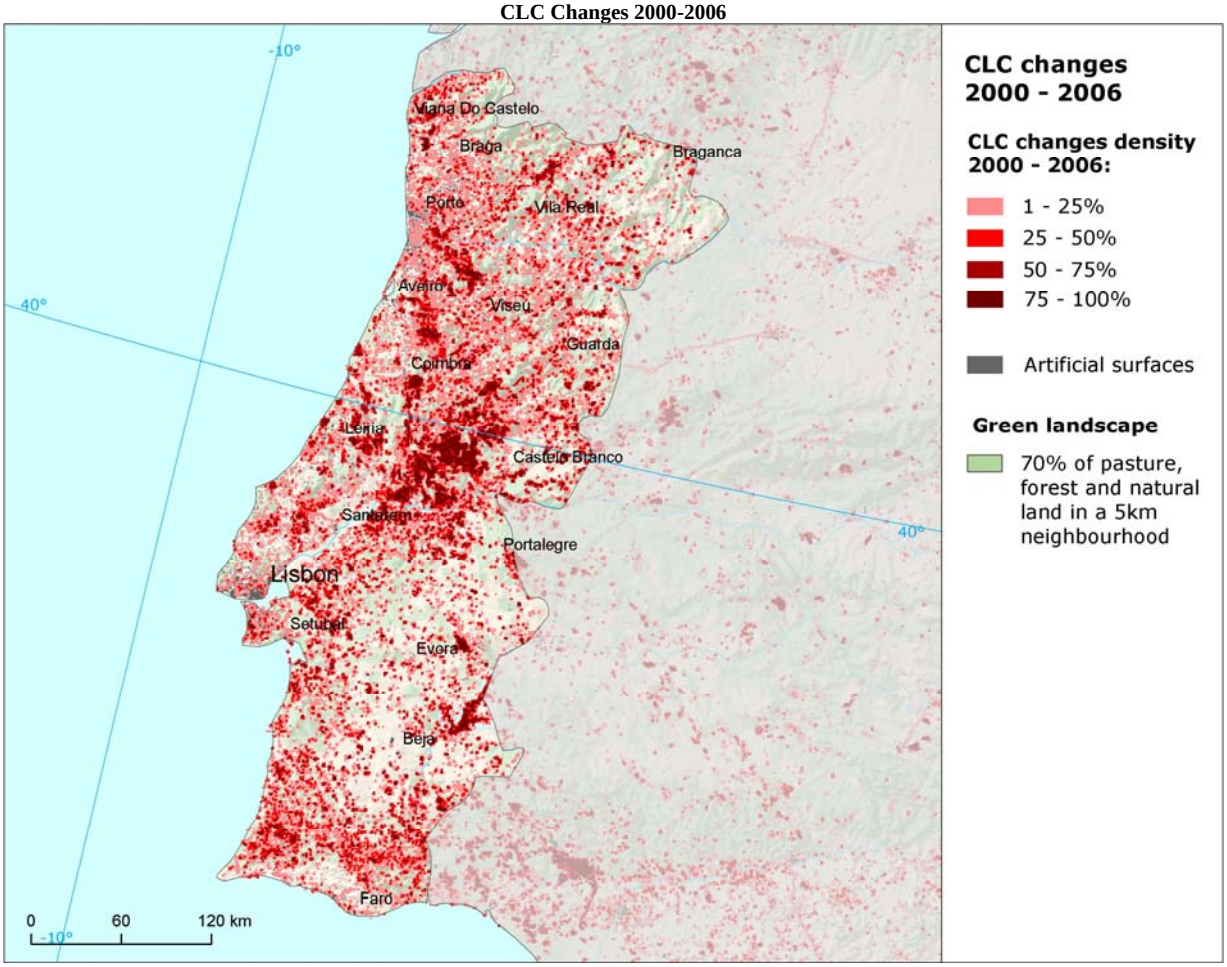


12.45. Mean annual conversions of wetlands and water LC [ha/year]

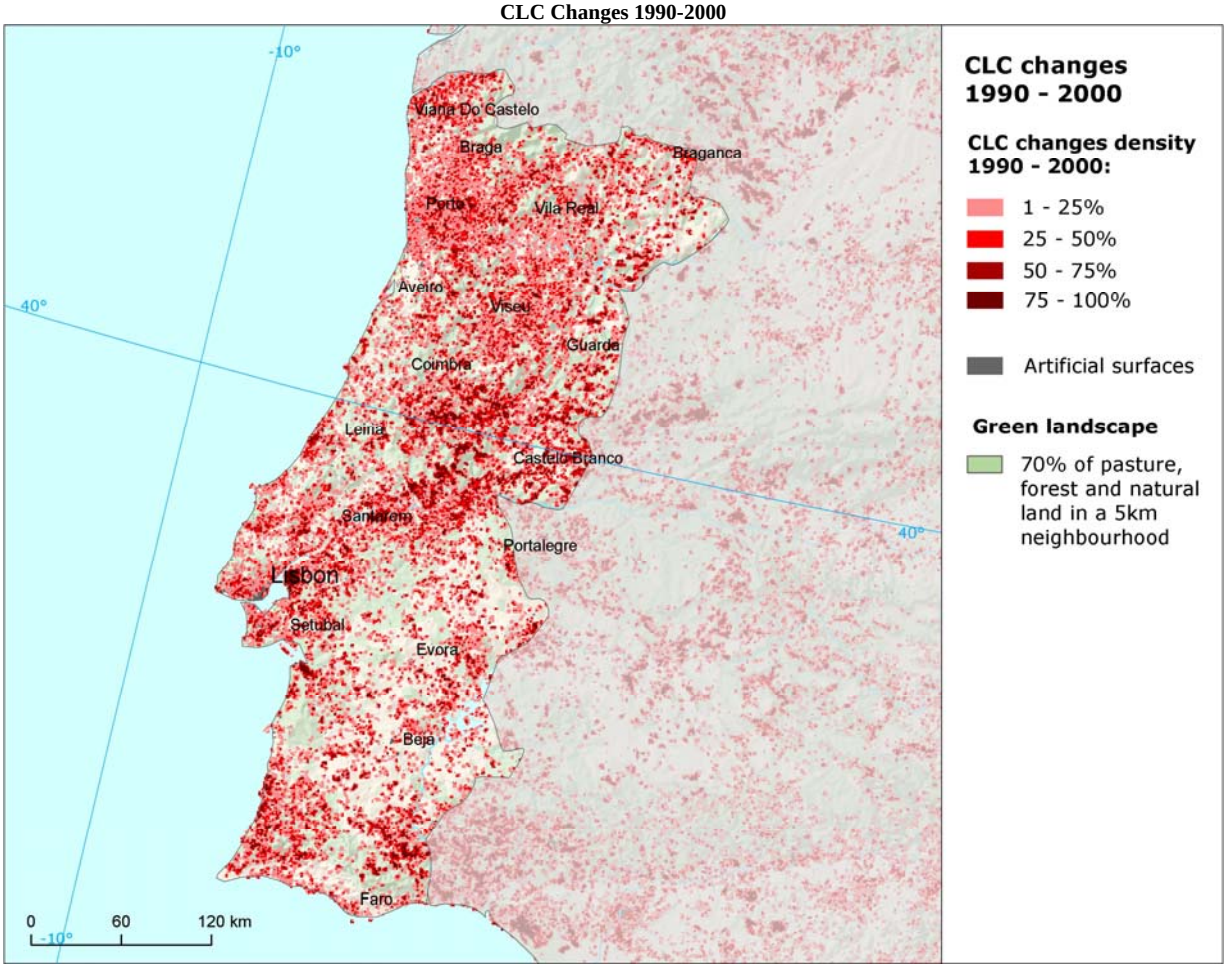


Portugal

CLC Changes 2000-2006

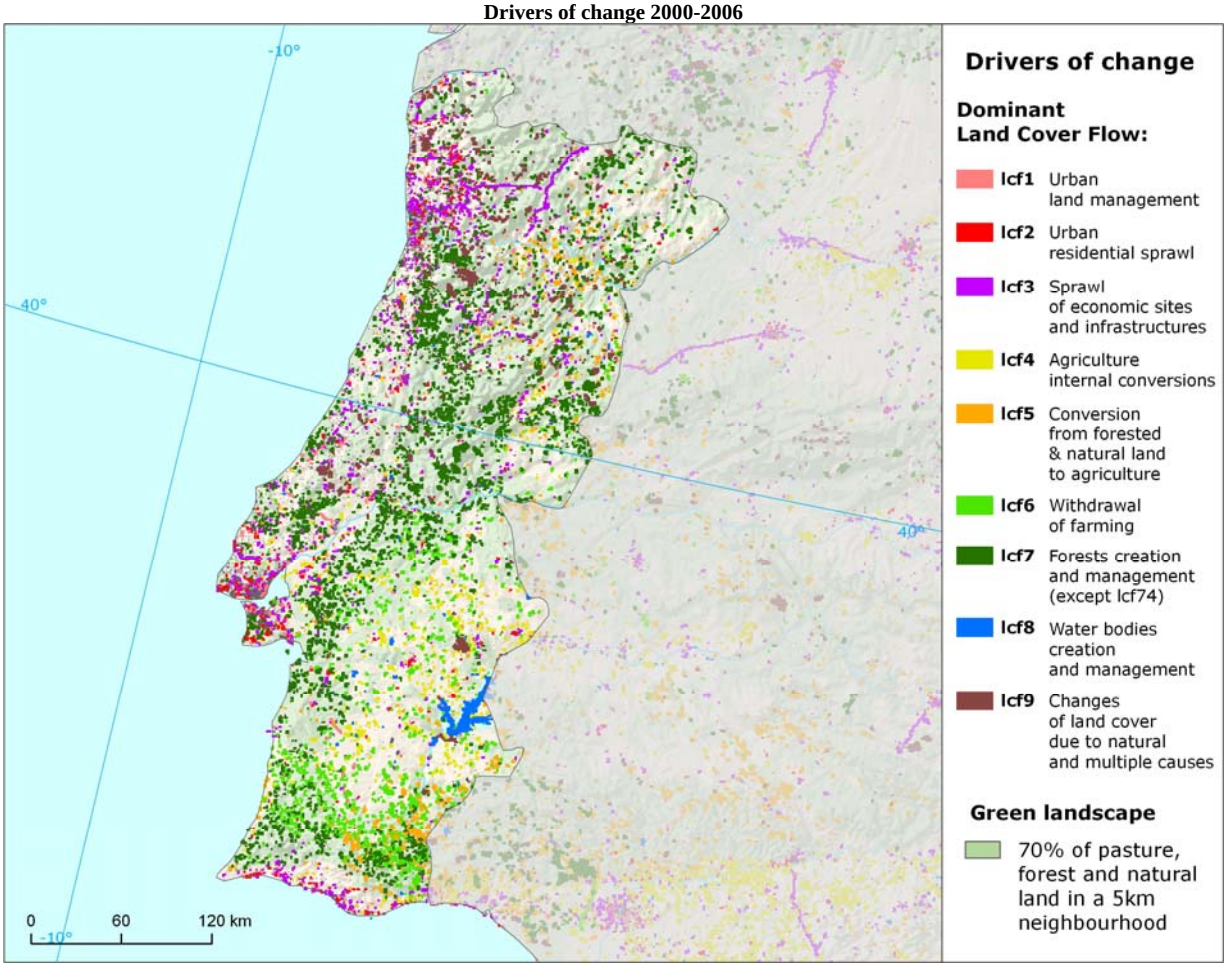


CLC Changes 1990-2000

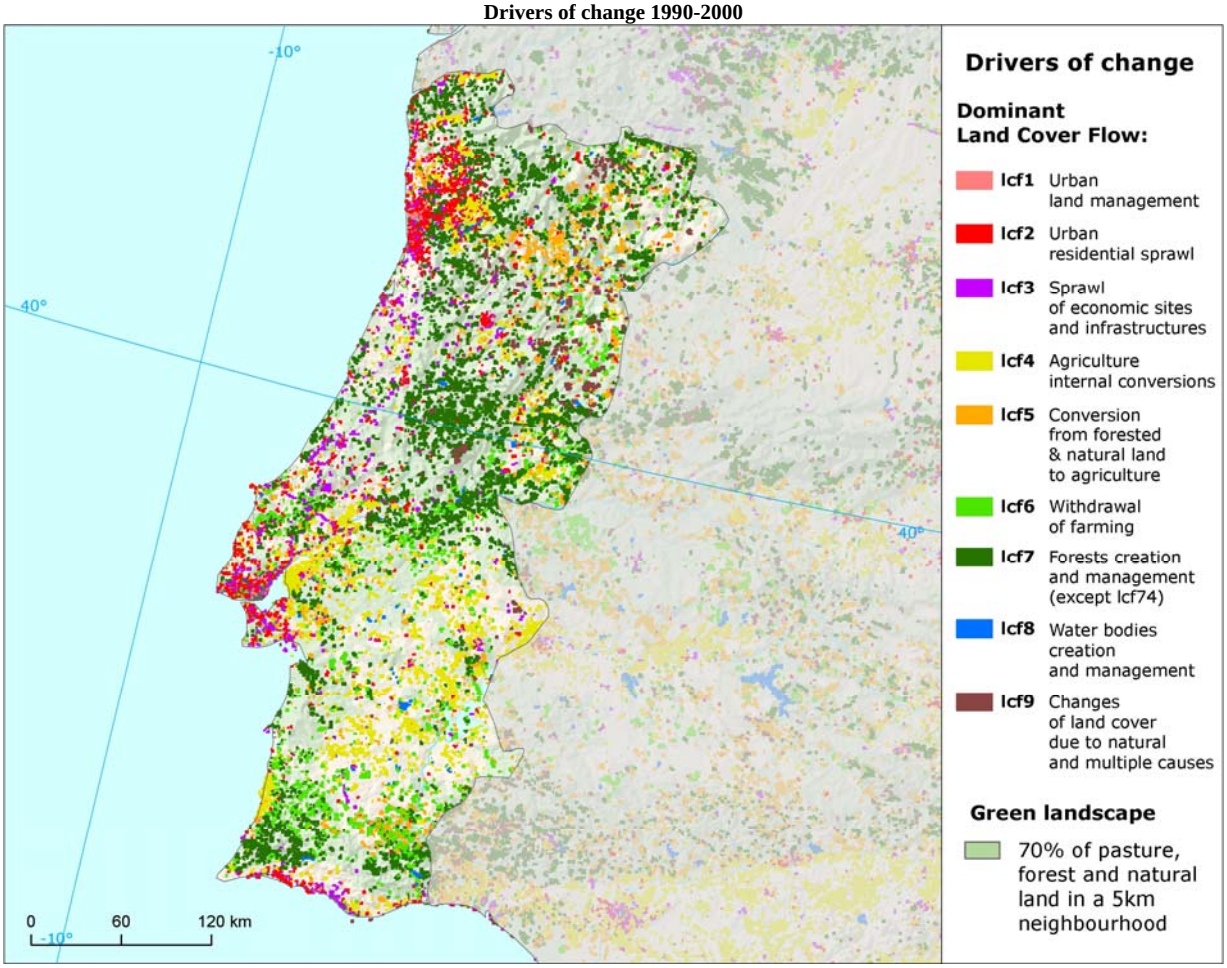


Portugal

Drivers of change 2000-2006

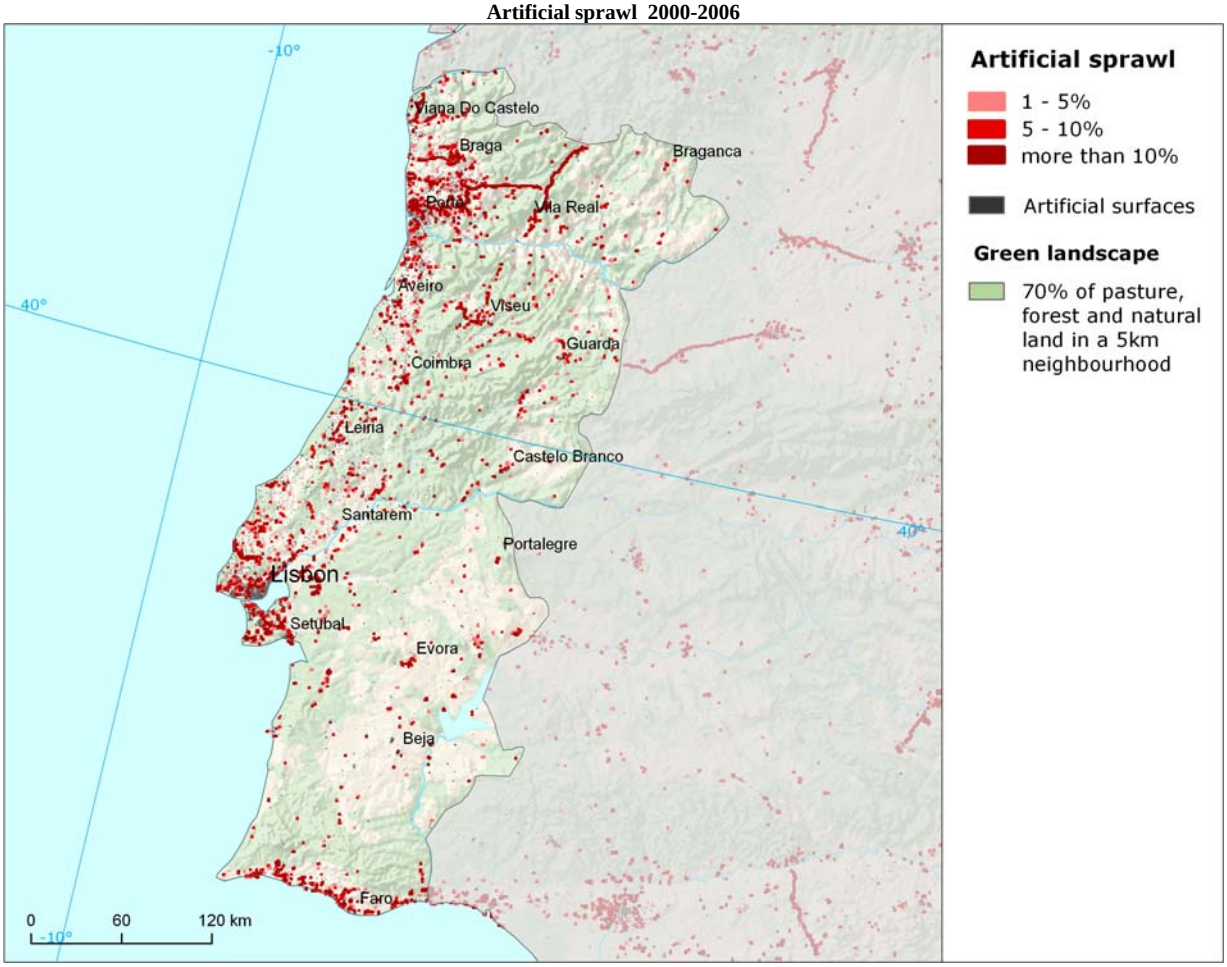


Drivers of change 1990-2000

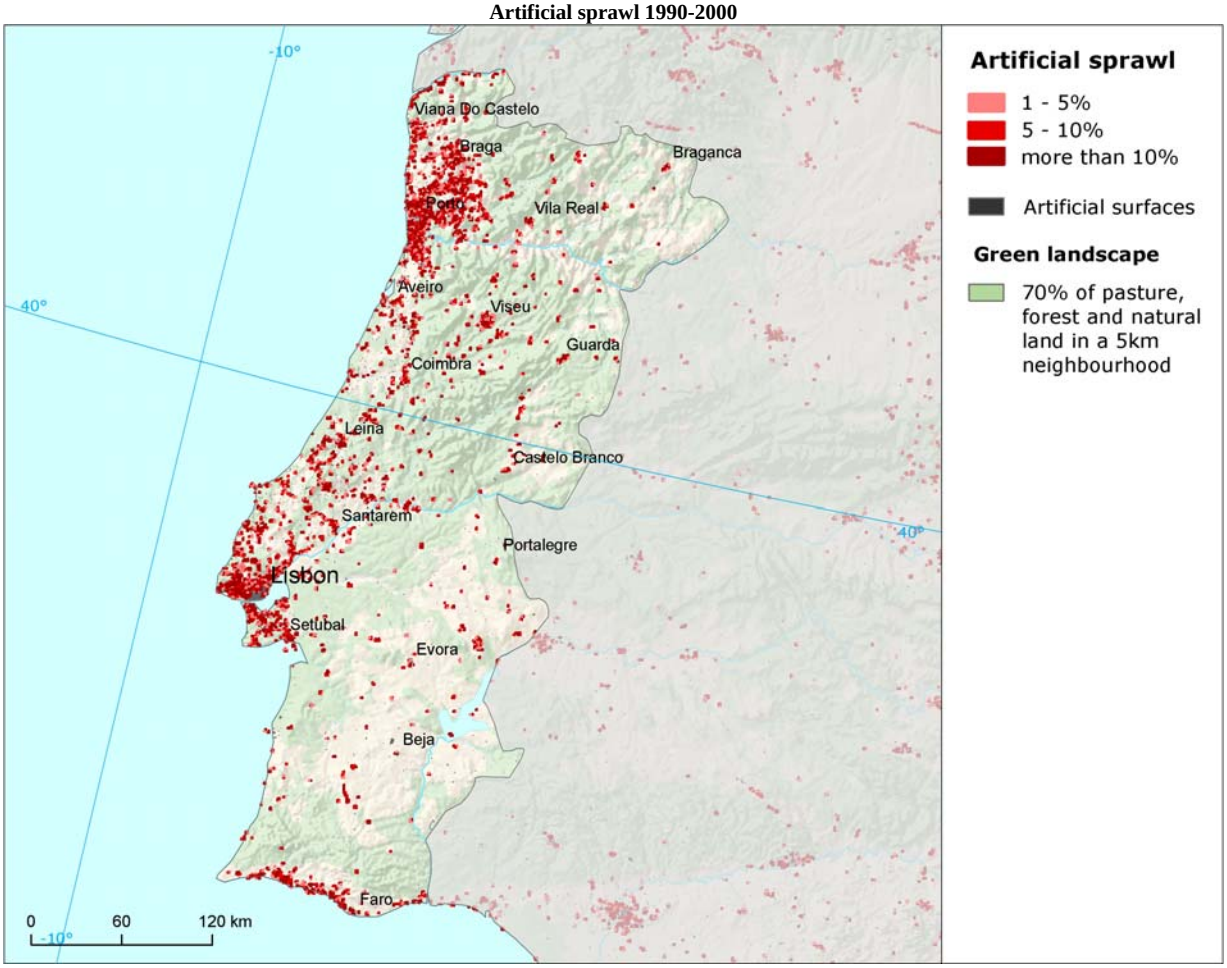


Portugal

Artificial sprawl 2000-2006

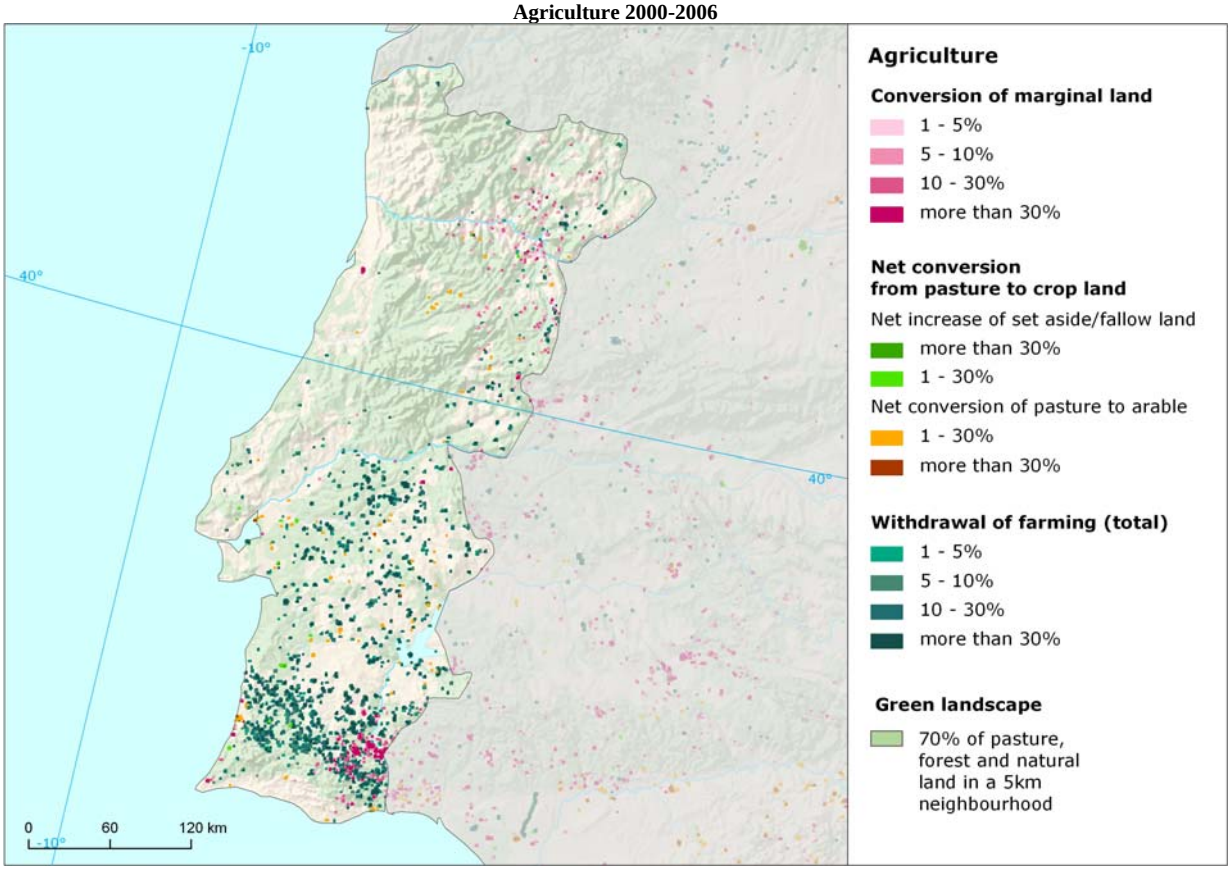


Artificial sprawl 1990-2000

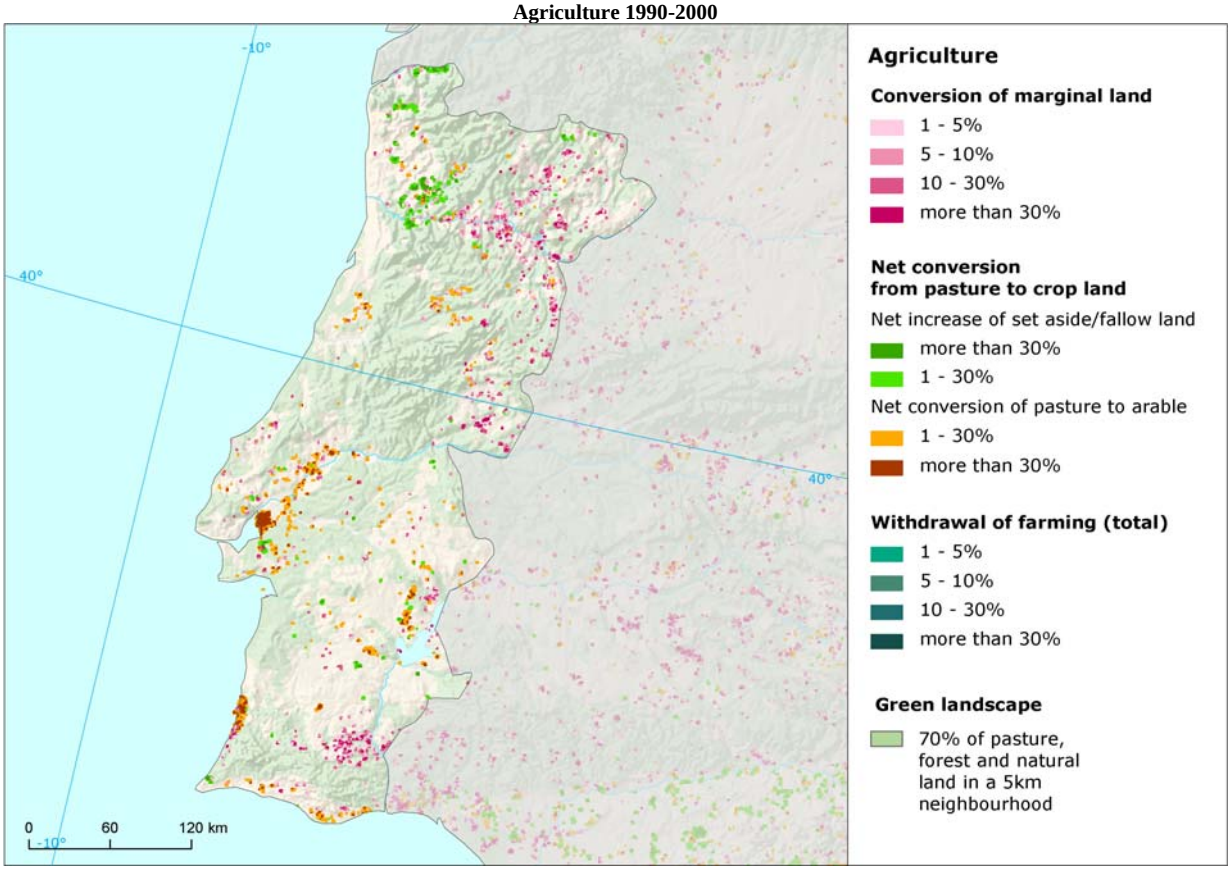


Portugal

Agriculture 2000-2006

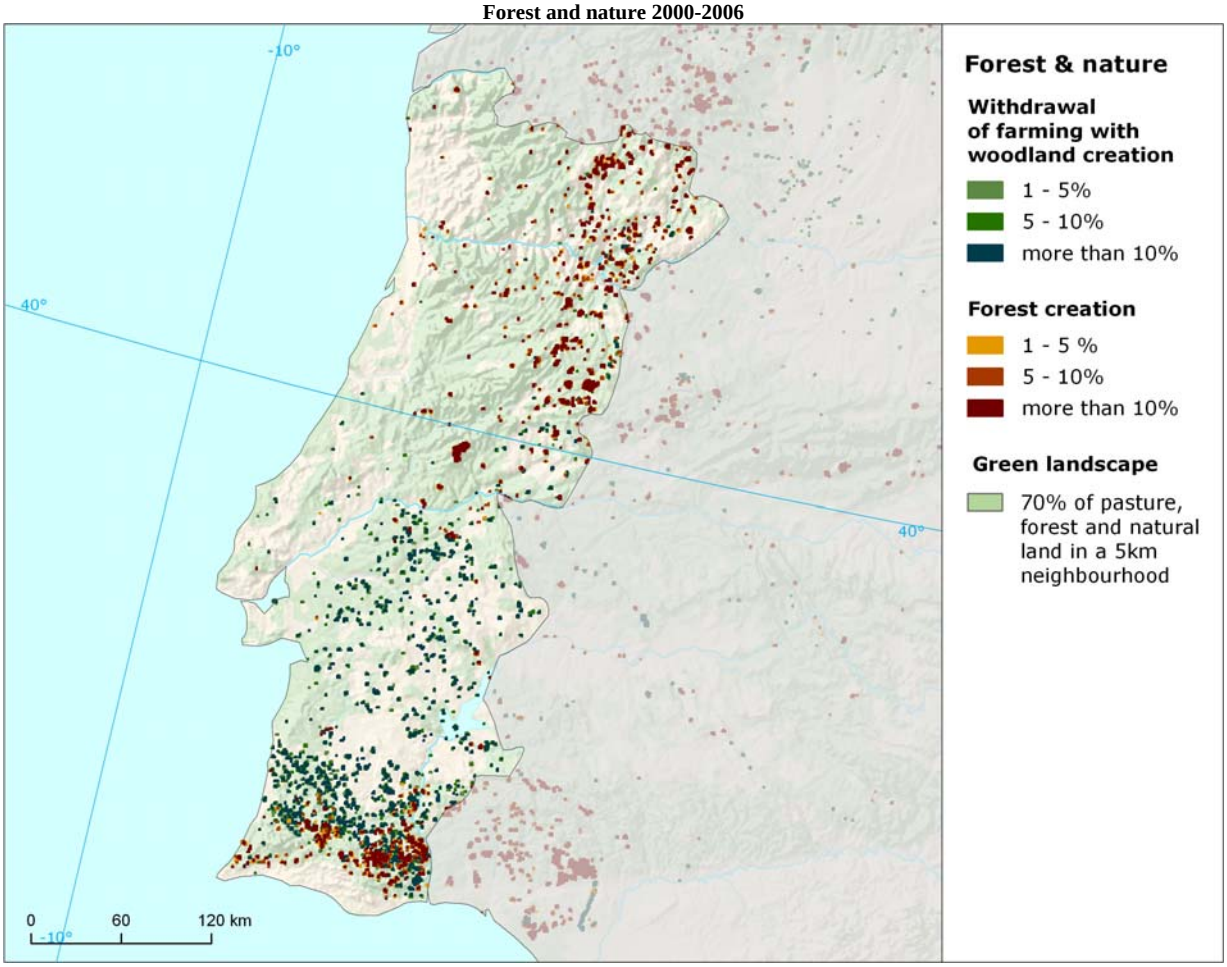


Agriculture 1990-2000



Portugal

Forest and nature 2000-2006



Forest and nature 1990-2000