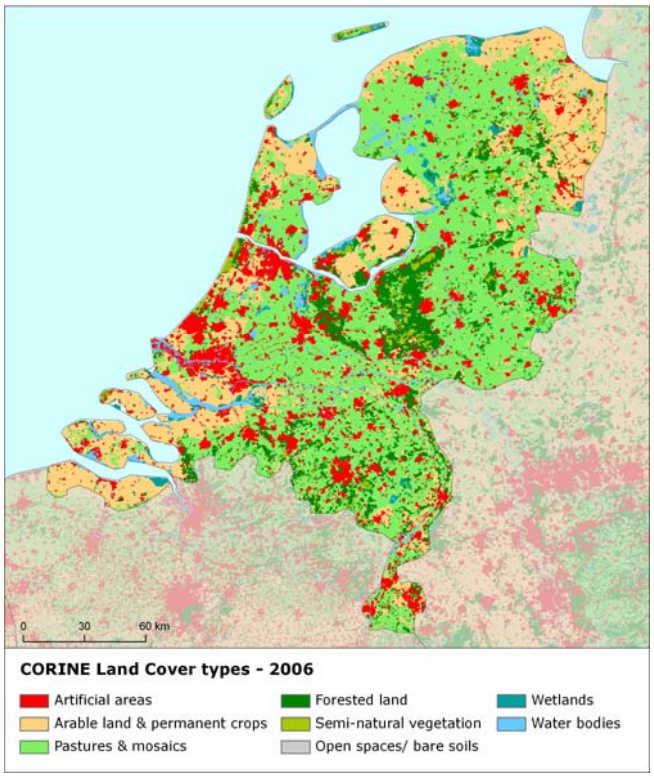
The Netherlands

Land cover 2006

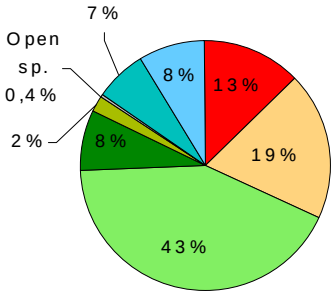
Overview of land cover & change 2000-2006

In the Netherlands, the landscape is dominated by agricultural land (62%), with a significant proportion of grassland and mosaic (43%), as well as a large presence of artificial surfaces (13%) and water bodies (8%). Compared with the previous period 1990-2000, the overall intensity changes in the Dutch landscape slowed slightly, nevertheless the development of densely urbanized lowland landscape of the Netherlands in period 2000-2006 is still dominated by intensive artificial land development (more than three-fourths of the total land cover change), which is primarily driven by sprawl of economic sites and infrastructures as well as by internal recycling of developed artificial areas (both of these flows accelerated from the previous period). However, the overall intensity of artificial land take is comparable to the previous period, being compensated by significant slowdown of residential sprawl. The artificial land take occurs mostly at the expense of agricultural areas.
Besides the artificial development, withdrawal of farming is the other most significant driver of change in the Dutch landscape. However, in comparison with the previous period, the intensity of this flow slightly decreased due to slowdown of withdrawal of farming with woodland creation. In contrast, internal agricultural conversions driven mostly by intensive conversion from pasture to arable/crop land (which were the second most significant driver of change during the 1990-2000 period), lost most of its power in the 2000-2006.
Concerning the spatial distribution of land cover exchange, change areas are densely distributed over the whole country, with increased concentration of artificial changes in surroundings of the capital city Amsterdam and other major cities.

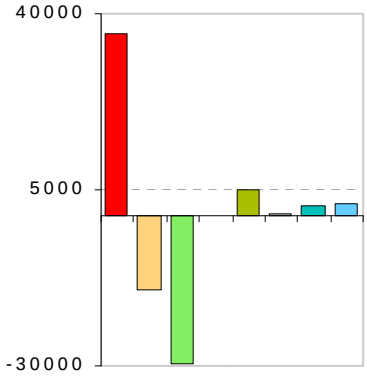
Note: The results presented here are based on a change analysis of 44 land cover types mapped consistently on a 1:100.000 scale across Europe over almost two decades 1990-2006 - see Corine land cover (CLC) programme for details.
Number of years between CLC2000-CLC2006 data for the Netherlands: 6



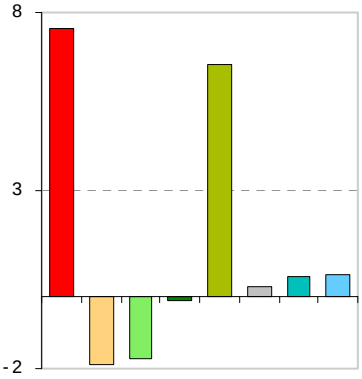
1.1. Land cover 2006 [% of total]



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

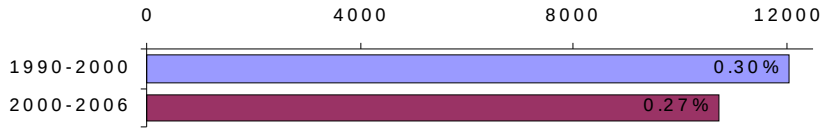
Summary balance table 2000-2006

	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	**4751**	**7771**	**17134**	**3167**	**752**	**152**	**2780**	**3359**	**39868**
Consumption of initial LC	129	166	300	35	7	2	2	2	644
Formation of new LC	488	19	4	33	56	3	18	25	644
Net Formation of LC	**359**	**-147**	**-297**	**-2**	**49**	**1**	**16**	**22**	**0**
Net formation as % of initial year	*7.5*	*-1.9*	*-1.7*	*-0.1*	*6.5*	*0.3*	*0.6*	*0.7*	
Total turnover of LC	**616**	**185**	**304**	**68**	**64**	**5**	**20**	**27**	**1289**
Total turnover as % of initial year	*13.0*	*2.4*	*1.8*	*2.1*	*8.5*	*3.0*	*0.7*	*0.8*	*3.2*
Land cover 2006	**5110**	**7624**	**16838**	**3165**	**801**	**153**	**2796**	**3382**	**39868**

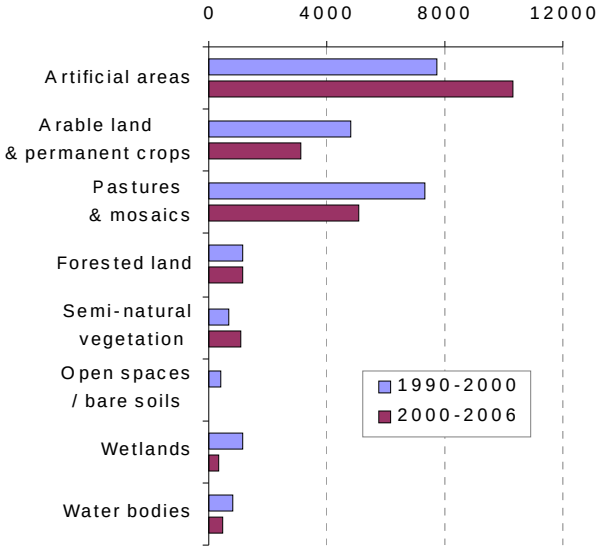
The Netherlands

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

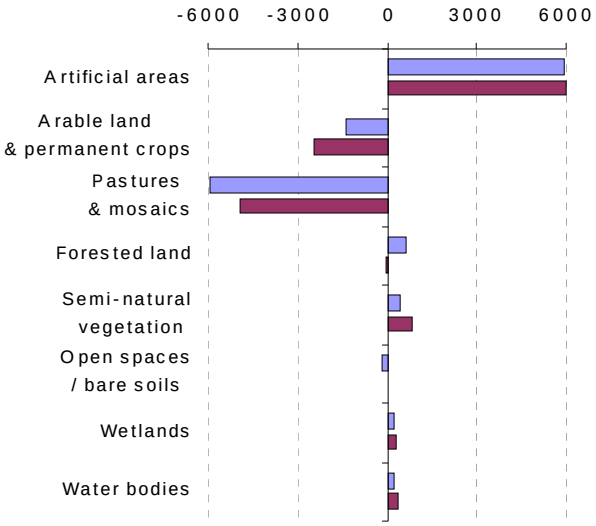
2.4. Annual land cover change [ha/year, % of total area]



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

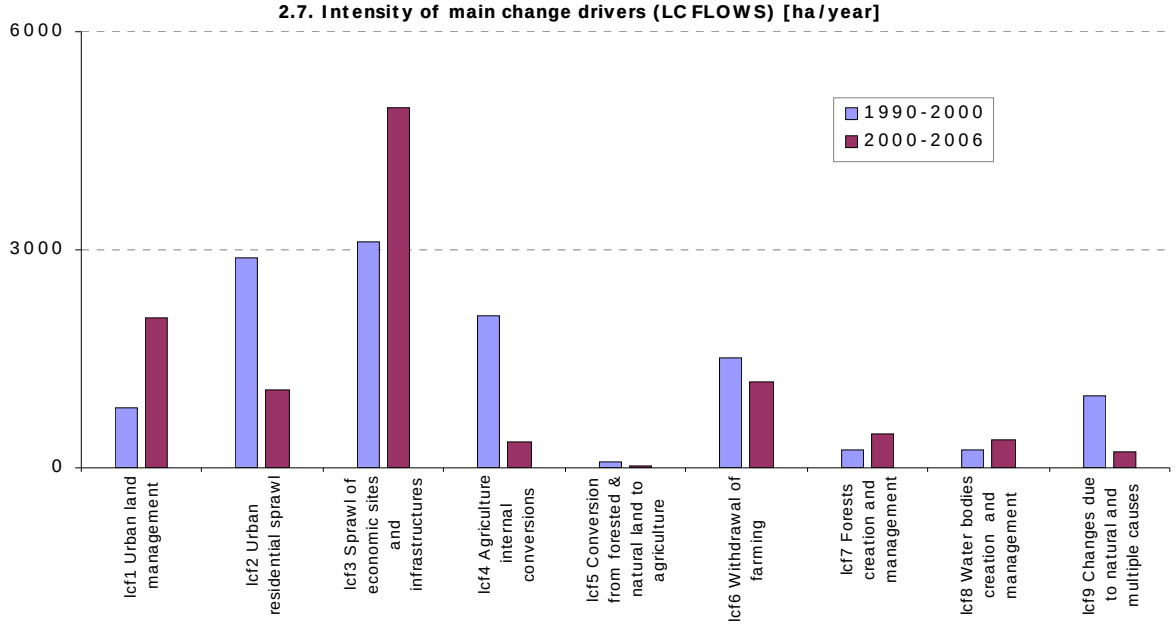


2.6. Net annual change of LC types [ha/year]



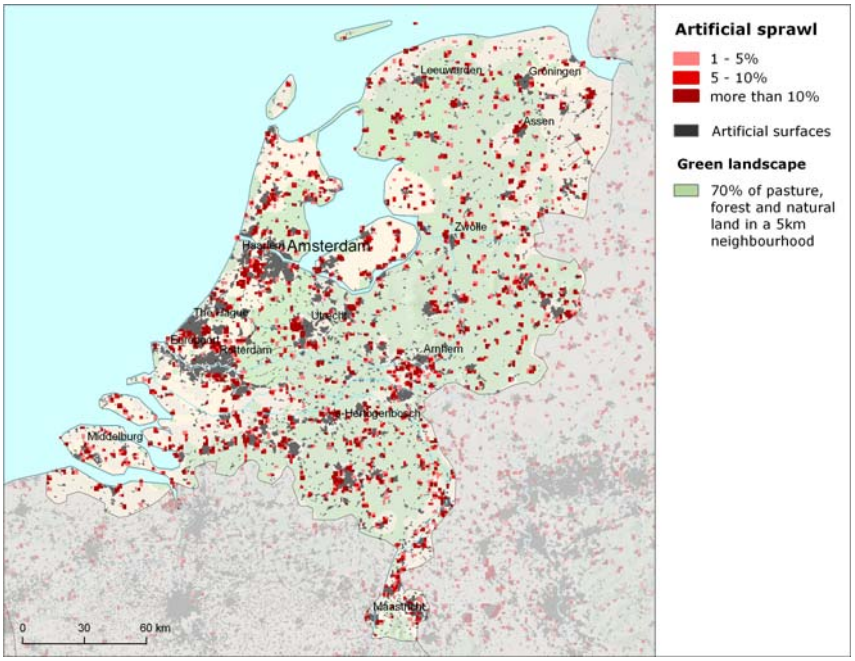
Summary trend figures	1990-2000	2000-2006
Annual land cover change [ha/year]	**12032**	**10740**
Annual land cover change as % of initial year	**0.30%**	**0.27%**
Land uptake by artificial development as mean annual change [ha/year]	6088	6093
Agricultural land uptake by urban and infrastructures development as mean annual change [ha/year]	6028	6193
Net uptake of forests and semi-natural land by agriculture as mean annual change [ha/year]	-1442	-1176
Net conversion from pasture to arable land and permanent crops as mean annual change [ha/year]	1647	208
Forest & other woodland net formation as mean annual change [ha/year]	642	-41
Dry semi-natural land cover net formation as mean annual change [ha/year]	291	825
Wetlands & water bodies net formation as mean annual change [ha/year]	469	639

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

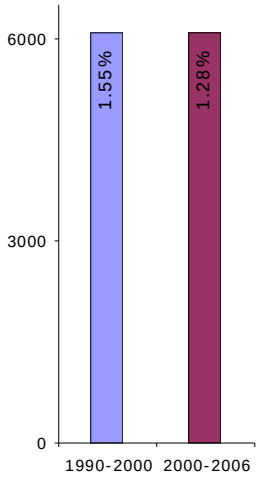


The Netherlands

Artificial areas



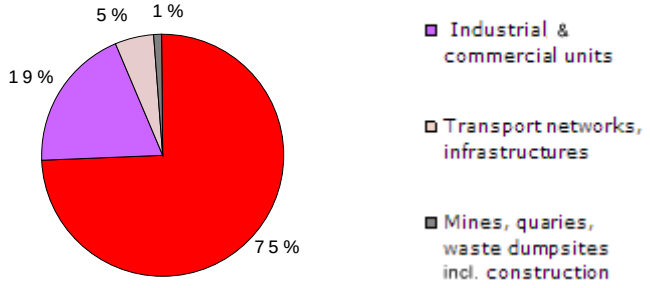
3.8. Artificial land take [ha/year, % of initial year]



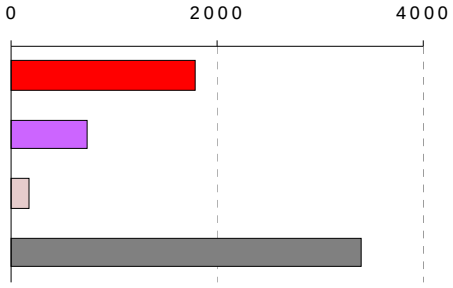
Acceleration of construction and urban land management

The overall intensity of artificial development in the Netherlands, characterized by turnover of artificial land, increased compared to the previous period 1990-2000.
However, the annual rate of the artificial land take is almost equal to the rate from the previous period. The increase of change dynamic within artificial areas is caused by increased intensity of urban land management (mostly conversion of former construction sites into discontinuous urban fabric, industrial or commercial units and green urban areas) and by accelerated extension of construction sites. In contrast, the intensity of both residential and commercial/industrial sprawl significantly decreased, compared with the previous period.
During 2000-2006, artificial land take, which occurs mainly at the expense of agricultural land (96%) with prevailing share of pastures and mosaics (60%), has been driven by expansion of construction sites (54%), which indicates potential of further urban development. The other most significant drivers of artificial land take are the diffuse residential sprawl (19%) and sprawl of industrial and commercial sites (12%), followed by sprawl of sport and leisure facilities (8%). Compared with the intensity of land take, the extent of consumption of artificial surfaces, represented by conversion of former construction or mineral extraction sites into agricultural or natural surfaces, is negligible. Spatial distribution pattern is even more concentrated around the main cities.

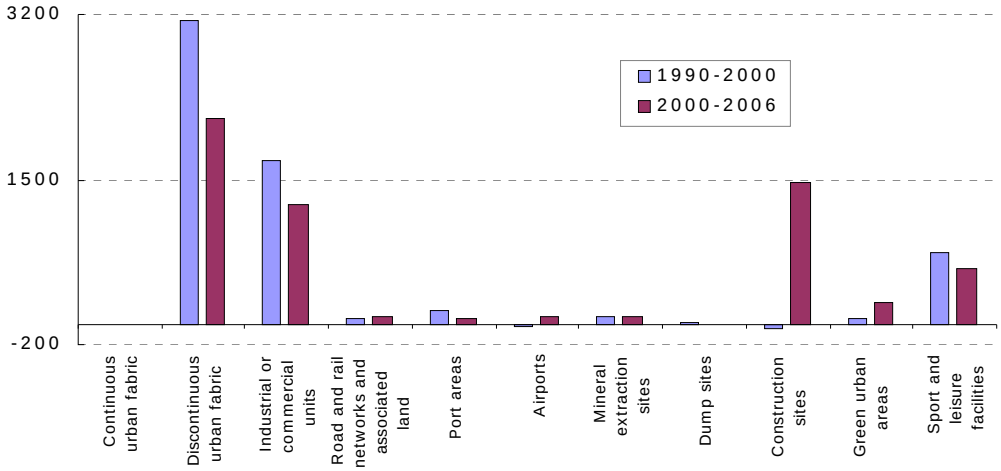
3.9. Artificial surfaces 2006 [% of total area]



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

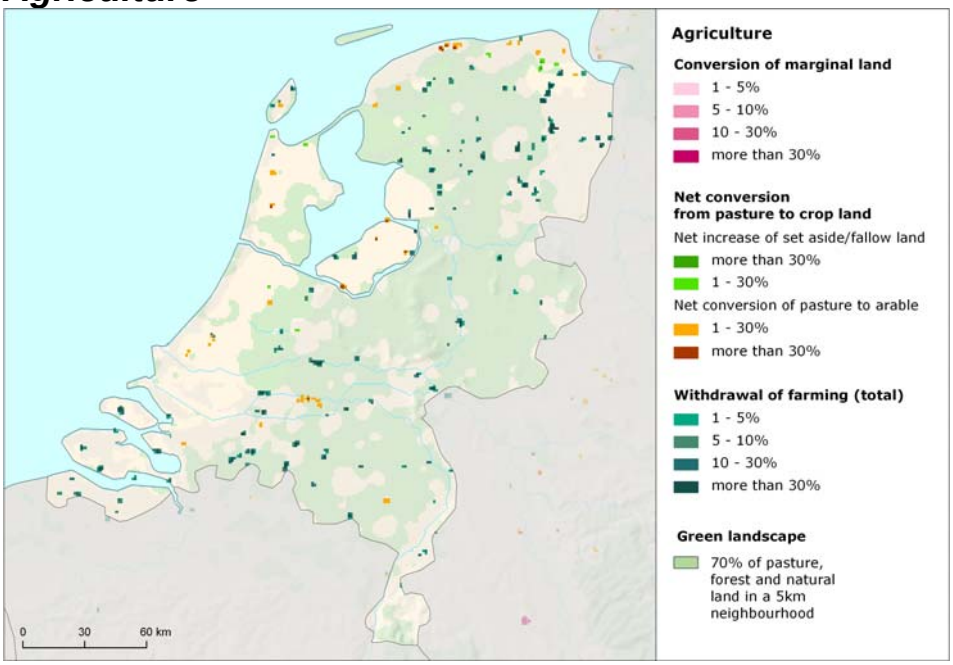


3.11. Mean annual artificial change by class [ha/year]



The Netherlands

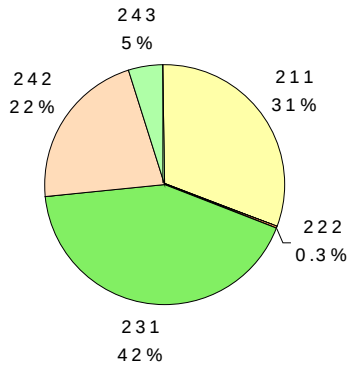
Agriculture

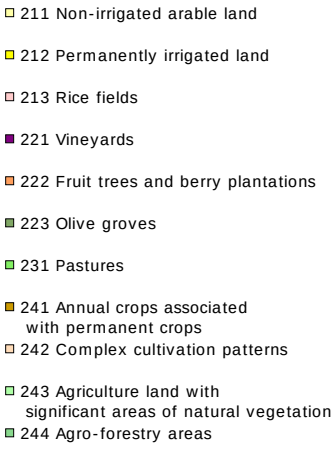


Agricultural land uptake by artificial development

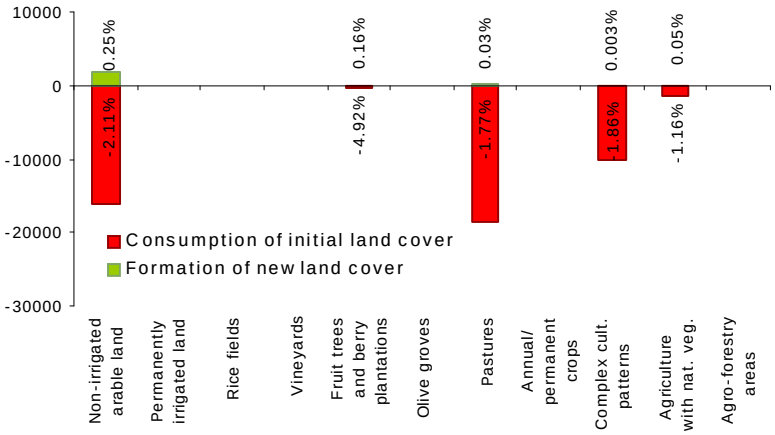
Agricultural landscape in the Netherlands is composed mostly of pastures, arable land and complex cultivation patterns. All agricultural surfaces have negative net change balance, with increased intensity of consumption of arable land and complex cultivation patterns and decreased intensity of consumption of pastures. The consumption has been driven mostly by artificial land take, with prevailing share of extension of construction sites, followed by sprawl of residential and commercial or industrial units. Almost equal share of arable land and pastures, followed by significant amount of complex cultivation patterns have been taken by artificial sprawl. In addition to artificial land take, agriculture areas have been consumed also by withdrawal of farming (mainly through conversion of former agricultural land to natural grassland or inland marches) and by water bodies creation. The only formation of agricultural land was caused by conversion of former construction and mineral extraction sites (and partially of peatbogs) into arable land or pasture, however, extent of these changes is very small. In comparison with the external consumption of agricultural land, internal changes in agriculture occurred to a lower extent. Moreover, the intensity of these internal changes decreased significantly, compared with the previous period 1990-2000. Regarding the direction of internal agricultural exchange, transfer from pasture to arable land or permanent crops prevails over the opposite flow of pasture expansion. Spatially, agriculture changes are regularly spread.

4.12. Agricultural areas 2006 [% of total area]

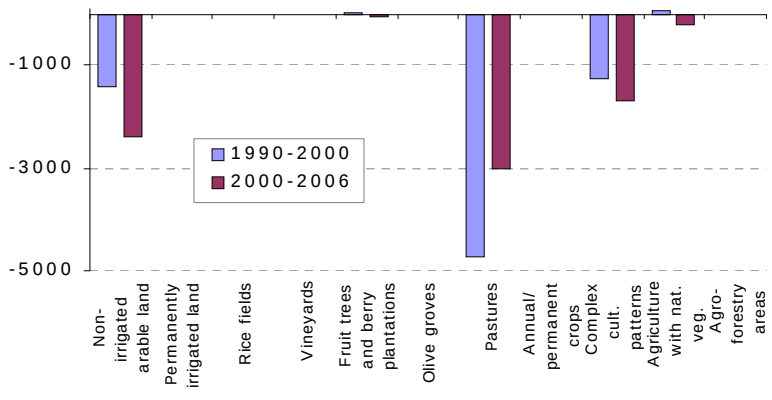




4.13. Development of agricultural areas 2000-2006 – detailed balance [ha]

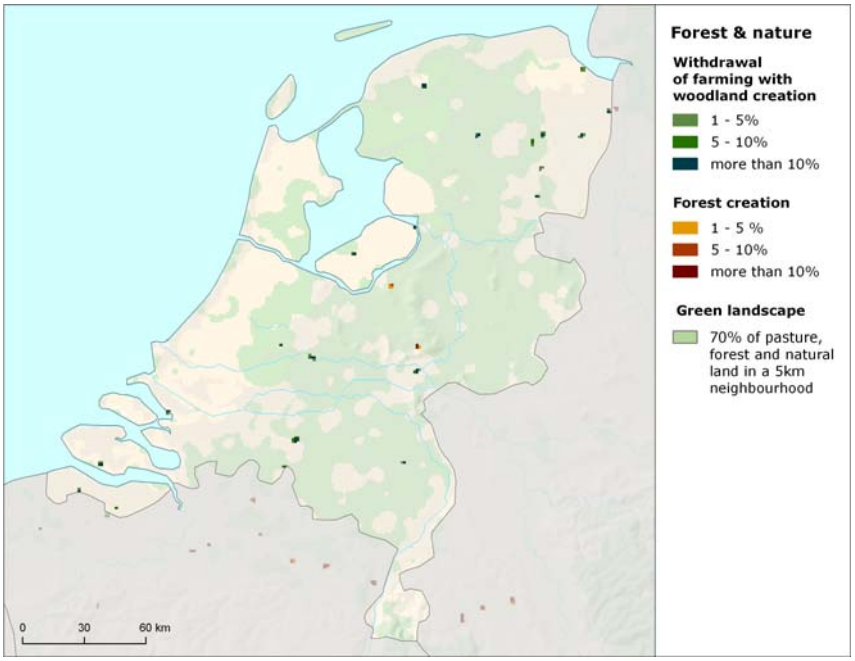


4.14. Mean annual agricultural change by class [ha/year]

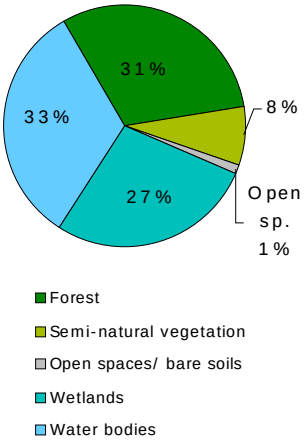


The Netherlands

Forest & nature



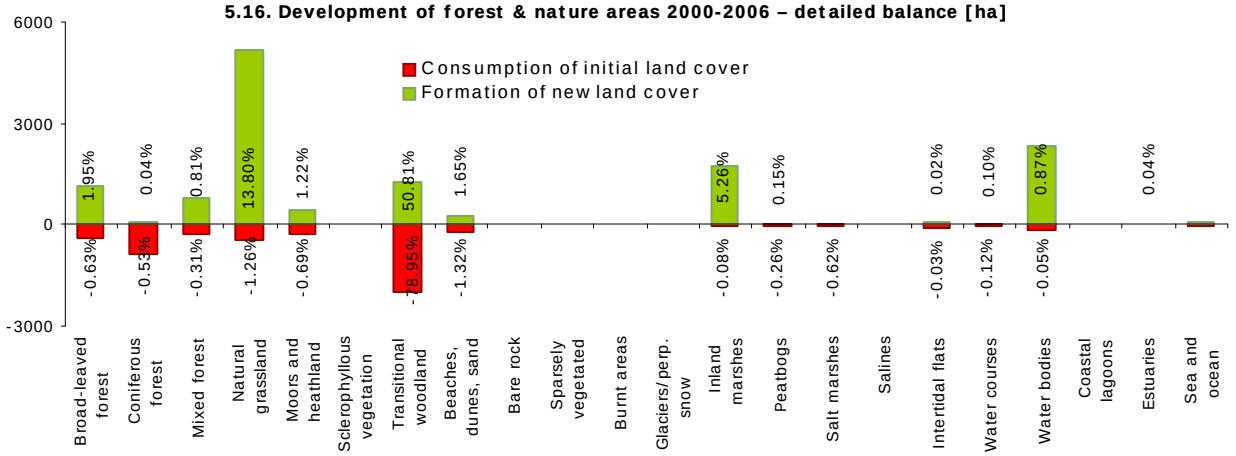
5.15. Forest & nature areas 2006 [% of total area]



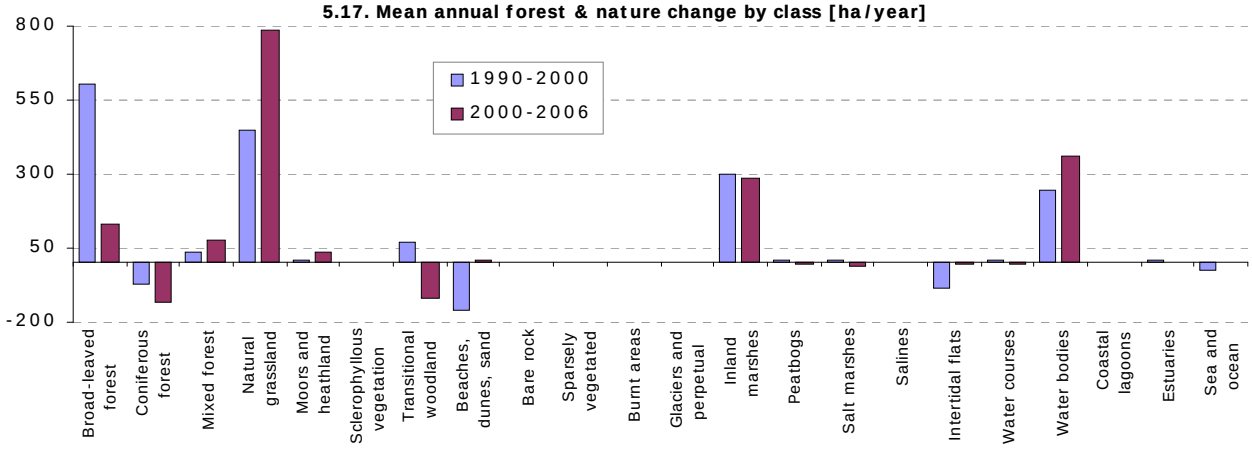
Withdrawal of farming without woodland creation

In contrast to agricultural surfaces, all natural land cover classes, with the only exceptions of coniferous forest and transitional woodland had positive balance of net formation in the period 2000-2006. The natural class with the most significant formation was natural grassland (almost 14% of initial area in 2000), mostly over the former agricultural land through withdrawal of farming without woodland creation. This flow accelerated more than twice compared to the previous period and became the most significant driver of change of natural surfaces in the Netherlands. Not only natural grassland, but also inland marshes (with more than 5% of initial area formation) have been formed through withdrawal of farming. The other significant flow in natural land in the Netherlands, which occurs with even increased intensity during 2000-2006 period, was water bodies creation (mainly over agricultural land).
In contrast, intensity of withdrawal of farming with woodland creation, which was the main driver of natural surfaces change in 90/00, decreased significantly. There were also significant decrease of intensity of changes due to natural and multiple causes, represented by conversions between coastal land cover types.

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



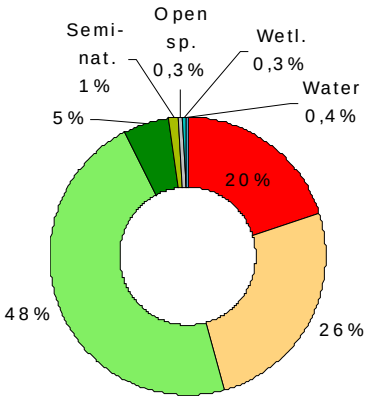
5.17. Mean annual forest & nature change by class [ha/year]



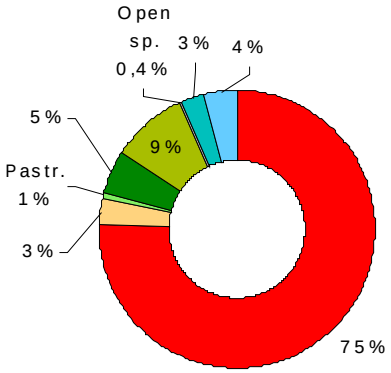
Annex: Land cover flows and trends

Land cover flows 2000-2006

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

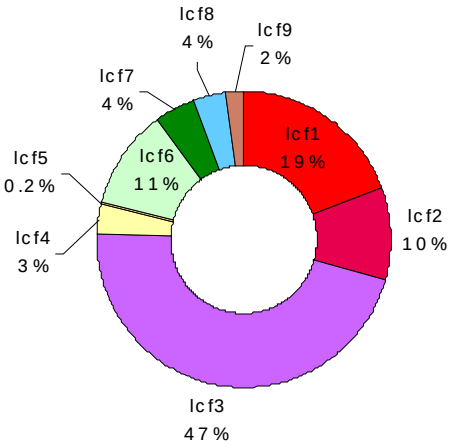


6.19. Formation of land cover 2000-2006 [% of total change area]



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]

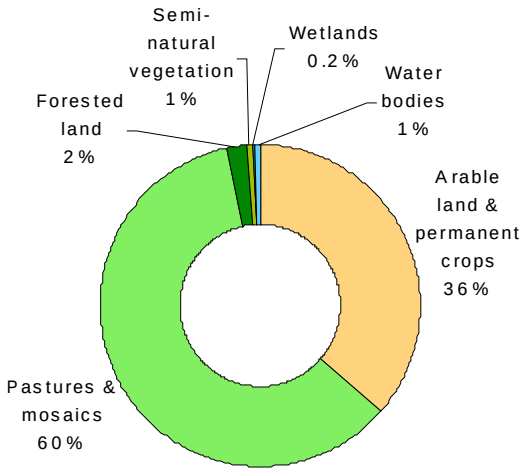


- lcf1 Urban land management
- lcf2 Urban residential sprawl
- lcf3 Sprawl of economic sites and infrastructures
- lcf4 Agriculture internal conversions
- lcf5 Conversion from forested & natural land to agriculture
- lcf6 Withdrawal of farming
- lcf7 Forests creation and management
- lcf8 Water bodies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

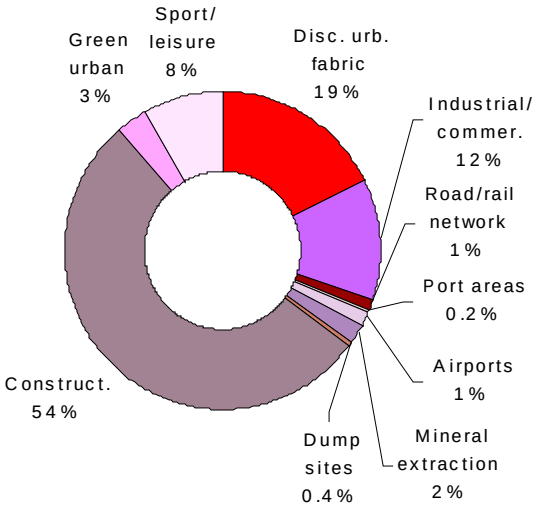
The Netherlands

Artificial areas

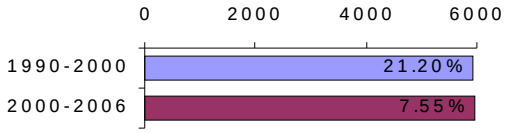
7.21. Consumption by artificial land take 2000-2006 [% of total]



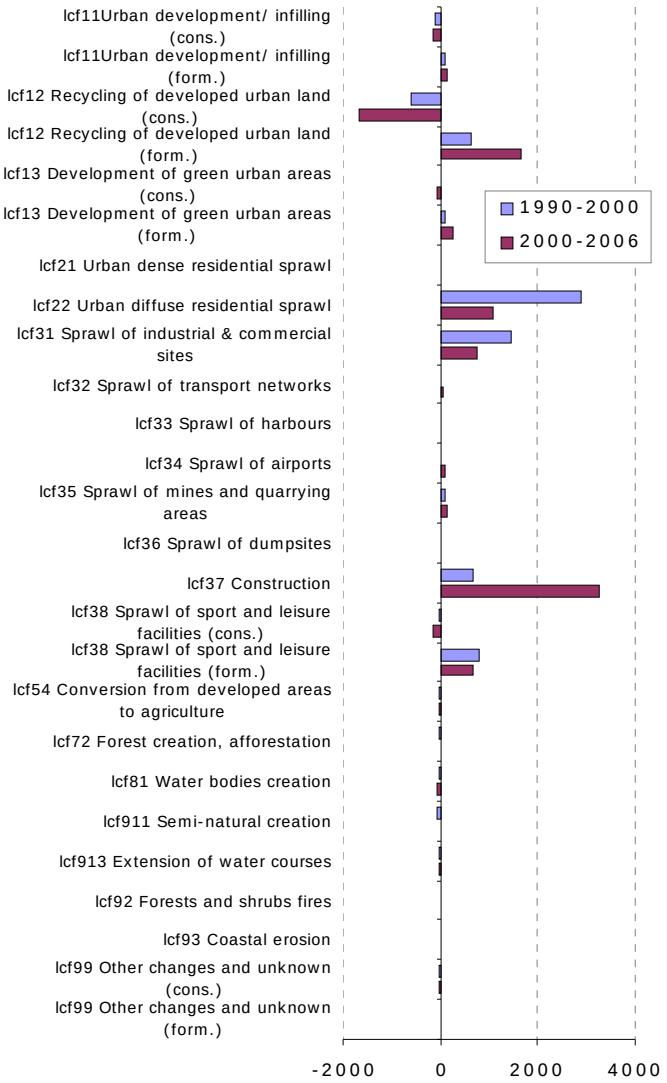
7.22. Formation by artificial land take 2000-2006 [% of total]



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



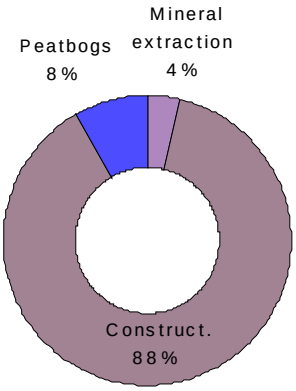
7.24. Artificial development by change drivers (LC FLOWS) [ha/year]



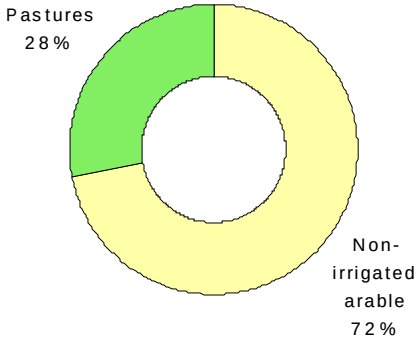
The Netherlands

Agriculture

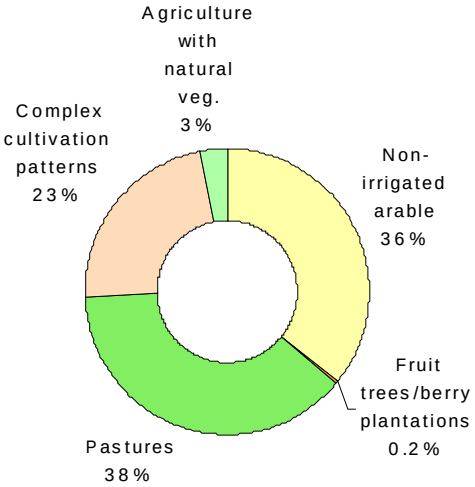
8.25. LC consumed by agriculture 2000-2006 [% of total]



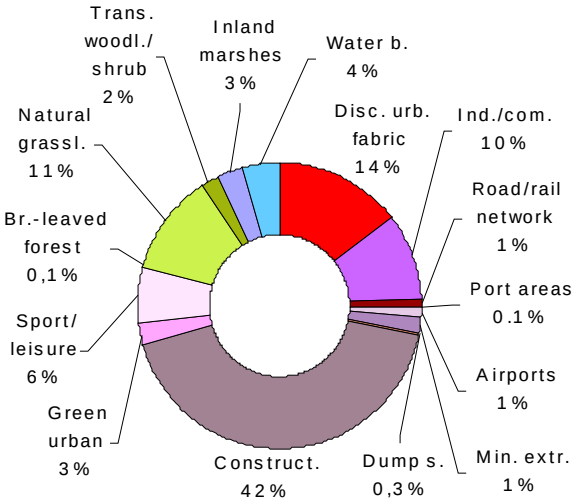
8.26. Formation of agricultural land from non-agriculture 2000-2006 [% of total]



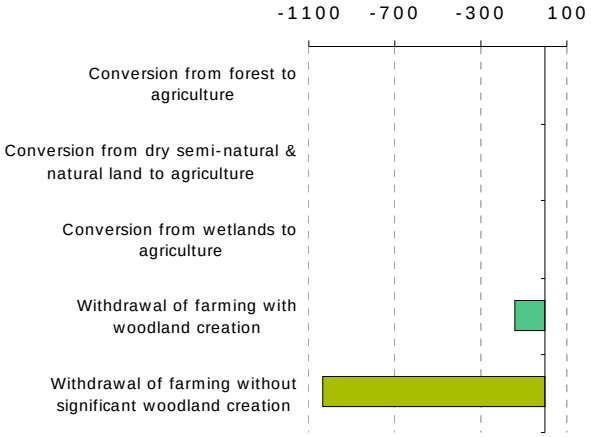
8.27. Consumption of agricultural land by non-agriculture 2000-2006 [% of total]



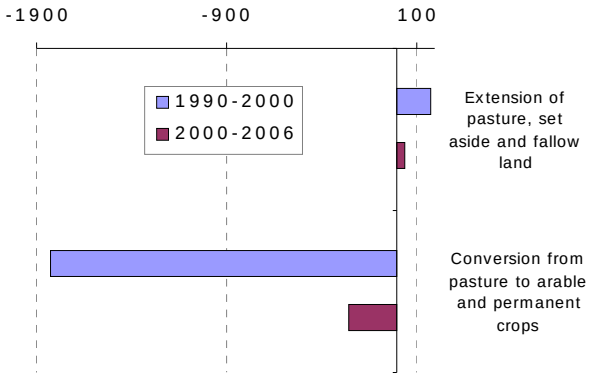
8.28. Formation of non-agricultural land from agriculture 2000-2006 [% of total]



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

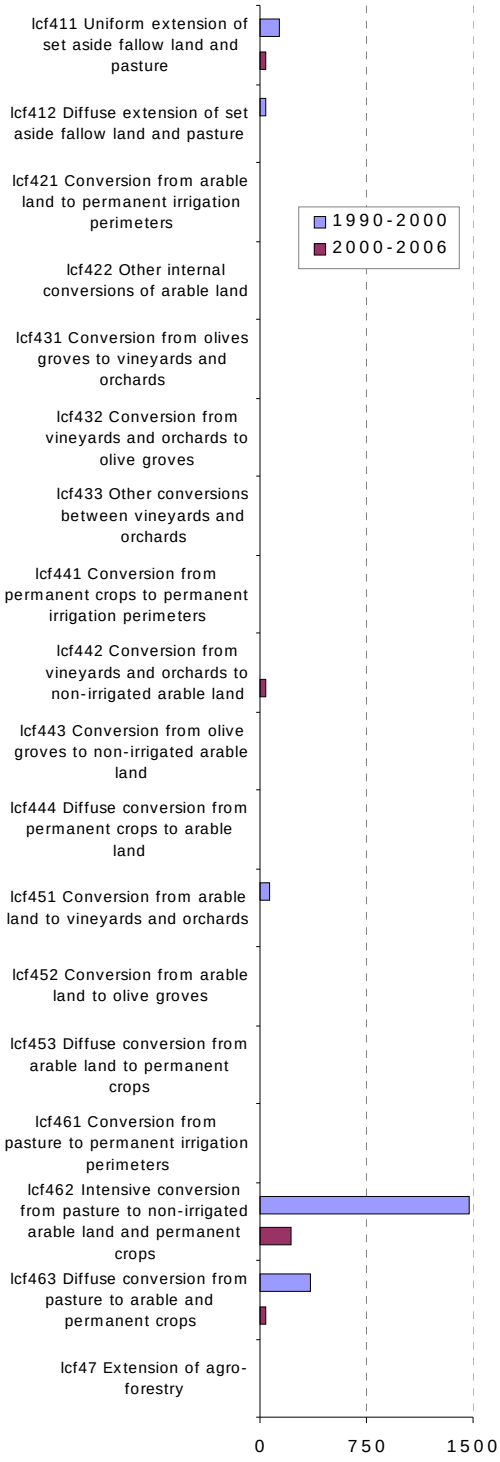


8.30. Mean annual conversion between arable land and pasture [ha/year]

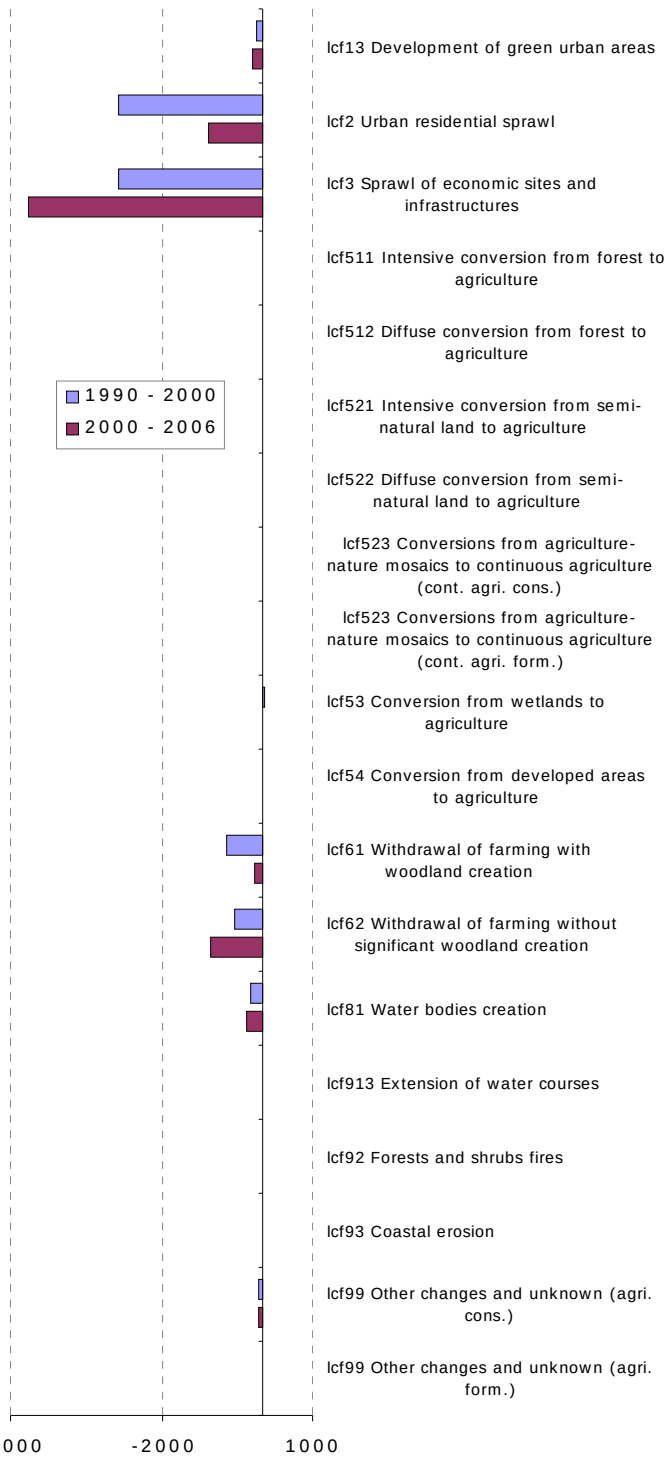


The Netherlands

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



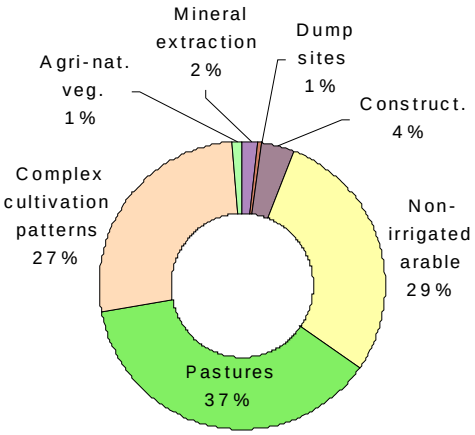
9.32. Mean annual conversions between agriculture and other LC types [ha/year]



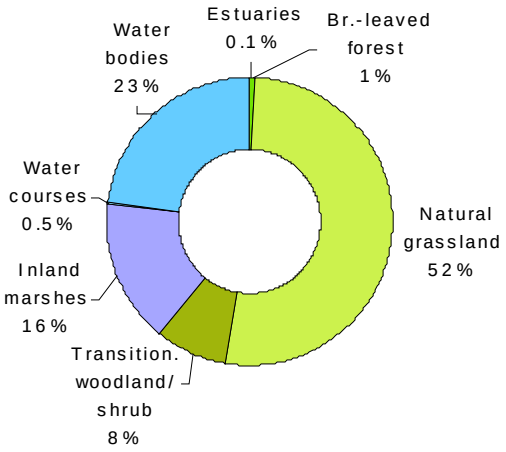
The Netherlands

Forest & nature

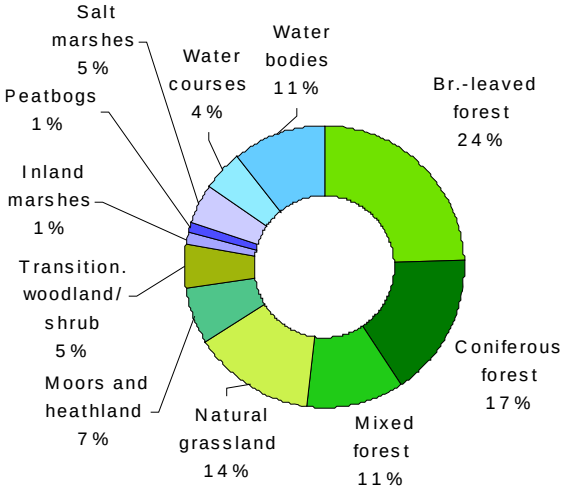
10.33. LC consumed by forest & nature 2000-2006 [% of total]



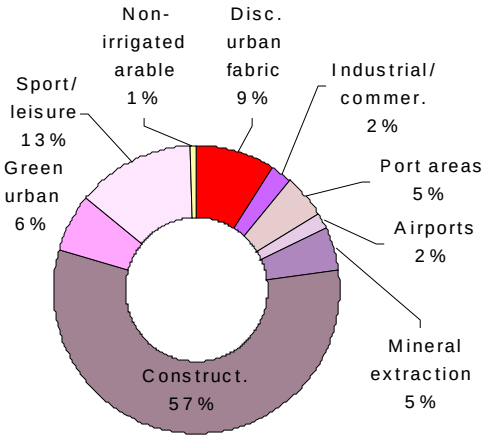
10.34. Formation of forest & nature land from non-forest /nature 2000-2006 [% of total]



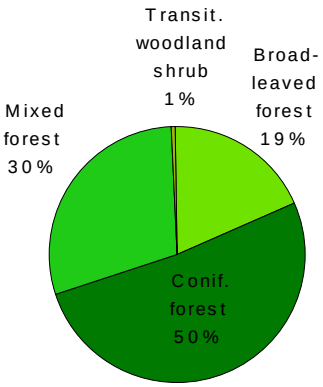
10.35. Consumption of forest & nature land by non-forest /nature 2000-2006 [% of total]



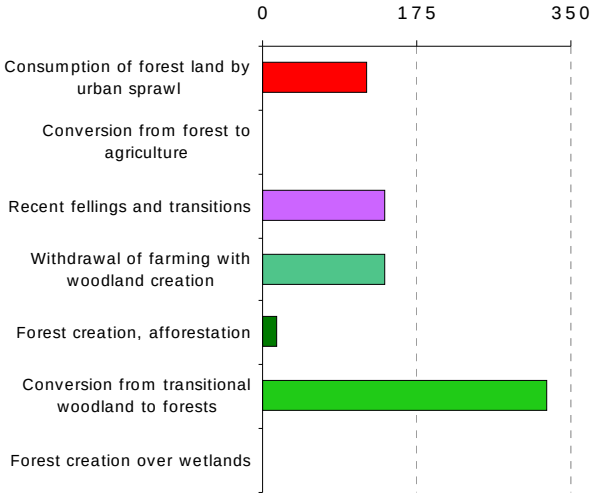
10.36. Formation of non-forest /nature land from forest & nature 2000-2006 [% of total]



10.37. Forested land 2006 [% of total area]

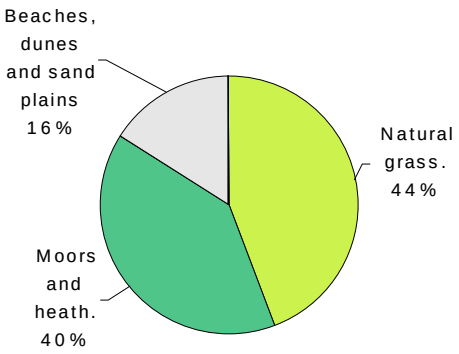


10.38. Main trends in woodland & forests consumption/formation 2000-2006 [ha/year]

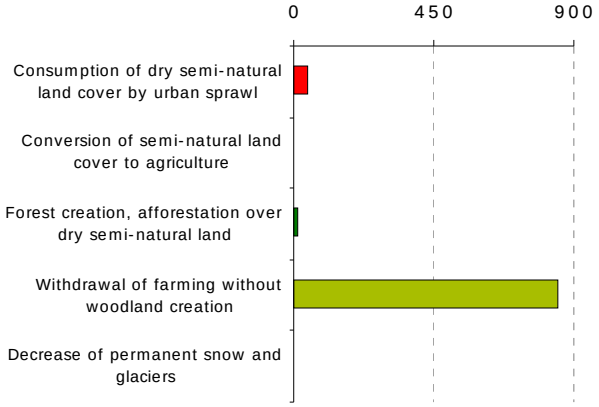


The Netherlands

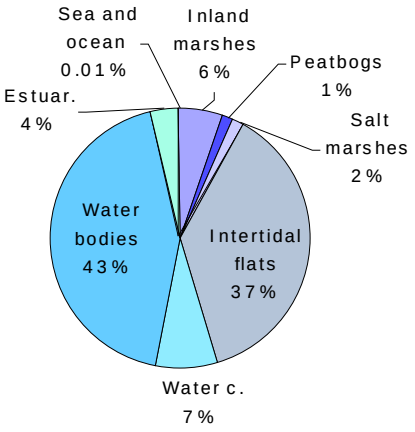
11.39. Dry semi-natural areas 2006 [% of total area]



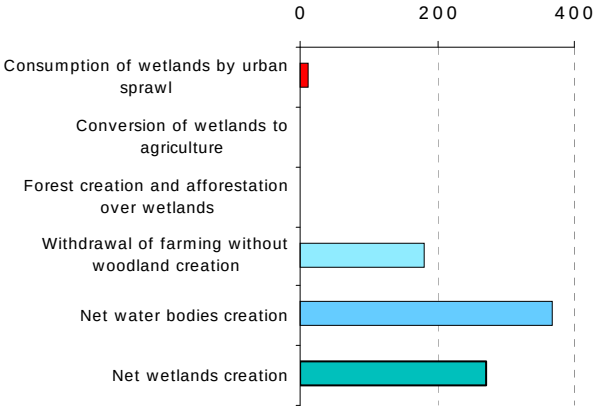
11.40. Main trends in dry semi-natural land consumption/formation 2000-2006 [ha/year]



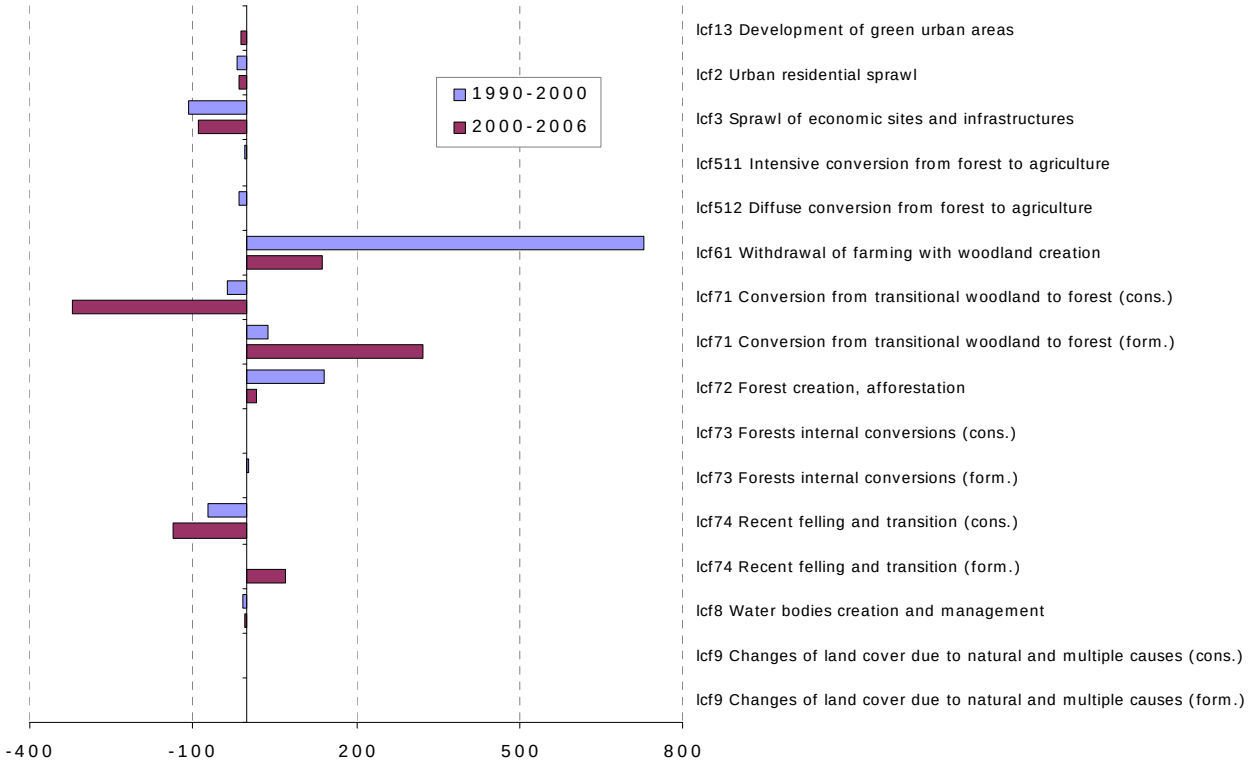
11.41. Wetlands & water 2006 [% of total area]



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

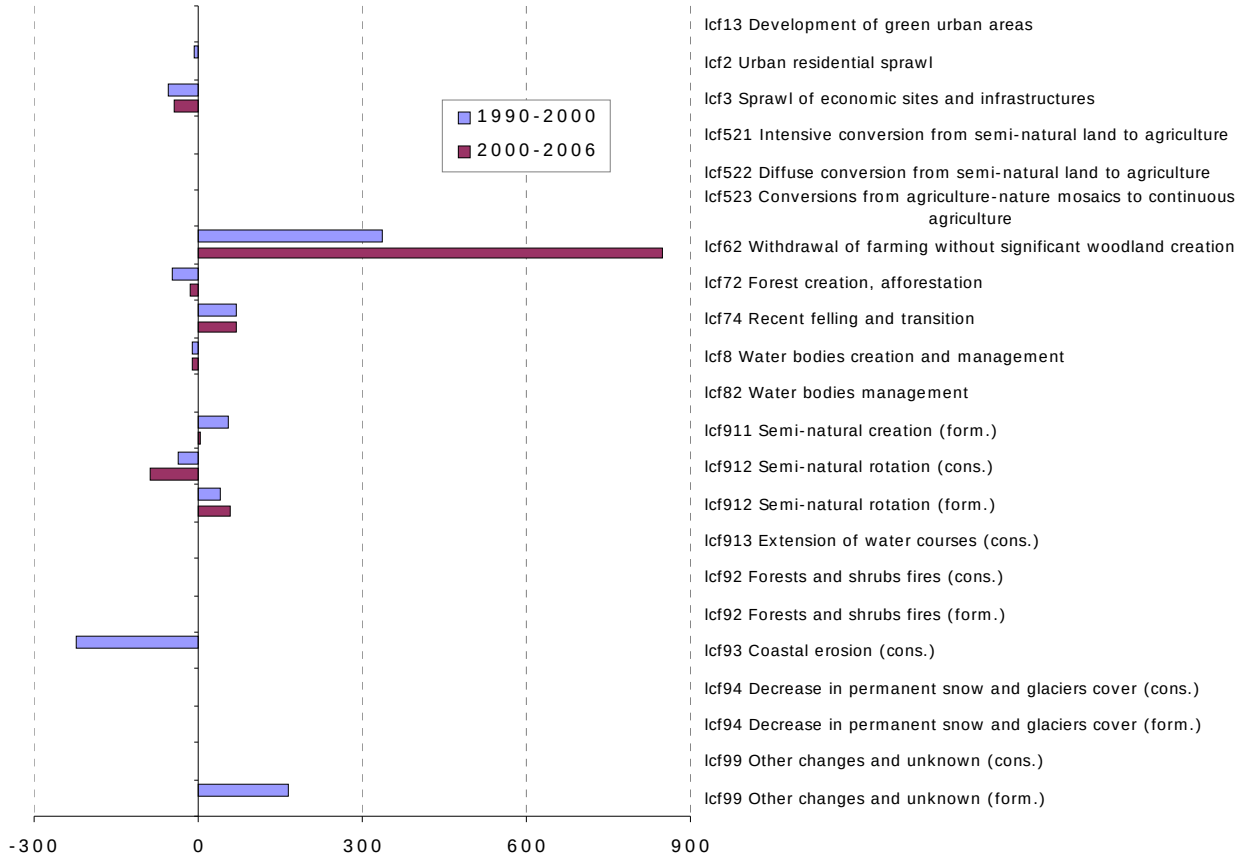


11.43. Mean annual conversions of forest & other woodland [ha/year]

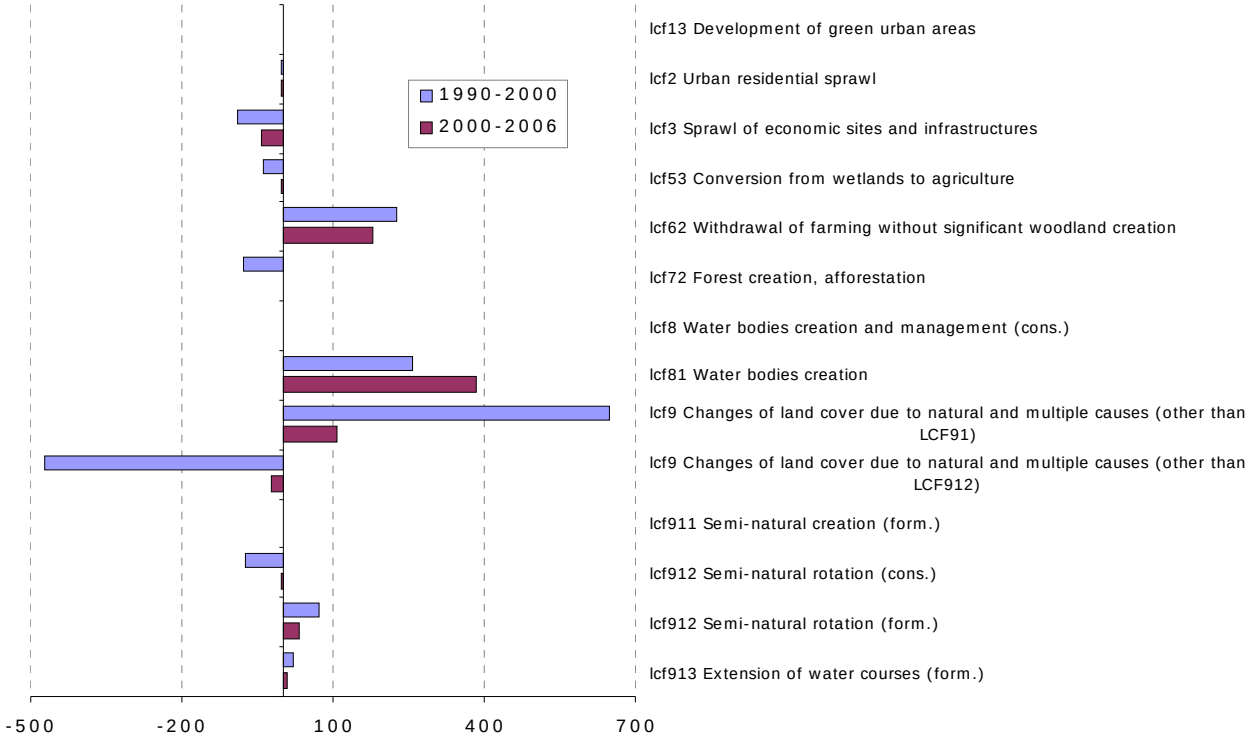


The Netherlands

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

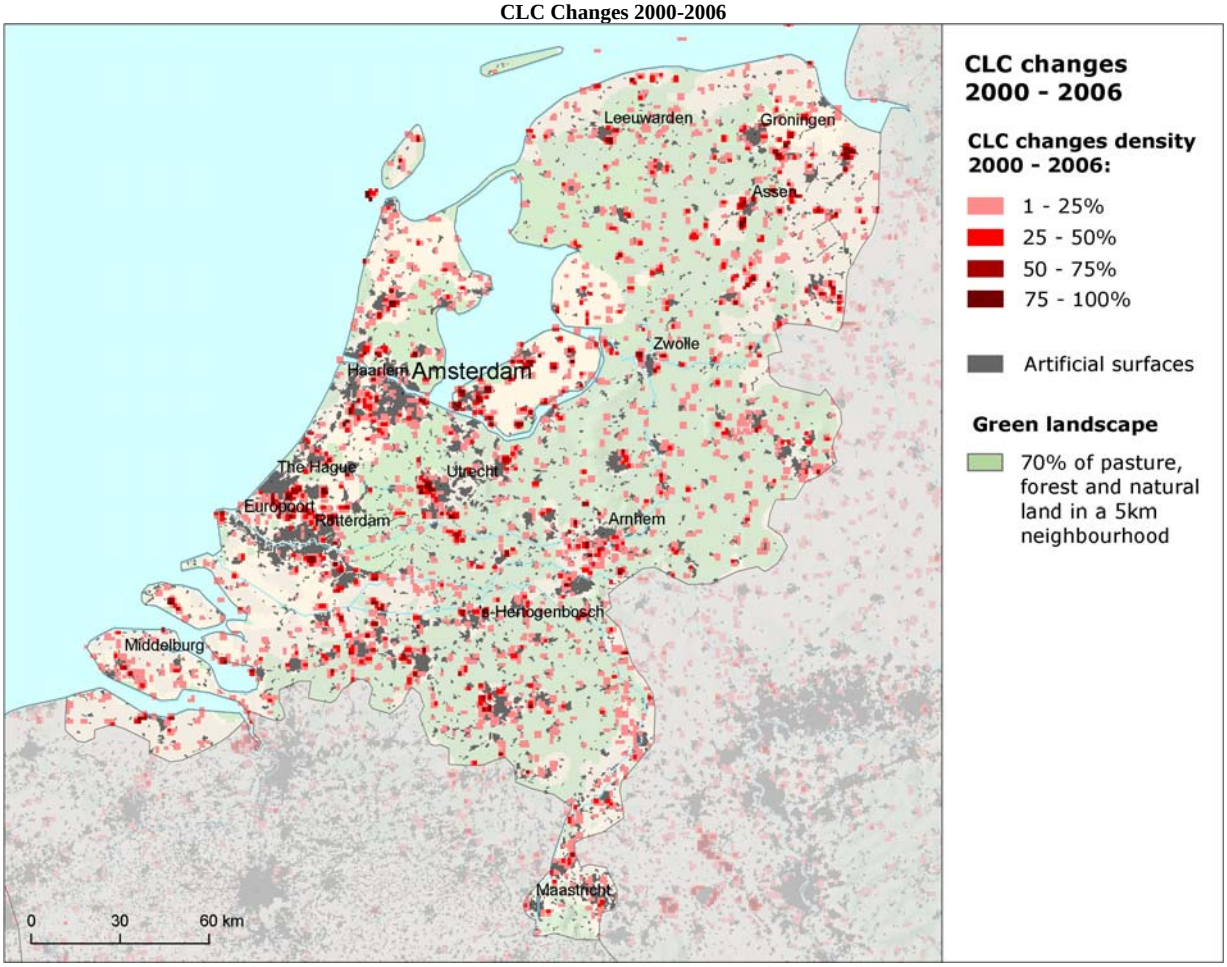


12.45. Mean annual conversions of wetlands and water LC [ha/year]

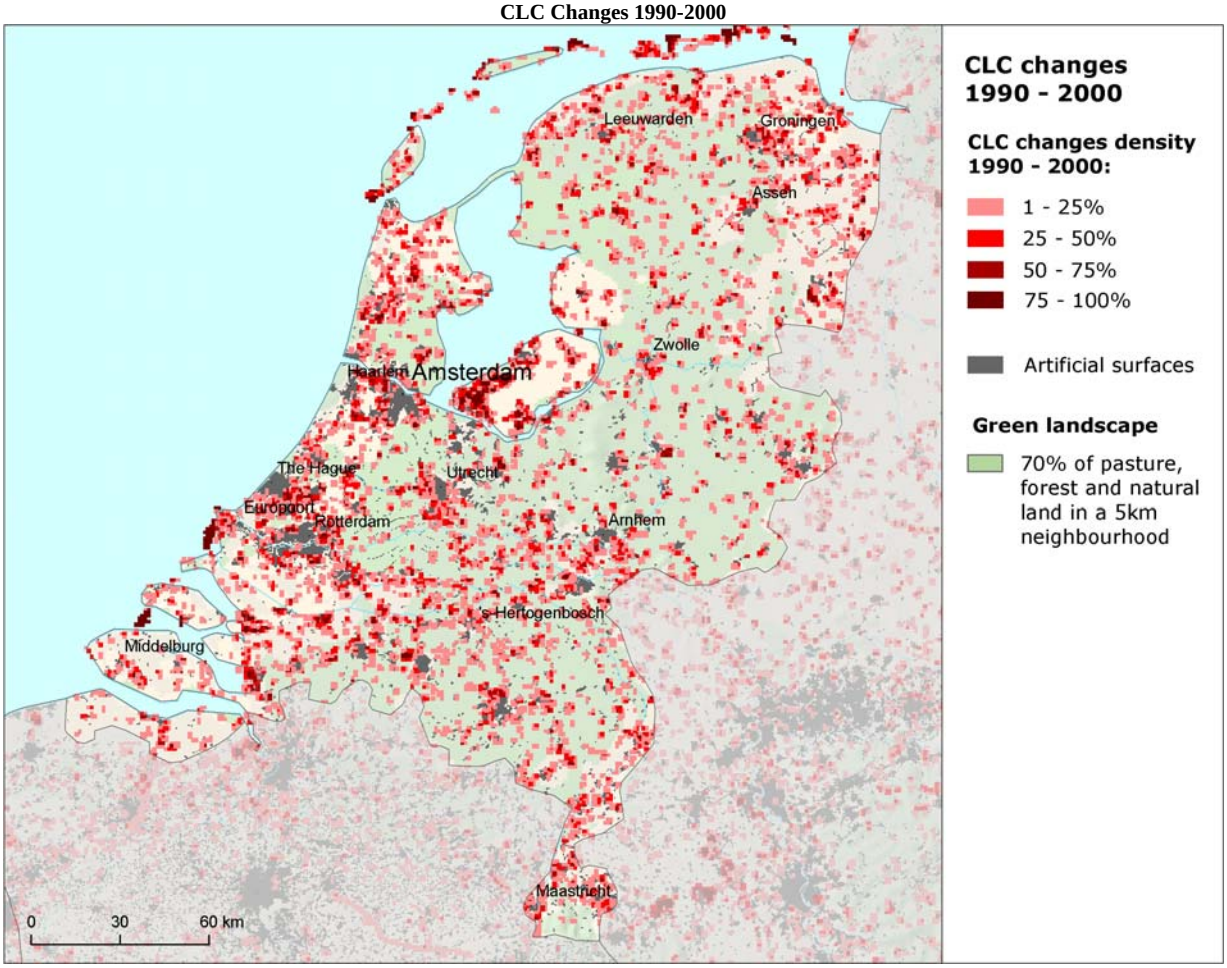


The Netherlands

CLC Changes 2000-2006

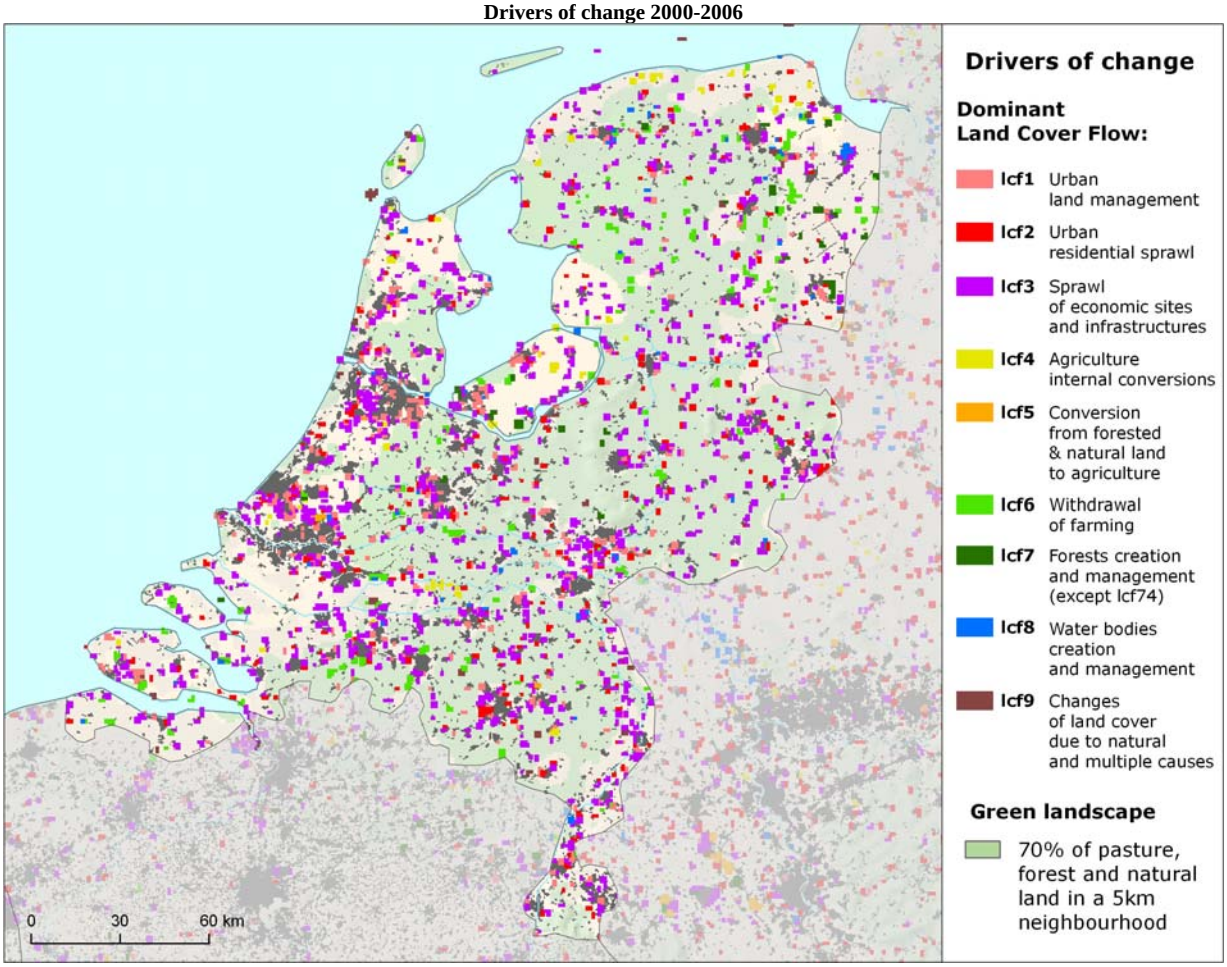


CLC Changes 1990-2000

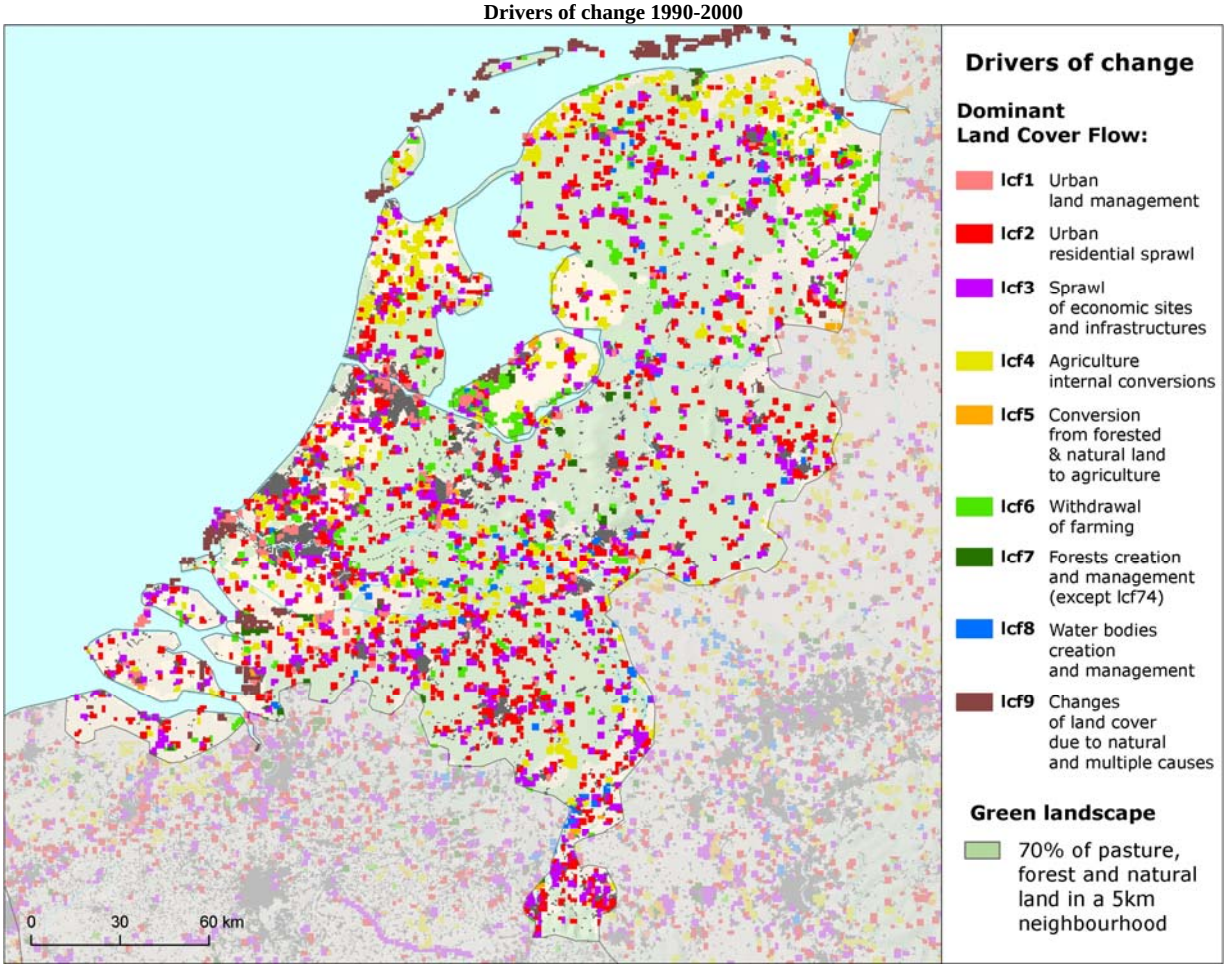


The Netherlands

Drivers of change 2000-2006

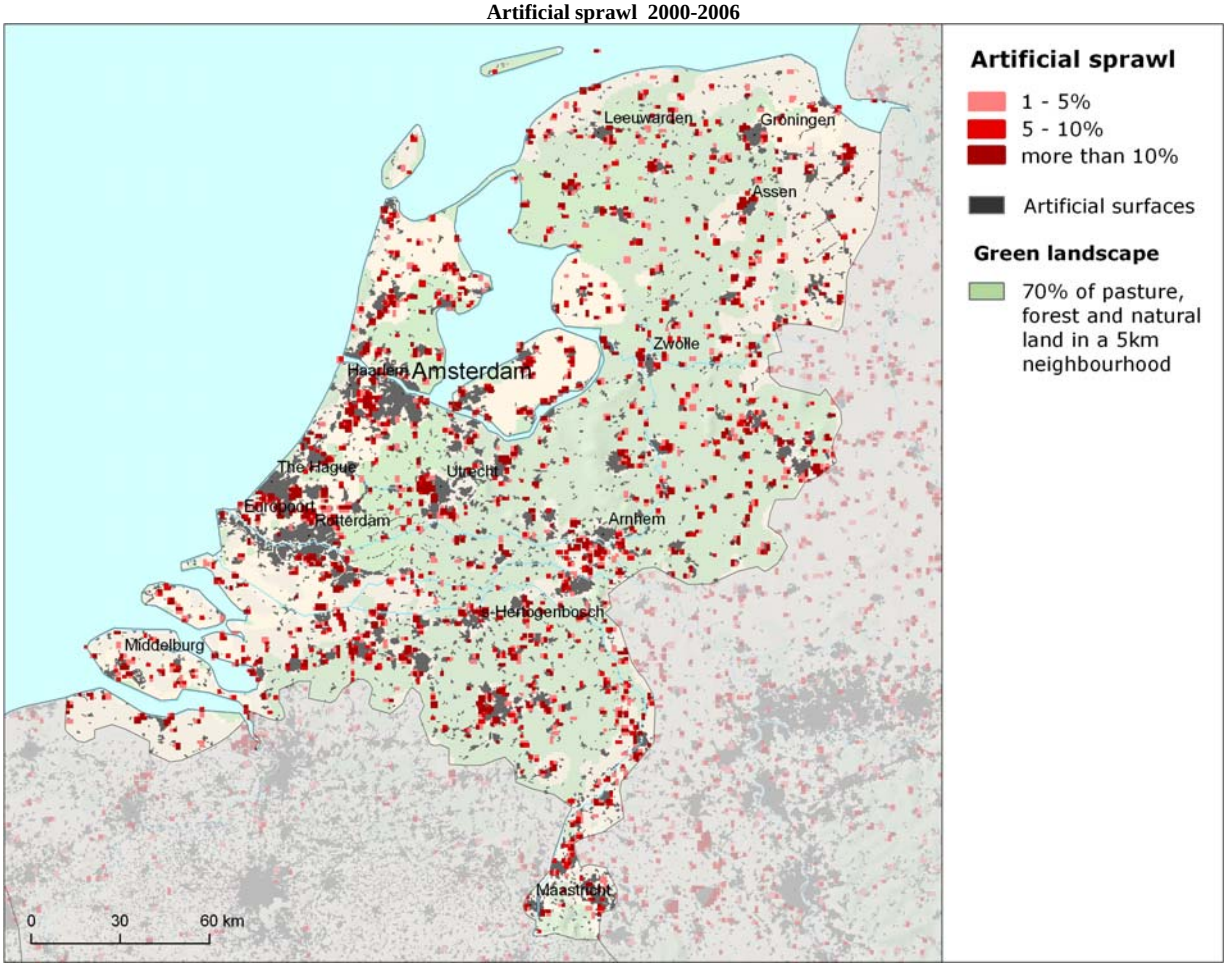


Drivers of change 1990-2000

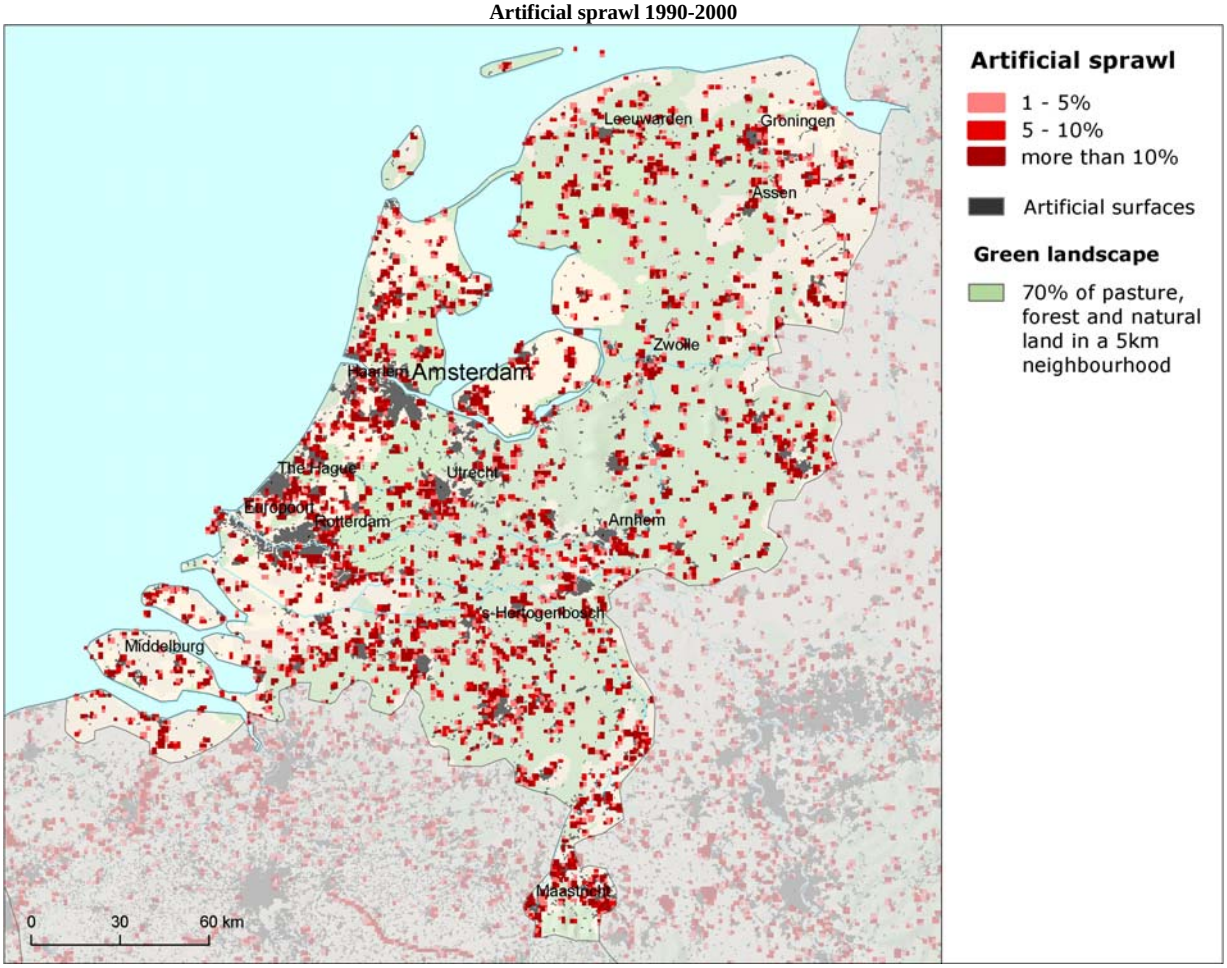


The Netherlands

Artificial sprawl 2000-2006

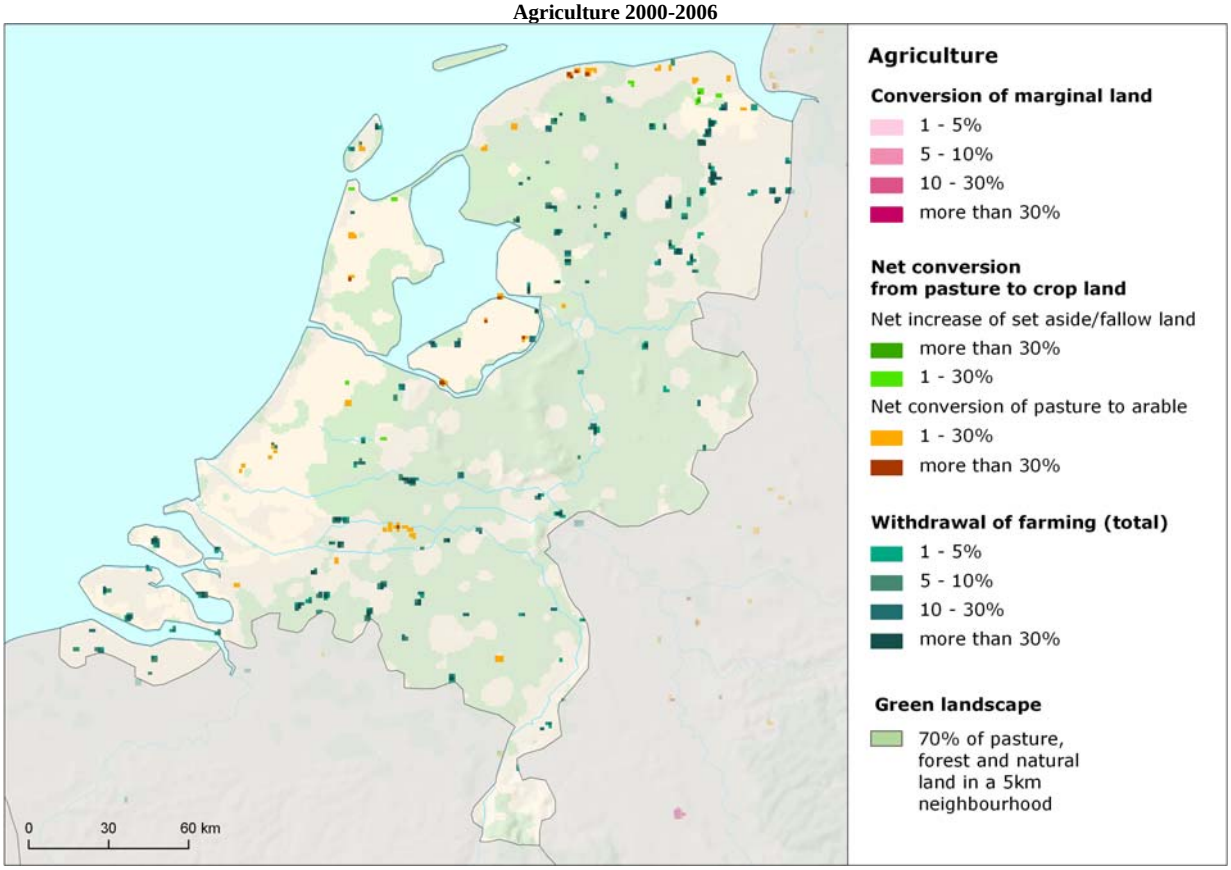


Artificial sprawl 1990-2000

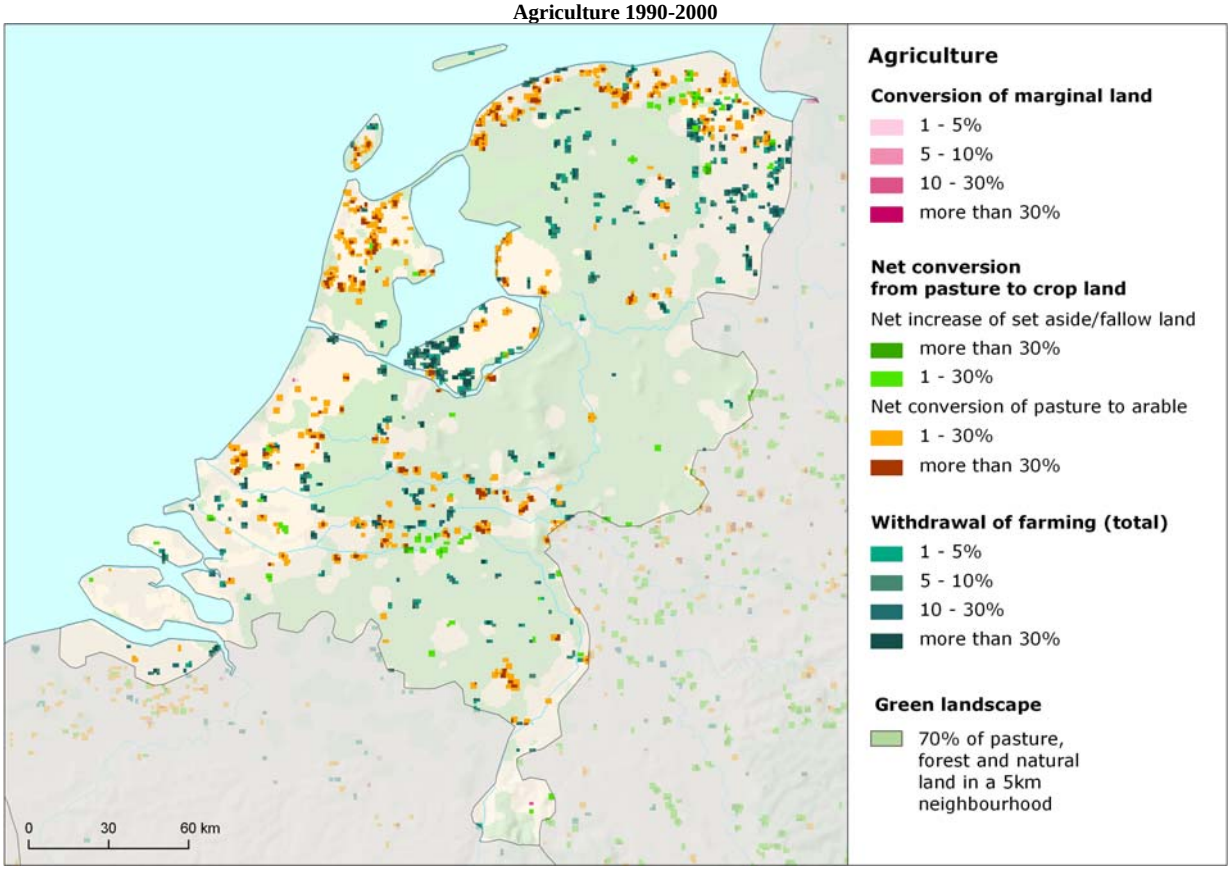


The Netherlands

Agriculture 2000-2006

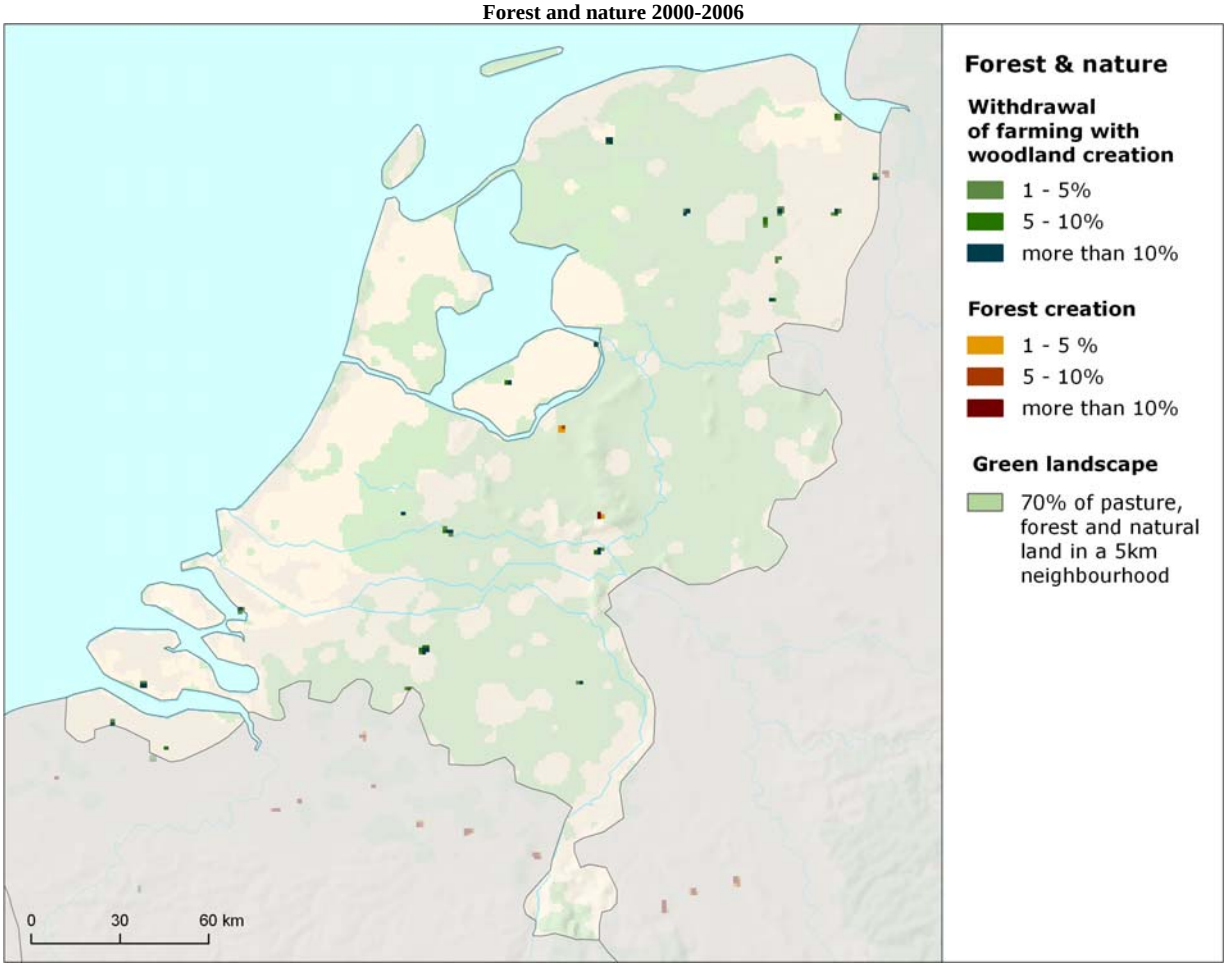


Agriculture 1990-2000



The Netherlands

Forest and nature 2000-2006



Forest and nature 1990-2000