Country fact sheet

Land cover 2012

Montenegro

September 2017

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European Environment Agency

Montenegro

Land cover 2012

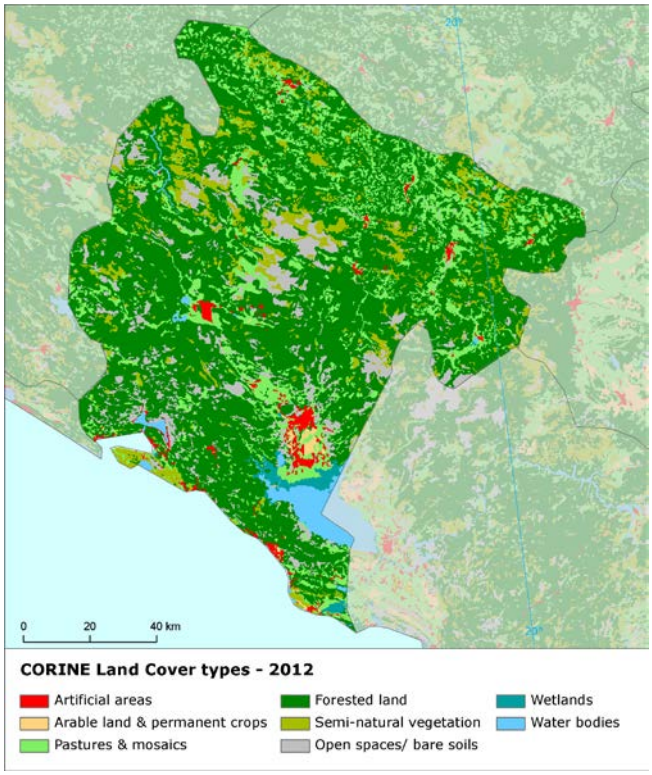
Overview of land cover & change 2006-2012

Comparing all three analytical periods of CLC changes, shows a slightly increasing trend in intensity of landscape development in Montenegro. However, with an annual land cover change rate of 0.06%, the overall pace of land cover development in the country is still very low in the European context.

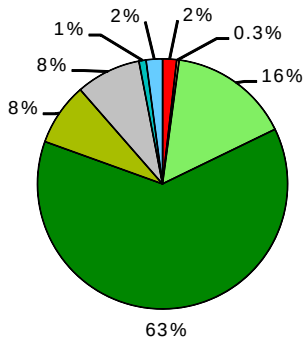
Untypically, changes due to natural and multiple causes are the main driver of landscape exchange in this country. This is caused by the occurrence of large forest fires in this period. On the other hand, the intensity of forest creation and management, which was the main driver in the previous period, decreased significantly and its level is comparable with the period 1990-2000. This change is caused by rapid decrease of intensity of both directions of forest internal transitions.

Artificial development shows an increasing trend, with an annual land take rate of 0.55%, which is one of the highest rates in Europe. The main drivers of urban extension are sprawl of mines and quarrying areas and of sport and leisure facilities. On the other hand, the intensity of agricultural development is rather low, with prevailing share of internal conversions, in particular conversion from pasture to arable or crop land.

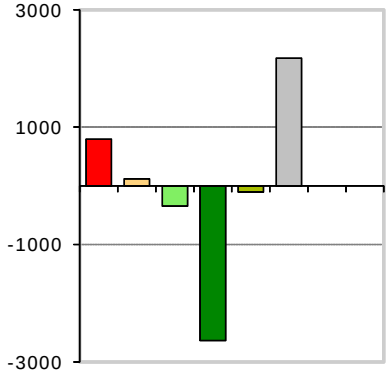
Note: The results presented here are based on a change analysis of 44 land cover types mapped consistently on a 1:100.000 scale across Europe over more than decade between 2000-2006-2012 - see Corine land cover (CLC) programme for details.
Number of years between CLC2006-CLC2012 data for Montenegro: 6



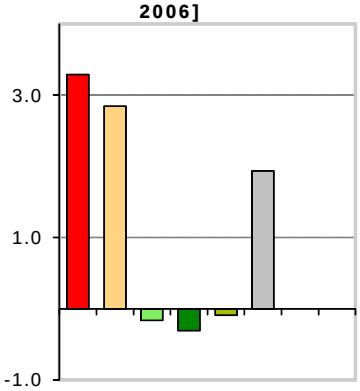
1.1. Land cover 2012 [% of total]



1.2. Net change in land cover 2006-2012 [ha]



1.3. Net change in land cover [% of initial year 2006]



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

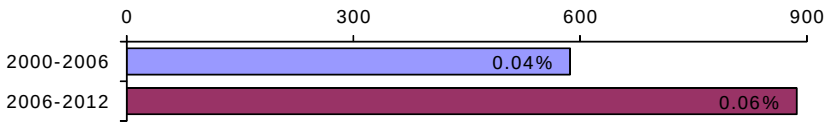
Summary balance table 2006-2012

	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 2006	**241**	**41**	**2143**	**8583**	**1103**	**1124**	**126**	**287**	**13650**
Consumption of initial LC	1.9	1.0	4.4	38.9	1.0	5.9	0.0	0.0	53
Formation of new LC	9.9	2.1	1.0	12.6	0.0	27.7	0.0	0.0	53
Net Formation of LC	**7.9**	**1.2**	**-3.5**	**-26.4**	**-1.0**	**21.8**	**0.0**	**0.0**	**0**
Net formation as % of initial year	*3.3*	*2.8*	*-0.2*	*-0.3*	*-0.1*	*1.9*	*0.0*	*0.0*	
Total turnover of LC	**11.8**	**3.1**	**5.4**	**51.5**	**1.0**	**33.6**	**0.0**	**0.0**	**106**
Total turnover as % of initial year	*4.9*	*7.4*	*0.3*	*0.6*	*0.1*	*3.0*	*0.0*	*0.0*	*0.8*
Land cover 2012	**249**	**43**	**2140**	**8557**	**1102**	**1146**	**126**	**287**	**13650**

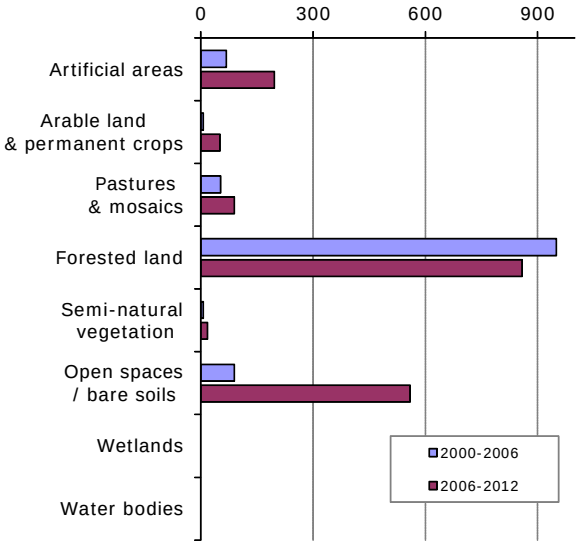
Montenegro

Land cover trends comparison 2000-2006 vs. 2006-2012

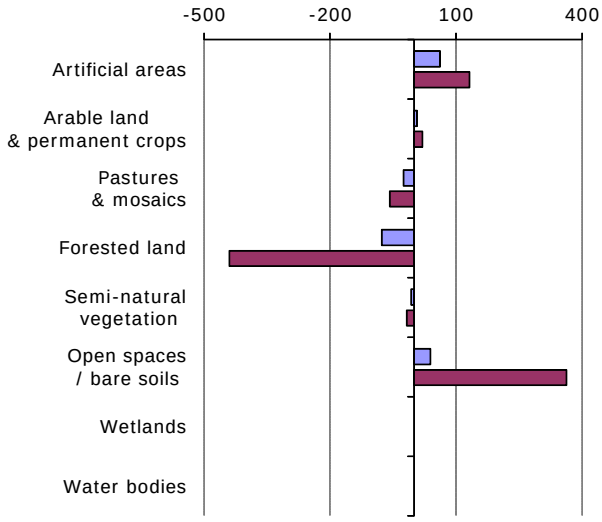
2.4. Annual land cover change [ha/year, % of total area]



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

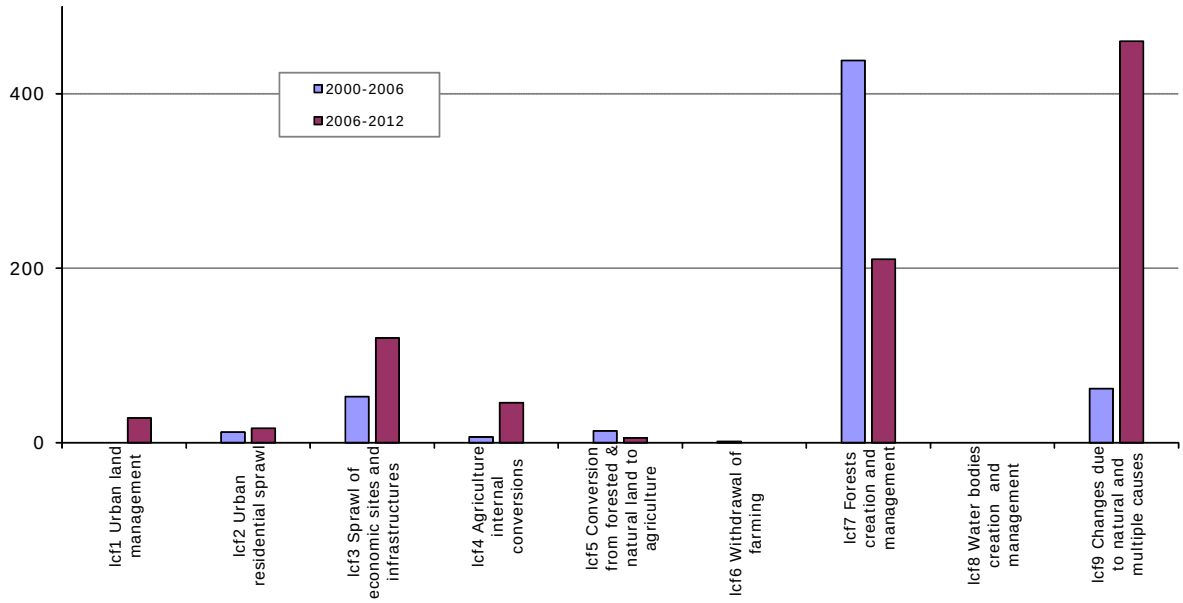


2.6. Net annual change of LC types [ha/year]



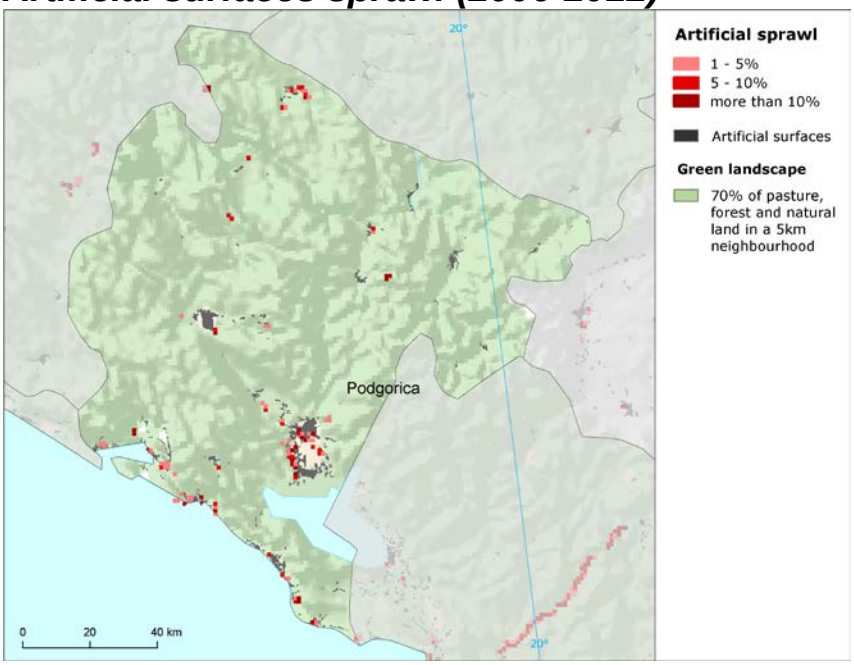
Summary trend figures	2000-2006	2006-2012
Annual land cover change [ha/year]	**587**	**887**
Annual land cover change as % of initial year	**0.04%**	**0.06%**
Land uptake by artificial development as mean annual change [ha/year]	65	132
Agricultural land uptake by urban and infrastructures development as mean annual change [ha/year]	31	44
Net uptake of forests and semi-natural land by agriculture as mean annual change [ha/year]	12	6
Net conversion from pasture to arable land and permanent crops as mean annual change [ha/year]	7	26
Forest & other woodland net formation as mean annual change [ha/year]	-77	-439
Dry semi-natural land cover net formation as mean annual change [ha/year]	45	345
Wetlands & water bodies net formation as mean annual change [ha/year]	0	0

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

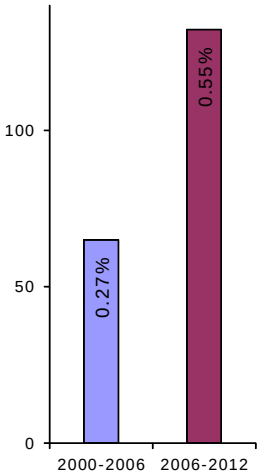


Montenegro

Artificial surfaces sprawl (2006-2012)



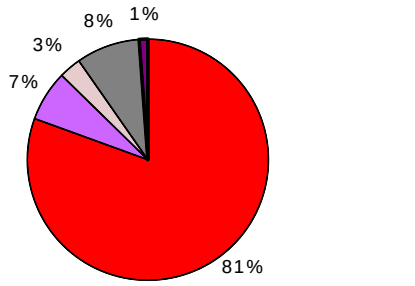
3.8. Artificial land take [ha/year, % of initial year]



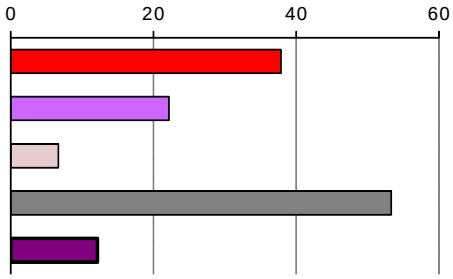
Artificial development

Artificial development in Montenegro is getting more and more intensive, with an annual artificial land take rate of 0,55%, it became one of the fastest in Europe. The internal structure is quite different, compared with the previous period. The most powerful driver is sprawl of mines and quarrying areas, which occurs in more than doubled intensity than in 2000-2006. Next, sprawl of sport and leisure facilities and industrial and commercial areas, which was almost absent in the previous period, became very powerful in 2006-2012. The residential sprawl in Montenegro is also quite significant, however, only a bit more intensive compared to the previous period. Beside the sprawl itself, artificial development is also represented by frequent urban development/infilling and recycling of developed urban land. Geographically, the artificial development is concentrated mainly around the capital city of Podgorica and also along the seashore. The extension of mining areas is concentrated around the Pljevlja city in the northern part of the country.

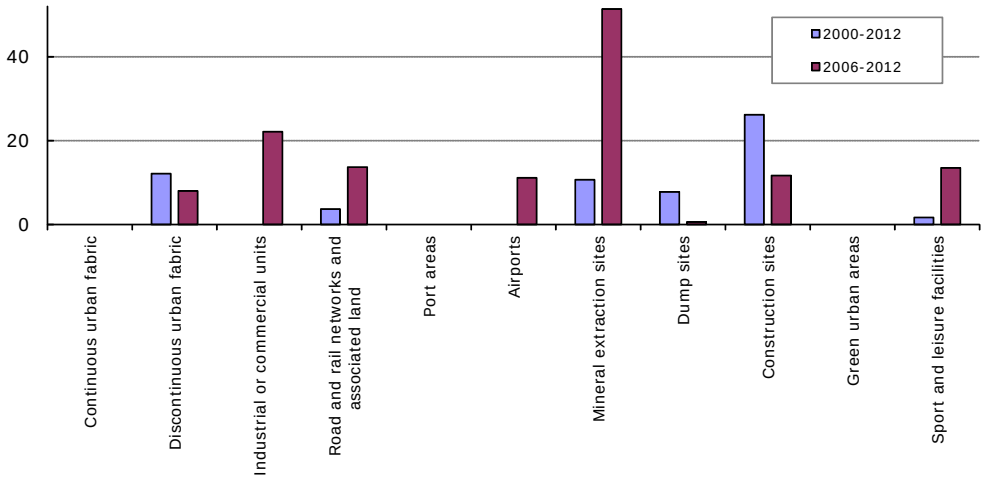
3.9. Artificial surfaces 2012 [% of total area]



3.10. Artificial land take 2006-2012 [ha/year]

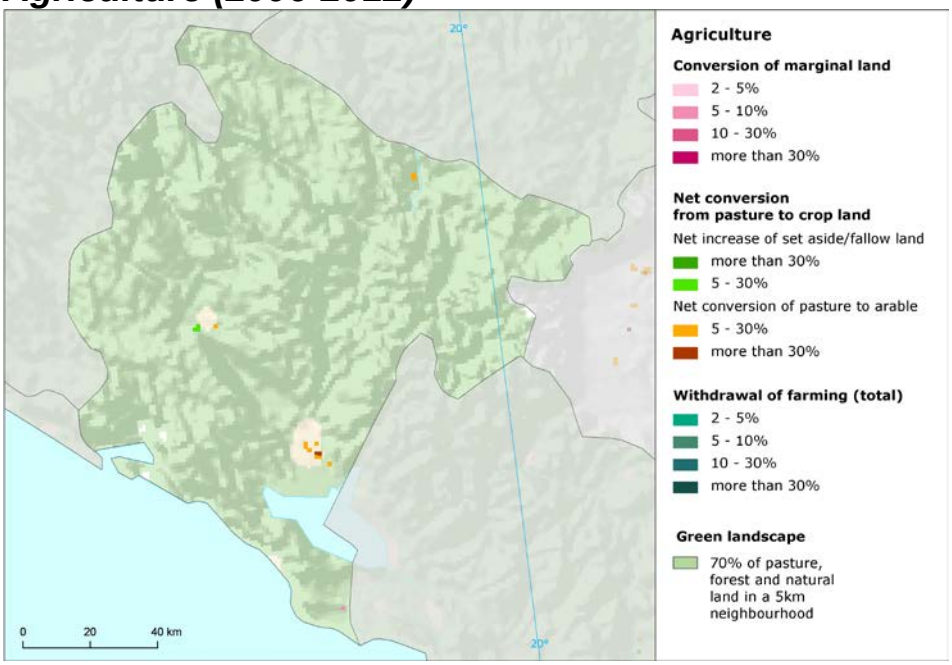


3.11. Mean annual artificial change by class [ha/year]



Montenegro

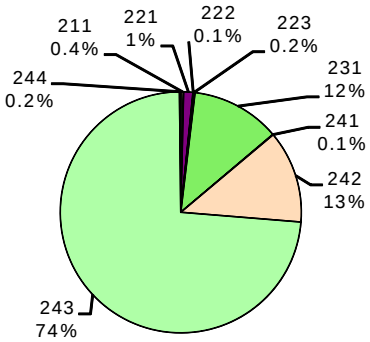
Agriculture (2006-2012)

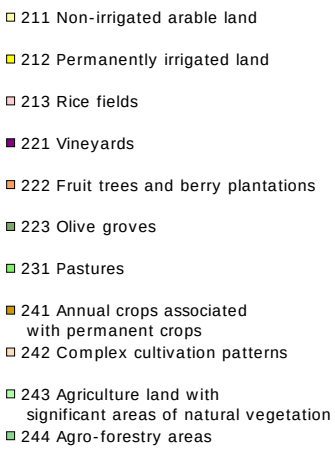


Pasture land consumption by artificial sprawl

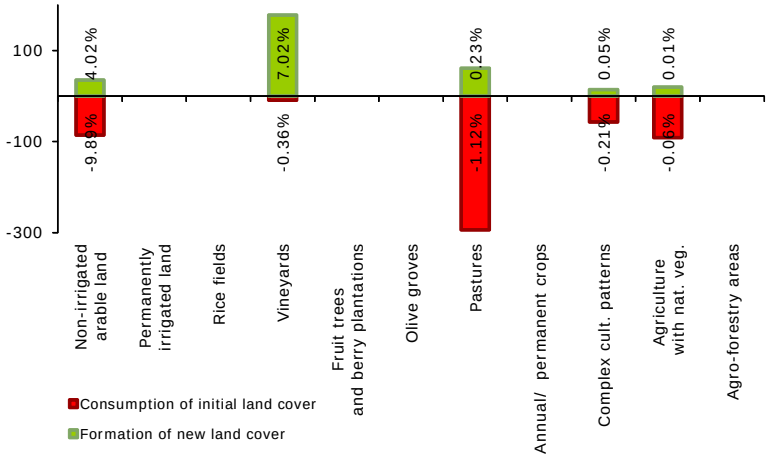
The intensity of agricultural development in Montenegro is very low in the long term, which is valid also for the period 2006-2012. There occurs some amount of agricultural land consumption by artificial sprawl – compared to previous period, this flow is more intensive. It is represented by consumption of pastures, agricultural land with natural vegetation or complex cultivation patterns by extension of mainly industrial/commercial and mineral extraction sites or urban fabric. From the perspective of internal agricultural flows, the conversion of pasture to arable and permanent crops is more frequent, however, also the intensity of these internal exchanges is quite low. Geographically, agricultural conversions are concentrated almost exclusively in the small lowland around the capital city Podgorica.

4.12. Agricultural areas 2012 [% of total area]

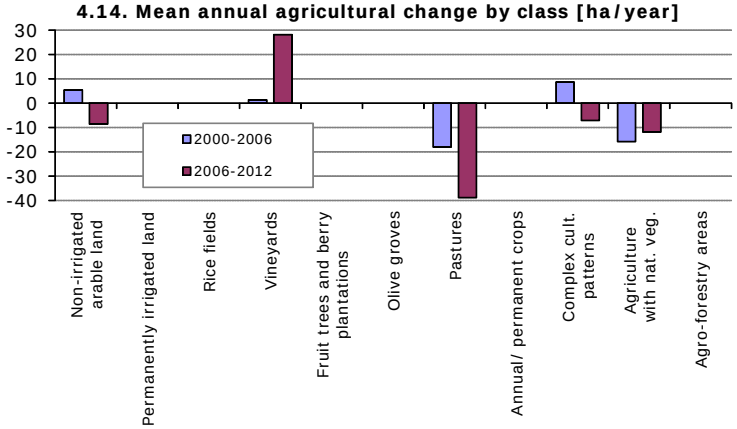




4.13. Development of agricultural areas 2006-2012 – detailed balance [ha]

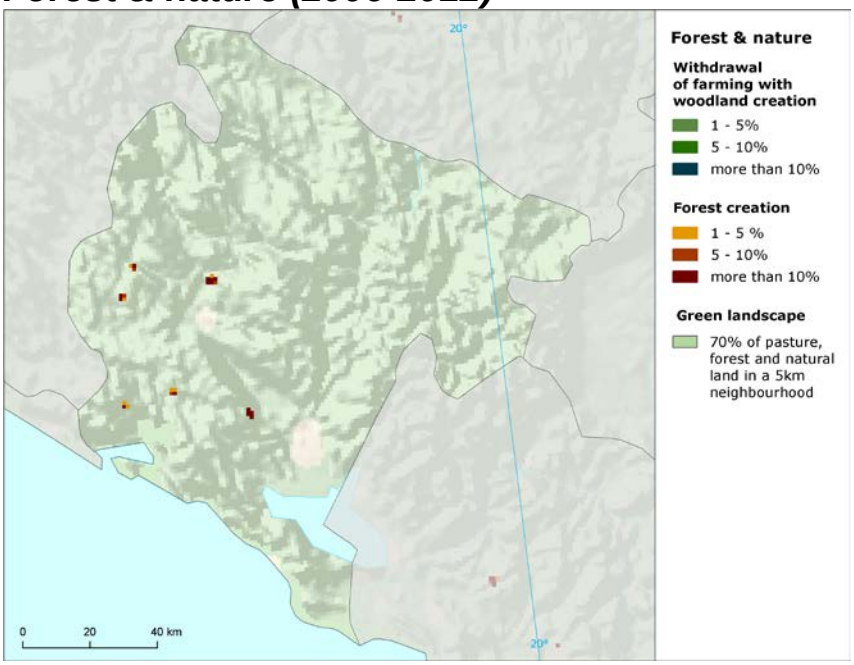


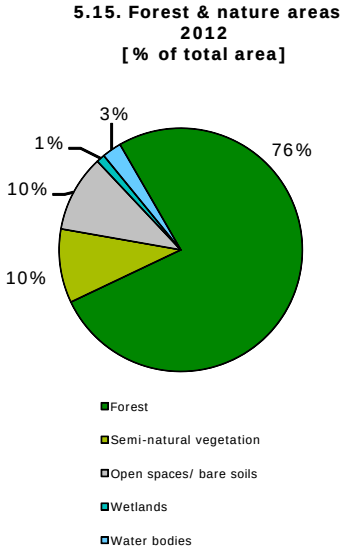
4.14. Mean annual agricultural change by class [ha/year]



Montenegro

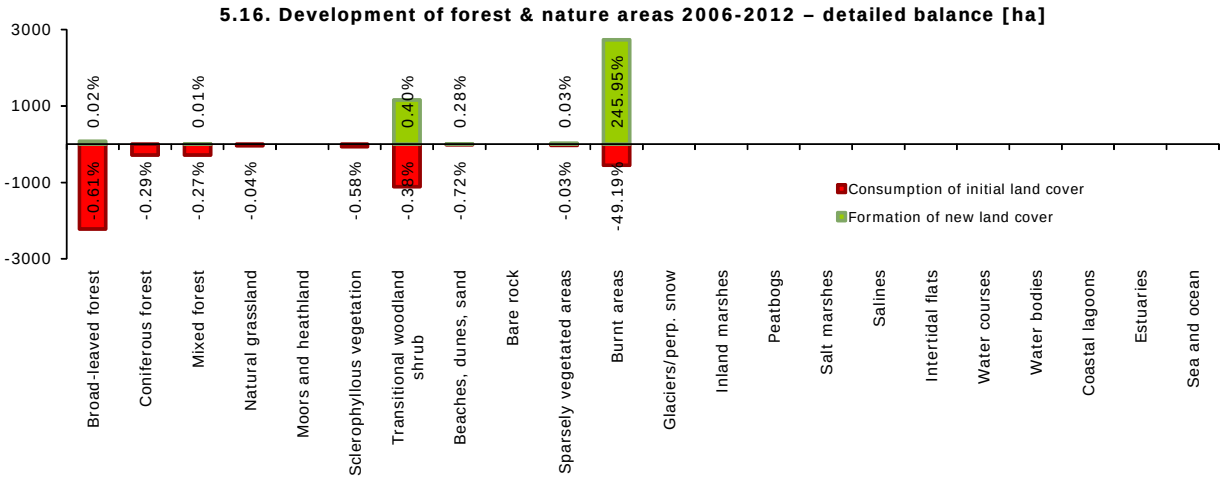
Forest & nature (2006-2012)

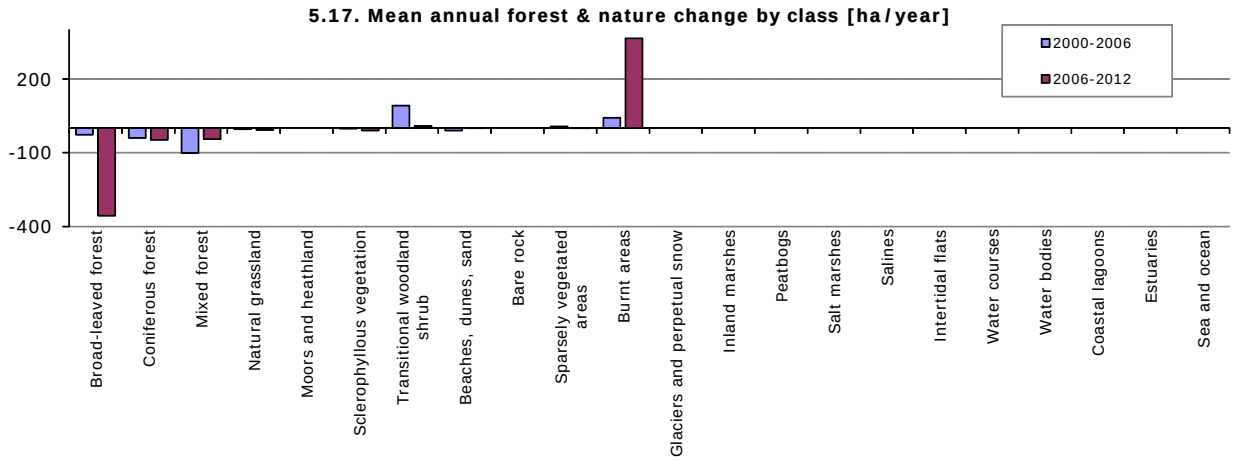




Frequent forest and shrub fires

Development of natural landscape is the most powerful land cover change driver in Montenegro. However, much of this flow is realized through frequent forest fires, which occurred between 2006 and 2012. These fires were by far not so frequent in the previous period. As a result, net formation of burnt area is about 217% in this period. Mostly broad-leaved forests or transitional woodlands were destroyed by the fires. Despite losing about half of its intensity, compared to period 2000-2006, forest creation and management is the second most intensive change driver in the country. It is represented mostly by recent felling and also by afforestation of burnt areas. Externally, natural land is consumed by sprawl of economic sites and infrastructures. This mainly concerns broad-leaved forests and transitional woodland and shrub areas.

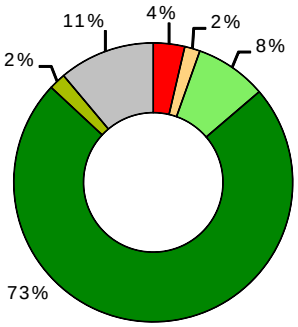




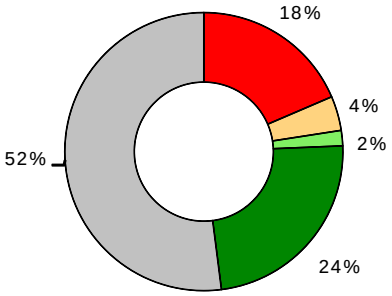
Annex: Land cover flows and trends

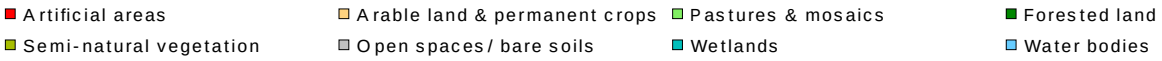
Land cover flows 2006-2012

6.18. Consumption of land cover 2006-2012 [% of total change area]

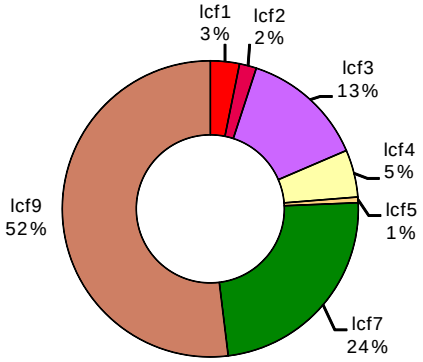


6.19. Formation of land cover 2006-2012 [% of total change area]





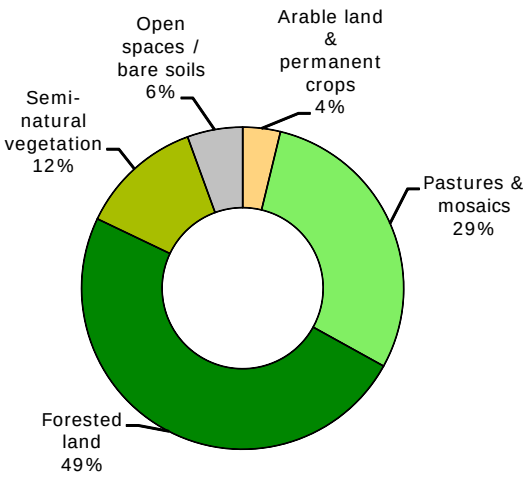
6.20. Drivers of change (LC FLOWS) 2006-2012 [% of total change area]



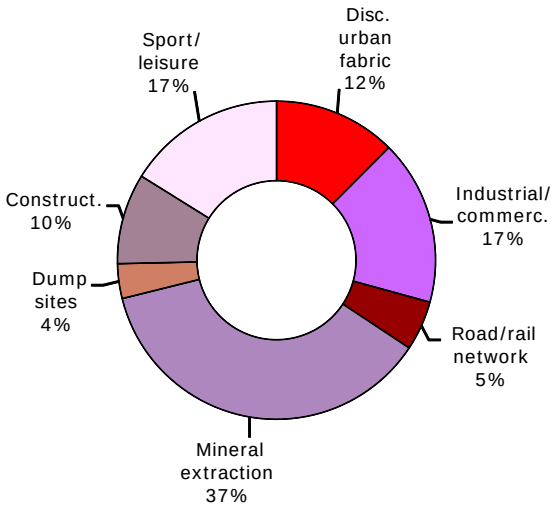
Montenegro

Artificial areas

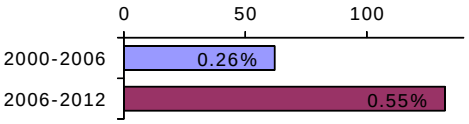
7.21. Consumption by artificial land take 2006-2012 [% of total]



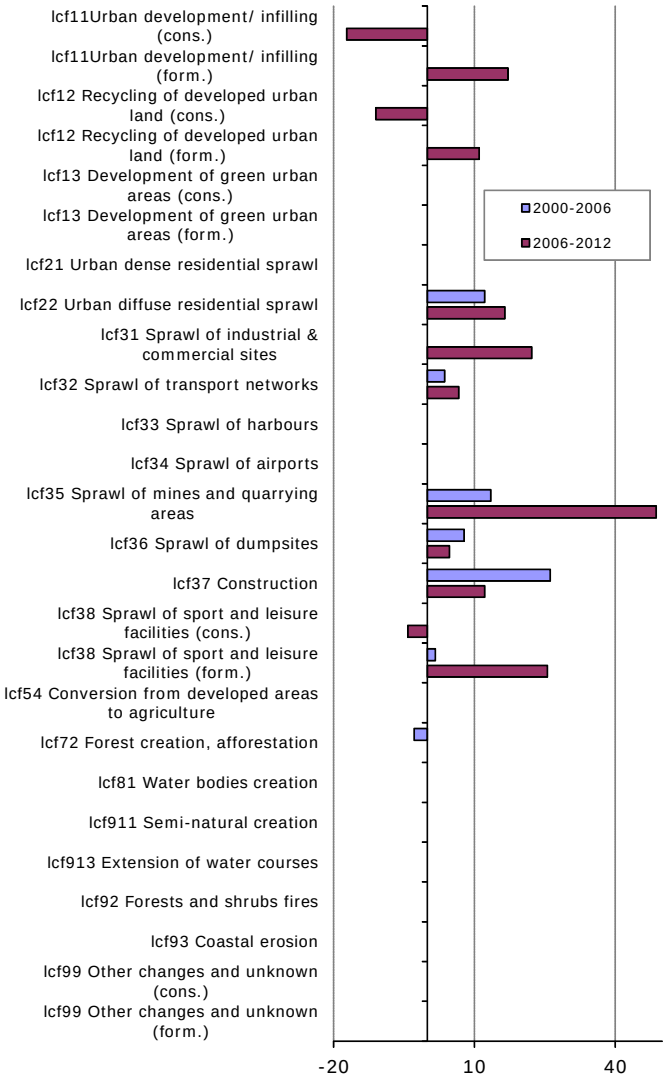
7.22. Formation by artificial land take 2006-2012 [% of total]



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



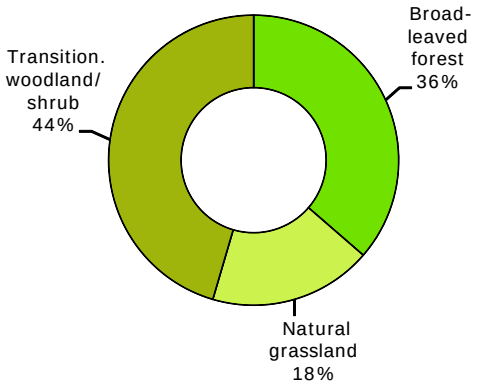
7.24. Artificial development by change drivers (LC FLOWS) [ha/year]



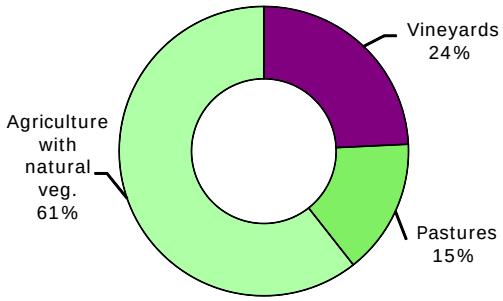
Montenegro

Agriculture

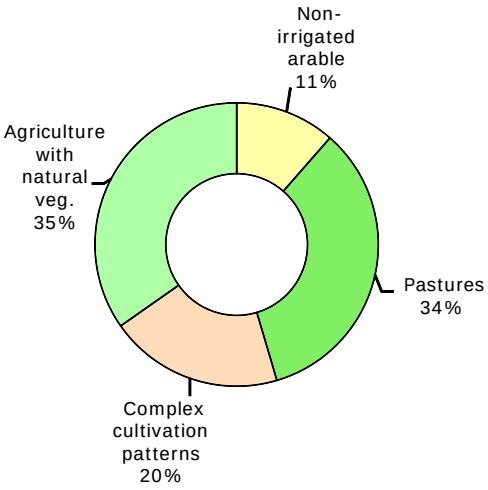
8.25. LC consumed by agriculture 2006-2012 [% of total]



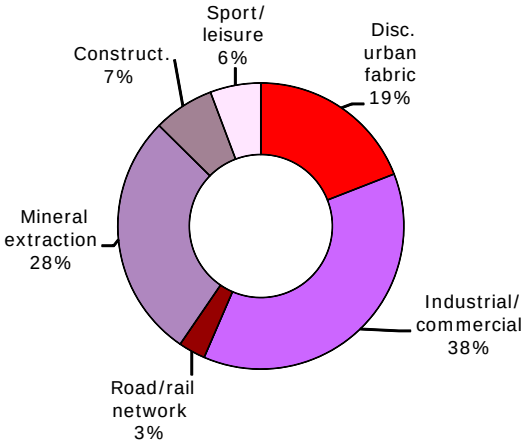
8.26. Formation of agricultural land from non-agriculture 2006-2012 [% of total]



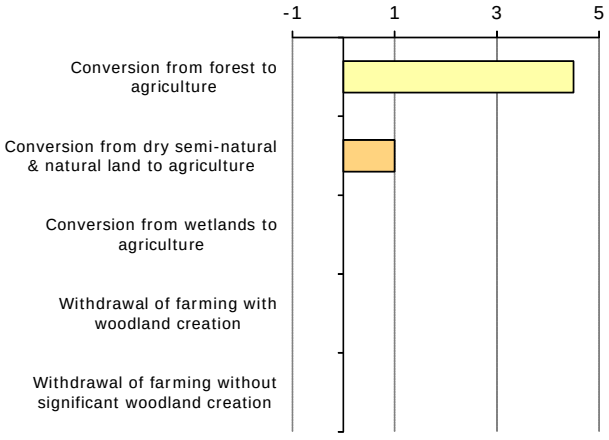
8.27. Consumption of agricultural land by non-agriculture 2006-2012 [% of total]



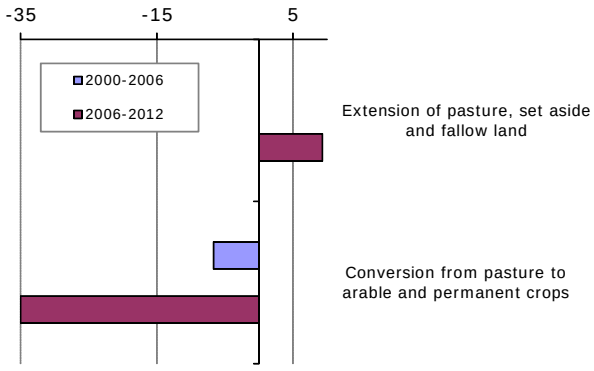
8.28. Formation of non-agricultural land from agriculture 2006-2012 [% of total]



8.29. Main annual conversions between agriculture and forests & semi-natural land 2006-2012 [ha/year]

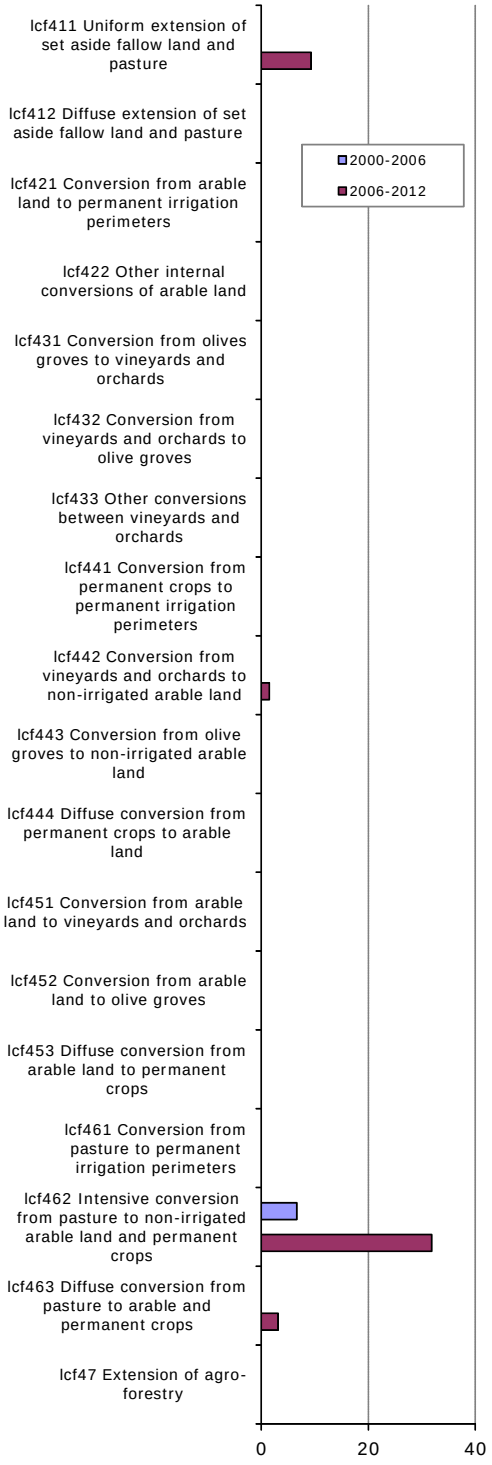


8.30. Mean annual conversion between arable land and pasture [ha/year]

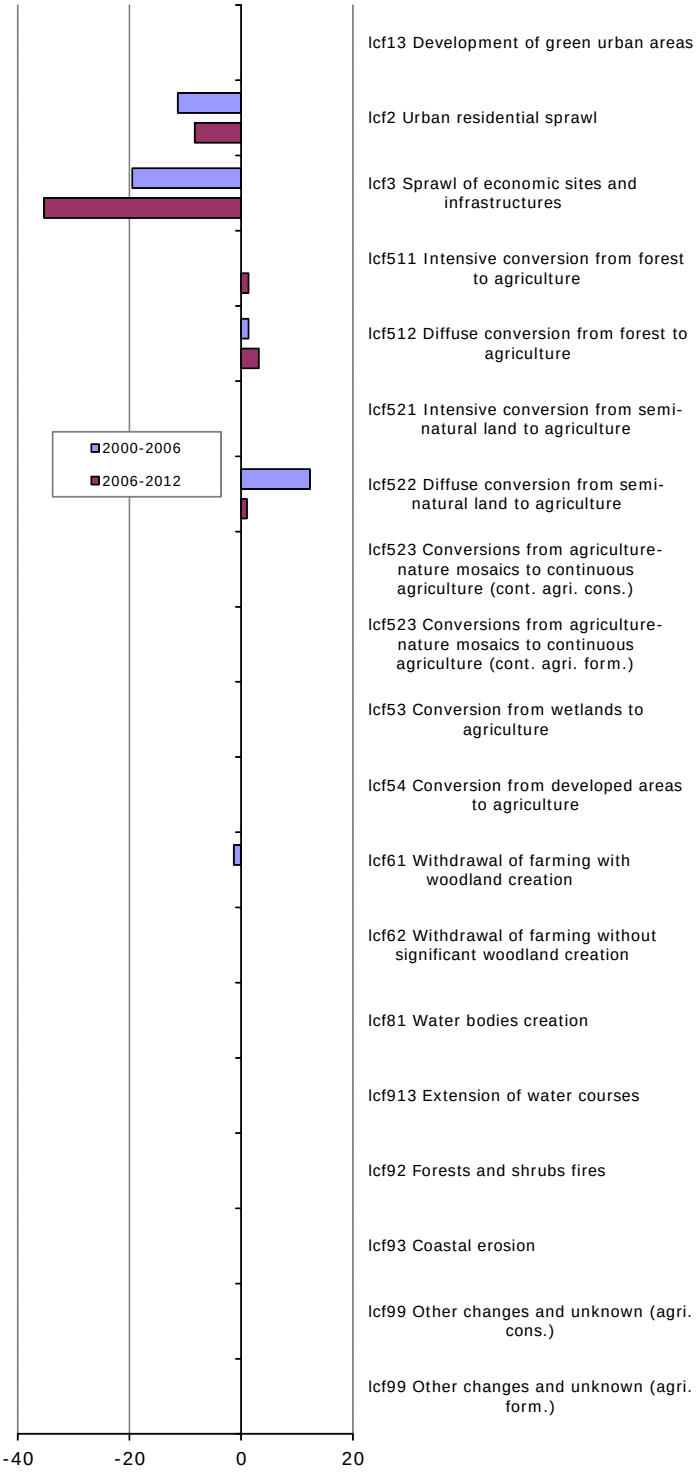


Montenegro

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



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



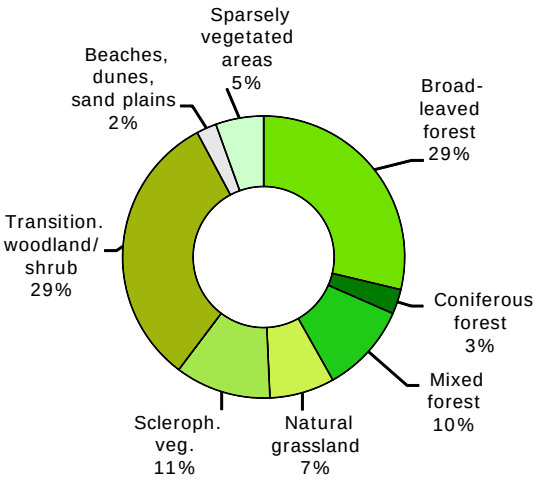
Montenegro

Forest & nature

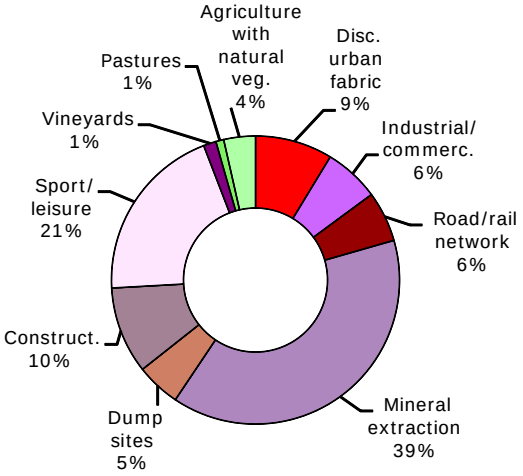
10.33. LC consumed by forest & nature 2006-2012 [% of total]

10.34. Formation of forest & nature land from non-forest /nature 2006-2012 [% of total]

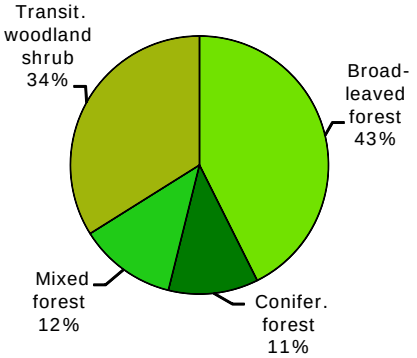
10.35. Consumption of forest & nature land by non-forest/nature 2006-2012 [% of total]



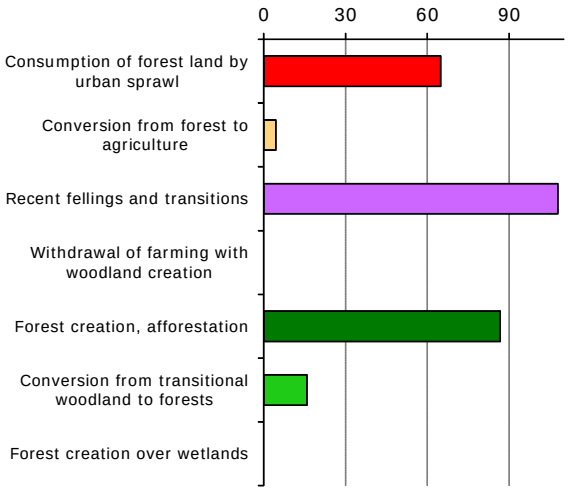
10.36. Formation of non-forest/nature land from forest & nature 2006-2012 [% of total]



10.37. Forested land 2012 [% of total area]

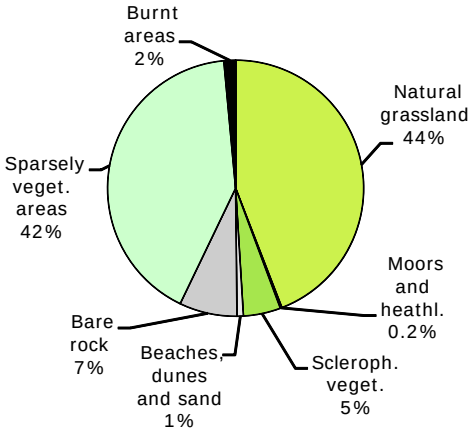


10.38. Main trends in woodland & forests consumption/formation 2006-2012 [ha/year]

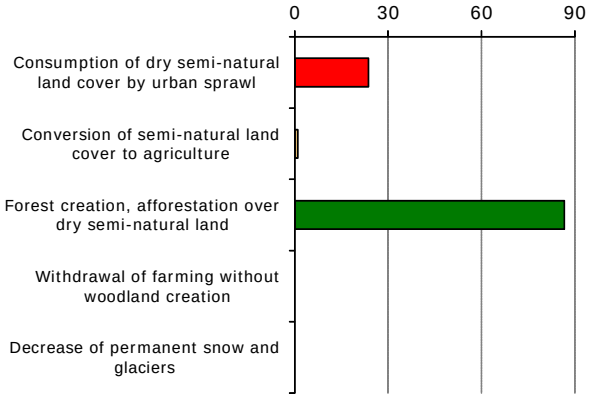


Montenegro

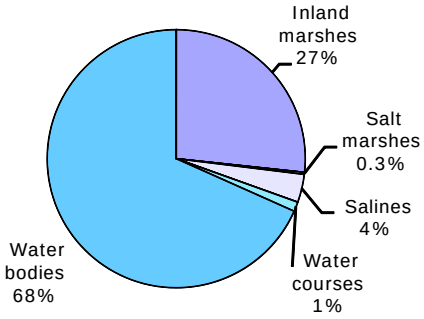
11.39. Dry semi-natural areas 2012 [% of total area]



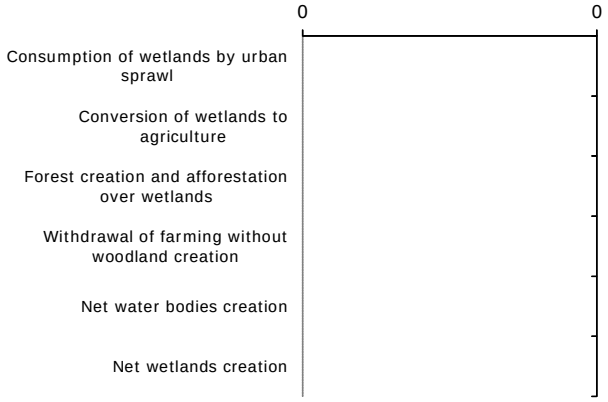
11.40. Main trends in dry semi-natural land consumption/formation 2006-2012 [ha/year]



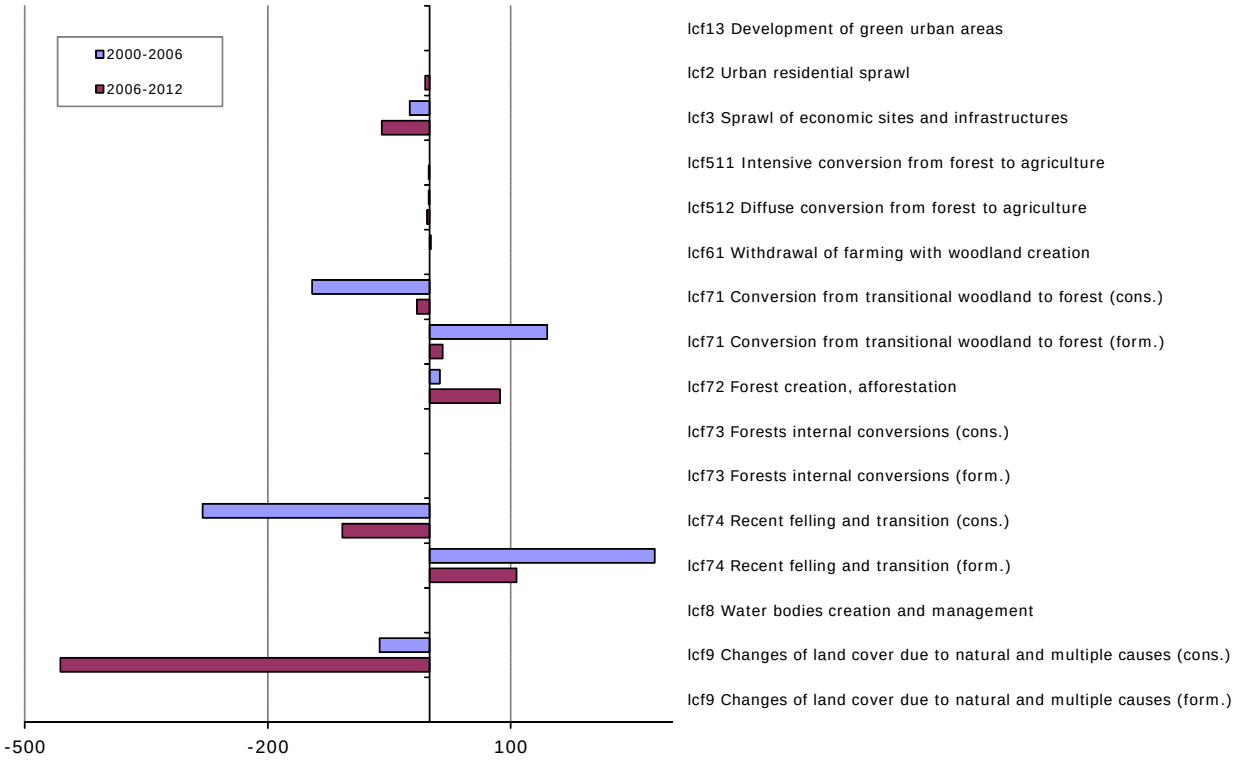
11.41. Wetlands & water 2012 [% of total area]



11.42. Main trends in wetlands & water consumption/formation 2006-2012 [ha/year]

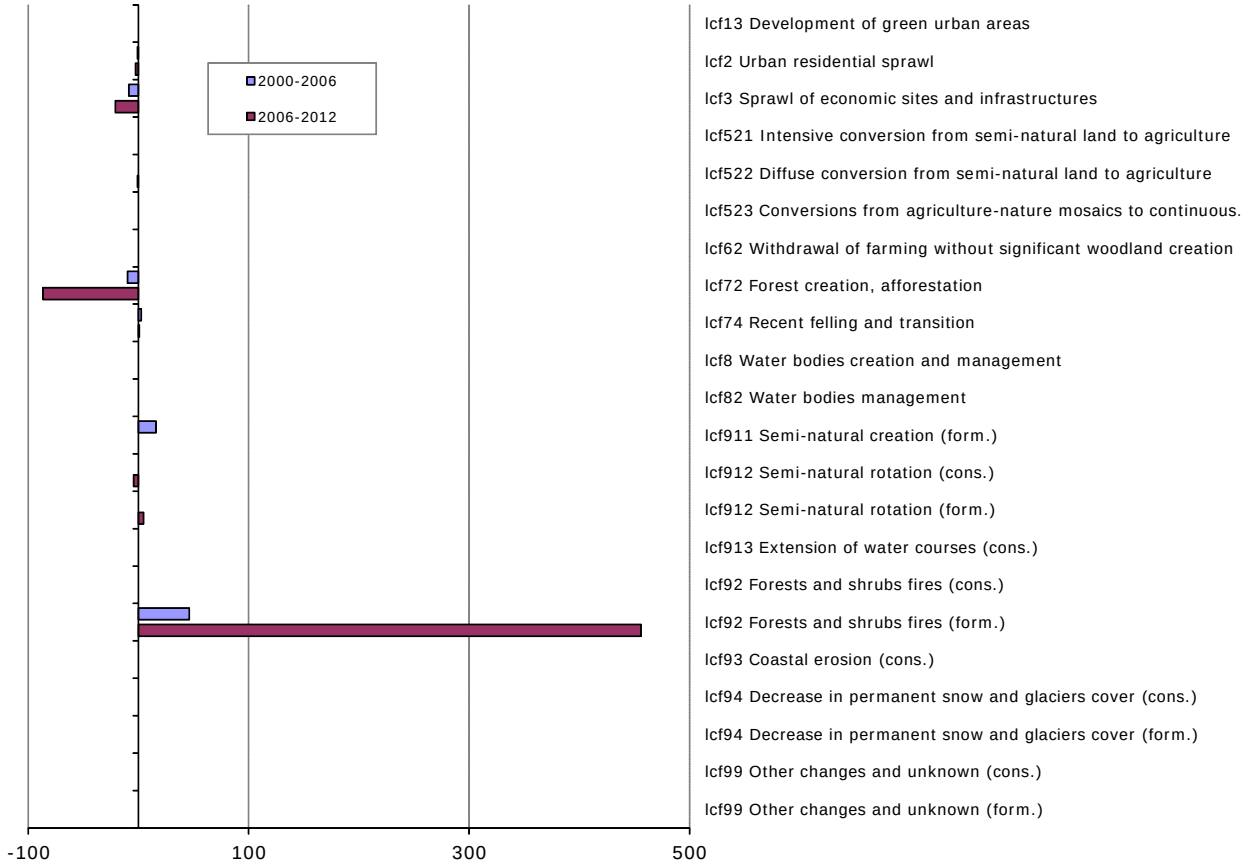


11.43. Mean annual conversions of forest & other woodland [ha/year]

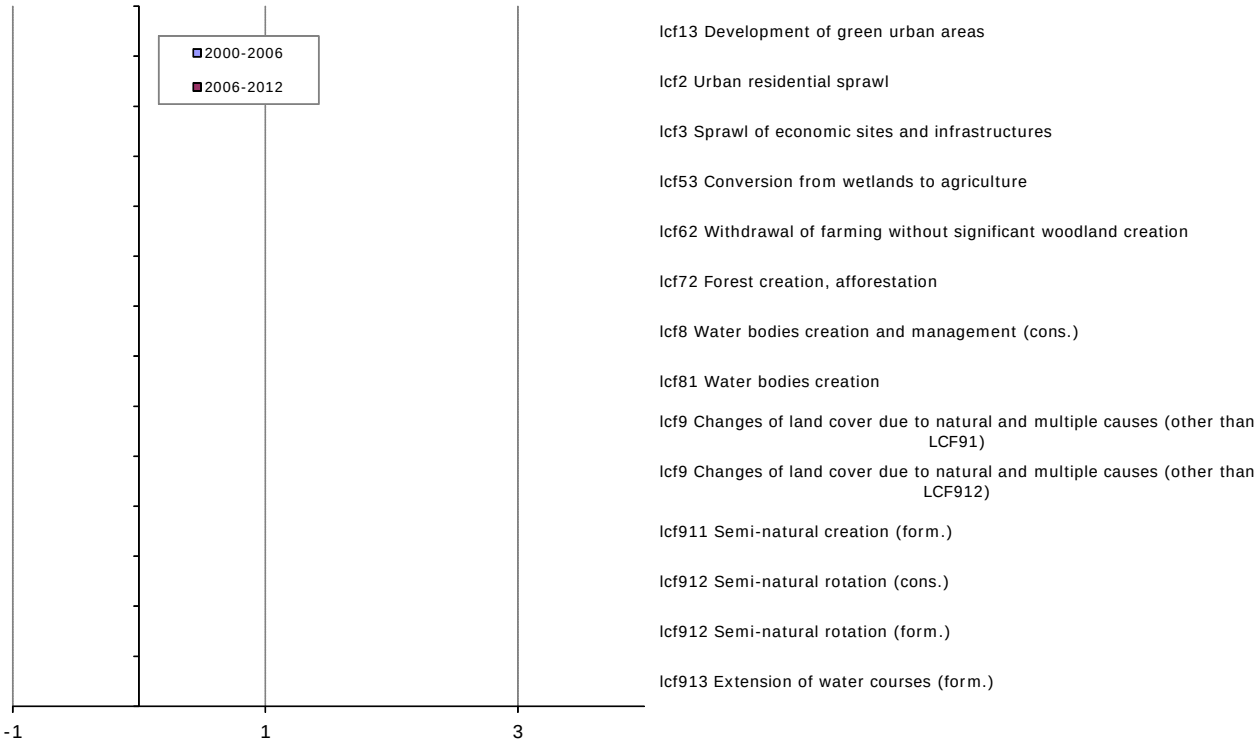


Montenegro

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

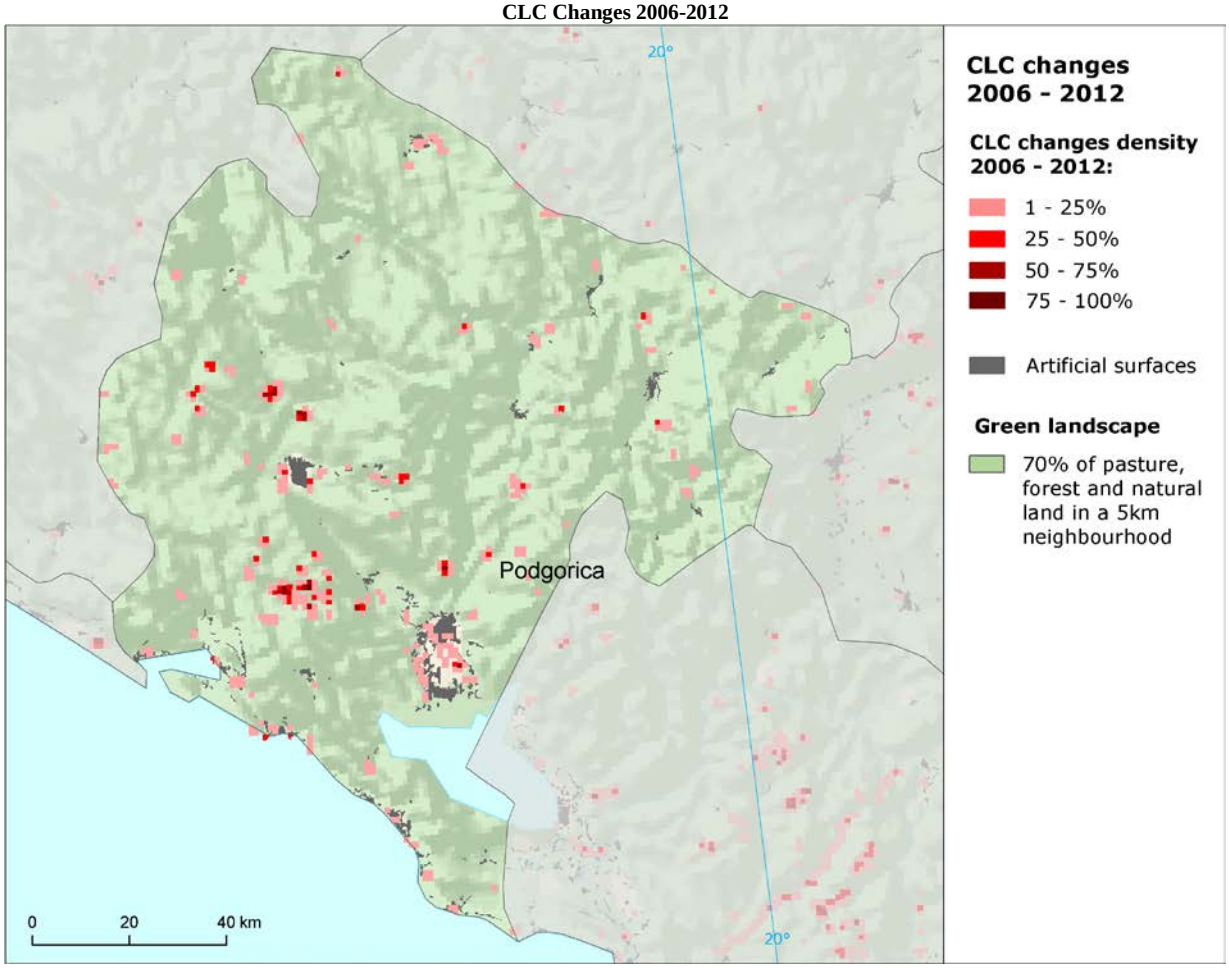


12.45. Mean annual conversions of wetlands and water LC [ha/year]

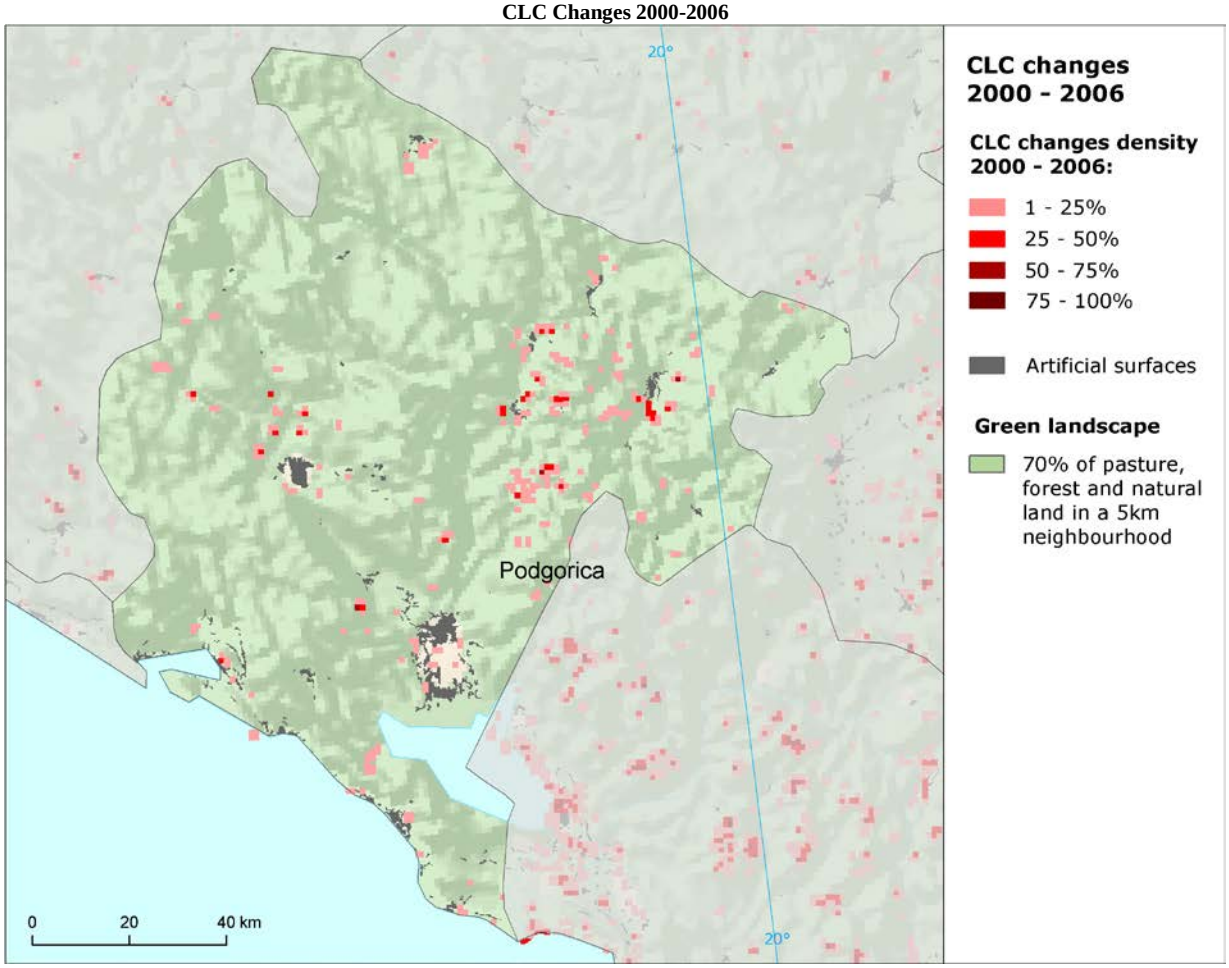


Montenegro

CLC Changes 2006-2012

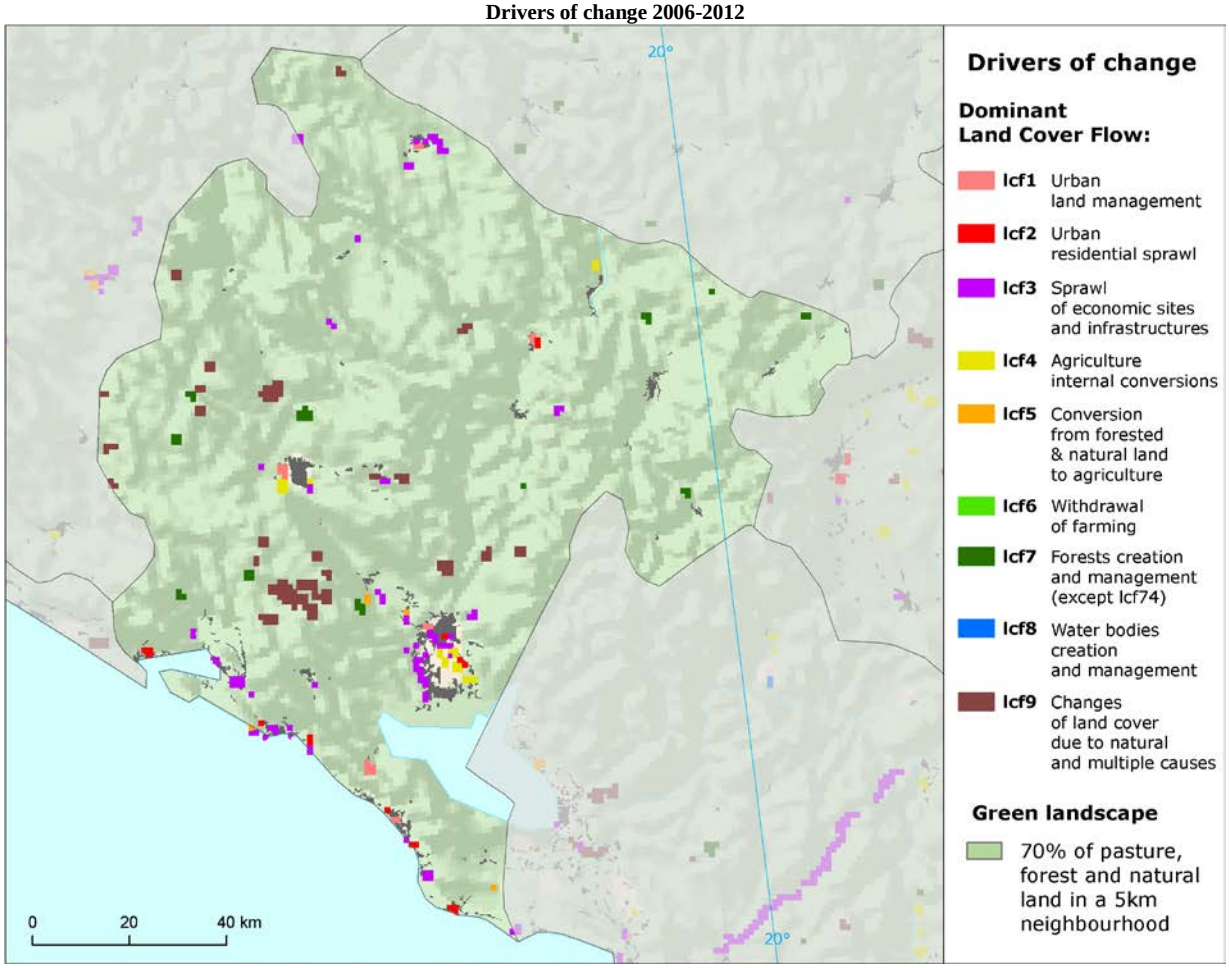


CLC Changes 2000-2006

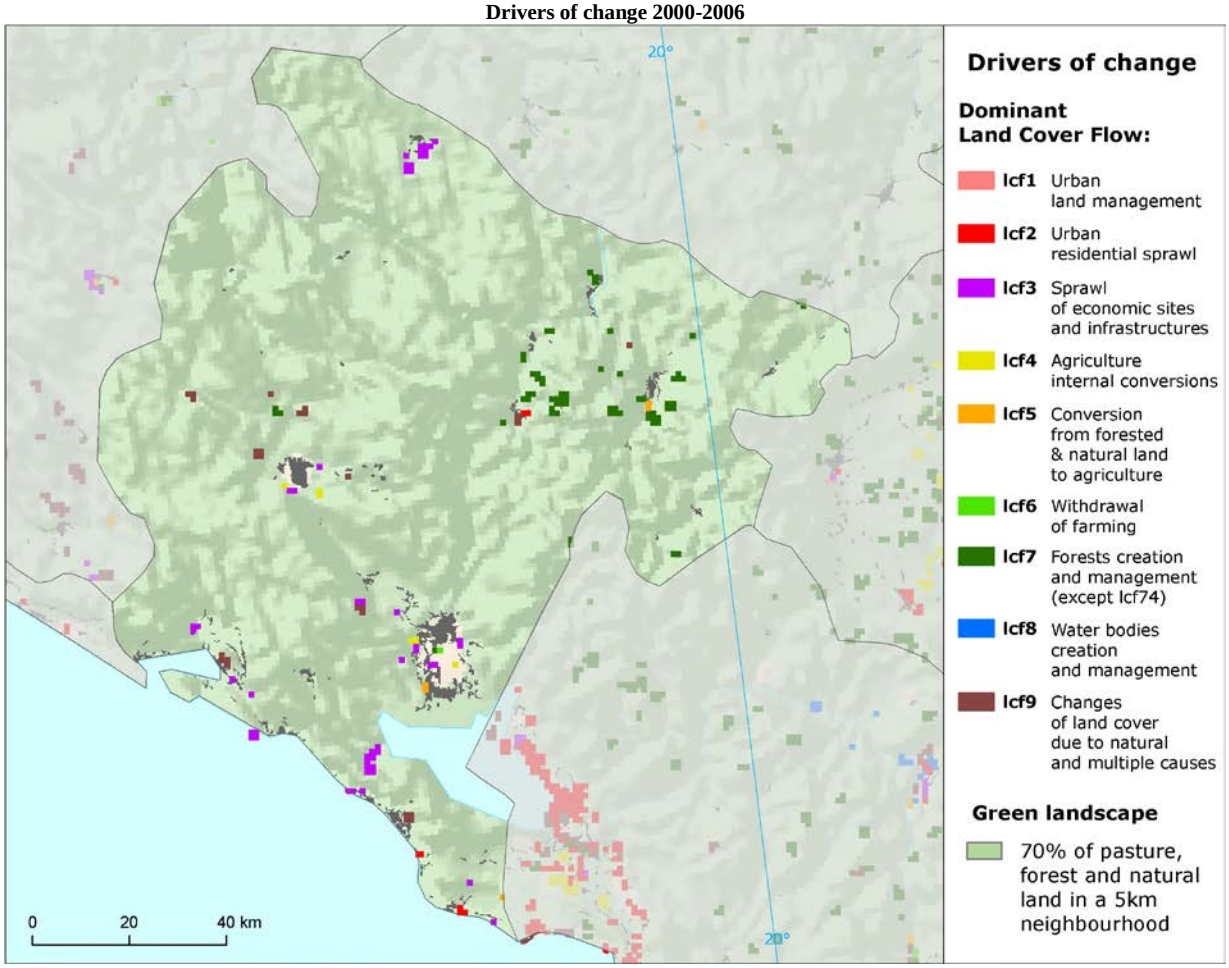


Montenegro

Drivers of change 2006-2012

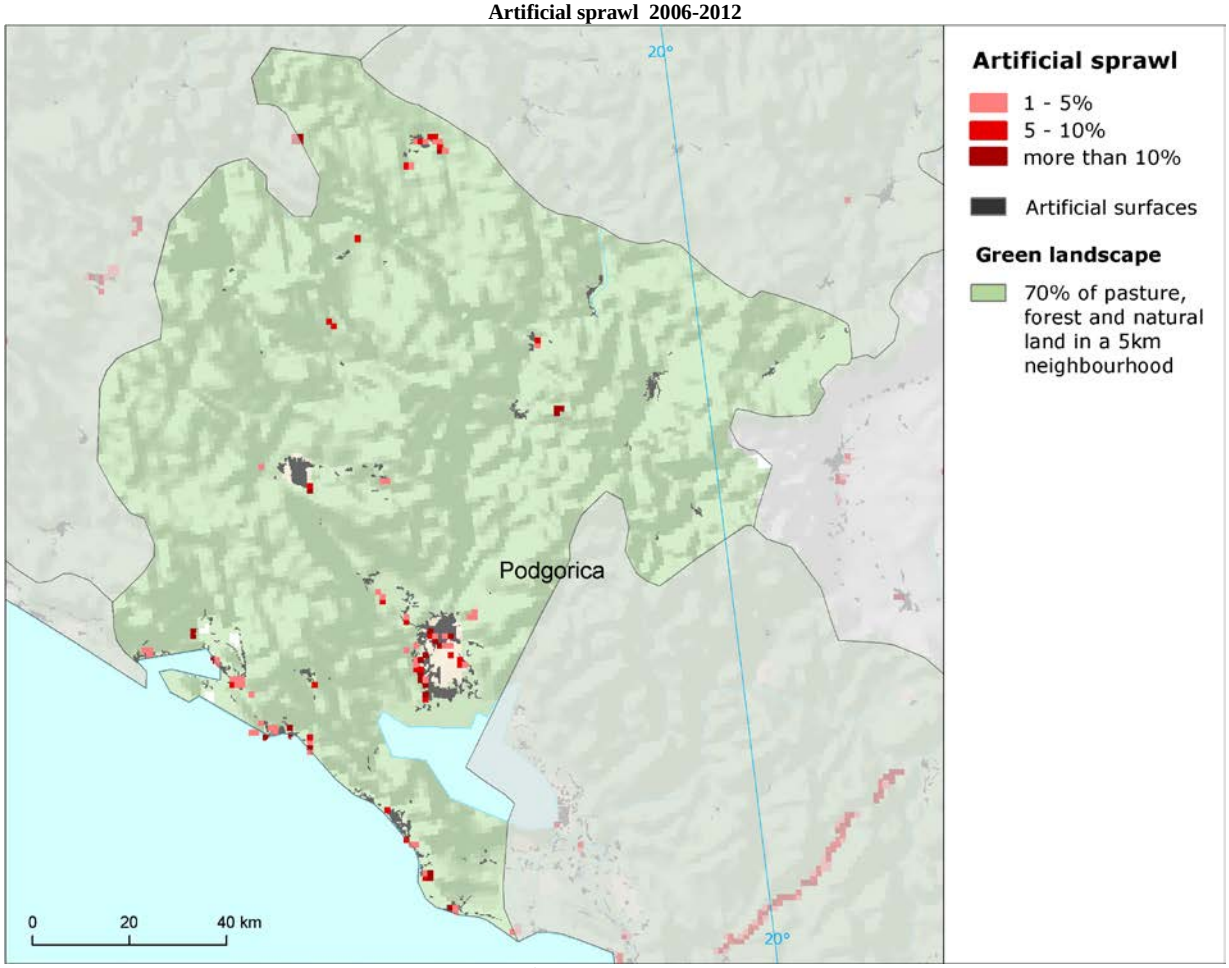


Drivers of change 2000-2006

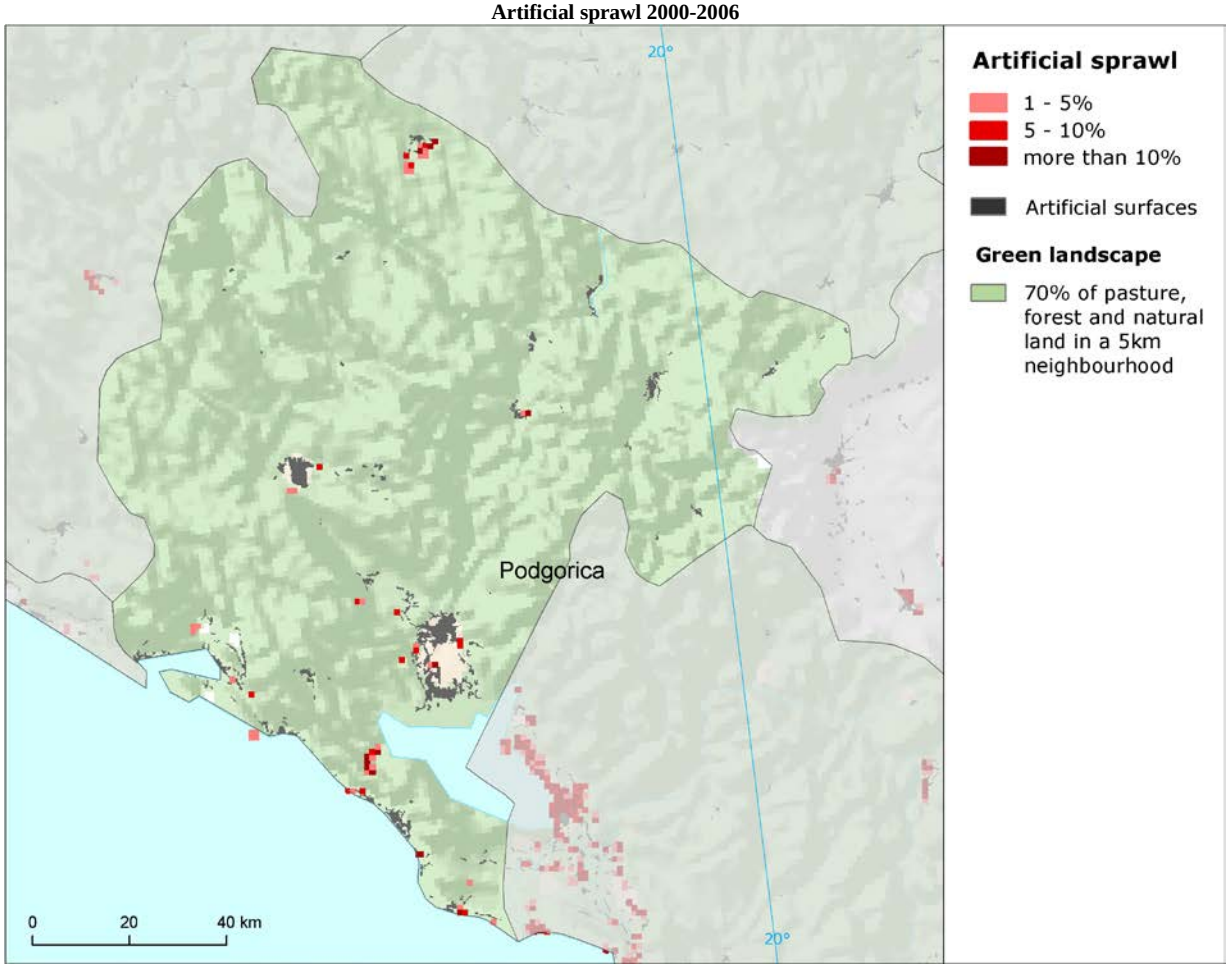


Montenegro

Artificial sprawl 2006-2012

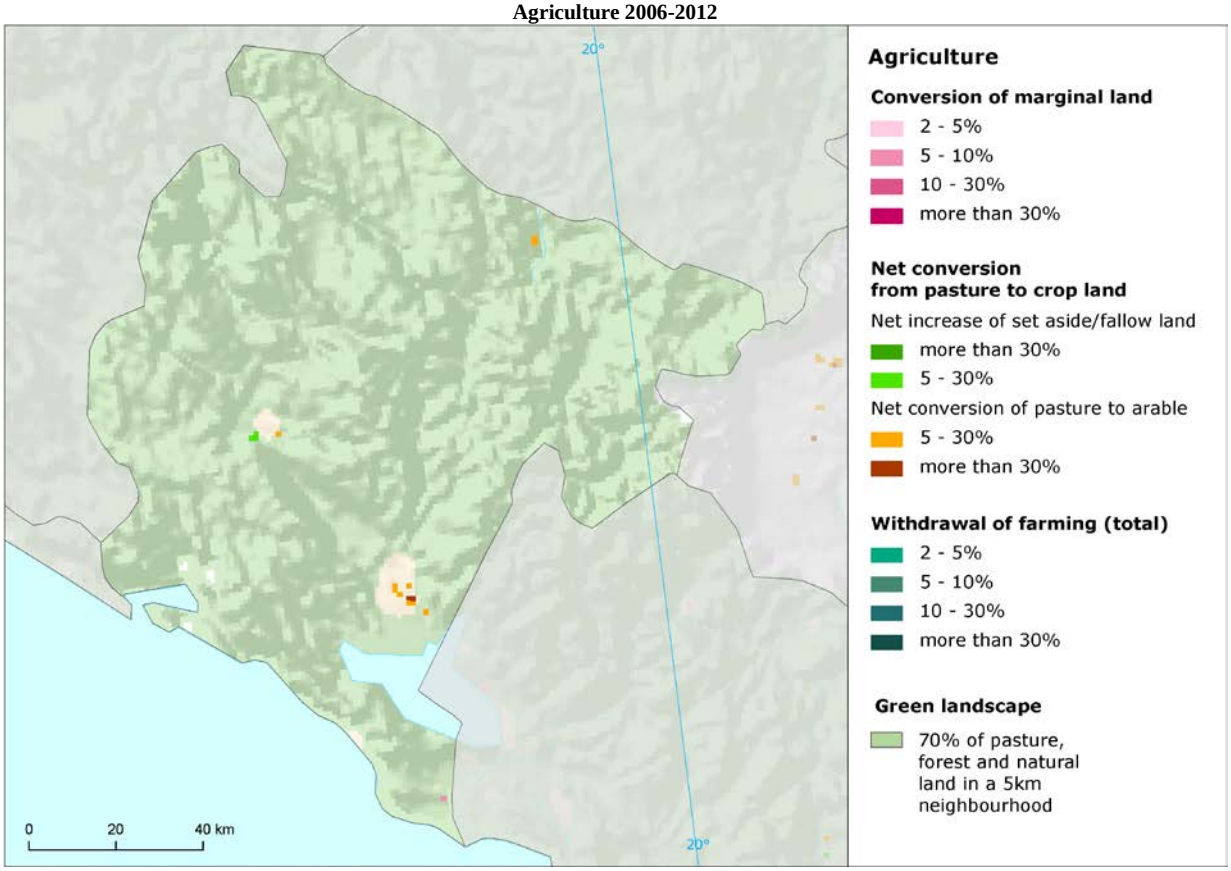


Artificial sprawl 2000-2006

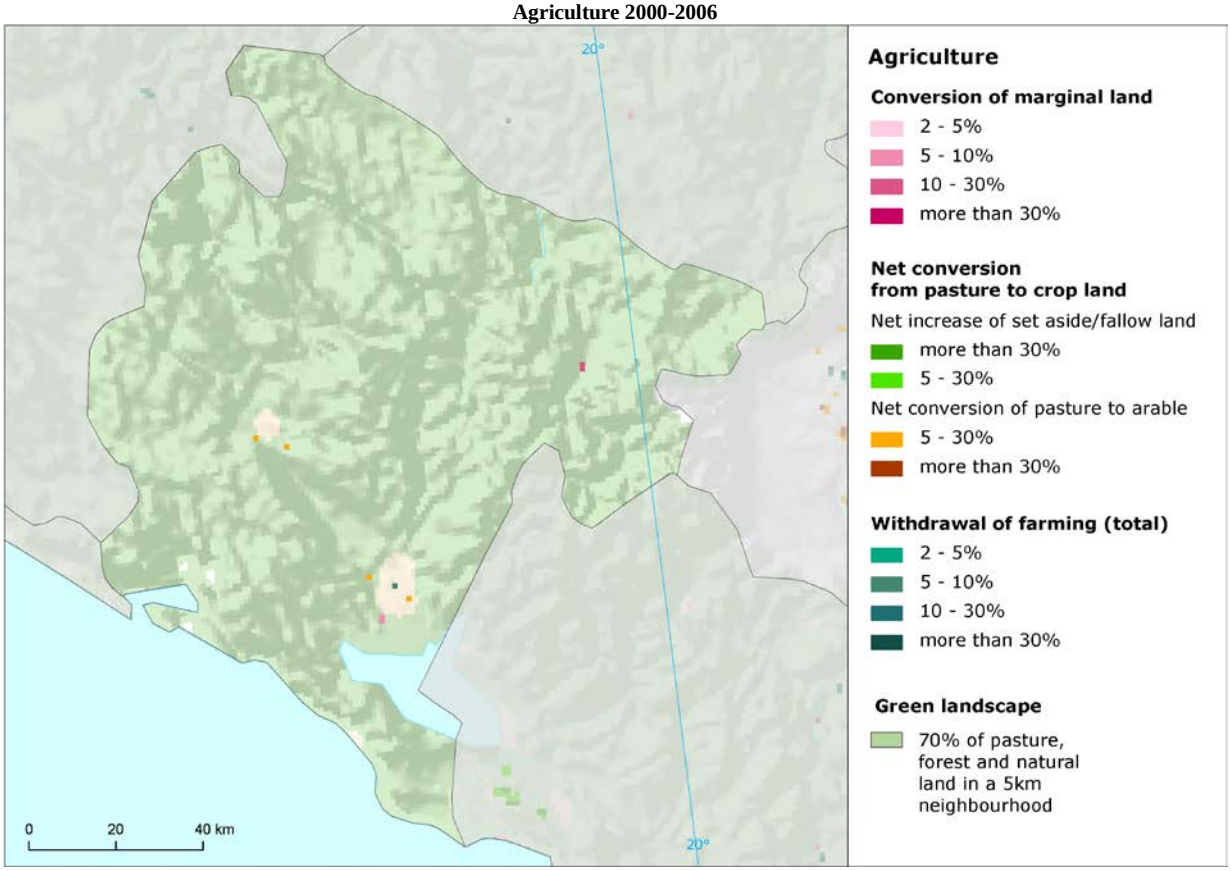


Montenegro

Agriculture 2006-2012

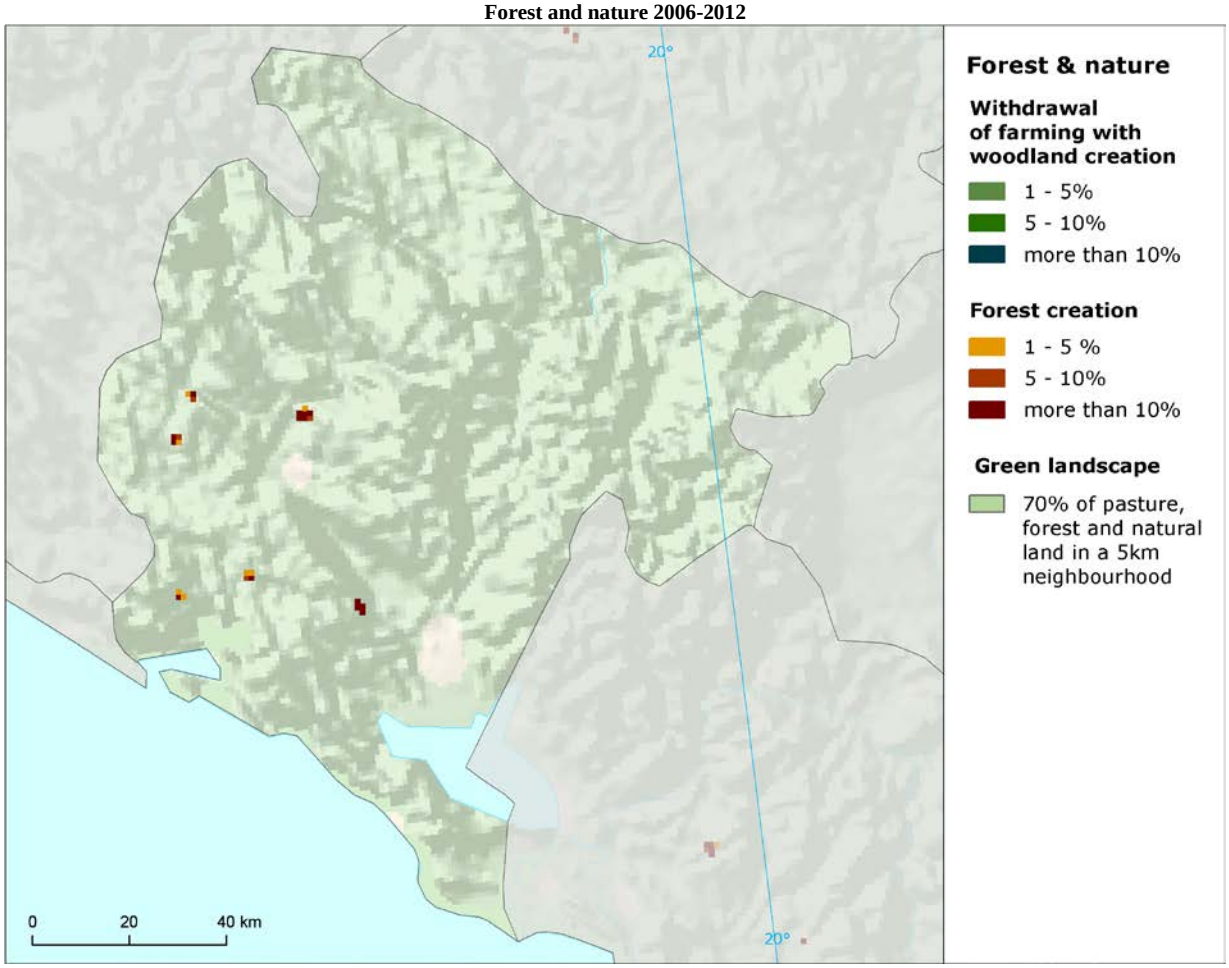


Agriculture 2000-2006



Montenegro

Forest and nature 2006-2012



Forest and nature 2000-2006