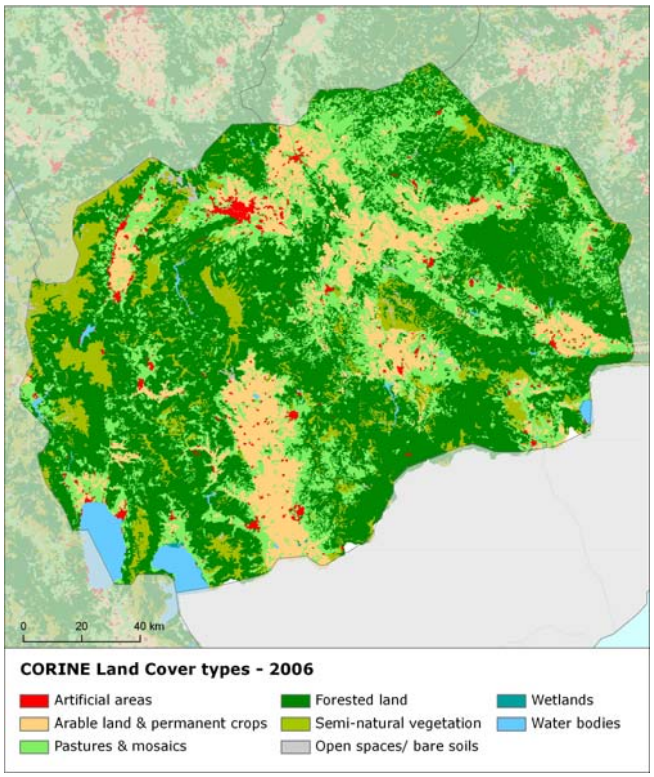
FYR of Macedonia

Land cover 2006

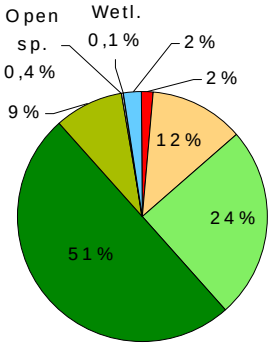
Overview of land cover & change 2000-2006

In period 2000-2006, the situation in landscape of the FYR of Macedonia can be characterized by dynamic development of agricultural land, driven by both internal agricultural conversions and external land cover exchange with artificial (former mineral extraction and dump sites) and forested areas, by sprawl of artificial areas over former agricultural and natural land cover and by new water bodies creation.
In absolute figures, changes in forested land and agriculture are the two most powerful drivers of change in the FYR of Macedonia. However, the majority of cases is attributable to forest internal conversions due to forestry activities. Besides, artificial land take (driven mainly by sprawl of economic sites and infrastructures) and water bodies creation and management are the other significant drivers of change in Macedonian landscape.
Concerning the spatial distribution of land cover changes, agricultural changes are situated mostly in the central part of the FYR of Macedonia. Change areas of forested and natural land are uniformly scattered over whole country. Artificial sprawl occurs mainly in surroundings of major cities and also in mineral extraction localities. Water bodies changes are concentrated mainly on north-west (new artificial lake Kozjak).

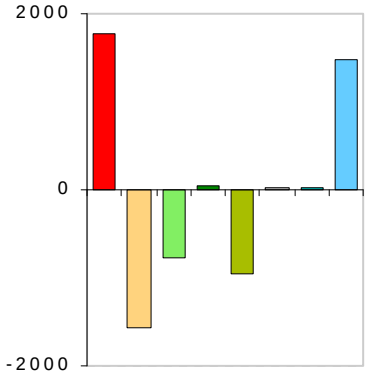
Note: The results presented here are based on a change analysis of 44 land cover types mapped consistently on a 1:100.000 scale across Europe over almost two decades 1990-2006 - see Corine land cover (CLC) programme for details. Number of years between CLC2000-CLC2006 data for in the FYR of Macedonia: 10



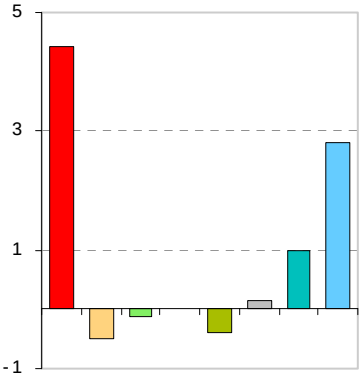
1.1. Land cover 2006 [% of total]



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

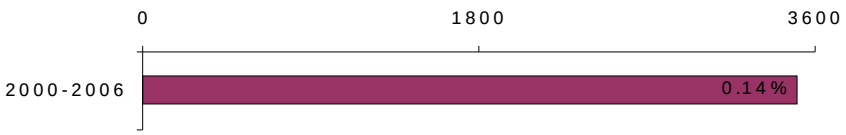
Summary balance table 2000-2006

	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	**397**	**3142**	**6171**	**12625**	**2338**	**93**	**19**	**524**	**25309**
Consumption of initial LC	9	45	32	253	10	0	1	1	350
Formation of new LC	26	29	24	253	1	0	1	15	350
Net Formation of LC	**18**	**-16**	**-8**	**0**	**-10**	**0**	**0**	**15**	**0**
Net formation as % of initial year	*4.4*	*-0.5*	*-0.1*	*0.0*	*-0.4*	*0.2*	*1.0*	*2.8*	
Total turnover of LC	**35**	**74**	**55**	**506**	**11**	**0**	**1**	**16**	**700**
Total turnover as % of initial year	*8.9*	*2.4*	*0.9*	*4.0*	*0.5*	*0.2*	*7.0*	*3.1*	*2.8*
Land cover 2006	**415**	**3126**	**6163**	**12625**	**2329**	**93**	**19**	**539**	**25309**

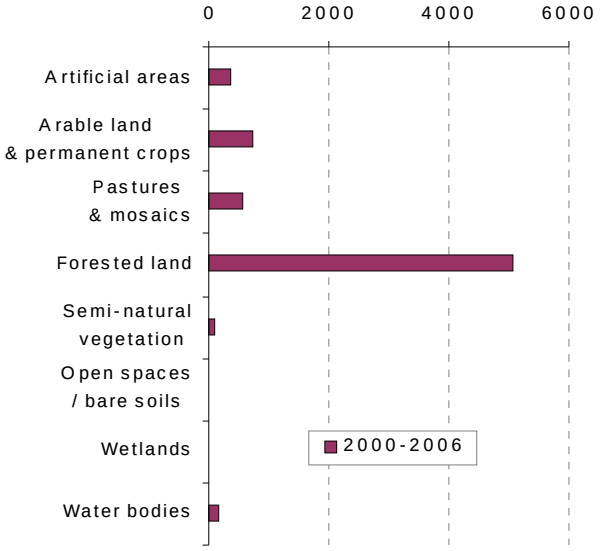
FYR of Macedonia

Land cover trends 2000-2006

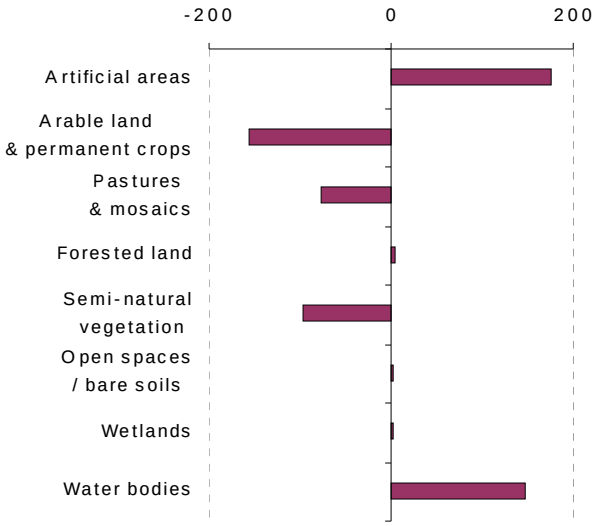
2.4. Annual land cover change [ha/year, % of total area]



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

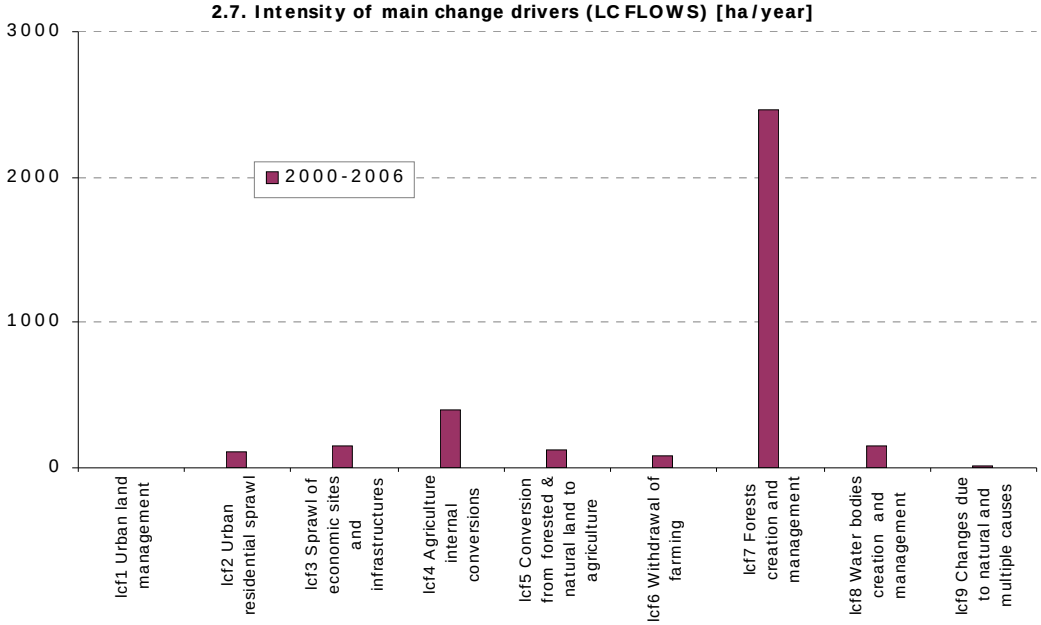


2.6. Net annual change of LC types [ha/year]



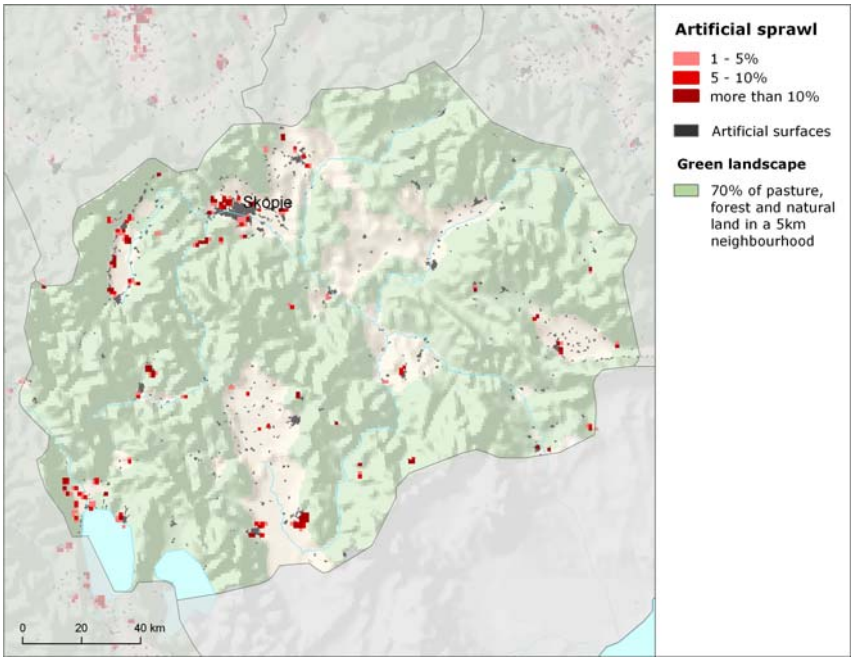
Summary trend figures	2000-2006
Annual land cover change [ha/year]	**3501**
Annual land cover change as % of initial year	**0.14%**
Land uptake by artificial development as mean annual change [ha/year]	263
Agricultural land uptake by urban and infrastructures development as mean annual change [ha/year]	266
Net uptake of forests and semi-natural land by agriculture as mean annual change [ha/year]	-52
Net conversion from pasture to arable land and permanent crops as mean annual change [ha/year]	-10
Forest & other woodland net formation as mean annual change [ha/year]	4
Dry semi-natural land cover net formation as mean annual change [ha/year]	-94
Wetlands & water bodies net formation as mean annual change [ha/year]	149

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

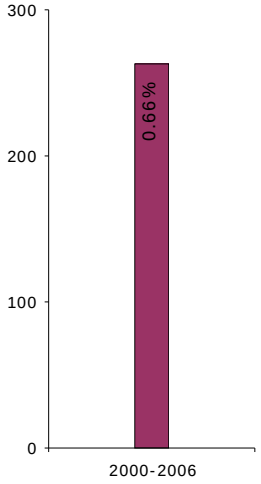


FYR of Macedonia

Artificial areas



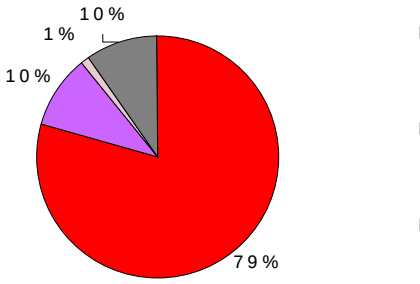
3.8. Artificial land take [ha/year, % of initial year]



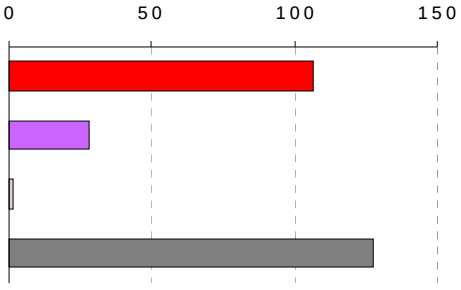
Residential sprawl, mineral extraction sites development

Artificial land take is moderate (0.66% a year) and occurs mainly in surrounding of the capital city Skopje and other major cities in the FYR of Macedonia. Besides, there is also significant concentration of artificial land development in locality of mineral extraction site in Suvodol in the southern part of the country. Land take is driven mostly by diffuse residential sprawl and by sprawl of mines and quarrying sites. The other contributors of land uptake are sprawl of dumpsites, extension of industrial or commercial areas and construction. Artificial land take took place mostly at the expense of agricultural land with prevailing share of pastures and agricultural areas with natural vegetation. In contrast, there is relatively large area of conversion from developed areas to agriculture (represented by conversion of former mineral extraction or dump sites into pastures).

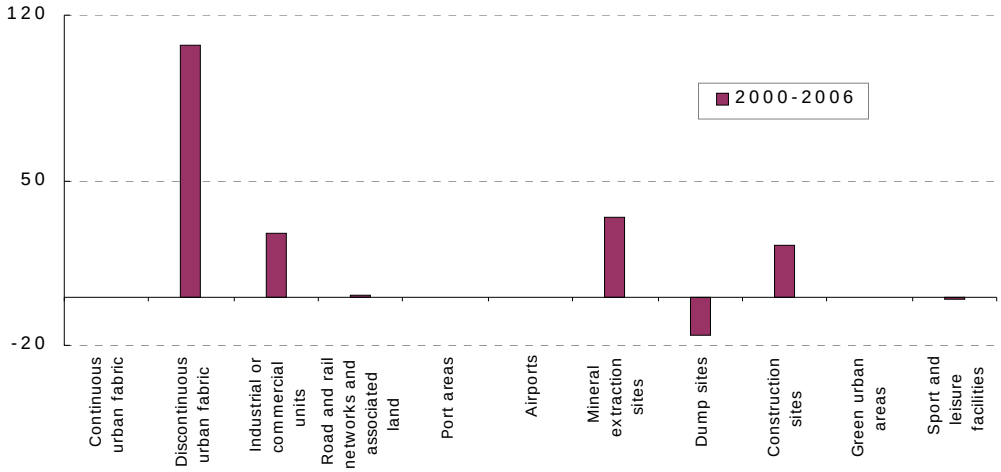
3.9. Artificial surfaces 2006 [% of total area]



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

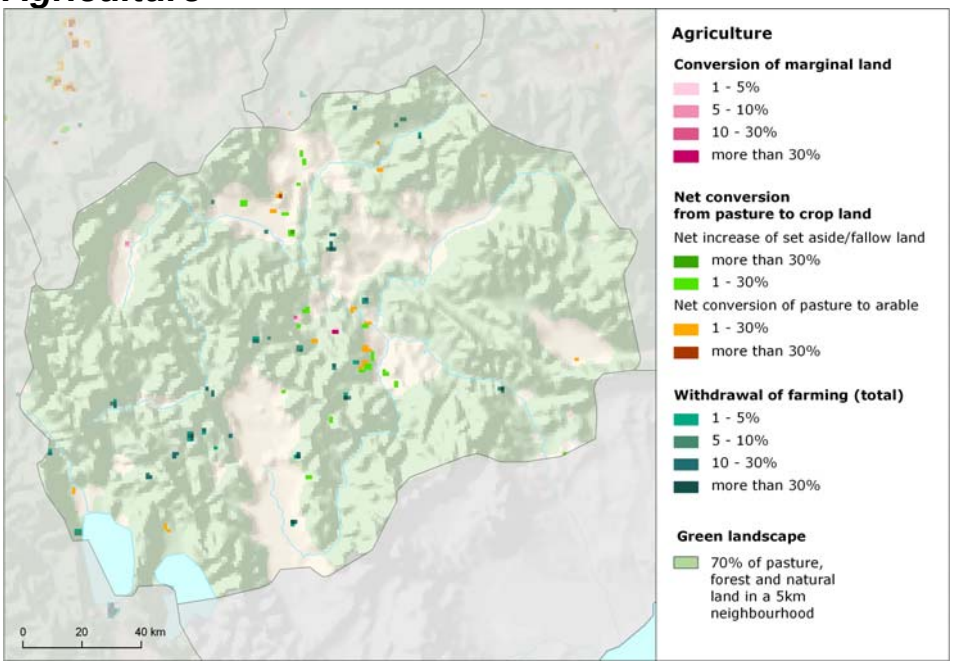


3.11. Mean annual artificial change by class [ha/year]



FYR of Macedonia

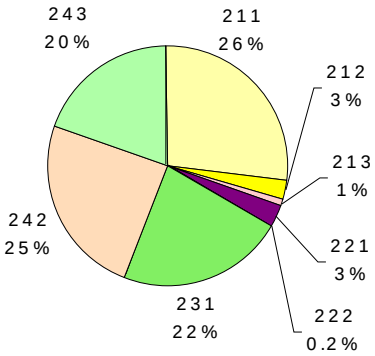
Agriculture



Decrease of permanent crops

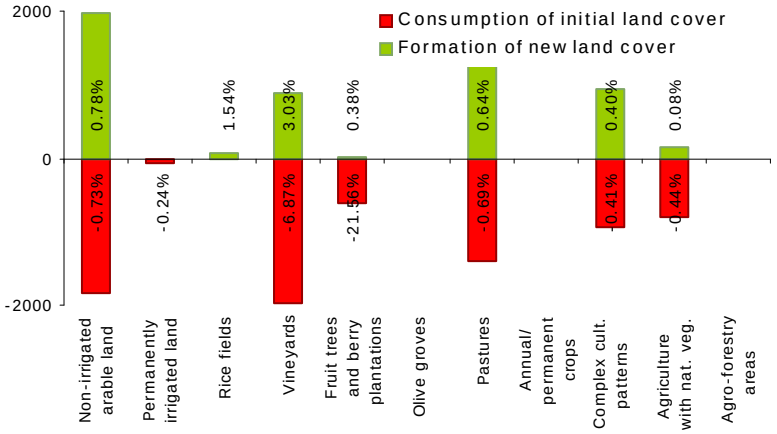
Agricultural land in the FYR of Macedonia is composted of almost equal share of arable land, complex cultivation patterns, pastures and agricultural areas with natural vegetation. Net change balance of the main agricultural land cover types (non-irrigated arable land, pastures and mosaics) is very low or steady; however there is dynamic development inside all major agricultural classes. The most significant internal agriculture change is the conversion from vineyards (~7% decrease) and orchards (~22% decrease) into arable land, followed by opposite conversion from arable land to vineyards/orchards. Conversions between arable/crop land and pasture/mosaics occur to a lesser extent, with slightly prevailing pasture extension. External conversions are represented mainly by consumption of agricultural land by both economical/industrial and residential sprawl, withdrawal of farming with woodland creation and water bodies creation. In contrast, new pastures have been formatted over former mineral extraction and dump sites. Most of the agricultural conversions occur in the central part of the FYR of Macedonia.

4.12. Agricultural areas 2006 [% of total area]

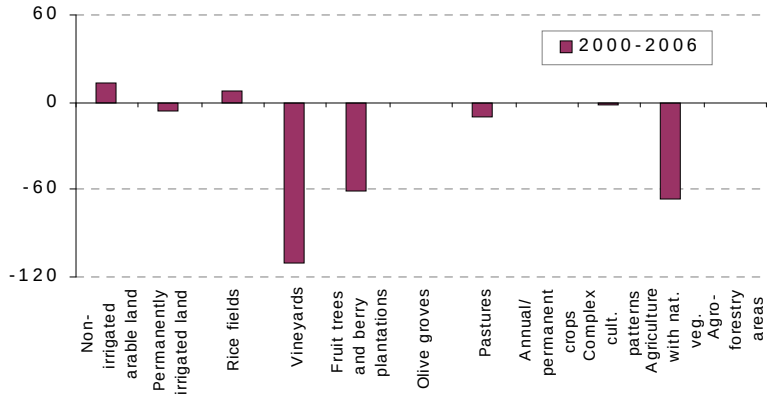


- 211 Non-irrigated arable land
- 212 Permanently irrigated land
- 213 Rice fields
- 221 Vineyards
- 222 Fruit trees and berry plantations
- 223 Olive groves
- 231 Pastures
- 241 Annual crops associated with permanent crops
- 242 Complex cultivation patterns
- 243 Agriculture land with significant areas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

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

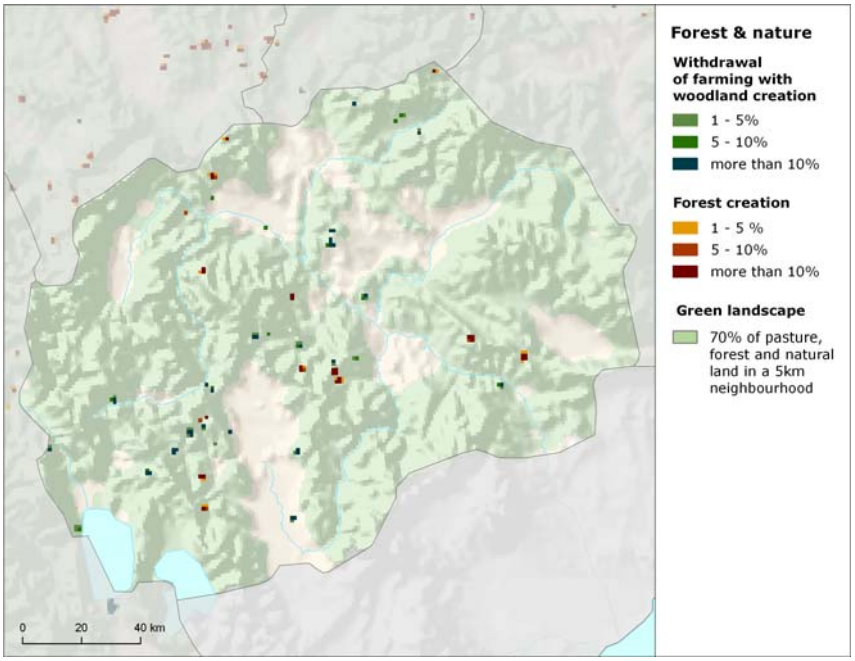


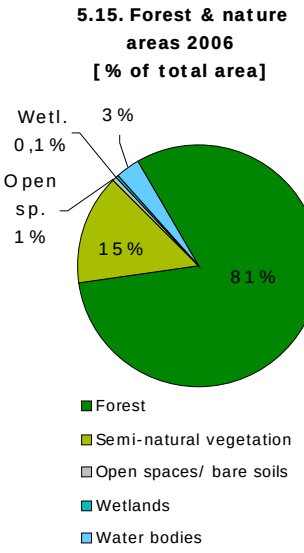
4.14. Mean annual agricultural change by class [ha/year]



FYR of Macedonia

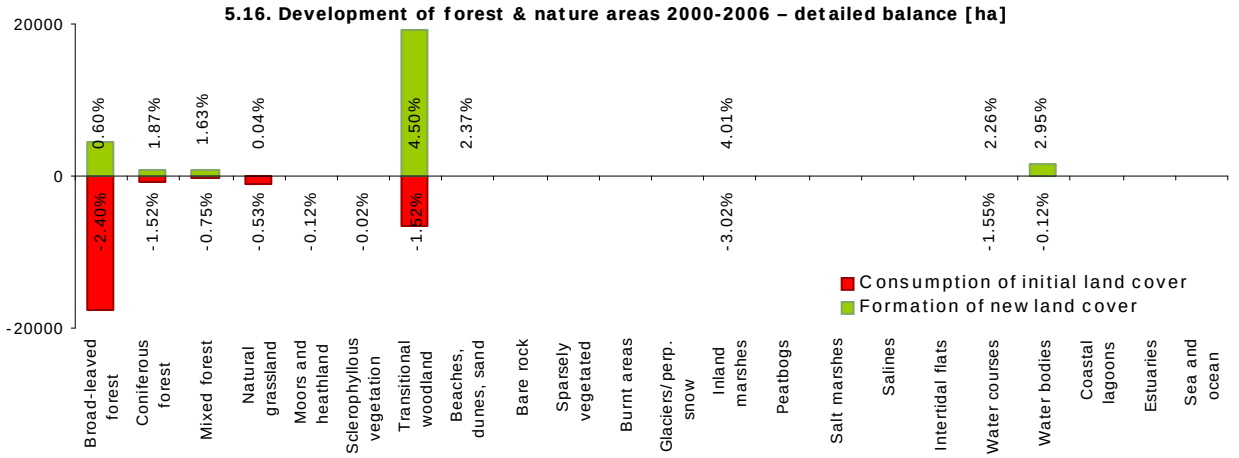
Forest & nature

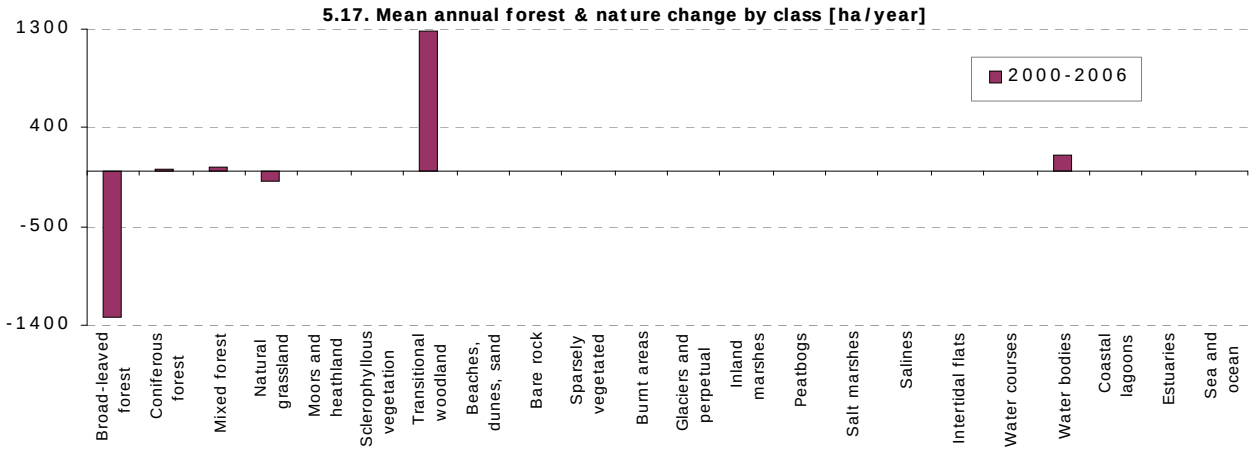




Water bodies creation, afforestation of natural grasslands

Natural landscape in the FYR of Macedonia is composed mainly of forested land (with prevailing share of broad-leaved forest and transitional woodland), natural grasslands, sclerophyllous vegetation areas and water bodies. Beside internal forest conversions, the most significant drivers of natural land cover change are creation of water bodies from former forest areas or agriculture mosaics, afforestation of natural grasslands and withdrawal of farming with woodland creation. Also, internal inland marshes change dynamic is high with resulting 1% net increase.

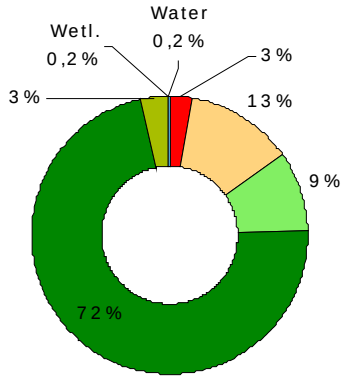




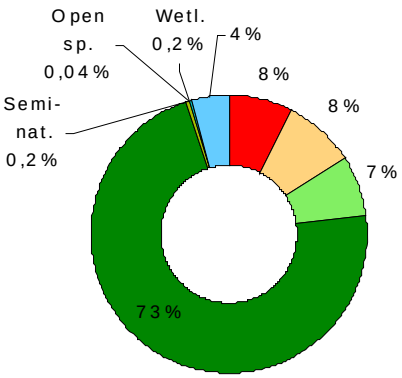
Annex: Land cover flows and trends

Land cover flows 2000-2006

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

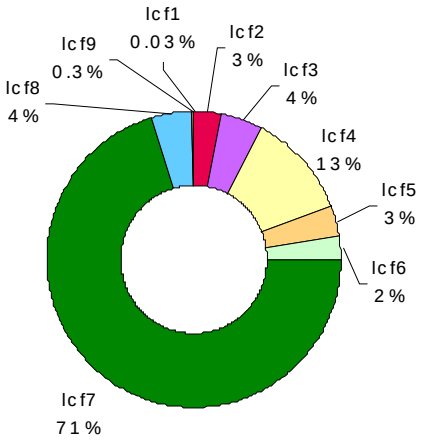


6.19. Formation of land cover 2000-2006 [% of total change area]



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]

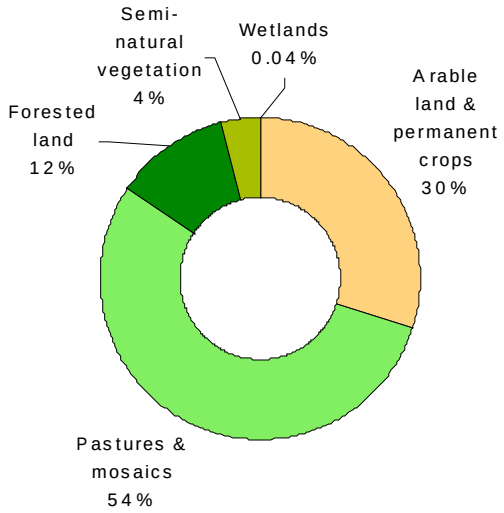


- lcf1 Urban land management
- lcf2 Urban residential sprawl
- lcf3 Sprawl of economic sites and infrastructures
- lcf4 Agriculture internal conversions
- lcf5 Conversion from forested & natural land to agriculture
- lcf6 Withdrawal of farming
- lcf7 Forests creation and management
- lcf8 Water bodies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

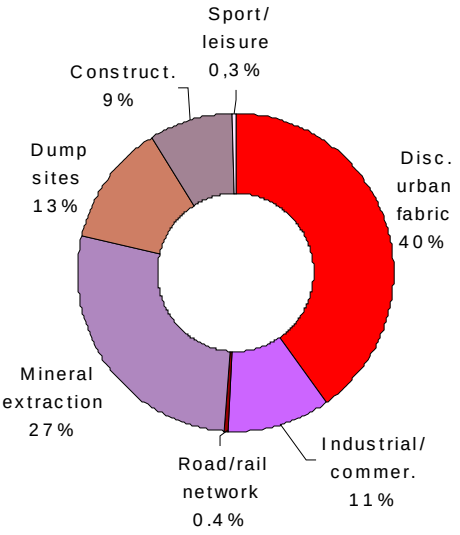
FYR of Macedonia

Artificial areas

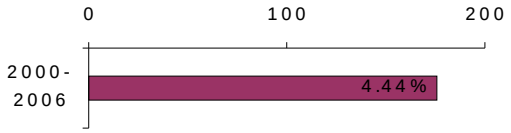
7.21. Consumption by artificial land take 2000-2006 [% of total]



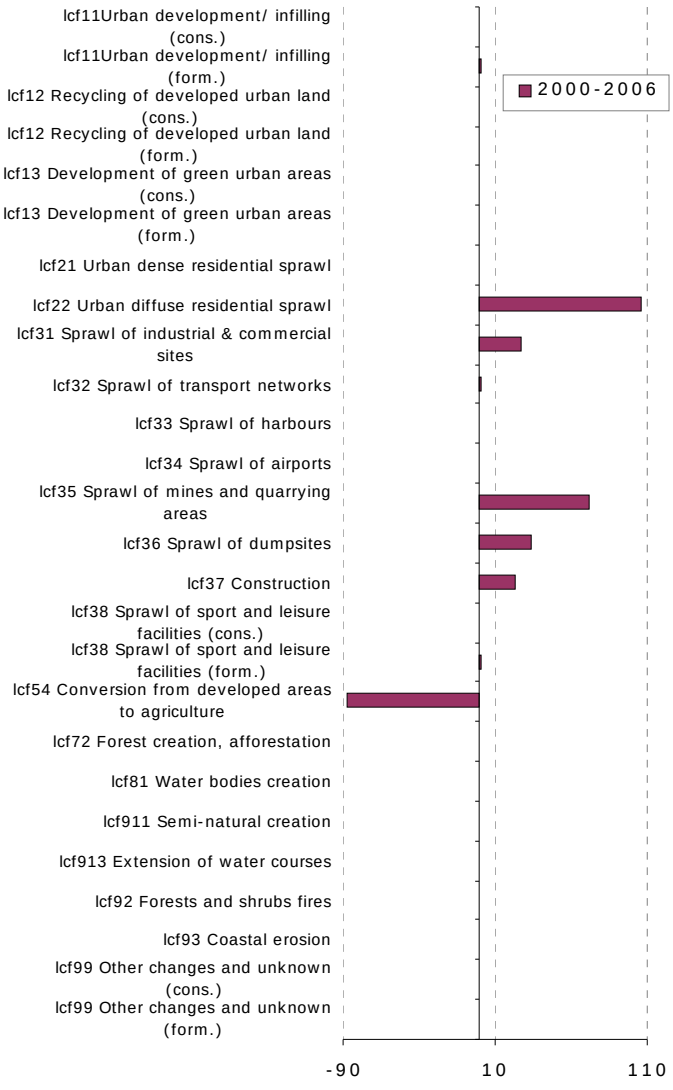
7.22. Formation by artificial land take 2000-2006 [% of total]



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



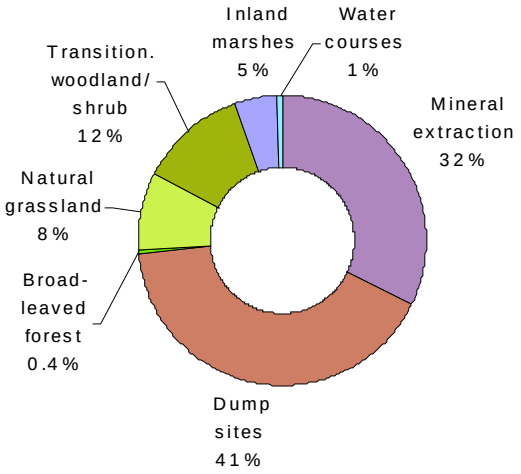
7.24. Artificial development by change drivers (LC FLOWS) [ha/year]



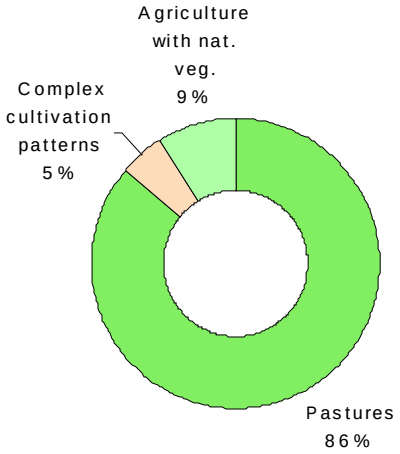
FYR of Macedonia

Agriculture

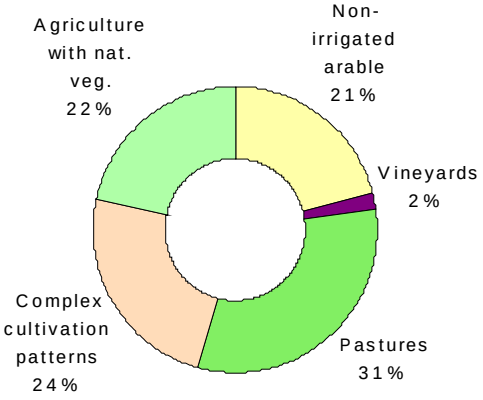
8.25. LC consumed by agriculture 2000-2006 [% of total]



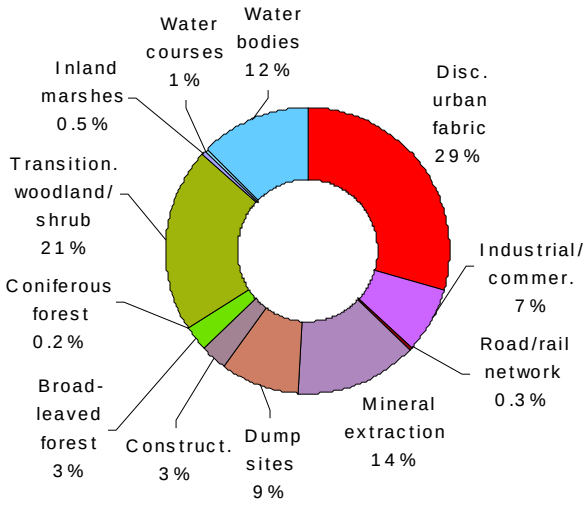
8.26. Formation of agricultural land from non-agriculture 2000-2006 [% of total]



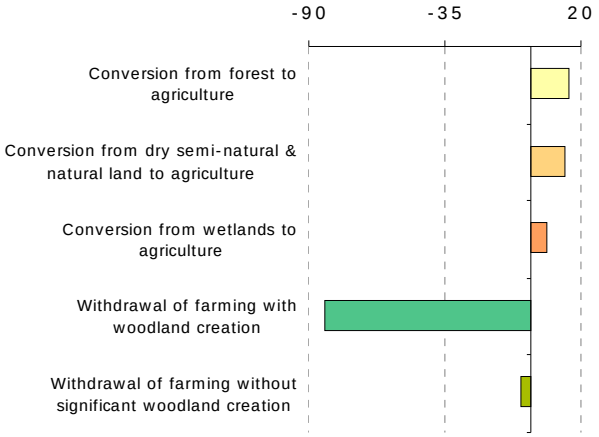
8.27. Consumption of agricultural land by non-agriculture 2000-2006 [% of total]



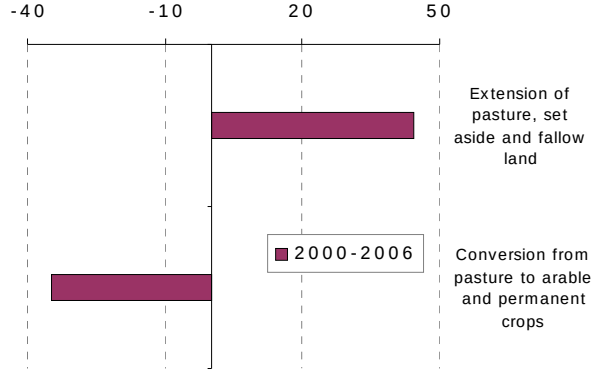
8.28. Formation of non-agricultural land from agriculture 2000-2006 [% of total]



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

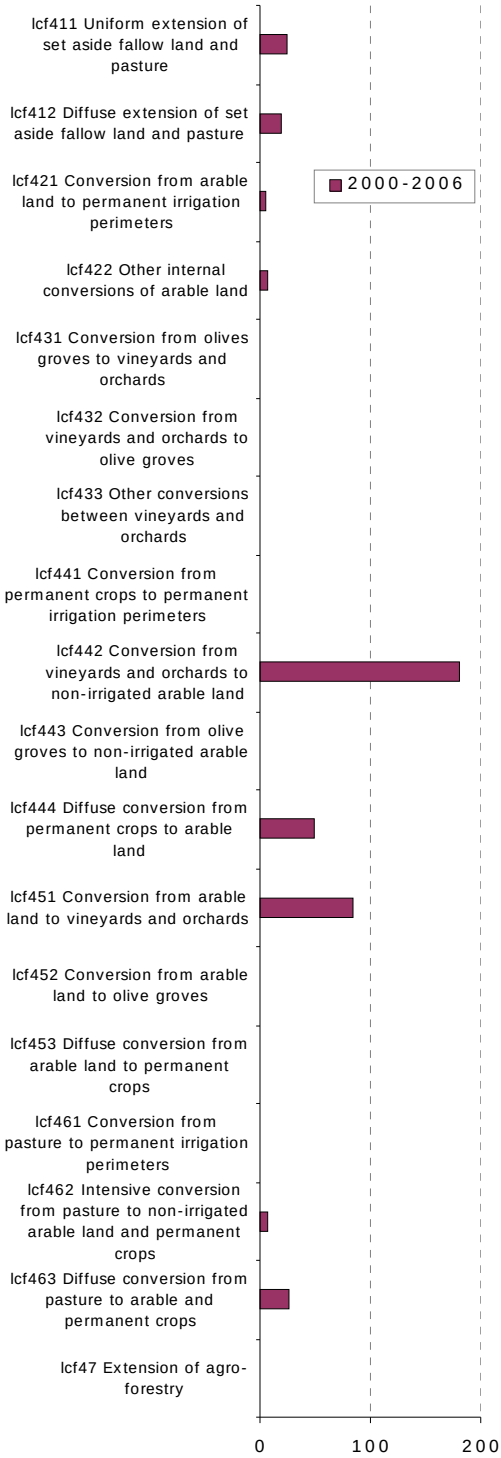


8.30. Mean annual conversion between arable land and pasture [ha/year]

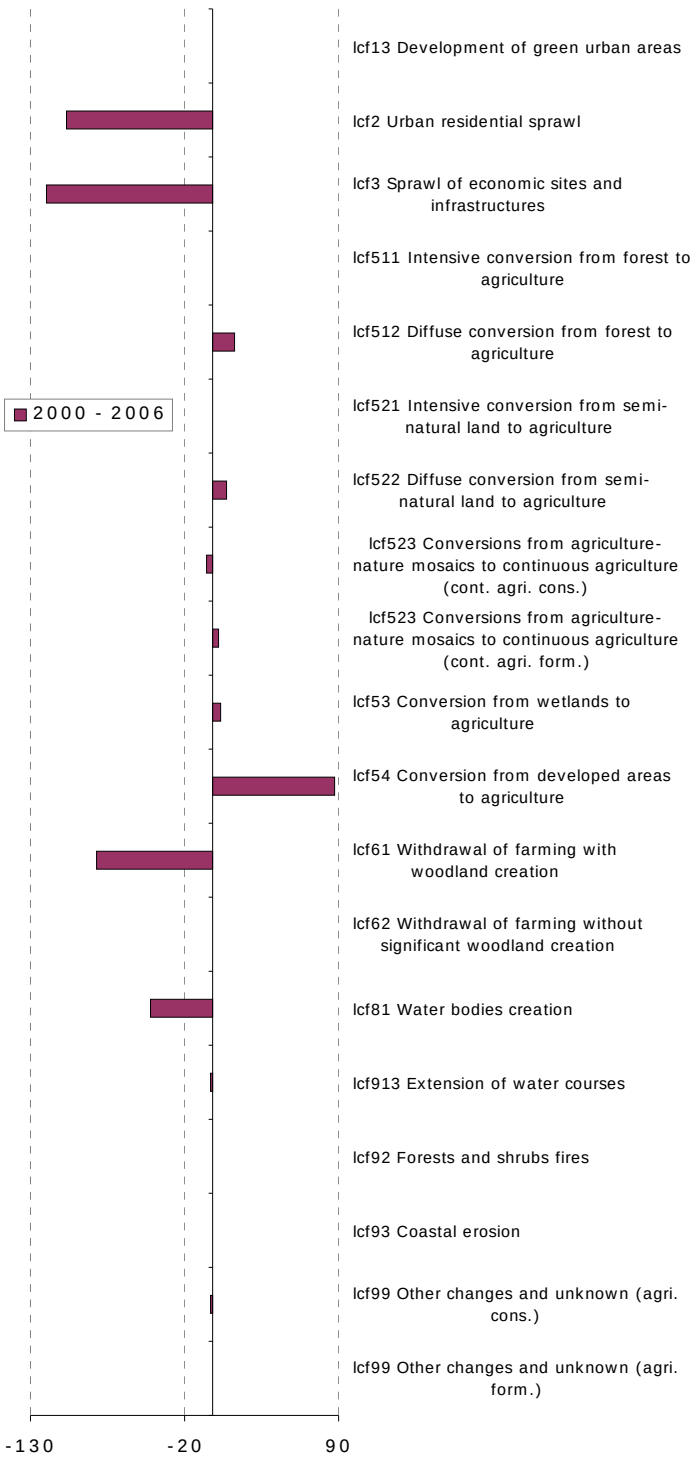


FYR of Macedonia

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



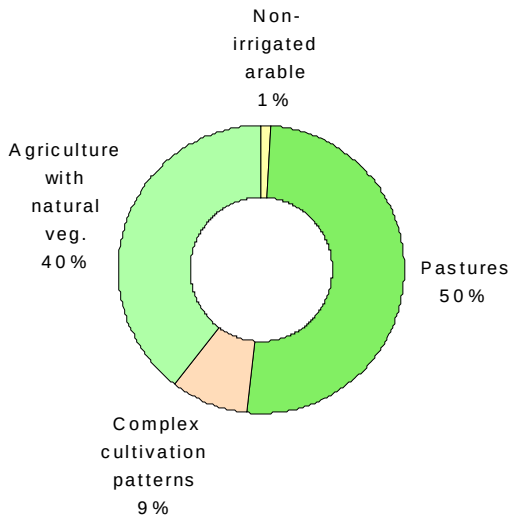
9.32. Mean annual conversions between agriculture and other LC types [ha/year]



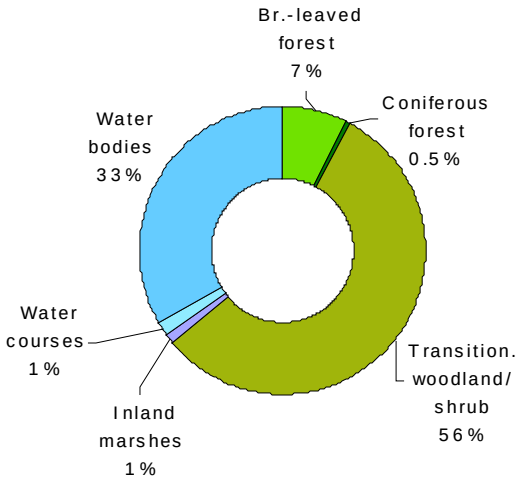
FYR of Macedonia

Forest & nature

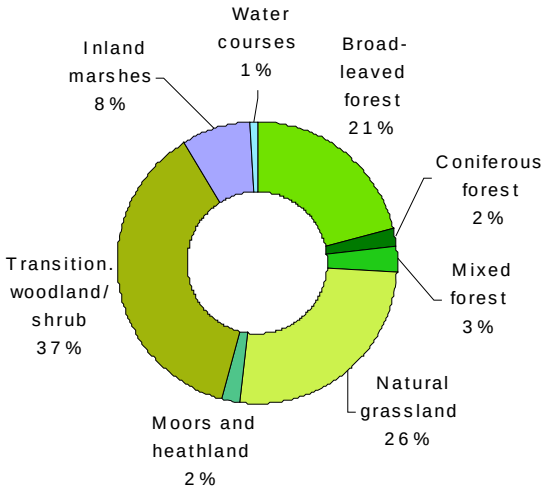
10.33. LC consumed by forest & nature 2000-2006 [% of total]



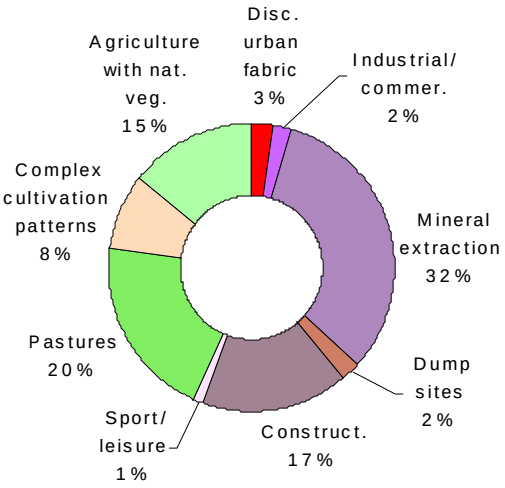
10.34. Formation of forest & nature land from non-forest /nature 2000-2006 [% of total]



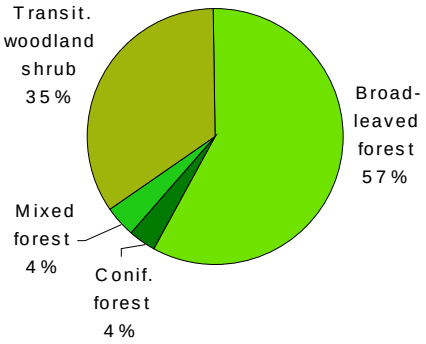
10.35. Consumption of forest & nature land by non-forest /nature 2000-2006 [% of total]



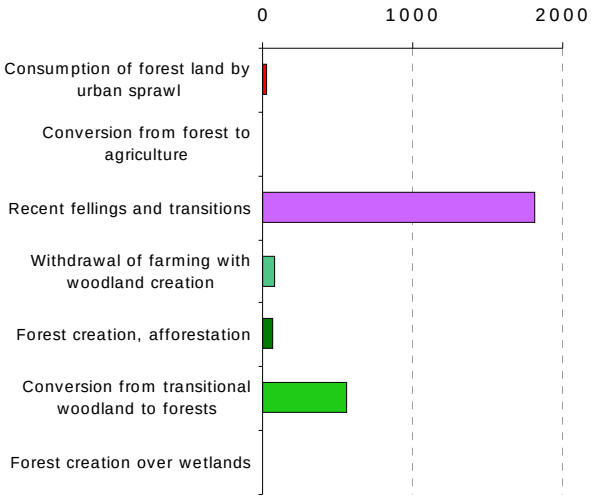
10.36. Formation of non-forest /nature land from forest & nature 2000-2006 [% of total]



10.37. Forested land 2006 [% of total area]

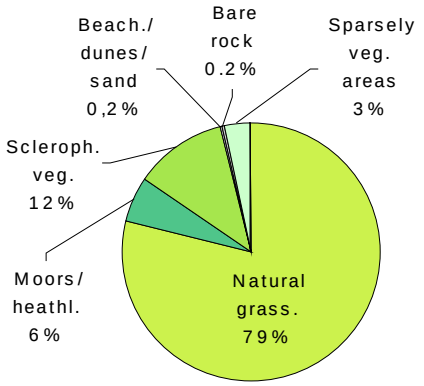


10.38. Main trends in woodland & forests consumption/formation 2000-2006 [ha/year]

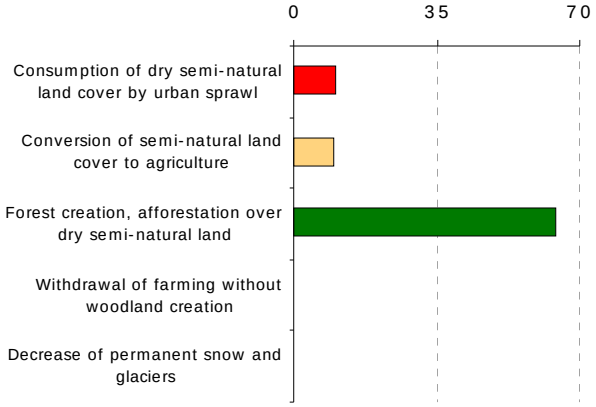


FYR of Macedonia

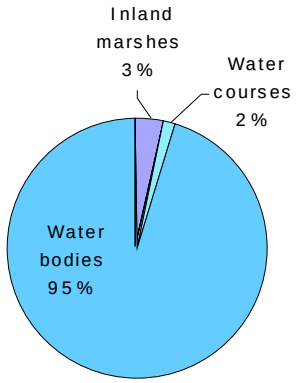
11.39. Dry semi-natural areas 2006 [% of total area]



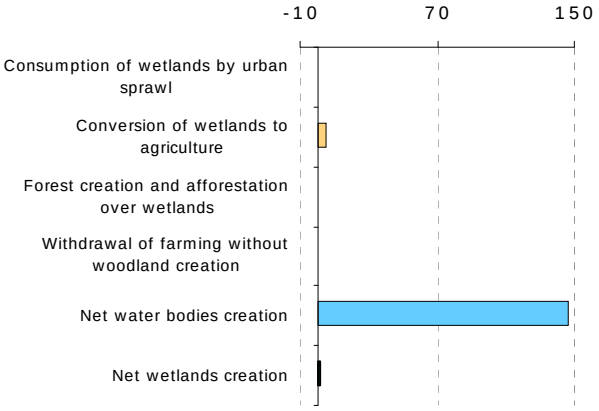
11.40. Main trends in dry semi-natural land consumption/formation 2000-2006 [ha/year]



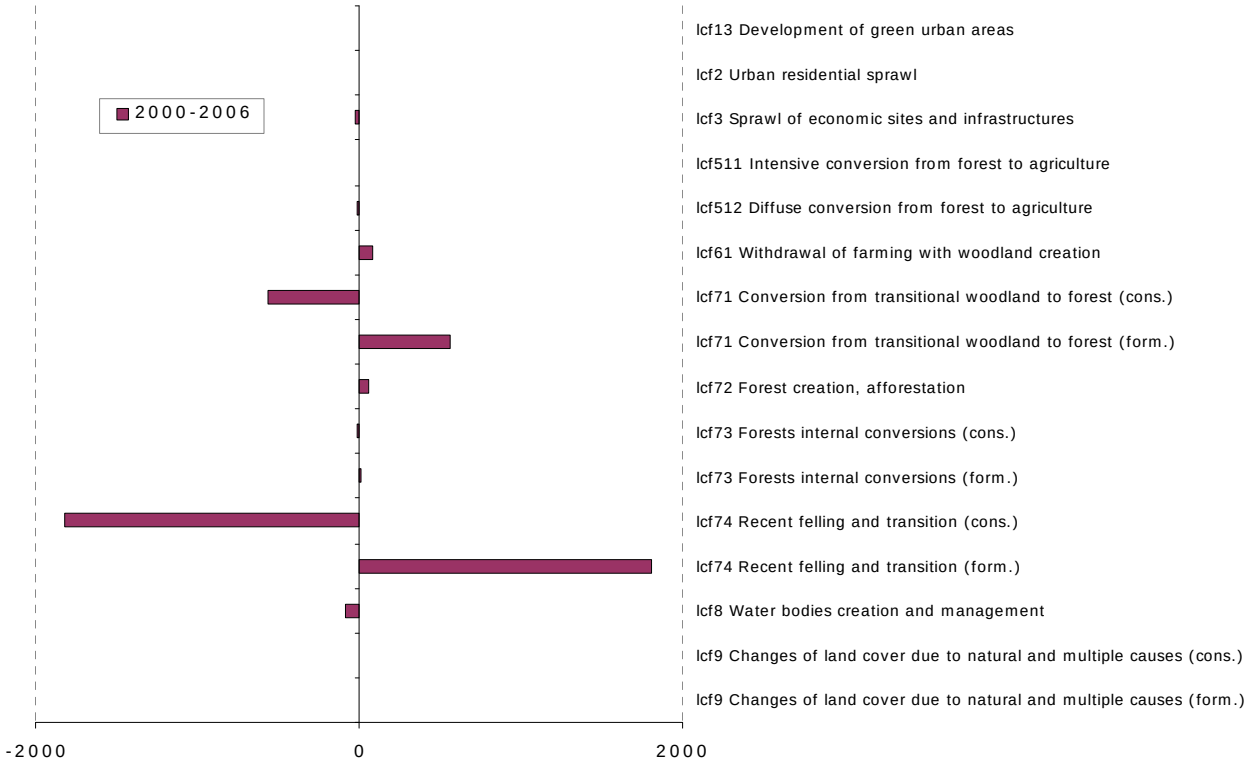
11.41. Wetlands & water 2006 [% of total area]



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



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



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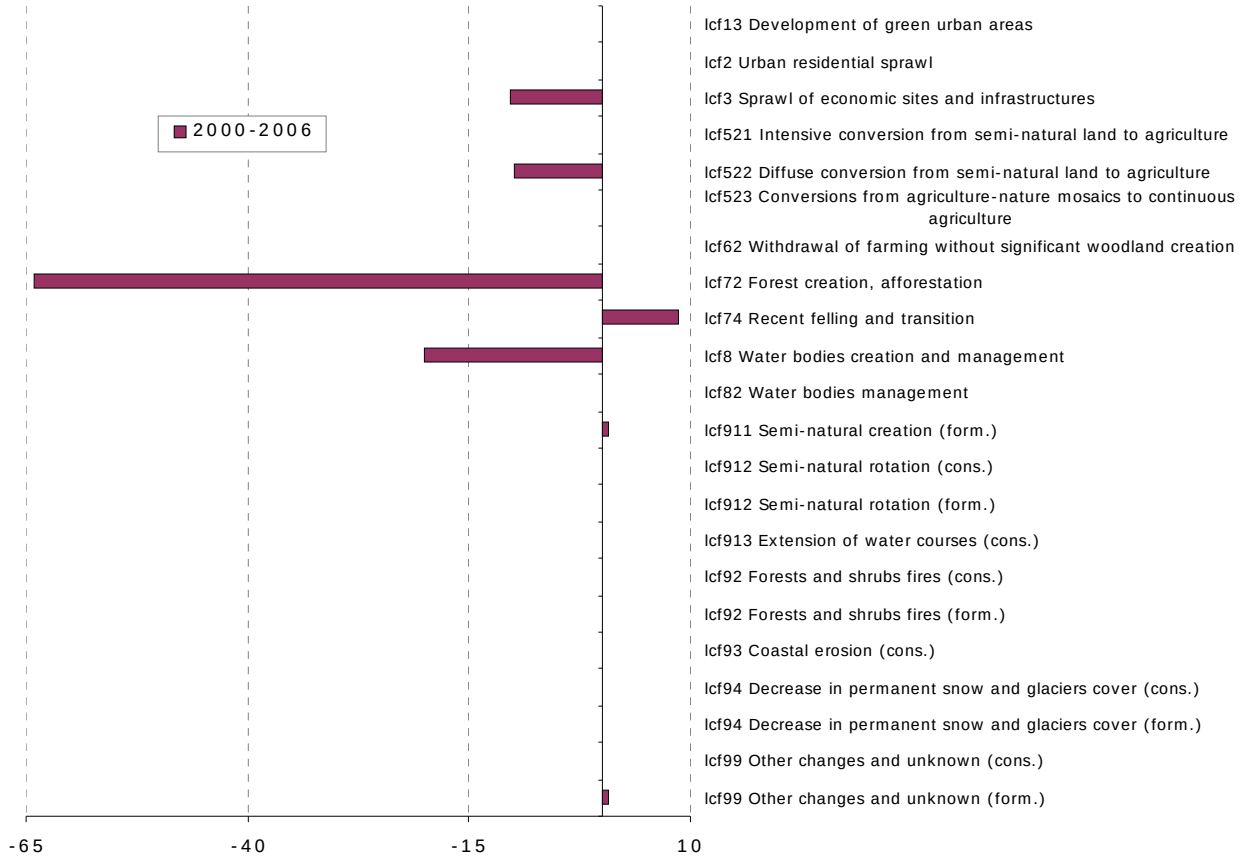
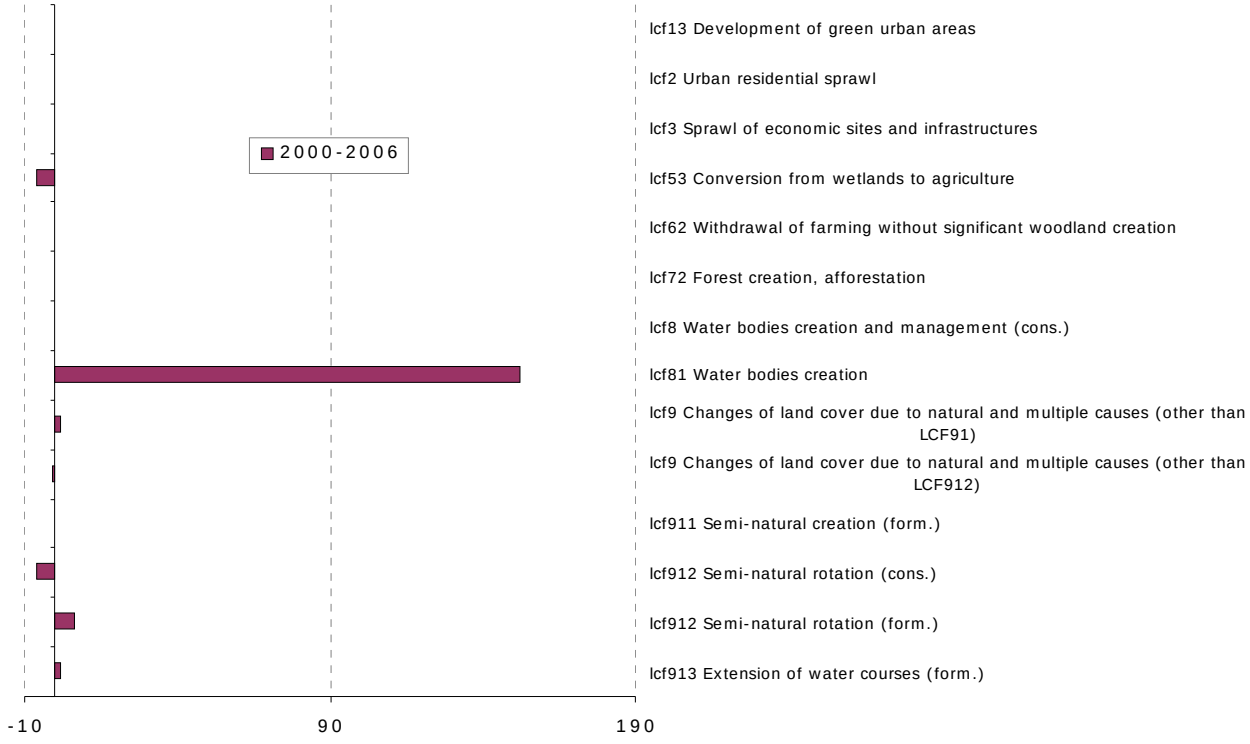
12.44. Mean annual conversions of dry semi-natural LC [ha/year]



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



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