

Serbia

Land cover 2006

Overview of land cover & change 2000-2006

Serbia consists of two regions with significantly different character of the landscape. Lowland region of Vojvodina, situated in the northern part of the country, has agricultural character with prevailing share of arable land and complex cultivation patterns and high concentration of artificial areas. In contrast, the southern part of the country is covered mainly by forests and other natural land cover types and by pastures.

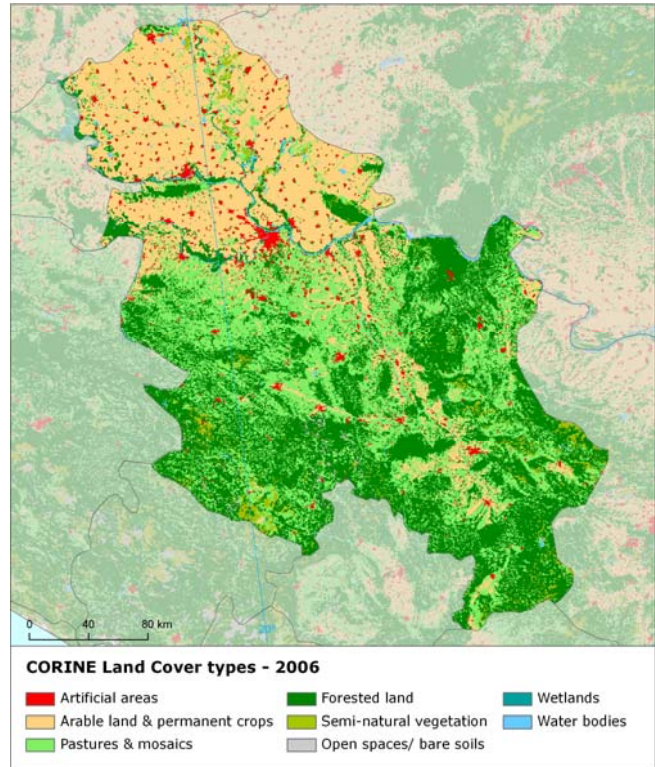
Also the spatial distribution of land cover changes is different for both parts of the country. Vojvodina is characterized by higher changes density, with forest and agricultural change areas concentrated mainly along major rivers (Dunav and Tisa). In the southern part of the country, change areas are uniformly scattered over the landscape.

Artificial land take occurs mostly in the surroundings of capital city Belgrade and other major cities like Novi Sad, Nis, and Subotica. Besides, there is also noticeable artificial sprawl connected with development of two major mining localities in central Serbia (near Lazarevac and Pozarevac).

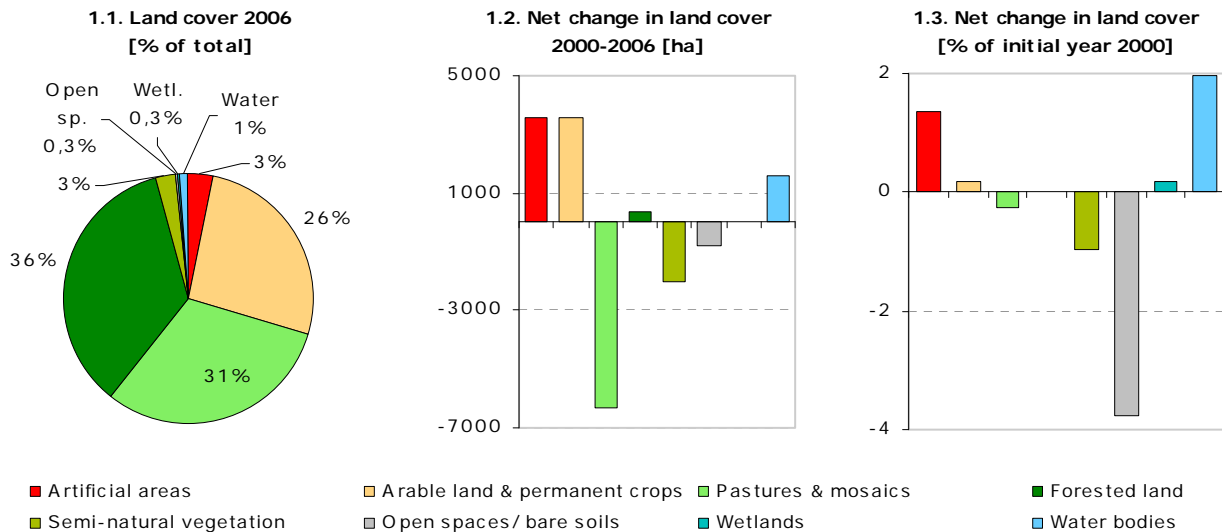
Compared to the previous period, the overall change dynamic in Serbian landscape significantly decreased during 2000-2006. It is caused mainly by lower intensity of forest and agriculture internal conversions, which are the main drivers of landscape development in Serbia. In contrast, artificial land take, which has been driven mostly by sprawl of economic sites and infrastructures, accelerated.

Forested land remains the land cover type with highest area turnover. However, formation of forested land is driven mostly by internal conversion from transitional woodland to forest due to regular forestry activities. The overall structure of agricultural surfaces exchange has been totally turned over during 2000-2006. In the previous period, there was significant consumption of arable/crop land and formation of pastures and mosaics. In contrast, the 2000-2006 period is characterized by positive balance of arable/crop land area and prevailing consumption of pastures/mosaics.

The other significant drivers of land cover exchange in Serbia are conversions from forested/natural land to agriculture and water bodies creation and management.



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 Serbia: 6



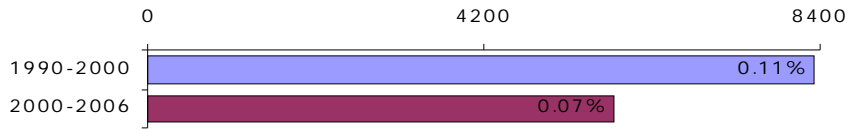
Summary balance table 2000-2006

	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	2578	20397	24063	27335	2061	211	224	828	77695
Consumption of initial LC	11	34	76	198	21	8	2	1	350
Formation of new LC	46	69	12	202	0	0	2	17	350
Net Formation of LC	35	36	-63	4	-20	-8	0	16	0
Net formation as % of initial year	1.4	0.2	-0.3	0.0	-1.0	-3.8	0.2	2.0	
Total turnover of LC	57	103	88	400	21	8	4	18	699
Total turnover as % of initial year	2.2	0.5	0.4	1.5	1.0	3.9	1.7	2.2	0.9
Land cover 2006	2613	20432	24000	27339	2040	203	224	844	77695

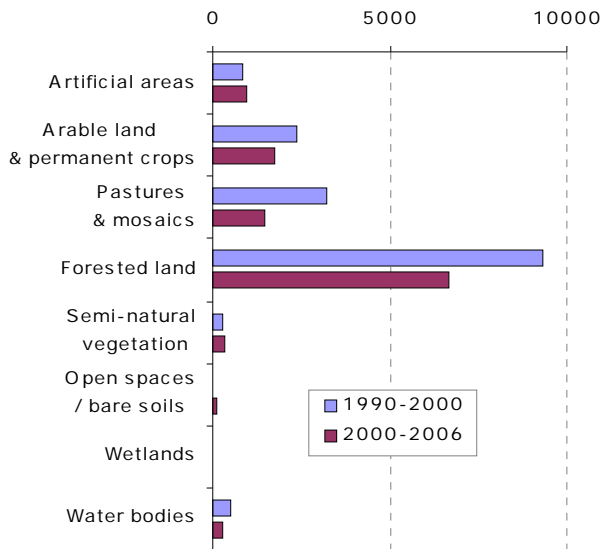
Serbia

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

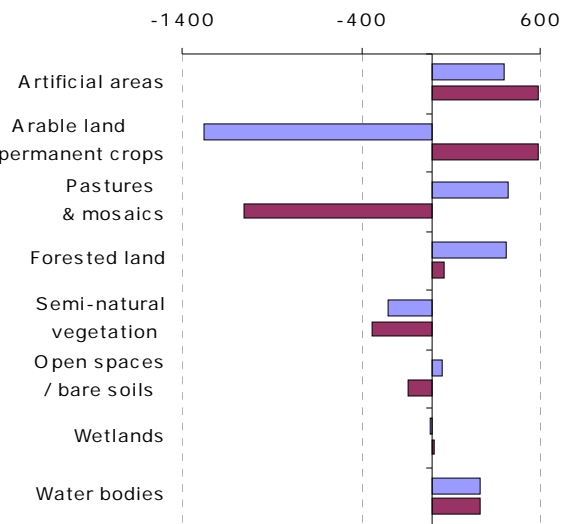
2.4. Annual land cover change
[ha/year, % of total area]



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

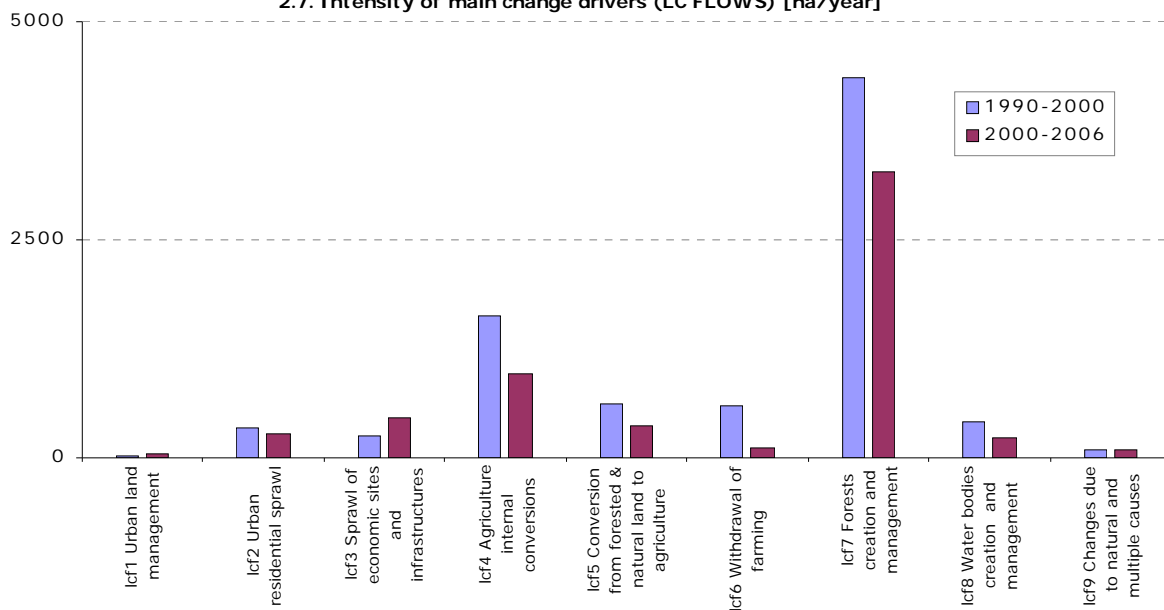


2.6. Net annual change of LC types [ha/year]

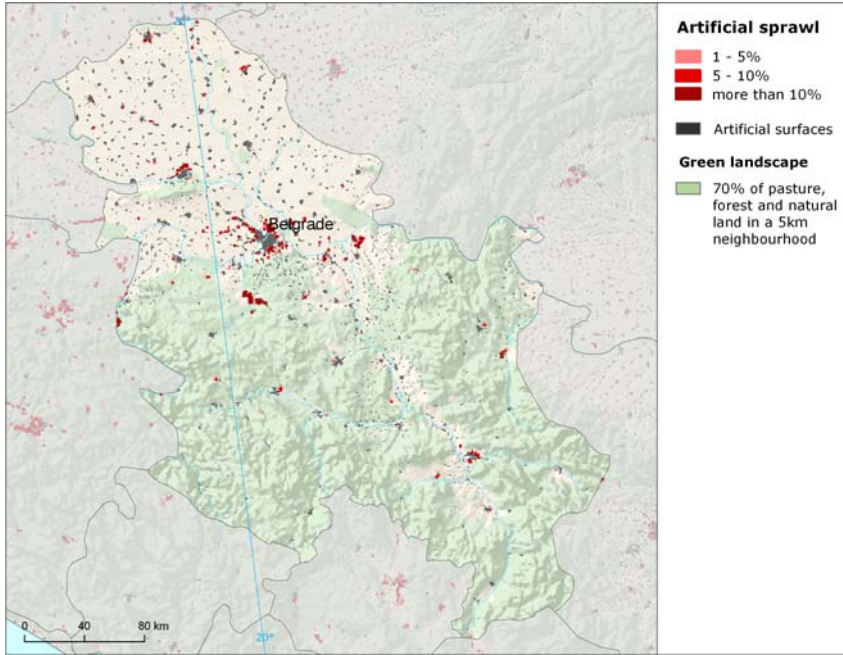


Summary trend figures		
	1990-2000	2000-2006
Annual land cover change [ha/year]	8316	5826
Annual land cover change as % of initial year	0.11%	0.07%
Land uptake by artificial development as mean annual change [ha/year]	598	722
Agricultural land uptake by urban and infrastructures development as mean annual change [ha/year]	803	706
Net uptake of forests and semi-natural land by agriculture as mean annual change [ha/year]	-70	235
Net conversion from pasture to arable land and permanent crops as mean annual change [ha/year]	-1033	540
Forest & other woodland net formation as mean annual change [ha/year]	412	64
Dry semi-natural land cover net formation as mean annual change [ha/year]	-206	-470
Wetlands & water bodies net formation as mean annual change [ha/year]	249	277

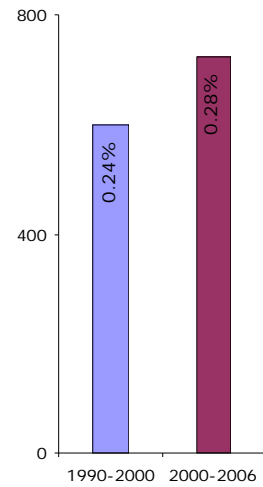
2.7. Intensity of main change drivers (LC FLOWS) [ha/year]



Artificial areas



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

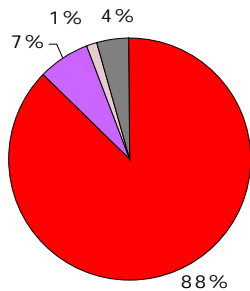


Accelerated extension of mines and quarrying

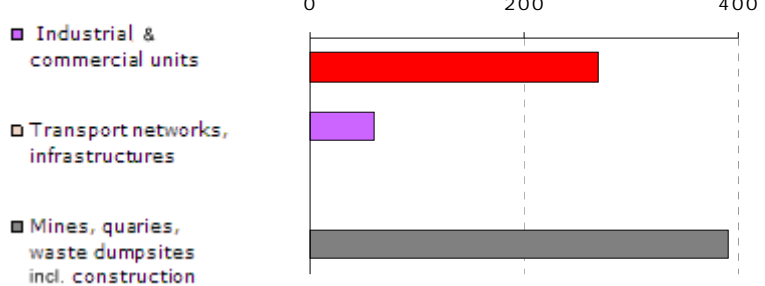
Overall artificial land take in Serbia slightly accelerated, compared to the previous period. This acceleration has been driven by sprawl of mines and quarrying areas (47%), which has been doubled compared to the previous period. In contrast, the intensity of diffuse residential sprawl (37%), which was the major driver of artificial land take during the previous period slightly decreased. However, this flow still remains the second most powerful driver of land take in 2000-2006. These two main drivers are accompanied (to a lesser extent) by sprawl of industrial/commercial sites (8%), construction (4%), and dump sites (4%).

Mainly agricultural areas (74%), with prevailing share of pastures and mosaics (53%), followed by forested land (25%) have been taken by artificial sprawl. Also, the intensity of urban land management, represented mainly by conversion of construction sites into discontinuous urban fabric, increased compared to the previous period. Beside the land take, artificial areas were also consumed by forest creation over former mineral extraction sites.

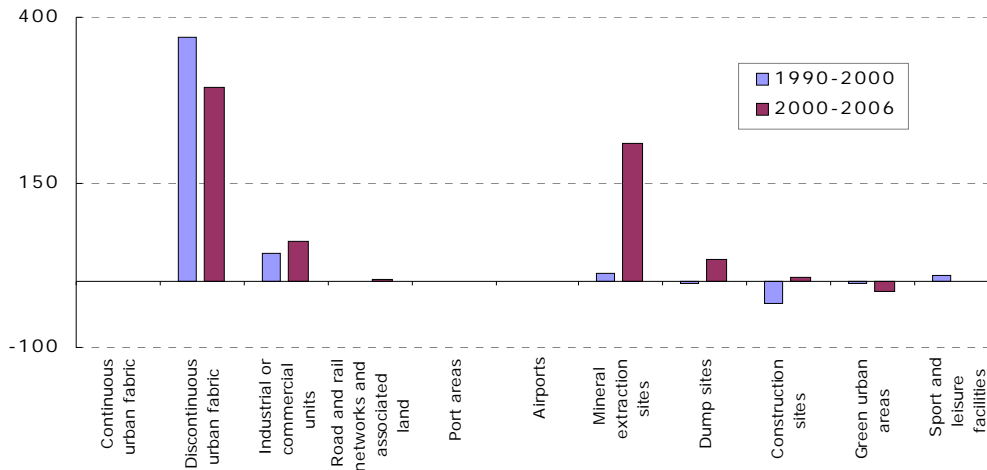
3.9. Artificial surfaces 2006 [% of total area]



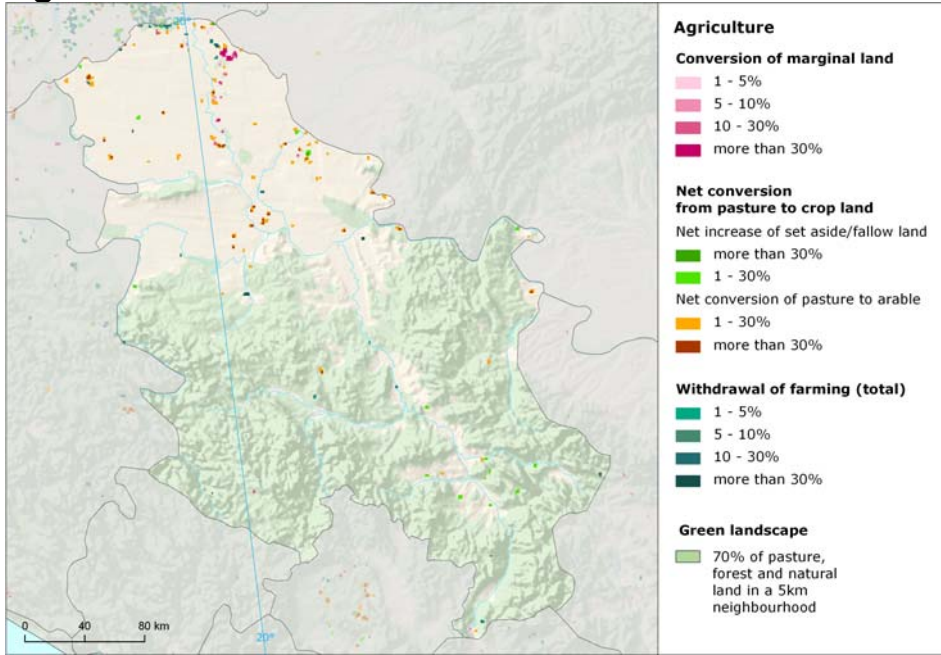
3.10. Artificial land take 2000-2006 [ha/year]



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



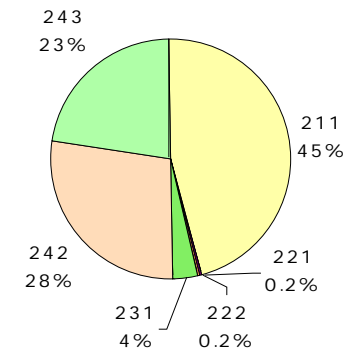
Agriculture



Dynamic development of agricultural land in Vojvodina

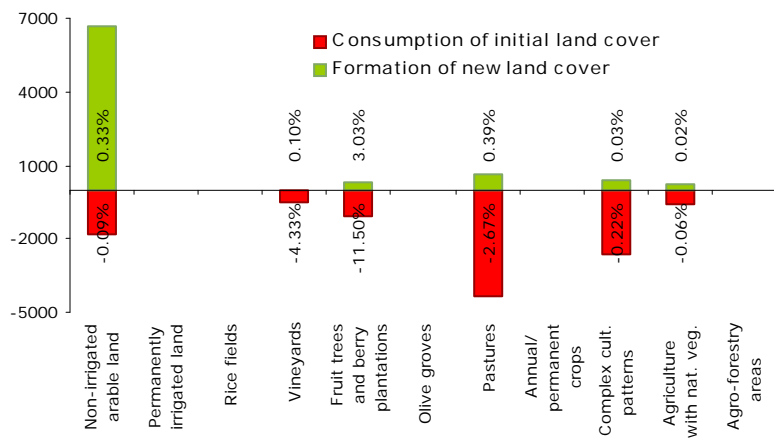
The situation in development of agricultural surfaces has stabilized during 2000-2006, which is documented by decrease of area turnover of both pastures/mosaics and arable/crop land. The structure of net change balance between arable land and pastures is completely opposite to the previous period, with prevailing formation of arable land. The other main contributor of arable land formation is the conversion from vineyards and orchards to non-irrigated arable land, which became the second most powerful driver of internal agricultural change in 2000-2006. Besides the agriculture internal conversions, which are the main driver of change in Serbian landscape, the development of agricultural land has been also influenced by various external flows. The most significant of them is artificial land take, namely urban residential sprawl, followed by sprawl of mineral extraction sites and sprawl of industrial and commercial units. Exchange between agriculture and natural surfaces has been represented mainly by formation of agricultural land through conversions from dry semi-natural land or forest (mostly natural grassland and transitional woodland areas). In contrast, agricultural areas have been consumed through water bodies creation and also through withdrawal of farming (mostly with transitional woodland creation). Most of agricultural conversion occurs in northern part of the Serbia (Vojvodina region).

4.12. Agricultural areas 2006 [% of total area]

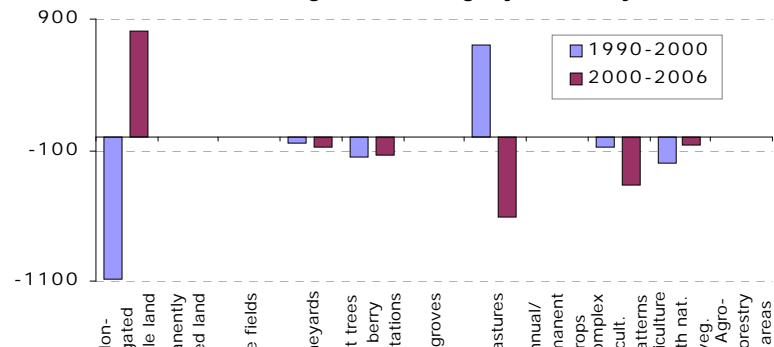


- 211 Non-irrigated arable land
- 212 Permanently irrigated land
- 213 Rice fields
- 221 Vineyards
- 222 Fruit trees and berry plantations
- 223 Olive groves
- 231 Pastures
- 241 Annual crops associated with permanent crops
- 242 Complex cultivation patterns
- 243 Agriculture land with significant areas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

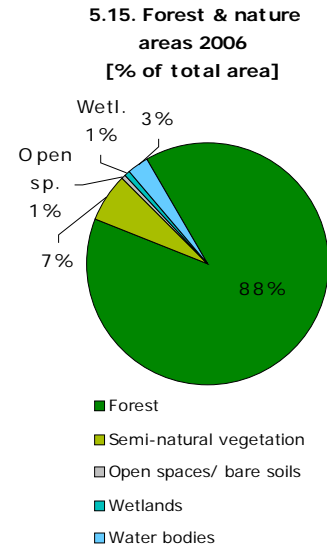
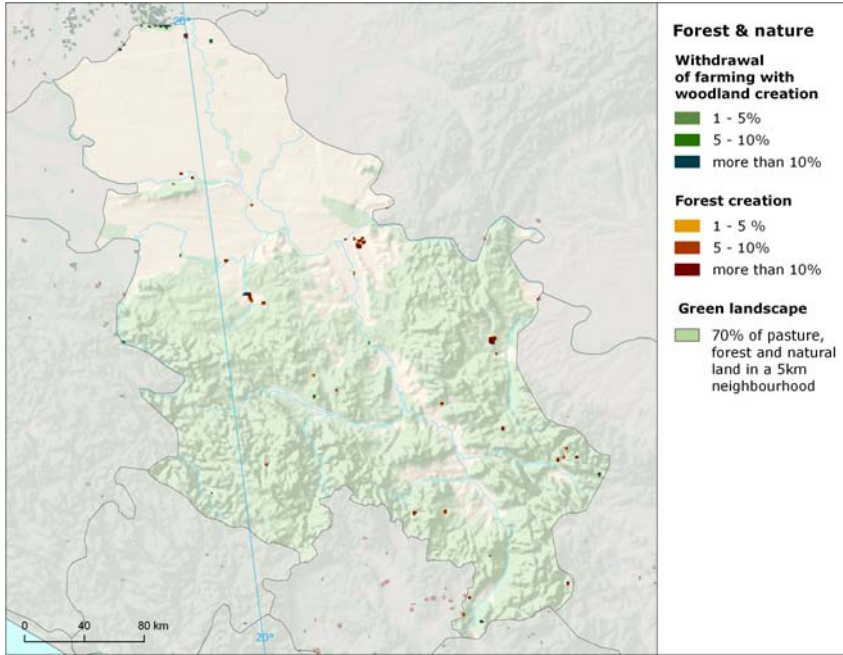
4.13. Development of agricultural areas 2000-2006 – detailed balance [ha]



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

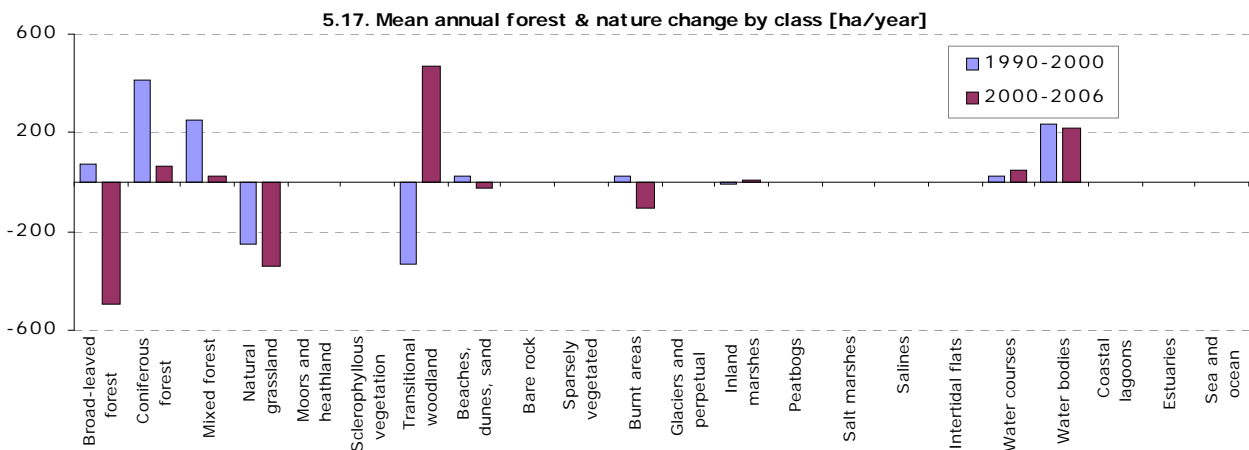
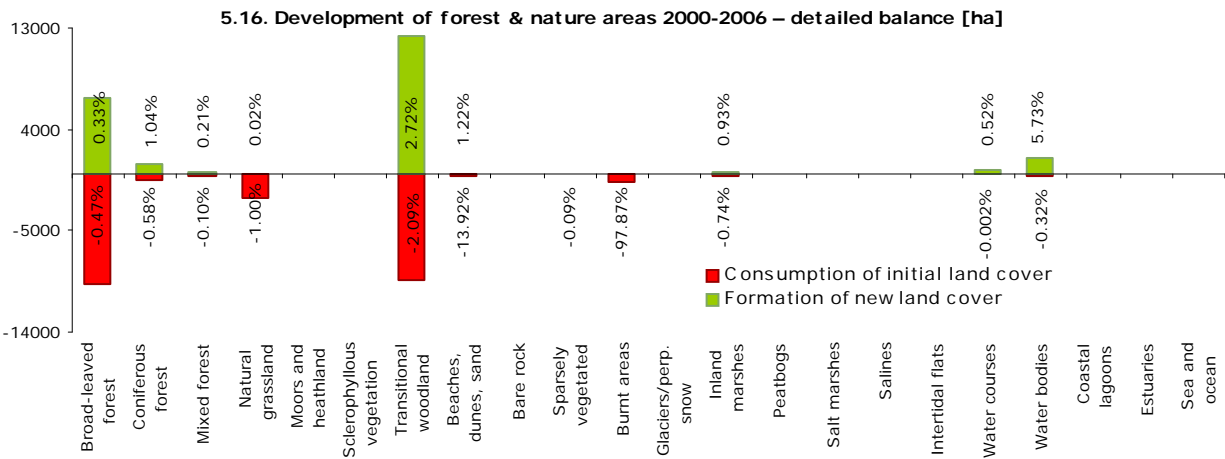


Forest & nature



Slow down of conversion from transitional woodland to forest

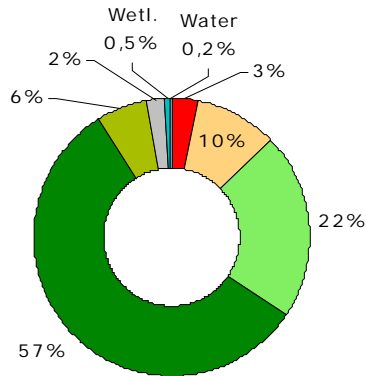
Similarly to previous period, exchange of natural surfaces in Serbia has been driven mainly by internal conversions of forested land. These conversions between transitional woodland and standing forests due to forestry activities are the main drivers of change not only within forested land, but also within whole Serbian landscape. However, the intensity of conversion from transitional woodland to forest decreased significantly, compared to the previous period, which causes negative net change balance of forested areas. Net change balance of other non-forested natural land cover classes is characterized by consumption of natural grasslands, restoration of burnt areas and formation of water bodies and water courses. Natural land, with prevailing share of natural grasslands (more than 50%) and transitional woodland, has been consumed mostly by arable land (over 60%) and by extension of mineral extraction sites. On the other hand, new transitional woodland and water bodies have been formatted over agricultural land or mineral extraction sites.



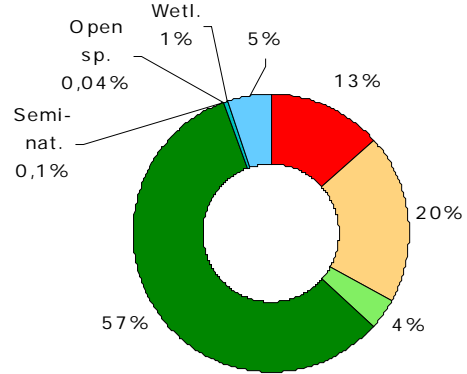
Annex: Land cover flows and trends

Land cover flows 2000-2006

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

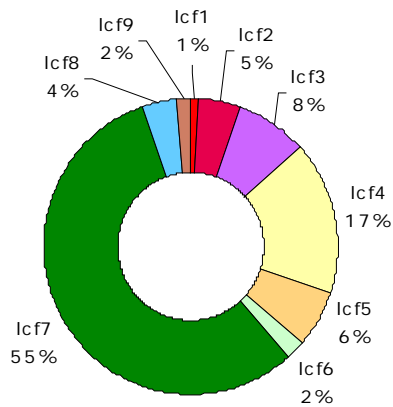


6.19. Formation of land cover 2000-2006 [% of total change area]



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

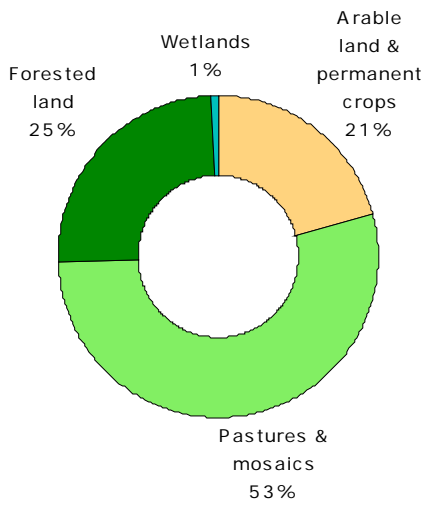
6.20. Drivers of change (LC FLOWS) 2000-2006 [% of total change area]



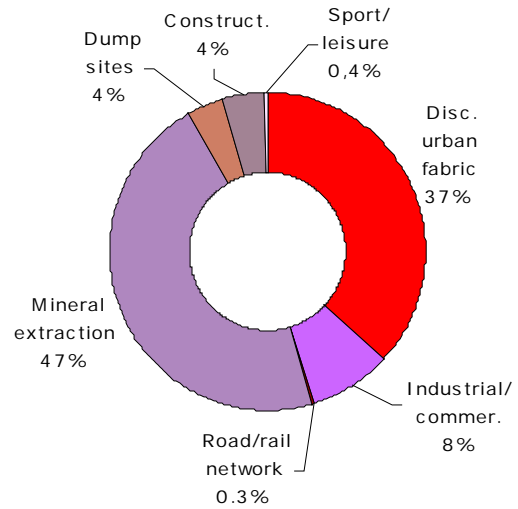
- Icf1 Urban land management
- Icf2 Urban residential sprawl
- Icf3 Sprawl of economic sites and infrastructures
- Icf4 Agriculture internal conversions
- Icf5 Conversion from forested & natural land to agriculture
- Icf6 Withdrawal of farming
- Icf7 Forests creation and management
- Icf8 Water bodies creation and management
- Icf9 Changes due to natural and multiple causes

Artificial areas

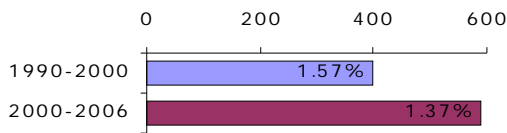
7.21. Consumption by artificial land take 2000-2006 [% of total]



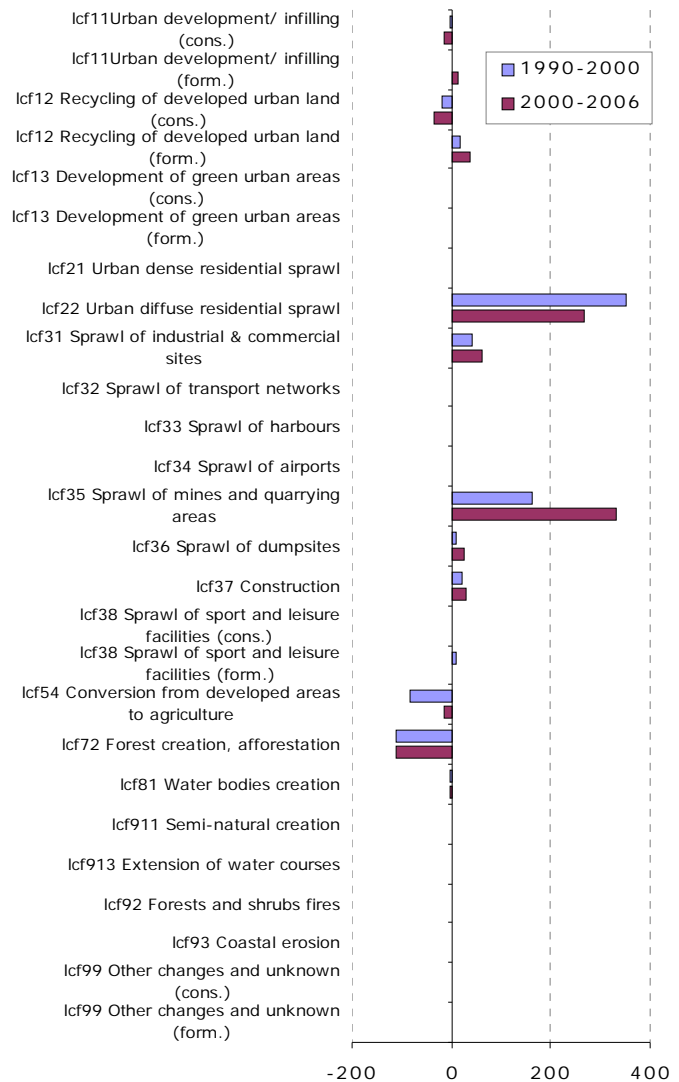
7.22. Formation by artificial land take 2000-2006 [% of total]



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



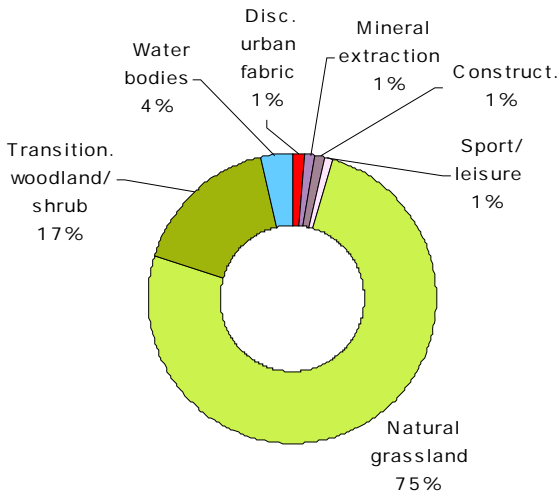
7.24. Artificial development by change drivers (LC FLOWS) [ha/year]



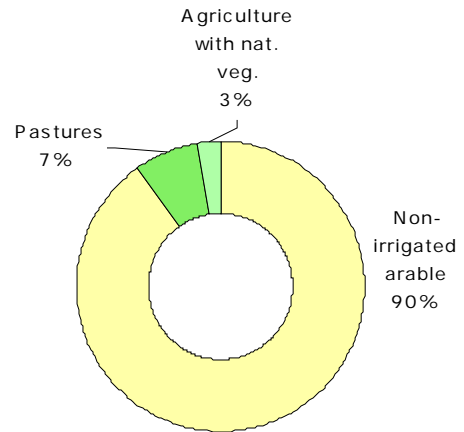
Serbia

Agriculture

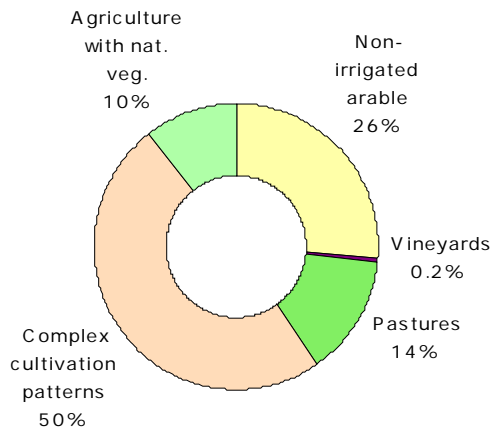
8.25. LC consumed by agriculture 2000-2006 [% of total]



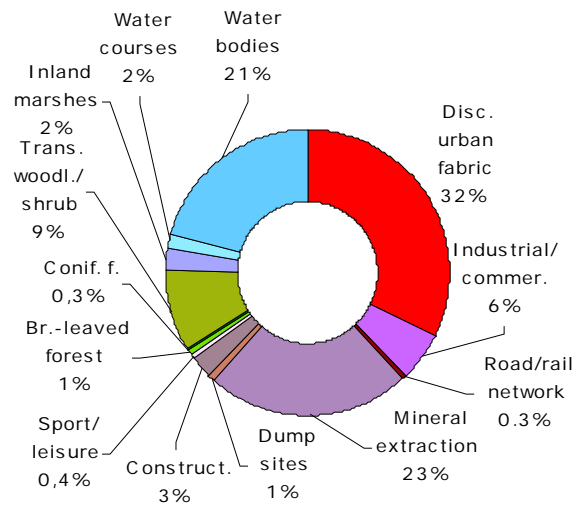
8.26. Formation of agricultural land from non-agriculture 2000-2006 [% of total]



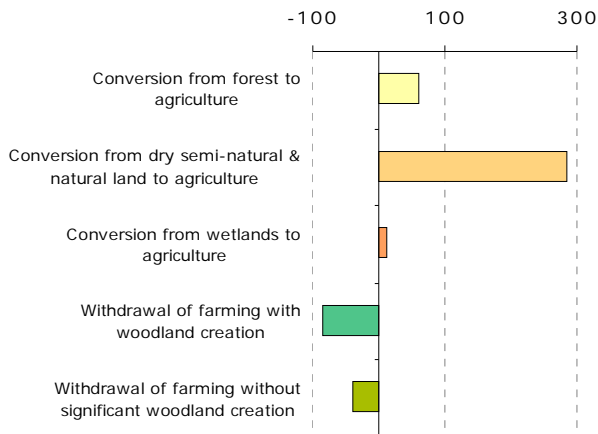
8.27. Consumption of agricultural land by non-agriculture 2000-2006 [% of total]



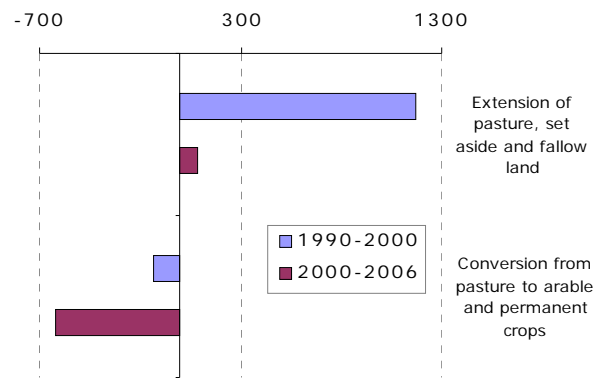
8.28. Formation of non-agricultural land from agriculture 2000-2006 [% of total]



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

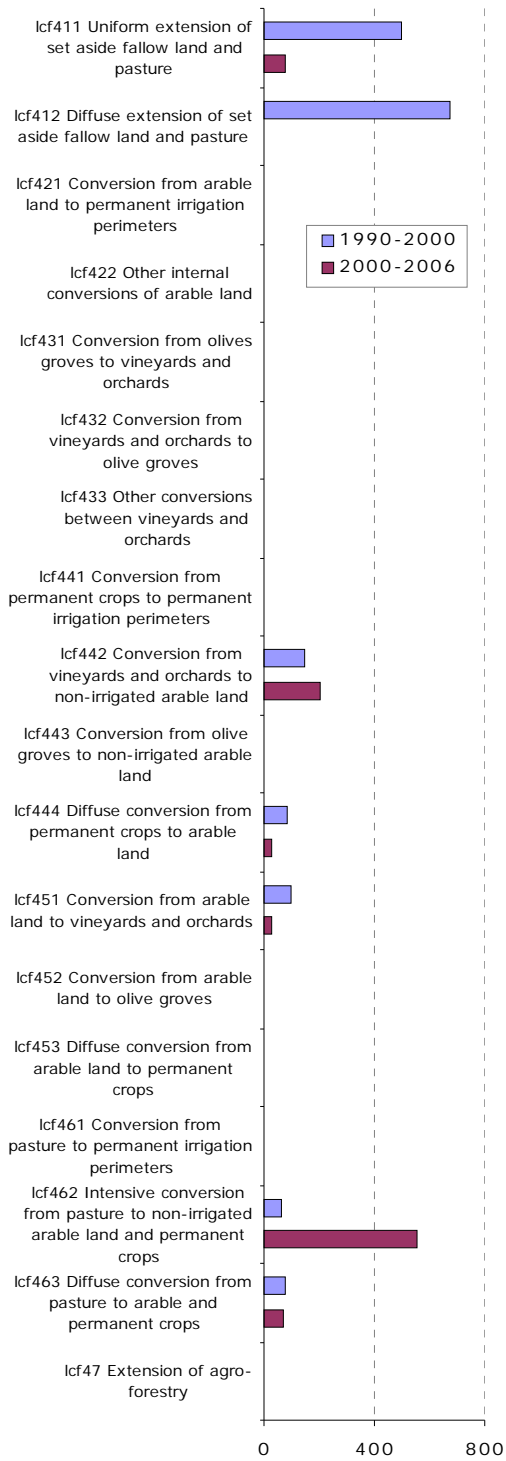


8.30. Mean annual conversion between arable land and pasture [ha/year]

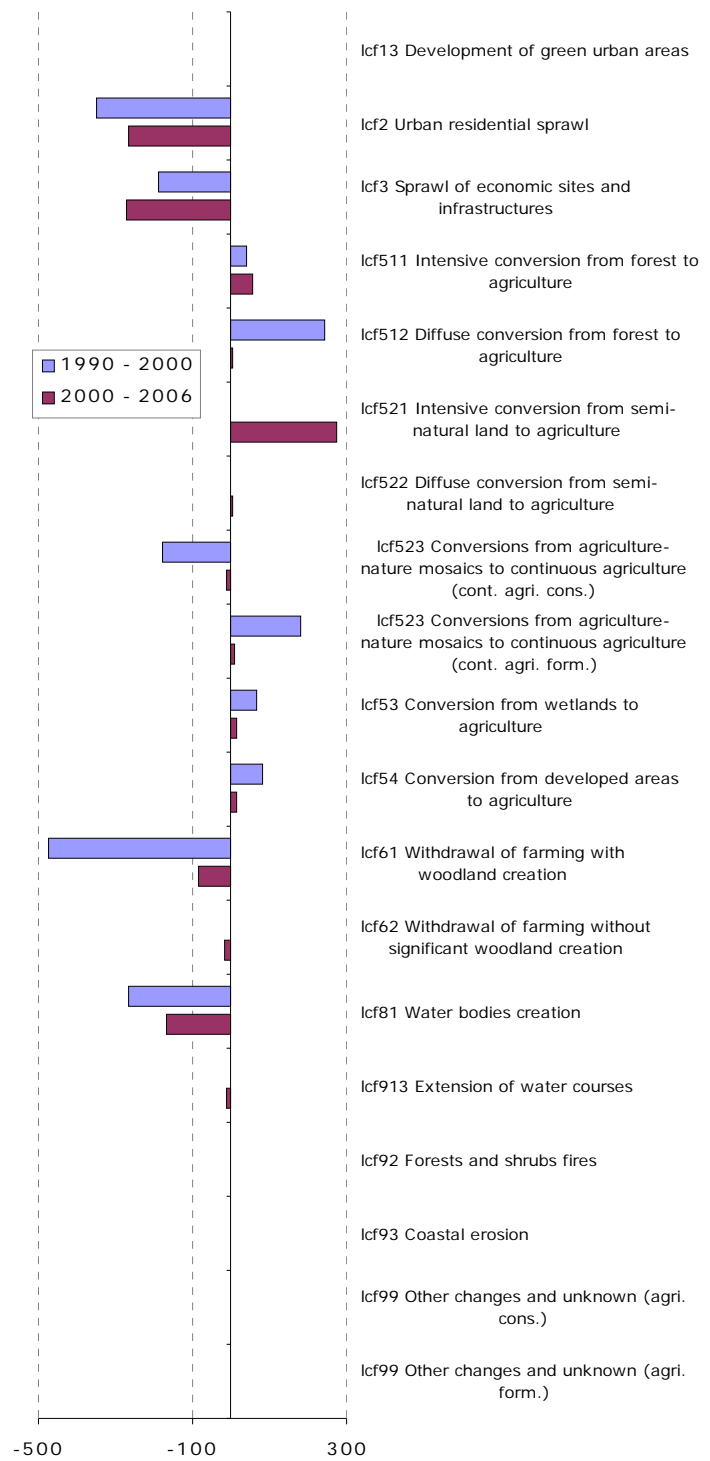


Serbia

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



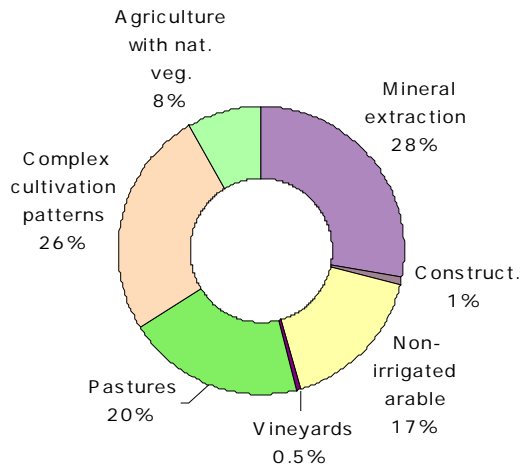
9.32. Mean annual conversions between agriculture and other LC types [ha/year]



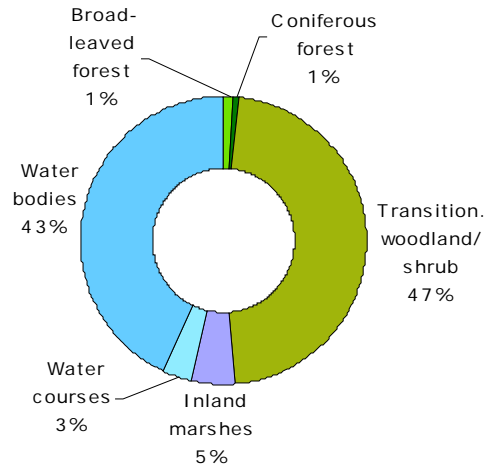
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Forest & nature

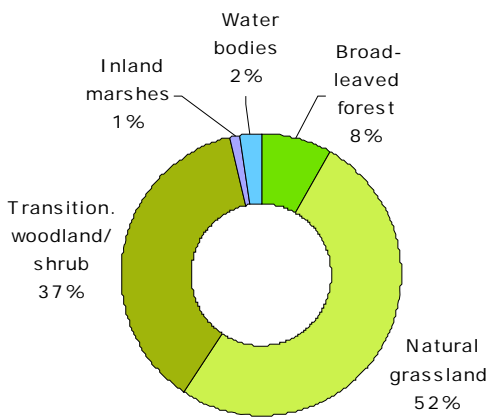
10.33. LC consumed by forest & nature 2000-2006 [% of total]



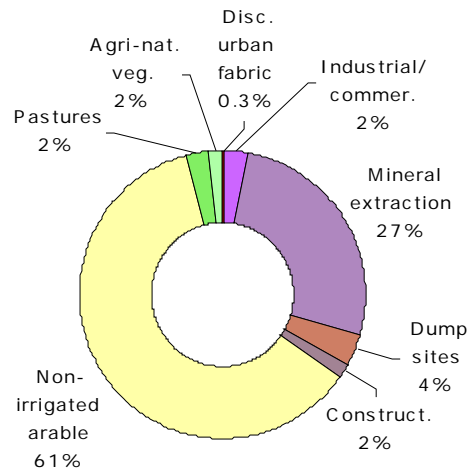
10.34. Formation of forest & nature land from non-forest /nature 2000-2006 [% of total]



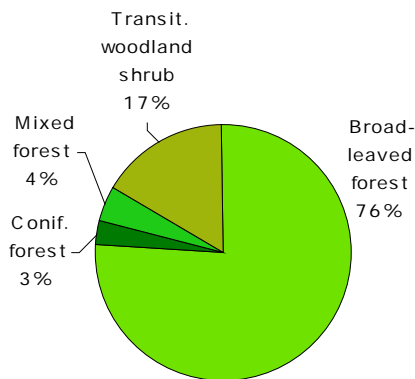
10.35. Consumption of forest & nature land by non-forest/nature 2000-2006 [% of total]



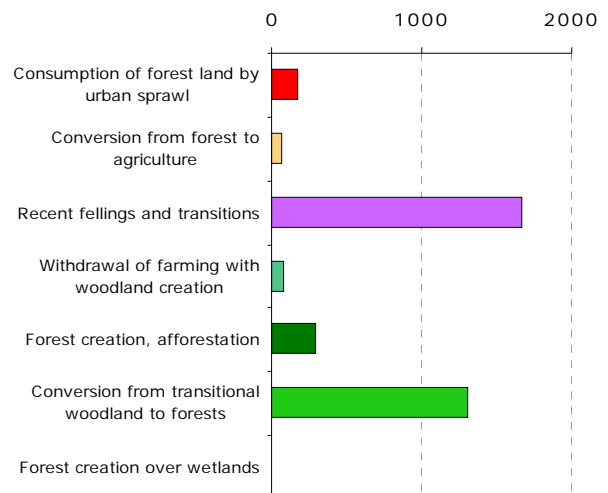
10.36. Formation of non-forest/nature land from forest & nature 2000-2006 [% of total]



10.37. Forested land 2006 [% of total area]

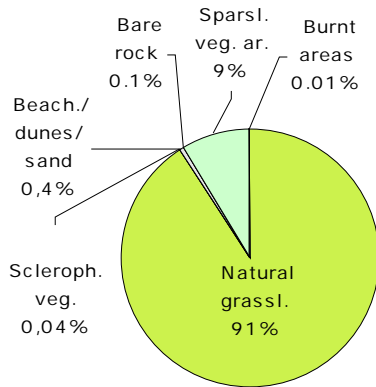


10.38. Main trends in woodland & forests consumption/formation 2000-2006 [ha/year]

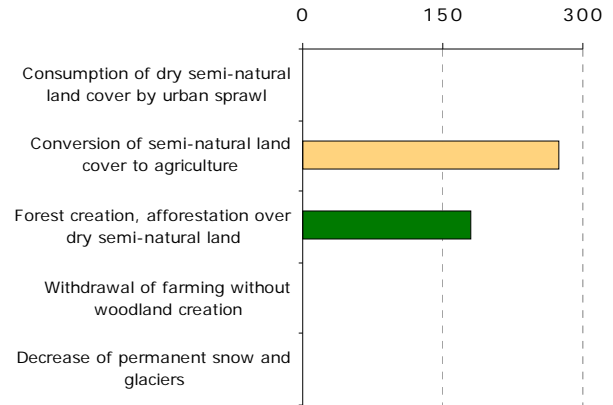


Serbia

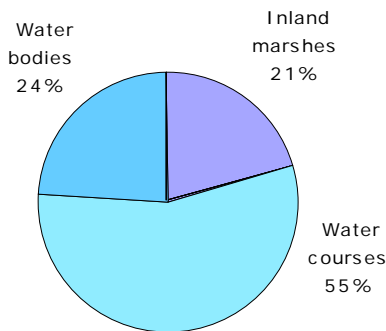
11.39. Dry semi-natural areas 2006
[% of total area]



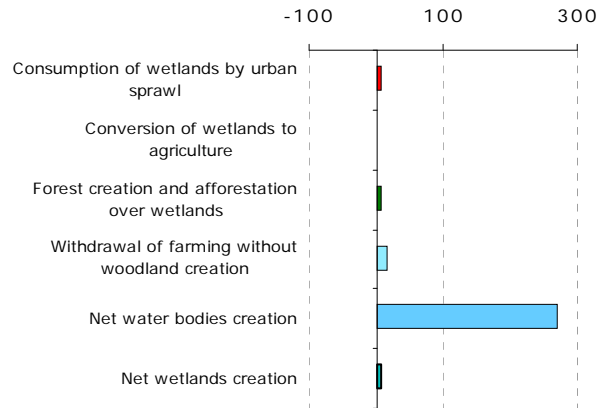
11.40. Main trends in dry semi-natural land consumption/formation 2000-2006 [ha/year]



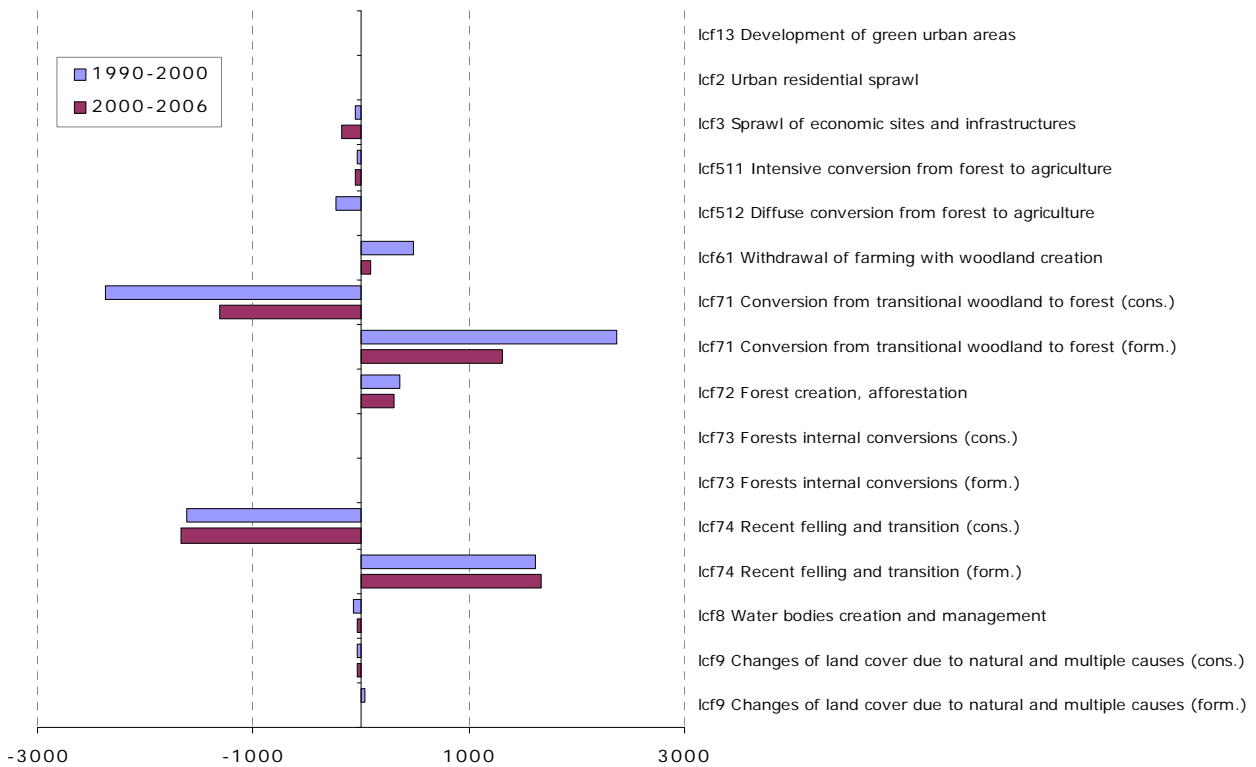
11.41. Wetlands & water 2006
[% of total area]



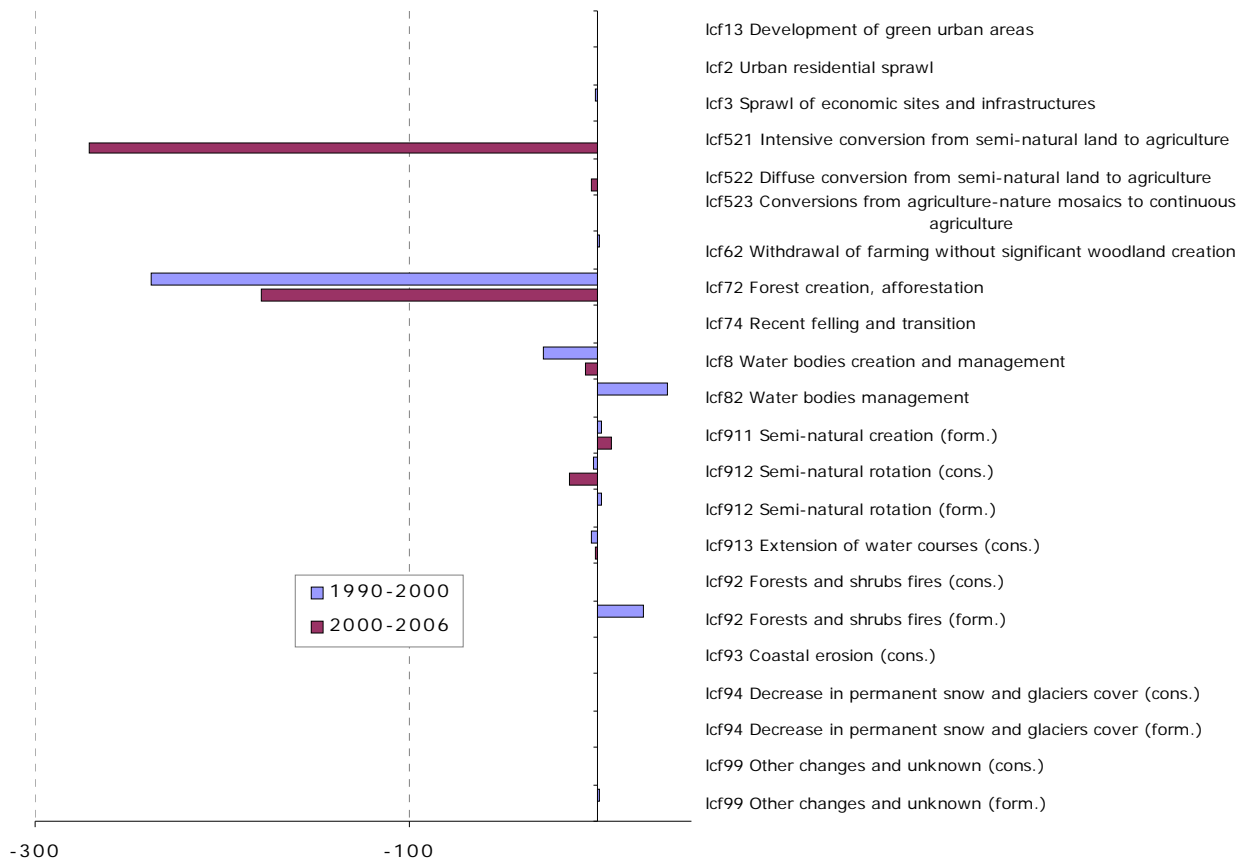
11.42. Main trends in wetlands & water consumption/formation 2000-2006 [ha/year]



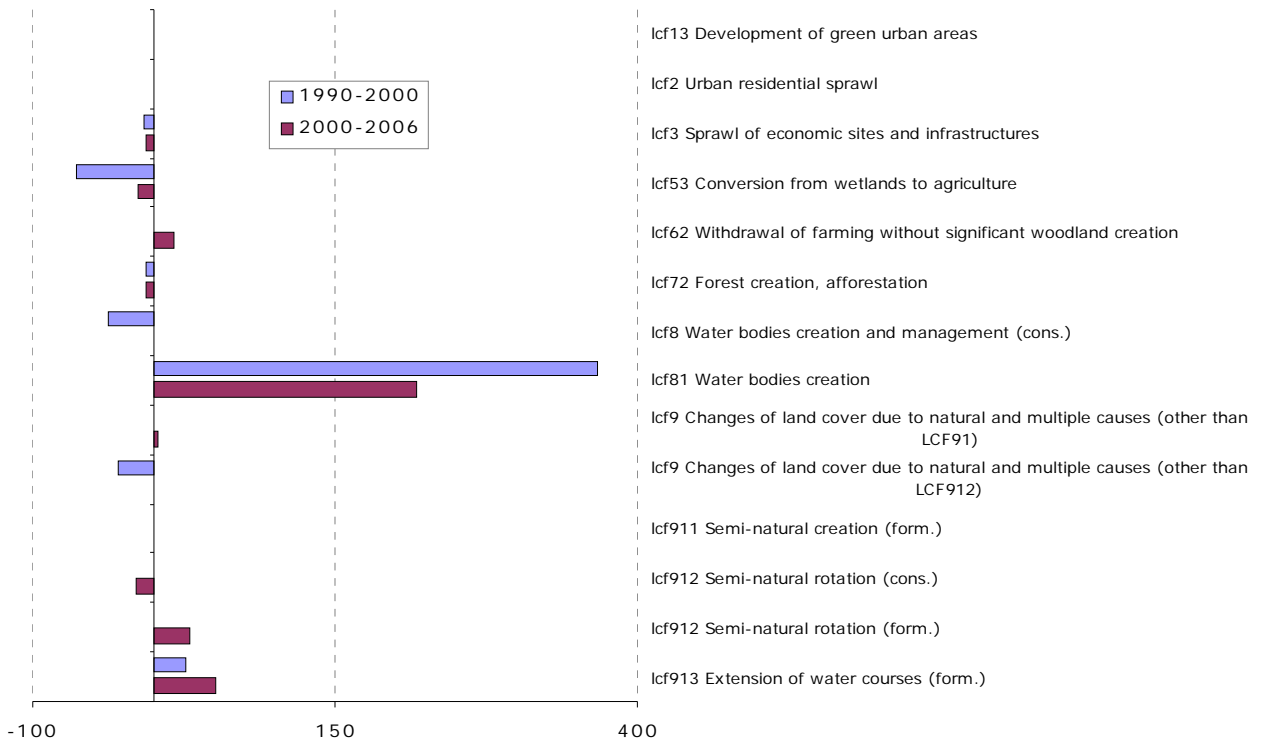
11.43. Mean annual conversions of forest & other woodland
[ha/year]



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

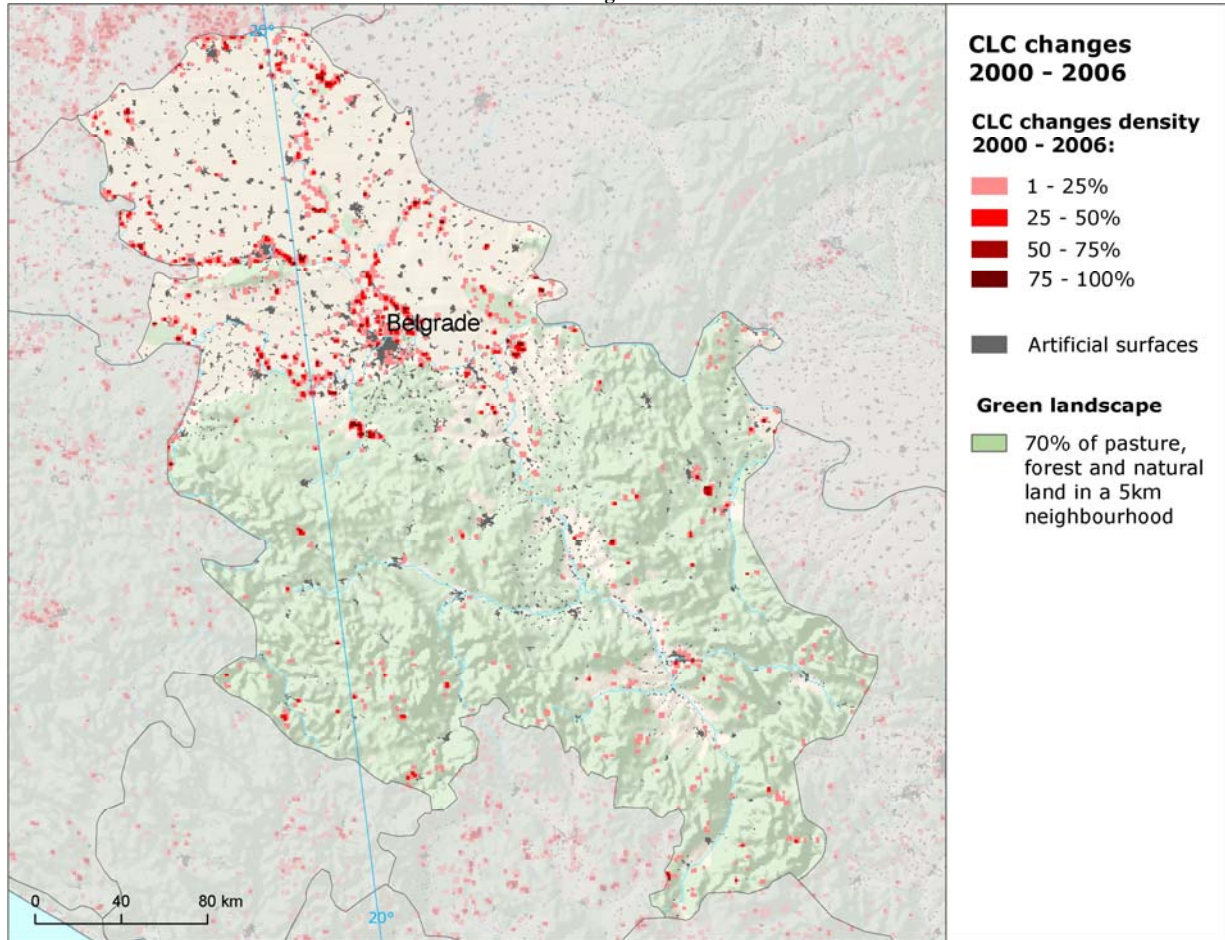


12.45. Mean annual conversions of wet lands and water LC [ha/year]

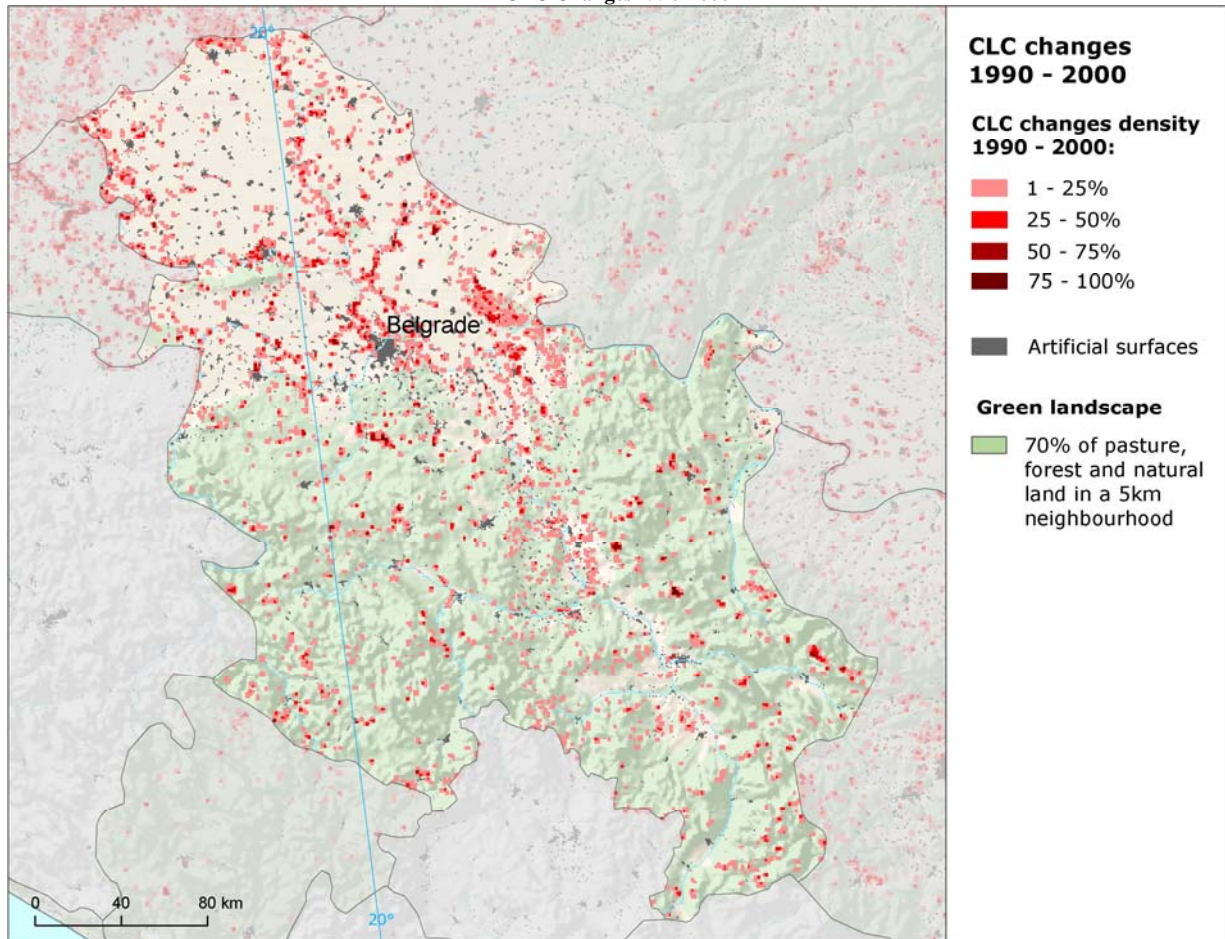


Serbia

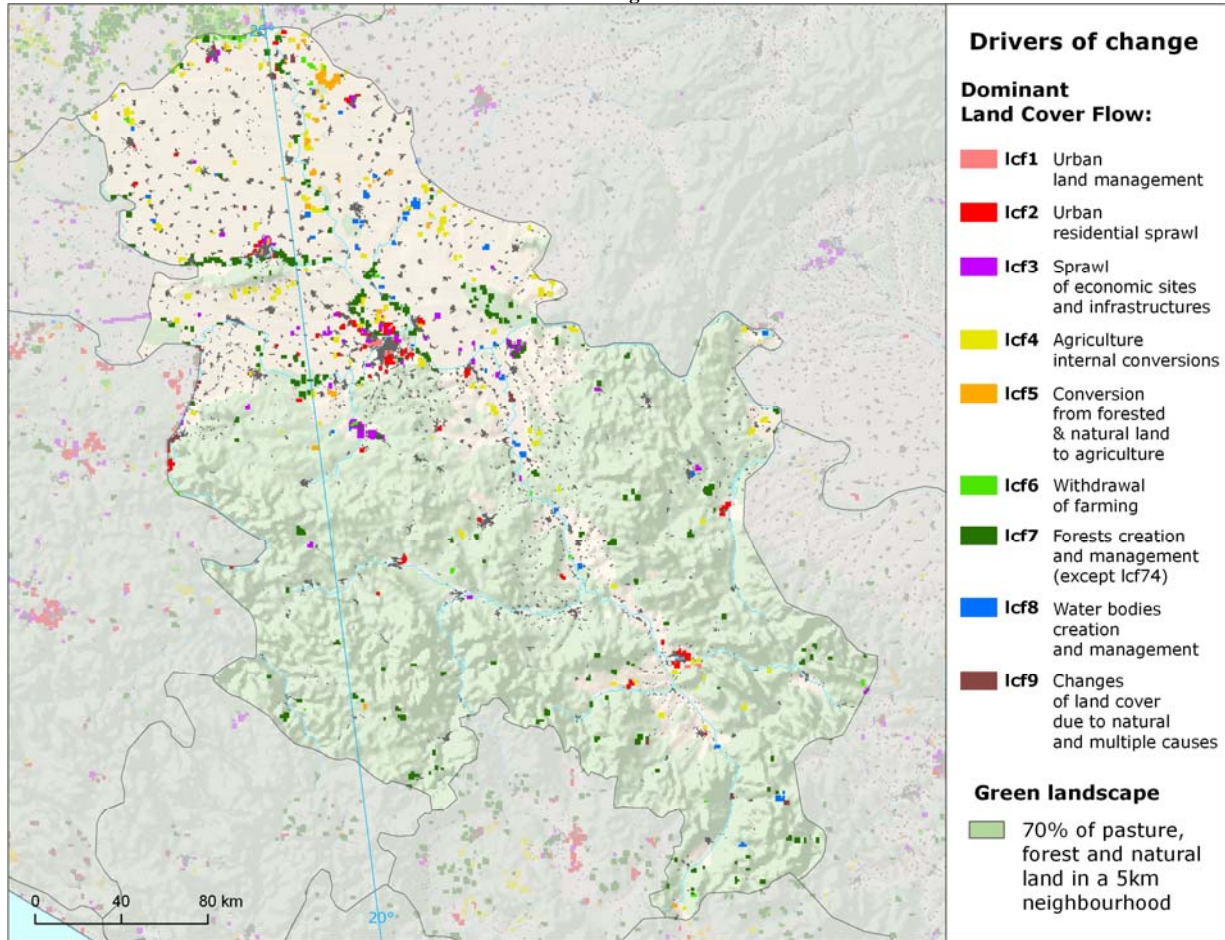
CLC Changes 2000-2006



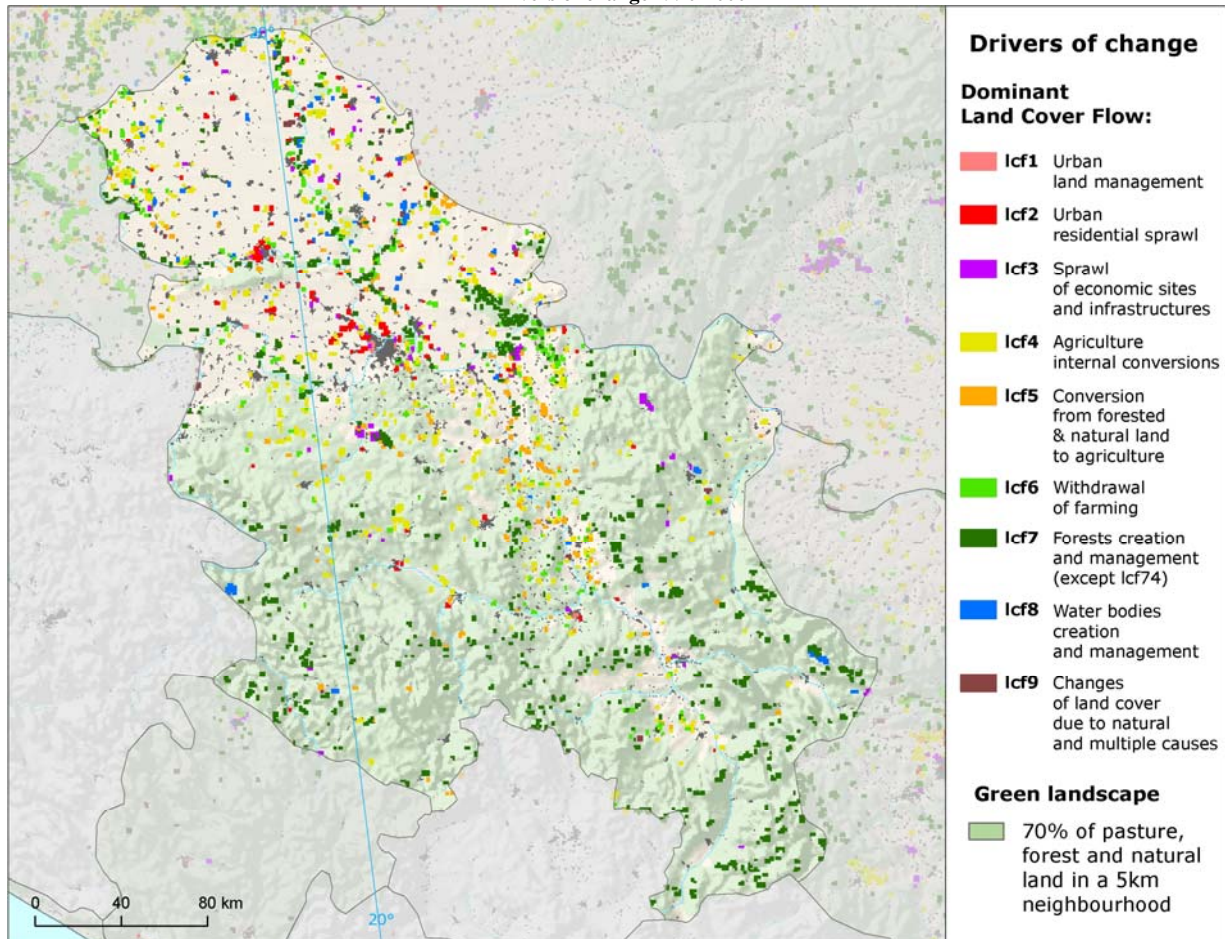
CLC Changes 1990-2000



Drivers of change 2000-2006

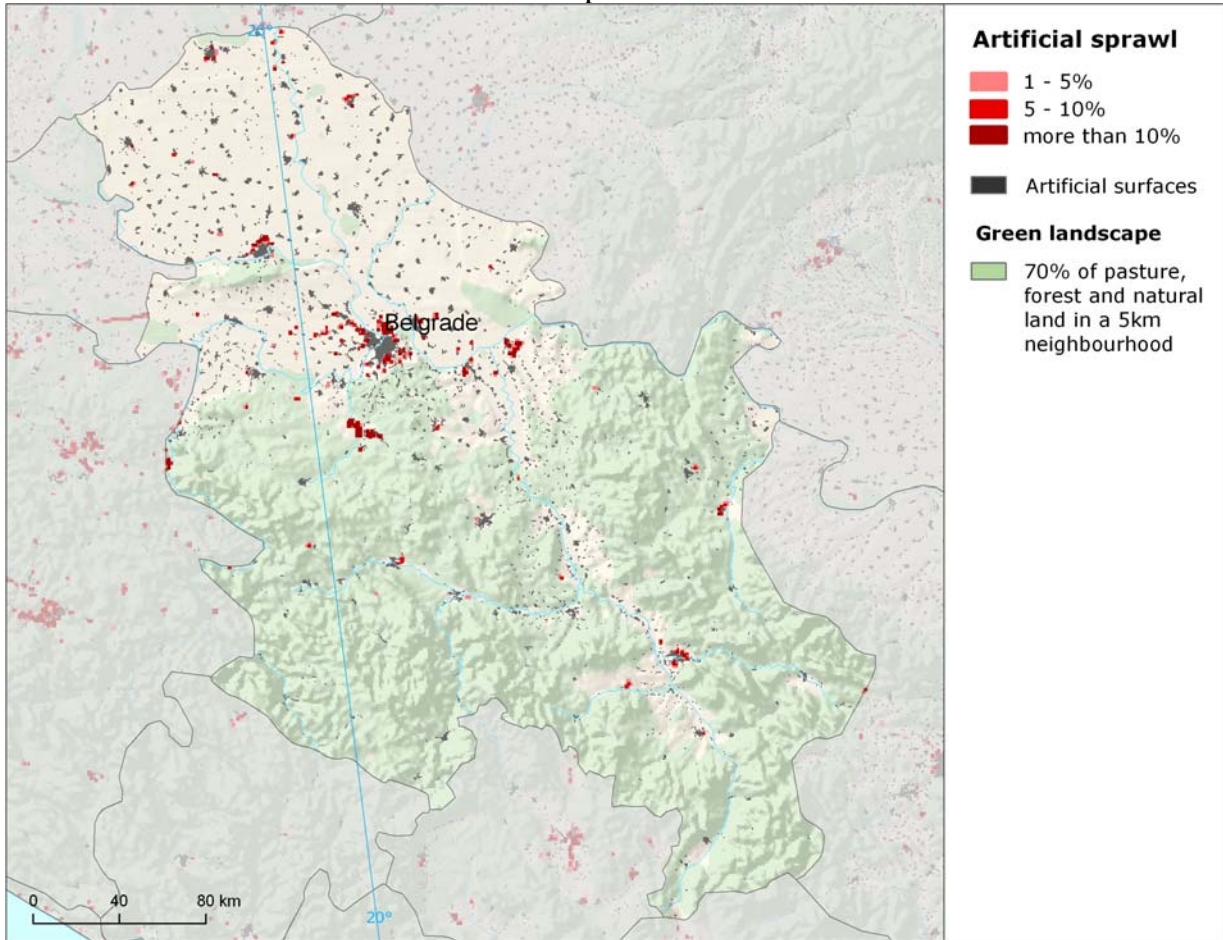


Drivers of change 1990-2000

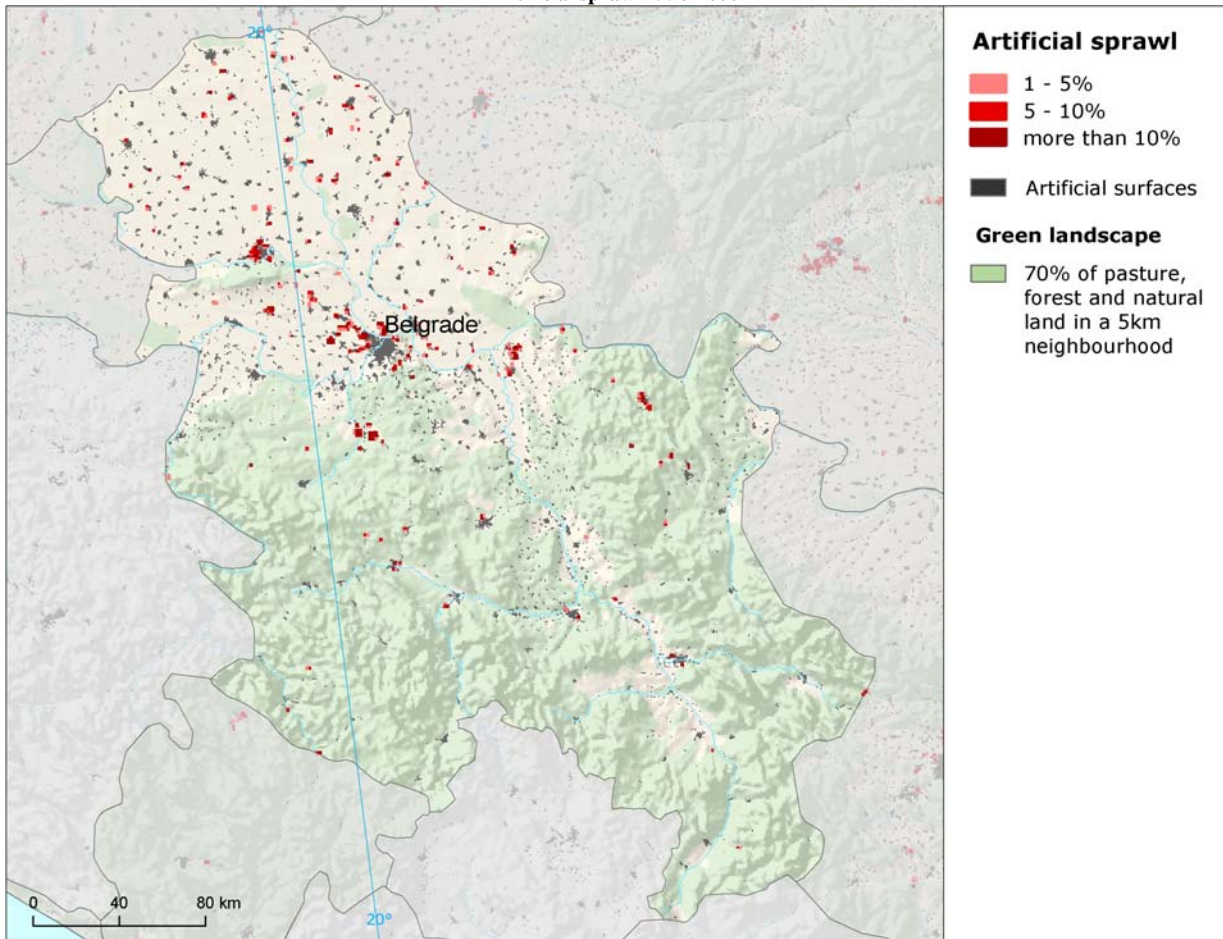


Serbia

Artificial sprawl 2000-2006

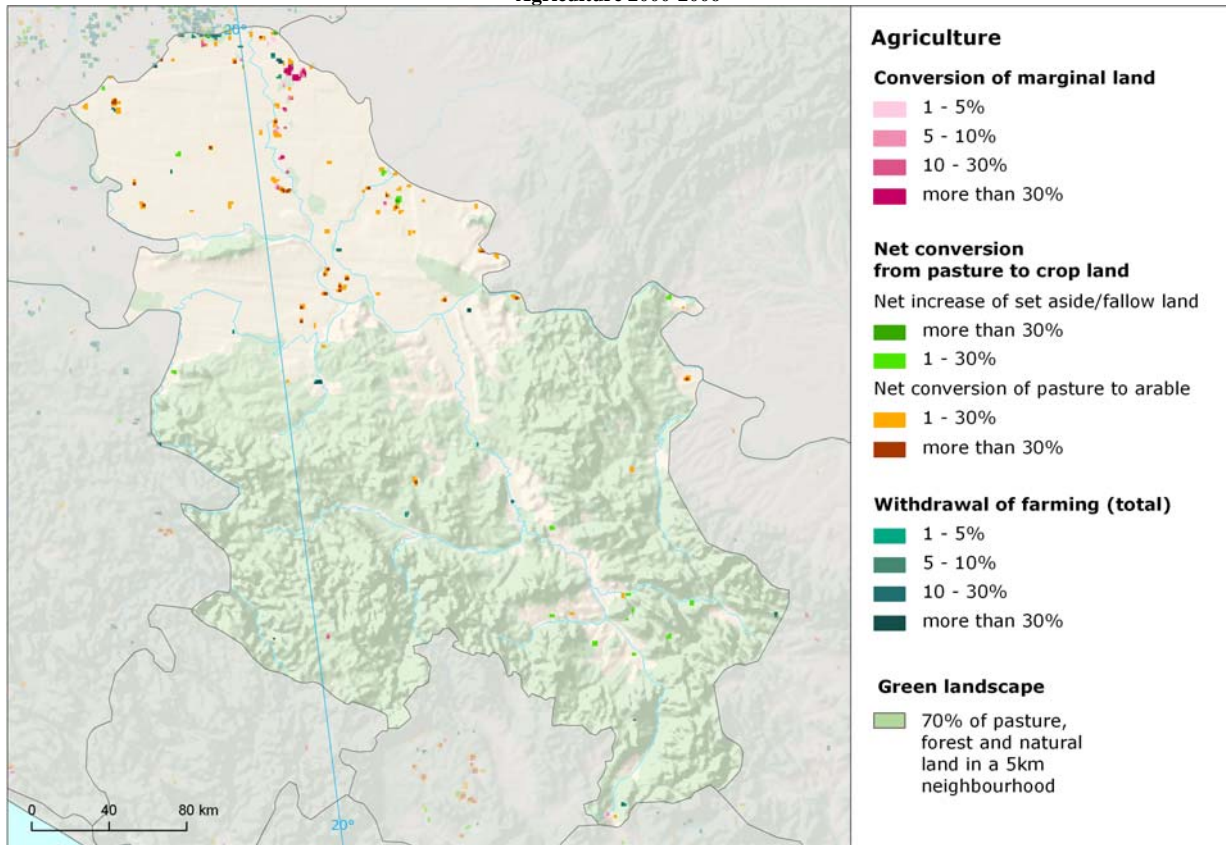


Artificial sprawl 1990-2000

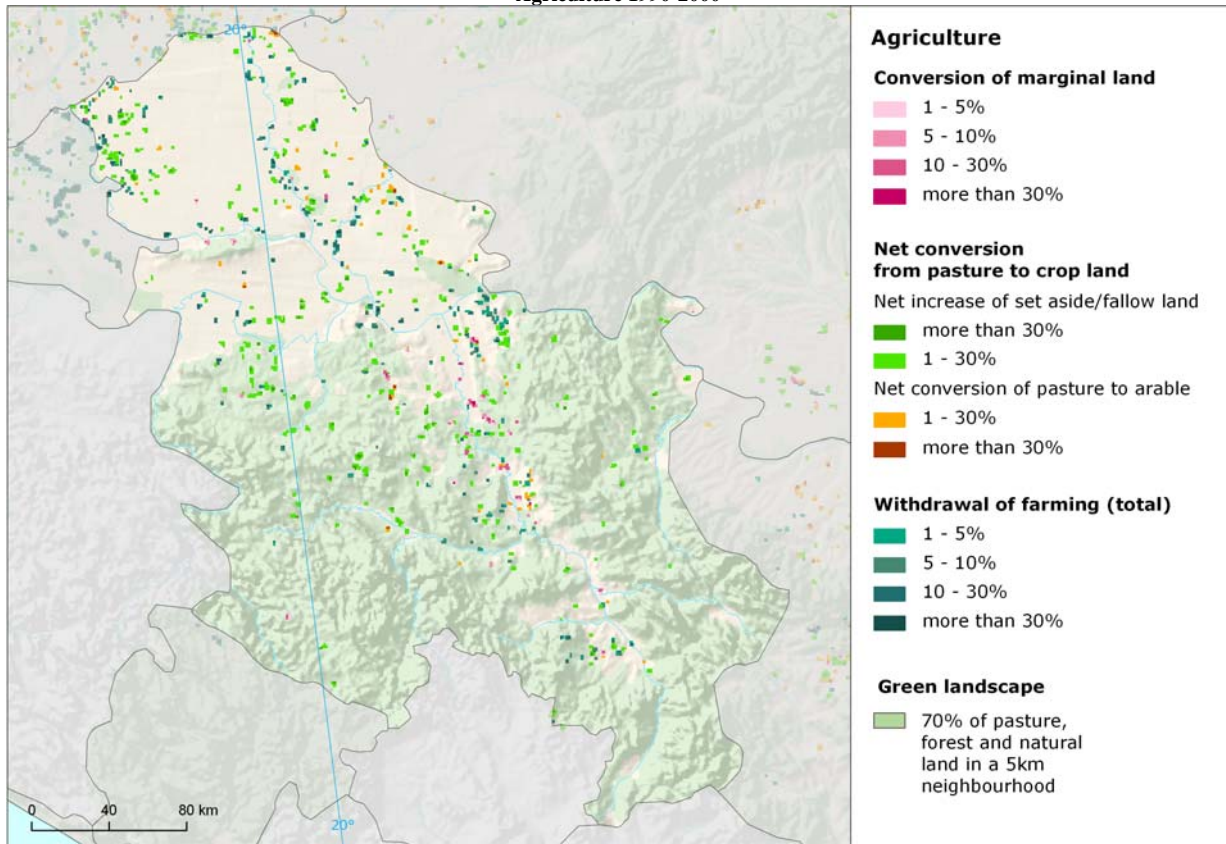


Serbia

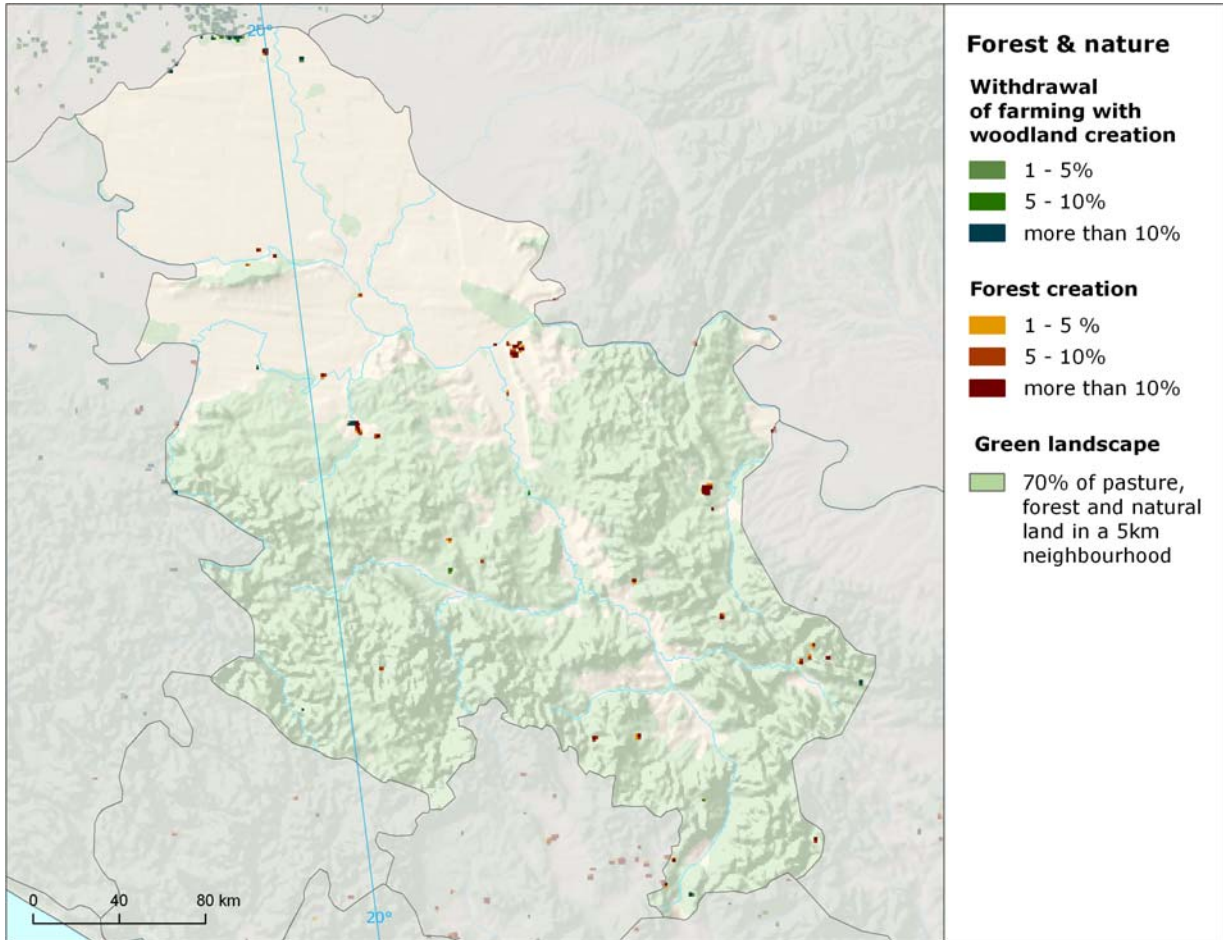
Agriculture 2000-2006



Agriculture 1990-2000



Forest and nature 2000-2006



Forest and nature 1990-2000

