

## Land cover 2012



**Estonia** 

September 2017

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# Land cover 2012

## Overview of land cover & change 2006-2012

Estonia shows an overall acceleration of land cover development, compared to previous period 2000-2006. The mean annual change rate increased from 0.38% to 0.62%, which indicates significant speed-up of the landscape transformation in this country.

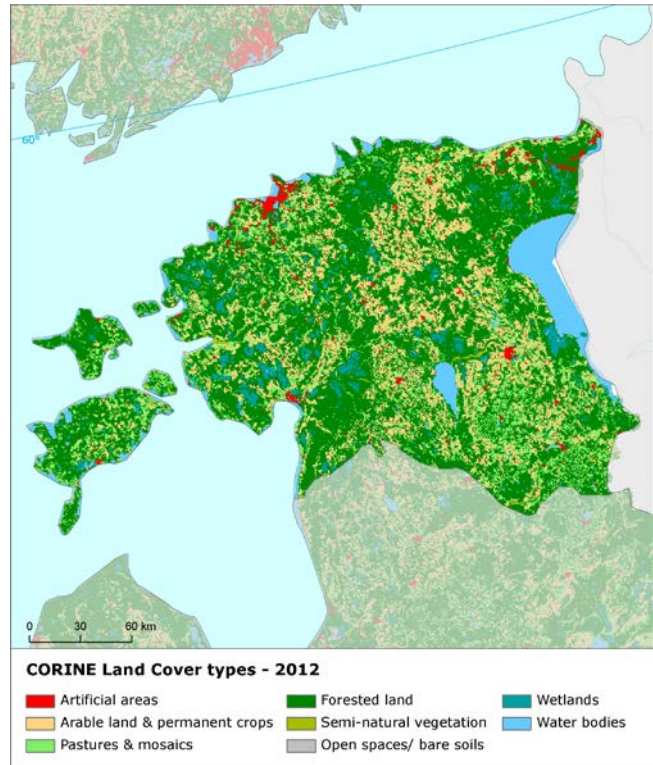
This acceleration has been caused mostly by rapid acceleration of agricultural internal conversions between arable land and pasture in both directions, which did not occur with such intensity during the previous period.

Considering the structure of the Estonian landscape, with prevailing natural land (56% of total area is covered by forests), it is not surprising that the most extensive driver of land cover development in the country is the forest creation and management.

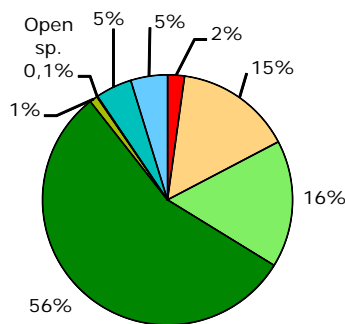
Compared to these internal conversions of forested and agricultural land, the intensity of urban sprawl is significantly lower. However, it has to be mentioned here, that the artificial land take in Estonia is one of the fastest in Europe. With mean annual land take rate of 0.84% of initial artificial land, it reaches the top among European countries. Comparing this 6-years period with the previous one, the pace of artificial sprawl is almost identical. Artificial development in this country is driven mostly by the sprawl of mines and quarrying areas and the intensity of recycling of developed urban land is also quite significant in Estonia. On the other hand, the intensity of diffuse residential sprawl, which was the second most powerful driver of artificial land change during the previous period, is considerably lower in 2006-2012.

*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.*

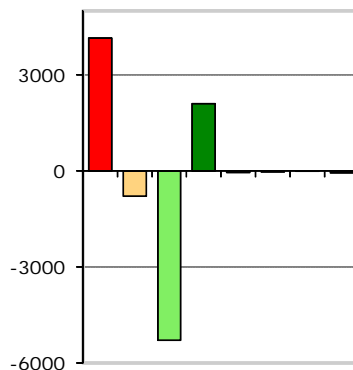
*Number of years between CLC2006-CLC2012 data for Estonia: 6*



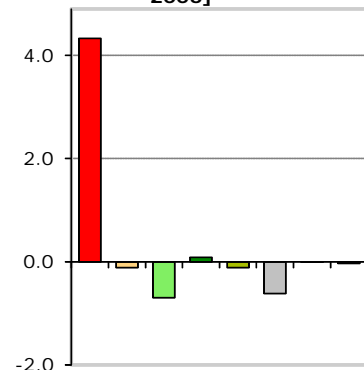
1.1. Land cover 2012 [% of total]



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



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



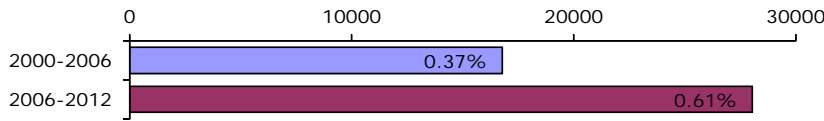
■ Artificial areas     
 ■ Arable land & permanent crops     
 ■ Pastures & mosaics     
 ■ Forested land  
■ Semi-natural vegetation     
 ■ Open spaces/ bare soils     
 ■ Wetlands     
 ■ Water bodies

Summary balance table 2006-2012

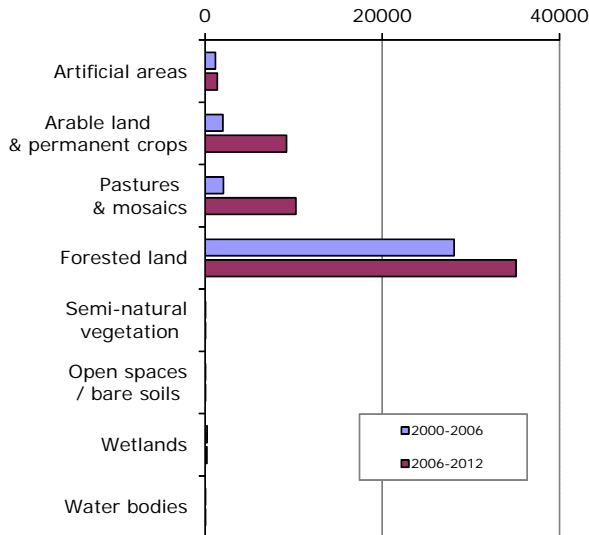
	Artificial areas	Arable land & permanent crops	Pastures & mosaics	Forested land	Semi-natural vegetation	Open spaces/ bare soils	Wetlands	Water bodies	TOTAL [hundreds ha]
<b>Land cover 2006</b>	959	6925	7576	25412	473	47	2149	2175	45715
Consumption of initial LC	19.7	279.6	333.3	1042.4	1.1	0.3	5.1	1.4	1683
Formation of new LC	61.2	271.6	280.4	1063.4	0.5	0.0	5.1	0.7	1683
<b>Net Formation of LC</b>	<b>41.5</b>	<b>-8.0</b>	<b>-53.0</b>	<b>21.0</b>	<b>-0.6</b>	<b>-0.3</b>	<b>-0.1</b>	<b>-0.7</b>	<b>0</b>
Net formation as % of initial year	4.3	-0.1	-0.7	0.1	-0.1	-0.6	0.0	0.0	
<b>Total turnover of LC</b>	<b>80.9</b>	<b>551.2</b>	<b>613.7</b>	<b>2105.8</b>	<b>1.6</b>	<b>0.3</b>	<b>10.2</b>	<b>2.0</b>	<b>3366</b>
Total turnover as % of initial year	8.4	8.0	8.1	8.3	0.3	0.6	0.5	0.1	7.4
<b>Land cover 2012</b>	<b>1001</b>	<b>6917</b>	<b>7523</b>	<b>25433</b>	<b>473</b>	<b>47</b>	<b>2149</b>	<b>2174</b>	<b>45715</b>

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

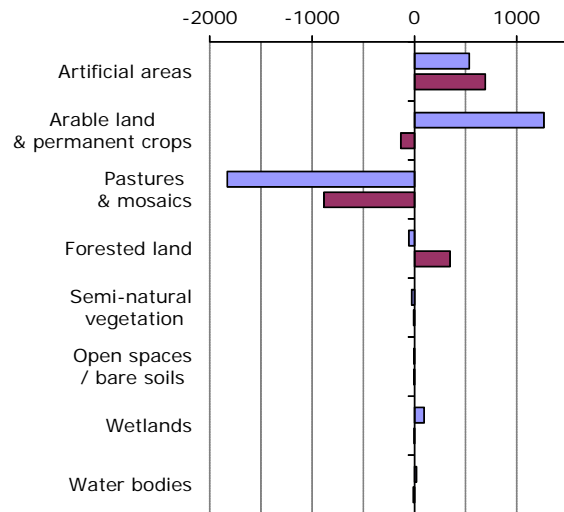
2.4. Annual land cover change  
[ha/year, % of total area]



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

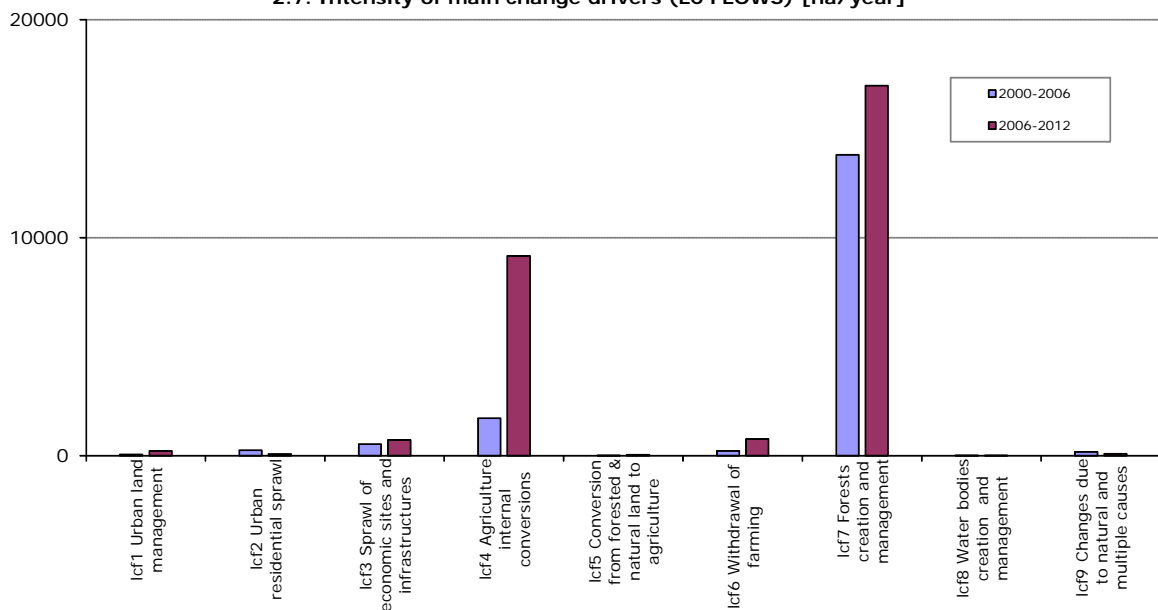


2.6. Net annual change of LC types [ha/year]

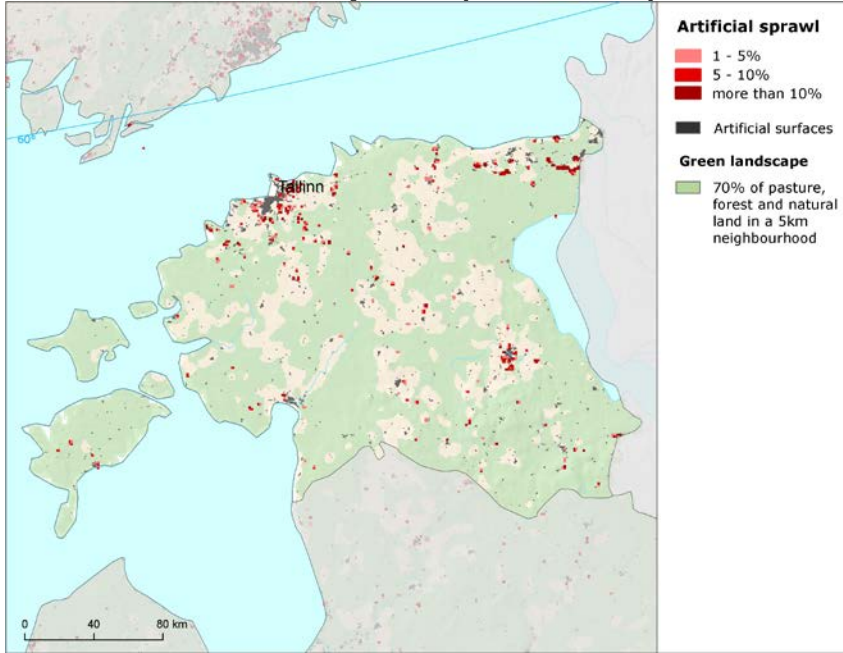


Summary trend figures		
	2000-2006	2006-2012
<b>Annual land cover change [ha/year]</b>	<b>16781</b>	<b>28047</b>
<b>Annual land cover change as % of initial year</b>	<b>0.37%</b>	<b>0.61%</b>
Land uptake by artificial development as mean annual change [ha/year]	781	789
Agricultural land uptake by urban and infrastructures development as mean annual change [ha/year]	356	303
Net uptake of forests and semi-natural land by agriculture as mean annual change [ha/year]	-211	-744
Net conversion from pasture to arable land and permanent crops as mean annual change [ha/year]	1526	-113
Forest & other woodland net formation as mean annual change [ha/year]	-56	350
Dry semi-natural land cover net formation as mean annual change [ha/year]	-31	-14
Wetlands & water bodies net formation as mean annual change [ha/year]	115	-12

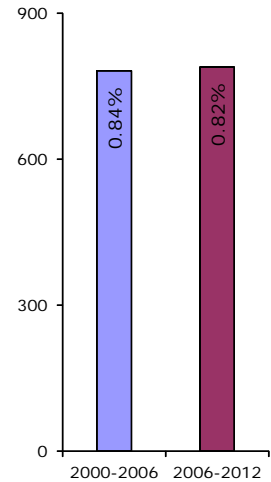
2.7. Intensity of main change drivers (LC FLOWS) [ha/year]



### Artificial surfaces sprawl (2006-2012)



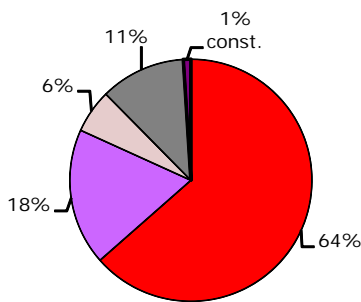
3.8. Artificial land take [ha/year, % of initial year]



### Speed-up of mineral extraction sites extension, slowdown of other sprawl

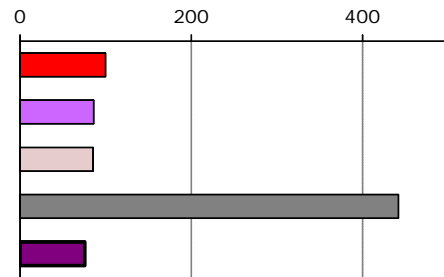
The intensity of artificial land take in Estonia is one of the highest in Europe. The internal structure of the sprawl shows that most of it is realized through extension of mineral extraction sites, which occurs with highly increased intensity compared to previous period. In contrast, the development of discontinuous urban fabric, which was the main driver of the artificial sprawl during the whole period 1990-2000-2006, and also of commercial and industrial areas, appears more in the frame of urban land recycling. It means that units which were under construction in the previous period are being finalized in the 2006-2012, but the extension itself became less intensive. This indicates a crucial shift in the structure of artificial development in Estonia, which is characterized by slowdown of residential and commercial/industrial development and speed-up of mines, quarries and dump sites extension. While the sprawl of residential fabric remains concentrated in the surroundings of the two largest Estonian cities – capital city of Tallin and Tartu, the extension of mineral extraction sites is located mostly in the north-eastern part of the country. The artificial development around Parnu city, which was observed during the previous period, has been significantly slowed down. Concerning the source, the sprawl in Estonia consumes mainly forested land (50%) and pastures (27%).

3.9. Artificial surfaces 2012 [% of total area]

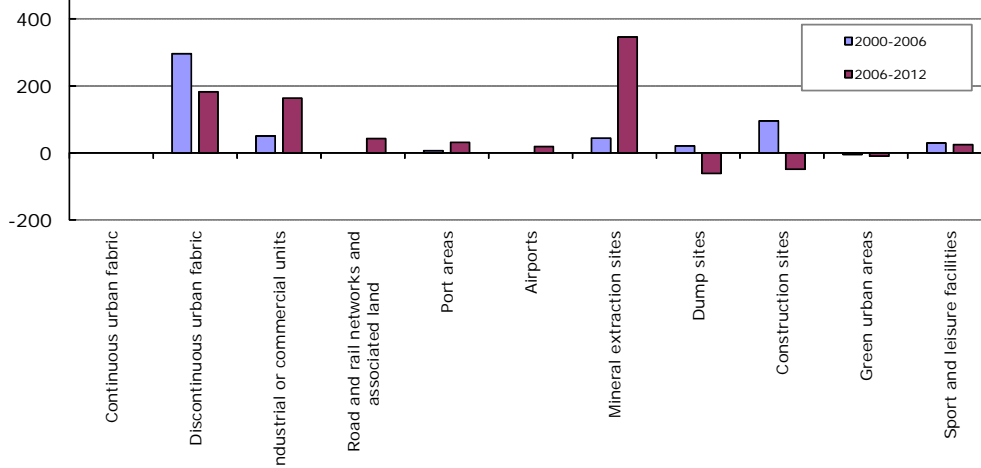


3.10. Artificial land take 2006-2012 [ha/year]

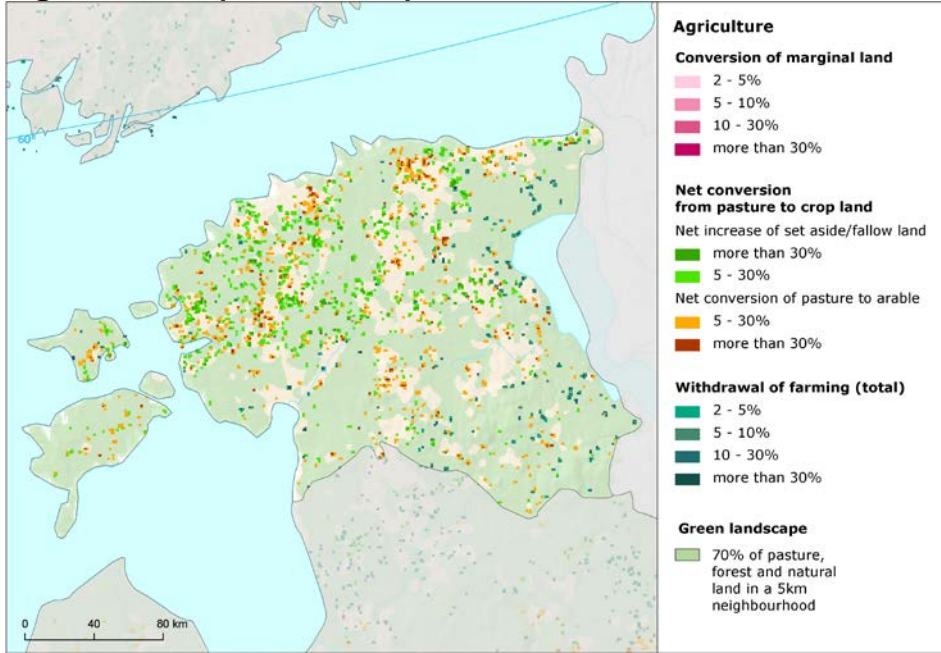
- Housing, services, recreation
- Industrial, commercial units
- Transport networks, infrastructures
- Mines, quarries, waste dumpsites
- Construction



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



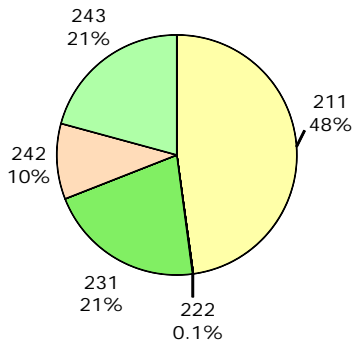
### Agriculture (2006-2012)



### Internal agriculture flows drive the overall landscape development

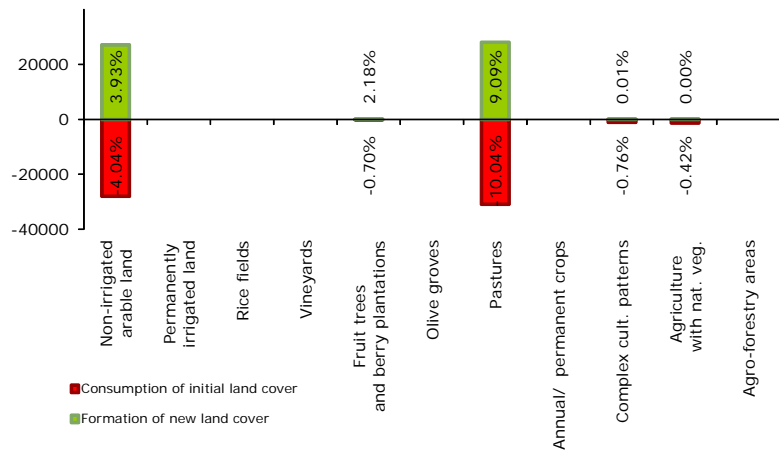
The development of agricultural land in Estonia, in particular significant increase of intensity of internal agricultural conversions, is the main reason for the overall acceleration of land cover development in the country. The conversion from pasture to arable land more than doubled its intensity and the opposite flow of pasture extension, which was not observed during the previous period, newly occurs with comparable intensity as the conversion to arable. Concerning the spatial pattern, conversion to arable land is distributed uniformly over most of the country, in contrast to extension of pasture, which is concentrated almost entirely in the northern half of Estonia. Beside these internal flows, also withdrawal of farming with woodland creation can be observed, mostly in the eastern part of the country. This flow, which also shows significantly increased intensity compared to previous period, is represented mainly by the conversion of pastures to transitional woodland and shrub.

4.12. Agricultural areas 2012 [% of total area]

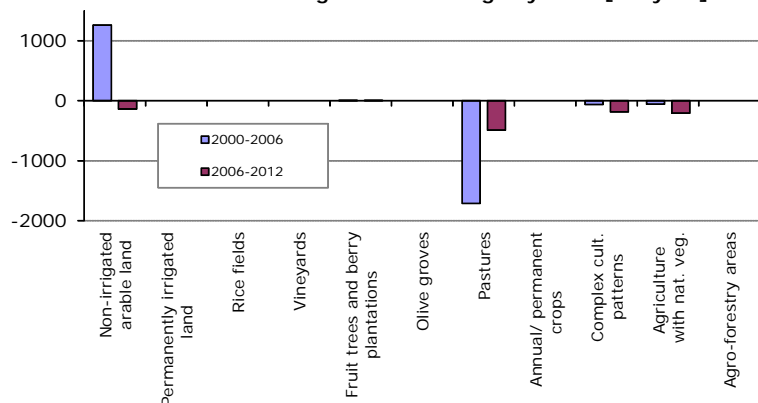


- 211 Non-irrigated arable land
- 212 Permanently irrigated land
- 213 Rice fields
- 221 Vineyards
- 222 Fruit trees and berry plantations
- 223 Olive groves
- 231 Pastures
- 241 Annual crops associated with permanent crops
- 242 Complex cultivation patterns
- 243 Agriculture land with significant areas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

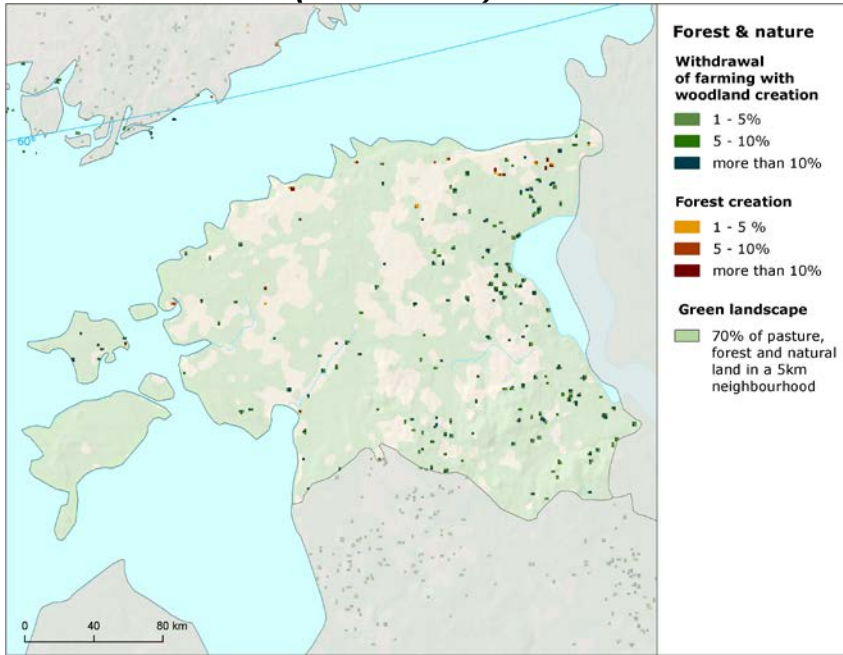
4.13. Development of agricultural areas 2006-2012 – detailed balance [ha]



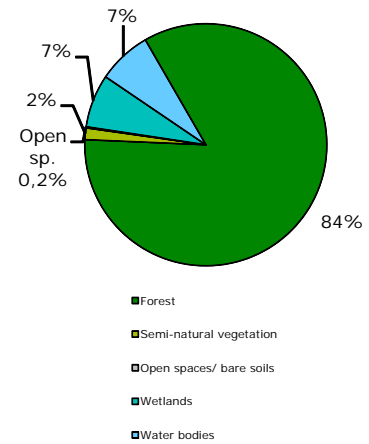
4.14. Mean annual agricultural change by class [ha/year]



### Forest & nature (2006-2012)



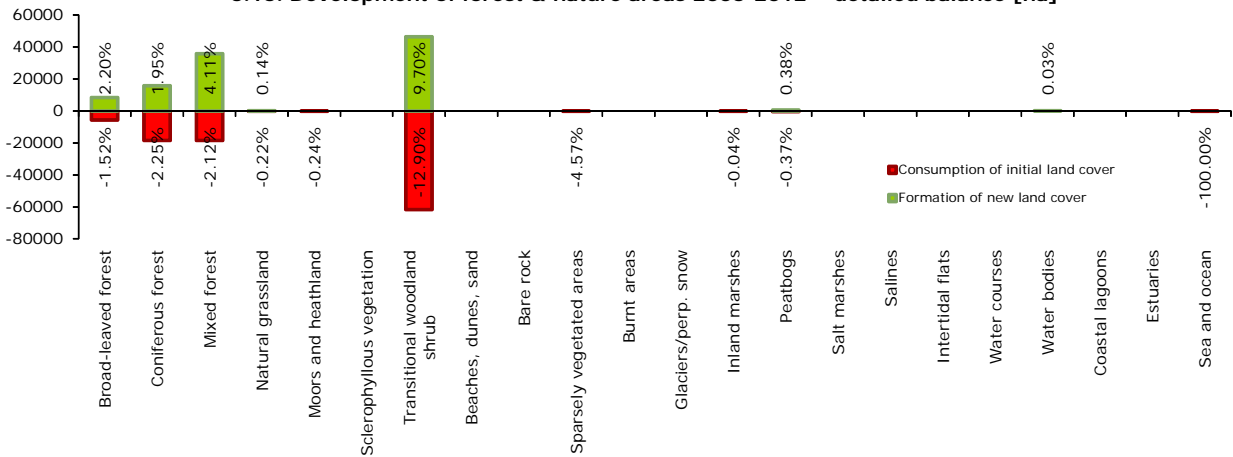
5.15. Forest & nature areas 2012 [% of total area]



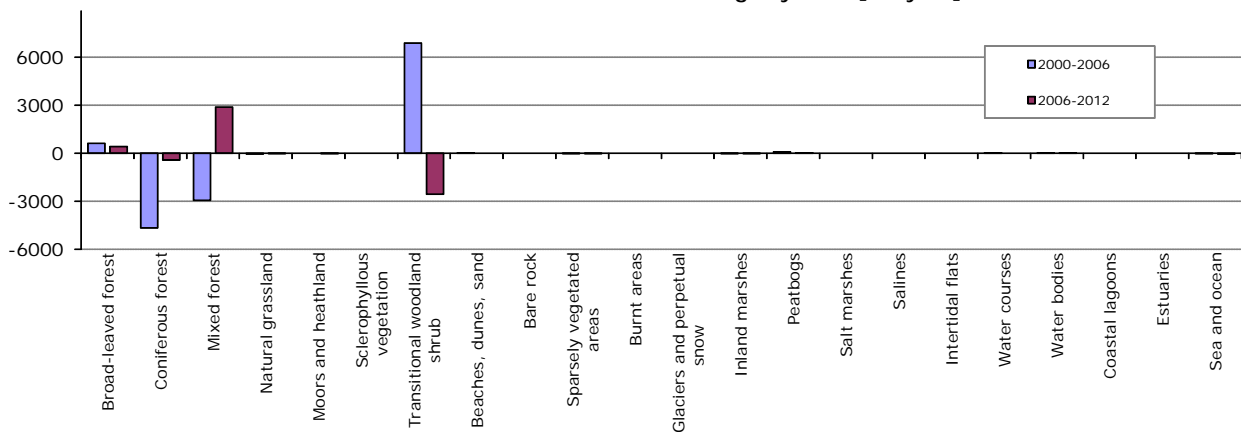
### Turnaround of internal forest conversions

Since the landscape in Estonia is characterised by its extensive forest coverage, it is not surprising that forest creation and management is the most powerful driver of land cover change in the country. The internal forest development switched its direction compared to the period 2000-2006. Now, the conversion from transitional woodland to forest is much more intensive than the opposite recent felling and transitional woodland creation. The other frequent source for formation of forested areas, mainly of new transitional woodland, is the withdrawal of farming accompanied by woodland creation, located mostly in the eastern part of the country. Pastures and agricultural land with natural vegetation are transformed into woodland in the frame of this conversion.

5.16. Development of forest & nature areas 2006-2012 – detailed balance [ha]



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

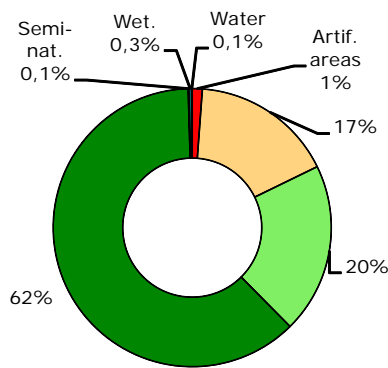




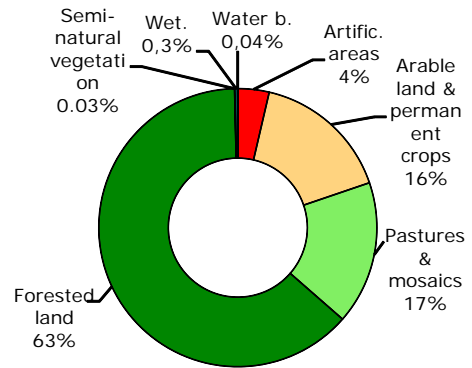
## Annex: Land cover flows and trends

### Land cover flows 2006-2012

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

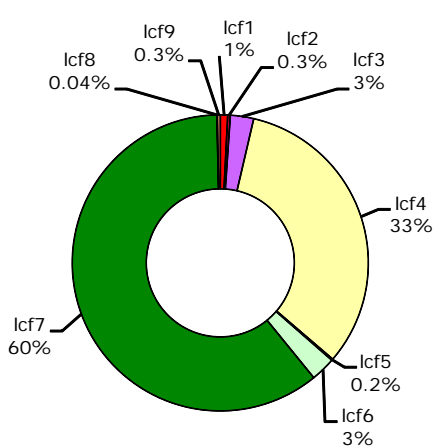


6.19. Formation of land cover 2006-2012 [% of total change area]



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

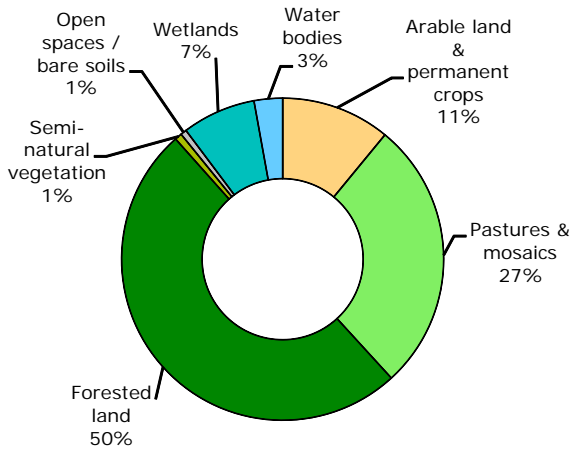
6.20. Drivers of change (LC FLOWS) 2006-2012 [% of total change area]



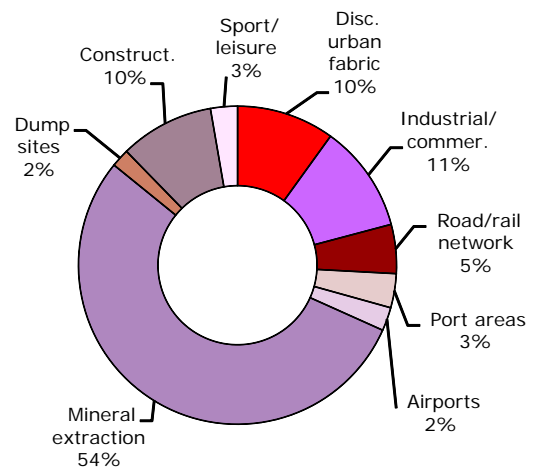
- Icf1 Urban land management
- Icf2 Urban residential sprawl
- Icf3 Sprawl of economic sites and infrastructures
- Icf4 Agriculture internal conversions
- Icf5 Conversion from forested & natural land to agriculture
- Icf6 Withdrawal of farming
- Icf7 Forests creation and management
- Icf8 Water bodies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

## Artificial areas

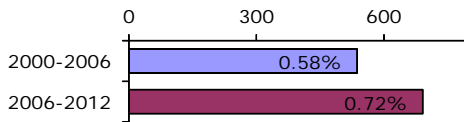
7.21. Consumption by artificial land take 2006-2012 [% of total]



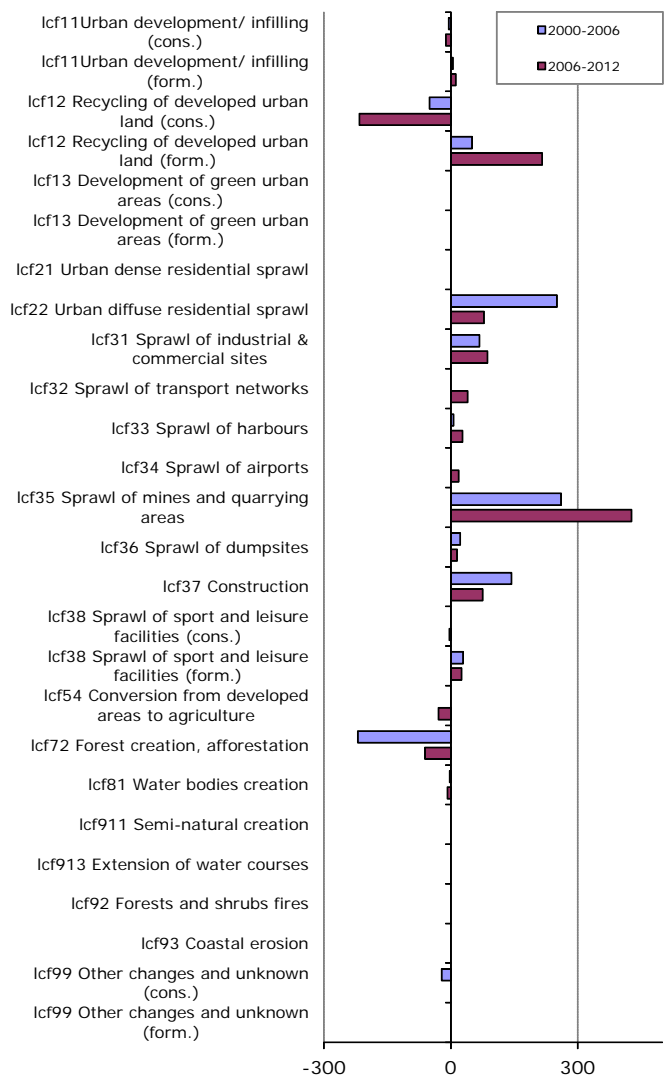
7.22. Formation by artificial land take 2006-2012 [% of total]



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



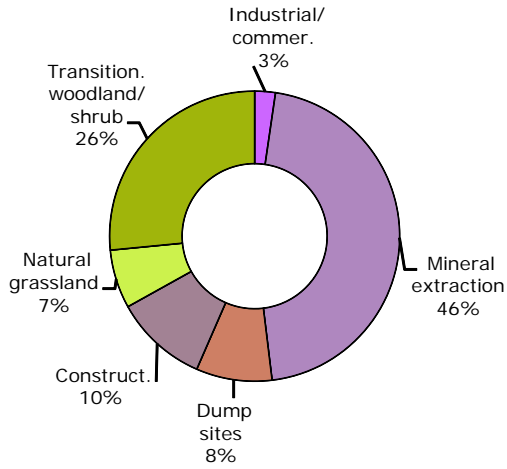
7.24. Artificial development by change drivers (LC FLOWS) [ha/year]



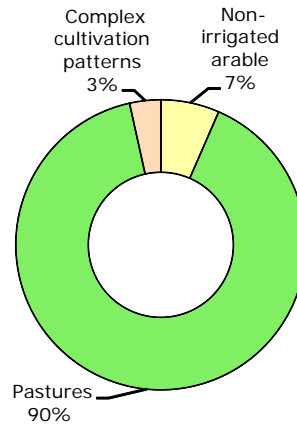


**Agriculture**

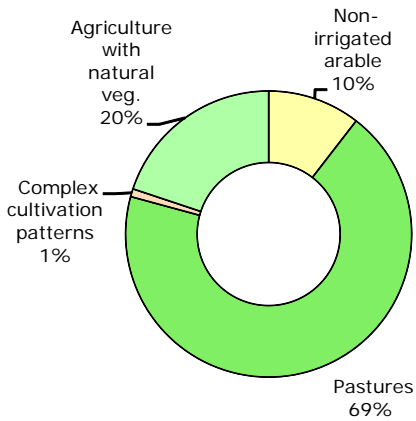
**8.25. LC consumed by agriculture 2006-2012 [% of total]**



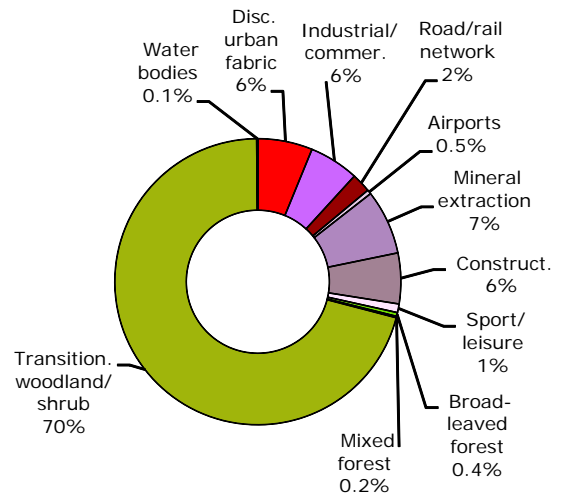
**8.26. Formation of agricultural land from non-agriculture 2006-2012 [% of total]**



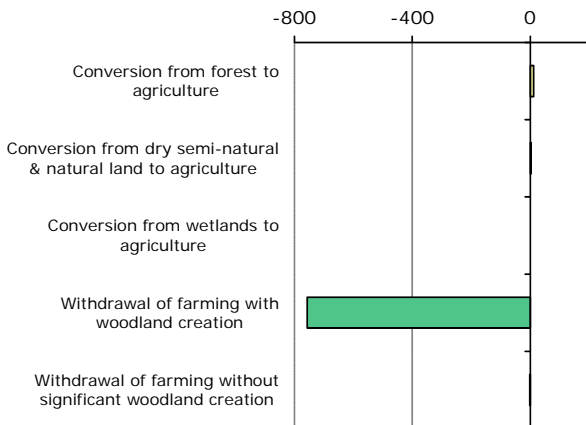
**8.27. Consumption of agricultural land by non-agriculture 2006-2012 [% of total]**



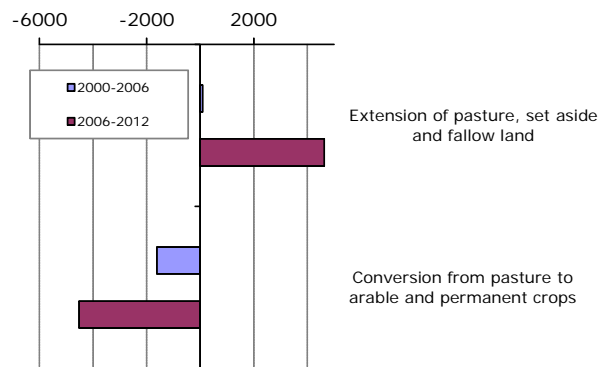
**8.28. Formation of non-agricultural land from agriculture 2006-2012 [% of total]**



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

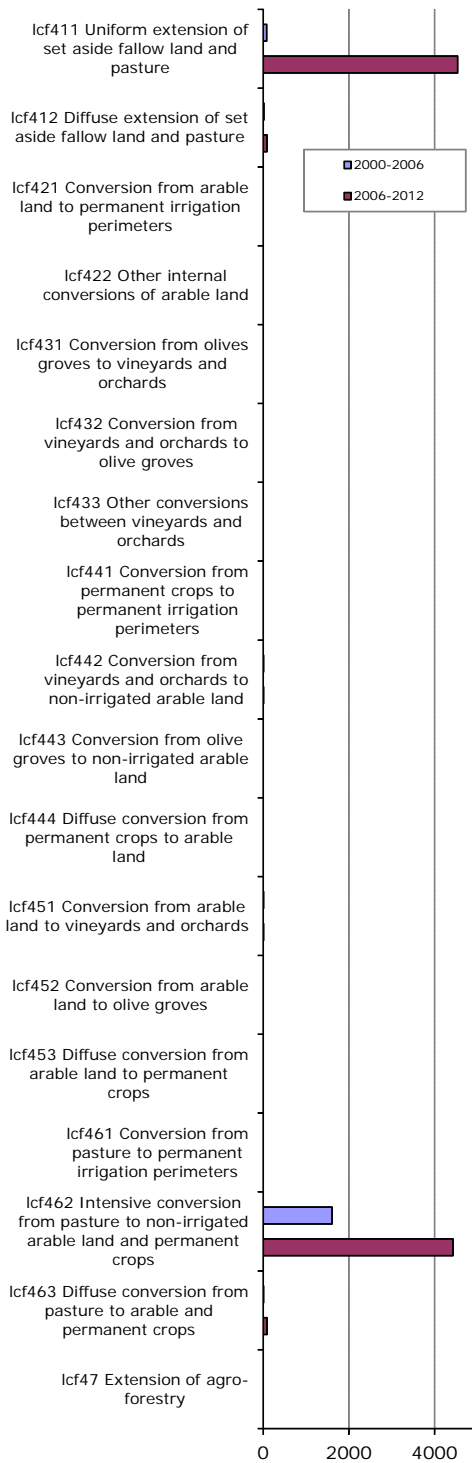


**8.30. Mean annual conversion between arable land and pasture [ha/year]**

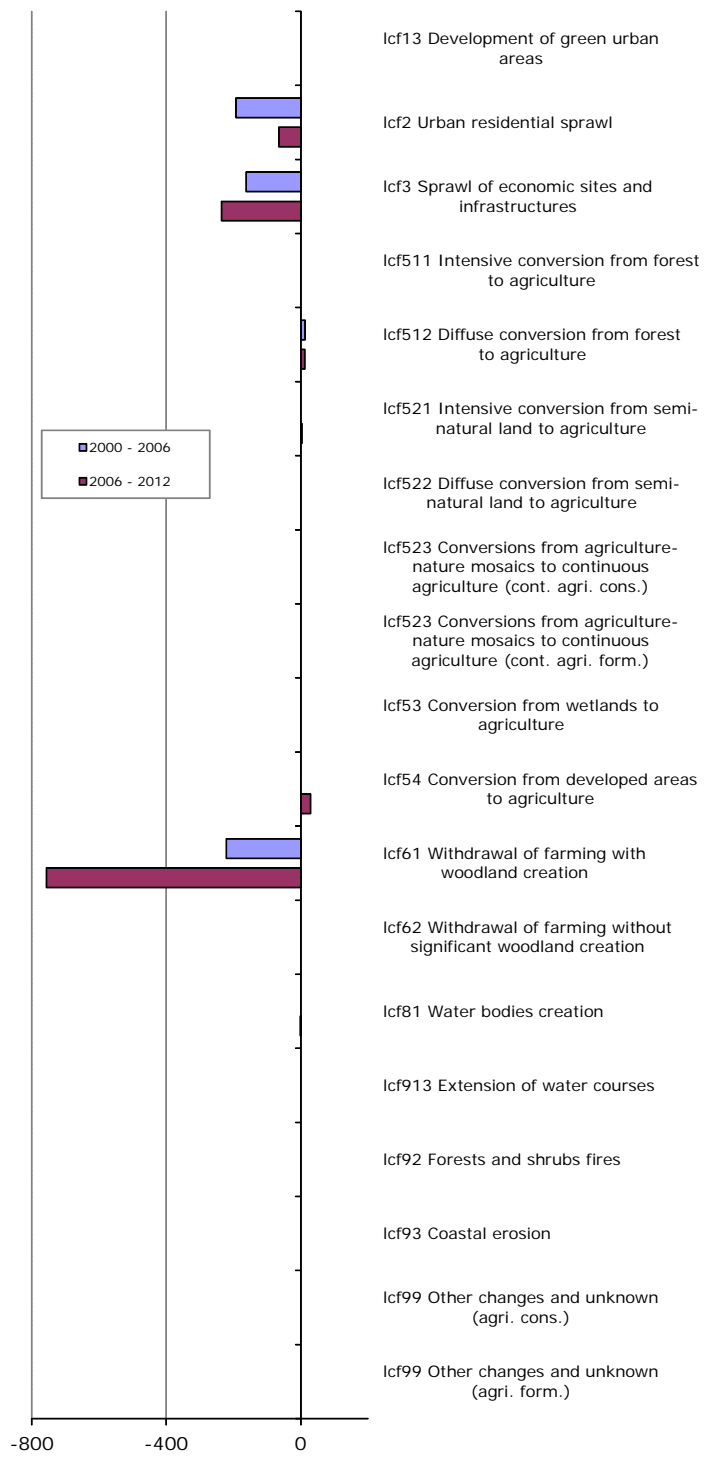


# Estonia

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

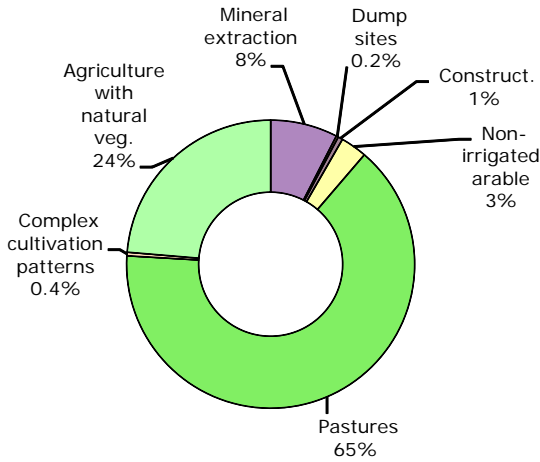


**9.32. Mean annual conversions between agriculture and other LC types [ha/year]**

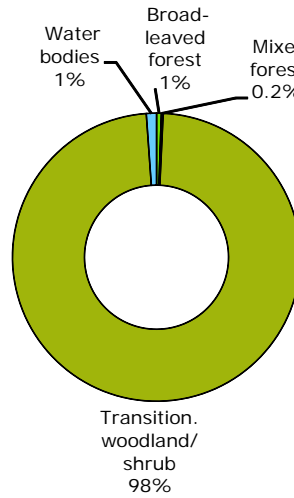


**Forest & nature**

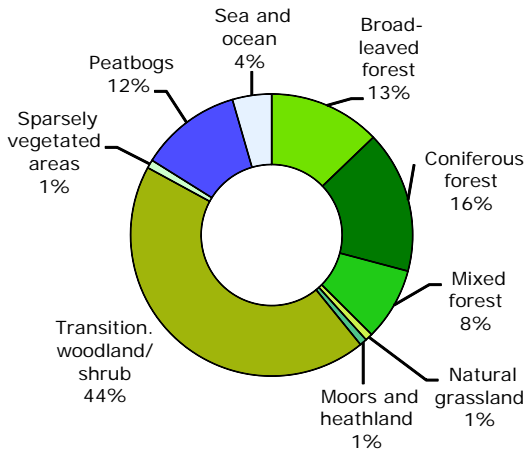
**10.33. LC consumed by forest & nature 2006-2012 [% of total]**



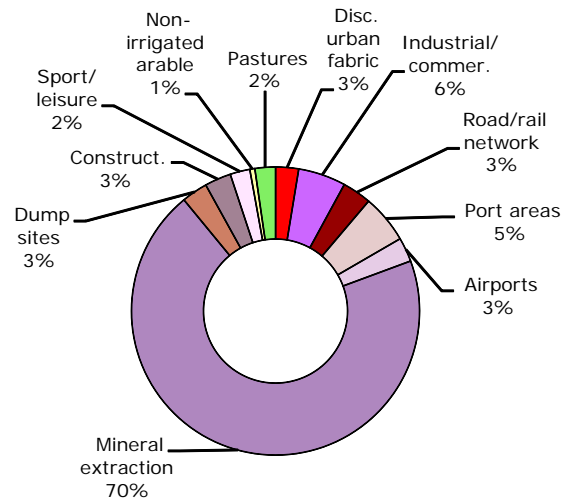
**10.34. Formation of forest & nature land from non-forest /nature 2006-2012 [% of total]**



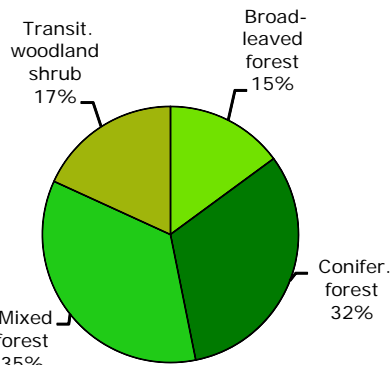
**10.35. Consumption of forest & nature land by non-forest/nature 2006-2012 [% of total]**



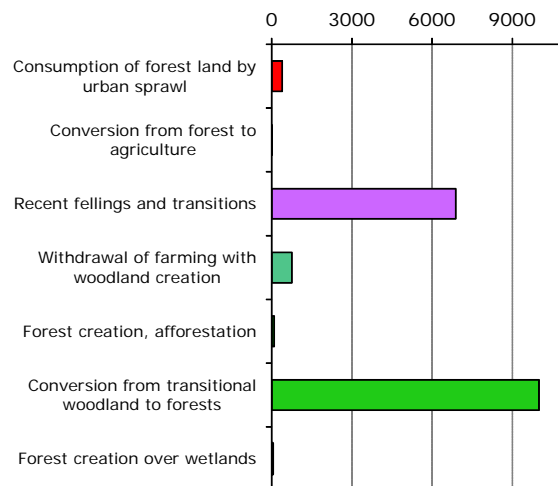
**10.36. Formation of non-forest/nature land from forest & nature 2006-2012 [% of total]**



**10.37. Forested land 2012 [% of total area]**



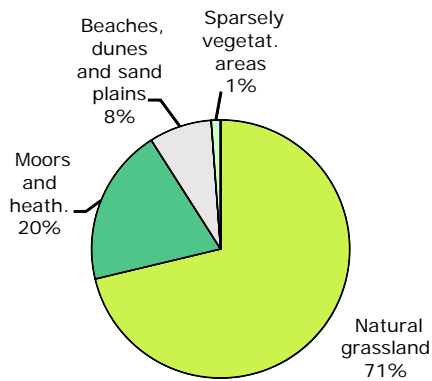
**10.38. Main trends in woodland & forests consumption/formation 2006-2012 [ha/year]**



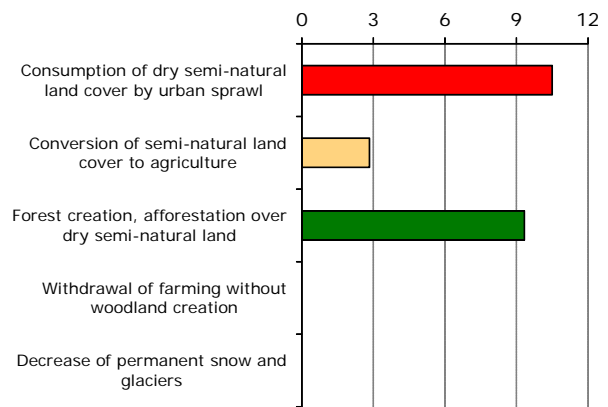


# Estonia

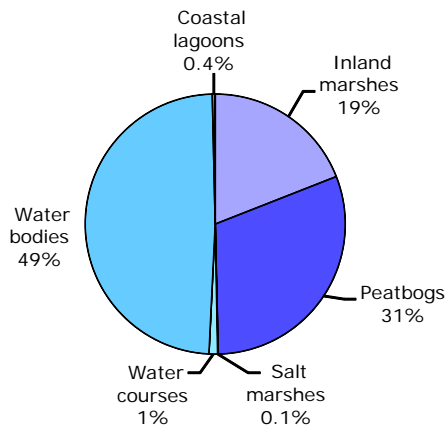
**11.39. Dry semi-natural areas 2012**  
[% of total area]



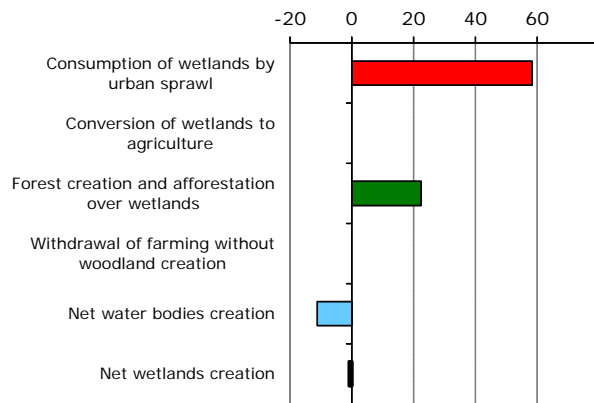
**11.40. Main trends in dry semi-natural land consumption/formation 2006-2012**  
[ha/year]



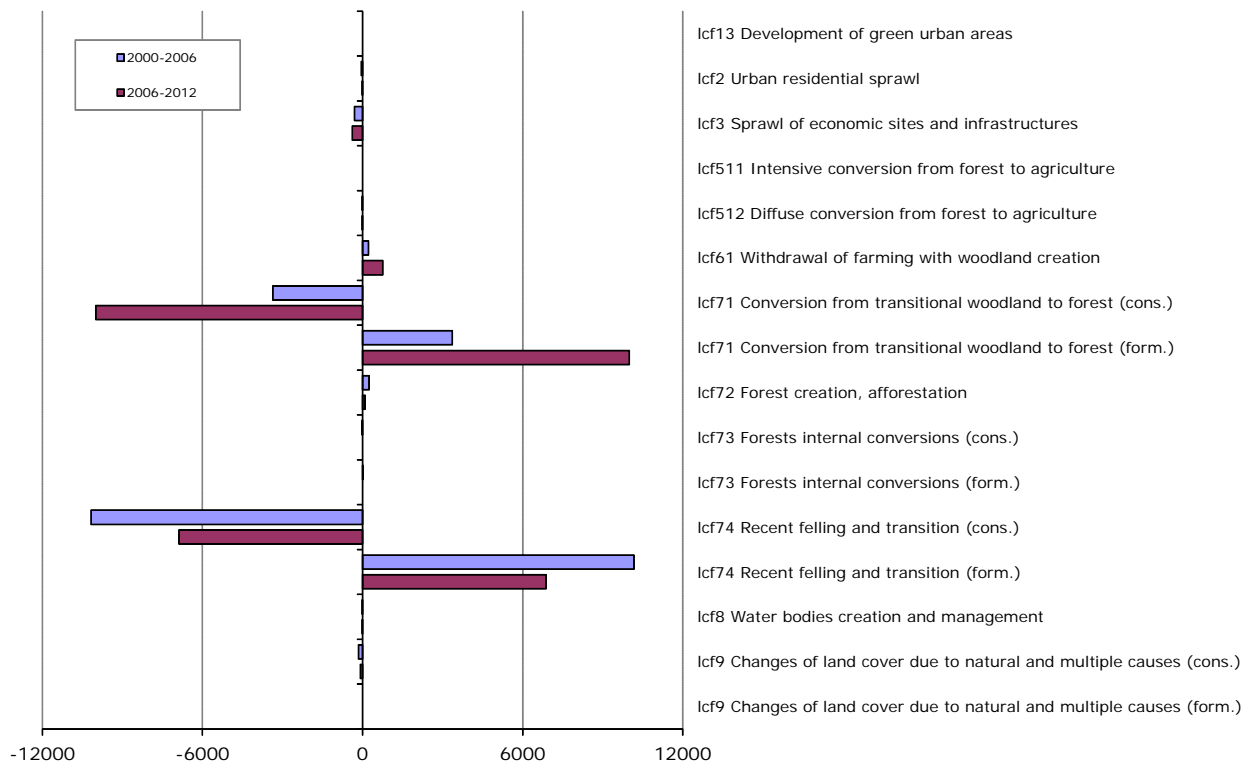
**11.41. Wetlands & water 2012**  
[% of total area]



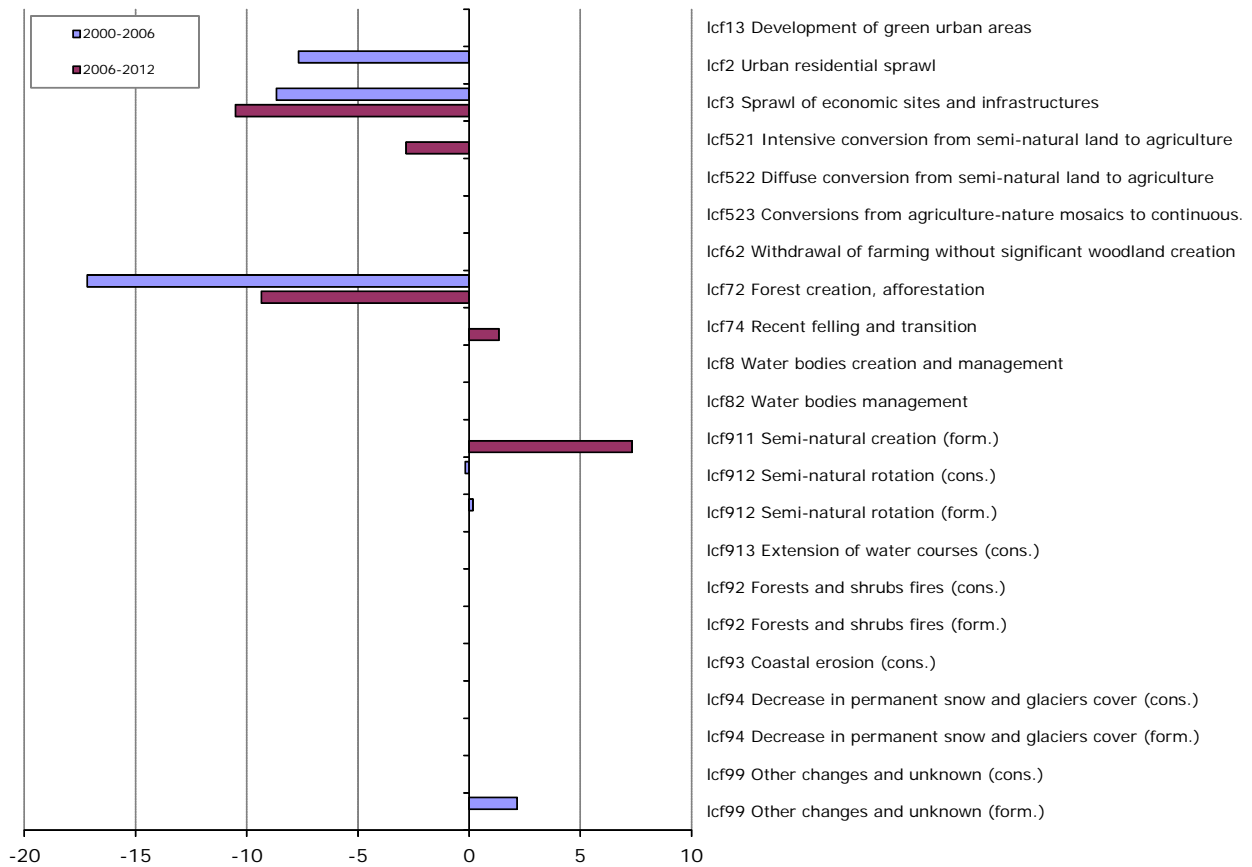
**11.42. Main trends in wetlands & water consumption/formation 2006-2012**  
[ha/year]



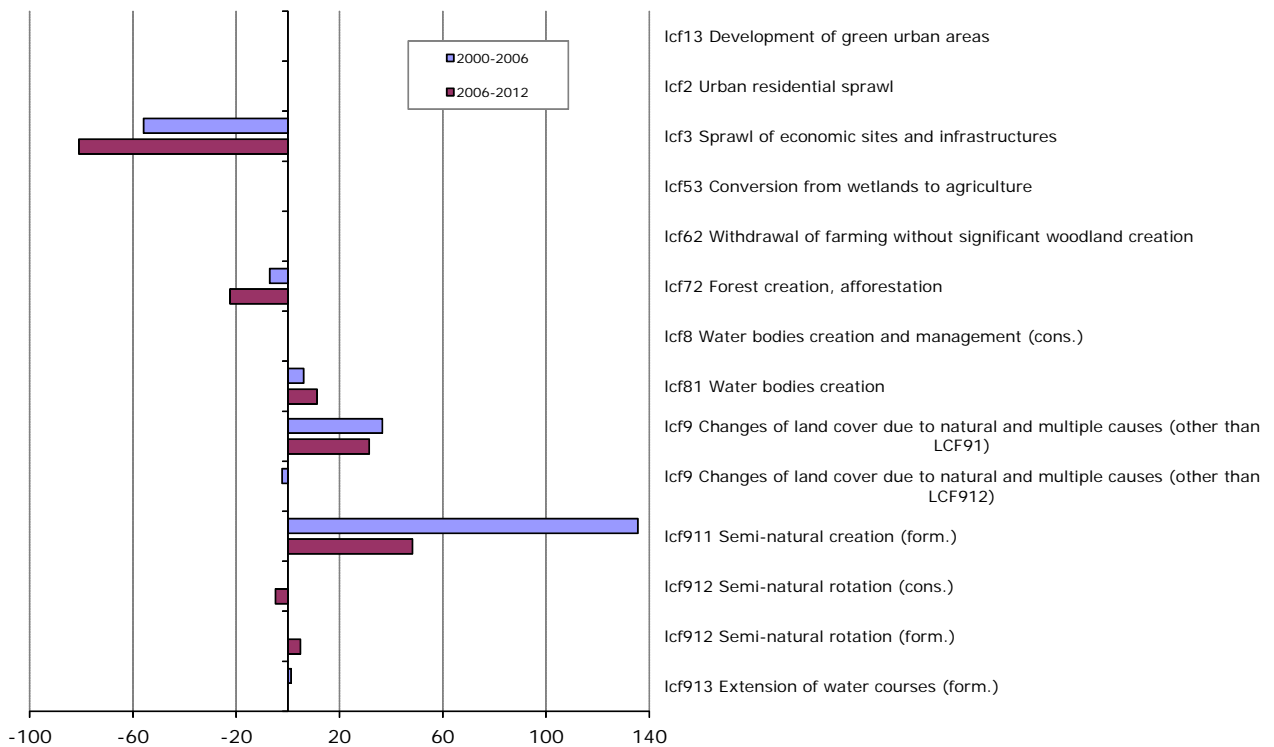
**11.43. Mean annual conversions of forest & other woodland**  
[ha/year]



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

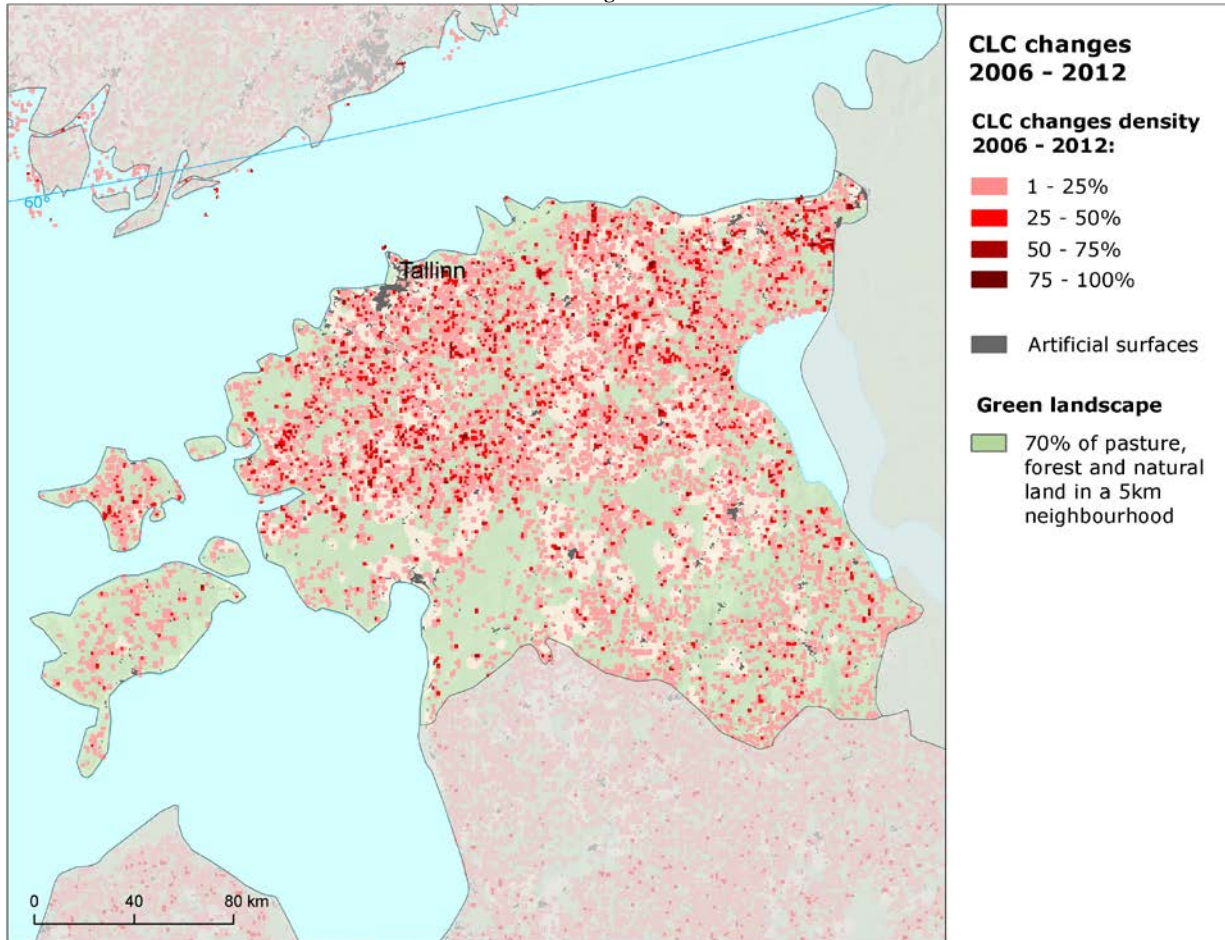


12.45. Mean annual conversions of wetlands and water LC [ha/year]

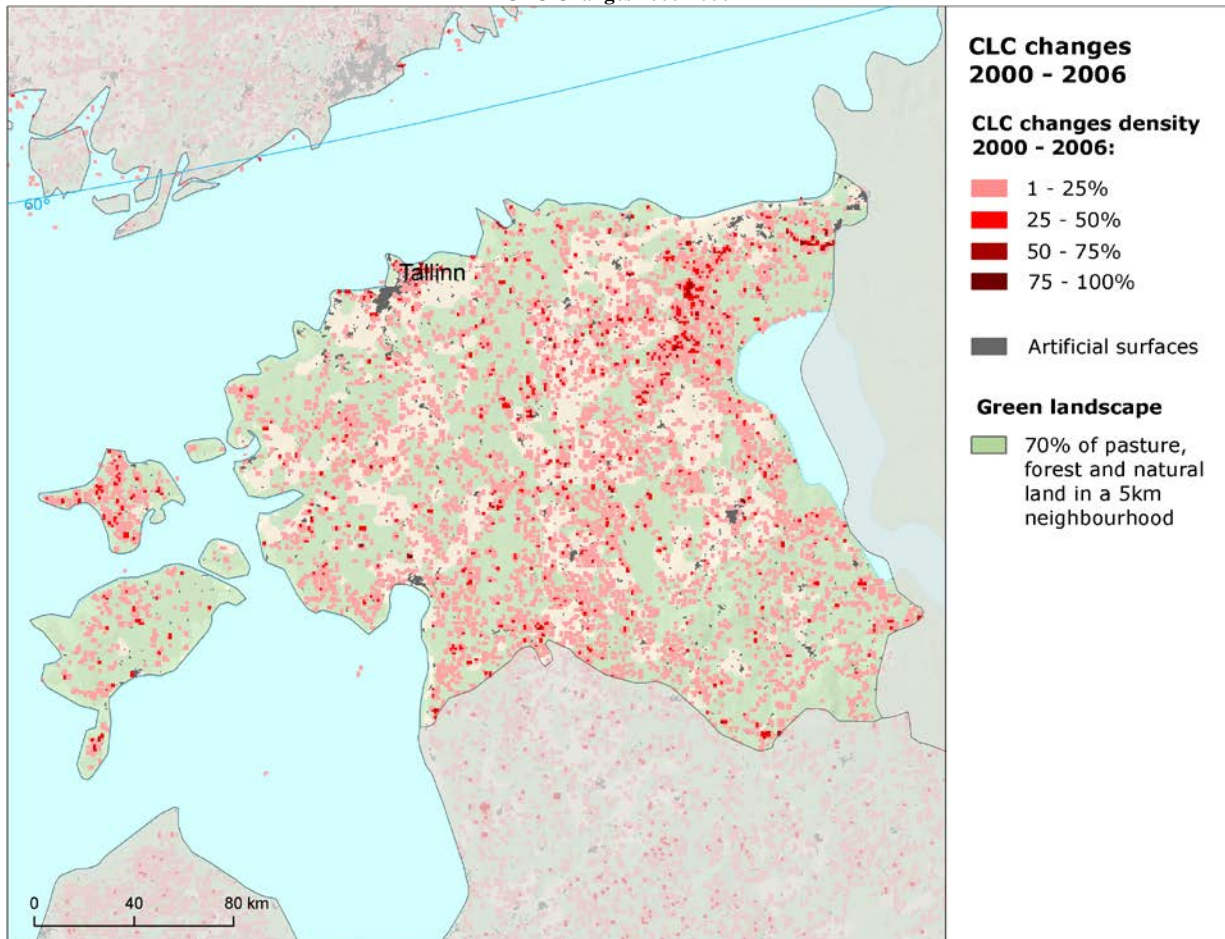


# Estonia

CLC Changes 2006-2012



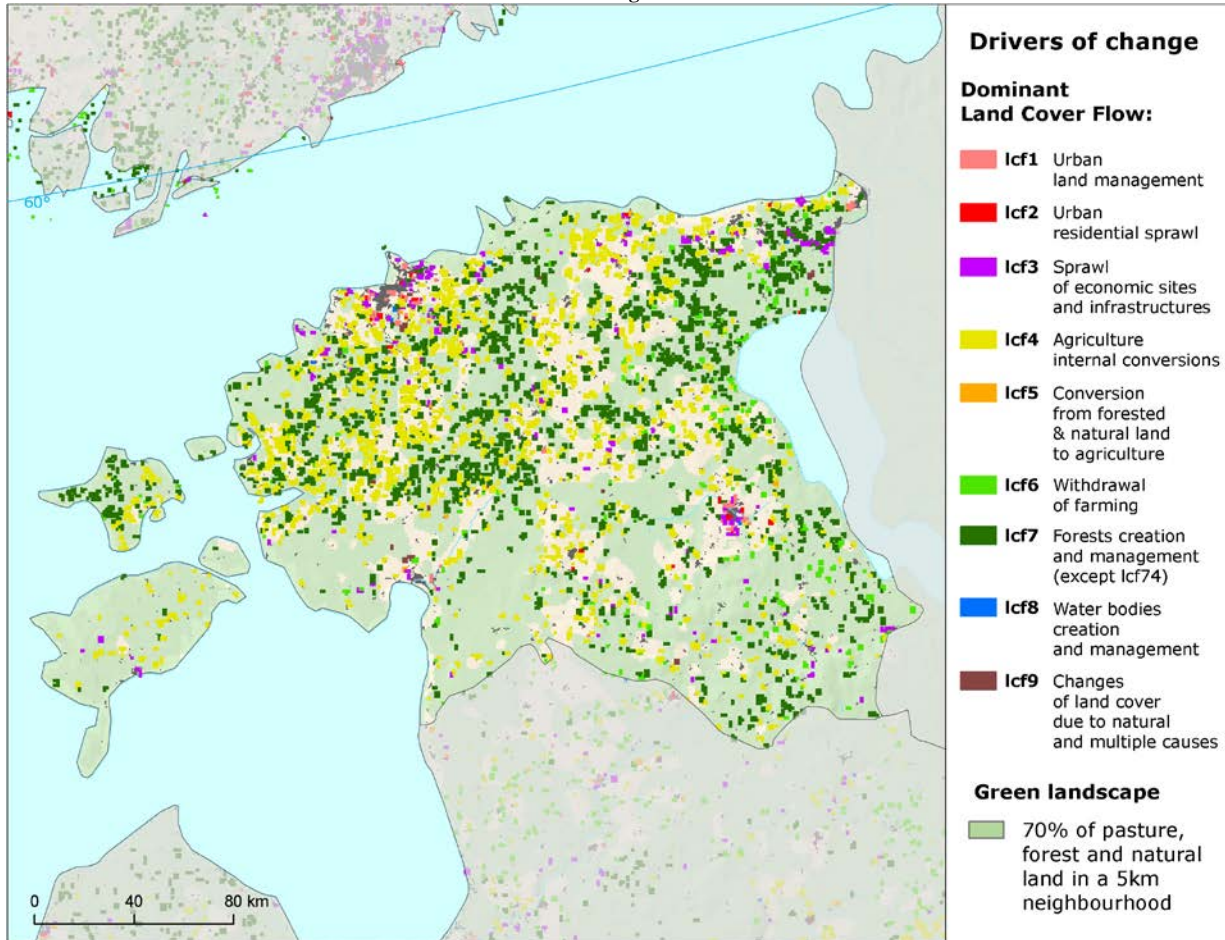
CLC Changes 2000-2006



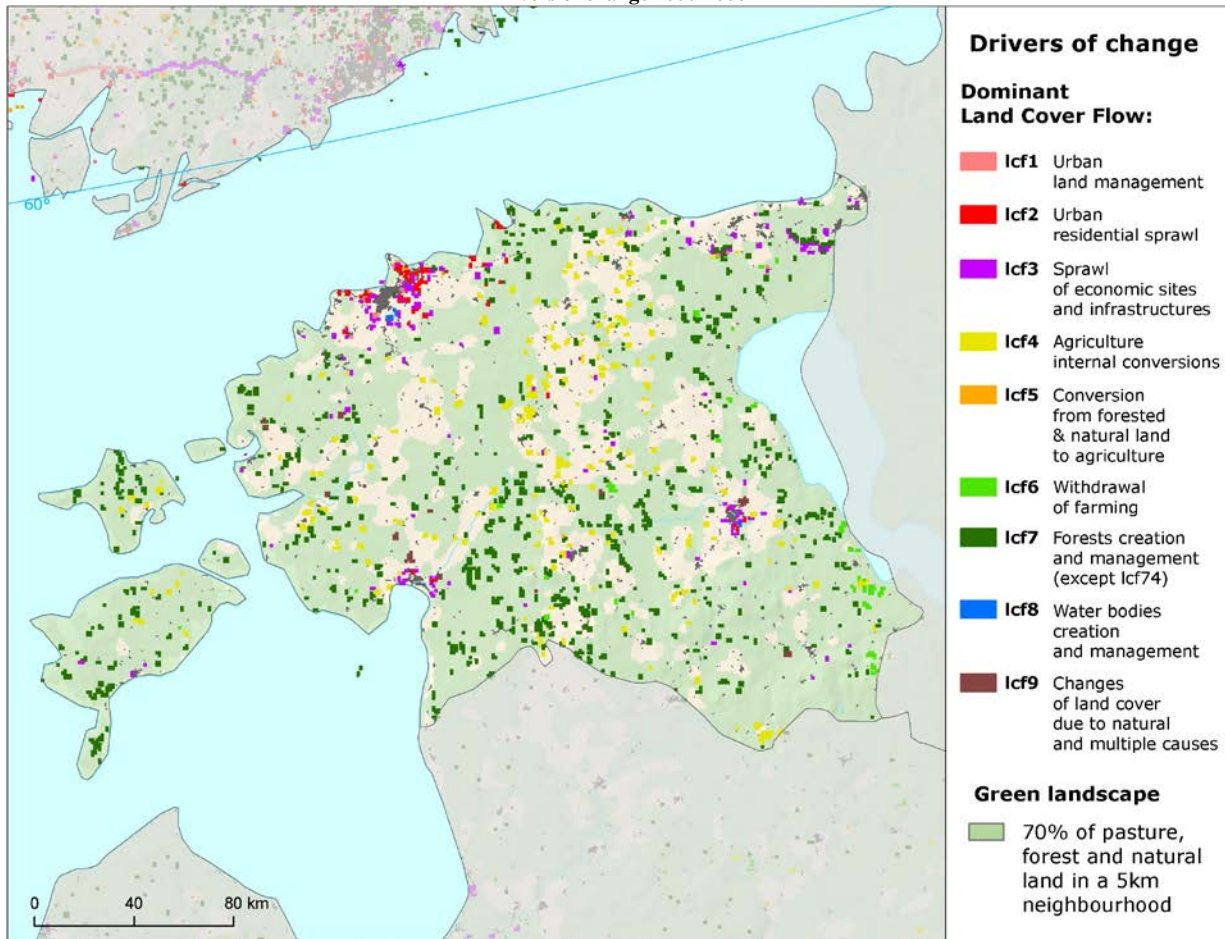


# Estonia

Drivers of change 2006-2012

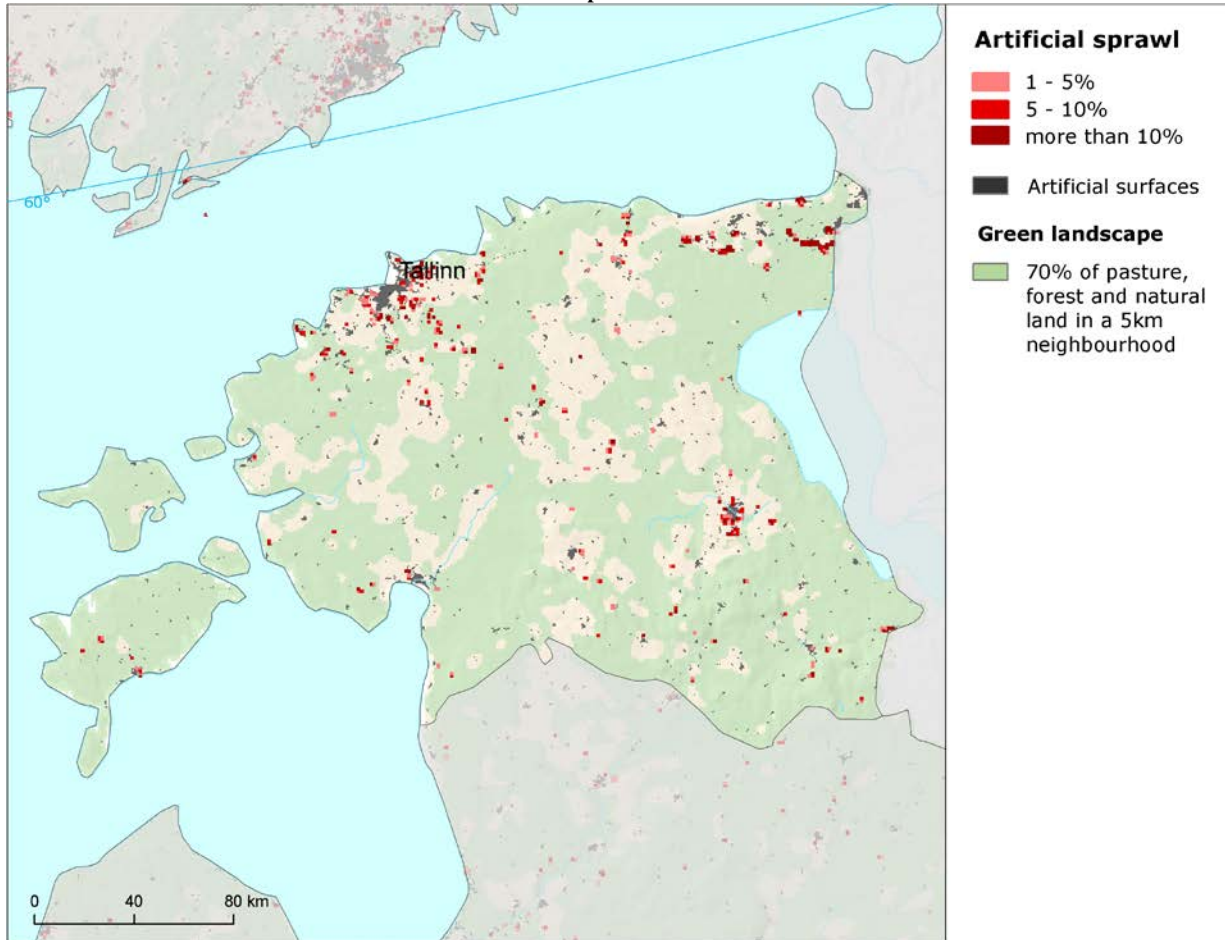


Drivers of change 2000-2006

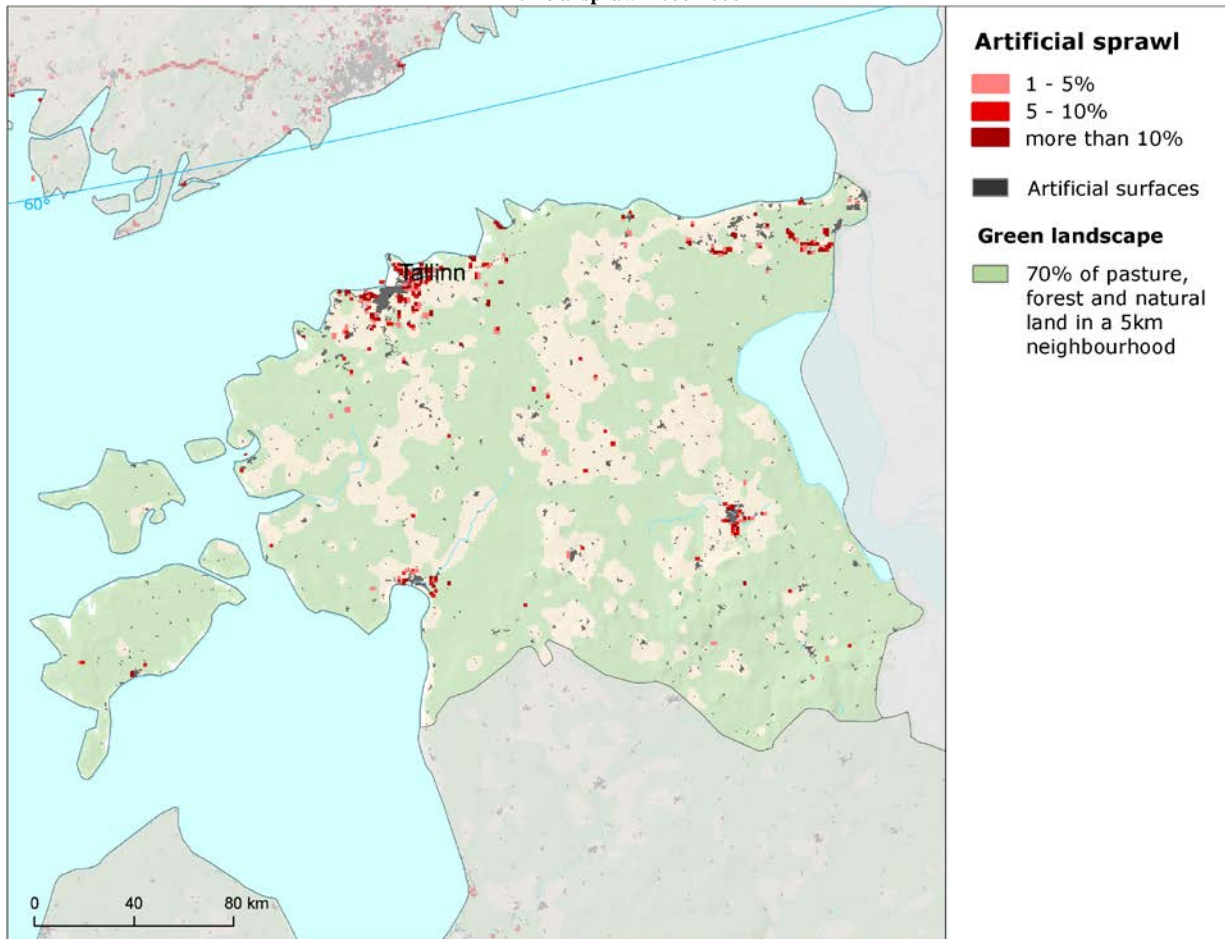


# Estonia

Artificial sprawl 2006-2012



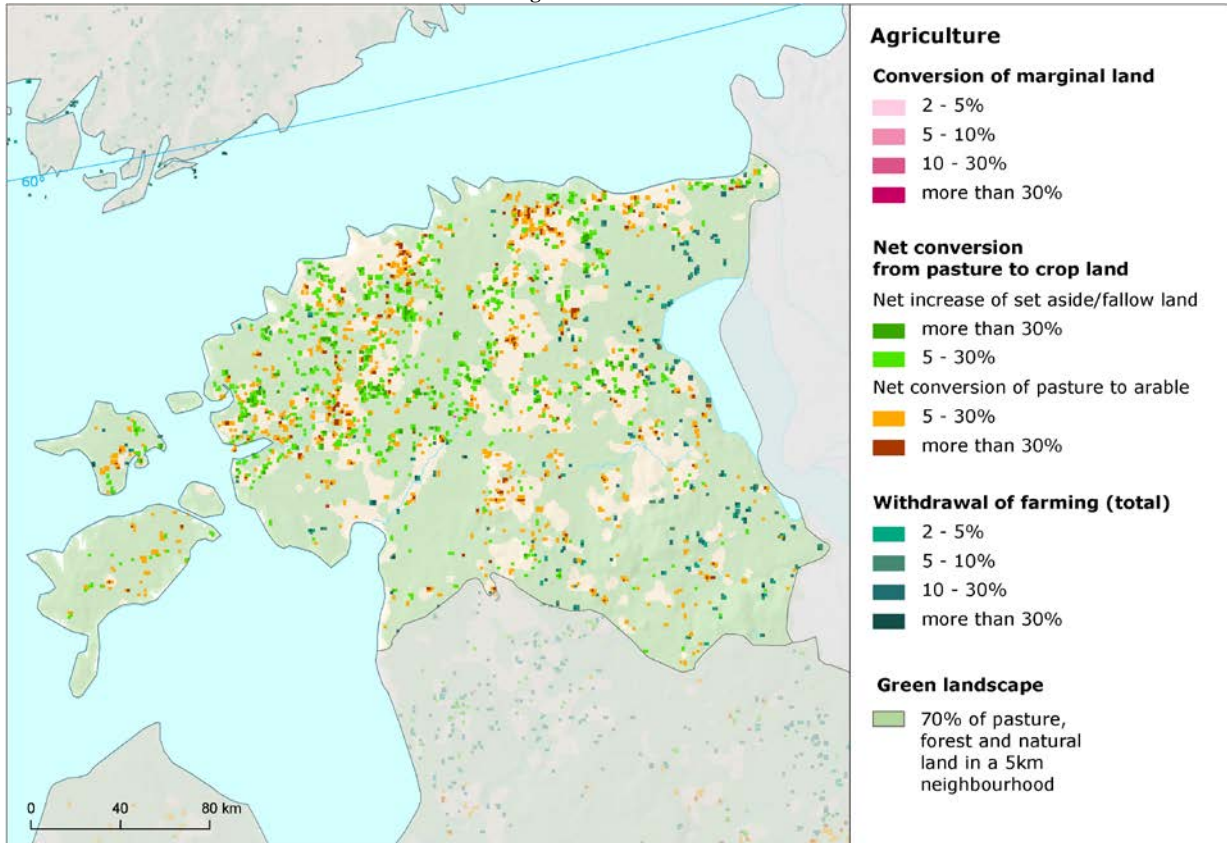
Artificial sprawl 2000-2006



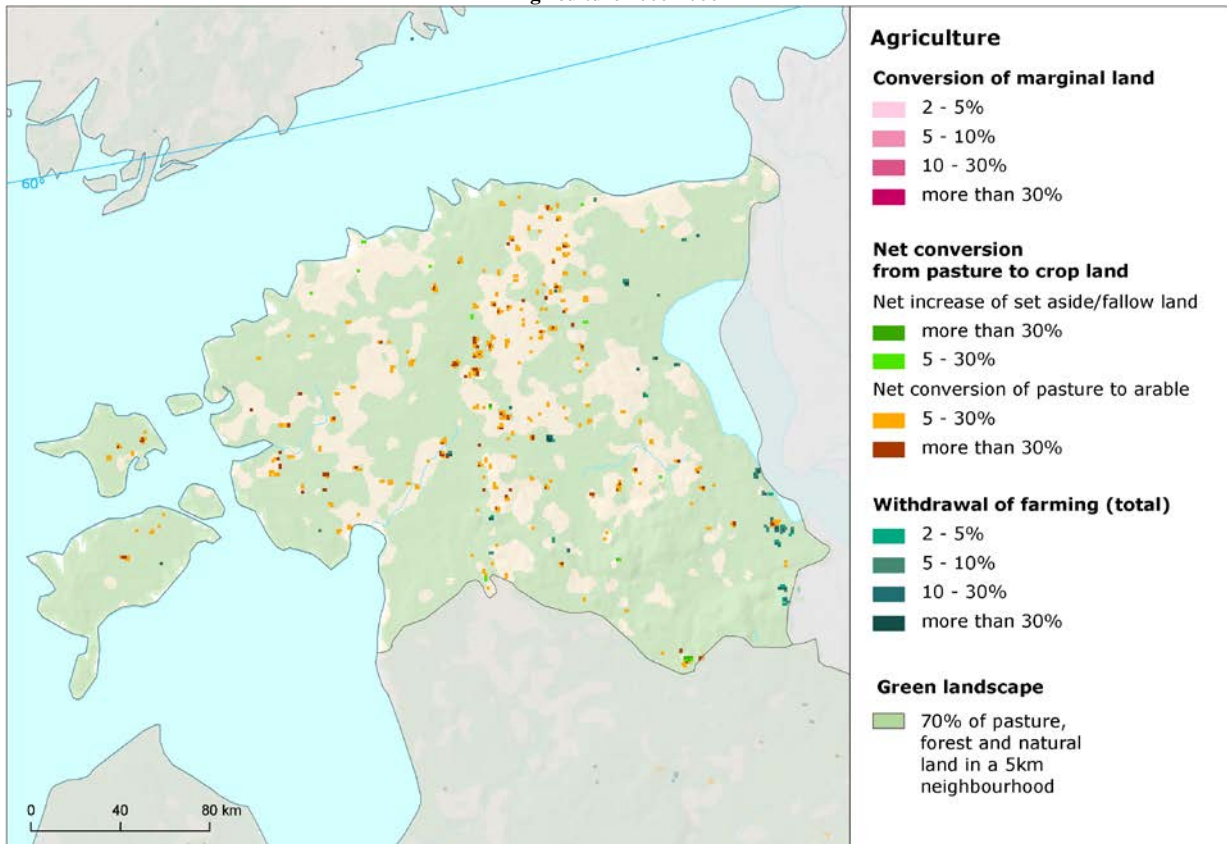


# Estonia

Agriculture 2006-2012



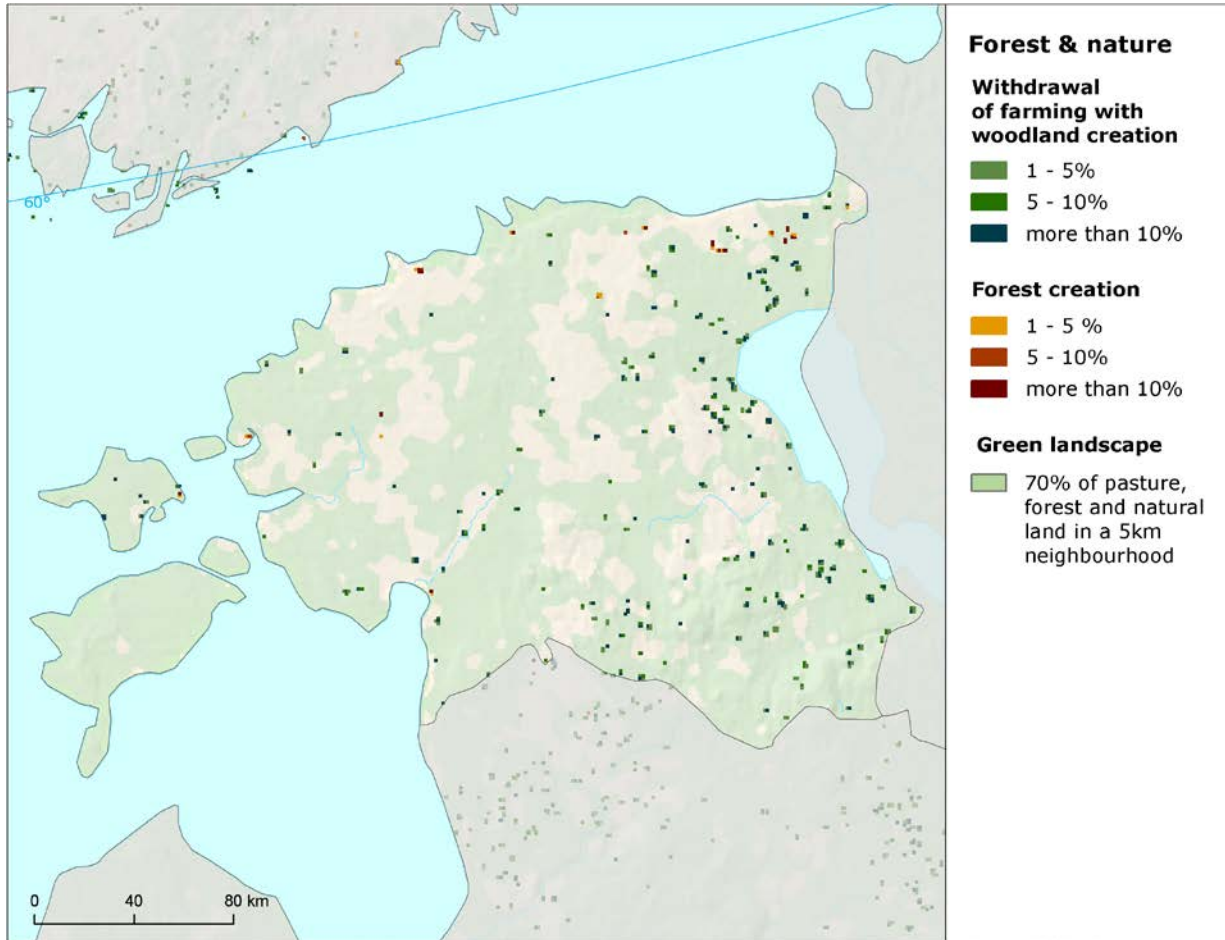
Agriculture 2000-2006





# Estonia

Forest and nature 2006-2012



Forest and nature 2000-2006

