Lithuania

Land cover 2012

Overview of land cover & change 2006-2012

The land cover development in Lithuania is getting slower, compared to the previous periods. With an annual change rate of 0.18%, its speed is slightly below the European average in the 2006-2012 period. This pace was a bit higher in the period 2000-2006, with a mean annual land take rate of 0.25%. However, both these values show a significant decrease of the land cover change intensity compared to the period 1990-2000, which was characterized by a change rate of 0.48% per year.

The main reason for this slowdown is the rapid decrease of the intensity of forest conversions, which were and still are the main drivers of the landscape development in the country. The intensity of both recent felling and opposite forest creation is about two times lower, compared to previous periods. In contrast, the intensity of the withdrawal of farming with woodland creation, which was rather low in the past, significantly increased and this flow plays now an important role in the Lithuanian land cover exchange.

Beside these two flows, also the internal agricultural conversions remain to be one of the main drivers of the land cover change, although several times weaker compared to the period 1990-2000, during which internal agricultural development was the most important driver of the landscape development in Lithuania.

The artificial land take is concentrated mostly around three largest Lithuanian cities – Vilnius, Kaunas and Kleipeda and is driven mainly by the construction and extension of mineral extraction areas. Its intensity is not very high – with an annual artificial land take rate of 0.3%, it is slightly below the European average. It is comparable with the previous period 2000-2006, however, the sprawl intensity was significantly lower before in Lithuania – in the period 1990-2000, the annual land take rate was only 0.07%.

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 Lithuania: 6

### Summary balance table 2006-2012

<table>
<thead>
<tr>
<th></th>
<th>Artificial areas</th>
<th>Arable land &amp; permanent crops</th>
<th>Pastures &amp; mosaics</th>
<th>Forested land</th>
<th>Semi-natural vegetation</th>
<th>Open spaces/ Bare soils</th>
<th>Wetlands</th>
<th>Water bodies</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land cover 2006</strong></td>
<td>2111</td>
<td>21391</td>
<td>17944</td>
<td>21803</td>
<td>49</td>
<td>32</td>
<td>615</td>
<td>1680</td>
<td>65625</td>
</tr>
<tr>
<td><strong>Consumption of initial LC</strong></td>
<td>40.4</td>
<td>74.3</td>
<td>241.4</td>
<td>349.5</td>
<td>1.4</td>
<td>3.6</td>
<td>2.0</td>
<td>0.1</td>
<td>713</td>
</tr>
<tr>
<td><strong>Formation of new LC</strong></td>
<td>62.3</td>
<td>119.2</td>
<td>31.8</td>
<td>494.4</td>
<td>0.2</td>
<td>0.0</td>
<td>1.3</td>
<td>3.4</td>
<td>713</td>
</tr>
<tr>
<td><strong>Net Formation of LC</strong></td>
<td>21.9</td>
<td>44.9</td>
<td>-209.5</td>
<td>144.9</td>
<td>-1.2</td>
<td>-3.6</td>
<td>-0.7</td>
<td>3.3</td>
<td>0</td>
</tr>
<tr>
<td><strong>Net formation as % of initial year</strong></td>
<td>1.0</td>
<td>0.2</td>
<td>-1.2</td>
<td>0.7</td>
<td>-2.4</td>
<td>-11.4</td>
<td>-0.1</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td><strong>Total turnover of LC</strong></td>
<td>102.7</td>
<td>193.6</td>
<td>273.2</td>
<td>843.9</td>
<td>1.6</td>
<td>3.6</td>
<td>3.4</td>
<td>3.5</td>
<td>1425</td>
</tr>
<tr>
<td><strong>Total turnover as % of initial year</strong></td>
<td>4.9</td>
<td>0.9</td>
<td>1.5</td>
<td>3.9</td>
<td>3.2</td>
<td>11.4</td>
<td>0.5</td>
<td>0.2</td>
<td>2.2</td>
</tr>
</tbody>
</table>

| **Land cover 2012** | 2133             | 21436                         | 17734             | 21948         | 48                      | 28                      | 614      | 1684        | 65625 |
Lithuania

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]

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

Summary trend figures

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual land cover change as % of initial year</td>
<td>0.25%</td>
<td>0.18%</td>
</tr>
<tr>
<td>Land uptake by artificial development as mean annual change [ha/year]</td>
<td>563</td>
<td>612</td>
</tr>
<tr>
<td>Agricultural land uptake by urban and infrastructures development as mean annual change [ha/year]</td>
<td>543</td>
<td>561</td>
</tr>
<tr>
<td>Net uptake of forests and semi-natural land by agriculture as mean annual change [ha/year]</td>
<td>-312</td>
<td>-2378</td>
</tr>
<tr>
<td>Net conversion from pasture to arable land and permanent crops as mean annual change [ha/year]</td>
<td>797</td>
<td>2013</td>
</tr>
<tr>
<td>Forest &amp; other woodland net formation as mean annual change [ha/year]</td>
<td>439</td>
<td>2415</td>
</tr>
<tr>
<td>Dry semi-natural land cover net formation as mean annual change [ha/year]</td>
<td>28</td>
<td>-80</td>
</tr>
<tr>
<td>Wetlands &amp; water bodies net formation as mean annual change [ha/year]</td>
<td>-81</td>
<td>44</td>
</tr>
</tbody>
</table>
Formation of residential fabric culminates

The recent rate of artificial land take in Lithuania is comparable to the previous period 2000-2006, in contrast to the net formation rate of artificial land, which decreased a bit. It indicates that not only the sprawl, but also the consumption of artificial surfaces (represented by afforestation or agricultural land creation over former mineral extraction sites) occurs in Lithuania. Recycling of developed urban land is the most extensive flow in the frame of artificial development in the country. A formation of discontinuous urban fabric, which was the main driver of the artificial development already in previous periods, continues with almost doubled intensity in the period 2006-2012. However, this residential area formation is realized mainly through finalization of units, which were under construction already during the previous period. The land take itself is driven mainly by new construction, together with the extension of mines and quarry areas. The sprawl is concentrated mostly in the surroundings of the capital city Vilnius (mostly recycling of developed urban land with residential units formation) and also of two other major Lithuanian cities – Kaunas and Klaipeda.
Agriculture (2006-2012)

Rapid increase of withdrawal of farming

The overall dynamics of agricultural development in Lithuania is high, and agricultural conversions belong to the major forces in the frame of land cover exchanges. The two most significant conversions of the Lithuanian agricultural land are the internal conversion from pasture to arable and also the withdrawal of farming with transitional woodland creation. While the first one was obvious already during the previous period, withdrawal of farming is much stronger in the 2006-2012 and became the second most extensive flow in Lithuania. Concerning the spatial distribution of these transitions, conversion from pasture to arable is uniformly scattered over most of the country, while the majority of the withdrawal of farming is concentrated in the eastern part of Lithuania. As a result of this development, pastures and agriculture with natural vegetation have negative balance of net change, in contrast to the arable land, with prevailing formation of area. Agricultural land is also consumed by the sprawl of economic sites and infrastructures, mostly by the extension of construction sites.

4.12. Agricultural areas 2012 [% of total area]


4.14. Mean annual agricultural change by class [ha/year]
Woodland creation becomes an important driver

Compared to the previous period, the intensity of the internal forest conversions significantly decreased, in contrast to the withdrawal of farming with forest creation, which became much stronger in the 2006-2012 period. Mostly, transitional woodland and shrub has been created in the frame of this flow. The overall balance of forested and natural land shows consumption of all forested types (broad-leaved, coniferous and mixed forest) and formation of transitional woodland and shrub – this balance is caused by both recent felling and transitional woodland formation over mainly pasture land. The geographical distribution of forest land conversion shows a similar pattern as in previous period with major concentration of withdrawal of farming located into the eastern part of the country. An interesting process which occurs in Lithuanian landscape is the abandonment of former mineral extraction sites with transitional woodland creation.
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]
Lithuania

Artificial areas

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

- Arable land & permanent crops 46%
- Pastures & mosaics 42%
- Forested land 12%
- Water bodies 0.3%

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

- Disc. urban fabric 12%
- Sport/leisure 3%
- Industrial/commer. 3%
- Road/rail network 2%
- Port areas 0.3%
- Airports 0.2%
- Minerald extraction 26%
- Construct. 53%
- Dump sites 1%

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

- 2000-2006: -0.22%
- 2006-2012: -0.17%

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

lcf11 Urban development/ infilling (cons.)
lcf11 Urban development/ infilling (form.)
lcf12 Recyling of developed urban land (cons.)
lcf12 Recycling of developed urban land (form.)
lcf13 Development of green urban areas (cons.)
lcf13 Development of green urban areas (form.)
lcf21 Urban dense residential sprawl
lcf22 Urban diffuse residential sprawl
lcf31 Sprawl of industrial & commercial sites
lcf32 Sprawl of transport networks
lcf33 Sprawl of harbours
lcf34 Sprawl of airports
lcf35 Sprawl of mines and quarrying areas
lcf36 Sprawl of dumpsites
lcf37 Construction
lcf38 Sprawl of sport and leisure facilities (cons.)
lcf38 Sprawl of sport and leisure facilities (form.)
lcf54 Conversion from developed areas to agriculture
lcf72 Forest creation, afforestation
lcf81 Water bodies creation
lcf91 Semi-natural creation
lcf913 Extension of water courses
lcf92 Forests and shrubs fires
lcf93 Coastal erosion
lcf99 Other changes and unknown (cons.)
lcf99 Other changes and unknown (form.)
Lithuania

Agriculture

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

Transition. woodland/shrub 21%
Coniferous forest 2%
Construct. 7%
Dump sites 27%
Mineral extraction 45%

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

Agriculture with natural veg. 11%
Complex cultivation patterns 3%
Non-irrigated arable 17%
Pastures 69%

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

Agriculture with natural veg. 27%
Complex cultivation patterns 12%
Pastures 26%
Fruit trees/berry plantations 0.1%
Non-irrigated arable 35%

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

Transition. woodland/shrub 80%
Disc. urban fabric 3%
Industrial commer. 1%
Road/rail network 0.4%
Mineral extraction 4%
Construct. 11%
Sport/leisure 1%
Coniferous forest 0.01%
Mixed forest 0.01%
Water bodies 1%

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

Conversion from forest to agriculture
Conversion from dry semi-natural & natural land to agriculture
Conversion from wetlands to agriculture
Withdrawal of farming with woodland creation
Withdrawal of farming without significant woodland creation
Extension of pasture, set aside and fallow land
Conversion from pasture to arable and permanent crops
Lithuania

Forest & nature

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

- Mineral extraction 6%
- Dump sites 0.3%
- Construct. 1%
- Agriculture with natural veg. 30%
- Complex cultivation patterns 8%
- Non-irrigated arable 29%
- Pastures 26%

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

- Water bodies 2%
- Inland marshes 0.2%
- Coniferous forest 0.01%
- Mixed forest 0.01%
- Natural grassland 0.1%
- Transition. woodland/shrub 97%

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

- Coastal lagoons 2%
- Broad-leaved forest 24%
- Mixed forest 8%
- Coniferous forest 22%
- Transition. woodland/shrub 45%

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

- Disc. urban fabric 1%
- Port areas 2%
- Airports 1%
- Industrial/commer. 2%
- Sport/leisure 3%
- Construct. 6%
- Mineral extraction 55%
- Dump sites 11%

10.37. Forested land 2012 [% of total area]

- Transit. woodland/shrub 14%
- Broad-leaved forest 20%
- Mixed forest 33%
- Conifer. forest 32%

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

- Consumption of forest land by urban sprawl
- Conversion from forest to agriculture
- Recent fellings and transitions
- Withdrawal of farming with woodland creation
- Forest creation, afforestation
- Conversion from transitional woodland to forests
- Forest creation over wetlands
**11.39. Dry semi-natural areas 2012 [% of total area]**

- Natural grassland: 19%
- Moors and heathland: 45%
- Beaches, dunes, and sand plains: 25%
- Sparsely vegetated areas: 12%
- Burnt areas: 1%

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

- Consumption of dry semi-natural land cover by urban sprawl
- Conversion of semi-natural land cover to agriculture
- Forest creation, afforestation over dry semi-natural land
- Withdrawal of farming without woodland creation
- Decrease of permanent snow and glaciers

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

- Water bodies: 47%
- Water courses: 8%
- Peatbogs: 18%
- Coastal lagoons: 18%
- Inland marshes: 9%

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

- Consumption of wetlands by urban sprawl
- Conversion of wetlands to agriculture
- Forest creation and afforestation over wetlands
- Withdrawal of farming without woodland creation
- Net water bodies creation
- Net wetlands creation

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

- icf13 Development of green urban areas
- icf2 Urban residential sprawl
- icf3 Sprawl of economic sites and infrastructures
- icf511 Intensive conversion from forest to agriculture
- icf512 Diffuse conversion from forest to agriculture
- icf61 Withdrawal of farming with woodland creation
- icf71 Conversion from transitional woodland to forest (cons.)
- icf71 Conversion from transitional woodland to forest (form.)
- icf72 Forest creation, afforestation
- icf73 Forests internal conversions (cons.)
- icf73 Forests internal conversions (form.)
- icf74 Recent felling and transition (cons.)
- icf74 Recent felling and transition (form.)
- icf8 Water bodies creation and management
- icf9 Changes of land cover due to natural and multiple causes (cons.)
- icf9 Changes of land cover due to natural and multiple causes (form.)
Lithuania

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

- lcf13 Development of green urban areas
- lcf2 Urban residential sprawl
- lcf3 Sprawl of economic sites and infrastructures
- lcf521 Intensive conversion from semi-natural land to agriculture
- lcf522 Diffuse conversion from semi-natural land to agriculture
- lcf523 Conversions from agriculture-nature mosaics to continuous.
- lcf62 Withdrawal of farming without significant woodland creation
- lcf72 Forest creation, afforestation
- lcf74 Recent felling and transition
- lcf8 Water bodies creation and management
- lcf82 Water bodies management
- lcf911 Semi-natural creation (form.)
- lcf912 Semi-natural rotation (cons.)
- lcf912 Semi-natural rotation (form.)
- lcf913 Extension of water courses (cons.)
- lcf92 Forests and shrubs fires (cons.)
- lcf92 Forests and shrubs fires (form.)
- lcf93 Coastal erosion (cons.)
- lcf94 Decrease in permanent snow and glaciers cover (cons.)
- lcf94 Decrease in permanent snow and glaciers cover (form.)
- lcf99 Other changes and unknown (cons.)
- lcf99 Other changes and unknown (form.)

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

- lcf13 Development of green urban areas
- lcf2 Urban residential sprawl
- lcf3 Sprawl of economic sites and infrastructures
- lcf53 Conversion from wetlands to agriculture
- lcf62 Withdrawal of farming without significant woodland creation
- lcf72 Forest creation, afforestation
- lcf8 Water bodies creation and management (cons.)
- lcf81 Water bodies creation
- lcf9 Changes of land cover due to natural and multiple causes (other than LCF91)
- lcf9 Changes of land cover due to natural and multiple causes (other than LCF912)
- lcf911 Semi-natural creation (form.)
- lcf912 Semi-natural rotation (cons.)
- lcf912 Semi-natural rotation (form.)
- lcf913 Extension of water courses (form.)
Lithuania

Drivers of change 2006-2012

Drivers of change 2000-2006