Land cover 2012

Kosovo*

*Under UNSCR 1244/99.

Photo: © Toni García, My City/EEA
Overview of land cover & change 2006-2012

The overall pace of land cover development in Kosovo (under UNSCR 1244/99) is quite slow, with a mean annual land cover change rate of 0.10%, which is about one half of the European average. Moreover, compared to the previous period 2000-2006, the intensity of the landscape development is getting lower. This slowdown is caused by the rapid decrease of intensity of forest creation and management. This decrease concerns both forest internal conversions and afforestation of non-forested land.

In the period 2006-2012, the sprawl of economic sites and infrastructures, which occurred with significantly higher intensity than in the period 2000-2006, became the most powerful driver of land cover development in Kosovo (under UNSCR 1244/99). On the other hand, the urban residential sprawl, which was the main driver of artificial development in the previous period, became less intensive in the period 2006-2012.

The second most intensive flow in the landscape of the country are agriculture internal conversions, which, however, occur with slightly lower intensity, compared to the previous period. These are represented mostly by conversion from pasture to arable land. There was also observed some amount of forest and shrub fires in the country, in the period 2006-2012, which is included in the flow “Changes due to natural and multiple causes”.

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 a decade between 2000-2006-2012 - see Corine land cover (CLC) programme for details.

Number of years between CLC2006-CLC2012 data for Kosovo (under UNSC 1244/99): 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 [hundreds ha]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land cover 2006</strong></td>
<td>328</td>
<td>1167</td>
<td>3213</td>
<td>5183</td>
<td>807</td>
<td>181</td>
<td>10</td>
<td>23</td>
<td>10912</td>
</tr>
<tr>
<td><strong>Consumption of initial LC</strong></td>
<td>2.8</td>
<td>16.9</td>
<td>20.8</td>
<td>21.1</td>
<td>2.7</td>
<td>2.1</td>
<td>0.0</td>
<td>0.0</td>
<td>66</td>
</tr>
<tr>
<td><strong>Formation of new LC</strong></td>
<td>28.6</td>
<td>16.3</td>
<td>1.3</td>
<td>9.8</td>
<td>0.0</td>
<td>10.3</td>
<td>0.0</td>
<td>0.0</td>
<td>66</td>
</tr>
<tr>
<td><strong>Net Formation of LC</strong></td>
<td>25.8</td>
<td>-0.5</td>
<td>-19.5</td>
<td>-11.3</td>
<td>-2.7</td>
<td>8.2</td>
<td>0.0</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Net formation as % of initial year</strong></td>
<td>7.8</td>
<td>0.0</td>
<td>-0.6</td>
<td>-0.2</td>
<td>-0.3</td>
<td>4.5</td>
<td>0.0</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total turnover of LC</strong></td>
<td>31.4</td>
<td>33.2</td>
<td>22.2</td>
<td>30.8</td>
<td>2.7</td>
<td>12.4</td>
<td>0.0</td>
<td>0.0</td>
<td>133</td>
</tr>
<tr>
<td><strong>Total turnover as % of initial year</strong></td>
<td>9.6</td>
<td>2.8</td>
<td>0.7</td>
<td>0.6</td>
<td>0.3</td>
<td>6.8</td>
<td>0.0</td>
<td>0.0</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Land cover 2012</strong></td>
<td>354</td>
<td>1166</td>
<td>3193</td>
<td>5172</td>
<td>804</td>
<td>189</td>
<td>10</td>
<td>23</td>
<td>10912</td>
</tr>
</tbody>
</table>
KOSOVO (under UNSCR 1244/99)

## Land cover trends 2006-2012

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-2006</td>
<td>1711</td>
</tr>
<tr>
<td>2006-2012</td>
<td>177</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Type</th>
<th>2000-2006</th>
<th>2006-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial areas</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Arable land &amp; permanent crops</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pastures &amp; mosaics</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Forested land</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Semi-natural vegetation</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Open spaces / bare soils</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dry semi-natural land cover</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wetlands</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Water bodies</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Type</th>
<th>2000-2006</th>
<th>2006-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial areas</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Arable land &amp; permanent crops</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pastures &amp; mosaics</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Forested land</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Semi-natural vegetation</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Open spaces / bare soils</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Dry semi-natural land cover</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wetlands</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Water bodies</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Summary trend figures 2000-2006

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual land cover change [ha/year]</td>
<td>1711</td>
</tr>
<tr>
<td>Annual land cover change as % of initial year</td>
<td>0.16%</td>
</tr>
<tr>
<td>Land uptake by artificial development as mean annual change [ha/year]</td>
<td>177</td>
</tr>
<tr>
<td>Agricultural land uptake by urban and infrastructures development as mean annual change [ha/year]</td>
<td>162</td>
</tr>
<tr>
<td>Net uptake of forests and semi-natural land by agriculture as mean annual change [ha/year]</td>
<td>-17</td>
</tr>
<tr>
<td>Net conversion from pasture to arable land and permanent crops as mean annual change [ha/year]</td>
<td>223</td>
</tr>
<tr>
<td>Forest &amp; other woodland net formation as mean annual change [ha/year]</td>
<td>137</td>
</tr>
<tr>
<td>Dry semi-natural land cover net formation as mean annual change [ha/year]</td>
<td>-104</td>
</tr>
<tr>
<td>Wetlands &amp; water bodies net formation as mean annual change [ha/year]</td>
<td>0</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Category</th>
<th>2000-2006</th>
<th>2006-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>lcf1 Urban land management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lcf2 Urban residential sprawl</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lcf3 Sprawl of economic sites and infrastructures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lcf4 Agriculture internal conversions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lcf5 Conversion from forested &amp; natural land to agriculture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lcf6 Withdrawal of farming</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lcf7 Forests creation and management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lcf8 Water bodies creation and management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lcf9 Changes due to natural and multiple causes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Extremely intensive artificial development in European context

The artificial development in Kosovo (under UNSCR 1244/99) between 2006 and 2012 is very strong, with even doubled intensity than in the previous period. The mean annual land take rate of 1.38% is by far the highest among European countries. Geographically, most of the artificial sprawl is concentrated in the surroundings of capital city of Pristina and there is also quite visible the construction of a highway, located in the southwest from the capital city, which should connect Pristina with the Adriatic coast. In contrast to the previous period, during which the artificial development was driven almost exclusively by residential sprawl, in the period 2006-2012, all components of the sprawl are very intensive, including sprawl of residential, commercial/industrial units, mines and dump sites as well as construction and extension of transportation networks.

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

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]
Agriculture (2006-2012)

Intensive conversion from pasture to arable land

Agricultural development in the county is driven mainly by internal agricultural conversions, with prevailing share of intensive conversion of pasture to arable land. Geographically, this process concentrates mainly in the central part of the country. On the other hand, diffuse conversion from pasture to arable land lost most of its intensity, compared to the previous period. The other significant internal agricultural flow is the conversion from vineyards and orchards to arable land. From external flows, agricultural land - mainly arable and complex cultivation patterns - is consumed by the sprawl of economic sites and infrastructures and also by residential sprawl. As a result of all these processes, arable land shows only a slightly positive net change balance, on the other hand, almost 7% of pasture land has been consumed during the period 2006-2012. The other agricultural land cover class with significant consumption are vineyards, with a consumption rate of about 11% of initial area.
KOSOVO (under UNSCR 1244/99)

Forest & nature (2006-2012)

Slowdown of forest internal conversions, forest fires

The exchange of natural landscape in Kosovo (under UNSCR 1244/99) lost most of its intensity, compared to the previous period, mainly due to significant slowdown of internal forest conversions, in particular of conversion from transitional woodland to forest. In the period 2006-2012, the main processes which occurred in the country landscape were forest and shrub fires. These consumed more than 1000 hectares of natural land, mainly of broad-leaved forest. Such fires were also present in the previous period 2000-2006, however, with slightly lower incidence and recently some of areas burnt between 2000 and 2006 are going through afforestation processes. Beside these processes, natural land (in particular transitional woodland/shrub, natural grassland and broad-leaved forest) is being consumed by the extension of mineral extraction and construction sites, which is a similar situation as in the previous period 2000-2006.
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]
KOSOVO (under UNSCR 1244/99)

Artificial areas

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

- Arable land & permanent crops: 43%
- Pastures & mosaics: 36%
- Forested land: 12%
- Open spaces / bare soils: 1%

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

- Disc. urban fabric: 23%
- Construct: 20%
- Dump sites: 1%
- Mineral extraction: 21%
- Airports: 9%
- Road/rail network: 3%

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Formation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-2006</td>
<td>0.41%</td>
</tr>
<tr>
<td>2006-2012</td>
<td>1.31%</td>
</tr>
</tbody>
</table>

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

- lcf11 Urban development/ infilling (cons.)
- lcf11 Urban development/ infilling (form.)
- lcf12 Recycling 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
- lcf911 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.)
**Agriculture**

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

- Industrial/commercial: 6%
- Natural grassland: 31%
- Broad-leaved forest: 6%
- Mineral extraction: 53%

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

- Non-irrigated arable: 37%
- Pastures: 63%

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

- Agriculture with natural veg.: 1%
- Complex cultivation patterns: 37%
- Pastures: 6%
- Vineyards: 12%
- Non-irrigated arable: 43%

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

- Green urban: 0.2%
- Sport/leisure: 0.4%
- Trans. woodland/s hrub: 1%
- Disc. urban fabric: 28%
- Industrial/commercial: 28%
- Airports: 11%
- Road/rail network: 3%
- Minerals extraction: 6%
- Dump sites: 1%
- Construct.: 19%

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

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

- Extension of pasture, set aside and fallow land
- Conversion from pasture to arable and permanent crops
KOSOVO (under UNSCR 1244/99)

Forest & nature

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

- Agriculture with natural veg. 13%
- Non-irrigated arable 38%
- Mineral extraction 49%

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

- Burnt areas 13%
- Transition, woodland/shrub 60%

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

- Sparsely vegetated areas 5%
- Broad-leaved forest 18%
- Natural grassland 43%
- Transition, woodland/shrub 29%

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

- Non-irrigated arable 10%
- Disc. urban fabric 2%
- Construct. 16%
- Mineral extraction 72%

10.37. Forested land 2012 [% of total area]

- Broad-leaved forest 76%
- Mixed forest 2%
- Conifer. forest 4%
- Transit. woodland/shrub 17%

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
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.)