Using Earth Observation data for producing environmental statistics

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• FAO collects annually, from its member states, statistics on the agri-environment, in relation to factors of production (fertilizers and pesticides, land use, water)

• World total response rates are 40-50%. RAP region at 40-50%

• Actual data provision through questionnaires is nonetheless more lacking. For instance, only 4-9 countries (out of 54) in RAP provided official data on Agricultural Land over the period 2010-2019; 11-17 for Cropland, 10-13 for meadows and pastures

• Against this background, countries are asked to provide even more data for reporting on multiple international processes, chiefly sustainability (2030 SDG Agenda) and climate change (UNFCCC)
To bridge this data gap, FAO develops methods and tools to support experts in member countries to work with available geospatial information to produce better environmental statistics, with multiple goals:

- Increase national data availability, and improve dissemination by FAO of basic environmental statistics (example 1: Land Cover-Land Use statistics)

- Enhance reporting by member countries to international processes (example 2: fires and peatland degradation statistics)
The boundaries and names shown and the designations used on these map(s) do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal status of any country, territory, city or area of its authorities, or concerning the delimitation of its frontier and boundaries. Dashed lines on maps represent approximate border lines for which there may not yet be full agreement.
**EXAMPLE 1: LAND COVER TO ESTIMATE LAND USE STATISTICS**

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Land Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural land</td>
<td>Arable land&lt;br&gt;Cropland&lt;br&gt;Land under permanent crops&lt;br&gt;Land under permanent meadows and pastures</td>
</tr>
<tr>
<td></td>
<td>Herbaceous crops&lt;br&gt;Woody crops&lt;br&gt;Multiple or layered crops</td>
</tr>
<tr>
<td>Forest land</td>
<td>Grassland&lt;br&gt;Shrub-covered areas</td>
</tr>
<tr>
<td>Other land</td>
<td>Tree-covered areas&lt;br&gt;Mangroves&lt;br&gt;Artificial surfaces (including urban areas)&lt;br&gt;Shrubs and/or herbaceous vegetation, aquatic or regularly flooded&lt;br&gt;Terrestrial barren land and Sparse vegetation&lt;br&gt;Permanent snow and glaciers&lt;br&gt;Inland water bodies&lt;br&gt;Coastal water bodies and intertidal areas</td>
</tr>
</tbody>
</table>

Total Country and Land Area
EXAMPLE 1: LAND COVER TO ESTIMATE LAND USE STATISTICS

Arable Land, 2018

Million ha

- United States of America
- India
- Russian Federation
- China, mainland
- Brazil
- Argentina
- Canada
- Nigeria
- Ukraine
- Australia

LAND USE
LAND COVER
### Example 1: Land Cover to Estimate Land Use Statistics

#### Permanent Crops, 2018

<table>
<thead>
<tr>
<th>Country</th>
<th>Land Use (million ha)</th>
<th>Land Cover (million ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>China, mainland</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>India</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Brazil</td>
<td>7.5</td>
<td>6</td>
</tr>
<tr>
<td>Malaysia</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Nigeria</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Philippines</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Spain</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Cote d'Ivoire</td>
<td>1</td>
<td>0.5</td>
</tr>
</tbody>
</table>
EXAMPLE 1: LAND COVER TO ESTIMATE LAND USE STATISTICS

Afghanistan QA/QC

Country area: 65,286
Country area - revision: 65,223

Legend:
- Land area
- Inland waters

<table>
<thead>
<tr>
<th>Land area</th>
<th>Inland waters</th>
</tr>
</thead>
<tbody>
<tr>
<td>65,286</td>
<td>63</td>
</tr>
<tr>
<td>65,223</td>
<td></td>
</tr>
</tbody>
</table>
EXAMPLE 2: ECOSYSTEM DEGRADATION and GHG EMISSIONS

FAO Hand in Hand Platform

Source: FAO Hand in Hand Platform

Source: FAO

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EXAMPLE 2: CURRENT VALIDATION

DRAINDED PEATLANDS AND FIRES, 2002-2019

Drained Peatlands, 2000-2018

Peatland Fires, 1990-2019

K tonne CO₂eq

Source: FAO

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• **Note** that geospatial products derived from remote sensing can be used to generate environment statistics at sub-national and national level that complement existing, more traditional processes

• **Encourage** countries to use tools, data platforms and other geospatial products to generate environmental and agricultural statistics at disaggregate levels

• **Note** that FAO’s Hand in Hand platform and FAOSTAT environmental statistics are a basis for capacity development activities, aimed at improving national analysis and international reporting across multiple processes

• **Recommend** FAO to provide countries technical assistance to use earth observation data in production of environmental and agricultural statistics
Thank you!

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