Methodology for the Production and Updating of Agricultural Land Use/Cover Data Set

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Agricultural Land Use/Cover Classification

European Common Agricultural Policy (CAP)

- Integrated Administration and Control System (IACS)
  - Land Parcel Identification System (LPIS)
    - Different Spatial References (Land Parcels)
    - Different National Needs
    - Possibility of Data Share
      - Different Land Use/Cover Classes
Study Area (approx. 4000 ha total area)
Three Rural Districts in Kayseri Province

Boundary Delineation / Adjudication
Fixed Boundaries Approach
Land Use / Cover Classes

Specified Classes

Common Classification
- Planted (Agricultural) – fruit orchards, olive groves, grapes etc.
- Protected (Agricultural) – green house or other protecting cover
- Meadow (Agricultural) – private land for animal grazing

Special Classifications
- Fertile (Agricultural) – only the ones in good condition
- Abandoned (Agricultural) – fertile but not in good condition
- Non-Agricultural (Agricultural)
- Infertile
- Built-up

Classification example – Abandoned land
## Land Use / Cover Classes

### Relation with CORINE Classes

<table>
<thead>
<tr>
<th>Land Use/Cover Class</th>
<th>CORINE Equivalent (Level 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertile</td>
<td>2.1. Arable land</td>
</tr>
<tr>
<td>Planted</td>
<td>2.2. Permanent crops</td>
</tr>
<tr>
<td>Protected</td>
<td>---</td>
</tr>
<tr>
<td>Meadow</td>
<td>2.3. Pastures</td>
</tr>
<tr>
<td>Abandoned</td>
<td>---</td>
</tr>
<tr>
<td>NoneAgricultural</td>
<td>---</td>
</tr>
<tr>
<td>Infertile</td>
<td>3.3. Open spaces with little or no vegetation</td>
</tr>
<tr>
<td>Built-Up</td>
<td>1.1. Urban fabric</td>
</tr>
<tr>
<td></td>
<td>1.2. Industrial, commercial and transport units</td>
</tr>
<tr>
<td></td>
<td>1.3. Mine, dump and construction sites</td>
</tr>
<tr>
<td></td>
<td>1.4. Artificial non-agricultural vegetated areas</td>
</tr>
</tbody>
</table>

### Production

- Ortho Image Interpretation based on Fixed Boundaries Approach
- Scale of Interpretation 1/1000
- Preserving original geometry of fixed boundary larger than 2 m
- Use of Two Different Data Sets (2010 – 2013)
- Two Different Boundary Delineation / Adjudication Methods
  - Without Cadastral Parcel Boundaries (Physical Blocks)
  - With Cadastral Parcel Boundaries (Sub-Parcels)
Production (Samples from Karahoyuk)
Physical Blocks (only Agricultural ones)

Production (Samples from Karahoyuk)
Sub-Parcels (for all Cadastral Parcels)
Interpretation problem of Abandoned Land (in the case of Physical Blocks)

Production (in Elagoz)
Physical Blocks (only Agricultural ones)
Production (in Elagoz)
Sub-Parcels (within all Cadastral Parcels)

Production (in Karahoyuk)
Physical Blocks (only Agricultural ones)
Production (in Karahoyuk)
Sub-Parcels (within all Cadastral Parcels)

Production (in Vatan)
Physical Blocks (only Agricultural ones)
Production (in Vatan)
Sub-Parcels (within all Cadastral Parcels)

Production
Classification of Physical Blocks – in only two classes
Production

Classification of Sub-Parcels – all classes

Legend
- Fertile
- NoneAgricultural
- Planted
- Infertile
- Abandoned
- Built-up
- Meadow

Updating Procedures
For Sub-Parcels

- Hierarchical topology between cadastral parcels and related sub-parcels must be preserved during maintenance/updating,
- Geometrical changes/updates on cadastral parcels should be traced and necessary sub-parcel updating should be carried out accordingly,
- Sub-parcel boundaries must not change seasonally/yearly, so they should be updated only they are changed,
- Changes of different sub-parcel boundaries representing different land use/cover class may occur differently, therefore different updating strategies for each land use/cover class should be developed.
- Edge detection algorithms may help for the detection of change in sub-parcel boundaries.
Updating Procedures (future work)
Detecting boundaries with edge detection algorithms
Results

Important ones ...

- Fixed boundaries approach only works for agricultural fields,
- It is impossible to digitise all physical block boundaries using fixed boundaries approach,
- Incorporating CORINE land cover methodology for none-agricultural areas makes the implementation ineffective,
- However, using cadastral parcel boundaries makes the classification of all types of land (except for state lands not registered in the land registry and cadastre system) possible,
- For unregistered state lands, in combination with sub-parcels inside cadastral parcels, easily identifiable physical blocks may be defined outside cadastral parcels.
- For sustainability of such a data set, the methodology and the classification as well should be further refined to meet the needs of all related government or private bodies.

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Thanks...

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