DEVELOPING A LAND USE CLASSIFICATION SYSTEM FOR AGRICULTURE

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LAND USE CLASSIFICATION FOR AGRICULTURE – THE REASONS

- Legislative requirements (SALA, CARA)
- To determine the current status of agricultural production in the country to ensure long term and sustainable food security

- What product is being produced where?
  - Homogenous agricultural production regions
- Impact of different land use practices on the status of natural agricultural resources
- Supporting agricultural infrastructure (on-farm & off-farm)
- Available markets (demand & supply)
- Access routes
- Contribution of agricultural production to the GDP
- Population dynamics, jobs creation and food security

Effective planning and decision making
APPROACH

• Departure point:

  • Land Cover vs Land Use

    • Land Cover = “the observed (bio)physical cover of the earth surface”

    • Land Use = “arrangements, activities and inputs people undertake in a certain land cover type to produce, change or maintain it”

• Single entity (land cover) vs multiple entities (land use)
LANDCOVER

Land Cover 2009 revised classification:

- Primarily Vegetated Area
  - Terrestrial
    - Natural & Semi-natural Vegetation
    - Cultivated & Managed Terrestrial Area
  - Aquatic or Regularly Flooded
    - Cultivated

- Primarily Non-Vegetated Area
  - Terrestrial
    - Bare Areas
    - Artificial Surfaces
  - Aquatic or Regularly Flooded
    - Natural water bodies
    - Artificial water bodies
Primarily Vegetated Area

FAO / Worldbank land use classification approach:

Terrestrial

Natural & Semi-natural Vegetation

Cultivated & Managed Terrestrial Area

Production from dry land agriculture

- Production from irrigated agriculture

  - Grazing

  - Conservation Area

  - Land Reclamation

  - Cropping

  - Perennial horticulture

  - Planted pastures

    + Grasses

    + Legumes

    + Woody Fodder Plants

  - Irrigated pasture

    + Grasses

    + Legumes

    + Grass-legume mixtures

    + Woody Fodder Plants

    + Irrigated cropping

    + Irrigated perennial horticulture

    + Irrigated seasonal horticulture
Artificial surfaces – Agricultural related:

- **Agriculture: Intensive horticulture structures**
  - **Shade netting**
    - Commodity type /s e.g. flowers (roses); vegetables (tomatoes)
  - **Tunnels**
    - Commodity type /s e.g. flowers (roses); vegetables (tomatoes)
  - **Glass houses**
    - Commodity type /s e.g. flowers (roses); vegetables (tomatoes)
  - **Nurseries**
    - Commodity type /s
Artificial surfaces – Agricultural vs Town planning

Agriculture:
- Processing, storage & handling structures
  - Abattoir
  - Refinery
  - Processing plant
  - Distilleries
  - Cotton Gin
  - Millers
  - Sun-dry platform / area
  - Silos
    - Farm shed
    - Cold rooms
    - Warehouses
    - Wine cellar
  - Dip tanks
    - "Drukgang"
    - Shearing sheds

Agriculture: On-farm housing
- Main Farm dwellings
  - Labour houses

Agriculture: On-farm Utilities
- Energy
  - Solar
  - Wind
  - Renewable energy
- Transmission stations
METHODOLOGY

• Independent from any observation method
  • Remote sensing
  • Satellite imagery
  • Visual interpretation
  • Surveys

• Assign a point per land use

• Scale dependant
  • Consolidate at various levels for different purposes
  • On farm → homogeneous farming area → local level → provincial → national
Example: 1: 250 000

<table>
<thead>
<tr>
<th>1:250 000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primarily Natural Vegetated area</td>
</tr>
<tr>
<td>Woodland</td>
</tr>
</tbody>
</table>
Example: 1: 50 000

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Primarily Natural Vegetated area</td>
</tr>
<tr>
<td>Woodland</td>
</tr>
<tr>
<td>Grazing</td>
</tr>
<tr>
<td>Cattle</td>
</tr>
<tr>
<td>Cultivated &amp; Managed areas</td>
</tr>
<tr>
<td>Cultivation: Irrigated</td>
</tr>
<tr>
<td>Planted pastures</td>
</tr>
</tbody>
</table>
**Example: 1: 2 000**

<table>
<thead>
<tr>
<th>1: 2 000</th>
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</thead>
<tbody>
<tr>
<td>Primarily Natural Vegetated area</td>
</tr>
<tr>
<td>Woodland</td>
</tr>
<tr>
<td>Grazing Cattle</td>
</tr>
<tr>
<td>Beef Bonsmara</td>
</tr>
<tr>
<td>Cultivated &amp; Managed areas</td>
</tr>
<tr>
<td>Cultivation Irrigated</td>
</tr>
<tr>
<td>Planted pastures</td>
</tr>
<tr>
<td>Legumes Lucerne</td>
</tr>
<tr>
<td>Primarily Non-Vegetated area</td>
</tr>
<tr>
<td>Bare areas</td>
</tr>
<tr>
<td>Feedlots Cattle</td>
</tr>
<tr>
<td>Primarily Non-Vegetated area</td>
</tr>
<tr>
<td>Artificial surfaces</td>
</tr>
<tr>
<td>Storage</td>
</tr>
<tr>
<td>Farm shed</td>
</tr>
<tr>
<td>Residential</td>
</tr>
<tr>
<td>Farm homestead</td>
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</tbody>
</table>
Example: 1: 2000
LAND USE LEVELS

Irrigated Grains (Cereals)
- Winter grains
  - Wheat
  - Barley
  - Oats
- Summer grains
  - Maize
  - Rye
  - Millets
  - Sorghum
  - Other

Irrigated Beverage crops

Irrigated Oil seeds
- Seasonal irrigated oilseeds
  - Castor bean
  - Linseed
  - Soya beans
  - Groundnuts
  - Sesame
  - Sunflower
  - Carola
  - Other

Irrigated croppings
- Perennial irrigated oilseed

Irrigated Sugar crops
- Seasonal irrigated sugar crops
  - Sugar beet
  - Sweet sorghum
- Perennial irrigated sugar crops
  - Sugar cane

Irrigated Fibre crops
- Seasonal irrigated fibre crops
  - Cotton
    - Jute, kenaf
  - Flux, hemp
  - Other

Irrigated legume crops

Irrigated Medicinal crops
- Seasonal medicinal crops
  - Irriagated Permanent medicinal crops
- Irrigated Seasonal industrial crops
- Irrigated Permanent industrial crops

Industrial crops

CONSTRAINTS / CHALLENGES

• Overlapping between Agriculture land use classes and Town planning land use classes (and others)
  o Direct & indirect linkages
• Consolidation of classes into one classification system
  o Ease of use
• Repetition of classes between categories
• Land cover vs. land use vs. activity per land use class
  o Classification class or attribute?
• Frequency of updating
• Custodianship
• Description, Interpretation of classes and correct use
• Central repository
  o Flow of information & ease of access