

Development of an Interim Framework for the National Land Use
Classification Standard, Methodology and Symbology for South Africa

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Meta-language for land use classification systems

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Overview

- Classification is subjective!
- Ontologies
- Threats to application-domain standards
- Land cover \neq land use
 - Different types of land cover
- Types of land cover
- Land cover meta-language
- Land use \neq zoning \neq planning
 - But have common elements

Classification is subjective!

- All digital data
 - Attempt to model and describe the world
 - Real or imaginary
 - As is, as planned, as might have been, as forecast, etc
- Always an abstraction of reality
- Always partial
 - Not complete
 - Biased by the compilers
 - Consciously or unconsciously
- Always just one of many possible ‘views’
- Not an exact duplication
 - Some things are approximated
 - Some things are simplified
 - Some things are ignored

Gratuitous slide on ontologies!

- **Ontology**
 - *the branch of metaphysics dealing with the nature of being*
 - [Concise Oxford Dictionary, 8th Ed]
 - One aspect (of many!) of ontology in philosophy is to classify things
 - For assessing existence, essence, qualities, etc
- **Ontology is a concept much abused in computer science!**
 - Formal representation of knowledge
 - Concepts within a domain
 - Relationships between those concepts
 - Shared vocabulary
 - Reason about the encoded knowledge
 - A wide range of interpretations of ontology
 - Standard set of terms and definitions (dictionary or glossary)
 - Fixed and controlled vocabulary
 - Taxonomy or classification
 - Extracting implicit relationships (automated reasoning, inference)
 - Eg: calculated topology in spatial data
 - Metalanguage
 - A language for describing another language or classification system

Threats to application-domain standards

- Different perspectives
 - Classification is a social and political construct
 - Policy maker vs technocrat vs business vs subsistence farmer vs consumer vs researcher
- Changing people's work processes
 - It is easy to specify a system standard someone else must implement
 - But don't impose on me some standard I did not approve of, or that makes me change!

Land cover ≠ land use

- Land cover

- *observed (bio)physical cover on the Earth's surface [ISO 19144-2]*
- Can generally be identified from remotely-sensed imagery
 - Though with significant error rates

- Land use

- *arrangements, activities and inputs people undertake in a certain land cover type to maintain it or produce change [ISO 19144-2]*
- Often needs close inspection on the ground
 - Usage can be obscured
 - Usage can change

Land cover ≠ land use



- **Factory**

- Light engineering vs heavy engineering vs food processing vs ???

- **Office block**

- Government vs commercial vs ???

Land cover ≠ land use



- **Factory**

- Light engineering vs heavy engineering
vs food processing vs ???

- **Office block**

- Government vs commercial vs ???

Or

- Abandoned
- Warehouse
- Shopping centre
- Offices

Or

- Sweat-shop
- Squatters
- Abandoned
- Shebeen
- Prison (Lubyanka)

Different types of land cover

- **Types**

- Physiognomy
- Spectral reflectance
- Ecological



Normally intermingled, confusingly

- **Dependencies**

- Scale, boundaries, minimum mapping unit, season, policy, culture, image quality, pixel size, metadata

- **Forest**

- Tree height, tree spacing, canopy cover, rate of growth, species (bamboo or palm?), ground cover, actual trees vs planned planting

Land cover meta-language

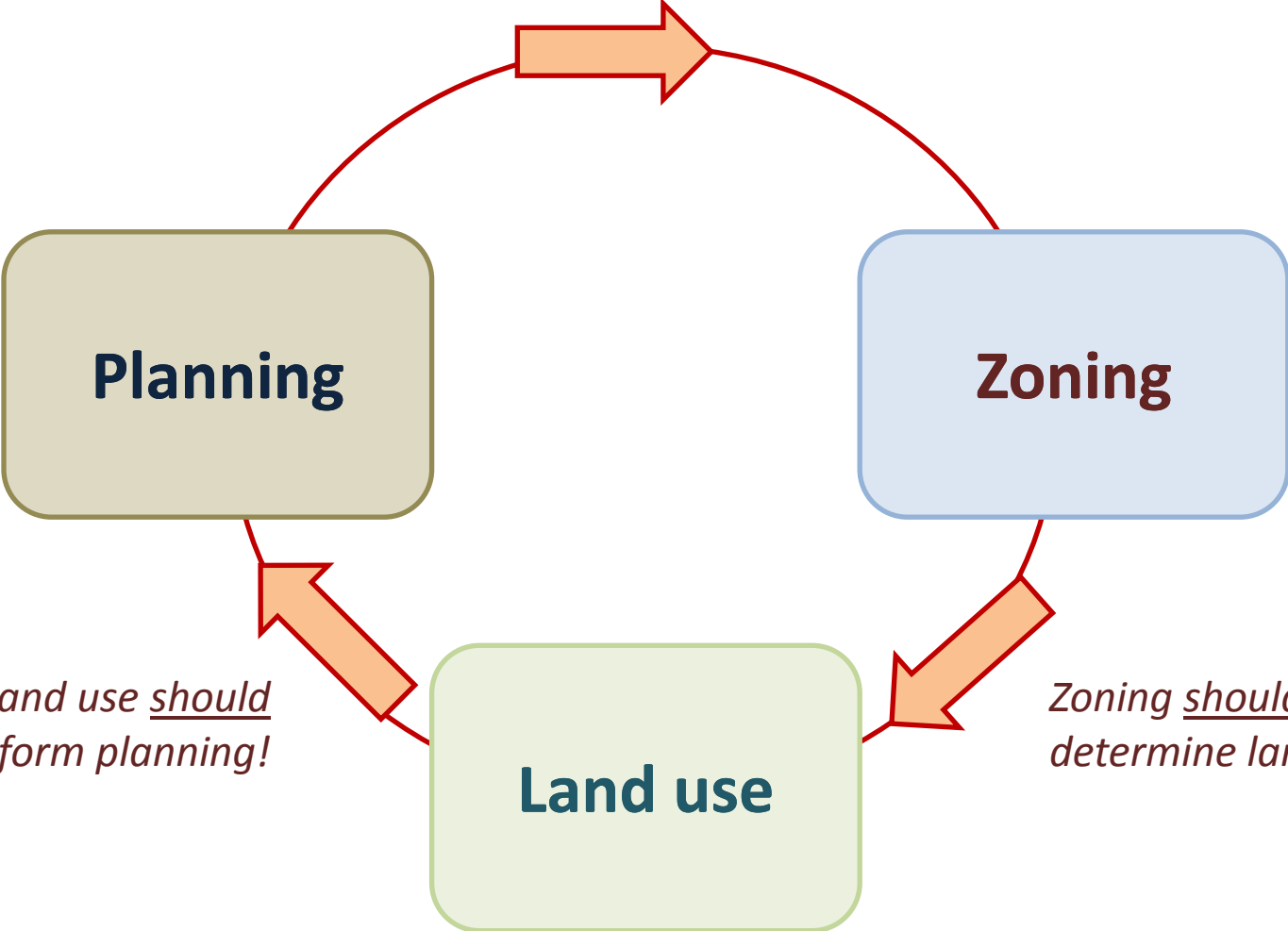
- Compare information from existing classification systems
 - Meaningfully
 - Consistently
 - Without replacing them
 - Complement the development of future classification systems
 - Describe consistently land cover legends (nomenclature)
- Facilitate creating a new land cover classification system

Land use ≠ zoning ≠ planning

- Land use does not stop at political boundaries
 - De facto usage of the area
 - Often mixed
 - Legal or illegal or uncertain
- Zoning is typically by cadastral parcel
 - Designated permitted uses
 - Use or function, building height, density, building lines, impervious surfaces, servitudes, responsibilities, etc
 - Parcels zoned differently can be tied together legally
 - Eg: required parking garage for a shopping centre
 - Segregate incompatible uses
 - Preserve character
- Planning should be a broad vision and based on evidence
 - Order and regulate land use efficiently, effectively and ethically
 - Reduce land-use conflicts
 - Systematic assessment
 - Current and potential economic and social conditions, alternative uses, available resources, future demands, aesthetics, etc

Land use, zoning and planning

Planning should determine zoning!



Land use should inform planning!

Zoning should determine land use!

Common elements

- Land use, zoning and planning have common elements
 - Residential, industrial, government, retail, commercial, transport, recreation, agriculture, natural, vacant, etc
 - Density, intensity, size, volume, activities, nuisances, heritage
 - Urban, peri-urban, rural
 - Managed or unmanaged
 - Formal or informal
 - Permanent, periodic, seasonal, occasional, temporary
 - Rights, responsibilities and restrictions (including servitudes)
 - Attributes (specific goods produced, services offered, etc)
 - Layers or strata
 - Complex three-dimensional classes
 - Unique vs dominant vs mixed vs ???
 - Ancillary and subservient uses

Conclusions

- A metalanguage describes the commonalities and differences in classes in a classification system
 - Facilitates converting data between classification systems
 - Reduces the need to change everyone's work practices
 - Can be used for land use, zoning and planning
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- References
 - ISO 19144-2:2012, *Geographic information – Classification systems – Part 2: Land cover meta language*
 - ISO 19152:2012, *Geographic information – Land Administration Domain Model (LADM)*

Thank you!

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