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Land Use Classification

Proposed for SEEA

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Outline of the Presentation

- **Background**

- **Role of land use classification (LUC) in SEEA**
- **FAO LUC used by IPCC Report**

- **Proposal**

- **LUC for agriculture, forestry, and fisheries based on major global LU databases**
- **LUC for others based on ECE & Eurostat LU classifications**

- **Assessment of the proposed LUC**

- **Rules and principles observed by the proposed LUC**
- **Strong linkage with ISIC**
- **Literature Review: to check the validity of the structure and categories of the proposed LUC**
- **Country LUCs Review: to see how much the proposed LUC can accommodate national LUCs**

Land Use and Cover Accounts in SEEA2003

Figure 8.5 Structure of the basic set of land cover/land use accounts

Call for a LCC

Call for a LUC

A. Stocks

Land cover x land use matrix

	Land Cover	Σ
Land Use		
Σ		

Land use x activities matrix

	Land Use	Σ
Activities / Sectors		
Σ		

B. Changes

Land cover changes matrix

	Land Cover (final state)	Σ
Land cover (initial state)		
Σ		

Land cover changes core account

	Initial state	Changes (gross or net) imputed to			Final state
		economic decisions	natural causes	multiple causes	
Land cover					
Σ					

FAO LUC Used in IPCC Report

FAO Classification (In Sequence of Increasing Intensity of Use)	IPCC Report
(a) Deserts (barren land and waste land)	-
(b) Non-Forest Wooded Lands	-
(c) Wetlands, Non-Forest	Wetlands
(d) Land under Forest	Forest Land
(e) Land under Forestry/Silviculture	Forest Land
(f) Land under Shifting Cultivation	Agroforestry Land
(g) Land under Agroforestry	Agroforestry Land
(h) Land with Temporary Fallow	Cropland
(i) Land under Permanent Meadows and Pastures	Rangeland/Grasslands
(j) Land under Temporary Meadows and Pastures	Rangeland/Grasslands
(k) Land under Permanent Crops	Agroforestry Land
(l) Land under Temporary Crops	Cropland
(m) Land under Temporary Crops Requiring Wetland Conditions	Wetlands
(n) Land under Protective Cover	Peri-Urban Land
(o) Land under Residential/Industrial/Transportation Facilities	Peri-Urban Land

Proposed LUC: First Level

<u>Code</u>	<u>Item</u>
<i>Area in Use</i>	
A	Agricultural land
B	Forest land
C	Land with aquaculture facilities
D	Land used for mining, quarrying, and construction
E	Land used for manufacturing
F	Land used for technical infrastructure
G	Land used for transportation and storage
H	Land used for commercial, financial, and public services
I	Land developed for recreational purposes
J	Residential areas
<i>Area Not in Use</i>	
K	Dry open land with special vegetation cover
L	Dry open land without, or with insignificant, vegetation cover
M	Wet open land
N	Other land, n.e.s.
<i>Water Area</i>	
O	Inland waters
P	Marine waters

Proposed LUC: Second Level

<u>Code</u>	<u>Item</u>
A1	Land under temporary crops
A2	Land under temporary meadows and pastures
A3	Land with temporary fallow
A4	Land under permanent crops
A5	Land under permanent meadows and pastures
A6	Land under protective cover
B1	Naturally regenerated forest land
B2	Planted forest land
C1	Hatcheries
C2	Managed grow-out sites
K1	Bushes and shrubs
K2	Herbaceous vegetation
L1	Barren and sandy land
L2	Glaciers and perpetual snow
O1	Areas with aquaculture or holding facilities
O2	Other inland water areas
P1	Areas with aquaculture or holding facilities
P2	Other marine water

Proposed LUC: Third Level

<u>Code</u>	<u>Item</u>
A11	Cereals
A12	Vegetables and melons
A13	Temporary oilseed crops
A14	Root/tuber crops with high starch or inulin content
A15	Temporary spice crops
A16	Leguminous crops
A17	Sugar crops
A18	Other temporary crops
A41	Fruit and nuts
A42	Permanent oilseed crops
A43	Beverage and permanent spice crops
A44	Other permanent crops
B11	<i>Primary forest</i>
B12	<i>Other naturally regenerated forest</i>
O21	Enhanced areas
O22	Open access waters without enhancement
P21	Enhanced areas
P22	Open access waters without enhancement

Rules and Principles Observed by the Proposed LUC

- **Completeness**
- **Absence of overlap**
- **Dominance**
- **Strict logic**
- **Simplicity and practice**
- **Spatial and temporal consistency**

Proposed LUC: Linkage with ISIC

Code	FAO Proposed LU Classification	Code	ISIC
A	Agricultural land	01	Crop and animal production, hunting and related service activities
B	Forest land	02	Forestry and logging
C	Land with aquaculture facilities	03	Fishing and aquaculture
D	Land used for mining, quarrying, and construction	05–09 41–43	Mining and quarrying Construction
E	Land used for manufacturing	10–33	Manufacturing
F	Land used for technical infrastructure	35 36–39	Electricity, gas, steam and air conditioning supply Water supply; sewerage, waste management and remediation activities
G	Land used for transportation and communication	49–53 58–63	Transportation and storage Information and communication
H	Land used for commercial, financial, and public services	45–47 55–56 64–66 68–75 77–82 84–88 94–96 99	Wholesale and retail trade; repair of motor vehicles and motorcycles Accommodation and food service activities Financial and insurance activities Real estate activities; Professional, scientific and technical activities Administrative and support service activities Public administration; Education; Social work activities Other service activities Activities of extraterritorial organizations and bodies
I	Land developed for recreational purposes	90–93	Arts, entertainment and recreation
J	Residential areas	97–98	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
O1	Areas with aquaculture or holding facilities	03	Fishing and aquaculture
P1	Areas with aquaculture or holding facilities	03	Fishing and aquaculture

Literature Review: Related to LUCs Recommended by Others in the Past

TITLE	A	B	C	D	E	F	G	H	I	J	K	L	M
Area in Use													
Agricultural land	●	●	●	●	*	●	●	●	●	●	●	●	●
Forest land	●	●	●	●	*	●	●	●	●	●	●	●	●
Land with aquaculture facilities			*			*	*		*		*		
Built-up and related land	●	*	●	*			*		●	●		●	●
Land used for mining, quarrying, and construction		●	●	●	●	*	●	●	●		●		●
Land used for manufacturing		*	●	*	●	*			●	●	●		*
Land used for technical infrastructure		*	●	*		*			●		*		*
Land used for transportation and storage		*	●	*	●	*					*		*
Land used for commercial, financial, and public services		*	*	*					●		●		*
Land developed for recreational purposes		●	●		●	●			●		●		
Residential areas		●	●	●	●	●			●		●		●
Area Not in Use			●		●	●	●	●	●				
Dry open land with special vegetation cover	●	●		●						●		●	●
Dry open land without, or with insignificant, vegetation cover		●		●						●		●	●
Wet open land	●	●	●	●					●	●	●	●	●
Water Area													
Inland waters		●	●	●		●	●		●	●	●	●	●

Country Case

Study:

Accommodating National LUCs

A - Argentina

B - Australia

C - Brazil

D - Canada

E - Canada

F - China

G - China

H - India

I - India

J - New Zealand

K - USA

L - USA

DE	TITLE	A	B	C	D	E	F	G	H	I	J	K	L
A	Agricultural land	●	●	●	●	●	●	●	●	●	●	●	●
A1	Land under temporary crops		●	●		●	●		●	●	*	*	*
	Cereals	●	●		●	●							
	Vegetables and melons	●	●		●	●							
	Temporary oilseed crops	*	●			●							
	Root/tuber crops with high starch or inulin content					●							
	Temporary spice crops	*	●										
	Leguminous crops	●	●			●							
	Sugar crops		●		●	●							
	Other temporary crops	*	●			●							
A2	Land under temporary meadows and pastures	●	*	*		*	*				*	*	*
A3	Land with temporary fallow	●		●	●				●	●		●	
A4	Land under permanent crops	*	●	●	●	●	●			●	*	*	*
A5	Land under permanent meadows and pastures	●	*	*	●	*	*		●	●	*	*	*
A6	Land under protective cover		●		●	*							
	Other agricultural land, nes				●					●		●	●
B	Forest land	●	●	●	*	●	●		●	●	●	●	●
B1	Naturally regenerated forest land	●	●	●				●					
B2	Planted forest land	●	●	●	●								
C	Land with aquaculture facilities												
	Built-up and related land			*		●	●	*	*			●	●
D	Land used for mining, quarrying, and construction		●			●	●						●
E	Land used for manufacturing		●									*	*
F	Land used for technical infrastructure			*									*
G	Land used for transportation and storage			*								●	*
H	Land used for commercial, financial, and public services		●									*	*
I	Land developed for recreational purposes		●			●							
J	Residential areas		●										●
	<i>Area Not in Use</i>			*					*	*			
K	Dry open land with special vegetation cover		*		*	●	*	●			*		●
L	Dry open land without, or with insignificant, vegetation cover					●		●	●		●		●
M	Wet open land		●		*	●		●			●		●
N	Other land, n.e.s.		●					●		●	●	●	●
	<i>Water Area</i>		●	*		●	●		*	*			
O	Inland waters		●				●						*
P	Marine waters		●				●						*

Summary and Conclusion

- **The proposed LUC is prepared based on the major LU databases at the global level for the sectors of agriculture, forestry, and fisheries**
- **For the other sectors it is derived from the LUCs recommended and used by ECE and Eurostat**
- **It observes and follows the conventional principles and rules for LU classifications *and***
- **takes into account of the LU classification used by researchers and analysts, particularly the IPCC Report**
- **Linkages are established between the proposed LUC and other economic-social classifications such as the ISIC and CPC**
- **Through a literature review of the LUCs recommended by others in the past and a review of the national LU classifications used by selected countries, the validity of the proposed LUC is checked by both intellectual and empirical tradition and practice**
- **As a result, it seems the structure and the definitions and descriptions of the categories in the proposed LUC to be proper and appropriate**

Questions to the London Group

- **Do you agree with the proposed LUC for SEEA?**
 - **The three-level structure in Table 1?**
 - **The definitions and descriptions of the categories of the proposed LUC in Table 2?**
- **Is it necessary to have a residual category such as “Other land, n.e.s.”?**
- **Should “land use for communication” together with “land use for transportation” as one category or “land use for communication” together with “land use for technical infrastructure” as one category?**