

Land Cover

A new SEEA compliant domain in FAOSTAT

ENVIRONMENT Team
FAO STATISTICS DIVISION



Food and Agriculture Organization
of the United Nations

Main objectives

Land Cover as proxy variable for Land Use: source of QA/QAC for Land use;

Support / reference dataset;

First global and multi-year dataset for land accounting (physical asset accounts);



SEEA Land Cover Classification

Land cover basic rules

Category	Basic rule
Artificial surfaces (including urban and associated areas)	The category is composed of any type of artificial surfaces.
Herbaceous crops	The category is composed of a main layer of cultivated herbaceous plants.
Woody crops	The category is composed of a main layer of cultivated tree or shrub plants.
Multiple or layered crops	The category is composed of at least two layers of cultivated woody and herbaceous plants or different layers of cultivated plants combined with natural vegetation.
Grassland	The category is composed of a main layer of natural herbaceous vegetation with a cover from 10 to 100 per cent.
Tree-covered areas	The category is composed of a main layer of natural trees with a cover from 10 to 100 per cent.
Mangroves	The category is composed of natural trees with a cover from 10 to 100 per cent in aquatic or regularly flooded areas in salt and brackish water.
Shrub-covered areas	The category is composed of a main layer of natural shrubs with a cover from 10 to 100 per cent.
Shrubs and/or herbaceous vegetation, aquatic or regularly flooded	The category is composed of natural shrubs or herbs with a cover from 10 to 100 per cent in aquatic or regularly flooded areas with water persistence from 2 to 12 months per year.
Sparsely natural vegetated areas	The category is composed of any type of natural vegetation (all growth forms) with a cover from 2 to 10 per cent.
Terrestrial barren land	The category is composed of abiotic natural surfaces.
Permanent snow and glaciers	The category is composed of any type of glacier and perennial snow with persistence of 12 months per year.
Inland water bodies	The category is composed of any type of inland water body with a water persistence of 12 months per year.
Coastal water bodies and inter-tidal areas	The category is composed on the basis of geographical features in relation to the sea (lagoons and estuaries) and abiotic surfaces subject to water persistence (intertidal variations).

14 LC classes;

Based on FAO,
LCC System and
Rules

UN SEEA CF, 2012

Rules codified as LCC classifiers (LCCS v2)

CLASS VALUE AND LABEL	CORRESPONDING LCC CLASSIFIERS
1 - Artificial surfaces	B15
2 - Herbaceous crops	A11 A3D1 // A3D3
3 - Woody crops	A11 A1D1 // A2D1 // A1D3 // A2D3
4 - Multiple or layered crops	A11 A1+A3 // A12A1 + A11A3
5 - Grassland	A12 A2A20
6 - Tree-covered areas	A12 A3A20 // A24 A3A20-R1
7 - Mangroves	A24 A1A20-R2 // A1A20-R3
8 - Shrub-covered areas	A12 A4A20 // A24 A2A20-R1
9 - Shrubs and/or herb. Veg., aquatic or reg. flooded	A24 A2A20-R1 // A4A16-R1
10 - Sparsely natural veg. areas	A12 A2A14 // A1A14 // A7A14 // A24 A2A16 // A1A16 // A7A16
11 - Terrestrial barren land	B16 A1 // A4 // A2 // A6 // B1 // B13
12 – Perm. snow and glaciers	B28 A2B1 // A3B1 // B27 A2B1 // A3B1
13 - Inland water bodies	A27 A1B1 // A3B2 // A28 A1B1 // A3B2
14 - Coastal water bodies and intertidal areas	B28 A1B3V5

Data sources: available Global Land Cover maps

1) MODIS (2001 – 2012) 500m (Friedl *et al.*, 2010)

2) CCI - LC (1992 – 2015) ESA Climate Change Initiative
300m (UCL Geomatics, 2017)

Geoprocessing; Country aggregates extracted through
FAO, GAUL (version 2014);

GAUL codes mapped to FAOSTAT codes (and M49, ISO);

Normalized to FAOSTAT Country Land Areas – Inland
water;



Original land cover legends: IGBP-MODIS

IGBP-MODIS CLASS VALUE AND LABEL	IGBP-MODIS LCC CLASSIFIERS
0 - Water	B27 A1 // B2 A1
1 - Evergreen Needleleaf forest	A12 A3A10B2XXD2E1 // A11 A1
2 - Evergreen Broadleaf forest	A12 A3A10B2XXD1E1 // A11 A1
3 - Deciduous Needleleaf forest	A12 A3A10B2XXD2E2 // A11 A1
4 - Deciduous Broadleaf forest	A12 A3A10B2XXD1E2 //A11 A1
5 -Mixed forest	A12 A3A10B2Z5 // A11 A1
6 - Closed shrublands	A12 A4A10B3–B9 // A11 A2
7 - Open shrublands	A12 A4A11B3–B9 // A11 A2
8 - Woody savannas	A12 A3A11B2XXXXXXF2F4F7G4–A12 // A11 A1 // A2
9 - Savannas	A12 A3A11B2XXXXXXF2F4F7G4–A13 // A11 A1 // A2
10 - Grasslands	A12 A2A20
11 - Permanent wetlands	A24 A1XXXV1 // A2XXXV1 // A1XXXV5 // A2XXXV5
12 – Croplands	A11 A3
13 - Urban and built up lands	B15
14 - Cropland/Natural vegetation mosaic	A11 A3 / A12 A2 / A3 / A4
15 - Snow and ice	B28 A2 // A3 // B27 A2 // A3
16 - Barren or sparsely vegetated	B16 // A12 A2A14 // A12 A4A14

17 LC classes;

Originally not based on LCCS

Translated to LCCS (v2) codes by Herold et al., 2008

Original land cover legends: CCI-LC

CCI-LC CLASS VALUE AND NAME – LEVEL 1	LCCS CODING
10 - Cropland, rainfed	A1XXXXXXXXD1 // A2XXXXXXXXD1 // A3XXXXXXXXD1
20 - Cropland, irrigated or post-flooding	A1XXXXXXXXD3 // A2XXXXXXXXD3 // A3XXXXXXXXD3 // A3XXXXXXXXD2
30 - Mosaic cropland (>50%) / nat. veg. (tree, shrub, herb.) <50%	A11 / A12
40 - Mosaic nat. veg. (tree, shrub, herb .cover) (>50%) / cropland (<50%)	A12 / A11
50 - Tree cover, broadleaved, evergreen, closed to open (>15%)	A12 A3A20B2XXD1E1 // A3A20B2XXD1E2-E4
60 - Tree cover, broadleaved, deciduous, closed to open (>15%)	A12 A3A20B2XXD1E2
70 - Tree cover, needleleaved, evergreen, closed to open (>15%)	A12 A3A20B2XXD2E1
80 - Tree cover, needleleaved, deciduous, closed to open (>15%)	A12 A3A20B2XXD2E2
90 - Tree cover, mixed leaf type (broadleaved and needleleaved)	A12 A3A20B2XXD1 / A3A20B2XXD2
100 - Mosaic tree and shrub (>50%) / herb. cover (<50%)	A12 A3A20 // A4A20 / A2A20
110 - Mosaic herbaceous cover (>50%) / tree and shrub (<50%)	A12 A2A20 / A3A20 // A4A20
120 – Shrubland	A12 A4A20
130 - Grassland	A12 A2A20
140 - Lichens and mosses	A12 A7A20
150 - Sparse veg. (tree, shrub, herb. cover) (<15%)	A12 A3A14 // A4A14 // A2A14
160 - Tree cover, flooded, fresh or brackish water	A24 A3A20B2C1D1-R1 // A3A20B2C2D1-R1
170 - Tree cover, flooded, saline water	A24 A3A20B2C1D1-C5-R2 // A3A20B2C1D1-C5-R3
180 - Shrub or herb. cover, flooded	A24 A4A20B3C1 // A4A20B3C2 // A4A20B3C3 // A2A20B4C1 // A2A20B4C2 // A2A20B4C3
190 - Urban areas	B15
200 - Bare areas	B16 A1 // A2
210 - Water bodies	B28 A1B1 // B27 A1B1
220 - Permanent snow and ice	B27 A2B1 // A3B1 // B28 A2B1 // A3B1

22 LC classes at Level 1;

Originally based on LCCS (v2)

LCCS codes reported in reference publication [UCL Geomatic, 2017](#)

Mapping to SEEA CF land cover classes

Based on **corresponding LCC classifiers** (e.g. IGBP MODIS Class 15 to SEEA 12 “Permanent snow and Glaciers” B28A2 B28A3 B27A2 B27A3)

Mutually exclusive mapping (rules for mosaic classes);

SEEA classes 4 “Multi-layered crops” and 14 “Coastal and intertidal areas” could not be mapped from current sources (assumed NA);

Dataset compiled in FAOSTAT:

<http://fenix.fao.org/faostat/internal/en/#data/LC>



FAOSTAT Agri-Environmental Indicators: LAND COVER

Land cover

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- Angola

Select All

Clear All

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Filter results e.g. area from modis

- Area from MODIS
- Area from CCI_LC

Select All

Clear All

[ITEMS](#)

Filter results e.g. artificial surfaces (including urba

- Artificial surfaces (including urban and associated ar...
- Herbaceous crops
- Woody crops
- Multiple or layered crops
- Grassland
- Tree-covered areas

[YEARS](#)

Filter results e.g. 2015

- 2015
- 2014
- 2013
- 2012
- 2011
- 2010

Land cover

[Bulk Downloads](#)

All Data	405 KB
All Data Normalized	1.06 MB
All Area Groups	60 KB
Africa	90 KB
Americas	72 KB
Asia	84 KB
Europe	70 KB
Oceania	21 KB

Last Update

May 18, 2017

Related Documents

-

[Definitions and standa...](#)



Metadata

FAOSTAT tools: Visualize

FAOSTAT

Area of SEEA land cover class

Search an Indicator or Commodity

Back to domains

Land Cover

The FAOSTAT domain Land Cover under the Agri-Environmental Indicators section contains land cover

Item

Woody crops

Area (1000 ha) of, Woody crops

Average 1992 - 2015

The designations employed and the boundaries shown on this map do not imply the endorsement of any opinion whatsoever on the part of FAO concerning the legal or constitutional status of any country or the delimitation of frontiers. South Sudan declared its independence on July 9, 2011. Due to data availability, the assessment presented in this map for South Sudan reflects the situation up to 2011 for the former Sudan.

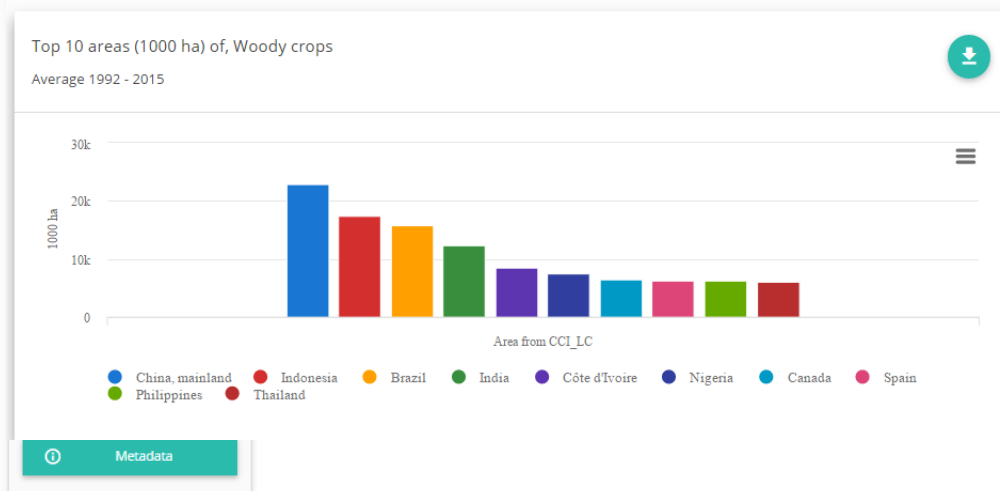
Area (1000 ha) of, Woody crops

1992 - 2015

Year	Area (1000 ha)
1992	180
1993	185
1994	190
1995	195
1996	198
1997	200
1998	202
1999	205
2000	208
2001	210
2002	212
2003	215
2004	218
2005	220
2006	222
2007	225
2008	225
2009	225
2010	225
2011	225
2012	225
2013	225
2014	225
2015	225

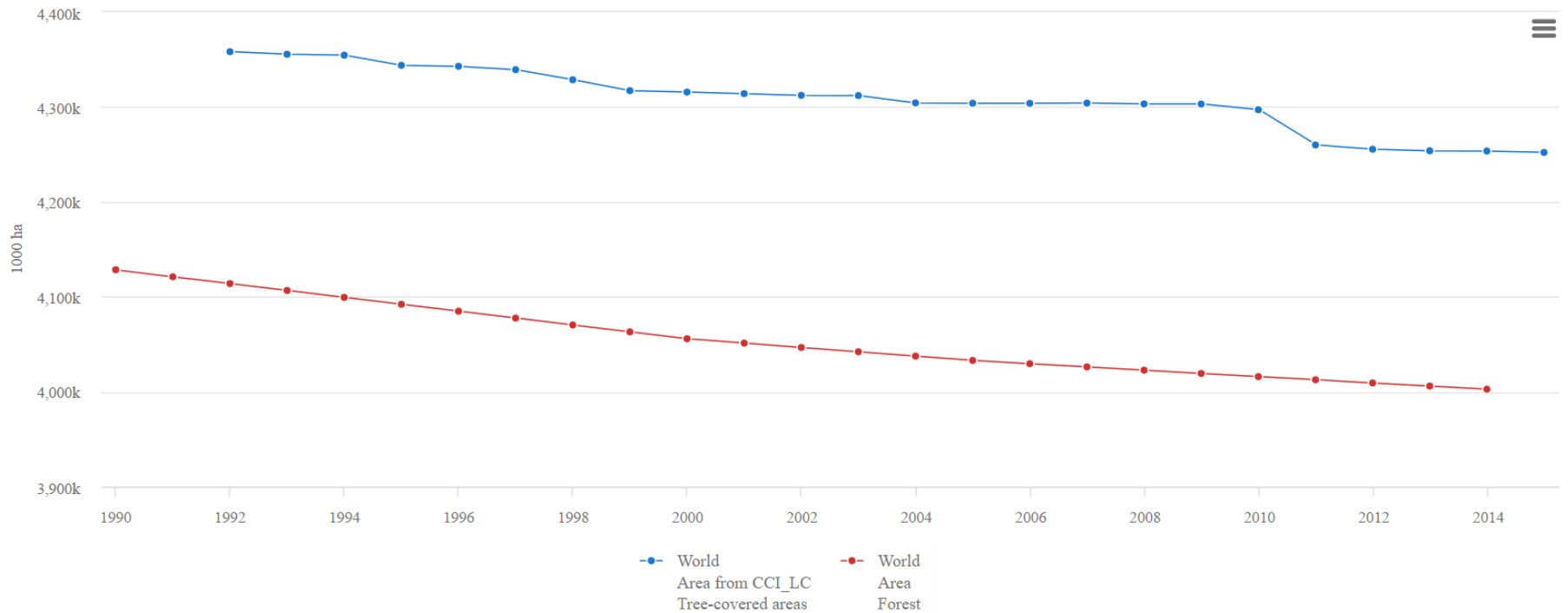
World
Area from CCI_LC
Woody crops

Area of Woody(crops) by continent



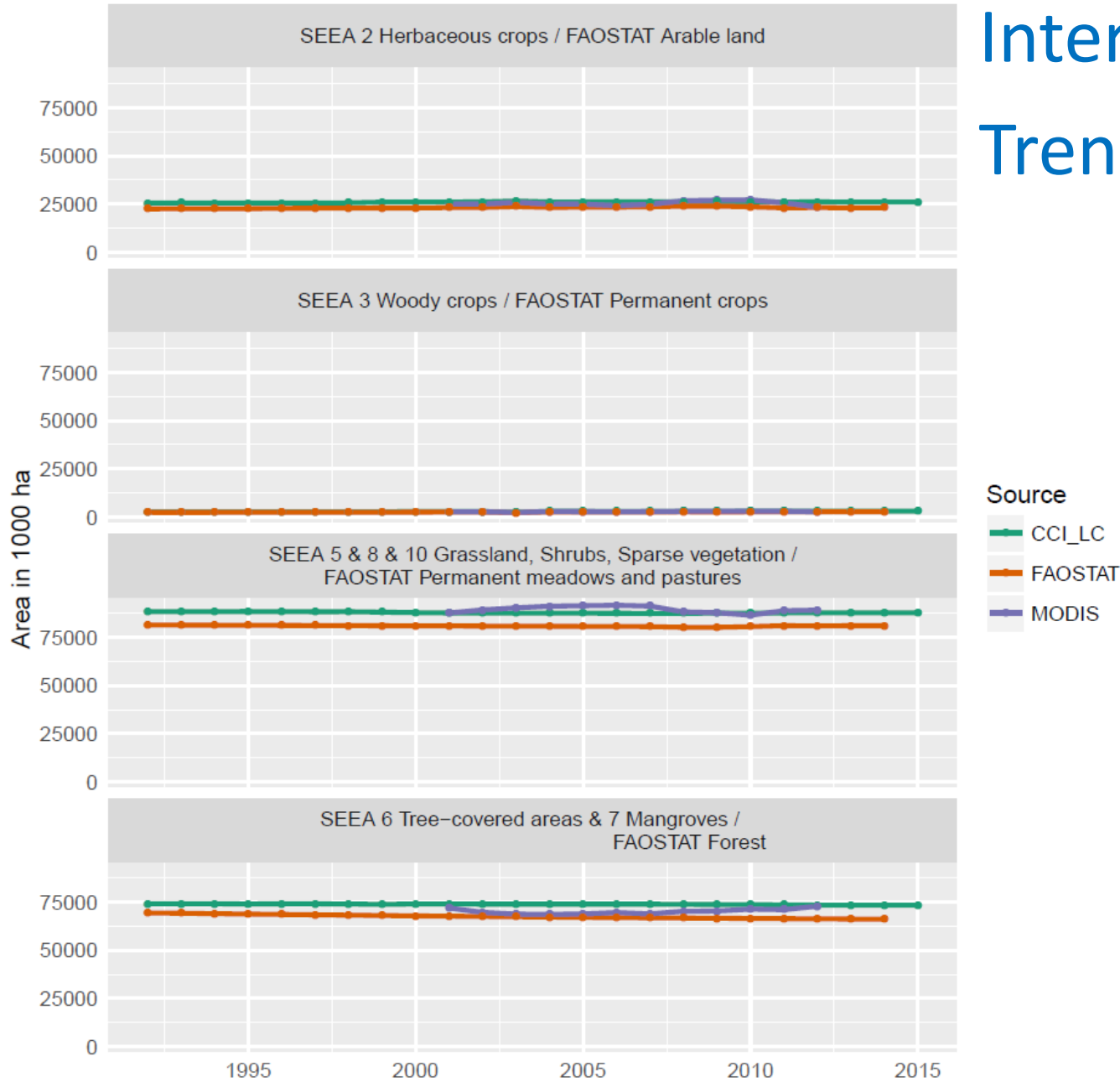
FAOSTAT tools: Compare for QAQC (Land Use)

Timeseries on selected data



Mexico

Internal QA/QC Trend analysis



Conclusions

- FAOSTAT LAND COVER database has been compiled and is currently undergoing internal peer review
- It maps MODIS and ESA land cover maps unto the SEEA fourteen land cover classes using LCCS vs.2
- It will be made available to external users in July 2017
- It will be used at FAO initially as QA/QC of FAOSTAT Land Use data

THANK YOU

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