LUCAS Master Grid record descriptor

Table of contents

1. Scope and introduction

This document is part of a series of reference documents defining the framework of the land use / cover area frame statistical survey (LUCAS). The LUCAS reference documents are periodically improved and adapted taking into account the experience from the implemented surveys and the requirements of the LUCAS data and information users.

LUCAS is coordinated by Eurostat, the statistical office of the European Union.

The EU Commission uses the micro data collected in the LUCAS survey to produce land cover and land use aggregated statistical tables and to calculate sustainable development indicators and land take.

Landscape indicators are also derived from the data collected in the survey. LUCAS micro data are also used for agri-environmental indicators (AEI), land use, land use change and forestry (LULUCF) indicators, and for European resource efficiency indicators.

Data from LUCAS can be used to help analyse and contribute to the development of various EU policy areas:

- **Common agricultural policy**

  A new green architecture fostering a sustainable and competitive agricultural sector contributing to the European green deal and the farm to fork strategy.

- **Soil thematic strategy**

  Preventing soil degradation, preserving soil functions, and restoring degraded soils

- **Biodiversity strategy for 2030**

  Protecting and restoring nature and biodiversity in the EU

- **2030 agenda for sustainable development**

  Encouraging the efficient use of resources for sustainable growth and land degradation neutrality

- **Farm to fork strategy**

  Building a fair, healthy, and environmentally friendly food system in the EU

- **EU climate action and the European green deal**

  Aiming to cutting greenhouse gas emissions, to investing in cutting-edge research and innovation, to preserving Europe's natural environment.

They can also be used for projects such as:

- **Copernicus**

  Land monitoring, spatial planning and resources management, as carried out by Copernicus earth observation programme.

  More information on land cover/use statistics and on LUCAS in general can be found on the Eurostat website.

LUCAS sampling

The LUCAS sampling is based on two-phase sampling with stratification of the master sample of points.

i) First phase (Master grid): The LUCAS master is obtained using a 4 km² grid (2x2 km) which includes around 1 000 000 points covering the EU-27 territory. Each of these points is classified into k land cover categories (the strata) on the basis of photointerpretation of aerial photos or satellite images. In 2022, these points in the master were stratified into 10 aggregated strata.

ii) Second phase (Sample): The final field sample is a sub-selection of the master. Samples of n points, out of N, is selected by strata and by NUTS2 and the n points are visited in order to determine the land cover and land use at a more detailed level[1]. The final aim of this strategy is to estimate the coverage of the full list of categories included in the LUCAS land cover and land use classification over the whole study area. In this way, it is possible to combine the information resulting from the photointerpretation with the information collected during the ground inspection of a portion of the N points selected in the first phase.

The final statistical estimates are based on the weights derived both from the master and the field observations collected on the field.

This document provides record descriptor of the Master Grid.

[1] The NUTS regions of ES(70) = Canary Islands, PT(20) = Azores, and PT3(20)= Madeira not included in second phase of LUCAS 2022

2. Record descriptor

Field name	Type	Description
POINT_ID	Integer	Identifier of the point
NUTS0_16	String	Country (NUTS 2016 Classification)
NUTS2_16	String	Region (NUTS 2016 Classification)
CLC18_R	Integer	CORINE Land Cover value attached to the LUCAS point
DIST_CLC18_m	Number	Distance of LUCAS point from nearest CLC urban polygon (CLC=1) in meters
X_LAEA	Integer	Longitude in LAEA
Y_LAEA	Integer	Latitude in LAEA
X_WGS84	Decimal	Longitude in WGS84
Y_WGS84	Decimal	Latitude in WGS84
ELEV	Integer	Elevation in meters (EUDEM)
STR18	Integer	Stratum 2018 (2018 Photointerpretation) 1 = Arable land 2 = Permanent crops 3 = Grass 4 = Wooded areas 5 = Shrubs 6 = Bare surface, low or rare vegetation 7 = Artificial constructions and sealed areas 8 = Inland water 9 = Transitional and Coastal Water 10 = Impossible to PI
eligible_grassland	Boolean	Eligible for grassland (not necessarily selected)
eligible_soil	Boolean	Eligible for soil (not necessarily selected)
eligible_ext_grassland	Boolean	Eligible for extended grassland (not necessarily selected)
eligible_LF	Boolean	Eligible for landscape features (not necessarily selected)
dehesas	Boolean	Dehesas point (only for ES_PT)
LUCAS_FLAG	Boolean	Belongs to LUCAS 2022 sample

Field name	Type	Description
STRATUM_LUCAS	Text	LUCAS 2022 sample stratum (e.g. PT4*1*11*4 - PT4 = NUTS 2 region, 1 = binary flag if the predicted LC equals the observed, 11 = 2nd digit CLC value, 4 = STR18 value)
Obs_type	Text	Observation type in 2022 survey FI = surveyed on field PI = Photointerpretation in the office
GRASSLAND_FLAG	Boolean	Belongs to GRASSLAND sample
Countries_reg	String	GRASSLAND country regions
EXT_GRASSLAND_FLAG	Boolean	Belongs to EXTENDED GRASSLAND 2022 sample
LF_FLAG	Boolean	Belongs to LANSCAPE FEATURES 2022 sample
SOIL_FLAG	Boolean	Belongs to SOIL 2022 sample
COPERNICUS_FLAG	Boolean	Belongs to COPERNICUS 2022 sample
NUTS0_21	String	Country (NUTS 2021 classification)
NUTS1_21	String	Sub_country_division (NUTS 2021 classification)
NUTS2_21	String	Region (NUTS 2021 classification)
NUTS3_21	String	Province (NUTS 2021 classification)
GRASSREG	String	GRASSLAND regions 1n = Atlantic-Northwest (North) 1s = Atlantic-Northwest (South) 2m = Boreal - Scandinavia + Baltic Sea (Middle) 2n = Boreal - Scandinavia + Baltic Sea (North) 2s = Boreal - Scandinavia + Baltic Sea (South) 3n = Atlantic – South + East (North) 3s = Atlantic – South + East (South) 4e = Continental – North (East) 4m = Continental – North (Middle) 4w = Continental – North (West) 5n = Mediterranean – West + Central (North) 5s = Mediterranean – West + Central (South) 6 = Continental – South 7 = Pannonian 8 = Continental – East 9 = Steppic + Black Sea region 10e = Mediterranean – East (East) 10n = Mediterranean – East (North) 10s = Mediterranean – East (South)
SLOPE	Number	Slope (EUDEM)

Field name	Type	Description
N00	Boolean	Natura 2000
COAST81	Number	COAST81 Integer. Distance in meters to coastal line up to 10 000 meters. Points located beyond that distance are classified as 0
NEARELEV	Number	NEARELEV Decimal. Elevation in meters of the nearest point in a road
NRDIST17	Decimal	NEARDIST Distance to nearest point on a road (meters)
NR_X17	Number	NEAR_X_LAEA coordinate of the nearest point in a road
NR_Y17	Number	NEAR_Y_LAEA coordinate of the nearest point in a road
NRANGL17	Decimal	NEARANGL. Angle to nearest point in a road.
BIOGEO16	String	Biogeographical region where point belongs: Alpine, Atlantic, Black Sea, Boreal, Continental, Macaronesia, Mediterranean, NA, Outside, Pannonian, Steppic.
LU11	Boolean	If the statistical prediction of the land use of the point is agricultural. For further information, consult our publication.
LC_flag	Boolean	If the statistical prediction of the land cover of the point is the same at its true value. For further information, consult our publication.

3. CORINE land cover

CORINE is a programme started as a prototype project working on many different environmental issues. One important product is an inventory of land use and land cover in 44 classes in 3 hierarchical levels.

CLC	LABEL1	LABEL2	LABEL3
111	Artificial surfaces	Urban fabric	Continuous urban fabric
112	Artificial surfaces	Urban fabric	Discontinuous urban fabric
121	Artificial surfaces	Industrial, commercial and transport units	Industrial or commercial units
122	Artificial surfaces	Industrial, commercial and transport units	Road and rail networks and associated land
123	Artificial surfaces	Industrial, commercial and transport units	Port areas
124	Artificial surfaces	Industrial, commercial and transport units	Airports
131	Artificial surfaces	Mine, dump and construction sites	Mineral extraction sites
132	Artificial surfaces	Mine, dump and construction sites	Dump sites
133	Artificial surfaces	Mine, dump and construction sites	Construction sites
141	Artificial surfaces	Artificial, nonagricultural vegetated areas	Green urban areas
142	Artificial surfaces	Artificial, nonagricultural vegetated areas	Sport and leisure facilities
211	Agricultural areas	Arable land	Non-irrigated arable land
212	Agricultural areas	Arable land	Permanently irrigated land
213	Agricultural areas	Arable land	Rice fields
221	Agricultural areas	Permanent crops	Vineyards
222	Agricultural areas	Permanent crops	Fruit trees and berry plantations
223	Agricultural areas	Permanent crops	Olive groves
231	Agricultural areas	Pastures	Pastures
241	Agricultural areas	Heterogeneous agricultural areas	Annual crops associated with permanent crops
242	Agricultural areas	Heterogeneous agricultural areas	Complex cultivation patterns
243	Agricultural areas	Heterogeneous agricultural areas	Land principally occupied by agriculture, with significant areas of natural vegetation

CLC	LABEL1	LABEL2	LABEL3
244	Agricultural areas	Heterogeneous agricultural areas	Agri-forestry areas
311	Forest and semi natural areas	Forests	Broad-leaved forest
312	Forest and semi natural areas	Forests	Coniferous forest
313	Forest and semi natural areas	Forests	Mixed forest
321	Forest and semi natural areas	Scrub and/or herbaceous vegetation associations	Natural grasslands
322	Forest and semi natural areas	Scrub and/or herbaceous vegetation associations	Moors and heathland
323	Forest and semi natural areas	Scrub and/or herbaceous vegetation associations	Sclerophyllous vegetation
324	Forest and semi natural areas	Scrub and/or herbaceous vegetation associations	Transitional woodland-shrub
331	Forest and semi natural areas	Open spaces with little or no vegetation	Beaches, dunes, sands
332	Forest and semi natural areas	Open spaces with little or no vegetation	Bare rocks
333	Forest and semi natural areas	Open spaces with little or no vegetation	Sparsely vegetated areas
334	Forest and semi natural areas	Open spaces with little or no vegetation	Burnt areas
335	Forest and semi natural areas	Open spaces with little or no vegetation	Glaciers and perpetual snow
411	Wetlands	Inland wetlands	Inland marshes
412	Wetlands	Inland wetlands	Peat bogs
421	Wetlands	Maritime wetlands	Salt marshes
422	Wetlands	Maritime wetlands	Salines
423	Wetlands	Maritime wetlands	Intertidal flats
511	Water bodies	Inland waters	Water courses
512	Water bodies	Inland waters	Water bodies
521	Water bodies	Marine waters	Coastal lagoons
522	Water bodies	Marine waters	Estuaries
523	Water bodies	Marine waters	Sea and ocean